DEPARTMENT OF THE INTERIOR
HUBERT WORK, Secretary

UNITED STATES GEOLOGICAL SURVEY
GEORGE OTIS SMITH, Director

WATER-SUPPLY PAPER 502

# SURFACE WATER SUPPLY OF THE UNITED STATES

## 1919 AND 1920

## PART II. SOUTH ATLANTIC SLOPE AND EASTERN GULF OF MEXICO BASINS

NATHAN C. GROVER, Chief Hydraulic Engineer
GUY C. STEVENS, C. G. PAULSEN, and WARREN E. HALL
District Engineers

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# CONTENTS.

## ILLUSTRATIONS.

# SURFACE WATER SUPPLY OF SOUTH ATLANTIC SLOPE AND EASTERN GULF OF MEXICO DRAINAGE BASINS, 1919 AND 1920.

## AUTHORIZATION AND SCOPE OF WORK.

This volume is one of a series of 14 reports presenting results of measurements of flow made on streams in the United States during the years ending September 30, 1919 and 1920.

The data presented in these reports were collected by the United States Geological Survey under the following authority contained in the organic law (20 Stat. L., p. 394):

*Provided,* That this officer [the Director] shall have the direction of the Geological Survey and the classification of public lands and examination of the geological structure, mineral resources, and products of the national domain.

The work was begun in 1886 in connection with special studies relating to irrigation in the arid West. Since the fiscal year ending June 30, 1895, successive sundry civil bills passed by Congress have carried the following item and appropriations:

For gaging the streams and determining the water supply of the United States, and for the investigation of underground currents and artesian wells, and for the preparation of reports upon the best methods of utilizing the water resources.

*Annual appropriations for the fiscal years ended June 30, 1895–1921.*

| | |
|---|---|
| 1895 | $12,500.00 |
| 1896 | 21,000.00 |
| 1897 to 1900, inclusive | 50,000.00 |
| 1901 to 1902, inclusive | 100,000.00 |
| 1903 to 1906, inclusive | 200,000.00 |
| 1907 | 150,000.00 |
| 1908 to 1910, inclusive | 100,000.00 |
| 1911 to 1917, inclusive | 150,000.00 |
| 1918 | 175,000.00 |
| 1919 | 148,244.10 |
| 1920 | 175,000.00 |
| 1921 | 180,000.00 |

In the execution of the work many private and State organizations have cooperated, either by furnishing data or by assisting in collecting data. Acknowledgments for cooperation of the first kind are made in connection with the description of each station affected; cooperation of the second kind is acknowledged on page 9.

Measurements of stream flow have been made at about 5,000 points in the United States and also at many points in Alaska and the Hawaiian Islands. In July, 1920, 1,350 gaging stations were being maintained by the Survey and the cooperating organizations. Many miscellaneous discharge measurements are made at other points. In connection with this work data were also collected in regard to precipitation, evaporation, storage reservoirs, river profiles, and water power in many sections of the country and will be made available in water-supply papers from time to time.

## DEFINITION OF TERMS.

The volume of water flowing in a stream—the "run-off" or "discharge"—is expressed in various terms, each of which has become associated with a certain class of work. These terms may be divided into two groups—(1) those that represent a rate of flow, as second-feet, gallons per minute, miners' inches, and discharge in second-feet per square mile, and (2) those that represent the actual quantity of water, as run-off in inches, acre-feet, and millions of cubic feet. The principal terms used in this series of reports are second-feet, second-feet per square mile, run-off in inches, and acre-feet. They may be defined as follows:

"Second-feet" is an abbreviation for "cubic feet per second." A second-foot is the rate of discharge of water flowing in a channel of rectangular cross section 1 foot wide and 1 foot deep at an average velocity of 1 foot per second. It is generally used as a fundamental unit from which others are computed.

"Second-feet per square mile" is the average number of cubic feet of water flowing per second from each square mile of area drained, on the assumption that the run-off is distributed uniformly both as regards time and area.

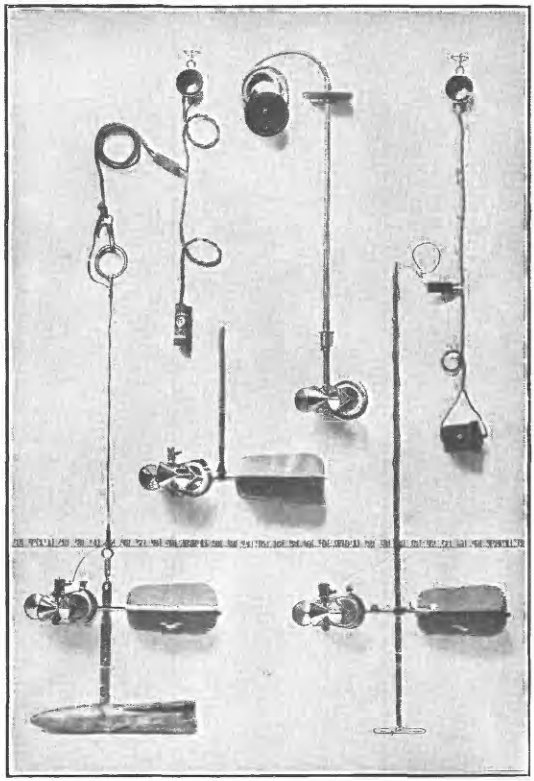
"Run-off in inches" is the depth to which an area would be covered if all the water flowing from it in a given period were uniformly distributed on the surface. It is used for comparing run-off with rainfall, which is usually expressed in depth in inches.

An "acre-foot," equivalent to 43,560 cubic feet, is the quantity required to cover an acre to the depth of 1 foot. The term is commonly used in connection with storage for irrigation.

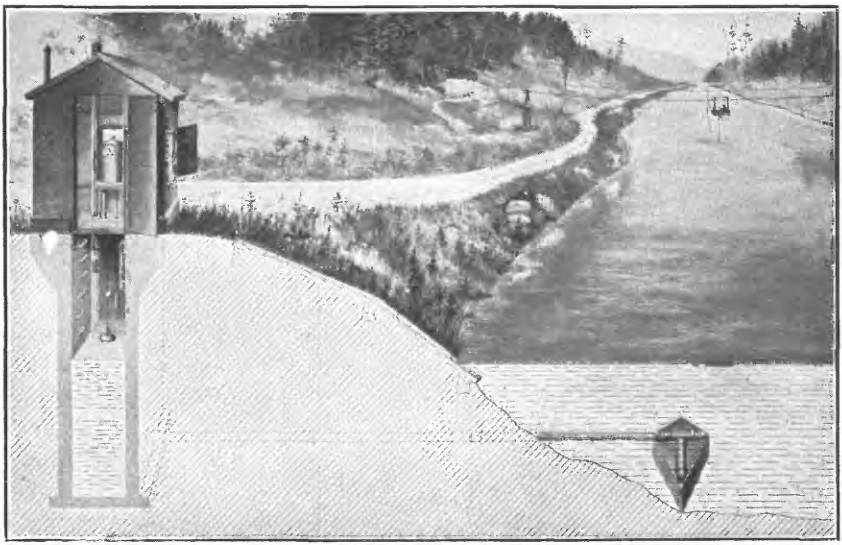
The following terms not in common use are here defined:

"Stage-discharge relation," an abbreviation for the term "relation of gage height to discharge."

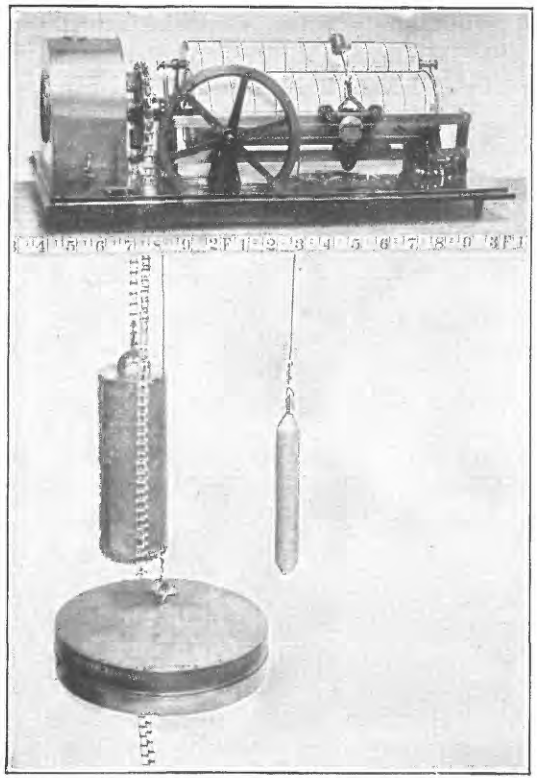
"Control," a term used to designate the section or sections of the stream below the gage which determine the stage-discharge relation at the gage. It should be noted that the control may not be the same section or sections at all stages.



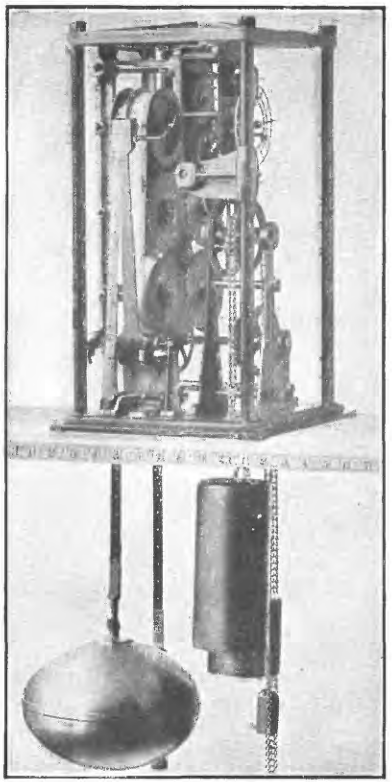
*A*. PRICE CURRENT METERS.



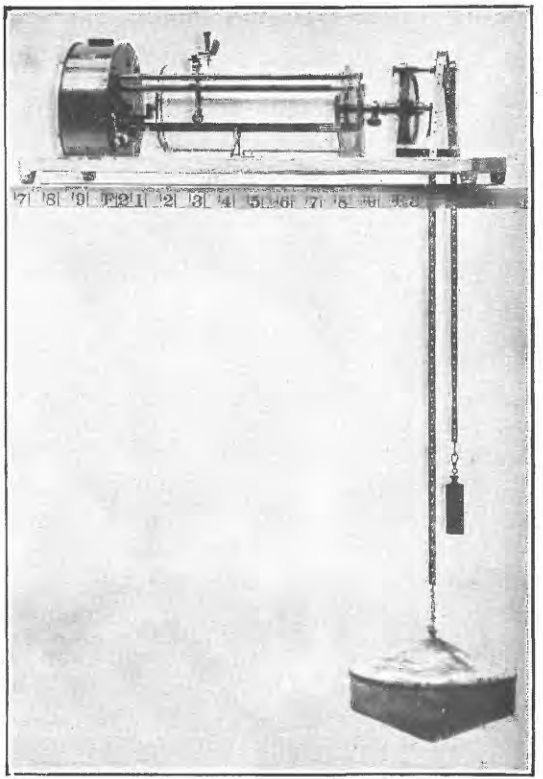
*B*. TYPICAL GAGING STATION.



*A*. STEVENS CONTINUOUS.



*B*. GURLEY PRINTING.



*C*. FRIEZ.

WATER-STAGE RECORDERS.

The "point of zero flow" for a given gaging station is that point on the gage—the gage height—at which water ceases to flow over the control.

## EXPLANATION OF DATA.

The data presented in this report cover the two-year period beginning October 1, 1918, and ending September 30, 1920. At the beginning of January in most parts of the United States much of the precipitation in the preceding three months is stored as ground water in the form of snow or ice, or in ponds, lakes, and swamps, and this stored water passes off in the streams during the spring break-up. At the end of September, on the other hand, the only stored water available for run-off is possibly a small quantity in the ground; therefore the run-off for the year beginning October 1 is practically all derived from precipitation within that year.

The base data collected at gaging stations consist of records of stage, measurements of discharge, and general information used to supplement the gage heights and discharge measurements in determining the daily flow. The records of stage are obtained either from direct readings on a staff or chain gage or from a water-stage recorder that gives a continuous record of the fluctuations. Measurements of discharge are made with a current meter. (See Pls. I, II.) The general methods are outlined in standard textbooks on the measurement of river discharge.

From the discharge measurements rating tables are prepared that give the discharge for any stage, and these rating tables, when applied to gage heights, give the discharge from which the daily, monthly, and yearly mean discharge is determined.

The data presented for each gaging station in the area covered by this report comprise a description of the station, a table giving results of discharge measurements, a table showing the daily discharge of the stream, and a table of monthly and yearly discharge and run-off.

If the base data are insufficient to determine the daily discharge, tables giving daily gage heights and results of discharge measurements are published.

The description of the station gives, in addition to statements regarding location and equipment, information in regard to any conditions that may affect the constancy of the stage-discharge relation, covering such subjects as the occurrence of ice, the use of the stream for log driving, shifting of control, and the cause and effect of backwater; it gives also information as to diversions that decrease the flow at the gage, artificial regulation, maximum and minimum recorded stages, and the accuracy of the records.

Many gaging stations on streams in the irrigated sections of the United States are located above most of the diversions from those

streams, and the discharge recorded does not show the water supply available for further development, as prior appropriations below the stations must first be satisfied. To give an idea of the amount of prior appropriations, a paragraph on diversions is presented in each station description. The figures given can not be considered exact but represent the best information available.

The table of daily discharge gives, in general, the discharge in second-feet corresponding to the mean of the gage heights read each day. At stations on streams subject to sudden or rapid diurnal fluctuation the discharge obtained from the rating table and the mean daily gage height may not be the true mean discharge for the day. If such stations are equipped with water-stage recorders the mean daily discharge may be obtained by averaging discharge at regular intervals during the day, or by using the discharge integrator, an instrument operating on the principle of the planimeter and containing as an essential element the rating curve of the station.

In the table of monthly discharge the column headed "Maximum" gives the mean flow for the day when the mean gage height was highest. As the gage height is the mean for the day it does not indicate correctly the stage when the water surface was at crest height, and the corresponding discharge was consequently larger than given in the maximum column. Likewise, in the column headed "minimum," the quantity given is the mean flow for the day when the mean gage height was lowest. The column headed "Mean" is the average flow in cubic feet for each second during the month. On this average flow computations recorded in the remaining columns, which are defined on page 2, are based.

## ACCURACY OF FIELD DATA AND COMPUTED RESULTS.

The accuracy of stream-flow data depends primarily (1) on the permanence of the stage-discharge relation and (2) on the accuracy of observation of stage, measurements of flow, and interpretation of records.

A paragraph in the description of the station or footnotes added to the tables gives information regarding the (1) permanence of the stage-discharge relation, (2) precision with which the discharge rating curve is defined, (3) refinement of gage readings, (4) frequency of gage readings, and (5) methods of applying daily gage heights to the rating table to obtain the daily discharge.[1]

For the rating tables "well defined" indicates, in general, that the rating is probably accurate within 5 per cent; "fairly well defined," within 10 per cent; "poorly defined," within 15 to 25 per cent.

[1] For a more detailed discussion of the accuracy of stream-flow data see Grover, N. C., and Hoyt, J. C., Accuracy of stream-flow data: U. S. Geol. Survey Water-Supply Paper 400, pp. 53-59, 1916.

These notes are very general and are based on the plotting of the individual measurements with reference to the mean rating curve.

The monthly means for any station may represent with high accuracy the quantity of water flowing past the gage, but the figures showing discharge per square mile and depth of run-off in inches may be subject to gross errors caused by the inclusion of large noncontributing districts in the measured drainage area, by lack of information concerning water diverted for irrigation or other use, or by inability to interpret the effect of artificial regulation of the flow of the river above the station. "Second-feet per square mile" and "Run-off in inches" are therefore not computed if such errors appear probable. The computations are also omitted for stations on streams draining areas in which the annual rainfall is less than 20 inches. All figures representing "second-feet per square mile" and "run-off in inches" published by the Survey in early reports should be used with caution because of possible inherent sources of error not known to the Survey.

The table of monthly discharge gives only a general idea of the flow at the station and should not be used for other than preliminary estimates; the tables of daily discharge allow more detailed studies of the variation in flow. It should be borne in mind, however, that the observations in each succeeding year may be expected to throw new light on data previously published.

## PUBLICATIONS.

Investigation of water resources by the United States Geological Survey has consisted in large part of measurements of the volume of flow of streams and studies of the conditions affecting that flow, but it has comprised also investigation of such closely allied subjects as irrigation, water storage, water powers, underground waters, and quality of waters. Most of the results of these investigations have been published in the series of water-supply papers, but some have appeared in the bulletins, monographs, professional papers, and annual reports.

The results of stream-flow measurements are now published annually in 12 parts, each part covering an area whose boundaries coincide with natural drainage features as indicated below:

Part I. North Atlantic slope basins.
II. South Atlantic slope and eastern Gulf of Mexico basins.
III. Ohio River basin.
IV. St. Lawrence River basin.
V. Upper Mississippi River and Hudson Bay basins.
VI. Missouri River basin.
VII. Lower Mississippi River basin.
VIII. Western Gulf of Mexico basins.

IX. Colorado River basin.
X. Great Basin.
XI. Pacific slope basins in California.
XII. North Pacific slope basins, published in three volumes:
A, Pacific slope basins in Washington and upper Columbia River basin.
B, Snake River basin.
C, Lower Columbia River basin and Pacific slope basins in Oregon.

Water-supply papers and other publications of the United States Geological Survey containing data in regard to the water resources of the United States may be obtained or consulted as indicated below:

1. Copies may be obtained free of charge by applying to the Director of the Geological Survey, Washington, D. C. The edition printed for free distribution is, however, small and is soon exhausted.

2. Copies may be purchased at nominal cost from the Superintendent of Documents, Government Printing Office, Washington, D. C., who will on application furnish lists giving prices.

3. Sets of the reports may be consulted in the libraries of the principal cities in the United States.

4. Complete sets are available for consultation in the local offices of the water-resources branch of the Geological Survey, as follows:

Boston, Mass., 2500 Customhouse.
Albany, N. Y., 704 Journal Building.
Trenton, N. J., State House.
Asheville, N. C., 33–35 Broadway.
Chattanooga, Tenn., 37 Municipal Building.
Columbus, Ohio, Orton Hall, Ohio State University.
Chicago, Ill., 1404 Kimball Building.
Madison, Wis., care of Railroad Commission of Wisconsin.
Ames, Iowa, 103 Engineering Hall, Iowa State College.
Rolla, Mo., Rolla Building, School of Mines.
Topeka, Kans., 23 Federal Building.
Helena, Mont., 52 National Bank Building.
Denver, Colo., 403 Post Office Building.
Salt Lake City, Utah, 313 Federal Building.
Idaho Falls, Idaho, 228 Federal Building.
Boise, Idaho, 615 Idaho Building.
Tacoma, Wash., 406 Federal Building.
Portland, Oreg., 606 Post Office Building.
San Francisco, Calif., 328 Customhouse.
Los Angeles, Calif., 602 Federal Building.
Tucson, Ariz., 210 Agricultural Building, University of Arizona.
Austin, Tex., State Capitol.
Honolulu, Hawaii, 25 Capitol Building.

A list of the Geological Survey's publications may be obtained by applying to the Director of the United States Geological Survey, Washington, D. C.

Stream-flow records have been obtained at about 5,000 points in the United States, and the data obtained have been published in the reports tabulated on pages 7 and 8.

*Stream-flow data in reports of the United States Geological Survey.*

[A=Annual Report; B=Bulletin; W=Water-Supply Paper.]

| Report. | Character of data. | Year. |
|---|---|---|
| 10th A, pt. 2 | Descriptive information only | |
| 11th A, pt. 2 | Monthly discharge and descriptive information | 1884 to Sept., 1890. |
| 12th A, pt. 2 | do | 1884 to June 30, 1891. |
| 13th A, pt. 3 | Mean discharge in second-feet | 1884 to Dec. 31, 1892. |
| 14th A, pt. 2 | Monthly discharge (long-time records, 1871 to 1893) | 1888 to Dec. 31, 1893. |
| B 131 | Descriptions, measurements, gage heights, and ratings | 1893 and 1894. |
| 16th A, pt. 2 | Descriptive information only | |
| B 140 | Descriptions, measurements, gage heights, ratings, and monthly discharge (also many data covering earlier years). | 1895. |
| W 11 | Gage heights (also gage heights for earlier years) | 1896. |
| 18th A, pt. 4 | Descriptions, measurements, ratings, and monthly discharge (also similar data for some earlier years). | 1895 and 1896. |
| W 15 | Descriptions, measurements, and gage heights, eastern United States, eastern Mississippi River, and Missouri River above junction with Kansas. | 1897. |
| W 16 | Descriptions, measurements, and gage heights, western Mississippi River below junction of Missouri and Platte, and western United States. | 1897. |
| 19th A, pt. 4 | Descriptions, measurements, ratings, and monthly discharge (also some long-time records). | 1897. |
| W 27 | Measurements, ratings, and gage heights, eastern United States, eastern Mississippi River, and Missouri River. | 1898. |
| W 28 | Measurements, ratings, and gage heights, Arkansas River and western United States. | 1898. |
| 20th A, pt. 4 | Monthly discharge (also for many earlier years) | 1898. |
| W 35 to 39 | Descriptions, measurements, gage heights, and ratings | 1899. |
| 21st A, pt. 4 | Monthly discharge | 1899. |
| W 47 to 52 | Descriptions, measurements, gage heights, and ratings | 1900. |
| 22d A, pt. 4 | Monthly discharge | 1900. |
| W 65, 66 | Descriptions, measurements, gage heights, and ratings | 1901. |
| W 75 | Monthly discharge | 1901. |
| W 82 to 85 | Complete data | 1902. |
| W 97 to 100 | do | 1903. |
| W 124 to 135 | do | 1904. |
| W 165 to 178 | do | 1905. |
| W 201 to 214 | do | 1906. |
| W 241 to 252 | do | 1907–8. |
| W 261 to 272 | do | 1909. |
| W 281 to 292 | do | 1910. |
| W 301 to 312 | do | 1911. |
| W 321 to 332 | do | 1912. |
| W 351 to 362 | do | 1913. |
| W 381 to 394 | do | 1914. |
| W 401 to 414 | do | 1915. |
| W 431 to 444 | do | 1916. |
| W 451 to 464 | do | 1917. |
| W 471 to 484 | do | 1918. |
| W 501 to 514 | do | 1919–20. |

The records at most of the stations discussed in these reports extend over a series of years, and miscellaneous measurements at many points other than regular gaging stations have been made each year. An index of the reports containing records obtained prior to 1904 has been published in Water-Supply Paper 119.

The following table gives, by years and drainage basins, the numbers of the papers on surface-water supply published from 1899 to 1920. The data for any particular station will in general be found in the reports covering the years during which the station was maintained. For example, data for Machias River at Whitneyville, Me., 1903 to 1920, are published in Water-Supply Papers 97, 124, 165, 201, 241, 261, 281, 301, 321, 351, 381, 401, 431, 451, 471, and 501, which contain records for the New England streams from 1903 to 1920. Results of miscellaneous measurements are published by drainage basins.

*Numbers of water-supply papers containing results of stream measurements, 1899–1920.*

| Year. | I North Atlantic slope (St. John River to York River). | II South Atlantic slope and eastern Gulf of Mexico (James River to the Mississippi). | III Ohio River basin. | IV St. Lawrence River and Great Lakes basins. | V Hudson Bay and upper Mississippi River basins. | VI Missouri River basin. | VII Lower Mississippi River basin. | VIII Western Gulf of Mexico basins. | IX Colorado River basin. | X Great Basin. | XI Pacific slope basins in California. | XII North Pacific slope basins. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | Pacific slope basins in Washington and upper Columbia River. | Snake River basin. | Lower Columbia River and Pacific slope basins in Oregon. |
| 1899[a] | 35 | [b] 35, 36 | 36 | 36 | 36 | [c] 36, 37 | 37 | 37 | [d] 37, 38 | 38, [e] 39 | 38, [f] 39 | 38 | 38 | 38 |
| 1900[g] | 47, [h] 48 | 48 | 48, [i] 49 | 49 | 49 | 49, [j] 50 | 50 | 50 | 50 | 51 | 51 | 51 | 51 | 51 |
| 1901 | 65, 75 | 65, 75 | 65, 75 | 65, 75 | [k] 65, 66, 75 | 66, 75 | [k] 65, 66, 75 | 66, 75 | 66, 75 | 66, 75 | 66, 75 | 66, 75 | 66, 75 | 66, 75 |
| 1902 | 82 | [b] 82, 83 | 83 | [l] 82, 83 | [k] 83, 85 | 84 | [k] 83, 84 | 84 | 85 | 85 | 85 | 85 | 85 | 85 |
| 1903 | 97 | [b] 97, 98 | 98 | 97 | [k] 98, 99, [m] 100 | 99 | [k] 98, 99 | 99 | 100 | 100 | 100 | 100 | 100 | 100 |
| 1904 | [n] 124, [o] 125, [p] 126 | [p] 126, 127 | 128 | 129 | [k] 128, 130 | 130, [q] 131 | [k] 128, 131 | 132 | 133 | 133, [r] 134 | 134 | 135 | 135 | 135 |
| 1905 | [n] 165, [o] 166, [p] 167 | [p] 167, 168 | 169 | 170 | 171 | 172 | [k] 179, 173 | 174 | 175, [s] 177 | 176, [r] 177 | 177 | 178 | 178 | [t] 177, 178 |
| 1906 | [n] 201, [o] 202, [p] 203 | [p] 203, 204 | 205 | 206 | 207 | 208 | [k] 205, 209 | 210 | 211 | 212, [r] 213 | 213 | 214 | 214 | 214 |
| 1907–8 | 241 | 242 | 243 | 244 | 245 | 246 | 247 | 248 | 249 | 250, [r] 251 | 251 | 252 | 252 | 252 |
| 1909 | 261 | 262 | 263 | 264 | 265 | 266 | 267 | 268 | 269 | 270, [r] 271 | 271 | 272 | 272 | 272 |
| 1910 | 281 | 282 | 283 | 284 | 285 | 286 | 287 | 288 | 289 | 290 | 291 | 292 | 292 | 292 |
| 1911 | 301 | 302 | 303 | 304 | 305 | 306 | 307 | 308 | 309 | 310 | 311 | 312 | 312 | 312 |
| 1912 | 321 | 322 | 323 | 324 | 325 | 326 | 327 | 328 | 329 | 330 | 331 | 332A | 332B | 332C |
| 1913 | 351 | 352 | 353 | 354 | 355 | 356 | 357 | 358 | 359 | 360 | 361 | 362A | 362B | 362C |
| 1914 | 381 | 382 | 383 | 384 | 385 | 386 | 387 | 388 | 389 | 390 | 391 | 392 | 393 | 394 |
| 1915 | 401 | 402 | 403 | 404 | 405 | 406 | 407 | 408 | 409 | 410 | 411 | 412 | 413 | 414 |
| 1916 | 431 | 432 | 433 | 434 | 435 | 436 | 437 | 438 | 439 | 440 | 441 | 442 | 443 | 444 |
| 1917 | 451 | 452 | 453 | 454 | 455 | 456 | 457 | 458 | 459 | 460 | 461 | 462 | 463 | 464 |
| 1918 | 471 | 472 | 473 | 474 | 475 | 476 | 477 | 478 | 479 | 480 | 481 | 482 | 483 | 484 |
| 1919–20 | 501 | 502 | 503 | 504 | 505 | 506 | 507 | 508 | 509 | 510 | 511 | 512 | 513 | 514 |

[a] Rating tables and index to Water-Supply Papers 35–39 contained in Water Supply-Paper 39. Estimates for 1899 in Twenty-first Annual Report, Part IV.
[b] James River only.
[c] Gallatin River.
[d] Green and Gunnison rivers and Grand River above junction with Gunnison.
[e] Mohave River only.
[f] Kings and Kern rivers and south Pacific coast basins.
[g] Rating tables and index to Water-Supply Papers 47–52 and data on precipitation, wells, and irrigation in California and Utah contained in Water-Supply Paper 52. Estimates for 1900 in Twenty-second Annual Report, Part IV.
[h] Wissahickon and Schuylkill rivers to James River.
[i] Scioto River.
[j] Loup and Platte rivers near Columbus, Nebr., and all tributaries below junction with Platte.
[k] Tributaries of Mississippi from east.
[l] Lake Ontario and tributaries to St. Lawrence River proper.
[m] Hudson Bay only.
[n] New England rivers only.
[o] Hudson River to Delaware River, inclusive.
[p] Susquehanna River to Yadkin River, inclusive.
[q] Platte and Kansas rivers.
[r] Great Basin in California except Truckee and Carson River basin
[s] Below junction with Gila.
[t] Rogue, Umpqua, and Siletz rivers only.

## COOPERATION.

Acknowledgments are due for financial assistance rendered by the Virginia Railway & Power Co., Alabama Geological Survey, Alabama Power Co., Central Georgia Power Co., Columbus Power Co., Georgia Geological Survey, Georgia Railway & Power Co., Juliette Milling Co., Rhodhiss Manufacturing Co., Roberts & Co., Tallassee Power Co., Thomson Water & Light Co., and United States Weather Bureau.

## DIVISION OF WORK.

Data for stations in the James and Roanoke drainage basins were collected and prepared for publication under direction of G. C. Stevens, district engineer, assisted by B. J. Peterson, J. J. Dirzulaitis, B. L. Bigwood, J. S. S. Jones, and V. B. Lamoureux.

The field data for drainage basins south of Roanoke River were collected under the direction of Warren E. Hall and C. G. Paulsen, district engineers, assisted by A. H. Condron, Olin P. Hall, and C. C. Babb. The data were prepared for publication under the direction of Warren E. Hall, assisted by A. H. Condron, L. J. Hall, and Miss E. M. Tiller. The manuscript was reviewed by B. J. Peterson.

## GAGING-STATION RECORDS.

### JAMES RIVER BASIN.

#### JAMES RIVER AT BUCHANAN, VA.

LOCATION.—At highway bridge near Chesapeake & Ohio Railway station at Buchanan, Botetourt County.

DRAINAGE AREA.—2,060 square miles.

RECORDS AVAILABLE.—August 18, 1895, to September 30, 1920.

GAGE.—Chain gage attached to highway bridge, installed November 21, 1903, to replace original wire gage read from August 18, 1895, to that date; read by D. D. Booze for United States Weather Bureau. Datum of gage lowered 2 feet, April 3, 1897, to avoid negative readings. A span of the bridge and the gage were destroyed by flood on the night of March 27, 1913. A temporary gage was used from April 22 to September 15, 1913, when a new gage was installed.

DISCHARGE MEASUREMENTS.—Made from downstream side of two-span highway bridge or by wading.

CHANNEL AND CONTROL.—Bed under bridge is composed of rock overlain with a thick deposit of mud. Banks high; not overflowed except in extreme floods. Control of boulders and gravel several hundred feet below station. Stage-discharge relation not permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year ending September 30, 1919, 18.0 feet January 3 (discharge, 60,300 second-feet); minimum stage, 2.2 feet October 17–25 (discharge, 505 second-feet).

Maximum stage recorded during year ending September 30, 1920, 12.8 feet March 20 (discharge, 32,600 second-feet); minimum stage, 2.1 feet September 18–27 (discharge, 445 second-feet).

1895–1920: Maximum stage recorded, 31 feet during the night of March 27, 1913 (determined by levels from flood marks October 2, 1914; discharge not determined); minimum stage, 1.2 feet (present gage datum) April 17 and May 2, 1896 (discharge, 260 second-feet).

ICE.—Stage-discharge relation affected by ice during severe winters.

ACCURACY.—Stage-discharge relation considered permanent for the years ending September 30, 1919 and 1920; affected by ice December 24, 1919, to January 21, 1920. Rating curve fairly well defined below 4,000 second-feet and poorly defined above. Gage read to tenths once daily. Daily discharge ascertained by applying daily gage height to rating table, except for periods of ice effect. Records poor from October 1, 1918, to May 22, 1920, owing to gage box slipping down 0.3 foot. Date of this change in position of gage box not known and therefore gage readings have not been corrected. Daily discharge from October 1, 1918, to May 22, 1920, may be about 30 per cent too large for minimum stages, decreasing to about 5 per cent for maximum stages. The gage box was replaced in correct position May 22, 1920, and the records are considered fair from this date to September 30, 1920. The gage readings during low stages appear to be too uniform. This may be due to inaccurate gage readings.

COOPERATION.—Since July 15, 1906, gage-height records have been furnished by United States Weather Bureau.

*Discharge measurements of James River at Buchanan, Va., during the year ending Sept. 30, 1920.*

| Date. | Made by— | Gage height. | Discharge. |
|---|---|---|---|
| | | *Feet.* | *Sec.-ft.* |
| May 22 | Peterson and Bigwood | 3.46 | 1,790 |
| June 24 | B. L. Bigwood | 3.45 | 1,790 |

NOTE.—No discharge measurements were made at this station during year ending Sept. 30, 1919.

*Daily discharge, in second-feet, of James River at Buchanan, Va., for the years ending Sept. 30, 1919 and 1920.*

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1918–19. | | | | | | | | | | | | |
| 1 | 715 | 9,040 | 2,070 | 3,670 | 1,520 | 5,800 | 3,470 | 1,650 | 2,560 | 3,670 | 1,650 | 715 |
| 2 | 715 | 6,580 | 1,920 | 37,100 | 1,520 | 9,040 | 3,080 | 5,040 | 2,900 | 2,560 | 1,920 | 715 |
| 3 | 715 | 4,560 | 1,780 | 60,300 | 1,520 | 6,320 | 2,720 | 6,320 | 2,560 | 2,220 | 1,920 | 715 |
| 4 | 715 | 3,270 | 1,650 | 28,800 | 1,520 | 4,330 | 2,390 | 5,040 | 1,920 | 1,920 | 1,780 | 715 |
| 5 | 640 | 2,390 | 1,520 | 13,300 | 1,650 | 3,880 | 2,220 | 3,470 | 1,650 | 1,650 | 1,780 | 715 |
| 6 | 640 | 2,070 | 1,400 | 9,900 | 1,520 | 4,100 | 2,070 | 2,560 | 1,780 | 1,650 | 1,650 | 715 |
| 7 | 640 | 1,780 | 1,400 | 7,100 | 1,520 | 3,880 | 1,920 | 2,220 | 1,780 | 1,650 | 1,400 | 715 |
| 8 | 640 | 1,520 | 1,290 | 5,040 | 1,520 | 3,670 | 1,780 | 4,330 | 1,650 | 1,650 | 1,290 | 715 |
| 9 | 640 | 1,290 | 1,290 | 4,100 | 1,520 | 9,320 | 1,650 | 5,800 | 1,650 | 1,650 | 1,180 | 715 |
| 10 | 570 | 1,080 | 1,290 | 3,670 | 1,400 | 12,000 | 1,520 | 9,320 | 1,520 | 1,520 | 1,080 | 715 |
| 11 | 570 | 975 | 1,290 | 3,470 | 1,490 | 8,760 | 1,780 | 12,400 | 1,780 | 1,520 | 1,080 | 715 |
| 12 | 570 | 880 | 1,180 | 3,270 | 1,400 | 6,320 | 8,760 | 8,480 | 2,070 | 1,520 | 1,080 | 715 |
| 13 | 570 | 795 | 1,180 | 3,080 | 1,400 | 4,560 | 13,000 | 6,580 | 1,920 | 1,520 | 975 | 640 |
| 14 | 570 | 715 | 1,780 | 2,900 | 1,650 | 3,670 | 6,060 | 5,540 | 1,780 | 1,520 | 975 | 640 |
| 15 | 570 | 715 | 17,200 | 2,720 | 1,780 | 3,470 | 3,470 | 5,040 | 1,650 | 1,520 | 975 | 640 |
| 16 | 570 | 715 | 26,200 | 2,720 | 1,650 | 3,470 | 4,100 | 4,330 | 1,400 | 2,220 | 975 | 640 |
| 17 | 505 | 715 | 15,000 | 2,560 | 1,650 | 3,270 | 7,100 | 4,100 | 1,400 | 2,560 | 1,080 | 640 |
| 18 | 505 | 880 | 9,320 | 2,560 | 1,520 | 3,270 | 4,560 | 4,100 | 1,520 | 4,560 | 975 | 640 |
| 19 | 505 | 4,330 | 6,840 | 2,390 | 1,520 | 3,080 | 4,100 | 3,880 | 1,400 | 7,640 | 975 | 640 |
| 20 | 505 | 3,270 | 4,560 | 2,390 | 1,520 | 2,900 | 3,670 | 3,880 | 1,400 | 25,300 | 975 | 640 |
| 21 | 505 | 2,560 | 3,670 | 2,220 | 1,780 | 2,720 | 3,270 | 6,060 | 1,290 | 15,400 | 975 | 640 |
| 22 | 505 | 2,070 | 7,370 | 2,220 | 1,780 | 2,390 | 2,900 | 6,580 | 1,290 | 13,700 | 880 | 640 |
| 23 | 505 | 1,780 | 42,200 | 2,070 | 1,650 | 2,220 | 2,720 | 4,560 | 1,290 | 7,100 | 880 | 640 |
| 24 | 505 | 1,520 | 16,800 | 3,080 | 1,650 | 2,070 | 2,560 | 4,330 | 1,290 | 5,800 | 880 | 570 |
| 25 | 505 | 1,400 | 7,640 | 2,560 | 1,650 | 1,920 | 2,390 | 4,100 | 4,100 | 4,560 | 880 | 570 |
| 26 | 6,320 | 1,290 | 4,560 | 2,220 | 7,100 | 1,780 | 2,220 | 4,100 | 6,320 | 3,880 | 795 | 570 |
| 27 | 15,800 | 1,180 | 4,100 | 1,920 | 7,370 | 1,650 | 2,070 | 3,880 | 32,600 | 3,080 | 795 | 570 |
| 28 | 4,800 | 1,400 | 3,880 | 1,780 | 5,290 | 4,560 | 1,920 | 3,470 | 22,700 | 2,560 | 795 | 570 |
| 29 | 3,080 | 2,220 | 3,670 | 1,650 | ..... | 6,580 | 1,780 | 3,080 | 9,320 | 2,070 | 795 | 570 |
| 30 | 3,470 | 2,070 | 3,470 | 1,650 | ..... | 4,330 | 1,650 | 2,900 | 5,540 | 1,780 | 795 | 570 |
| 31 | 15,800 | ..... | 3,270 | 1,520 | ..... | 3,880 | ..... | 2,560 | ..... | 1,650 | 715 | ..... |

*Daily discharge, in second-feet, of James River at Buchanan, Va., for the years ending Sept. 30, 1919 and 1920*—Continued.

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1919-20. | | | | | | | | | | | | |
| 1 | 570 | 640 | 1,520 | | 2,900 | 2,560 | 2,220 | 2,560 | 1,080 | 795 | 505 | 975 |
| 2 | 570 | 640 | 1,400 | | 2,720 | 2,560 | 3,470 | 2,390 | 975 | 795 | 505 | 880 |
| 3 | 570 | 640 | 1,400 | | 2,560 | 2,070 | 15,000 | 2,220 | 975 | 880 | 505 | 795 |
| 4 | 570 | 640 | 1,400 | | 7,920 | 3,080 | 9,900 | 2,070 | 975 | 1,180 | 505 | 715 |
| 5 | 570 | 640 | 1,400 | | 14,000 | 6,060 | 7,100 | 1,920 | 1,080 | 1,400 | 505 | 715 |
| 6 | 570 | 640 | 1,400 | | 9,040 | 14,400 | 7,370 | 1,780 | 2,390 | 1,180 | 505 | 640 |
| 7 | 570 | 640 | 1,520 | | 6,580 | 7,100 | 6,840 | 1,780 | 7,100 | 975 | 505 | 640 |
| 8 | 570 | 570 | 10,800 | | 4,560 | 4,560 | 6,320 | 1,780 | 3,880 | 975 | 505 | 570 |
| 9 | 570 | 570 | 7,640 | | 3,470 | 3,880 | 5,290 | 1,650 | 2,560 | 975 | 505 | 570 |
| 10 | 570 | 570 | 12,700 | | 3,080 | 3,470 | 4,560 | 1,650 | 1,920 | 975 | 795 | 570 |
| 11 | 570 | 570 | 9,320 | 830 | 2,900 | 3,080 | 3,880 | 1,650 | 1,520 | 1,400 | 1,180 | 505 |
| 12 | 570 | 640 | 6,320 | | 2,720 | 2,900 | 3,470 | 1,650 | 1,400 | 1,780 | 1,780 | 505 |
| 13 | 715 | 640 | 3,470 | | 3,080 | 3,270 | 3,080 | 1,520 | 1,290 | 2,390 | 2,220 | 505 |
| 14 | 795 | 640 | 3,470 | | 3,670 | 6,840 | 2,900 | 1,780 | 1,290 | 2,070 | 2,560 | 505 |
| 15 | 795 | 640 | 3,470 | | 3,470 | 6,320 | 2,720 | 1,920 | 1,290 | 1,920 | 3,670 | 505 |
| 16 | 715 | 640 | 2,390 | | 3,470 | 4,560 | 2,720 | 2,070 | 1,180 | 1,920 | 2,560 | 505 |
| 17 | 715 | 640 | 2,220 | | 3,270 | 4,560 | 2,560 | 1,920 | 1,180 | 1,780 | 2,220 | 505 |
| 18 | 715 | 640 | 2,070 | | 3,080 | 6,320 | 2,560 | 1,920 | 1,080 | 1,650 | 2,070 | 445 |
| 19 | 715 | 570 | 1,920 | | 2,900 | 10,500 | 2,390 | 1,920 | 1,080 | 1,520 | 4,560 | 445 |
| 20 | 640 | 570 | 1,780 | | 2,560 | 32,600 | 2,720 | 1,780 | 1,180 | 1,400 | 9,900 | 445 |
| 21 | 640 | 570 | 1,650 | | 2,390 | 13,300 | 2,560 | 1,780 | 1,780 | 1,080 | 10,200 | 445 |
| 22 | 640 | 570 | 1,520 | 1,780 | 2,220 | 9,320 | 2,560 | 1,650 | 3,080 | 880 | 7,100 | 445 |
| 23 | 640 | 570 | 1,400 | 12,700 | 2,220 | 6,580 | 2,390 | 1,520 | 3,470 | 715 | 3,470 | 445 |
| 24 | 795 | 570 | | 15,000 | 3,080 | 5,290 | 2,390 | 1,400 | 1,780 | 640 | 2,560 | 445 |
| 25 | 880 | 570 | | 16,800 | 4,560 | 4,330 | 2,220 | 1,400 | 1,180 | 570 | 1,920 | 445 |
| 26 | 795 | 570 | | 9,900 | 3,470 | 3,670 | 2,220 | 1,400 | 1,080 | 570 | 1,520 | 445 |
| 27 | 715 | 1,400 | 1,090 | 7,100 | 3,080 | 3,470 | 2,220 | 1,290 | 975 | 505 | 1,400 | 445 |
| 28 | 715 | 1,520 | | 5,540 | 2,720 | 3,080 | 3,270 | 1,290 | 880 | 505 | 1,400 | 570 |
| 29 | 640 | 1,520 | | 4,100 | 2,560 | 2,720 | 2,900 | 1,180 | 795 | 505 | 1,290 | 640 |
| 30 | 640 | 1,520 | | 3,470 | ..... | 2,560 | 2,560 | 1,180 | 795 | 505 | 1,180 | 795 |
| 31 | 640 | ..... | | 3,080 | ..... | 2,390 | ..... | 1,080 | ..... | 505 | 1,180 | ..... |

NOTE.—Stage-discharge relation affected by ice Dec. 24, 1919, to Jan. 21, 1920, discharge estimated by comparison with other stations on James River and by study of weather records. Discharge, Oct. 1, 1918, to May 22, 1920, subject to error (see "Accuracy" paragraph).

*Monthly discharge of James River at Buchanan, Va., for the years ending Sept. 30, 1919 and 1920.*

[Drainage area, 2,060 square miles.]

| Month. | Discharge in second-feet. | | | | Run-off in inches. |
|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square mile. | |
| 1918-19. | | | | | |
| October | 15,800 | 505 | 2,060 | 1.00 | 1.15 |
| November | 9,040 | 715 | 2,170 | 1.05 | 1.17 |
| December | 42,200 | 1,180 | 6,480 | 3.15 | 3.63 |
| January | 60,300 | 1,520 | 7,220 | 3.50 | 4.04 |
| February | 7,370 | 1,400 | 2,110 | 1.02 | 1.06 |
| March | 12,000 | 1,650 | 4,490 | 2.18 | 2.51 |
| April | 13,000 | 1,520 | 3,430 | 1.67 | 1.86 |
| May | 12,400 | 1,650 | 4,830 | 2.34 | 2.70 |
| June | 32,600 | 1,290 | 4,070 | 1.98 | 2.21 |
| July | 25,300 | 1,520 | 4,250 | 2.06 | 2.38 |
| August | 1,920 | 715 | 1,130 | .549 | .63 |
| September | 715 | 570 | 654 | .317 | .35 |
| The year | 60,300 | 505 | 3,600 | 1.75 | 23.69 |
| 1919-20. | | | | | |
| October | 880 | 570 | 658 | .319 | .37 |
| November | 1,520 | 570 | 725 | .352 | .39 |
| December | 12,700 | ..... | 2,930 | 1.42 | 1.64 |
| January | 16,800 | ..... | 3,130 | 1.52 | 1.75 |
| February | 14,000 | 2,220 | 3,940 | 1.91 | 2.06 |
| March | 32,600 | 2,070 | 6,050 | 2.94 | 3.39 |
| April | 15,000 | 2,220 | 4,080 | 1.98 | 2.21 |
| May | 2,560 | 1,080 | 1,710 | .830 | .96 |
| June | 7,100 | 795 | 1,710 | .830 | .93 |
| July | 2,390 | 505 | 1,130 | .549 | .63 |
| August | 10,200 | 505 | 2,300 | 1.12 | 1.29 |
| September | 975 | 445 | 569 | .276 | .31 |
| The year | 32,600 | 445 | 2,410 | 1.17 | 15.93 |

### JAMES RIVER AT CARTERSVILLE, VA.

LOCATION.—At highway bridge between Pemberton and Cartersville, Cumberland County, 50 miles above Richmond. Willis River enters from the south 1 mile above station and Rivanna River from the north 7 miles above.

DRAINAGE AREA.—6,230 square miles.

RECORDS AVAILABLE.—January 1, 1899, to September 30, 1920.

GAGE.—Chain on downstream side and near Cartersville end of bridge; read by B.W. Palmore. Wire gage used previous to July 24, 1903.

DISCHARGE MEASUREMENTS.—Made from bridge.

CHANNEL AND CONTROL.—Bed composed of rocks and sand; shifts somewhat during floods. Banks high; left bank is overflowed at a stage of about 20 feet.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year ending September 30, 1919, 22.98 feet at 9 a. m. January 4 (discharge, 82,900 second-feet); minimum stage, 0.75 foot at 10 a. m. September 17 (discharge, 830 second-feet).

Maximum stage recorded during year ending September 30, 1920, 20.17 feet at 10 a. m. February 4 (discharge, 67,300 second-feet); minimum stage, 0.77 foot October 10 (discharge, 910 second-feet).

1899–1920: Maximum stage recorded, 26.7 feet at 6 p. m. December 30, 1901 (discharge, about 106,000 second-feet); minimum stage, 0.5 foot October 3, 1914 (discharge, 800 second-feet). A discharge of 603 second-feet (gage height, 0.42 foot) was measured September 8, 1897, but gage-height record corresponding to this measurement is probably subject to error.

ICE.—Stage-discharge relation affected by ice during winter of 1919–20.

ACCURACY.—Stage-discharge relation practically permanent during the years ending September 30, 1919 and 1920; affected by ice January 4–22, 1920. Rating curve well defined between 1,300 and 40,000 second-feet and is extended for high stages. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table, except during period of ice effect. Records good for open-water periods and fair for winter periods.

The following discharge measurement was made by B. J. Peterson and K. K. Hoyt:
June 25, 1920: Gage height, 4.39 feet; discharge, 7,880 second-feet.

*Daily discharge, in second-feet, of James River at Cartersville, Va., for the years ending Sept. 30, 1919 and 1920.*

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1918-19.** | | | | | | | | | | | | |
| 1 | 1,790 | 5,240 | 4,600 | 7,360 | 6,150 | 18,700 | 10,300 | 5,460 | 5,920 | 11,400 | 5,460 | 1,790 |
| 2 | 1,790 | 19,300 | 6,150 | 17,700 | 5,690 | 18,000 | 8,650 | 9,730 | 5,920 | 8,650 | 7,360 | 1,880 |
| 3 | 1,630 | 12,000 | 5,240 | 67,800 | 5,240 | 16,400 | 7,360 | 10,000 | 6,390 | 6,870 | 6,870 | 1,790 |
| 4 | 1,550 | 5,460 | 4,390 | 80,500 | 5,240 | 14,300 | 6,630 | 10,300 | 7,870 | 5,690 | 5,460 | 1,880 |
| 5 | 1,470 | 5,920 | 3,990 | 57,600 | 5,240 | 12,000 | 6,390 | 10,800 | 5,240 | 5,029 | 4,600 | 1,790 |
| 6 | 1,470 | 5,020 | 3,210 | 24,400 | 5,020 | 10,800 | 6,150 | 8,650 | 8,650 | 4,600 | 4,390 | 1,630 |
| 7 | 1,310 | 6,150 | 3,400 | 12,000 | 4,810 | 9,730 | 5,690 | 8,920 | 10,600 | 4,190 | 16,800 | 1,630 |
| 8 | 1,230 | 3,590 | 3,020 | 17,400 | 4,390 | 9,190 | 5,460 | 9,190 | 9,730 | 3,990 | 7,360 | 1,550 |
| 9 | 1,230 | 3,400 | 3,020 | 12,200 | 4,190 | 13,700 | 5,240 | 9,190 | 9,190 | 3,790 | 5,690 | 1,470 |
| 10 | 1,150 | 2,830 | 3,210 | 11,100 | 3,990 | 25,800 | 5,240 | 20,900 | 5,020 | 4,190 | 4,190 | 1,390 |
| 11 | 1,230 | 2,650 | 3,210 | 8,650 | 3,790 | 22,300 | 5,240 | 27,500 | 4,810 | 3,790 | 3,990 | 1,630 |
| 12 | 1,310 | 2,470 | 3,020 | 7,610 | 3,990 | 18,700 | 14,600 | 32,200 | 4,600 | 3,590 | 3,210 | 1,710 |
| 13 | 1,390 | 2,650 | 3,210 | 6,630 | 3,790 | 14,300 | 14,600 | 20,000 | 19,000 | 4,390 | 3,790 | 1,470 |
| 14 | 1,230 | 2,470 | 5,020 | 6,390 | 4,190 | 11,700 | 13,700 | 14,300 | 7,610 | 2,830 | 4,190 | 1,230 |
| 15 | 1,310 | 2,470 | 8,390 | 5,920 | 5,460 | 10,600 | 13,100 | 11,700 | 6,870 | 2,650 | 3,790 | 1,150 |
| 16 | 990 | 2,130 | 11,700 | 5,690 | 5,920 | 8,920 | 12,500 | 11,100 | 6,390 | 6,390 | 3,590 | 1,390 |
| 17 | 1,230 | 2,300 | 32,600 | 5,460 | 7,110 | 8,650 | 24,400 | 10,800 | 5,240 | 14,600 | 3,400 | 990 |
| 18 | 1,150 | 2,830 | 24,700 | 5,690 | 6,870 | 7,870 | 22,600 | 10,000 | 4,810 | 20,600 | 3,020 | 1,310 |
| 19 | 1,150 | 5,460 | 21,600 | 6,150 | 6,390 | 7,610 | 14,300 | 8,920 | 5,460 | 33,700 | 2,650 | 1,150 |
| 20 | 1,310 | 6,390 | 12,000 | 7,110 | 5,920 | 7,610 | 12,800 | 8,650 | 4,810 | 44,500 | 2,020 | 1,070 |
| 21 | 1,150 | 6,870 | 10,300 | 9,190 | 5,920 | 7,360 | 10,000 | 15,800 | 4,190 | 54,100 | 2,650 | 1,230 |
| 22 | 1,150 | 5,240 | 21,300 | 8,390 | 8,130 | 6,870 | 8,650 | 20,600 | 3,990 | 51,500 | 2,650 | 1,150 |
| 23 | 1,150 | 4,390 | 32,900 | 7,610 | 8,650 | 6,630 | 7,610 | 19,000 | 3,790 | 55,000 | 2,470 | 1,310 |
| 24 | 1,230 | 4,190 | 47,400 | 11,100 | 6,390 | 5,920 | 7,610 | 14,900 | 3,590 | 26,400 | 2,300 | 1,230 |
| 25 | 1,150 | 3,210 | 30,000 | 11,100 | 6,870 | 5,690 | 7,360 | 12,800 | 4,190 | 23,000 | 2,130 | 1,630 |
| 26 | 1,390 | 2,830 | 20,300 | 11,700 | 9,190 | 5,020 | 6,630 | 10,600 | 9,190 | 15,800 | 1,790 | 1,470 |
| 27 | 3,790 | 2,650 | 16,400 | 14,300 | 10,600 | 5,460 | 5,920 | 9,730 | 26,800 | 14,300 | 1,880 | 1,390 |
| 28 | 12,000 | 2,470 | 12,800 | 11,400 | 11,400 | 12,200 | 5,460 | 8,920 | 34,800 | 10,600 | 1,960 | 1,390 |
| 29 | 8,650 | 3,210 | 10,600 | 9,460 | ..... | 12,800 | 5,240 | 8,650 | 27,200 | 7,870 | 1,790 | 1,150 |
| 30 | 5,920 | 3,590 | 8,650 | 7,870 | ..... | 12,500 | 5,240 | 8,130 | 18,300 | 6,870 | 1,710 | 1,150 |
| 31 | 4,810 | ..... | 7,610 | 6,870 | ..... | 11,700 | ..... | 6,870 | ..... | 6,390 | 1,790 | ..... |
| **1919-20.** | | | | | | | | | | | | |
| 1 | 1,310 | 1,470 | 2,130 | 2,470 | 6,390 | 5,690 | 8,390 | 6,390 | 2,830 | 2,650 | 1,790 | 6,870 |
| 2 | 1,230 | 1,710 | 2,650 | 2,470 | 7,110 | 5,460 | 10,600 | 5,920 | 3,020 | 2,130 | 1,960 | 5,240 |
| 3 | 1,070 | 1,960 | 2,650 | 2,300 | 38,600 | 6,920 | 14,000 | 5,460 | 3,020 | 2,300 | 1,880 | 4,810 |
| 4 | 1,150 | 1,880 | 2,650 | | 64,500 | 4,600 | 14,300 | 5,020 | 3,790 | 2,470 | 1,790 | 4,190 |
| 5 | 1,230 | 2,300 | 2,470 | | 39,700 | 5,920 | 14,900 | 4,810 | 4,390 | 2,300 | 1,960 | 3,790 |
| 6 | 1,150 | 2,650 | 2,650 | | 27,800 | 16,100 | 24,700 | 4,600 | 5,920 | 1,960 | 1,960 | 3,990 |
| 7 | 990 | 2,470 | 2,830 | | 22,300 | 25,000 | 15,800 | 4,390 | 8,920 | 2,300 | 3,590 | 7,610 |
| 8 | 990 | 2,300 | 3,210 | | 16,100 | 24,700 | 14,000 | 4,810 | 13,100 | 3,400 | 3,210 | 4,600 |
| 9 | 1,070 | 2,130 | 3,590 | | 14,000 | 12,800 | 12,200 | 4,600 | 7,870 | 3,020 | 2,650 | 4,190 |
| 10 | 910 | 1,710 | 6,390 | | 13,700 | 10,300 | 11,700 | 4,600 | 5,460 | 2,830 | 2,300 | 4,390 |
| 11 | 1,070 | 1,630 | 19,600 | | 13,400 | 10,000 | 10,800 | 4,390 | 4,810 | 2,830 | 2,470 | 3,990 |
| 12 | 1,230 | 1,710 | 16,800 | | 12,800 | 8,130 | 10,000 | 4,190 | 5,920 | 2,650 | 3,210 | 3,400 |
| 13 | 1,150 | 2,650 | 11,700 | 2,200 | 12,200 | 8,920 | 14,300 | 4,190 | 5,240 | 14,600 | 4,600 | 2,650 |
| 14 | 1,310 | 6,630 | 10,000 | | 11,700 | 9,460 | 12,800 | 4,600 | 3,790 | 11,700 | 4,810 | 2,300 |
| 15 | 1,630 | 3,990 | 6,870 | | 11,700 | 10,800 | 11,700 | 4,600 | 3,020 | 7,870 | 5,690 | 2,130 |
| 16 | 2,650 | 3,590 | 5,920 | | 11,100 | 14,000 | 8,650 | 4,810 | 3,210 | 6,150 | 8,130 | 1,960 |
| 17 | 2,650 | 2,650 | 5,690 | | 10,600 | 11,100 | 7,870 | 5,020 | 3,020 | 6,390 | 6,630 | 2,300 |
| 18 | 2,300 | 2,130 | 5,020 | | 10,300 | 10,600 | 7,360 | 4,390 | 2,300 | 7,110 | 6,630 | 2,130 |
| 19 | 1,960 | 1,960 | 4,600 | | 9,730 | 17,700 | 6,630 | 4,600 | 2,470 | 7,360 | 9,460 | 1,790 |
| 20 | 1,470 | 1,880 | 3,790 | | 9,460 | 32,200 | 6,390 | 4,390 | 3,790 | 7,360 | 17,100 | 1,630 |
| 21 | 1,390 | 1,790 | 3,790 | | 9,190 | 39,400 | 6,630 | 4,390 | 6,150 | 6,390 | 53,200 | 1,790 |
| 22 | 1,230 | 1,960 | 3,400 | | 8,920 | 25,000 | 8,390 | 4,190 | 10,800 | 4,390 | 31,800 | 1,710 |
| 23 | 1,470 | 1,880 | 3,400 | | 8,390 | 19,000 | 8,390 | 4,190 | 7,870 | 4,390 | 16,800 | 2,020 |
| 24 | 1,630 | 1,710 | 3,210 | | 8,390 | 14,600 | 10,000 | 3,790 | 7,360 | 3,990 | 12,000 | 2,650 |
| 25 | 1,790 | 1,550 | 3,020 | | 8,130 | 13,400 | 9,460 | 3,790 | 8,650 | 4,810 | 9,190 | 4,600 |
| 26 | 1,630 | 1,550 | 3,020 | 14,600 | 7,870 | 10,300 | 8,650 | 4,190 | 6,870 | 7,870 | 7,360 | 3,790 |
| 27 | 1,630 | 1,880 | 2,650 | | 7,360 | 9,460 | 7,610 | 4,190 | 4,810 | 4,600 | 5,690 | 3,020 |
| 28 | 1,960 | 1,710 | 2,470 | | 7,110 | 8,920 | 7,870 | 3,790 | 3,590 | 3,990 | 26,800 | 2,650 |
| 29 | 2,130 | 1,630 | 2,300 | | 6,870 | 8,390 | 7,110 | 3,790 | 3,400 | 2,650 | 44,500 | 7,110 |
| 30 | 1,960 | 1,710 | 2,470 | | ..... | 7,110 | 6,630 | 3,590 | 8,020 | 2,130 | 12,500 | 8,650 |
| 31 | 1,790 | ..... | 2,650 | | ..... | 6,150 | ..... | 3,400 | ..... | 1,790 | 8,130 | ..... |

NOTE.—Stage-discharge relation affected by ice Jan. 4–22, 1920, and gage heights in error Jan. 23 to Feb. 1, 1920; discharge estimated by comparison with stations at Columbia, Lynchburg, and Buchanan, and by study of weather records.

*Monthly discharge of James River at Cartersville, Va., for the years ending Sept. 30, 1919 and 1920.*

| Month. | Discharge in second-feet. | | | | Run-off in inches. |
|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square mile. | |
| 1918–19. | | | | | |
| October | 12,000 | 990 | 2,240 | 0.360 | 0.42 |
| November | 19,300 | 2,130 | 4,650 | .746 | .83 |
| December | 47,400 | 3,020 | 12,400 | 1.99 | 2.29 |
| January | 80,500 | 5,460 | 15,800 | 2.54 | 2.93 |
| February | 11,400 | 3,790 | 6,090 | .977 | 1.02 |
| March | 25,800 | 5,020 | 11,600 | 1.86 | 2.14 |
| April | 24,400 | 5,240 | 9,490 | 1.52 | 1.70 |
| May | 32,200 | 5,460 | 12,700 | 2.04 | 2.35 |
| June | 34,800 | 3,590 | 9,340 | 1.50 | 1.67 |
| July | 55,000 | 2,650 | 15,100 | 2.46 | 2.84 |
| August | 16,800 | 1,710 | 4,060 | .652 | .75 |
| September | 1,880 | 990 | 1,430 | .230 | .26 |
| The year | 80,500 | 990 | 8,780 | 1.41 | 19.20 |
| 1919–20. | | | | | |
| October | 2,650 | 910 | 1,520 | .244 | .28 |
| November | 6,630 | 1,470 | 2,230 | .358 | .40 |
| December | 19,600 | 2,130 | 4,950 | .795 | .92 |
| January | | | 5,820 | .934 | 1.08 |
| February | 64,500 | | 15,000 | 2.41 | 2.60 |
| March | 39,400 | 4,600 | 13,200 | 2.12 | 2.44 |
| April | 24,700 | 6,390 | 10,600 | 1.70 | 1.90 |
| May | 6,390 | 3,400 | 4,490 | .721 | .83 |
| June | 13,100 | 2,300 | 5,250 | .843 | .94 |
| July | 14,600 | 1,790 | 4,720 | .758 | .87 |
| August | 53,200 | 1,790 | 10,300 | 1.65 | 1.90 |
| September | 8,650 | 1,630 | 3,730 | .599 | .67 |
| The year | 64,500 | 910 | 6,790 | 1.09 | 14.83 |

## ROANOKE RIVER BASIN.

### ROANOKE RIVER AT ROANOKE, VA.

LOCATION.—At Walnut Street highway bridge in Roanoke, Roanoke County.

DRAINAGE AREA.—388 square miles.

RECORDS AVAILABLE.—July 10, 1896, to July 15, 1906; May 7, 1907, to September 30, 1920.

GAGE.—Chain on downstream side of Walnut Street bridge; read by employee of Roanoke Railway & Electric Co. Wire gage used previous to November 28, 1903.

DISCHARGE MEASUREMENTS.—Made from downstream side of Walnut Street bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of coarse gravel and small boulders. Banks may be overflowed at extreme flood stages. Control, loose boulders.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year ending September 30, 1919, 7.88 feet at 8 a. m. January 3 (discharge, 8,170 second-feet); minimum stage, 0.71 foot at 8 a. m. September 30 (discharge, 77 second-feet).

Maximum stage recorded during year ending September 30, 1920, 5.57 feet at 8 a. m. February 4 (discharge, 5,060 second-feet); minimum, 0.59 foot July 31 and August 1 (discharge, 55 second-feet).

1896–1920: Maximum stage recorded, 14.34 feet August 6, 1901 (discharge, 16,900 second-feet); minimum stage recorded, zero on morning of December 23, 1909, when flow was retarded by freezing.

ICE.—Stage-discharge relation seriously affected by ice during winter of 1919–20.

ACCURACY.—Discharge measurements made in 1918 and 1920 indicate that stage-discharge relation changed February 14, 1918. Stage-discharge relation permanent during years ending September 30, 1919 and 1920, except as affected by ice. Rating curve fairly well defined between 50 and 7,000 second-feet. Gage read to hundredths once daily. Daily discharge ascertained by applying gage height to rating table. Records fair.

COOPERATION.—Gage-height record furnished by Roanoke Railway & Electric Co., J. W. Hancock, general manager.

*Discharge measurements of Roanoke River at Roanoke, Va., during the year ending Sept. 30, 1920.*

| Date. | Made by— | Gage height. | Discharge. |
|---|---|---|---|
| | | *Feet.* | *Sec.-ft.* |
| May 25 | Peterson and Bigwood | 1.26 | 246 |
| June 26 | B. L. Bigwood | .92 | 138 |

NOTE.—No discharge measurements were made at this station during year ending Sept. 30, 1919.

*Daily discharge, in second-feet, of Roanoke River at Roanoke, Va., for the years ending Sept. 30, 1918–1920.*

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1917–18. | | | | | | | | | | | | |
| 1 | 60 | 142 | 80 | | | 242 | 308 | 1,310 | 301 | 2,130 | 2,770 | 650 |
| 2 | 60 | 103 | 80 | | | 242 | 281 | 1,000 | 261 | 905 | 1,000 | 445 |
| 3 | 56 | 73 | 69 | | | 223 | 242 | 772 | 242 | 507 | 612 | 343 |
| 4 | 55 | 66 | 69 | | 235 | 206 | 242 | 650 | 261 | 389 | 445 | 281 |
| 5 | 52 | 66 | 69 | | | 242 | 206 | 541 | 223 | 335 | 322 | 261 |
| 6 | 52 | 52 | 69 | 30 | | 301 | 172 | 476 | 195 | 301 | 281 | 281 |
| 7 | 53 | 69 | 69 | | 142 | 541 | 206 | 417 | 206 | 261 | 261 | 261 |
| 8 | 56 | 69 | 69 | | 176 | 772 | 206 | 417 | 198 | 253 | 281 | 301 |
| 9 | 58 | 60 | 148 | | 215 | 575 | 541 | 389 | 188 | 253 | 223 | 1,050 |
| 10 | 60 | 56 | | | 2,020 | 507 | 1,420 | 366 | 182 | 242 | 206 | 507 |
| 11 | 75 | 69 | | | 2,140 | 445 | 2,130 | 366 | 162 | 223 | 188 | 389 |
| 12 | 60 | 60 | | | 2,140 | 389 | 1,890 | 322 | 156 | 188 | 182 | 343 |
| 13 | 52 | 60 | | | 2,900 | 476 | 1,590 | 322 | 156 | 261 | 172 | 301 |
| 14 | 60 | 60 | | | 1,900 | 690 | 1,260 | 366 | 146 | 231 | 223 | 261 |
| 15 | 58 | 60 | | | 1,480 | 541 | 1,480 | 343 | 140 | 188 | 172 | 238 |
| 16 | 56 | 52 | | 600 | 1,590 | 417 | 1,150 | 322 | 130 | 156 | 261 | 216 |
| 17 | 53 | 52 | | | 905 | 343 | 860 | 322 | 242 | 198 | 206 | 192 |
| 18 | 55 | 49 | | | 612 | 322 | 690 | 289 | 343 | 343 | 206 | 1,100 |
| 19 | 53 | 60 | | | 476 | 281 | 541 | 366 | 3,180 | 952 | 1,420 | 690 |
| 20 | 66 | 60 | | | 476 | 261 | 541 | 417 | 690 | 541 | 650 | 389 |
| 21 | 56 | 60 | 45 | | 575 | 730 | 3,180 | 690 | 343 | 366 | 343 | 575 |
| 22 | 55 | 60 | | | 445 | 1,360 | 2,900 | 3,440 | 309 | 301 | 281 | 476 |
| 23 | 53 | 60 | | | 445 | 860 | 1,480 | 860 | 261 | 261 | 242 | 417 |
| 24 | 62 | 60 | | | 366 | 952 | 1,050 | 612 | 216 | 242 | 206 | 322 |
| 25 | 84 | 60 | | | 322 | 1,050 | 772 | 445 | 188 | 206 | 188 | 293 |
| 26 | 69 | 60 | | 400 | 301 | 772 | 612 | 389 | 7,630 | 541 | 172 | 269 |
| 27 | 69 | 60 | | | 301 | 612 | 1,150 | 366 | 1,590 | 281 | 261 | 253 |
| 28 | 69 | 60 | | | 281 | 507 | 1,050 | 905 | 905 | 261 | 952 | 231 |
| 29 | 73 | 60 | | | ..... | 389 | 860 | 476 | 575 | 445 | 417 | 209 |
| 30 | 148 | 80 | | | ..... | 362 | 690 | 507 | 690 | 301 | 301 | 195 |
| 31 | 184 | ..... | | | ..... | 335 | ..... | 343 | ..... | 343 | 261 | ..... |

*Daily discharge, in second-feet, of Roanoke River at Roanoke, Va., for the years ending Sept. 30, 1918–1920*—Continued.

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1918–19. | | | | | | | | | | | | |
| 1 | 182 | 1,050 | 417 | 815 | 389 | 860 | 343 | 389 | 289 | 476 | 1,150 | 116 |
| 2 | 166 | 730 | 301 | 1,890 | 366 | 730 | 326 | 1,420 | 417 | 389 | 541 | 119 |
| 3 | 156 | 612 | 297 | 8,170 | 343 | 650 | 309 | 860 | 289 | 339 | 417 | 116 |
| 4 | 156 | 507 | 297 | 3,040 | 366 | 575 | 293 | 660 | 269 | 314 | 322 | 114 |
| 5 | 156 | 389 | 261 | 1,530 | 366 | 507 | 326 | 507 | 261 | 285 | 281 | 114 |
| 6 | 156 | 343 | 242 | 1,260 | 366 | 690 | 309 | 476 | 417 | 269 | 250 | 114 |
| 7 | 156 | 322 | 231 | 952 | 335 | 575 | 289 | 445 | 301 | 250 | 250 | 111 |
| 8 | 156 | 301 | 223 | 815 | 330 | 541 | 277 | 417 | 289 | 231 | 212 | 108 |
| 9 | 156 | 281 | 216 | 730 | 314 | 1,000 | 265 | 366 | 269 | 220 | 198 | 106 |
| 10 | 156 | 261 | 202 | 612 | 301 | 1,310 | 265 | 389 | 250 | 212 | 188 | 101 |
| 11 | 156 | 253 | 195 | 575 | 289 | 952 | 277 | 389 | 343 | 206 | 178 | 98 |
| 12 | 156 | 234 | 195 | 541 | 285 | 860 | 860 | 389 | 1,890 | 202 | 250 | 93 |
| 13 | 153 | 223 | 188 | 476 | 281 | 650 | 650 | 343 | 612 | 212 | 238 | 91 |
| 14 | 153 | 216 | 188 | 476 | 650 | 575 | 476 | 417 | 417 | 265 | 212 | 91 |
| 15 | 150 | 202 | 3,310 | 445 | 1,050 | 507 | 445 | 507 | 366 | 238 | 195 | 91 |
| 16 | 146 | 195 | 1,200 | 417 | 860 | 476 | 417 | 476 | 330 | 242 | 172 | 91 |
| 17 | 137 | 206 | 6,960 | 389 | 650 | 445 | 445 | 476 | 281 | 445 | 159 | 89 |
| 18 | 130 | 343 | 2,510 | 541 | 541 | 445 | 507 | 445 | 269 | 650 | 153 | 89 |
| 19 | 124 | 343 | 1,360 | 507 | 476 | 445 | 445 | 445 | 261 | 815 | 153 | 89 |
| 20 | 124 | 301 | 952 | 507 | 417 | 389 | 389 | 476 | 250 | 1,590 | 150 | 87 |
| 21 | 195 | 265 | 730 | 476 | 445 | 389 | 366 | 1,360 | 242 | 1,480 | 146 | 87 |
| 22 | 156 | 250 | 1,890 | 445 | 476 | 366 | 335 | 815 | 330 | 772 | 140 | 96 |
| 23 | 140 | 242 | 3,580 | 417 | 905 | 343 | 330 | 650 | 366 | 541 | 134 | 91 |
| 24 | 130 | 231 | 1,770 | 860 | 815 | 335 | 343 | 541 | 612 | 1,200 | 127 | 89 |
| 25 | 140 | 220 | 1,420 | 650 | 730 | 330 | 366 | 507 | 2,010 | 612 | 121 | 87 |
| 26 | 2,130 | 206 | 1,050 | 612 | 1,650 | 314 | 326 | 445 | 1,260 | 445 | 116 | 87 |
| 27 | 1,100 | 198 | 815 | 575 | 1,150 | 335 | 309 | 389 | 3,180 | 366 | 116 | 84 |
| 28 | 772 | 301 | 650 | 507 | 860 | 507 | 293 | 541 | 1,890 | 322 | 116 | 82 |
| 29 | 541 | 541 | 575 | 476 | ..... | 389 | 281 | 366 | 1,050 | 289 | 116 | 80 |
| 30 | 730 | 445 | 541 | 445 | ..... | 366 | 293 | 335 | 650 | 261 | 116 | 77 |
| 31 | 2,510 | ..... | 476 | 417 | ..... | 366 | ..... | 293 | ..... | 238 | 116 | ..... |
| 1919–20. | | | | | | | | | | | | |
| 1 | 73 | 93 | 103 | 86 | 234 | 273 | 952 | 202 | 175 | 96 | 55 | 134 |
| 2 | 71 | 130 | 98 | 86 | 220 | 257 | 1,420 | 195 | 159 | 93 | 75 | 119 |
| 3 | 69 | 121 | 93 | 86 | 206 | 238 | 1,360 | 185 | 146 | 153 | 75 | 93 |
| 4 | 67 | 108 | 89 | 86 | 5,060 | 223 | 1,100 | 178 | 389 | 169 | 73 | 86 |
| 5 | 82 | 98 | 89 | 86 | 2,250 | 612 | 815 | 172 | 417 | 242 | 69 | 93 |
| 6 | 101 | 89 | 93 | 86 | 1,360 | 815 | 650 | 166 | 690 | 223 | 98 | 93 |
| 7 | 93 | 89 | 114 | 86 | 772 | 612 | 507 | 162 | 343 | 212 | 98 | 93 |
| 8 | 91 | 89 | 389 | 86 | 575 | 417 | 445 | 242 | 273 | 169 | 98 | 93 |
| 9 | 91 | 89 | 343 | 86 | 445 | 366 | 389 | 281 | 227 | 134 | 98 | 93 |
| 10 | 89 | 87 | 1,050 | 127 | 366 | 322 | 366 | 216 | 198 | 111 | 98 | 93 |
| 11 | 89 | 89 | 690 | 108 | 335 | 301 | 330 | 206 | 185 | 98 | 98 | 93 |
| 12 | 89 | 108 | 417 | 89 | 301 | 269 | 305 | 198 | 166 | 206 | 111 | 93 |
| 13 | 137 | 156 | 318 | 84 | 318 | 445 | 281 | 339 | 153 | 146 | 124 | 87 |
| 14 | 150 | 150 | 281 | 77 | 314 | 417 | 265 | 314 | 146 | 143 | 124 | 77 |
| 15 | 150 | 143 | 253 | 77 | 281 | 389 | 253 | 289 | 192 | 124 | 261 | 71 |
| 16 | 159 | 137 | 227 | 89 | 198 | 389 | 246 | 273 | 172 | 124 | 172 | 71 |
| 17 | 143 | 130 | 209 | 106 | 253 | 366 | 242 | 250 | 156 | 98 | 172 | 67 |
| 18 | 137 | 124 | 192 | 80 | 281 | 445 | 234 | 234 | 143 | 111 | 476 | 67 |
| 19 | 137 | 119 | 182 | 80 | 265 | 417 | 223 | 227 | 130 | 140 | 3,580 | 67 |
| 20 | 134 | 114 | 175 | 80 | 250 | 1,310 | 216 | 281 | 159 | 124 | 1,100 | 64 |
| 21 | 130 | 108 | 169 | 114 | 234 | 1,050 | 216 | 234 | 389 | 111 | 730 | 62 |
| 22 | 124 | 103 | 159 | 127 | 227 | 650 | 212 | 227 | 322 | 98 | 650 | 62 |
| 23 | 121 | 101 | 153 | 343 | 261 | 445 | 206 | 220 | 269 | 91 | 507 | 134 |
| 24 | 116 | 98 | 143 | 318 | 322 | 417 | 198 | 212 | 212 | 75 | 343 | 507 |
| 25 | 114 | 98 | 143 | 1,200 | 389 | 389 | 192 | 242 | 156 | 98 | 314 | 507 |
| 26 | 108 | 101 | 143 | 690 | 366 | 366 | 273 | 281 | 146 | 87 | 216 | 335 |
| 27 | 106 | 103 | 143 | 476 | 289 | 322 | 242 | 265 | 130 | 66 | 216 | 293 |
| 28 | 103 | 114 | 134 | 389 | 281 | 301 | 234 | 238 | 116 | 66 | 216 | 253 |
| 29 | 101 | 114 | 121 | 318 | 277 | 277 | 216 | 227 | 106 | 56 | 182 | 182 |
| 30 | 98 | 108 | 111 | 285 | ..... | 261 | 206 | 220 | 101 | 56 | 150 | 182 |
| 31 | 96 | ..... | 101 | 253 | ..... | 246 | ..... | 198 | ..... | 55 | 150 | ..... |

NOTE.—Stage-discharge relation affected by ice Dec. 10, 1917, to Feb. 7, 1918, Jan. 1–9 and 18–20, 1920; discharge estimated by study of weather records and observer's notes. Discharge interpolated Mar. 30 to Apr. 1, 1918.

*Monthly discharge of Roanoke River at Roanoke, Va., for the years ending Sept. 30, 1918–1920.*

[Drainage area, 388 square miles.]

| Month | Discharge in second-feet. | | | | Run-off in inches. |
|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square mile. | |
| 1917–18. | | | | | |
| October | 184 | 52 | 66.8 | 0.172 | 0.20 |
| November | 142 | 49 | 65.3 | .168 | .19 |
| December | 148 | ..... | 55.2 | .142 | .16 |
| January | ..... | ..... | 345 | .889 | 1.02 |
| February | 2,900 | 142 | 772 | 1.99 | 2.07 |
| March | 1,360 | 206 | 514 | 1.32 | 1.52 |
| April | 3,180 | 172 | 990 | 2.55 | 2.84 |
| May | 3,440 | 289 | 607 | 1.56 | 1.80 |
| June | 7,630 | 130 | 677 | 1.74 | 1.94 |
| July | 2,130 | 156 | 400 | 1.03 | 1.19 |
| August | 2,770 | 172 | 442 | 1.14 | 1.31 |
| September | 1,100 | 192 | 391 | 1.01 | 1.13 |
| The year | 7,630 | ..... | 440 | 1.13 | 15.37 |
| 1918–19. | | | | | |
| October | 2,510 | 124 | 373 | .961 | 1.11 |
| November | 1,050 | 195 | 340 | .876 | .98 |
| December | 6,960 | 188 | 1,070 | 2.76 | 3.18 |
| January | 8,170 | 390 | 986 | 2.54 | 2.93 |
| February | 1,650 | 281 | 572 | 1.47 | 1.53 |
| March | 1,310 | 314 | 556 | 1.43 | 1.65 |
| April | 860 | 265 | 372 | .959 | 1.07 |
| May | 1,420 | 293 | 534 | 1.38 | 1.59 |
| June | 3,180 | 242 | 655 | 1.69 | 1.89 |
| July | 1,590 | 202 | 464 | 1.20 | 1.38 |
| August | 1,150 | 116 | 227 | .585 | .67 |
| September | 119 | 77 | 96.3 | .248 | .28 |
| The year | 8,170 | 77 | 522 | 1.35 | 18.26 |
| 1919–20. | | | | | |
| October | 159 | 67 | 109 | .281 | .32 |
| November | 156 | 87 | 110 | .284 | .32 |
| December | 1,050 | 89 | 223 | .575 | .66 |
| January | 1,200 | ..... | 203 | .523 | .60 |
| February | 5,060 | 198 | 584 | 1.51 | 1.63 |
| March | 1,310 | 223 | 439 | 1.13 | 1.30 |
| April | 1,420 | 192 | 426 | 1.10 | 1.23 |
| May | 339 | 162 | 230 | .593 | .68 |
| June | 690 | 101 | 219 | .564 | .63 |
| July | 242 | 55 | 122 | .314 | .36 |
| August | 3,580 | 55 | 346 | .892 | 1.03 |
| September | 507 | 62 | 142 | .366 | .41 |
| The year | 5,060 | 55 | 261 | .673 | 9.17 |

## ROANOKE RIVER AT OLD GASTON, N. C.

LOCATION.—At bridge of Roanoke Railway Co. at Old Gaston, Northampton County, three-fourths mile below mouth of Indian Creek, 1½ miles north of Thelma, and 2½ miles above mouth of Deep Creek.

DRAINAGE AREA.—8,350 square miles.

RECORDS AVAILABLE.—December 7, 1911, to September 30, 1920.

GAGE.—Chain gage attached to outside of guard timber on downstream side of second span from right end of deck-railroad bridge; read by R. A. Howell.

DISCHARGE MEASUREMENTS.—Made from downstream side of bridge to which gage is attached. Measuring section broken by 11 bridge piers.

CHANNEL AND CONTROL.—Channel fairly permanent; point of control, about a mile below gage, is of rock and probably permanent. Left bank subject to overflow in extreme floods, but a fair determination can be made of the overflow discharge around the bridge.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year ending September 30, 1919, 12.7 feet at 7.55 a. m. July 23 (discharge, 110,000 second-feet); minimum stage, 1.0 foot at 7.45 a. m. October 10 and 15 (discharge, 900 second-feet).

Maximum stage recorded during year ending September 30, 1920, 10.9 feet at 8.30 a. m. February 7 (discharge, 75,400 second-feet); minimum stage, 1.2 feet October 3–6, 8–11, January 7 and September 22 (discharge, 1,370 second-feet).

1911–1920: Maximum stage recorded, 16.6 feet at 7 a. m. March 18, 1912 (discharge, 210,000 second-feet); minimum stage, 0.95 foot at 6 a. m. October 1, 1914 (discharge, 790 second-feet).

ICE.—Ice forms to considerable thickness at this station during severe winters, and the stage-discharge relation is seriously affected.

REGULATION.—During periods of low water there are variations in flow, probably due to weekly (Sunday) shutdown of large power plants farther upstream. These variations are observable at power plants at Roanoke Rapids and Weldon on Tuesdays or Wednesdays.

ACCURACY.—Stage-discharge relation permanent; affected by ice January 1–6, 1920. Rating curve well defined below 33,300 second-feet, and fairly well defined to 180,000 second-feet. Gage read to tenths once daily. Daily discharge ascertained by applying daily gage height to rating table. Records good for open-water periods and fair for periods of ice effect.

The following discharge measurement was made by B. J. Peterson and K. K. Hoyt:
June 24, 1920: Gage height, 3.42 feet; discharge, 9,080 second-feet.

*Daily discharge, in second-feet, of Roanoke River at Old Gaston, N. C., for the years ending Sept. 30, 1919 and 1920.*

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1918–19. | | | | | | | | | | | | |
| 1 | 2,160 | 5,500 | 11,400 | 8,630 | 9,060 | 10,900 | 7,800 | 4,780 | 6,240 | 10,900 | 6,240 | 4,080 |
| 2 | 2,460 | 10,900 | 9,500 | 7,800 | 7,010 | 19,900 | 6,240 | 9,960 | 5,870 | 7,010 | 22,800 | 3,740 |
| 3 | 1,880 | 9,060 | 7,400 | 20,600 | 5,870 | 29,000 | 5,500 | 10,900 | 7,010 | 6,240 | 15,300 | 3,410 |
| 4 | 1,620 | 7,400 | 7,010 | 61,900 | 6,240 | 27,400 | 4,430 | 14,700 | 9,500 | 5,500 | 11,900 | 2,770 |
| 5 | 2,160 | 5,500 | 6,620 | 70,800 | 7,010 | 17,200 | 3,740 | 10,400 | 7,400 | 4,780 | 10,400 | 3,090 |
| 6 | 2,770 | 4,780 | 5,870 | 91,700 | 8,210 | 16,600 | 10,900 | 8,630 | 16,600 | 7,010 | 7,400 | 2,770 |
| 7 | 2,460 | 4,430 | 5,500 | 22,800 | 7,400 | 21,400 | 9,060 | 11,400 | 25,100 | 6,240 | 6,620 | 2,160 |
| 8 | 1,880 | 3,740 | 3,740 | 11,900 | 7,010 | 15,900 | 7,400 | 9,960 | 22,100 | 13,600 | 6,240 | 2,460 |
| 9 | 1,370 | 3,410 | 4,080 | 9,960 | 7,400 | 11,400 | 7,800 | 15,300 | 13,600 | 10,900 | 5,500 | 2,770 |
| 10 | 900 | 2,770 | 3,740 | 9,060 | 6,620 | 30,700 | 7,010 | 13,600 | 9,960 | 6,240 | 4,780 | 1,880 |
| 11 | 1,130 | 3,740 | 3,410 | 8,210 | 5,500 | 47,300 | 6,240 | 13,600 | 7,400 | 5,140 | 6,240 | 1,620 |
| 12 | 900 | 2,460 | 2,770 | 7,800 | 6,620 | 29,000 | 5,500 | 11,400 | 7,010 | 3,740 | 4,080 | 1,370 |
| 13 | 1,370 | 2,160 | 3,090 | 7,010 | 6,240 | 22,800 | 14,700 | 9,500 | 13,000 | 4,430 | 6,240 | 1,620 |
| 14 | 1,130 | 3,090 | 2,770 | 6,620 | 7,400 | 11,900 | 19,900 | 7,010 | 22,100 | 3,090 | 7,400 | 2,460 |
| 15 | 900 | 2,460 | 3,740 | 6,620 | 8,630 | 9,960 | 10,900 | 6,240 | 11,400 | 4,080 | 8,210 | 2,160 |
| 16 | 1,130 | 2,770 | 6,240 | 5,500 | 13,000 | 9,500 | 9,500 | 14,700 | 7,400 | 4,430 | 10,400 | 1,880 |
| 17 | 1,370 | 2,770 | 22,800 | 4,780 | 10,900 | 8,210 | 11,400 | 10,900 | 6,240 | 15,300 | 9,060 | 1,620 |
| 18 | 1,370 | 4,780 | 24,300 | 5,140 | 9,500 | 7,400 | 16,600 | 15,300 | 5,500 | 64,300 | 7,400 | 1,880 |
| 19 | 1,620 | 5,500 | 23,600 | 22,100 | 8,210 | 7,010 | 9,960 | 9,500 | 4,780 | 63,100 | 10,900 | 2,160 |
| 20 | 1,880 | 4,430 | 15,300 | 17,200 | 7,400 | 8,630 | 7,400 | 7,400 | 3,740 | 66,700 | 7,400 | 1,880 |
| 21 | 2,160 | 14,700 | 11,900 | 10,900 | 6,620 | 7,800 | 7,010 | 9,500 | 3,410 | 82,300 | 6,620 | 1,620 |
| 22 | 1,370 | 9,960 | 10,900 | 9,960 | 7,400 | 7,400 | 6,620 | 8,630 | 3,740 | 91,700 | 4,430 | 1,370 |
| 23 | 1,620 | 5,870 | 8,210 | 9,060 | 15,900 | 7,400 | 7,800 | 9,960 | 4,430 | 110,000 | 3,740 | 2,770 |
| 24 | 1,880 | 3,740 | 33,300 | 8,210 | 23,660 | 7,010 | 7,400 | 10,400 | 6,620 | 73,800 | 4,080 | 3,090 |
| 25 | 2,160 | 3,410 | 42,500 | 9,500 | 22,100 | 6,620 | 9,060 | 10,900 | 6,240 | 55,300 | 3,410 | 3,740 |
| 26 | 1,880 | 2,770 | 22,800 | 11,400 | 19,200 | 6,240 | 9,500 | 19,900 | 5,140 | 23,600 | 3,090 | 2,460 |
| 27 | 1,880 | 3,410 | 17,900 | 21,400 | 17,900 | 5,500 | 6,620 | 14,700 | 23,600 | 9,500 | 1,620 | 2,160 |
| 28 | 1,620 | 2,770 | 16,600 | 20,600 | 16,600 | 7,010 | 4,780 | 26,600 | 45,400 | 8,630 | 2,160 | 1,620 |
| 29 | 10,400 | 5,870 | 10,900 | 14,700 | ..... | 9,960 | 6,240 | 10,400 | 42,500 | 8,210 | 1,880 | 1,370 |
| 30 | 8,210 | 9,060 | 9,500 | 10,900 | ..... | 10,900 | 5,500 | 8,210 | 29,000 | 7,800 | 1,370 | 2,160 |
| 31 | 4,080 | ..... | 8,630 | 9,500 | ..... | 9,060 | ..... | 7,010 | ..... | 7,010 | 2,460 | ..... |

*Daily discharge, in second-feet, of Roanoke River at Old Gaston, N. C., for the years ending Sept. 30, 1919 and 1920*—Continued.

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1919-20. | | | | | | | | | | | | |
| 1 | 1,880 | 2,770 | 3,740 | 1,450 | 8,210 | 6,620 | 9,060 | 8,630 | 3,090 | 3,410 | 2,160 | 4,780 |
| 2 | 1,620 | 2,460 | 3,090 | 1,450 | 15,300 | 5,870 | 8,210 | 7,010 | 2,770 | 3,090 | 1,880 | 3,740 |
| 3 | 1,370 | 2,160 | 4,430 | 1,450 | 17,200 | 5,500 | 14,700 | 5,500 | 2,460 | 3,090 | 1,880 | 3,410 |
| 4 | 1,370 | 2,460 | 3,740 | 1,450 | 35,100 | 4,430 | 14,700 | 4,780 | 3,410 | 3,090 | 1,880 | 3,090 |
| 5 | 1,370 | 1,880 | 3,410 | 1,450 | 60,800 | 5,500 | 14,200 | 3,740 | 4,780 | 2,770 | 2,160 | 2,770 |
| 6 | 1,370 | 2,770 | 3,090 | 1,450 | 68,000 | 7,400 | 34,200 | 4,080 | 16,600 | 2,160 | 4,430 | 3,410 |
| 7 | 1,620 | 2,460 | 2,770 | 1,370 | 75,400 | 16,600 | 31,500 | 3,740 | 25,100 | 3,090 | 5,870 | 3,740 |
| 8 | 1,370 | 2,160 | 2,160 | 2,160 | 20,600 | 10,400 | 19,200 | 4,430 | 13,600 | 4,080 | 5,870 | 3,740 |
| 9 | 1,370 | 2,160 | 3,410 | 3,090 | 11,400 | 9,060 | 11,400 | 9,060 | 9,500 | 4,430 | 5,140 | 3,740 |
| 10 | 1,370 | 2,460 | 6,240 | 4,780 | 9,960 | 8,210 | 10,400 | 8,210 | 7,400 | 4,080 | 4,780 | 6,620 |
| 11 | 1,370 | 2,770 | 6,620 | 5,140 | 9,060 | 7,400 | 8,210 | 6,240 | 5,140 | 5,500 | 7,800 | 3,410 |
| 12 | 1,620 | 2,460 | 13,600 | 4,780 | 10,400 | 6,620 | 7,400 | 4,780 | 4,430 | 4,780 | 7,400 | 4,430 |
| 13 | 1,880 | 2,160 | 10,400 | 3,410 | 11,400 | 7,010 | 8,210 | 4,080 | 4,080 | 8,210 | 7,400 | 3,740 |
| 14 | 2,160 | 1,880 | 7,400 | 2,770 | 13,600 | 16,600 | 15,900 | 5,140 | 3,740 | 9,060 | 9,060 | 2,460 |
| 15 | 1,880 | 3,410 | 6,240 | 3,090 | 9,060 | 22,800 | 22,800 | 7,010 | 3,410 | 8,210 | 10,400 | 2,770 |
| 16 | 3,740 | 7,800 | 5,870 | 2,770 | 7,800 | 15,300 | 8,210 | 5,870 | 3,090 | 7,400 | 11,400 | 2,770 |
| 17 | 5,500 | 6,620 | 5,870 | 4,080 | 7,400 | 11,400 | 7,400 | 4,080 | 3,090 | 5,500 | 11,900 | 2,160 |
| 18 | 5,870 | 3,740 | 3,740 | 3,740 | 7,010 | 10,400 | 6,240 | 3,740 | 3,410 | 5,140 | 10,900 | 1,620 |
| 19 | 6,620 | 4,430 | 3,410 | 7,010 | 6,240 | 7,400 | 6,240 | 4,780 | 3,740 | 7,010 | 7,800 | 1,880 |
| 20 | 7,010 | 3,740 | 3,090 | 4,430 | 7,010 | 28,200 | 6,620 | 4,430 | 4,430 | 6,620 | 9,500 | 2,160 |
| 21 | 6,240 | 3,410 | 3,410 | 3,740 | 7,400 | 25,100 | 7,010 | 3,740 | 4,780 | 12,500 | 37,800 | 1,620 |
| 22 | 4,780 | 3,090 | 2,770 | 3,410 | 5,870 | 22,800 | 9,060 | 4,430 | 8,210 | 10,400 | 36,900 | 1,370 |
| 23 | 4,430 | 3,090 | 2,160 | 3,740 | 5,500 | 17,200 | 10,900 | 5,870 | 12,500 | 7,400 | 17,900 | 1,880 |
| 24 | 3,090 | 2,770 | 2,460 | 4,430 | 5,870 | 9,500 | 9,060 | 5,140 | 11,400 | 5,140 | 10,400 | 2,160 |
| 25 | 3,740 | 2,460 | 1,880 | 4,780 | 6,620 | 8,630 | 6,240 | 4,780 | 7,800 | 5,870 | 8,210 | 3,410 |
| 26 | 4,430 | 3,090 | 2,160 | 7,010 | 5,500 | 7,800 | 7,010 | 5,500 | 10,400 | 4,430 | 6,240 | 7,010 |
| 27 | 5,140 | 2,460 | 1,880 | 10,900 | 7,010 | 7,400 | 9,500 | 4,080 | 9,060 | 2,770 | 5,500 | 6,620 |
| 28 | 4,080 | 2,770 | 3,090 | 9,060 | 7,800 | 7,010 | 11,900 | 4,430 | 8,210 | 4,430 | 4,780 | 5,140 |
| 29 | 3,740 | 3,090 | 2,770 | 10,400 | 7,400 | 9,500 | 13,000 | 4,080 | 7,010 | 3,090 | 4,430 | 5,140 |
| 30 | 3,410 | 5,140 | 2,160 | 13,600 | ..... | 8,630 | 10,400 | 3,740 | 6,240 | 2,770 | 12,500 | 6,240 |
| 31 | 3,090 | ..... | 1,880 | 13,600 | ..... | 9,960 | ..... | 3,410 | ..... | 2,160 | 5,500 | ..... |

NOTE.—Stage-discharge relation affected by ice Jan. 1-6, 1920; gage heights apparently in error Mar. 20-22, Apr. 22-26, June 1, 2, 21-23, July 13, 14, Aug. 11-14, 24-27, Nov. 19-23, Dec. 1, 2, 1919, Apr. 18, 19, 24 June 15, and 16, 1920; discharge estimated by comparison with records of Roanoke at Weldon and Clarksville and by study of weather records.

*Monthly discharge of Roanoke River at Old Gaston, N. C., for the years ending Sept. 30, 1919 and 1920.*

[Drainage area, 8,350 square miles.]

| Month. | Discharge in second-feet. | | | | Run-off in inches. |
|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square mile. | |
| 1918-19. | | | | | |
| October | 10,400 | 900 | 2,250 | 0.269 | 0.31 |
| November | 14,700 | 2,160 | 5,110 | .612 | .68 |
| December | 42,500 | 2,770 | 11,800 | 1.41 | 1.63 |
| January | 91,700 | 4,780 | 17,500 | 2.10 | 2.42 |
| February | 23,600 | 5,500 | 10,200 | 1.22 | 1.27 |
| March | 47,300 | 5,500 | 14,400 | 1.72 | 1.98 |
| April | 19,900 | 3,740 | 8,420 | 1.01 | 1.13 |
| May | 26,600 | 4,780 | 11,300 | 1.35 | 1.56 |
| June | 45,400 | ..... | 12,700 | 1.52 | 1.70 |
| July | 110,000 | ..... | 25,500 | 3.05 | 3.52 |
| August | 22,800 | 1,370 | 6,750 | .808 | .93 |
| September | 4,080 | 1,370 | 2,340 | .280 | .31 |
| The year | 110,000 | 900 | 10,700 | 1.28 | 17.44 |

*Monthly discharge of Roanoke River at Old Gaston, N. C., for the years ending Sept. 30, 1919 and 1920*—Continued.

| Month. | Discharge in second-feet. | | | | Run-off in inches. |
|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square mile. | |
| 1919-20. | | | | | |
| October | 7,010 | 1,370 | 3,180 | 0.381 | 0.44 |
| November | 7,800 | 1,890 | 3,140 | .376 | .42 |
| December | 13,600 | 1,880 | 4,160 | .498 | .57 |
| January | 13,600 | 1,370 | 4,710 | .564 | .65 |
| February | 75,400 | 5,500 | 16,200 | 1.94 | 2.09 |
| March | 28,200 | 4,490 | 11,200 | 1.34 | 1.54 |
| April | 34,200 | 6,240 | 12,000 | 1.44 | 1.61 |
| May | 9,060 | 3,410 | 5,110 | .612 | .71 |
| June | 25,100 | 2,460 | 7,100 | .850 | .95 |
| July | 12,500 | 2,160 | 5,220 | .625 | .72 |
| August | 37,800 | 1,890 | 9,020 | 1.08 | 1.24 |
| September | 7,010 | 1,370 | 3,570 | .428 | .48 |
| The year | 75,400 | 1,370 | 7,000 | .838 | 11.42 |

## PEEDEE RIVER BASIN.

### YADKIN RIVER NEAR SALISBURY, N. C.

LOCATION.—At highway bridge known as Piedmont toll bridge, 1,000 feet upstream from Southern Railway bridge, 4 miles east of Spencer, 5 miles downstream from mouth of South Yadkin River, 6 miles east of Salisbury, Rowan County, and 26 miles upstream from American Aluminum Co.'s hydroelectric plant near Whitney, N. C.

DRAINAGE AREA.—3,400 square miles.

RECORDS AVAILABLE.—September 24, 1895, to December 31, 1909; September 1, 1911, to September 30, 1920.

GAGE.—Chain gage attached to highway bridge; read by J. T. Yarbrough. From the date of establishment to May 31, 1899, the gage was at the Southern Railway bridge, and from May 31, 1899, it was at the highway bridge until moved back to the railroad bridge early in 1903, where it remained until the end of 1905. Since January 1, 1906, the gage has been at the highway bridge; the datum originally established there in 1899 was maintained until April 25, 1920, when zero of gage was lowered 0.07 foot. The last gage at the railroad bridge read the same as the gage at the highway bridge at gage height 3.2 feet, but not for higher and lower stages. Datum of the original gage at railroad bridge somewhat uncertain.

DISCHARGE MEASUREMENTS.—Made from downstream side of highway bridge. During the time that gage was at railroad bridge most of the measurements were made from that bridge. During flood of July, 1916, water rose over floor of highway bridge, making it necessary to use railroad bridge.

CHANNEL AND CONTROL.—Channel wide and rather rough. Control is a rock ledge about 500 feet below bridge extending entirely across river. Control permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year ending September 30, 1919, 16.9 feet at 10 p. m. July 20 (discharge, 80,000 second-feet); minimum stage recorded, 1.75 feet at 7 a. m. October 11, 16, and 18 (discharge, 1,270 second-feet). Minimum probably due to regulation by power plant upstream.

Maximum stage recorded during year ending September 30, 1920, 10.23 feet at 6 p. m. April 3 (discharge, 40,000 second-feet); minimum stage recorded, 1.78 feet at 7 a. m. and 6 p. m. January 6 (discharge, 1,390 second-feet). Minimum probably caused by shutting off of a power plant upstream).

1895–1920: Maximum stage recorded, 23.8 feet at 1 a. m. July 16, 1919 (discharge, 121,000 second-feet); minimum stage recorded, 1.2 feet September 20, October 6, November 22 and 26, 1897 (discharge, 900 second-feet).

ICE.—Never enough to affect stage-discharge relation.

DIVERSIONS.—None.

REGULATION.—Flow during low stages may be somewhat affected by developed powers on the river and tributaries above.

ACCURACY.—Stage-discharge relation practically permanent. Rating curve well defined between 1,180 and 20,000 second-feet and very well defined up to 121,000 second-feet Gage read to half-tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

*Discharge measurements of Yadkin River near Salisbury, N. C., during the years ending Sept. 30, 1919 and 1920.*

| Date. | Made by— | Gage height. | Discharge. | Date. | Made by— | Gage height. | Discharge. |
|---|---|---|---|---|---|---|---|
| 1919. | | *Feet.* | *Sec.-ft.* | 1920. | | *Feet.* | *Sec.-ft.* |
| June 25 | A. H. Condron | 5.34 | 13,800 | Aug. 18 | Tallassee Power Co. | 3.75 | 6,610 |
| 1920. | | | | 26 | do. | 2.72 | 3,410 |
| Apr. 25 | do. | [a] 2.88 | 4,260 | Sept. 1 | do. | 3.27 | 5,140 |
| Aug. 18 | Warren E Hall | 3.75 | 6,810 | | | | |

[a] Zero of gage lowered 0.07 foot on Apr. 25, 1920.

*Daily discharge, in second-feet, of Yadkin River near Salisbury, N. C., for the years ending Sept. 30, 1919 and 1920.*

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1918–19. | | | | | | | | | | | | |
| 1 | 1,760 | 19,000 | 4,200 | 4,840 | 5,160 | 13,400 | 4,520 | 10,400 | 4,520 | 4,200 | 4,840 | 3,900 |
| 2 | 1,660 | 8,820 | 3,900 | 7,300 | 4,840 | 17,500 | 4,840 | 15,600 | 4,520 | 3,900 | 5,160 | 3,600 |
| 3 | 1,660 | 5,840 | 3,600 | 37,400 | 4,520 | 10,400 | 4,520 | 10,800 | 4,520 | 3,450 | 4,520 | 2,880 |
| 4 | 1,760 | 5,160 | 3,300 | 45,200 | 4,840 | 8,440 | 4,840 | 6,920 | 4,520 | 3,450 | 3,900 | 2,610 |
| 5 | 1,560 | 4,520 | 3,300 | 16,000 | 5,160 | 7,300 | 5,840 | 5,840 | 4,200 | 3,300 | 3,900 | 2,610 |
| 6 | 1,360 | 3,900 | 3,020 | 8,440 | 4,840 | 19,500 | 5,160 | 6,560 | 4,520 | 3,300 | 3,300 | 2,350 |
| 7 | 1,560 | 3,960 | 3,020 | 6,920 | 4,520 | 14,700 | 5,160 | 8,060 | 4,200 | 3,300 | 3,600 | 2,480 |
| 8 | 1,360 | 3,600 | 2,880 | 6,200 | 4,200 | 8,440 | 4,840 | 8,820 | 4,200 | 3,900 | 3,300 | 2,480 |
| 9 | 1,460 | 3,300 | 3,020 | 5,840 | 4,200 | 25,700 | 4,520 | 12,000 | 3,900 | 3,300 | 3,300 | 2,350 |
| 10 | 1,560 | 3,300 | 2,880 | 5,500 | 4,200 | 36,200 | 4,520 | 11,600 | 4,520 | 3,450 | 3,020 | 2,350 |
| 11 | 1,460 | 3,300 | 2,740 | 5,160 | 4,200 | 16,500 | 4,520 | 8,060 | 4,520 | 3,160 | 3,300 | 2,350 |
| 12 | 1,560 | 3,020 | 2,740 | 4,840 | 4,200 | 9,200 | 12,000 | 8,060 | 4,520 | 3,300 | 3,020 | 2,350 |
| 13 | 1,460 | 3,020 | 2,880 | 4,840 | 4,200 | 7,680 | 10,400 | 6,200 | 4,200 | 2,740 | 12,400 | 2,480 |
| 14 | 1,660 | 2,880 | 2,740 | 4,520 | 8,060 | 6,920 | 6,560 | 11,200 | 4,200 | 3,160 | 5,840 | 2,220 |
| 15 | 1,550 | 2,740 | 12,400 | 4,520 | 10,000 | 6,200 | 5,840 | 10,400 | 3,600 | 3,160 | 4,840 | 2,350 |
| 16 | 1,460 | 2,610 | 15,200 | 4,200 | 6,920 | 6,200 | 5,160 | 7,300 | 4,520 | 4,520 | 4,520 | 2,220 |
| 17 | 1,560 | 3,300 | 20,500 | 4,520 | 5,500 | 6,560 | 7,300 | 6,560 | 3,450 | 7,680 | 4,520 | 2,220 |
| 18 | 1,360 | 8,060 | 24,600 | 5,840 | 5,160 | 6,560 | 6,920 | 5,840 | 3,900 | 6,920 | 4,520 | 2,220 |
| 19 | 1,560 | 7,680 | 10,000 | 9,600 | 4,520 | 6,560 | 5,160 | 5,160 | 3,900 | 20,500 | 4,200 | 2,100 |
| 20 | 1,460 | 4,840 | 6,560 | 6,200 | 4,520 | 6,200 | 4,840 | 5,160 | 3,600 | 69,200 | 3,300 | 2,100 |
| 21 | 2,220 | 3,900 | 5,160 | 5,160 | 4,520 | 5,160 | 4,520 | 7,300 | 3,600 | 72,200 | 3,450 | 2,100 |
| 22 | 2,480 | 3,600 | 9,600 | 4,840 | 5,160 | 5,840 | 4,520 | 10,400 | 4,520 | 35,000 | 3,160 | 2,350 |
| 23 | 2,220 | 3,160 | 42,200 | 4,840 | 15,600 | 5,160 | 4,520 | 6,560 | 3,900 | 33,800 | 3,160 | 2,350 |
| 24 | 1,760 | 3,160 | 30,200 | 9,600 | 11,200 | 5,160 | 5,160 | 5,840 | 4,520 | 17,500 | 3,160 | 2,350 |
| 25 | 1,760 | 3,160 | 18,500 | 8,820 | 8,820 | 5,160 | 5,160 | 5,840 | 10,400 | 8,440 | 3,160 | 2,350 |
| 26 | 10,000 | 2,740 | 11,600 | 10,800 | 17,000 | 4,480 | 3,900 | 10,400 | 14,700 | 6,560 | 2,880 | 2,350 |
| 27 | 34,400 | 2,880 | 8,060 | 16,500 | 12,000 | 5,500 | 4,200 | 10,400 | 9,200 | 5,160 | 2,740 | 2,100 |
| 28 | 26,800 | 3,900 | 6,560 | 9,600 | 7,680 | 7,680 | 4,520 | 10,000 | 6,560 | 5,160 | 2,610 | 1,870 |
| 29 | 8,440 | 9,600 | 5,840 | 7,300 | ..... | 6,560 | 4,200 | 6,560 | 6,560 | 4,520 | 2,740 | 2,100 |
| 30 | 15,600 | 6,560 | 5,160 | 6,200 | ..... | 5,500 | 5,160 | 5,840 | 5,160 | 4,840 | 3,300 | 2,220 |
| 31 | 26,800 | ..... | 5,160 | 5,560 | ..... | 5,160 | ..... | 5,500 | ..... | 4,520 | 3,900 | ..... |

*Daily discharge, in second-feet, of Yadkin River near Salisbury, N. C., for the years ending Sept. 30, 1919 and 1920*—Continued.

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1919–20. | | | | | | | | | | | | |
| 1 | 1,960 | 2,420 | 2,820 | 2,550 | 4,180 | 3,710 | 7,300 | 4,120 | 2,610 | 2,740 | 1,820 | 4,920 |
| 2 | 2,070 | 2,420 | 2,680 | 2,550 | 3,710 | 3,410 | 12,900 | 3,960 | 2,480 | 2,610 | 2,240 | 4,280 |
| 3 | 2,070 | 2,680 | 2,550 | 2,550 | 5,160 | 3,110 | 37,400 | 3,960 | 2,610 | 2,740 | 2,020 | 3,640 |
| 4 | 1,960 | 2,420 | 2,550 | 2,300 | 20,500 | 3,110 | 21,500 | 3,640 | 3,480 | 2,880 | 2,020 | 3,480 |
| 5 | 2,070 | 2,420 | 2,420 | 1,860 | 19,500 | 6,920 | 27,400 | 3,640 | 7,360 | 2,480 | 2,020 | 3,020 |
| 6 | 2,550 | 2,300 | 2,420 | 1,420 | 8,820 | 12,000 | 27,900 | 3,480 | 12,900 | 2,240 | 2,360 | 3,320 |
| 7 | 1,960 | 2,300 | 2,550 | 1,960 | 5,840 | 7,300 | 13,400 | 3,320 | 7,720 | 2,240 | 2,610 | 3,020 |
| 8 | 1,960 | 2,300 | 2,960 | 2,820 | 4,820 | 5,160 | 8,060 | 4,920 | 4,920 | 3,320 | 3,320 | 3,320 |
| 9 | 2,180 | 2,300 | 3,560 | 3,410 | 4,180 | 4,180 | 6,920 | 5,600 | 3,800 | 3,480 | 4,600 | 3,020 |
| 10 | 2,070 | 2,420 | 10,400 | 3,110 | 4,020 | 4,020 | 6,560 | 3,640 | 3,480 | 2,480 | 6,280 | 3,640 |
| 11 | 2,300 | 2,300 | 16,000 | 2,820 | 3,860 | 3,860 | 5,840 | 3,480 | 3,320 | 3,640 | 8,840 | 4,280 |
| 12 | 2,180 | 2,550 | 7,300 | 2,680 | 3,710 | 3,860 | 5,500 | 3,320 | 3,020 | 4,120 | 8,460 | 3,320 |
| 13 | 3,530 | 5,160 | 5,500 | 2,420 | 4,180 | 12,000 | 13,800 | 3,320 | 3,020 | 6,280 | 5,940 | 3,640 |
| 14 | 3,560 | 8,060 | 4,820 | 2,300 | 4,820 | 14,700 | 12,900 | 3,320 | 2,740 | 3,960 | 4,920 | 3,320 |
| 15 | 4,180 | 4,340 | 5,500 | 2,300 | 4,020 | 8,060 | 6,560 | 3,320 | 2,610 | 3,020 | 5,940 | 3,320 |
| 16 | 3,260 | 3,410 | 4,340 | 2,300 | 3,710 | 5,840 | 5,500 | 2,740 | 2,480 | 4,280 | 6,280 | 3,640 |
| 17 | 2,680 | 3,260 | 3,710 | 2,550 | 3,260 | 6,560 | 5,160 | 3,020 | 2,740 | 4,280 | 6,280 | 4,120 |
| 18 | 2,680 | 2,960 | 3,560 | 2,820 | 3,260 | 7,300 | 4,820 | 3,020 | 2,480 | 3,800 | 6,640 | 3,320 |
| 19 | 3,260 | 2,960 | 3,260 | 2,680 | 3,410 | 7,300 | 4,500 | 3,320 | 2,740 | 3,800 | 8,460 | 2,740 |
| 20 | 2,820 | 2,680 | 3,110 | 2,550 | 3,260 | 12,000 | 4,500 | 3,960 | 3,640 | 7,360 | 9,600 | 2,740 |
| 21 | 2,550 | 2,550 | 3,110 | 2,420 | 3,110 | 8,820 | 6,200 | 4,280 | 7,720 | 6,280 | 6,280 | 2,480 |
| 22 | 2,420 | 2,550 | 3,110 | 2,680 | 3,110 | 5,840 | 6,560 | 3,800 | 9,220 | 7,360 | 6,640 | 2,480 |
| 23 | 4,820 | 2,680 | 2,960 | 2,550 | 3,410 | 5,160 | 5,160 | 3,320 | 5,600 | 4,600 | 5,260 | 2,880 |
| 24 | 7,300 | 2,680 | 2,680 | 5,160 | 4,340 | 4,500 | 4,500 | 3,020 | 3,960 | 2,880 | 4,280 | 4,920 |
| 25 | 4,820 | 2,550 | 2,960 | 9,200 | 6,920 | 4,500 | 4,020 | 3,020 | 3,960 | 2,610 | 3,640 | 10,000 |
| 26 | 3,860 | 2,550 | 2,820 | 8,060 | 6,560 | 5,160 | 4,280 | 3,480 | 4,120 | 3,020 | 3,320 | 4,920 |
| 27 | 3,410 | 2,550 | 2,680 | 5,500 | 5,160 | 6,560 | 7,720 | 3,640 | 3,020 | 2,480 | 12,400 | 4,280 |
| 28 | 2,820 | 2,550 | 2,820 | 7,300 | 4,020 | 5,500 | 6,640 | 3,020 | 2,740 | 2,130 | 25,200 | 5,600 |
| 29 | 2,820 | 2,420 | 2,820 | 10,400 | 3,860 | 7,680 | 5,260 | 2,880 | 2,610 | 2,130 | 20,000 | 5,600 |
| 30 | 2,550 | 2,550 | 2,550 | 7,300 | ..... | 12,000 | 4,600 | 3,020 | 2,740 | 2,020 | 7,360 | 8,080 |
| 31 | 2,550 | ..... | 2,680 | 5,160 | ..... | 8,060 | ..... | 2,480 | ..... | 1,920 | 6,280 | ..... |

*Monthly discharge of Yadkin River near Salisbury, N. C., for the years ending Sept. 30, 1919 and 1920.*

[Drainage area, 3,400 square miles.]

| Month. | Discharge in second-feet. | | | | Run-off in inches. |
|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square mile. | |
| 1918–19. | | | | | |
| October | 34,400 | 1,360 | 5,270 | 1.55 | 1.79 |
| November | 19,000 | 2,610 | 4,850 | 1.43 | 1.60 |
| December | 42,200 | 2,740 | 9,370 | 2.76 | 3.18 |
| January | 45,200 | 4,200 | 9,260 | 2.72 | 3.14 |
| February | 17,000 | 4,200 | 6,630 | 1.95 | 2.03 |
| March | 36,200 | 4,840 | 9,740 | 2.86 | 3.30 |
| April | 12,000 | 3,900 | 5,440 | 1.60 | 1.78 |
| May | 15,600 | 5,160 | 8,230 | 2.42 | 2.79 |
| June | 14,700 | 3,600 | 5,100 | 1.50 | 1.67 |
| July | 72,200 | 2,740 | 11,500 | 3.38 | 3.90 |
| August | 12,400 | 2,610 | 3,990 | 1.17 | 1.35 |
| September | 3,900 | 1,870 | 2,410 | .709 | .79 |
| The year | 72,200 | 1,360 | 6,850 | 2.01 | 27.32 |
| 1919–20. | | | | | |
| October | 7,300 | 1,960 | 2,940 | .865 | .99 |
| November | 8,060 | 2,300 | 2,910 | .856 | .96 |
| December | 16,000 | 2,420 | 3,970 | 1.17 | 1.35 |
| January | 10,400 | 1,420 | 3,730 | 1.10 | 1.27 |
| February | 20,500 | 3,110 | 5,470 | 1.61 | 1.74 |
| March | 14,700 | 3,110 | 6,720 | 1.98 | 2.28 |
| April | 37,400 | 4,020 | 9,780 | 2.88 | 3.21 |
| May | 5,600 | 2,480 | 3,520 | 1.04 | 1.20 |
| June | 12,900 | 2,480 | 4,190 | 1.23 | 1.37 |
| July | 7,360 | 1,920 | 3,520 | 1.04 | 1.20 |
| August | 25,200 | 1,820 | 6,490 | 1.91 | 2.20 |
| September | 10,000 | 2,480 | 4,040 | 1.19 | 1.33 |
| The year | 37,400 | 1,420 | 4,770 | 1.40 | 19.10 |

## SANTEE RIVER BASIN.

### CATAWBA RIVER AT RHODHISS, N. C.

LOCATION.—At highway bridge 1,000 feet below dam of Rhodhiss ManufacturingCo., 1 mile from Carolina & Northwestern Railroad station in Rhodhiss, Caldwell County. Tailrace of company's cotton mills empties into river 300 feet upstream from gage.

DRAINAGE AREA.—1,180 square miles (determined by Rhodhiss Manufacturing Co.).

RECORDS AVAILABLE.—April 13, 1917, to March 31, 1920, when station was discontinued.

GAGE.—Chain gage attached to upstream side of highway bridge; read by A. C. Holbar.

DISCHARGE MEASUREMENTS.—Made from the bridge.

CHANNEL AND CONTROL.—Bed composed of rock.; probably permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year ending September 30, 1919, 19.2 feet at 2 a. m. October 26 (discharge, 52,900 second-feet); minimum stage recorded, 1.4 feet at 6 p. m. September 20–21 (discharge, 630 second-feet).

Maximum stage recorded during period October 1, 1919, to March 31, 1920, 5.1 feet at 5 p. m. March 29 (discharge, 8,280 second-feet); minimum stage recorded, 0.2 foot November 16–17 and December 6 (discha rge, about 100 second-feet). Minimum stage is due to shutdown of plant above gage.

1917–1920: Maximum stage recorded, 19.2 feet at 2 a. m. October 26, 1918 (discharge, 52,900 second-feet); minimum stage recorded, 0.2 foot November 16–17 and December 6, 1919 (estimated discharge 100 second-feet), caused by shutdown of plant above gage.

ICE.—Stage-discharge relation not affected by ice.

DIVERSIONS.—None.

REGULATIONS.—Fluctuations at low stages caused by operation of power plant of the Rhodhiss Manufacturing Co. On several occasions the plant was shut down while pond filled with water. This resulted in very low stages at gage, particularly noticeable on November 16–17 and December 6, 1919. When the big storage dam at Bridgewater, N. C., was cut in, some time after January 1, 1919, regulation became quite noticeable. The station was discontinued March 31, 1920, because of regulation by Bridgewater dam.

ACCURACY.—Stage-discharge relation probably permanent. Rating curve used after October 1, 1918, differs somewhat from the curve used before that date, principally because of improved methods in making discharge measurements. Rating curve well defined between 630 and 3,000 second-feet; fairly good up to 10,000 second-feet. Above 10,000 and below 630 second-feet curve is extended without sufficient data and records should be used with caution. Gage read to tenths once daily; occasionally twice a day. Daily discharge ascertained by applying daily gage height to rating table. Records only fair.

*Discharge measurements of Catawba River at Rhodhiss, N. C., during the years ending Sept. 30, 1919 and 1920.*

| Date. | Made by— | Gage height. | Discharge. | Date. | Made by— | Gage height. | Discharge. |
|---|---|---|---|---|---|---|---|
| 1918. | | *Feet.* | *Sec.-ft.* | 1920 | | *Feet.* | *Sec.-ft.* |
| Oct. 2 | C. C. Babb | 1.54 | 748 | Apr. 22 | A. H. Condron | 2.20 | 1,640 |
| 3 | do | 1.51 | 762 | | | | |
| 1919 | | | | | | | |
| May 30 | do | 2.68 | 2,370 | | | | |
| June 21 | A. H. Condron | 2.48 | 2,050 | | | | |

*Daily discharge, in second-feet, of Catawba River at Rhodhiss, N. C., for the period Oct. 1, 1918, to Mar. 31, 1920.*

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1918-19. | | | | | | | | | | | | |
| 1 | 850 | 8,000 | 2,400 | 3,360 | 2,580 | 4,780 | 2,580 | 3,360 | 2,240 | 2,760 | 2,240 | 1,350 |
| 2 | 795 | 5,820 | 2,240 | 4,280 | 2,580 | 3,800 | 2,580 | 2,960 | 1,930 | 2,400 | 2,080 | 1,350 |
| 3 | 740 | 4,520 | 2,080 | 12,400 | 2,400 | 2,960 | 2,400 | 2,400 | 1,930 | 2,240 | 1,780 | 970 |
| 4 | 740 | 3,580 | 1,930 | 6,600 | 1,930 | 2,760 | 2,240 | 2,400 | 1,490 | 2,080 | 1,630 | 1,490 |
| 5 | 740 | 2,960 | 1,630 | 5,300 | 1,780 | 3,360 | 2,400 | 2,400 | 2,080 | 1,930 | 1,490 | 1,220 |
| 6 | 740 | 2,760 | 1,630 | 4,280 | 1,780 | 5,560 | 2,240 | 2,960 | 1,930 | 2,080 | 1,490 | 1,090 |
| 7 | 740 | 2,580 | 1,630 | 3,800 | 1,780 | 3,580 | 2,080 | 3,580 | 2,960 | 2,080 | 1,630 | 850 |
| 8 | 740 | 2,240 | 1,220 | 3,580 | 1,780 | 3,160 | 2,080 | 3,360 | 2,760 | 3,580 | 1,490 | 850 |
| 9 | 685 | 2,080 | 1,220 | 3,360 | 1,780 | 12,100 | 2,080 | 3,800 | 3,160 | 2,240 | 1,490 | 1,090 |
| 10 | 685 | 1,930 | 1,350 | 2,960 | 1,780 | 7,160 | 2,960 | 5,040 | 2,080 | 2,080 | 1,490 | 1,090 |
| 11 | 685 | 1,930 | 1,490 | 2,760 | 1,780 | 4,780 | 5,040 | 4,040 | 1,220 | 2,080 | 1,630 | 1,630 |
| 12 | 795 | 1,930 | 1,630 | 2,580 | 1,780 | 4,040 | 3,580 | 4,040 | 1,780 | 1,630 | 7,440 | 1,350 |
| 13 | 850 | 1,780 | 1,630 | 2,580 | 1,930 | 3,800 | 2,760 | 6,080 | 1,930 | 1,780 | 2,400 | 740 |
| 14 | 850 | 1,700 | 1,930 | 2,580 | 4,040 | 2,960 | 2,580 | 5,820 | 1,780 | 2,080 | 2,080 | 740 |
| 15 | 795 | 1,700 | 5,820 | 2,240 | 2,760 | 2,760 | 2,580 | 4,040 | 1,630 | 1,930 | 3,360 | 1,090 |
| 16 | 795 | 1,630 | 4,780 | 2,080 | 2,580 | 3,580 | 2,580 | 3,360 | 1,630 | 2,580 | 3,360 | 740 |
| 17 | 740 | 4,280 | 15,200 | 2,080 | 2,240 | 3,360 | 2,400 | 2,960 | 1,630 | 1,930 | 1,780 | 970 |
| 18 | 740 | 7,440 | 8,000 | 2,240 | 2,240 | 3,360 | 2,240 | 2,960 | 1,930 | 3,580 | 1,630 | 970 |
| 19 | 910 | 4,040 | 6,080 | 2,240 | 2,080 | 3,160 | 2,080 | 2,760 | 1,780 | 8,840 | 1,090 | 970 |
| 20 | 2,080 | 2,960 | 4,280 | 2,080 | 2,080 | 2,760 | 2,080 | 4,280 | 2,080 | 20,600 | 1,220 | 630 |
| 21 | 1,490 | 2,400 | 3,800 | 1,930 | 2,080 | 2,760 | 2,080 | 5,300 | 1,930 | 13,600 | 1,220 | 630 |
| 22 | 1,030 | 2,240 | 22,200 | 1,630 | 2,080 | 2,760 | 2,080 | 4,040 | 1,930 | 13,300 | 1,220 | 850 |
| 23 | 795 | 2,080 | 16,500 | 2,580 | 4,280 | 2,580 | 2,240 | 3,160 | 3,160 | 8,000 | 1,220 | 1,350 |
| 24 | 740 | 2,580 | 10,000 | 4,280 | 3,160 | 2,240 | 1,930 | 2,760 | 6,600 | 6,340 | 1,090 | 1,350 |
| 25 | 10,300 | 2,240 | 8,560 | 2,580 | 3,800 | 2,240 | 1,930 | 3,160 | 4,780 | 5,300 | 1,090 | 1,220 |
| 26 | 39,800 | 2,400 | 6,340 | 4,780 | 4,280 | 2,240 | 1,930 | 3,580 | 9,400 | 4,780 | 1,090 | 1,220 |
| 27 | 16,500 | 2,240 | 5,300 | 3,800 | 3,160 | 3,580 | 2,080 | 3,800 | 6,340 | 3,580 | 1,090 | 1,350 |
| 28 | 9,400 | 1,700 | 4,780 | 3,360 | 2,960 | 3,580 | 1,930 | 2,580 | 5,560 | 2,400 | 1,090 | 850 |
| 29 | 18,100 | 3,160 | 4,280 | 2,960 | ..... | 3,580 | 2,080 | 2,760 | 3,800 | 2,240 | 1,780 | 970 |
| 30 | 24,800 | 2,400 | 3,800 | 2,960 | ..... | 3,580 | 2,760 | 2,400 | 2,960 | 2,240 | 1,490 | 1,420 |
| 31 | 14,500 | ..... | 3,360 | 2,760 | ..... | 3,160 | ..... | 2,400 | ..... | 2,240 | 1,350 | ..... |

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1919-20. | | | | | | | 1919-20. | | | | | | |
| 1 | 1,630 | 2,760 | 1,930 | 970 | 1,090 | 970 | 16 | 970 | 100 | 1,090 | 2,080 | 850 | 1,220 |
| 2 | 1,350 | 970 | 1,780 | 970 | 850 | 970 | 17 | 970 | 100 | 970 | 1,930 | 970 | 2,760 |
| 3 | 2,080 | 970 | 1,490 | 630 | 2,240 | 970 | 18 | 740 | 1,930 | 970 | 1,490 | 970 | 1,780 |
| 4 | 2,080 | 2,760 | 1,090 | 1,090 | 6,080 | 970 | 19 | 850 | 2,080 | 970 | 1,490 | 970 | 2,240 |
| 5 | 790 | 1,780 | 630 | 1,090 | 3,800 | 2,580 | 20 | 970 | 1,630 | 740 | 1,490 | 970 | 2,240 |
| 6 | 850 | 1,220 | 100 | 2,080 | 1,780 | 1,630 | 21 | 740 | 1,780 | 740 | 1,490 | 1,090 | 1,780 |
| 7 | 1,490 | 1,220 | 1,490 | 1,930 | 1,350 | 1,220 | 22 | 1,930 | 1,780 | 970 | 1,490 | 1,090 | 1,490 |
| 8 | 1,490 | 630 | 1,490 | 1,930 | 1,090 | 1,090 | 23 | 2,080 | 970 | 1,090 | 1,490 | 1,090 | 1,350 |
| 9 | 1,490 | 740 | 3,160 | 1,930 | 1,090 | 1,090 | 24 | 1,630 | 970 | 630 | 1,930 | 1,490 | 1,220 |
| 10 | 1,090 | 970 | 6,600 | 1,930 | 1,090 | 1,090 | 25 | 970 | 1,350 | 630 | 1,930 | 1,930 | 1,090 |
| 11 | 1,490 | 1,220 | 2,240 | 1,930 | 1,090 | 1,090 | 26 | 850 | 1,490 | 630 | 1,780 | 1,350 | 1,630 |
| 12 | 740 | 1,630 | 1,780 | 1,930 | 1,220 | 1,220 | 27 | 850 | 1,490 | 630 | 1,090 | 1,090 | 1,350 |
| 13 | 970 | 1,630 | 1,490 | 1,780 | 1,220 | 1,780 | 28 | 970 | 1,630 | 630 | 1,490 | 970 | 1,350 |
| 14 | 1,090 | 970 | 1,350 | 1,780 | 970 | 1,630 | 29 | 970 | 1,780 | 970 | 1,630 | 970 | 8,280 |
| 15 | 970 | 630 | 1,220 | 1,930 | 850 | 1,350 | 30 | 1,780 | 2,080 | 970 | 1,630 | ..... | 2,760 |
| | | | | | | | 31 | 1,780 | ..... | 970 | 1,630 | ..... | 1,930 |

NOTE.—Gage read twice daily on following days: Oct. 3, 5, 9, 10, 12, 14, 16, 18, 25, 26 to Nov. 5, Nov. 16, 18, 20, 23, 30, Dec. 1, 15-31, 1918, Jan. 1-15, 24, 27, Feb. 14, 23, 26, Mar. 1, 2, 9-10, Apr. 30, May 14, 21, 30, June 24, 26, July 18-26, Aug. 12 and 15, 1919. Gage not read Aug. 2, 3, and 23-25, 1919; discharge interpolated. Power plant above gage shut down Nov. 16, 17, and Dec. 6, 1919; discharge estimated and should be used with caution.

*Monthly discharge of Catawba River at Rhodhiss, N, C., for the period Oct. 1, 1918, to Mar. 31, 1920.*

[Drainage area, 1,180 square miles.]

| Month. | Discharge in second-feet. | | | | Run-off in inches. |
|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square mile. | |
| 1918–19. | | | | | |
| October | 39,800 | 685 | 4,970 | 4.21 | 4.85 |
| November | 8,000 | 1,630 | 2,980 | 2.53 | 2.82 |
| December | 22,200 | 1,220 | 5,070 | 4.30 | 4.96 |
| January | 12,400 | 1,630 | 3,450 | 2.92 | 3.37 |
| February | 4,280 | 1,780 | 2,480 | 2.10 | 2.19 |
| March | 12,100 | 2,240 | 3,740 | 3.17 | 3.66 |
| April | 5,040 | 1,930 | 2,420 | 2.05 | 2.29 |
| May | 6,080 | 2,400 | 3,500 | 2.97 | 3.42 |
| June | 9,400 | 1,220 | 2,880 | 2.44 | 2.72 |
| July | 20,600 | 1,630 | 4,340 | 3.68 | 4.24 |
| August | 7,440 | 1,090 | 1,820 | 1.54 | 1.78 |
| September | 1,630 | 630 | 1,080 | .915 | 1.02 |
| The year | 39,800 | 630 | 3,240 | 2.75 | 37.32 |
| 1919–20. | | | | | |
| October | 2,080 | 740 | 1,250 | 1.06 | 1.22 |
| November | 2,760 | 100 | 1,380 | 1.17 | 1.30 |
| December | 6,600 | 100 | 1,340 | 1.14 | 1.31 |
| January | 2,080 | 630 | 1,610 | 1.36 | 1.57 |
| February | 6,080 | 850 | 1,430 | 1.21 | 1.30 |
| March | 8,280 | 970 | 1,750 | 1.48 | 1.71 |

## SAVANNAH RIVER BASIN.

### CHATTOOGA RIVER NEAR TALLULAH FALLS, GA.

LOCATION.—300 feet above mouth of Camp Creek, 5½ miles above junction with Tallulah River, and 8 miles east of Tallulah Falls, Rabun County.

DRAINAGE AREA.—256 square miles (measured on topographic maps).

RECORDS AVAILABLE.—January 1, 1917, to January 28, 1918; September 25, 1918, to September 30, 1920.

GAGE.—Gurley 7-day recording gage installed on right bank August 17, 1917. On the same date a new vertical staff gage was installed about 30 feet upstream, to which all recording gage records are referred. Prior to August 17, 1917, readings were taken from an old vertical staff gage at same location as new staff gage and set at same datum. Gage read by employees of Georgia Railway & Power Co.

DISCHARGE MEASUREMENTS.—Made from cable at gage location.

CHANNEL AND CONTROL.—Section under cable may shift somewhat. Control is a solid rock shoal about 100 feet below gage; practically permanent.

EXTREMES OF DISCHARGE.—Maximum mean daily stage recorded during year ending September 30, 1919, 11.4 feet December 22 (discharge, 12,400 second-feet); minimum stage, 0.6 foot October 16–18 (discharge, 255 second-feet).

Maximum stage recorded during year ending September 30, 1920, 9.9 feet at 4 p. m. December 9 (discharge, 10,200 second-feet); minimum stage, 0.99 foot from 2 to 4 p. m. November 9 (discharge, 386 second-feet).

1917–1920: Maximum stage recorded, 12.2 feet March 24, 1917 (discharge, 13,900 second-feet [1]); minimum stage, 0.6 foot October 16–18, 1918 (discharge, 255 second-feet).

ICE.—Stage-discharge relation not affected by ice.

[1] Revised.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined between 280 and 2,500 second-feet. Operation of water-stage recorder satisfactory except for stopping of clock over a number of short periods as indicated in footnote to daily-discharge table. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspecting gage-height graph. Records excellent.

COOPERATION.—Gage-height record furnished by Georgia Railway & Power Co.

*Discharge measurements of Chattooga River near Tallulah Falls, Ga., during the year ending Sept. 30, 1919.*

| Date. | Made by— | Gage height. | Discharge. |
|---|---|---|---|
| | | *Feet.* | *Sec.-ft.* |
| Feb. 15 | Condron and Dooley | 3.04 | 1,580 |
| 23 | Paulsen and Dooley | 3.54 | 2,010 |
| May 24 | Condron and Dooley | 1.96 | 840 |

NOTE.—No discharge measurements were made during year ending Sept. 30, 1920.

*Daily discharge, in second-feet, of Chattooga River near Tallulah Falls, Ga., for the years ending Sept. 30, 1919 and 1920.*

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1918-19. | | | | | | | | | | | | |
| 1 | 302 | 2,650 | 980 | 2,150 | 1,240 | 1,630 | 1,310 | 1,100 | 810 | 920 | 920 | 655 |
| 2 | 302 | 1,170 | 920 | 2,960 | 1,170 | 1,470 | 1,240 | 1,040 | 755 | 865 | 865 | 605 |
| 3 | 285 | 1,630 | 865 | 3,290 | 1,170 | 1,390 | 1,240 | 980 | 755 | 810 | 920 | 605 |
| 4 | 285 | 810 | 865 | 2,250 | 1,390 | 1,310 | 1,240 | 980 | 755 | 810 | 865 | 605 |
| 5 | 285 | 1,310 | 810 | 1,880 | 1,240 | 2,450 | 1,240 | 980 | 755 | 755 | 865 | 582 |
| 6 | 285 | 1,170 | 810 | 1,710 | 1,170 | 2,450 | 1,170 | 980 | 755 | 1,310 | 920 | 560 |
| 7 | 270 | 1,100 | 755 | 1,630 | 1,170 | 1,790 | 1,170 | 1,710 | 755 | 980 | 810 | 538 |
| 8 | 270 | 1,040 | 755 | 1,550 | 1,100 | 1,880 | 1,100 | 1,880 | 755 | 980 | 810 | 515 |
| 9 | 255 | 980 | 755 | 1,550 | 1,100 | 3,870 | 1,100 | 1,390 | 705 | 865 | 810 | 515 |
| 10 | 255 | 920 | 705 | 1,470 | 1,040 | 2,350 | 1,100 | 1,170 | 705 | 865 | 755 | 515 |
| 11 | 255 | 920 | 755 | 1,390 | 1,040 | 1,970 | 2,150 | 1,100 | 705 | 810 | 755 | 515 |
| 12 | 270 | 865 | 755 | 1,310 | 1,040 | 1,790 | 1,630 | 1,040 | 705 | 755 | 1,710 | 492 |
| 13 | 285 | 865 | 705 | 1,340 | 1,710 | 1,710 | 1,390 | 1,100 | 705 | 755 | 980 | 470 |
| 14 | 270 | 810 | 1,240 | 1,310 | 2,350 | 1,550 | 1,240 | 1,100 | 705 | 865 | 865 | 470 |
| 15 | 255 | 810 | 2,060 | 1,240 | 1,550 | 1,550 | 1,240 | 1,040 | 705 | 810 | 810 | 470 |
| 16 | 255 | 810 | 3,510 | 1,240 | 1,390 | 2,060 | 1,790 | 980 | 705 | 755 | 810 | 470 |
| 17 | 255 | 1,470 | 1,970 | 1,630 | 1,240 | 2,060 | 1,790 | 980 | 705 | 755 | 705 | 470 |
| 18 | 255 | 1,630 | 1,470 | 1,970 | 1,240 | 2,150 | 1,470 | 920 | 705 | 2,250 | 705 | 450 |
| 19 | 255 | 1,100 | 1,240 | 1,470 | 1,170 | 1,790 | 1,310 | 920 | 705 | 5,750 | 655 | 450 |
| 20 | 492 | 980 | 1,170 | 1,390 | 1,170 | 1,710 | 1,240 | 1,040 | 705 | 1,880 | 655 | 470 |
| 21 | 582 | 920 | 4,710 | 1,310 | 1,310 | 1,630 | 1,240 | 1,040 | 705 | 1,630 | 655 | 470 |
| 22 | 372 | 865 | 12,400 | 1,240 | 2,750 | 1,550 | 1,100 | 920 | 865 | 1,390 | 705 | 470 |
| 23 | 320 | 865 | 4,590 | 2,060 | 2,150 | 1,470 | 1,170 | 920 | 755 | 1,550 | 655 | 470 |
| 24 | 655 | 865 | 4,110 | 1,880 | 1,630 | 1,390 | 1,100 | 865 | 980 | 1,170 | 655 | 450 |
| 25 | 5,360 | 810 | 3,180 | 1,550 | 1,880 | 1,390 | 1,100 | 810 | 810 | 1,100 | 655 | 430 |
| 26 | 2,150 | 755 | 2,650 | 2,250 | 1,710 | 1,310 | 1,040 | 920 | 980 | 1,240 | 605 | 410 |
| 27 | 2,550 | 755 | 2,250 | 1,790 | 1,470 | 1,880 | 1,040 | 1,040 | 1,170 | 1,100 | 605 | 410 |
| 28 | 3,290 | 1,970 | 2,060 | 1,550 | 1,470 | 1,710 | 1,040 | 865 | 980 | 980 | 605 | 430 |
| 29 | 9,900 | 1,390 | 1,880 | 1,390 | ..... | 1,550 | 1,040 | 1,040 | 1,240 | 920 | 1,170 | 430 |
| 30 | 7,550 | 1,040 | 1,790 | 1,310 | ..... | 1,390 | 1,040 | 980 | 1,040 | 920 | 1,040 | 430 |
| 31 | 4,110 | ..... | 1,710 | 1,310 | ..... | 1,390 | ..... | 865 | ..... | 920 | 755 | ..... |

*Daily discharge, in second-feet, of Chattooga River near Tallulah Falls, Ga., for the years ending Sept. 30, 1919 and 1920*—Continued.

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1919–20. | | | | | | | | | | | | |
| 1 | 430 | 450 | 705 | 605 | 1,100 | 810 | 1,710 | 1,390 | 865 | 582 | 605 | 1,470 |
| 2 | 470 | 538 | 605 | 605 | 1,040 | 755 | 5,620 | 1,310 | 865 | 560 | 605 | 1,390 |
| 3 | 705 | 450 | 560 | 605 | 1,240 | 755 | 3,070 | 1,310 | 920 | 655 | 605 | 2,150 |
| 4 | 865 | 430 | 560 | 582 | 1,710 | 810 | 3,990 | 1,240 | 920 | 590 | 582 | 1,790 |
| 5 | 450 | 430 | 515 | 538 | 1,390 | 1,470 | 3,510 | 1,240 | 920 | 515 | 560 | 1,710 |
| 6 | 430 | 410 | 515 | 605 | 1,240 | 1,100 | 2,450 | 1,240 | 865 | 582 | 582 | 1,710 |
| 7 | 410 | 390 | 705 | 655 | 1,170 | 980 | 2,150 | 1,170 | 810 | 1,550 | 582 | 1,550 |
| 8 | 410 | 390 | 1,310 | 755 | 1,100 | 865 | 1,880 | 1,240 | 810 | 865 | 655 | 1,550 |
| 9 | 450 | 390 | 6,850 | 1,100 | 1,040 | 865 | 2,060 | 1,170 | 810 | 705 | 1,310 | 1,550 |
| 10 | 430 | 390 | 4,230 | 1,040 | 1,040 | 865 | 1,180 | 1,100 | 755 | 655 | 1,970 | 1,550 |
| 11 | 410 | 755 | 1,970 | 810 | 980 | 865 | 1,630 | 1,100 | 755 | 705 | 1,790 | 1,310 |
| 12 | 410 | 1,390 | 1,550 | 755 | 980 | 1,100 | 1,550 | 1,100 | 755 | 655 | 3,070 | 1,310 |
| 13 | 450 | 1,100 | 1,240 | 705 | 980 | 1,880 | 1,470 | 1,240 | 705 | 605 | 2,850 | 1,310 |
| 14 | 515 | 755 | 1,100 | 705 | 920 | 1,390 | 1,390 | 1,170 | 705 | 582 | 2,550 | 1,240 |
| 15 | 515 | 655 | 980 | 655 | 865 | 1,170 | 1,310 | 1,100 | 705 | 582 | 2,650 | 1,240 |
| 16 | 450 | 560 | 920 | 655 | 865 | 1,100 | 1,310 | 1,040 | 705 | 582 | 2,550 | 1,240 |
| 17 | 450 | 538 | 865 | 810 | 865 | 1,390 | 1,310 | 1,040 | 655 | 705 | 2,150 | 1,240 |
| 18 | 430 | 515 | 810 | 705 | 865 | 1,240 | 1,170 | 1,040 | 655 | 920 | 2,060 | 1,170 |
| 19 | 430 | 492 | 810 | 705 | 865 | 1,470 | 1,170 | 1,040 | 655 | 1,390 | 2,060 | 1,100 |
| 20 | 430 | 470 | 755 | 655 | 810 | 1,470 | 1,310 | 980 | 1,170 | 1,040 | 2,060 | 1,100 |
| 21 | 430 | 470 | 755 | 810 | 810 | 1,170 | 1,880 | 980 | 1,240 | 1,040 | 2,350 | 1,100 |
| 22 | 582 | 450 | 655 | 810 | 920 | 1,100 | 1,390 | 980 | 755 | 920 | 2,060 | 1,100 |
| 23 | 865 | 450 | 515 | 865 | 980 | 1,040 | 1,310 | 980 | 705 | 810 | 3,870 | 1,100 |
| 24 | 755 | 430 | 605 | 1,630 | 920 | 980 | 1,170 | 920 | 755 | 755 | 1,630 | 980 |
| 25 | 560 | 430 | 605 | 2,450 | 865 | 980 | 1,100 | 980 | 655 | 705 | 1,550 | 810 |
| 26 | 492 | 655 | 605 | 2,550 | 865 | 1,630 | 1,390 | 1,040 | 655 | 705 | 1,470 | 755 |
| 27 | 470 | 755 | 655 | 2,450 | 810 | 1,390 | 1,630 | 980 | 605 | 655 | 3,070 | 755 |
| 28 | 450 | 582 | 655 | 2,060 | 810 | 1,390 | 1,390 | 920 | 605 | 655 | 1,790 | 755 |
| 29 | 430 | 560 | 655 | 1,630 | 810 | 2,750 | 1,240 | 865 | 605 | 655 | 1,710 | 755 |
| 30 | 430 | 810 | 605 | 1,470 | ..... | 1,630 | 1,170 | 865 | 605 | 605 | 1,790 | 810 |
| 31 | 430 | ..... | 605 | 1,240 | ..... | 1,310 | ..... | 865 | ..... | 655 | 1,630 | ..... |

NOTE.—Owing to stopping of clock, only maximum and minimum stages were recorded by the gage for each of following periods: 4.30 p. m. Feb. 14 to noon Feb. 15, 1919; 9.30 p. m. May 23 to noon May 24; 5 a. m. June 7 to 10 a. m. June 28; 11 a. m. July 18 to noon July 19; 1 a. m. July 24 to 4.10 p. m. July 26; 2. a. m. Aug. 8 to 4 p. m. Aug. 9; 4.30 a. m. Aug. 29 to 4.35 p. m. Aug. 30; noon Sept. 9 to 11 a. m. Sept. 13; 10 a. m. Sept. 25 to 4 p. m. Oct. 4; 3.30 p. m. Dec. 22 to 11 a. m. Dec. 27, 1919; and 4.30 p. m. July 13 to 9.15 a. m. July 17, 1920. Mean daily gage heights for these periods determined from graph based on maximum and minimum stages and comparison with record for Tallulah River near Seed, Ga.

*Monthly discharge of Chattooga River near Tallulah Falls, Ga., for the years ending Sept. 30, 1919 and 1920.*

[Drainage area, 256 square miles.]

| Month. | Discharge in second-feet. | | | | Run-off in inches. |
|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square mile. | |
| 1918–19. | | | | | |
| October | 9,900 | 255 | 1,370 | 5.35 | 6.17 |
| November | 2,650 | 755 | 1,110 | 4.34 | 4.84 |
| December | 12,400 | 705 | 2,080 | 8.12 | 9.36 |
| January | 3,290 | 1,240 | 1,690 | 6.60 | 7.61 |
| February | 2,750 | 1,040 | 1,430 | 5.59 | 5.82 |
| March | 3,870 | 1,310 | 1,790 | 6.99 | 8.06 |
| April | 2,150 | 1,040 | 1,270 | 4.96 | 5.53 |
| May | 1,880 | 810 | 1,050 | 4.10 | 4.73 |
| June | 1,240 | 705 | 803 | 3.14 | 3.50 |
| July | 5,750 | 755 | 1,210 | 4.73 | 5.45 |
| August | 1,710 | 605 | 816 | 3.19 | 3.68 |
| September | 655 | 410 | 494 | 1.93 | 2.15 |
| The year | 12,400 | 255 | 1,260 | 4.92 | 66.90 |

*Monthly discharge of Chattooga River near Tallulah Falls, Ga., for the years ending Sept. 30, 1919 and 1920*—Continued.

| Month. | Discharge in second-feet. | | | | Run-off in inches. |
|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square mile. | |
| 1919–20. | | | | | |
| October | 865 | 410 | 498 | 1.95 | 2.25 |
| November | 1,390 | 390 | 570 | 2.23 | 2.49 |
| December | 6,850 | 515 | 1,110 | 4.34 | 5.00 |
| January | 2,550 | 538 | 1,040 | 4.06 | 4.68 |
| February | 1,710 | 810 | 995 | 3.89 | 4.20 |
| March | 2,750 | 755 | 1,220 | 4.77 | 5.50 |
| April | 5,620 | 1,100 | 1,850 | 7.23 | 8.07 |
| May | 1,390 | 865 | 1,080 | 4.22 | 4.86 |
| June | 1,240 | 605 | 773 | 3.02 | 3.37 |
| July | 1,550 | 515 | 747 | 2.92 | 3.37 |
| August | 3,870 | 560 | 1,770 | 6.91 | 7.97 |
| September | 2,150 | 755 | 1,250 | 4.88 | 5.44 |
| The year | 6,850 | 390 | 1,080 | 4.22 | 57.20 |

### TALLULAH RIVER NEAR SEED, GA.

LOCATION.—One-fourth mile upstream from head of Rabun Lake, 1 mile downstream from Bridge Creek, 5 miles north of Seed, Rabun County, 6 miles due west of Lakemont railroad station, 10 miles upstream from Rabun (or Mathis) dam, and 7 miles below Burton dam.

DRAINAGE AREA.—127 square miles (measured on topographic maps).

RECORDS AVAILABLE.—January 6, 1916, to April 25, 1920, when station was discontinued.

GAGE.—Staff gage in three sections on right bank; read by employees of Georgia Railway & Power Co.

DISCHARGE MEASUREMENTS.—Made from cable and car about 200 feet upstream for low and medium stages. Flood measurements made from suspension footbridge 1 mile downstream from gage.

CHANNEL AND CONTROL.—Bed composed of rock, sand, and gravel; rather rough but permanent. Control is a ledge which extends across river and over which water drops sharply, about 250 feet downstream from gage; probably permanent. Point of zero flow, gage height—0.5 foot.

EXTREMES OF DISCHARGE.—Maximum mean daily stage recorded during year ending September 30, 1919, 7.8 feet December 22 (discharge, 7,490 second-feet); minimum mean daily stage, 0.83 foot October 8–11, 16–17, and 19 (discharge, 100 second-feet).

Maximum mean daily stage recorded during period October 1, 1919, to April 25, 1920, 5.2 feet December 9 (discharge, 4,190 second-feet); minimum mean daily stage, 0.74 foot March 25, due to shutting off of water by Burton storage dam (discharge, 72 second-feet).

1916–1920: Maximum stage recorded, 8.2 feet at 6 p. m. July 9, 1916 (discharge, 8,010 second-feet); minimum mean daily stage, that of March 25, 1920.

ICE.—Never enough to affect stage-discharge relation.

REGULATION.—Practically none until about March 19, 1920, when the gates of Burton storage dam which was being built about 7 miles upstream were partly closed. After March 19, 1920, stages were affected largely by this storage but the daily fluctuations of stage were not sudden or often.

ACCURACY.—Stage-discharge relation permanent; not affected by ice. Rating curve well defined between 100 and 5,500 second-feet. Gage read to hundredths three times daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

*Discharge measurements of Tallulah River near Seed, Ga., during the year ending Sept. 30, 1919.*

[Made by Condron and Dooley.]

| Date. | Gage height. | Discharge. |
|---|---|---|
| | *Feet.* | *Sec.-ft.* |
| May 23 | 1.57 | 475 |
| 23 | 1.57 | 472 |

NOTE.—No discharge measurements were made during year ending Sept. 30, 1920.

*Daily discharge, in second-feet, of Tallulah River near Seed, Ga., for the period, Oct. 1, 1918, to Apr. 25, 1920.*

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1918-19. | | | | | | | | | | | | |
| 1 | 129 | 1,080 | 495 | 1,180 | 670 | 830 | 750 | 595 | 462 | 528 | 400 | 276 |
| 2 | 122 | 830 | 462 | 1,920 | 670 | 750 | 710 | 528 | 424 | 495 | 382 | 260 |
| 3 | 118 | 710 | 430 | 1,810 | 630 | 710 | 710 | 495 | 412 | 424 | 710 | 255 |
| 4 | 114 | 560 | 406 | 1,310 | 750 | 670 | 710 | 495 | 400 | 394 | 528 | 250 |
| 5 | 111 | 528 | 382 | 1,080 | 670 | 1,400 | 710 | 495 | 388 | 382 | 670 | 235 |
| 6 | 108 | 462 | 370 | 1,080 | 630 | 1,220 | 630 | 528 | 376 | 1,080 | 462 | 230 |
| 7 | 104 | 430 | 359 | 950 | 630 | 950 | 630 | 870 | 364 | 595 | 430 | 225 |
| 8 | 100 | 418 | 354 | 910 | 595 | 910 | 630 | 995 | 354 | 630 | 388 | 225 |
| 9 | 100 | 394 | 342 | 870 | 630 | 1,920 | 595 | 710 | 354 | 528 | 364 | 220 |
| 10 | 100 | 376 | 337 | 790 | 595 | 1,180 | 595 | 630 | 337 | 528 | 359 | 220 |
| 11 | 100 | 359 | 376 | 750 | 560 | 1,040 | 1,220 | 595 | 332 | 462 | 359 | 215 |
| 12 | 108 | 348 | 348 | 710 | 560 | 950 | 790 | 528 | 326 | 424 | 359 | 235 |
| 13 | 122 | 337 | 359 | 670 | 1,310 | 870 | 710 | 595 | 326 | 406 | 348 | 201 |
| 14 | 111 | 326 | 995 | 670 | 1,310 | 830 | 670 | 560 | 315 | 462 | 337 | 206 |
| 15 | 104 | 315 | 910 | 670 | 950 | 830 | 630 | 528 | 326 | 406 | 320 | 192 |
| 16 | 100 | 388 | 2,580 | 630 | 790 | 1,180 | 1,500 | 495 | 348 | 382 | 342 | 196 |
| 17 | 100 | 710 | 1,130 | 1,040 | 710 | 1,130 | 950 | 495 | 342 | 359 | 320 | 188 |
| 18 | 104 | 595 | 830 | 995 | 670 | 1,130 | 830 | 462 | 337 | 382 | 304 | 183 |
| 19 | 100 | 495 | 710 | 790 | 630 | 995 | 710 | 462 | 337 | 1,700 | 298 | 183 |
| 20 | 332 | 430 | 630 | 710 | 630 | 910 | 670 | 710 | 304 | 995 | 282 | 192 |
| 21 | 192 | 406 | 1,400 | 670 | 710 | 870 | 630 | 528 | 304 | 750 | 298 | 206 |
| 22 | 141 | 400 | 7,490 | 630 | 1,810 | 790 | 630 | 462 | 528 | 870 | 298 | 210 |
| 23 | 129 | 388 | 2,360 | 1,400 | 1,180 | 750 | 595 | 462 | 342 | 830 | 293 | 192 |
| 24 | 220 | 382 | 2,360 | 995 | 910 | 750 | 560 | 462 | 670 | 670 | 320 | 183 |
| 25 | 1,180 | 364 | 1,700 | 870 | 1,130 | 710 | 560 | 430 | 412 | 670 | 276 | 174 |
| 26 | 870 | 342 | 1,400 | 1,400 | 950 | 710 | 560 | 462 | 670 | 710 | 266 | 170 |
| 27 | 1,040 | 332 | 1,220 | 1,040 | 830 | 1,600 | 528 | 630 | 910 | 595 | 260 | 165 |
| 28 | 1,600 | 1,310 | 1,130 | 870 | 1,700 | 1,130 | 528 | 462 | 560 | 560 | 260 | 165 |
| 29 | 4,910 | 710 | 1,040 | 830 | ..... | 910 | 528 | 830 | 1,400 | 630 | 260 | 161 |
| 30 | 3,710 | 560 | 950 | 750 | ..... | 870 | 528 | 528 | 670 | 528 | 394 | 157 |
| 31 | 1,700 | ..... | 910 | 710 | ..... | 790 | ..... | 495 | ..... | 418 | 320 | ..... |

*Daily discharge, in second-feet, of Tallulah River near Seed, Ga., for the period, Oct. 1, 1918, to Apr. 25, 1920*—Continued.

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1919-20. | | | | | | | | | | | | |
| 1 | 153 | 215 | 320 | 326 | 670 | 495 | 174 | | | | | |
| 2 | 165 | 276 | 282 | 315 | 630 | 495 | 528 | | | | | |
| 3 | 271 | 225 | 260 | 315 | 750 | 462 | 210 | | | | | |
| 4 | 215 | 210 | 250 | 315 | 870 | 462 | 2,690 | | | | | |
| 5 | 188 | 201 | 250 | 310 | 910 | 630 | 240 | | | | | |
| 6 | 178 | 188 | 250 | 304 | 670 | 630 | 192 | | | | | |
| 7 | 174 | 183 | 430 | 326 | 560 | 630 | 174 | | | | | |
| 8 | 170 | 183 | 830 | 337 | 560 | 595 | 157 | | | | | |
| 9 | 245 | 183 | 4,190 | 495 | 595 | 560 | 201 | | | | | |
| 10 | 210 | 178 | 2,470 | 394 | 595 | 560 | 165 | | | | | |
| 11 | 183 | 595 | 1,130 | 382 | 595 | 560 | 153 | | | | | |
| 12 | 183 | 870 | 870 | 388 | 560 | 630 | 149 | | | | | |
| 13 | 266 | 528 | 710 | 388 | 528 | 750 | 141 | | | | | |
| 14 | 240 | 364 | 710 | 376 | 495 | 710 | 125 | | | | | |
| 15 | 210 | 320 | 595 | 370 | 495 | 710 | 122 | | | | | |
| 16 | 192 | 276 | 528 | 400 | 495 | 710 | 133 | | | | | |
| 17 | 192 | 260 | 495 | 400 | 495 | 750 | 129 | | | | | |
| 18 | 201 | 250 | 462 | 394 | 495 | 750 | 118 | | | | | |
| 19 | 201 | 230 | 528 | 394 | 495 | 430 | 111 | | | | | |
| 20 | 188 | 220 | 462 | 394 | 495 | 122 | 114 | | | | | |
| 21 | 183 | 210 | 430 | 400 | 495 | 97 | 161 | | | | | |
| 22 | 196 | 210 | 271 | 406 | 560 | 87 | 125 | | | | | |
| 23 | 528 | 206 | 153 | 424 | 560 | 81 | 118 | | | | | |
| 24 | 495 | 201 | 250 | 595 | 560 | 75 | 104 | | | | | |
| 25 | 282 | 201 | 276 | 595 | 560 | 72 | 100 | | | | | |
| 26 | 240 | 332 | 293 | 670 | 560 | 153 | | | | | | |
| 27 | 225 | 271 | 304 | 670 | 528 | 100 | | | | | | |
| 28 | 210 | 240 | 315 | 710 | 528 | 178 | | | | | | |
| 29 | 201 | 255 | 315 | 710 | 495 | 220 | | | | | | |
| 30 | 201 | 430 | 315 | 710 | | 141 | | | | | | |
| 31 | 201 | | 315 | 670 | | 122 | | | | | | |

*Monthly discharge of Tallulah River near Seed, Ga., for the period Oct. 1, 1918, to Apr. 25, 1920.*

[Drainage area, 127 square miles.]

| Month. | Discharge in second-feet. | | | | Run-off in inches. |
|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square mile. | |
| 1918-19. | | | | | |
| October | 4,910 | 100 | 583 | 4.59 | 5.29 |
| November | 1,310 | 315 | 510 | 4.02 | 4.48 |
| December | 7,490 | 337 | 1,120 | 8.82 | 10.17 |
| January | 1,920 | 630 | 958 | 7.54 | 8.69 |
| February | 1,810 | 560 | 850 | 6.69 | 6.97 |
| March | 1,920 | 670 | 977 | 7.69 | 8.87 |
| April | 1,500 | 528 | 700 | 5.51 | 6.15 |
| May | 995 | 430 | 565 | 4.45 | 5.13 |
| June | 1,400 | 304 | 454 | 3.57 | 3.98 |
| July | 1,700 | 359 | 606 | 4.77 | 5.50 |
| August | 710 | 260 | 362 | 2.85 | 3.29 |
| September | 276 | 157 | 206 | 1.62 | 1.81 |
| The year | 7,490 | 100 | 658 | 5.18 | 70.33 |
| 1919-20. | | | | | |
| October | 528 | 153 | 225 | 1.77 | 2.04 |
| November | 870 | 178 | 284 | 2.24 | 2.50 |
| December | 4,190 | 153 | 621 | 4.89 | 5.64 |
| January | 710 | 304 | 448 | 3.53 | 4.07 |
| February | 910 | 495 | 579 | 4.56 | 4.92 |
| March | 750 | 72 | 418 | 3.29 | 3.79 |
| April 1-25 | 2,690 | 100 | 265 | 2.09 | 1.94 |

## ALTAMAHA RIVER BASIN.

### OCMULGEE RIVER AT JULIETTE, GA.

LOCATION.—1 mile below Juliette railroad station, 1 mile below Juliette cotton mills, which are on left side of river opposite Juliette, 2½ miles below mouth of Towaliga River, 20 miles upstream from Macon, and 20 miles below Jackson dam. Ocmulgee River forms line between Jones and Monroe counties; gage is in Jones County.

DRAINAGE AREA.—2,100 square miles (measured on post-route map).

RECORDS AVAILABLE.—June 3, 1916, to September 30, 1920.

GAGE.—Stevens continuous water-stage recorder in concrete stilling well on left bank of river.

DISCHARGE MEASUREMENTS.—Made from a cable about 150 feet upstream from gage.

CHANNEL AND CONTROL.—Bed composed of sand and solid rock at gage section. Banks high; subject to overflow at about 15 feet gage height. Control is a rock ledge across bottom of river 600 feet below gage; and a rock shoal about half a mile downstream forms a control which keeps stage-discharge relation permanent.

EXTREMES OF DISCHARGE.—Maximum stage during year ending September 30, 1919, from water-stage recorder, 20.4 feet from 8 a. m. to noon December 23 (discharge, 28,100 second-feet); minimum stage from water-stage recorder, 2.74 feet from 4 to 5 p. m. November 4 (discharge, 270 second-feet, from extension of rating curve). Minimum stage probably due to shutting off of flow at Jackson dam.

Maximum stage during year ending September 30, 1920, by tape measurements from rod to flood marks in gage house, 30.8 feet from 9 to 11 a. m. December 11 (discharge, 52,900 second-feet); minimum stage from water-stage recorder, 3.34 feet at 1 a. m. October 13 (discharge, 570 second-feet). Minimum stage probably due to shutting off of flow at Jackson dam.

1916–1920: Maximum stage recorded, 30.8 feet from 9 to 11 a. m. December 11, 1919 (discharge, 52 900 second-feet); minimum stage from water-stage recorder, 2.74 feet from 4 to 5 p. m. November 4, 1918 (discharge, 270 feet, from extension of rating curve). Minimum stage probably due to action of storage at Jackson dam.

A stage of 32.0 feet was probably reached by the flood in 1886. This stage was determined from marks pointed out by local residents and may be subject to error. Discharge corresponding to this stage is about 55,800 second-feet.

ICE.—None.

DIVERSIONS.—None.

REGULATION.—Considerable fluctuations in stage are caused by operation of the hydroelectric plant about 20 miles upstream, near Jackson, Ga. Minor diurnal fluctuations are caused by operation of Juliette mills 1 mile upstream and the hydroelectric plant on Towaliga River at High Falls, about 15 miles away.

ACCURACY.—Stage-discharge relation probably permanent. Rating curve well defined between 600 and 25,000 second-feet and fairly well defined between 25,000 and 45,000 second-feet; extended above 45,000 second-feet. Operation of water-stage recorder satisfactory except for a number of short periods when clock stopped as indicated in footnote to daily-discharge table. Daily discharge for year ending September 30, 1919, ascertained by averaging the hourly discharge; for year ending September 30, 1920, by use of discharge integrator. Records good.

*Discharge measurements of Ocmulgee River at Juliette, Ga., during the years ending Sept. 30, 1919 and 1920.*

| Date. | Made by— | Gage height. | Discharge. | Date. | Made by— | Gage height. | Discharge. |
|---|---|---|---|---|---|---|---|
| | | *Feet.* | *Sec.-ft.* | | | *Feet.* | *Sec.-ft.* |
| 1918. | | | | 1919. | | | |
| Oct. 9 | A. H. Condron | 3.64 | 730 | July 25 | A. H. Condron | 11.51 | 10,700 |
| | | | | Sept. 17 | Warren E. Hall and A. H. Condron. | 4.55 | 1,520 |
| 1919. | | | | | | | |
| Feb. 19 | do | 5.80 | 2,710 | 18 | do | 4.10 | 1,050 |
| Apr. 15 | do | 4.38 | 1,200 | Dec. 23 | A. H. Condron | 6.24 | 3,060 |

*Daily discharge, in second-feet, of Ocmulgee River at Juliette, Ga., for the years ending Sept. 30, 1919 and 1920.*

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1918–19.** | | | | | | | | | | | | |
| 1 | 982 | 797 | 4,450 | 2,690 | 2,780 | 5,460 | 2,320 | 1,920 | 1,050 | 1,430 | 2,030 | 1,870 |
| 2 | 965 | 828 | 4,210 | 4,910 | 2,020 | 4,210 | 2,260 | 1,870 | 1,310 | 1,390 | 2,030 | 1,580 |
| 3 | 853 | 629 | 2,770 | 6,710 | 2,790 | 4,240 | 2,200 | 1,610 | 1,650 | 1,390 | 1,940 | 1,620 |
| 4 | 781 | 448 | 2,150 | 8,180 | 3,290 | 3,290 | 2,120 | 1,020 | 1,650 | 1,020 | 3,600 | 1,620 |
| 5 | 819 | 804 | 2,110 | 5,220 | 3,130 | 3,760 | 2,000 | 1,400 | 1,640 | 932 | 2,600 | 1,470 |
| 6 | 732 | 853 | 2,060 | 4,650 | 2,920 | 4,590 | | 1,810 | 1,590 | 1,390 | 2,250 | 1,300 |
| 7 | 610 | 895 | 1,920 | 3,120 | 2,720 | 4,750 | | 1,770 | 1,450 | 1,300 | 4,520 | 892 |
| 8 | 782 | 895 | 1,240 | 2,980 | 2,390 | 4,140 | | 1,820 | 927 | 1,500 | 8,060 | 1,120 |
| 9 | 757 | 1,020 | 1,770 | 2,950 | 1,650 | 12,100 | 1,850 | 1,680 | 1,370 | 4,420 | 3,280 | 1,480 |
| 10 | 663 | 637 | 2,300 | 2,810 | 2,420 | 13,400 | | 1,670 | 1,620 | 2,800 | 3,080 | 1,480 |
| 11 | 652 | 484 | 2,290 | 2,510 | 2,480 | 16,300 | | 1,060 | 1,690 | 4,820 | 3,280 | 1,470 |
| 12 | 695 | 933 | 2,300 | 1,660 | 2,400 | 8,680 | 2,060 | 1,620 | 1,710 | 5,510 | 2,270 | |
| 13 | 600 | 1,030 | 2,300 | 2,300 | 2,660 | 5,430 | 1,700 | 1,950 | 1,680 | 4,040 | 2,080 | |
| 14 | 586 | 1,170 | 5,920 | 2,530 | 3,220 | 3,820 | | 2,560 | | 2,930 | 1,970 | 1,300 |
| 15 | 625 | 1,200 | 2,800 | 2,420 | 2,650 | 2,950 | 1,830 | 2,060 | | 1,690 | 1,900 | |
| 16 | 652 | 1,080 | 2,630 | 2,370 | 1,810 | 2,570 | | 2,050 | 1,450 | 1,860 | 1,530 | |
| 17 | 618 | 1,520 | 2,610 | 2,660 | 2,370 | 4,270 | 2,000 | 1,720 | | 2,610 | 1,060 | 1,440 |
| 18 | 565 | 1,100 | 2,420 | 3,220 | 2,530 | 5,540 | | 1,010 | | 3,070 | 1,370 | 1,430 |
| 19 | 606 | 1,140 | 2,340 | 2,650 | 2,440 | 4,700 | 1,760 | 1,360 | | 4,820 | 1,620 | 1,490 |
| 20 | 595 | 1,100 | 2,380 | 3,380 | 2,630 | 3,870 | 1,070 | 1,770 | | 4,920 | 1,650 | 1,800 |
| 21 | 726 | 1,120 | 7,370 | 3,330 | 3,120 | 3,290 | 1,610 | 1,760 | 1,070 | 5,520 | 1,670 | 1,390 |
| 22 | 712 | 1,340 | 20,800 | 3,080 | 5,240 | 2,880 | 1,920 | 1,760 | 862 | 4,250 | 1,700 | 1,210 |
| 23 | 591 | 1,340 | 27,300 | 2,990 | 9,410 | 2,260 | 1,880 | 1,650 | 1,500 | 5,020 | 1,680 | 1,420 |
| 24 | 689 | 948 | 22,200 | 3,020 | 8,730 | 2,820 | 1,820 | 1,410 | 2,200 | 6,190 | 1,610 | 3,120 |
| 25 | 2,460 | 1,200 | 14,000 | 4,130 | 18,000 | 2,820 | 1,760 | 872 | 2,460 | 9,930 | 3,200 | 1,320 |
| 26 | 1,210 | 1,490 | 7,590 | 8,660 | 22,100 | 2,550 | 1,570 | 1,210 | 1,740 | 7,080 | 3,700 | 1,340 |
| 27 | 690 | 1,680 | 4,900 | 9,120 | 12,100 | 2,500 | 1,030 | 1,600 | 1,790 | 4,880 | 2,700 | 1,280 |
| 28 | 438 | 4,320 | 3,180 | 7,020 | 6,840 | 2,760 | 1,450 | 1,660 | 1,390 | 3,740 | 1,800 | 856 |
| 29 | 959 | 2,890 | 2,450 | 5,080 | ..... | 2,090 | 1,790 | 1,620 | 950 | 2,550 | 1,920 | 997 |
| 30 | 1,110 | 3,360 | 3,100 | 3,970 | ..... | 1,610 | 1,860 | 1,710 | 1,190 | 1,950 | 1,700 | 1,350 |
| 31 | 1,300 | ..... | 2,940 | 3,290 | ..... | 2,160 | ..... | 1,610 | ..... | 1,880 | 1,150 | ..... |
| **1919–20.** | | | | | | | | | | | | |
| 1 | 1,390 | 1,780 | 1,220 | 2,640 | | 2,540 | 8,040 | 3,350 | 2,080 | 1,860 | 1,280 | 2,220 |
| 2 | 1,500 | 1,820 | 1,470 | 2,520 | | 3,000 | 11,100 | 1,460 | 1,940 | 1,880 | 1,320 | 2,070 |
| 3 | 1,450 | 1,320 | 1,440 | 2,380 | | 2,810 | 15,600 | 9,740 | 1,850 | 1,560 | 1,850 | 2,490 |
| 4 | 1,250 | 1,800 | 1,420 | 1,380 | 9,200 | 2,840 | 12,700 | 13,700 | 1,870 | 1,280 | 2,150 | 2,060 |
| 5 | 835 | 1,760 | 1,420 | 1,110 | | 3,520 | 9,360 | 9,930 | 2,020 | 1,110 | 3,460 | 3,410 |
| 6 | 880 | 1,730 | 1,120 | | | 3,110 | 6,500 | 7,480 | 2,280 | 1,640 | 4,750 | 4,310 |
| 7 | 1,240 | 1,780 | 930 | | | 1,940 | 4,780 | 6,160 | 2,780 | 1,850 | 2,750 | 3,660 |
| 8 | 1,280 | 1,680 | 4,200 | 3,400 | | 2,390 | 4,220 | 3,900 | 2,800 | 1,960 | 2,050 | 2,400 |
| 9 | 2,080 | 1,050 | 15,600 | | | 2,810 | 4,490 | 1,880 | 2,500 | 1,950 | 2,120 | 2,400 |
| 10 | 1,440 | 1,220 | 36,000 | | | 2,880 | 4,620 | 2,370 | 1,850 | 1,900 | 2,600 | 3,890 |
| 11 | 1,270 | 1,670 | 50,800 | 1,830 | 4,800 | 2,650 | 3,530 | 2,880 | 1,820 | 1,580 | 3,380 | 4,510 |
| 12 | 785 | 1,570 | 38,300 | 2,900 | | 4,700 | 3,920 | 2,700 | 1,730 | 1,730 | 10,500 | 3,250 |
| 13 | 865 | 1,640 | 17,600 | 3,580 | | 8,090 | 4,430 | 3,530 | 1,120 | 2,200 | 10,300 | 2,830 |
| 14 | 1,300 | 1,610 | 9,160 | 3,440 | | 9,680 | 4,030 | 7,540 | 1,220 | 2,420 | 5,480 | 2,380 |
| 15 | 1,320 | 1,460 | 7,530 | 3,640 | 4,150 | 9,060 | 3,700 | 6,830 | 1,790 | 2,480 | 3,720 | 2,260 |
| 16 | 1,350 | 970 | 3,630 | 4,020 | | 5,990 | 3,620 | | 1,840 | 2,760 | 5,670 | 2,220 |
| 17 | 1,390 | 1,170 | 6,490 | 4,740 | | 12,900 | 2,760 | | 1,780 | 3,020 | 6,330 | 2,120 |
| 18 | 1,310 | 1,560 | 4,440 | 3,120 | | 23,200 | 3,200 | | 1,790 | 3,390 | 9,070 | 1,880 |
| 19 | 835 | 1,550 | 4,900 | 3,530 | 3,400 | 21,400 | 2,220 | 3,000 | 1,720 | 7,720 | 6,940 | 1,180 |
| 20 | 940 | 1,530 | 3,680 | 3,760 | | 18,600 | 2,840 | | 1,180 | 7,220 | 5,100 | 1,600 |
| 21 | 1,740 | 1,500 | 2,290 | 3,580 | | 11,600 | 2,540 | | 1,340 | 6,530 | 2,410 | 2,200 |
| 22 | 3,020 | 1,470 | 3,030 | 3,560 | 1,780 | 7,860 | 3,140 | | 1,870 | 8,000 | 2,000 | 2,100 |
| 23 | 2,020 | 1,020 | 3,370 | 3,080 | 2,520 | 5,750 | 4,170 | 1,960 | 1,840 | 5,410 | 5,060 | 2,090 |
| 24 | 2,270 | 1,180 | 2,850 | 3,180 | 2,820 | 4,300 | 3,520 | 2,410 | 1,940 | 2,910 | 3,930 | 1,970 |
| 25 | 1,590 | 1,660 | 1,760 | ..... | 3,400 | 3,850 | 2,760 | 2,810 | 2,150 | 1,620 | 2,300 | 1,820 |
| 26 | 960 | 1,750 | 1,840 | ..... | 3,280 | 4,040 | 2,940 | 3,360 | 1,820 | 1,690 | 2,220 | 1,280 |
| 27 | 985 | 1,620 | 2,290 | ..... | 3,020 | 7,600 | 5,390 | 4,920 | 1,120 | 2,540 | 2,550 | 1,540 |
| 28 | 1,840 | 1,600 | 1,900 | ..... | 2,760 | 9,000 | 10,300 | 3,660 | 1,220 | 2,620 | 4,570 | 2,140 |
| 29 | 1,810 | 1,640 | 2,520 | ..... | 2,030 | 28,500 | 9,570 | 2,160 | 1,870 | 2,170 | 4,350 | 2,360 |
| 30 | 1,830 | 1,160 | 3,060 | ..... | ..... | 26,500 | 5,770 | 1,310 | 1,840 | 2,150 | 4,880 | 3,250 |
| 31 | 1,820 | ..... | 2,900 | ..... | ..... | 13,400 | ..... | 1,420 | ..... | 1,860 | 3,900 | ..... |

NOTE.—Only the range of stage is available for following periods when gage did not operate satisfactorily: Apr. 6–11, 13–14, 16–18, June 14–20, 1919, Jan. 6–10, Jan. 25 to Feb. 14, Feb. 16–21, 1920. No record or range in stage Sept. 12–16, 1919, and May, 16–22, 1920. Braced figures show mean discharge for periods when gage did not operate, determined by use of curve showing relation between mean weekly gage height at Macon and mean weekly discharge at Juliette. Discharge Dec. 17–19, 1919, estimated by comparison with records for Jackson and Macon.

*Monthly discharge, in second-feet, of Ocmulgee River at Juliette, Ga., for the years ending Sept. 30, 1919 and 1920.*

| Month. | 1918–19. | | | 1919–20. | | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Maximum. | Minimum. | Mean. |
| October | 2,460 | 438 | 807 | 3,020 | 785 | 1,440 |
| November | 4,320 | 448 | 1,280 | 1,820 | 970 | 1,510 |
| December | 27,300 | 1,240 | 5,450 | 50,800 | 930 | 7,710 |
| January | 9,120 | 1,660 | 3,990 | ..... | 1,110 | 4,950 |
| February | 22,100 | 1,650 | 4,890 | ..... | 1,780 | 4,970 |
| March | 16,300 | 1,610 | 4,700 | 25,800 | 1,940 | 8,600 |
| April | ..... | ..... | 1,830 | 15,600 | 2,220 | 5,530 |
| May | 2,560 | 872 | 1,630 | 13,700 | 1,310 | 4,140 |
| June | 2,460 | 862 | 1,490 | 2,800 | 1,120 | 1,830 |
| July | 9,930 | 932 | 3,450 | 8,000 | 1,110 | 2,870 |
| August | 8,060 | 1,060 | 2,420 | 10,500 | 1,280 | 4,160 |
| September | 3,120 | 856 | 1,430 | 4,510 | 1,180 | 2,460 |
| The year | 27,300 | 438 | 2,780 | 50,800 | 785 | 4,190 |

NOTE.—Discharge in second-feet per square mile and run-off in inches not computed owing to regulation by Jackson dam.

### OCONEE RIVER NEAR GREENSBORO, GA.

LOCATION.—At highway bridge connecting Morgan and Greene counties, Ga., 1½ miles downstream from Town Creek, 4 miles upstream from mouth of Apalachee River, and 5 miles west of Greensboro, Greene County, on road to Madison, Ga.

DRAINAGE AREA.—1,100 square miles.

RECORDS AVAILABLE.—July 25, 1903, to September 30, 1920.

GAGE.—Chain gage attached to bridge; read by N. T. Oakes.

DISCHARGE MEASUREMENTS.—Made from downstream side of bridge.

CHANNEL AND CONTROL.—Bed composed chiefly of sand; slightly shifting. Control section not known, but practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year ending September 30, 1919, 20.6 feet December 24 (discharge, 25,400 second-feet); minimum stage recorded, 0.3 foot October 6 (discharge, 161 second-feet).

Maximum stage recorded during year ending September 30, 1920, 30.0 feet at 8.30 a. m. December 11 (discharge, 53,600 second-feet); minimum stage recorded, 1.5 feet at 7 a. m. October 1 and 5 p. m. October 7 (discharge, 460 second-feet).

1903–1920: Maximum stage recorded, 35.4 feet August 26, 1908 (discharge not determined); minimum stage recorded, 0.2 foot in forenoon of July 15, 1918 (discharge, 141 second-feet).

ICE.—None.

DIVERSIONS.—None.

REGULATION.—Considerable diurnal fluctuation caused by operation of power plants.

ACCURACY.—Stage-discharge relation practically permanent. Rating curve well defined between 250 and 6,000 second-feet; extended above 6,000 second-feet on basis of area and mean velocity curves, and the discharge for crest of flood on December 11, 1919, as computed, using concrete dam at Athens as weir and correcting for difference in drainage area. For stages above 13 feet (discharge, 7,400 second-feet) this curve gives results considerably in excess of those obtained by curves previously used, the difference increasing with the stage. Gage read to tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

*Discharge measurements of Oconee River near Greensboro, Ga., during the year ending Sept. 30, 1919.*

[Made by A. H. Condron.]

| Date. | Gage height. | Discharge. | Date. | Gage height. | Discharge. |
|---|---|---|---|---|---|
| | *Feet.* | *Sec.-ft.* | | *Feet.* | *Sec.-ft.* |
| Oct. 12 | 0.75 | 258 | July 26 | 9.90 | 4,620 |
| May 31 | 2.35 | 764 | 26 | 9.90 | 4,740 |

NOTE.—No discharge measurements were made at this station during year ending Sept. 30, 1920.

*Daily discharge, in second-feet, of Oconee River near Greensboro, Ga., for the years ending Sept. 30, 1919 and 1920.*

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1918-19. | | | | | | | | | | | | |
| 1 | 326 | 4,350 | 4,350 | 1,320 | 1,590 | 3,170 | 1,190 | 890 | 750 | 1,110 | 1,030 | 1,110 |
| 2 | 352 | 3,230 | 2,120 | 1,980 | 1,410 | 2,330 | 1,110 | 925 | 715 | 960 | 1,070 | 1,190 |
| 3 | 432 | 1,820 | 1,500 | 5,270 | 1,410 | 1,980 | 1,110 | 960 | 680 | 890 | 1,460 | 820 |
| 4 | 288 | 1,150 | 1,190 | 4,740 | 1,680 | 1,820 | 1,110 | 890 | 680 | 820 | 1,110 | 680 |
| 5 | 326 | 960 | 1,030 | 2,720 | 1,780 | 1,820 | 1,110 | 855 | 750 | 715 | 1,320 | 647 |
| 6 | 194 | 890 | 995 | 1,980 | 1,540 | 3,710 | 1,190 | 1,070 | 820 | 750 | 1,360 | 614 |
| 7 | 252 | 820 | 960 | 1,540 | 1,360 | 3,110 | 1,190 | 1,410 | 680 | 820 | 1,070 | 490 |
| 8 | 378 | 750 | 890 | 1,540 | 1,280 | 2,220 | 1,110 | 1,280 | 582 | 890 | 1,110 | 550 |
| 9 | 276 | 785 | 960 | 1,540 | 1,230 | 5,270 | 1,110 | 1,320 | 647 | 4,870 | 2,330 | 614 |
| 10 | 301 | 614 | 960 | 1,360 | 1,230 | 10,500 | 1,030 | 1,110 | 614 | 8,320 | 2,020 | 680 |
| 11 | 301 | 715 | 820 | 1,280 | 1,150 | 13,800 | 1,190 | 925 | 614 | 21,900 | 1,280 | 550 |
| 12 | 314 | 715 | 750 | 1,150 | 1,030 | 10,100 | 1,460 | 890 | 750 | 22,500 | 2,720 | 750 |
| 13 | 276 | 750 | 647 | 1,190 | 1,280 | 2,990 | 1,190 | 855 | 680 | 5,550 | 1,360 | 680 |
| 14 | 326 | 550 | 960 | 1,110 | 2,120 | 2,120 | 1,070 | 1,030 | 890 | 1,540 | 960 | 680 |
| 15 | 378 | 550 | 5,060 | 1,110 | 1,820 | 1,820 | 1,030 | 1,110 | 715 | 1,460 | 890 | 550 |
| 16 | 314 | 614 | 4,870 | 1,030 | 1,460 | 1,720 | 1,280 | 890 | 647 | 1,820 | 995 | 550 |
| 17 | 352 | 3,230 | 2,220 | 1,150 | 1,280 | 1,720 | 1,360 | 960 | 614 | 2,020 | 820 | 550 |
| 18 | 326 | 1,110 | 1,820 | 2,220 | 1,190 | 2,330 | 1,280 | 750 | 1,030 | 3,470 | 820 | 352 |
| 19 | 326 | 1,150 | 1,820 | 2,330 | 1,230 | 2,220 | 1,110 | 785 | 890 | 4,540 | 750 | 432 |
| 20 | 264 | 995 | 1,110 | 1,920 | 1,150 | 1,720 | 1,030 | 785 | 680 | 5,690 | 647 | 960 |
| 21 | 326 | 820 | 1,640 | 1,540 | 1,360 | 1,540 | 1,030 | 820 | 614 | 6,110 | 680 | 890 |
| 22 | 614 | 750 | 7,400 | 1,190 | 2,880 | 1,460 | 960 | 1,110 | 550 | 5,410 | 925 | 2,440 |
| 23 | 550 | 680 | 22,200 | 1,280 | 5,770 | 1,360 | 890 | 855 | 4,160 | 3,350 | 2,440 | 1,920 |
| 24 | 490 | 614 | 24,800 | 3,470 | 8,320 | 1,360 | 890 | 785 | 3,900 | 2,600 | 1,920 | 995 |
| 25 | 5,000 | 750 | 19,700 | 4,480 | 8,000 | 1 360 | 890 | 750 | 4,480 | 3,170 | 1,820 | 647 |
| 26 | 9,000 | 820 | 9,720 | 6,020 | 6,860 | 1,280 | 820 | 750 | 5,410 | 4,160 | 1,720 | 647 |
| 27 | 10,500 | 750 | 3,530 | 5,690 | 5,410 | 1,320 | 820 | 750 | 5,410 | 2,220 | 925 | 520 |
| 28 | 4,870 | 2,990 | 2,180 | 6,020 | 2,940 | 1,460 | 890 | 750 | 6,020 | 1,590 | 785 | 520 |
| 29 | 2,220 | 6,110 | 1,640 | 3,290 | ..... | 1,360 | 820 | 750 | 5,930 | 1,280 | 750 | 550 |
| 30 | 1,980 | 6,400 | 1,540 | 2,220 | ..... | 1,230 | 820 | 820 | 1,880 | 1,110 | 890 | 550 |
| 31 | 3,590 | ..... | 1,360 | 1,780 | ..... | 1,230 | ..... | 820 | ..... | 1,280 | 1,360 | ..... |

*Daily discharge, in second-feet, of Oconee River near Greensboro, Ga., for the years ending Sept. 30, 1919 and 1920*—Continued.

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1919–20. | | | | | | | | | | | | |
| 1 | 490 | 820 | 1,460 | 1,070 | 2,020 | 1,540 | 6,020 | 1,980 | 1,190 | 890 | 750 | 1,360 |
| 2 | 490 | 820 | 1,070 | 1,070 | 1,820 | 1,460 | 6,020 | 1,720 | 1,190 | 820 | 890 | 960 |
| 3 | 490 | 960 | 820 | 1,030 | 3,290 | 1,320 | 12,200 | 3,830 | 1,190 | 820 | 855 | 1,780 |
| 4 | 614 | 855 | 750 | 960 | 5,060 | 1,360 | 13,100 | 3,900 | 1,150 | 855 | 960 | 1,720 |
| 5 | 550 | 750 | 715 | 960 | 5,550 | 2,220 | 8,640 | 2,440 | 1,280 | 890 | 820 | 1,360 |
| 6 | 520 | 750 | 715 | 890 | 3,470 | 1,980 | 4,740 | 1,920 | 1,640 | 890 | 680 | 1,540 |
| 7 | 490 | 680 | 890 | 960 | 2,770 | 1,500 | 2,990 | 1,820 | 1,640 | 960 | 820 | 2,020 |
| 8 | 614 | 680 | 12,200 | 1,540 | 2,080 | 1,360 | 2,500 | 1,720 | 1,190 | 1,680 | 680 | 1,410 |
| 9 | 3,590 | 614 | 25,700 | 1,720 | 1,820 | 1,320 | 2,440 | 1,640 | 1,150 | 1,360 | 2,220 | 3,960 |
| 10 | 2,990 | 647 | 41,000 | 1,500 | 1,720 | 1,280 | 3,710 | 1,540 | 1,110 | 1,110 | 2,990 | 6,300 |
| 11 | 1,410 | 680 | 52,400 | 1,280 | 1,640 | 1,280 | 3,960 | 1,500 | 1,030 | 1,280 | 4,610 | 7,260 |
| 12 | 820 | 960 | 40,400 | 1,150 | 1,720 | 1,460 | 2,770 | 1,500 | 1,030 | 1,190 | 4,870 | 4,870 |
| 13 | 750 | 1,410 | 21,600 | 1,110 | 3,960 | 5,690 | 2,500 | 2,720 | 960 | 1,540 | 3,590 | 1,460 |
| 14 | 680 | 1,190 | 10,100 | 1,030 | 4,220 | 9,540 | 2,120 | 6,020 | 890 | 1,360 | 1,820 | 1,150 |
| 15 | 614 | 925 | 4,870 | 1,030 | 2,550 | 12,700 | 2,120 | 10,900 | 960 | 2,020 | 3,230 | 1,030 |
| 16 | 750 | 785 | 2,550 | 1,110 | 1,920 | 3,960 | 1,920 | 7,700 | 925 | 1,920 | 4,610 | 1,030 |
| 17 | 1,360 | 820 | 2,020 | 1,820 | 1,680 | 5,690 | 1,920 | 2,330 | 890 | 1,640 | 3,710 | 4,740 |
| 18 | 1,540 | 680 | 1,820 | 1,590 | 1,540 | 13,300 | 1,820 | 1,920 | 890 | 1,360 | 5,620 | 1,360 |
| 19 | 1,280 | 750 | 1,640 | 1,360 | 1,640 | 8,640 | 1,780 | 2,180 | 1,150 | 2,550 | 4,480 | 960 |
| 20 | 1,360 | 680 | 1,640 | 1,190 | 1,540 | 6,510 | 1,780 | 2,020 | 960 | 2,330 | 4,740 | 960 |
| 21 | 890 | 680 | 1,720 | 1,150 | 1,360 | 6,300 | 2,220 | 1,820 | 2,020 | 3,110 | 4,220 | 890 |
| 22 | 750 | 680 | 1,640 | 1,110 | 1,640 | 3,650 | 4,540 | 1,720 | 2,440 | 1,820 | 1,820 | 855 |
| 23 | 1,460 | 614 | 1,540 | 1,070 | 3,710 | 2,660 | 5,000 | 1,500 | 1,410 | 1,320 | 1,640 | 890 |
| 24 | 4,940 | 750 | 1,360 | 1,070 | 3,900 | 2,180 | 3,110 | 1,540 | 1,110 | 1,070 | 1,360 | 785 |
| 25 | 4,870 | 680 | 1,280 | 3,230 | 2,440 | 1,920 | 1,920 | 2,120 | 2,440 | 925 | 1,110 | 890 |
| 26 | 2,440 | 715 | 1,190 | 6,860 | 2,020 | 3,710 | 1,780 | 1,720 | 2,020 | 925 | 1,030 | 960 |
| 27 | 1,460 | 680 | 1,190 | 12,700 | 1,640 | 5,690 | 2,660 | 1,540 | 1,190 | 890 | 1,230 | 855 |
| 28 | 960 | 680 | 1,150 | 20,200 | 1,500 | 5,620 | 5,000 | 1,360 | 1,110 | 820 | 1,460 | 820 |
| 29 | 995 | 715 | 1,190 | 9,360 | 1,500 | 10,100 | 6,020 | 1,280 | 960 | 785 | 1,410 | 890 |
| 30 | 820 | 820 | 1,110 | 3,960 | ..... | 18,100 | 3,110 | 1,190 | 890 | 785 | 1,360 | 1,460 |
| 31 | 750 | ..... | 1,030 | 2,550 | ..... | 13,600 | ..... | 1,280 | ..... | 750 | 1,410 | ..... |

*Monthly discharge of Oconee River near Greensboro, Ga., for the years ending Sept. 30, 1919 and 1920.*

[Drainage area, 1,100 square miles.]

| Month. | Discharge in second-feet. | | | | Run-off in inches. |
|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square mile. | |
| 1918–19. | | | | | |
| October | 10,500 | 194 | 1,470 | 1.34 | 1.54 |
| November | 6,400 | 550 | 1,550 | 1.41 | 1.57 |
| December | 24,800 | 647 | 4,220 | 3.84 | 4.43 |
| January | 6,020 | 1,030 | 2,430 | 2.21 | 2.55 |
| February | 8,320 | 1,030 | 2,490 | 2.26 | 2.35 |
| March | 13,800 | 1,230 | 2,950 | 2.68 | 3.09 |
| April | 1,460 | 820 | 1,070 | .973 | 1.09 |
| May | 1,410 | 750 | 924 | .840 | .97 |
| June | 6,020 | 550 | 1,760 | 1.60 | 1.78 |
| July | 22,500 | 715 | 3,960 | 3.60 | 4.15 |
| August | 2,720 | 647 | 1,270 | 1.15 | 1.33 |
| September | 2,440 | 352 | 771 | .701 | .78 |
| The year | 24,800 | 194 | 2,080 | 1.89 | 25.63 |
| 1919–20. | | | | | |
| October | 4,940 | 490 | 1,350 | 1.23 | 1.42 |
| November | 1,410 | 614 | 782 | .711 | .79 |
| December | 52,400 | 715 | 7,700 | 7.00 | 8.07 |
| January | 20,200 | 890 | 2,830 | 2.57 | 2.96 |
| February | 5,500 | 1,360 | 2,470 | 2.25 | 2.43 |
| March | 18,100 | 1,280 | 5,090 | 4.63 | 5.34 |
| April | 13,100 | 1,780 | 4,010 | 3.65 | 4.07 |
| May | 10,900 | 1,190 | 2,530 | 2.30 | 2.65 |
| June | 2,440 | 890 | 1,270 | 1.15 | 1.28 |
| July | 3,110 | 750 | 1,310 | 1.19 | 1.37 |
| August | 5,620 | 680 | 2,290 | 2.08 | 2.40 |
| September | 7,260 | 785 | 1,880 | 1.71 | 1.91 |
| The year | 52,400 | 490 | 2,800 | 2.55 | 34.69 |

### OCONEE RIVER AT FRALEYS FERRY, NEAR MILLEDGEVILLE, GA.

LOCATION.—At Fraley's Ferry in Baldwin County, 4 miles downstream from mouth of Little River and 6 miles upstream from Milledgeville.

DRAINAGE AREA.—2,840 square miles.

RECORDS AVAILABLE.—May 23, 1906, to December 31, 1908; October 6, 1909, to September 30, 1920.

GAGE.—A combination sloping and vertical rod gage on left bank. Low-water section, inclined, is 75 feet upstream from ferry cable and extends to 8.5 feet; vertical section, 8.5 to 10.0 feet, at same site. High-water section, 10.0 to 20.0 feet, attached to tree 75 feet upstream from inclined section. Read by B. L. Butts and Mack Simmonds.

DISCHARGE MEASUREMENTS.—Made from ferryboat.

CHANNEL AND CONTROL.—Sandy and shifting at measuring section. Control formed by a rock ledge extending across river 200 feet downstream; permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during the year ending September 30, 1919, 17.7 feet at 8 a. m. February 26 (discharge, 43,600 second-feet); minimum stage recorded, 3.88 feet at 5 p. m. October 8 (discharge, 182 second-feet).

Maximum stage recorded during year ending September 30, 1920, 19.0 feet at 7 a. m. and 5 p. m. December 13 (discharge, 49,500 second-feet); minimum stage recorded, 4.6 feet at 5 p. m. November 11 (discharge, 590 second-feet).

1906–1920: Maximum stage recorded, May 23, 1906, to December 31, 1908, and October 6, 1909, to September 30, 1920, approximately 24.6 feet March 17, 1913 (discharge, about 93,600 second-feet, revised determination); minimum stage recorded, 3.88 feet at 5 p. m. October 8, 1918 (discharge, 182 second-feet).

ICE.—None.

DIVERSIONS.—None.

REGULATION.—Operation of power plants a great distance upstream can cause only slight fluctuations.

ACCURACY.—Stage-discharge relation practically permanent. Rating curve well-defined between 400 and 4,200 second-feet. Above 4,200 second-feet curve is based on flood run-off obtained from stations at Greensboro and Dublin. Gage read to half-tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records below 4,200 second-feet good; above that stage fair.

*Discharge measurements of Oconee River at Fraley's Ferry, near Milledgeville, Ga., during the year ending Sept. 30, 1919.*

[Made by A. H. Condron.]

| Date. | Gage height. | Discharge. |
|---|---|---|
| | *Feet.* | *Sec.-ft.* |
| Oct. 11 | 4.45 | 4.85 |
| May 30 | 5.47 | 1,360 |

*Daily discharge, in second-feet, of Oconee River at Fraley's Ferry, near Milledgeville, Ga., for the years ending Sept. 30, 1919, and 1920.*

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1918-19. | | | | | | | | | | | | |
| 1 | 790 | 5,480 | 9,510 | 3,000 | 3,720 | 7,020 | 2,360 | 1,790 | 2,060 | 4,140 | 2,360 | 2,840 |
| 2 | 790 | 5,020 | 4,360 | 4,800 | 3,340 | 5,970 | 2,360 | 1,790 | 1,790 | 1,920 | 3,000 | 2,520 |
| 3 | 790 | 3,520 | 3,720 | 26,600 | 3,000 | 5,480 | 2,210 | 1,790 | 1,660 | 1,530 | 2,840 | 1,530 |
| 4 | 790 | 2,360 | 2,840 | 15,100 | 3,720 | 4,580 | 2,210 | 2,060 | 1,790 | 1,360 | 3,160 | 1,410 |
| 5 | 750 | 1,790 | 2,680 | 7,020 | 4,140 | 4,580 | 2,520 | 1,920 | 1,790 | 1,250 | 3,160 | 1,250 |
| 6 | 630 | 1,410 | 2,060 | 5,020 | 3,720 | 10,800 | 2,520 | 1,660 | 1,410 | 1,660 | 4,140 | 1,150 |
| 7 | 471 | 1,250 | 1,790 | 4,140 | 3,160 | 8,210 | 2,360 | 2,360 | 1,530 | 1,790 | 5,480 | 1,150 |
| 8 | 204 | 1,200 | 1,790 | 3,720 | 3,000 | 5,480 | 2,360 | 3,160 | 1,300 | 1,530 | 4,580 | 1,100 |
| 9 | 471 | 1,150 | 1,660 | 3,520 | 2,840 | 12,900 | 2,360 | 2,680 | 1,200 | 3,920 | 8,210 | 1,060 |
| 10 | 506 | 1,100 | 1,790 | 3,340 | 2,680 | 15,100 | 2,210 | 2,360 | 1,250 | 7,300 | 9,840 | 1,060 |
| 11 | 555 | 1,100 | 1,660 | 3,000 | 2,520 | 18,100 | 2,360 | 2,060 | 1,250 | 12,900 | 5,020 | 1,010 |
| 12 | 420 | 1,100 | 1,530 | 2,840 | 2,360 | 15,800 | 3,340 | 1,790 | 1,360 | 16,200 | 3,340 | 1,060 |
| 13 | 396 | 1,100 | 1,530 | 2,680 | 2,680 | 8,210 | 3,000 | 1,530 | 1,300 | 14,300 | 4,800 | 1,060 |
| 14 | 402 | 1,100 | 2,060 | 2,680 | 6,480 | 4,800 | 2,360 | 1,920 | 1,250 | 5,020 | 2,680 | 1,060 |
| 15 | 438 | 965 | 8,210 | 2,520 | 5,020 | 4,140 | 2,060 | 2,060 | 1,530 | 2,360 | 2,680 | 1,010 |
| 16 | 520 | 1,060 | 13,600 | 2,360 | 3,720 | 3,720 | 2,360 | 1,920 | 1,300 | 3,340 | 2,520 | 1,010 |
| 17 | 396 | 2,060 | 7,590 | 2,680 | 3,000 | 4,140 | 3,340 | 1,530 | 1,150 | 7,020 | 2,210 | 920 |
| 18 | 426 | 7,020 | 3,720 | 6,480 | 2,680 | 5,250 | 3,000 | 1,530 | 2,060 | 9,510 | 1,660 | 750 |
| 19 | 630 | 2,360 | 3,000 | 6,220 | 2,680 | 5,020 | 2,360 | 1,360 | 2,060 | 11,900 | 1,410 | 710 |
| 20 | 670 | 2,060 | 1,530 | 4,580 | 2,680 | 4,580 | 2,060 | 1,530 | 1,530 | 7,020 | 1,300 | 1,010 |
| 21 | 790 | 1,660 | 3,340 | 3,720 | 4,360 | 3,340 | 2,060 | 1,790 | 1,200 | 12,200 | 1,300 | 1,790 |
| 22 | 920 | 1,410 | 25,400 | 4,140 | 7,590 | 3,000 | 2,060 | 2,060 | 1,060 | 9,510 | 1,660 | 1,920 |
| 23 | 1,010 | 1,530 | 28,200 | 4,580 | 14,300 | 3,000 | 1,920 | 1,790 | 3,720 | 22,600 | 2,060 | 3,340 |
| 24 | 1,100 | 1,410 | 29,100 | 4,360 | 13,600 | 2,840 | 1,790 | 1,530 | 12,200 | 26,600 | 3,000 | 2,520 |
| 25 | 3,000 | 1,530 | 30,300 | 8,210 | 36,000 | 2,840 | 1,790 | 1,530 | 6,220 | 27,400 | 5,480 | 1,410 |
| 26 | 12,200 | 1,920 | 17,700 | 22,600 | 41,300 | 2,680 | 1,790 | 1,360 | 7,890 | 9,510 | 4,800 | 1,200 |
| 27 | 15,400 | 1,920 | 9,180 | 16,600 | 12,600 | 2,680 | 1,530 | 1,250 | 12,200 | 8,210 | 2,060 | 1,100 |
| 28 | 10,200 | 12,200 | 4,800 | 11,900 | 10,200 | 2,680 | 1,530 | 1,250 | 12,200 | 5,020 | 1,790 | 1,010 |
| 29 | 4,580 | 15,800 | 4,140 | 7,020 | ..... | 2,680 | 1,410 | 1,410 | 10,500 | 3,160 | 1,530 | 920 |
| 30 | 2,840 | 11,500 | 3,520 | 4,360 | ..... | 2,520 | 1,790 | 1,410 | 5,480 | 3,000 | 1,410 | 790 |
| 31 | 4,800 | ..... | 3,160 | 3,920 | ..... | 2,520 | ..... | 1,530 | ..... | 2,680 | 2,060 | ..... |
| 1919-20. | | | | | | | | | | | | |
| 1 | 965 | 1,530 | 1,010 | 2,210 | 4,800 | 3,720 | 14,300 | 5,970 | 2,680 | 1,920 | 1,660 | 2,680 |
| 2 | 920 | 2,360 | 1,010 | 2,060 | 4,800 | 2,680 | 20,700 | 3,720 | 2,210 | 1,790 | 1,790 | 2,680 |
| 3 | 920 | 1,010 | 1,200 | 2,060 | 6,480 | 2,840 | 21,100 | 8,210 | 2,210 | 2,060 | 2,060 | 2,680 |
| 4 | 965 | 1,060 | 1,360 | 2,210 | 19,600 | 2,680 | 20,400 | 11,500 | 2,210 | 3,520 | 2,060 | 3,720 |
| 5 | 1,300 | 1,060 | 1,410 | 2,360 | 12,900 | 2,360 | 23,000 | 9,510 | 2,360 | 3,000 | 2,360 | 3,720 |
| 6 | 965 | 1,010 | 1,410 | 2,360 | 10,200 | 2,360 | 13,200 | 6,750 | 2,680 | 2,210 | 2,210 | 3,340 |
| 7 | 920 | 1,010 | 1,790 | 2,680 | 4,840 | 2,680 | 9,510 | 3,720 | 3,000 | 2,210 | 2,060 | 3,520 |
| 8 | 830 | 1,010 | 10,500 | 2,680 | 2,360 | 2,680 | 7,590 | 3,720 | 2,680 | 2,210 | 2,060 | 3,340 |
| 9 | 4,580 | 1,060 | 19,600 | 3,340 | 2,060 | 2,680 | 5,970 | 3,520 | 2,520 | 3,000 | 3,340 | 2,840 |
| 10 | 9,510 | 920 | 23,400 | 3,720 | 2,210 | 2,680 | 8,530 | 3,340 | 2,360 | 3,000 | 5,480 | 6,480 |
| 11 | 5,720 | 750 | 31,600 | 2,210 | 3,920 | 2,680 | 10,200 | 3,340 | 2,210 | 3,720 | 5,970 | 9,510 |
| 12 | 2,360 | 1,100 | 44,900 | 2,210 | 10,500 | 2,520 | 5,970 | 3,000 | 2,210 | 5,020 | 10,200 | 8,530 |
| 13 | 1,410 | 1,100 | 49,500 | 2,360 | 19,600 | 25,000 | 7,590 | 3,340 | 2,060 | 3,160 | 9,840 | 4,140 |
| 14 | 965 | 1,660 | 18,800 | 2,360 | 8,850 | 17,300 | 4,800 | 6,480 | 2,060 | 2,060 | 7,590 | 3,160 |
| 15 | 2,680 | 1,150 | 12,900 | 2,360 | 6,480 | 14,300 | 3,720 | 8,530 | 2,060 | 2,060 | 4,800 | 2,060 |
| 16 | 1,790 | 1,530 | 7,300 | 2,360 | 6,220 | 10,800 | 3,720 | 8,850 | 2,060 | 3,000 | 7,020 | 1,920 |
| 17 | 2,210 | 1,250 | 5,970 | 2,840 | 5,020 | 14,000 | 3,720 | 6,480 | 2,060 | 3,720 | 6,480 | 5,020 |
| 18 | 3,160 | 1,100 | 4,140 | 5,970 | 4,140 | 30,800 | 3,720 | 3,720 | 2,060 | 5,970 | 11,500 | 5,480 |
| 19 | 3,000 | 1,100 | 3,160 | 3,720 | 2,840 | 26,600 | 3,720 | 4,140 | 2,060 | 5,970 | 13,200 | 3,520 |
| 20 | 2,060 | 830 | 2,360 | 2,060 | 2,840 | 21,500 | 3,720 | 4,140 | 2,060 | 5,720 | 7,020 | 2,840 |
| 21 | 2,060 | 920 | 3,000 | 2,060 | 2,840 | 11,500 | 3,720 | 3,520 | 2,360 | 5,970 | 6,480 | 2,680 |
| 22 | 3,000 | 1,010 | 3,720 | 2,360 | 4,140 | 8,850 | 5,020 | 3,720 | 2,680 | 6,750 | 3,720 | 2,520 |
| 23 | 3,720 | 1,100 | 2,360 | 2,840 | 5,020 | 8,210 | 6,480 | 3,340 | 2,520 | 4,580 | 2,840 | 2,360 |
| 24 | 4,840 | 1,010 | 1,100 | 2,680 | 6,220 | 7,300 | 5,020 | 3,340 | 2,360 | 2,060 | 2,680 | 2,210 |
| 25 | 10,500 | 1,010 | 2,210 | 16,600 | 5,970 | 7,020 | 3,340 | 7,020 | 2,210 | 2,060 | 2,520 | 2,060 |
| 26 | 6,480 | 1,060 | 2,680 | 29,500 | 4,580 | 7,020 | 2,840 | 7,020 | 2,060 | 2,060 | 2,360 | 1,920 |
| 27 | 3,720 | 1,010 | 2,360 | 33,800 | 3,920 | 9,510 | 8,210 | 3,720 | 2,060 | 2,060 | 2,360 | 1,790 |
| 28 | 1,010 | 1,060 | 2,360 | 33,400 | 3,720 | 13,600 | 11,500 | 3,720 | 2,060 | 1,790 | 3,920 | 1,790 |
| 29 | 2,680 | 1,100 | 2,360 | 23,400 | 3,720 | 44,400 | 9,510 | 3,340 | 2,060 | 1,790 | 4,360 | 2,060 |
| 30 | 1,100 | 1,100 | 2,360 | 21,100 | ..... | 34,200 | 7,590 | 3,160 | 2,060 | 1,790 | 3,720 | 3,720 |
| 31 | 1,100 | ..... | 2,210 | 6,220 | ..... | 21,900 | ..... | 2,840 | ..... | 1,530 | 2,840 | ..... |

*Monthly discharge of Oconee River at Fraley's Ferry, near Milledgeville, Ga., for the years ending Sept. 30, 1919 and 1920.*

[Drainage area, 2,840 square miles.]

| Month. | Discharge in second-feet. | | | | Run-off in inches. |
|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square mile. | |
| 1918-19. | | | | | |
| October | 15,400 | 204 | 2,190 | 0.771 | 0.89 |
| November | 15,800 | 965 | 3,170 | 1.12 | 1.25 |
| December | 30,300 | 1,530 | 7,600 | 2.68 | 3.09 |
| January | 26,600 | 2,360 | 6,570 | 2.31 | 2.66 |
| February | 41,300 | 2,360 | 7,400 | 2.61 | 2.72 |
| March | 18,100 | 2,520 | 5,960 | 2.10 | 2.42 |
| April | 3,340 | 1,410 | 2,250 | .792 | .88 |
| May | 3,160 | 1,250 | 1,800 | .634 | .73 |
| June | 12,200 | 1,060 | 3,440 | 1.21 | 1.35 |
| July | 27,400 | 1,250 | 7,900 | 2.79 | 3.22 |
| August | 9,840 | 1,300 | 3,280 | 1.15 | 1.33 |
| September | 3,340 | 710 | 1,360 | .479 | .53 |
| The year | 41,300 | 204 | 4,410 | 1.55 | 21.07 |
| 1919-20. | | | | | |
| October | 10,500 | 830 | 2,820 | .993 | 1.14 |
| November | 2,360 | 750 | 1,130 | .398 | .44 |
| December | 49,500 | 1,010 | 8,710 | 3.07 | 3.54 |
| January | 33,800 | 2,060 | 7,300 | 2.59 | 2.99 |
| February | 19,600 | 2,060 | 6,240 | 2.19 | 2.36 |
| March | 44,400 | 2,260 | 11,800 | 4.15 | 4.78 |
| April | 23,000 | 2,840 | 8,610 | 3.03 | 3.38 |
| May | 11,500 | 2,840 | 5,060 | 1.78 | 2.05 |
| June | 3,000 | 2,060 | 2,270 | .799 | .89 |
| July | 6,750 | 1,530 | 3,150 | 1.11 | 1.28 |
| August | 13,200 | 1,660 | 4,720 | 1.67 | 1.92 |
| September | 9,510 | 1,790 | 3,480 | 1.23 | 1.37 |
| The year | 49,500 | 750 | 5,460 | 1.92 | 26.14 |

## APALACHICOLA RIVER BASIN.

### CHATTAHOOCHEE RIVER NEAR NORCROSS, GA.

LOCATION.—At Medlock's Bridge, 1½ miles upstream from mouth of John Creek, 4½ miles north of Norcross, Gwinnett County, 5 miles below Suwanee Creek, 17 miles upstream from Bull Sluice dam, 30 miles below mouth of Chestatee River, and 35 miles below Dunlap dam. The river here forms the boundary between Gwinnett and Milton counties.

DRAINAGE AREA.—1,170 square miles.

RECORDS AVAILABLE.—January 9, 1903, to September 30, 1920.

GAGE.—Chain gage on toll bridge; read by W. O. Medlock. January 1 to September 30, 1916, a Dexter water-stage recorder on right bank just above bridge, and referred to chain gage without change in datum, was also used for recording stages below 7 feet. See "Regulation."

DISCHARGE MEASUREMENTS.—Made from downstream side of bridge.

CHANNEL AND CONTROL.—Bed sandy; shifts. Control is a rock shoal about 2½ miles downstream and is more pronounced for higher stages than for low. Medium stages are affected somewhat by shifting bottom conditions between gage and rock shoal. However at extreme low stages control seems to be practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year ending September 30, 1919, 21.3 feet at 3.30 p. m. December 23 (discharge, 35,900 second-feet); minimum stage, 1.16 feet at 7 a. m. October 10 and 7 a. m. October 13 (discharge, 614 second-feet).

Maximum stage during year ending September 30, 1920, 27.1 feet at 3 p. m. December 10 (discharge, 54,700 second-feet); minimum stage, 1.5 feet at 7 a. m. October 2 and 7 a. m. October 3 (discharge, 770 second-feet).

1903–1920: Maximum stage, 27.1 feet at 3 p. m. December 10, 1919 (discharge, 54,700 second-feet); minimum stage recorded, 1.02 feet October 21, 1911 (discharge, 294 second-feet). It is believed that this low stage was caused by shutting off flow at the two power dams near Gainesville, Ga.

ICE.—Never enough to affect stage-discharge relation.

REGULATION.—Diurnal fluctuation is caused by operation of hydroelectric plants on Chattahoochee and Chestatee rivers near Gainesville, Ga. Monthly discharge, January to September, 1916, determined from records of water-stage recorder, agreed very closely with that obtained by using mean daily gage heights from two readings of chain gage per day, indicating that monthly discharge obtained by using records from chain gage are not seriously in error. See Water-Supply Paper 472, p. 34.

ACCURACY.—Stage-discharge relation practically permanent during the years ending September 30, 1919 and 1920. Rating curve used for these years revised slightly so as to average the discharge measurements better; curve well defined between 800 and 55,000 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

*Discharge measurements of Chattahoochee River near Norcross, Ga., during the years ending Sept. 30, 1919 and 1920.*

| Date. | Made by— | Gage height. | Discharge. | Date. | Made by— | Gage height. | Discharge. |
|---|---|---|---|---|---|---|---|
| 1918. | | *Feet.* | *Sec.-ft.* | 1919. | | *Feet.* | *Sec.-ft.* |
| Oct. 2 | A. H. Condron | 1.66 | 876 | Sept. 5 | Hall and Condron | 2.12 | 1,170 |
| 2 | do | 1.67 | 879 | Oct. 29 | Warren E. Hall | 2.17 | 1,180 |
| 2 | do | 1.65 | 848 | Dec. 6 | do | 2.33 | 1,290 |
| Nov. 15 | do | 2.53 | 1,380 | 12 | Hall and Condron | 7.14 | 6,830 |
| Dec. 24 | do | 11.97 | 11,900 | 12 | do | 6.41 | 5,580 |
| 1919. | | | | 29 | A. H. Condron | 2.90 | 1,910 |
| Mar. 15 | do | 4.76 | 3,860 | 1920. | | | |
| Apr. 22 | do | 3.74 | 2,860 | Feb. 21 | do | 3.23 | 2,220 |
| May 2 | do | 3.94 | 3,050 | May 28 | Hall and Condron | 4.42 | 3,490 |
| 18 | do | 3.28 | 2,260 | 28 | do | 4.42 | 3,470 |
| Aug. 8 | Condron and Tiller | 2.40 | 1,530 | Sept. 15 | Warren E. Hall | 3.14 | 2,160 |

*Daily discharge, in second-feet, of Chattahoochee River near Norcross, Ga., for the years ending Sept. 30, 1919 and 1920.*

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1918-19. | | | | | | | | | | | | |
| 1 | 820 | 8,960 | 2,820 | 3,260 | 3,150 | 3,810 | 3,040 | 2,380 | 1,940 | 1,740 | 2,050 | 1,640 |
| 2 | 770 | 4,140 | 2,160 | 4,580 | 2,820 | 3,480 | 2,820 | 2,710 | 1,740 | 1,550 | 2,820 | 1,370 |
| 3 | 880 | 3,260 | 2,160 | 7,880 | 2,820 | 3,480 | 2,930 | 2,380 | 1,740 | 1,550 | 1,640 | 1,210 |
| 4 | 820 | 2,600 | 1,940 | 6,680 | 3,040 | 3,150 | 2,820 | 2,160 | 1,740 | 1,550 | 1,840 | 1,070 |
| 5 | 695 | 2,380 | 1,840 | 4,580 | 3,480 | 3,700 | 3,040 | 2,160 | 1,740 | 1,550 | 1,550 | 1,070 |
| 6 | 720 | 2,160 | 1,640 | 3,700 | 2,820 | 7,640 | 2,820 | 2,270 | 1,740 | 1,840 | 1,460 | 1,040 |
| 7 | 695 | 1,940 | 1,640 | 3,480 | 2,820 | 5,720 | 2,820 | 2,380 | 1,640 | 1,940 | 1,460 | 1,070 |
| 8 | 720 | 1,740 | 1,550 | 3,150 | 2,600 | 4,360 | 2,600 | 7,400 | 1,640 | 1,940 | 1,370 | 1,000 |
| 9 | 720 | 1,740 | 1,550 | 3,260 | 2,710 | 12,600 | 2,710 | 5,720 | 1,550 | 2,820 | 1,290 | 1,000 |
| 10 | 695 | 1,740 | 1,550 | 3,040 | 2,710 | 13,300 | 2,600 | 3,700 | 1,550 | 2,820 | 1,370 | 1,000 |
| 11 | 720 | 1,640 | 1,550 | 2,820 | 2,600 | 5,840 | 3,150 | 3,150 | 1,940 | 2,050 | 1,210 | 1,000 |
| 12 | 720 | 1,550 | 1,460 | 2,600 | 2,380 | 4,690 | 4,250 | 2,820 | 1,640 | 1,740 | 1,460 | 1,210 |
| 13 | 720 | 1,550 | 1,640 | 2,600 | 2,820 | 4,360 | 3,260 | 2,820 | 1,640 | 1,640 | 1,290 | 1,070 |
| 14 | 820 | 1,370 | 1,550 | 2,490 | 4,580 | 3,920 | 2,820 | 3,040 | 1,550 | 2,160 | 1,290 | 970 |
| 15 | 770 | 1,550 | 3,590 | 2,600 | 4,910 | 3,920 | 2,820 | 2,710 | 1,460 | 2,380 | 1,290 | 880 |
| 16 | 720 | 1,370 | 3,920 | 2,380 | 3,480 | 3,700 | 3,700 | 2,380 | 2,160 | 2,600 | 1,210 | 910 |
| 17 | 770 | 1,740 | 9,560 | 2,600 | 3,150 | 4,140 | 5,600 | 2,380 | 3,260 | 1,640 | 1,210 | 940 |
| 18 | 720 | 3,040 | 4,360 | 4,580 | 2,820 | 4,470 | 3,700 | 2,270 | 2,050 | 1,640 | 1,070 | 880 |
| 19 | 770 | 2,490 | 3,150 | 4,250 | 2,820 | 4,030 | 3,260 | 2,160 | 2,160 | 4,250 | 1,210 | 850 |
| 20 | 820 | 1,840 | 2,600 | 3,260 | 2,600 | 3,700 | 3,040 | 2,160 | 1,840 | 7,160 | 1,070 | 880 |
| 21 | 1,040 | 1,740 | 3,810 | 3,040 | 3,150 | 3,480 | 2,820 | 2,600 | 1,550 | 4,140 | 1,070 | 940 |
| 22 | 1,000 | 1,550 | 14,400 | 2,600 | 6,440 | 3,260 | 2,600 | 2,160 | 1,460 | 2,820 | 1,460 | 1,740 |
| 23 | 1,040 | 1,640 | 33,300 | 4,140 | 12,800 | 3,260 | 2,710 | 2,160 | 1,460 | 2,380 | 1,460 | 1,140 |
| 24 | 1,210 | 1,550 | 16,400 | 8,600 | 6,200 | 3,150 | 2,490 | 2,050 | 2,270 | 2,050 | 1,740 | 1,000 |
| 25 | 3,480 | 1,640 | 11,200 | 5,020 | 5,480 | 3,150 | 2,600 | 1,940 | 4,030 | 2,050 | 1,940 | 940 |
| 26 | 5,240 | 1,550 | 6,200 | 8,960 | 5,720 | 2,930 | 2,380 | 1,940 | 4,360 | 2,490 | 1,460 | 880 |
| 27 | 4,580 | 1,550 | 4,910 | 8,600 | 4,580 | 3,260 | 2,380 | 2,050 | 4,800 | 2,160 | 1,290 | 880 |
| 28 | 2,930 | 4,800 | 4,140 | 4,800 | 3,920 | 4,690 | 2,270 | 1,940 | 3,480 | 1,840 | 1,000 | 850 |
| 29 | 4,690 | 8,840 | 3,920 | 4,030 | ..... | 3,700 | 2,380 | 1,940 | 2,380 | 1,640 | 1,000 | 850 |
| 30 | 14,800 | 3,920 | 3,480 | 3,480 | ..... | 3,260 | 2,380 | 2,160 | 1,940 | 1,550 | 2,710 | 820 |
| 31 | 25,300 | ..... | 3,260 | 3,260 | ..... | 3,040 | ..... | 1,940 | ..... | 1,550 | 2,710 | ..... |
| 1919-20. | | | | | | | | | | | | |
| 1 | 850 | 1,140 | 1,840 | 1,740 | 3,040 | 2,380 | 7,160 | 3,700 | 2,600 | 1,940 | 1,640 | 2,380 |
| 2 | 820 | 1,740 | 1,640 | 1,740 | 2,820 | 2,270 | 12,400 | 3,700 | 2,600 | 1,940 | 1,550 | 2,160 |
| 3 | 940 | 1,550 | 1,370 | 1,640 | 4,360 | 2,160 | 17,300 | 5,480 | 2,600 | 2,050 | 1,740 | 2,050 |
| 4 | 2,600 | 1,370 | 1,290 | 1,550 | 6,680 | 2,270 | 8,960 | 4,250 | 2,820 | 1,940 | 1,640 | 2,160 |
| 5 | 1,940 | 1,140 | 1,370 | 1,550 | 5,720 | 3,480 | 10,900 | 3,700 | 5,240 | 1,840 | 1,550 | 2,270 |
| 6 | 1,070 | 1,140 | 1,290 | 1,550 | 4,140 | 4,140 | 7,400 | 4,030 | 3,700 | 1,840 | 1,640 | 2,270 |
| 7 | 1,070 | 1,070 | 1,940 | 1,640 | 3,480 | 2,930 | 5,720 | 3,920 | 2,820 | 2,160 | 1,550 | 2,160 |
| 8 | 970 | 1,070 | 5,960 | 2,380 | 3,260 | 2,600 | 5,020 | 3,700 | 2,600 | 2,710 | 1,550 | 2,600 |
| 9 | 1,210 | 940 | 16,400 | 2,600 | 3,040 | 2,490 | 6,440 | 3,480 | 2,490 | 1,940 | 3,480 | 5,480 |
| 10 | 1,210 | 1,000 | 52,000 | 3,260 | 2,820 | 2,380 | 7,160 | 3,370 | 2,380 | 2,600 | 4,470 | 5,960 |
| 11 | 1,070 | 1,140 | 34,400 | 2,820 | 2,820 | 2,380 | 5,480 | 3,260 | 2,380 | 3,480 | 4,580 | 3,260 |
| 12 | 1,000 | 1,940 | 6,800 | 2,380 | 2,710 | 3,480 | 4,910 | 3,150 | 2,270 | 4,250 | 7,160 | 2,380 |
| 13 | 1,000 | 3,920 | 4,580 | 2,160 | 3,150 | 9,080 | 6,440 | 9,560 | 2,160 | 2,380 | 7,760 | 2,160 |
| 14 | 1,210 | 2,820 | 4,140 | 1,940 | 2,930 | 5,480 | 4,580 | 6,680 | 2,160 | 2,160 | 9,440 | 2,050 |
| 15 | 1,210 | 1,940 | 3,920 | 1,740 | 2,600 | 3,920 | 4,250 | 3,920 | 2,050 | 1,840 | 10,600 | 2,160 |
| 16 | 1,070 | 1,640 | 3,260 | 1,940 | 2,490 | 3,260 | 4,140 | 3,480 | 1,940 | 3,370 | 9,320 | 1,940 |
| 17 | 1,840 | 1,550 | 2,820 | 2,380 | 2,380 | 5,840 | 4,250 | 3,260 | 2,050 | 2,600 | 6,920 | 1,740 |
| 18 | 1,550 | 1,370 | 2,820 | 2,380 | 2,380 | 5,960 | 4,030 | 3,370 | 1,940 | 3,480 | 5,720 | 1,940 |
| 19 | 1,290 | 1,140 | 2,710 | 2,160 | 2,380 | 6,200 | 3,810 | 3,920 | 2,160 | 3,700 | 5,240 | 1,740 |
| 20 | 1,140 | 1,210 | 2,820 | 2,050 | 2,380 | 9,080 | 3,810 | 3,700 | 5,720 | 4,690 | 6,680 | 1,740 |
| 21 | 940 | 1,210 | 2,600 | 1,940 | 2,160 | 5,020 | 13,700 | 3,480 | 4,800 | 3,700 | 5,020 | 1,640 |
| 22 | 1,070 | 1,140 | 2,380 | 1,940 | 3,700 | 3,920 | 10,900 | 3,370 | 3,260 | 3,700 | 4,360 | 1,550 |
| 23 | 2,820 | 1,140 | 2,160 | 1,940 | 6,200 | 3,480 | 5,720 | 3,260 | 2,380 | 3,150 | 3,700 | 1,640 |
| 24 | 5,360 | 1,140 | 2,160 | 4,360 | 3,700 | 3,260 | 4,580 | 3,040 | 4,800 | 2,380 | 3,040 | 1,640 |
| 25 | 2,380 | 1,140 | 2,050 | 9,560 | 3,150 | 3,150 | 4,140 | 3,040 | 3,040 | 2,160 | 2,820 | 1,840 |
| 26 | 1,740 | 1,210 | 1,940 | 10,600 | 2,710 | 5,240 | 3,920 | 3,480 | 2,380 | 1,840 | 2,600 | 1,740 |
| 27 | 1,370 | 1,370 | 1,940 | 14,000 | 2,600 | 5,480 | 7,280 | 3,260 | 2,160 | 1,940 | 3,480 | 1,550 |
| 28 | 1,210 | 1,370 | 1,940 | 6,680 | 2,490 | 5,600 | 5,480 | 3,480 | 1,940 | 1,740 | 3,480 | 1,550 |
| 29 | 1,210 | 1,140 | 1,840 | 4,580 | 2,380 | 13,300 | 4,360 | 3,040 | 1,940 | 1,740 | 2,820 | 1,550 |
| 30 | 1,140 | 1,140 | 1,840 | 3,810 | ..... | 10,600 | 3,920 | 2,820 | 2,160 | 1,640 | 2,820 | 1,840 |
| 31 | 1,140 | ..... | 1,740 | 3,370 | ..... | 5,240 | ..... | 2,710 | ..... | 1,740 | 3,480 | ..... |

*Monthly discharge of Chattahoochee River near Norcross, Ga., for the years ending Sept. 30, 1919 and 1920.*

[Drainage area, 1,170 square miles.]

| Month. | Discharge in second-feet. | | | | Run-off in inches. |
|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square mile. | |
| 1918-19. | | | | | |
| October | 25,300 | 695 | 2,590 | 2.21 | 2.55 |
| November | 8,960 | 1,370 | 2,590 | 2.21 | 2.47 |
| December | 33,300 | 1,460 | 5,070 | 4.33 | 4.99 |
| January | 8,960 | 2,380 | 4,200 | 3.59 | 4.14 |
| February | 12,800 | 2,380 | 3,910 | 3.34 | 3.48 |
| March | 13,300 | 2,930 | 4,550 | 3.89 | 4.48 |
| April | 5,600 | 2,270 | 2,960 | 2.53 | 2.82 |
| May | 7,400 | 1,940 | 2,650 | 2.26 | 2.61 |
| June | 4,800 | 1,460 | 2,150 | 1.84 | 2.05 |
| July | 7,160 | 1,550 | 2,300 | 1.97 | 2.27 |
| August | 2,820 | 1,000 | 1,520 | 1.30 | 1.50 |
| September | 1,740 | 820 | 1,040 | .889 | .99 |
| The year | 33,300 | 695 | 2,960 | 2.53 | 34.35 |
| 1919-20. | | | | | |
| October | 5,360 | 820 | 1,470 | 1.26 | 1.45 |
| November | 3,920 | 940 | 1,430 | 1.22 | 1.36 |
| December | 52,000 | 1,290 | 5,680 | 4.85 | 5.59 |
| January | 14,000 | 1,550 | 3,370 | 2.88 | 3.32 |
| February | 6,680 | 2,160 | 3,260 | 2.79 | 3.01 |
| March | 13,300 | 2,160 | 4,710 | 4.03 | 4.65 |
| April | 17,300 | 3,810 | 6,600 | 5.64 | 6.29 |
| May | 9,560 | 2,710 | 3,830 | 3.27 | 3.77 |
| June | 5,720 | 1,940 | 2,780 | 2.38 | 2.66 |
| July | 4,690 | 1,640 | 2,540 | 2.17 | 2.50 |
| August | 10,600 | 1,550 | 4,250 | 3.63 | 4.18 |
| September | 5,960 | 1,550 | 2,240 | 1.91 | 2.13 |
| The year | 52,000 | 820 | 3,520 | 3.01 | 40.91 |

### CHATTAHOOCHEE RIVER AT WEST POINT, GA.

LOCATION.—At West Point waterworks pumping plant, just below Oseligee Creek, one-fourth mile east of Alabama-Georgia State line in Troup County, and 1 mile upstream from West Point railroad station. Prior to October 20, 1912, station was at Montgomery Street Bridge in West Point.

DRAINAGE AREA.—3,300 square miles.

RECORDS AVAILABLE.—July 30, 1896, to September 30, 1920.

GAGE.—Original gage was a standard box chain on downstream handrail of Montgomery Street Bridge. On October 20, 1912, the gage was moved 1 mile upstream to a point opposite city pumping plant. A staff gage (0–18 feet) was placed on left bank. This gage was read from October 20, 1912, to December 10, 1919, by using a telescope from pumping station which is on right bank. The flood of December 10, 1919, put the gage out of commission. On January 14, 1920, the rod on left bank was replaced but could not be read below 6 feet because of a sand bar formed by flood. A short section of rod (0–6.7) was located on right bank. Both rods were set to same datum but the right-bank section reads slightly higher than the left-bank section. Since January 14, 1920, the observer has read right-bank gage during stages below 6 feet and left-bank gage for stages above 6 feet. The observer is J. H. Miller.

DISCHARGE MEASUREMENTS.—Made from Montgomery Street Bridge 1 mile downstream. No tributaries enter between gage and bridge. Bridge washed away December 10, 1919. Measurements have since been made from the Atlanta & West Point Railroad bridge and from a temporary pontoon bridge.

CHANNEL AND CONTROL.—Bed rough and rocky; fairly permanent. Banks subject to overflow at high stages. Control is a rock ledge extending across river just below gage and is not affected by Langdale dam 5 miles downstream.

EXTREMES OF DISCHARGE.—Maximum mean daily stage during year ending September 30, 1919, 21.0 feet December 23 (discharge, 63,700 second-feet); minimum mean daily stage, 2.2 feet October 10 and 12 (discharge, 1,200 second-feet).

Maximum stage recorded during year ending September 30, 1920, 30.0 feet (obtained by levels to flood mark) at 2 p. m. December 10 (discharge, 134,000 second-feet); minimum mean daily stage, 2.4 feet October 31 (discharge, 1,420 second-feet).

1896–1920: Maximum stage, 30.0 feet at 2 p. m. December 10, 1919 (discharge, 134,000 second-feet); minimum stage recorded (old gage), 0.8 foot September 18–21, 1896 (discharge, 780 second-feet).

ICE.—None.

DIVERSIONS.—None.

REGULATION.—Operation of power plants a great distance upstream causes some diurnal fluctuation but a mean of three daily readings is probably very accurate.

ACCURACY.—Stage-discharge relation changed during high water December 10, 1919. Rating curve used October 1, 1918, to December 10, 1919, well defined between 1,700 and 60,000 second-feet; curve used December 10, 1919, to September 30, 1920, well defined between 1,000 and 60,000 second-feet. The curves are identical above 28,000 second-feet; above 60,000 second-feet the curve is extended on basis of the discharge computed for the crest of the flood on December 10, 1919, using the Goat Rock dam, 12 miles above Columbus, Ga., as a weir and correcting for difference in drainage area. Gage read to tenths three times daily; during high water more often. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

*Discharge measurements of Chattahoochee River at West Point, Ga., during the years ending Sept. 30, 1919 and 1920.*

[Made by A. H. Condron.]

| Date. | Gage height. | Discharge. | Date. | Gage height. | Discharge. |
|---|---|---|---|---|---|
| 1918. | *Feet.* | *Sec.-ft.* | 1919. | *Feet.* | *Sec.-ft.* |
| Nov. 21 | 3.96 | 3,950 | Oct. 29 | 3.20 | 2,600 |
| 1919. | | | 1920. | | |
| Mar. 1 | 6.67 | 10,400 | Jan. 15 | 4.68 | 5,270 |
| Oct. 29 | 3.16 | 2,500 | Feb. 25 | 6.23 | 9,460 |

*Daily discharge, in second-feet, of Chattahoochee River at West Point, Ga., for the years ending Sept. 30, 1919 and 1920.*

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1918-19. | | | | | | | | | | | | |
| 1 | 1,800 | 22,000 | 12,200 | 7,250 | 6,750 | 10,500 | 6,750 | 4,530 | 6,000 | 3,870 | 3,660 | 3,870 |
| 2 | 1,420 | 24,500 | 7,000 | 7,750 | 8,250 | 9,250 | 6,250 | 5,000 | 5,500 | 3,270 | 5,750 | 4,530 |
| 3 | 1,420 | 16,200 | 5,500 | 13,000 | 8,250 | 8,500 | 6,250 | 4,530 | 5,000 | 3,080 | 5,500 | 2,900 |
| 4 | 1,420 | 5,750 | 4,530 | 15,200 | 7,250 | 8,000 | 6,250 | 4,530 | 4,300 | 2,900 | 6,000 | 2,730 |
| 5 | 1,540 | 4,530 | 4,080 | 14,800 | 7,000 | 7,750 | 6,250 | 4,300 | 6,250 | 3,270 | 3,460 | 2,560 |
| 6 | 1,420 | 3,080 | 3,870 | 10,800 | 6,250 | 14,800 | 6,250 | 4,530 | 3,460 | 2,730 | 3,660 | 2,400 |
| 7 | 1,420 | 3,460 | 3,660 | 8,500 | 6,000 | 14,000 | 6,000 | 4,760 | 3,270 | 3,270 | 3,460 | 2,400 |
| 8 | 1,310 | 3,080 | 3,460 | 7,500 | 5,750 | 15,500 | 6,000 | 6,750 | 3,460 | 2,900 | 3,460 | 2,090 |
| 9 | 1,420 | 3,080 | 3,870 | 7,000 | 5,750 | 54,200 | 5,500 | 6,500 | 3,080 | 4,080 | 4,530 | 2,240 |
| 10 | 1,200 | 2,900 | 3,270 | 6,750 | 5,500 | 48,400 | 5,500 | 10,500 | 2,900 | 8,250 | 5,750 | 2,090 |
| 11 | 1,310 | 2,900 | 3,080 | 6,500 | 8,500 | 30,100 | 7,750 | 7,250 | 2,900 | 5,750 | 3,660 | 1,940 |
| 12 | 1,200 | 2,730 | 3,080 | 5,750 | 12,200 | 25,500 | 7,750 | 5,500 | 3,080 | 5,000 | 5,000 | 2,400 |
| 13 | 1,310 | 2,560 | 3,270 | 5,500 | 10,500 | 12,200 | 7,750 | 5,250 | 3,270 | 5,000 | 5,250 | 3,270 |
| 14 | 1,310 | 2,730 | 4,080 | 5,750 | 11,000 | 10,500 | 7,500 | 6,500 | 3,270 | 4,300 | 3,460 | 2,730 |
| 15 | 1,800 | 2,560 | 8,250 | 5,250 | 8,250 | 9,750 | 6,250 | 5,750 | 2,900 | 3,460 | 6,000 | 2,400 |
| 16 | 1,310 | 2,730 | 7,750 | 5,000 | 7,500 | 9,250 | 10,000 | 6,000 | 3,080 | 5,000 | 5,500 | 1,800 |
| 17 | 1,540 | 4,080 | 7,000 | 6,250 | 6,250 | 10,000 | 13,500 | 4,760 | 3,460 | 9,250 | 3,460 | 1,800 |
| 18 | 1,940 | 4,080 | 9,000 | 13,500 | 6,000 | 16,000 | 10,200 | 4,300 | 6,000 | 7,750 | 3,270 | 1,800 |
| 19 | 1,420 | 3,870 | 10,500 | 12,500 | 7,500 | 12,000 | 10,200 | 4,080 | 6,000 | 6,750 | 2,560 | 1,670 |
| 20 | 1,670 | 4,080 | 7,500 | 11,200 | 11,800 | 10,200 | 7,000 | 3,870 | 4,080 | 8,000 | 2,560 | 1,800 |
| 21 | 1,670 | 3,660 | 24,000 | 9,250 | 16,800 | 8,750 | 6,250 | 3,870 | 3,660 | 13,000 | 2,560 | 1,800 |
| 22 | 1,800 | 3,080 | 58,500 | 7,000 | 20,000 | 8,250 | 6,000 | 4,080 | 2,900 | 9,750 | 2,900 | 1,940 |
| 23 | 1,800 | 3,270 | 63,700 | 7,250 | 28,000 | 7,750 | 5,500 | 4,300 | 3,870 | 7,500 | 3,460 | 2,090 |
| 24 | 1,800 | 3,660 | 46,800 | 10,800 | 27,200 | 7,500 | 5,500 | 3,870 | 4,300 | 5,750 | 6,500 | 2,400 |
| 25 | 6,250 | 3,660 | 41,700 | 14,000 | 18,800 | 7,250 | 5,000 | 3,460 | 4,300 | 10,000 | 3,870 | 2,090 |
| 26 | 6,250 | 3,460 | 41,700 | 22,800 | 13,200 | 7,000 | 5,000 | 3,660 | 4,080 | 9,750 | 7,000 | 1,940 |
| 27 | 6,750 | 3,460 | 25,500 | 24,200 | 7,750 | 8,750 | 4,530 | 3,660 | 4,760 | 8,250 | 4,300 | 1,800 |
| 28 | 6,500 | 12,500 | 11,500 | 20,500 | 7,250 | 8,750 | 4,530 | 4,080 | 6,250 | 6,000 | 3,080 | 1,670 |
| 29 | 6,750 | 21,800 | 9,500 | 14,200 | ..... | 8,000 | 4,760 | 4,530 | 6,500 | 4,530 | 2,730 | 1,540 |
| 30 | 11,500 | 12,200 | 7,500 | 10,200 | ..... | 8,500 | 4,530 | 4,530 | 5,250 | 4,080 | 5,000 | 2,090 |
| 31 | 21,800 | ..... | 7,750 | 8,500 | ..... | 7,000 | ..... | 6,000 | ..... | 3,270 | 3,080 | ..... |
| 1919-20. | | | | | | | | | | | | |
| 1 | 1,540 | 2,400 | 5,000 | 3,580 | 9,500 | 6,250 | 21,800 | 10,200 | 6,000 | 3,800 | 3,580 | 5,750 |
| 2 | 1,540 | 2,730 | 3,870 | 3,360 | 7,750 | 6,000 | 24,000 | 9,250 | 6,000 | 4,260 | 3,580 | 4,750 |
| 3 | 2,240 | 4,080 | 3,270 | 3,360 | 12,000 | 5,750 | 30,800 | 27,100 | 5,750 | 4,030 | 3,800 | 5,250 |
| 4 | 2,090 | 3,460 | 3,080 | 3,360 | 26,200 | 6,000 | 27,700 | 47,900 | 5,500 | 4,750 | 8,500 | 6,000 |
| 5 | 2,090 | 2,730 | 2,730 | 2,950 | 27,400 | 7,250 | 26,800 | 21,800 | 8,500 | 5,000 | 7,250 | 5,000 |
| 6 | 3,660 | 2,560 | 2,560 | 2,580 | 20,200 | 8,750 | 15,000 | 13,500 | 10,000 | 4,750 | 6,000 | 4,260 |
| 7 | 2,560 | 2,400 | 2,730 | 3,800 | 13,500 | 8,250 | 20,500 | 12,000 | 11,200 | 4,260 | 4,260 | 4,260 |
| 8 | 1,940 | 2,240 | 26,200 | 6,000 | 10,500 | 7,750 | 17,800 | 10,500 | 7,750 | 4,260 | 4,030 | 5,000 |
| 9 | 2,560 | 2,240 | 57,800 | 7,750 | 9,000 | 6,750 | 12,800 | 9,750 | 6,500 | 4,750 | 6,250 | 5,500 |
| 10 | 7,500 | 3,870 | 134,000 | 8,250 | 8,250 | 6,250 | 12,800 | 9,500 | 3,800 | 4,750 | 12,500 | 8,250 |
| 11 | 3,870 | 2,400 | 71,400 | 6,750 | 8,250 | 6,000 | 16,000 | 8,500 | 5,250 | 7,750 | 13,000 | 11,000 |
| 12 | 2,730 | 3,270 | 44,200 | 6,250 | 8,250 | 6,000 | 12,500 | 8,000 | 4,750 | 9,750 | 13,200 | 8,500 |
| 13 | 2,400 | 3,030 | 36,800 | 5,750 | 12,200 | 25,200 | 12,000 | 17,000 | 4,750 | 15,200 | 16,800 | 5,000 |
| 14 | 2,090 | 4,300 | 31,100 | 5,000 | 12,000 | 23,800 | 10,800 | 24,000 | 4,750 | 8,500 | 13,800 | 4,030 |
| 15 | 1,940 | 5,250 | 14,000 | 5,500 | 9,500 | 16,500 | 10,800 | 21,000 | 5,000 | 5,500 | 13,500 | 3,800 |
| 16 | 2,240 | 4,080 | 9,200 | 6,000 | 8,250 | 10,800 | 9,750 | 13,500 | 4,750 | 6,750 | 10,500 | 3,580 |
| 17 | 2,400 | 3,270 | 7,950 | 10,000 | 7,750 | 32,200 | 10,000 | 9,000 | 4,260 | 8,000 | 24,500 | 3,580 |
| 18 | 2,560 | 2,900 | 7,950 | 9,500 | 7,500 | 53,600 | 10,200 | 9,250 | 4,260 | 8,750 | 22,800 | 3,580 |
| 19 | 3,270 | 2,730 | 7,640 | 7,750 | 7,000 | 32,800 | 9,500 | 11,000 | 5,000 | 9,000 | 20,200 | 3,360 |
| 20 | 3,460 | 2,560 | 7,960 | 6,750 | 6,750 | 29,200 | 9,250 | 10,000 | 10,000 | 12,000 | 12,800 | 3,360 |
| 21 | 2,400 | 2,400 | 7,330 | 6,250 | 7,000 | 21,800 | 12,000 | 9,500 | 14,800 | 19,800 | 13,500 | 2,950 |
| 22 | 2,560 | 2,240 | 6,710 | 6,750 | 6,750 | 16,200 | 21,800 | 8,500 | 12,200 | 23,800 | 16,800 | 2,950 |
| 23 | 2,730 | 2,400 | 6,010 | 5,500 | 7,500 | 11,500 | 23,500 | 7,250 | 8,250 | 13,500 | 9,250 | 2,950 |
| 24 | 7,090 | 2,400 | 6,010 | 10,200 | 9,750 | 10,000 | 20,800 | 7,500 | 6,250 | 8,000 | 7,750 | 3,150 |
| 25 | 11,800 | 2,240 | 5,710 | 21,500 | 9,500 | 9,250 | 10,800 | 8,500 | 5,250 | 6,250 | 6,000 | 2,950 |
| 26 | 8,000 | 2,560 | 5,470 | 29,200 | 7,750 | 18,500 | 9,250 | 10,000 | 7,750 | 4,750 | 5,250 | 6,000 |
| 27 | 4,760 | 2,730 | 5,470 | 45,700 | 7,000 | 18,500 | 26,000 | 8,500 | 5,500 | 4,500 | 5,000 | 3,800 |
| 28 | 3,080 | 2,560 | 5,470 | 37,600 | 6,500 | 15,000 | 22,000 | 7,500 | 5,000 | 3,800 | 8,750 | 2,760 |
| 29 | 2,560 | 2,560 | 5,750 | 28,000 | 6,250 | 127,000 | 18,200 | 7,750 | 4,750 | 3,580 | 10,000 | 3,800 |
| 30 | 2,560 | 4,760 | 5,000 | 14,500 | ..... | 41,200 | 12,000 | 7,250 | 4,030 | 3,800 | 6,750 | 2,950 |
| 31 | 1,420 | ..... | 4,500 | 11,000 | ..... | 25,000 | ..... | 6,250 | ..... | 3,580 | 6,250 | ..... |

NOTE.—Discharge, Dec. 10, 1919, corresponds to crest stage. Discharge, Dec. 12–14 and 16–28, 1919, obtained by averaging discharge at Norcross and at Goat Rock dam; Jan. 1–14, 1920, determined from gage readings obtained at West Point by U. S. Weather Bureau; May 1–3, 1920, determined from mean daily gage height obtained from two readings of gage a day.

*Monthly discharge of Chattahoochee River at West Point, Ga., for the years ending Sept. 30, 1919 and 1920.*

[Drainage area, 3,300 square miles.]

| Month. | Discharge in second-feet. | | | | Run-off in inches. |
|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square mile. | |
| 1918–19. | | | | | |
| October | 21,800 | 1,200 | 3,290 | 1.00 | 1.15 |
| November | 24,500 | 2,560 | 6,390 | 1.94 | 2.16 |
| December | 63,700 | 3,080 | 14,600 | 4.42 | 5.10 |
| January | 24,200 | 5,000 | 10,500 | 3.18 | 3.67 |
| February | 28,000 | 5,500 | 10,500 | 3.18 | 3.31 |
| March | 54,200 | 7,000 | 13,700 | 4.15 | 4.78 |
| April | 13,500 | 4,530 | 6,680 | 2.02 | 2.25 |
| May | 10,500 | 3,460 | 5,010 | 1.52 | 1.75 |
| June | 6,500 | 2,900 | 4,240 | 1.28 | 1.43 |
| July | 13,000 | 2,730 | 5,800 | 1.76 | 2.03 |
| August | 7,000 | 2,560 | 4,210 | 1.28 | 1.48 |
| September | 4,530 | 1,540 | 2,290 | .694 | .77 |
| The year | 63,700 | 1,200 | 7,270 | 2.20 | 29.88 |
| 1919–20. | | | | | |
| October | 11,800 | 1,420 | 3,340 | 1.01 | 1.16 |
| November | 5,250 | 2,240 | 2,980 | .903 | 1.01 |
| December | 134,000 | 2,560 | 17,500 | 5.30 | 6.11 |
| January | 45,700 | 2,580 | 10,700 | 3.24 | 3.74 |
| February | 27,400 | 6,250 | 10,300 | 3.12 | 3.36 |
| March | 127,000 | 5,750 | 20,000 | 6.06 | 6.99 |
| April | 30,800 | 9,250 | 16,600 | 5.03 | 5.61 |
| May | 47,900 | 6,250 | 12,600 | 3.82 | 4.40 |
| June | 14,800 | 3,800 | 6,580 | 1.99 | 2.22 |
| July | 23,800 | 3,580 | 7,460 | 2.26 | 2.61 |
| August | 24,500 | 3,580 | 10,200 | 3.09 | 3.56 |
| September | 11,000 | 2,760 | 4,600 | 1.39 | 1.55 |
| The year | 134,000 | 1,420 | 10,300 | 3.12 | 42.32 |

### FLINT RIVER NEAR WOODBURY, GA.

LOCATION.—At the Macon & Birmingham Railroad bridge one-fourth mile downstream from mouth of Elkins Creek, one-third mile upstream from mouth of Cane Creek, and 3 miles east of Woodbury, Pike County.

DRAINAGE AREA.—1,090 square miles.

RECORDS AVAILABLE.—March 29, 1900, to September 30, 1920.

GAGE.—Chain gage attached to guardrail on downstream side of Macon & Birmingham Railroad bridge; installed May 24, 1918. Prior to that date gage was a vertical staff in four sections on left bank about 300 feet above present gage. Gages set to same datum. Slope between gages negligible at low and medium stages since the low wagon bridge immediately below the old staff gage was washed out in July, 1916. Zero of gage, 660 feet above sea level. Gage read twice daily by E. T. Riggins.

DISCHARGE MEASUREMENTS.—Made from downstream side of railroad bridge which does not make a right angle with the current.

CHANNEL AND CONTROL.—Bottom consists chiefly of rock; rough; current irregular. Control formed by a shoal 1 mile downstream; shifts occasionally.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year ending September 30, 1919, 10.5 feet at 7 a. m. December 24 (discharge, 19,100 second-feet); minimum stage, −0.04 foot October 14–15 (discharge, 236 second-feet).

Maximum stage recorded during year ending September 30, 1920, 17.1 feet at 7 a. m. December 11 (discharge, 38,400 second-feet); minimum stage, 0.28 foot at 7 a. m. and 5 p. m. October 1 (discharge, 361 second-feet).

1900–1920: Maximum stage recorded, 17.1 feet at 7 a. m. December 11, 1919 (discharge, 38,400 second-feet); minimum stage, −0.04 foot October 8–10, 1911 (discharge, 86 second-feet).

ICE.—None.

DIVERSIONS.—None.

REGULATION.—Some slight diurnal fluctuations caused by operation of small mills on tributary streams.

ACCURACY.—Stage-discharge relation practically permanent during years ending September 30, 1919 and 1920. Rating curve well defined between 200 and 24,000 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

*Discharge measurements of Flint River near Woodbury, Ga., during the year ending Sept. 30, 1919.*

| Date. | Made by— | Gage height. | Discharge. |
|---|---|---|---|
| | | *Feet.* | *Sec.-ft.* |
| Dec. 27 | A. H. Condron | 2.97 | 3,170 |
| May 28 | ....do.... | .78 | 694 |
| Sept. 20 | W. E. Hall and A. H. Condron | .43 | *a* 341 |

*a* Measured from boat at a section 1¼ miles below gage.

NOTE.—No discharge measurements were made at this station during the year ending Sept. 30, 1920.

*Daily discharge, in second-feet, of Flint River near Woodbury, Ga., for the years ending Sept. 30, 1919 and 1920.*

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1918-19. | | | | | | | | | | | | |
| 1 | 325 | 1,310 | 3,750 | 1,130 | 1,600 | 5,170 | 1,040 | 690 | 1,130 | 480 | 1,500 | 860 |
| 2 | 285 | 1,040 | 2,430 | 2,050 | 1,400 | 3,150 | 1,040 | 860 | 1,040 | 420 | 1,710 | 1,040 |
| 3 | 285 | 860 | 1,710 | 5,680 | 1 310 | 2,300 | 1,040 | 770 | 950 | 370 | 5,860 | 860 |
| 4 | 285 | 610 | 1,220 | 5,000 | 2,170 | 1,930 | 1,040 | 690 | 860 | 370 | 5,860 | 690 |
| 5 | 285 | 540 | 950 | 3,600 | 2,170 | 2,050 | 1,220 | 690 | 770 | 420 | 3,000 | 610 |
| 6 | 285 | 480 | 860 | 2,430 | 1,930 | 4,200 | 1,130 | 1,040 | 610 | 480 | 1,600 | 540 |
| 7 | 250 | 480 | 770 | 1,930 | 1,600 | 3,750 | 1,040 | 1,130 | 610 | 540 | 9,400 | 540 |
| 8 | 250 | 480 | 690 | 1,710 | 1,400 | 2,710 | 1,040 | 1,220 | 540 | 540 | 4,050 | 480 |
| 9 | 250 | 480 | 690 | 1,600 | 1,310 | 9 620 | 1,040 | 1,130 | 610 | 1,400 | 1,600 | 480 |
| 10 | 250 | 420 | 690 | 1,500 | 1,220 | 13,000 | 950 | 1,040 | 610 | 2,430 | 1,600 | 420 |
| 11 | 250 | 420 | 690 | 1,400 | 1,220 | 12,800 | 1,310 | 1,040 | 480 | 1,820 | 1,310 | 420 |
| 12 | 250 | 420 | 690 | 1,220 | 1,130 | 7,920 | 1,600 | 860 | 480 | 1,400 | 1,600 | 420 |
| 13 | 250 | 420 | 610 | 1,220 | 1,600 | 2,850 | 1,400 | 860 | 480 | 1,710 | 1,310 | 420 |
| 14 | 250 | 370 | 1,040 | 1,130 | 4,050 | 2,170 | 1,220 | 1,130 | 480 | 1,710 | 1,130 | 480 |
| 15 | 250 | 370 | 2,170 | 1,130 | 3,600 | 1,820 | 1,040 | 1,220 | 480 | 860 | 1,040 | 480 |
| 16 | 285 | 420 | 2,170 | 1,040 | 2,570 | 1,600 | 1,500 | 1,040 | 480 | 770 | 1,040 | 420 |
| 17 | 250 | 540 | 1,820 | 1,500 | 1,310 | 2,430 | 2,050 | 950 | 480 | 2,170 | 1,040 | 420 |
| 18 | 285 | 690 | 1,400 | 2,570 | 1,500 | 4,050 | 1,820 | 770 | 1,310 | 2,570 | 770 | 420 |
| 19 | 285 | 770 | 1,040 | 3,150 | 1,310 | 3,450 | 1,500 | 690 | 1,220 | 2,430 | 690 | 420 |
| 20 | 325 | 770 | 1,040 | 3,150 | 1,220 | 2,570 | 1,220 | 690 | 1,040 | 3,150 | 610 | 420 |
| 21 | 325 | 480 | 4,520 | 2,300 | 2,300 | 1,930 | 1,040 | 610 | 770 | 2,430 | 690 | 480 |
| 22 | 370 | 540 | 16,500 | 1,820 | 3,000 | 1,600 | 950 | 610 | 540 | 1,600 | 770 | 480 |
| 23 | 420 | 540 | 18,300 | 1,820 | 4,050 | 1,400 | 950 | 690 | 770 | 2,570 | 690 | 420 |
| 24 | 420 | 690 | 18,600 | 1,930 | 4,050 | 1,310 | 860 | 690 | 540 | 8,740 | 1,600 | 420 |
| 25 | 1,130 | 860 | 13,800 | 2,050 | 10,900 | 1,310 | 860 | 690 | 860 | 14,000 | 2,430 | 420 |
| 26 | 1,310 | 950 | 6,770 | 3,750 | 15,200 | 1,220 | 770 | 610 | 690 | 10,500 | 2,850 | 420 |
| 27 | 1,220 | 950 | 3,300 | 4,200 | 10,300 | 1,400 | 690 | 540 | 610 | 6,770 | 2,570 | 420 |
| 28 | 950 | 2,710 | 1,930 | 3,900 | 6,220 | 1,310 | 690 | 690 | 610 | 3,900 | 1,400 | 370 |
| 29 | 860 | 4,360 | 1,600 | 3,150 | ..... | 1,220 | 690 | 690 | 480 | 2,170 | 950 | 370 |
| 30 | 1,220 | 4,360 | 1,400 | 2,300 | ..... | 1,220 | 690 | 770 | 480 | 1,310 | 860 | 370 |
| 31 | 2,430 | ..... | 1,310 | 1,820 | ..... | 1,130 | ..... | 950 | ..... | 1,400 | 950 | ..... |

*Daily discharge, in second-feet, of Flint River near Woodbury, Ga., for the years ending Sept. 30, 1919 and 1920*—Continued.

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1919–20. | | | | | | | | | | | | |
| 1 | 370 | 690 | 1,040 | 1,040 | 2,300 | 1,310 | 6,770 | 3,300 | 1,130 | 540 | 540 | 1,040 |
| 2 | 370 | 1,400 | 950 | 950 | 1,930 | 1,220 | 7,340 | 1,820 | 1,040 | 690 | 690 | 770 |
| 3 | 770 | 1,220 | 860 | 950 | 5,340 | 1,220 | 9,180 | 6,400 | 950 | 690 | 1,710 | 3,450 |
| 4 | 540 | 950 | 860 | 950 | 11,400 | 1,310 | 7,720 | 13,300 | 950 | 610 | 3,900 | 1,600 |
| 5 | 540 | 860 | 770 | 860 | 11,400 | 2,430 | 5,000 | 11,400 | 1,600 | 610 | 2,850 | 1,310 |
| 6 | 480 | 690 | 690 | 950 | 9,620 | 2,170 | 3,300 | 8,120 | 1,930 | 690 | 2,570 | 1,130 |
| 7 | 480 | 610 | 770 | 1,400 | 6,400 | 1,930 | 2,300 | 4,050 | 1,400 | 690 | 3,000 | 950 |
| 8 | 480 | 610 | 4,840 | 2,050 | 3,300 | 1,710 | 2,170 | 3,150 | 1,220 | 860 | 1,820 | 860 |
| 9 | 480 | 540 | 17,500 | 2,300 | 2,430 | 1,400 | 2,300 | 2,570 | 1,040 | 860 | 1,710 | 1,040 |
| 10 | 950 | 540 | 34,500 | 2,430 | 2,050 | 1,310 | 3,150 | 2,050 | 860 | 860 | 1,710 | 1,820 |
| 11 | 1,130 | 610 | 36,900 | 1,930 | 2,300 | 1,310 | 2,710 | 1,710 | 860 | 2,050 | 2,300 | 1,400 |
| 12 | 770 | 1,040 | 27,900 | 1,600 | 2,430 | 1,400 | 2,300 | 1,600 | 860 | 1,820 | 3,750 | 1,040 |
| 13 | 610 | 1,710 | 16,800 | 1,400 | 3,150 | 2,710 | 2,050 | 4,360 | 770 | 860 | 5,340 | 860 |
| 14 | 540 | 1,600 | 7,530 | 1,310 | 3,000 | 3,000 | 1,820 | 6,400 | 770 | 1,400 | 4,360 | 690 |
| 15 | 480 | 1,500 | 5,170 | 1,220 | 2,850 | 4,050 | 1,600 | 4,200 | 770 | 1,220 | 3,000 | 610 |
| 16 | 480 | 1,130 | 3,150 | 1,220 | 2,430 | 3,600 | 1,600 | 3,450 | 690 | 2,050 | 4,050 | 540 |
| 17 | 1,600 | 770 | 2,570 | 2,850 | 2,050 | 16,200 | 2,300 | 2,300 | 610 | 2,430 | 4,520 | 540 |
| 18 | 1,400 | 690 | 1,930 | 3,150 | 1,820 | 21,100 | 2,430 | 1,930 | 690 | 4,360 | 6,580 | 540 |
| 19 | 1,400 | 690 | 1,710 | 3,150 | 1,710 | 14,700 | 2,050 | 1,820 | 690 | 6,400 | 4,360 | 480 |
| 20 | 1,220 | 690 | 1,600 | 2,300 | 1,710 | 14,200 | 1,820 | 1,820 | 770 | 4,680 | 3,900 | 480 |
| 21 | 1,040 | 610 | 1,500 | 1,930 | 1,500 | 10,100 | 1,600 | 1,600 | 1,310 | 4,050 | 2,050 | 480 |
| 22 | 1,310 | 610 | 1,400 | 1,600 | 1,400 | 6,770 | 1,500 | 1,500 | 1,310 | 4,680 | 1,400 | 420 |
| 23 | 1,220 | 610 | 1,310 | 1,500 | 1,820 | 3,750 | 1,500 | 1,400 | 1,220 | 3,750 | 1,220 | 420 |
| 24 | 1,930 | 610 | 1,220 | 1,710 | 1,930 | 2,570 | 1,500 | 1,310 | 1,040 | 3,150 | 1,130 | 420 |
| 25 | 1,400 | 610 | 1,130 | 3,150 | 1,820 | 2,170 | 1,400 | 1,220 | 1,040 | 1,600 | 1,040 | 690 |
| 26 | 1,130 | 610 | 1,040 | 7,920 | 1,500 | 2,570 | 1,310 | 1,400 | 690 | 1,040 | 860 | 770 |
| 27 | 950 | 610 | 1,040 | 10,100 | 1,310 | 4,050 | 5,000 | 2,050 | 610 | 860 | 860 | 690 |
| 28 | 860 | 610 | 1,040 | 10,300 | 1,310 | 6,040 | 7,150 | 1,820 | 540 | 770 | 1,400 | 690 |
| 29 | 610 | 690 | 1,040 | 7,920 | 1,310 | 15,500 | 7,530 | 1,400 | 540 | 690 | 1,820 | 770 |
| 30 | 610 | 860 | 1,040 | 5,340 | ..... | 19,100 | 5,680 | 1,220 | 540 | 610 | 1,600 | 770 |
| 31 | 610 | ..... | 1,040 | 3,150 | ..... | 14,200 | ..... | 1,130 | ..... | 540 | 1,400 | ..... |

*Monthly discharge of Flint River near Woodbury, Ga., for the years ending Sept. 30, 1919 and 1920.*

[Drainage area, 1,090 square miles.]

| Month. | Discharge in second-feet. | | | | Run-off in inches. |
|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square mile. | |
| 1918–19. | | | | | |
| October | 2,430 | 250 | 519 | 0.476 | 0.55 |
| November | 4,360 | 370 | 944 | .866 | .97 |
| December | 18,600 | 610 | 3,690 | 3.39 | 3.91 |
| January | 5,680 | 1,040 | 2,360 | 2.17 | 2.50 |
| February | 15,200 | 1,130 | 3,270 | 3.00 | 3.12 |
| March | 13,000 | 1,130 | 3,370 | 3.09 | 3.56 |
| April | 2,050 | 690 | 1,110 | 1.02 | 1.14 |
| May | 1,220 | 540 | 840 | .771 | .89 |
| June | 1,310 | 480 | 700 | .642 | .72 |
| July | 14,000 | 370 | 2,630 | 2.41 | 2.78 |
| August | 9,400 | 610 | 2,020 | 1.85 | 2.13 |
| September | 1,040 | 370 | 500 | .459 | .51 |
| The year | 18,600 | 250 | 1,830 | 1.68 | 22.78 |
| 1919–20. | | | | | |
| October | 1,930 | 370 | 863 | .792 | .91 |
| November | 1,710 | 540 | 832 | .763 | .85 |
| December | 36,900 | 690 | 5,830 | 5.35 | 6.17 |
| January | 10,300 | 860 | 2,860 | 2.62 | 3.02 |
| February | 11,400 | 1,310 | 3,220 | 2.95 | 3.18 |
| March | 21,100 | 1,220 | 5,970 | 5.48 | 6.32 |
| April | 9,180 | 1,310 | 3,470 | 3.18 | 3.55 |
| May | 13,300 | 1,130 | 3,280 | 3.01 | 3.47 |
| June | 1,930 | 540 | 948 | .870 | .97 |
| July | 6,400 | 540 | 1,810 | 1.66 | 1.91 |
| August | 6,580 | 540 | 2,500 | 2.29 | 2.64 |
| September | 3,450 | 420 | 909 | .834 | .93 |
| The year | 36,900 | 370 | 2,720 | 2.50 | 33.92 |

### FLINT RIVER NEAR CULLODEN, GA.

LOCATION.—At Grays Ferry, Upson County, 1½ miles upstream from mouth of Auchumpkee Creek and 14 miles southwest of Culloden.

DRAINAGE AREA.—2,000 square miles.

RECORDS AVAILABLE.—July 1, 1911, to September 30, 1920.

GAGE.—Original gage was a staff in four sections on left bank at old ferry landing. In August, 1918, a Stevens continuous water-stage recorder with a standard wooden well and shelter was installed on left bank about 100 feet upstream from old rod gage; the Stevens gage was replaced by a Gurley 7-day graph recorder. Gage inspected by Arthur Preston.

DISCHARGE MEASUREMENTS.—Made from rowboat held in place by a small galvanized cable stretched taut across river.

CHANNEL AND CONTROL.—Channel sandy and shifting at gage. Control is a rock ledge half a mile downstream; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year ending September 30, 1919, 26.5 feet at 5 a. m. February 26 (discharge, 45,300 second-feet); minimum stage, 1.33 feet at 8 a. m. October 12 (discharge, 265 second-feet).

Maximum stage recorded during year ending September 30, 1920, 27.6 feet at 3 p. m. December 11 (discharge, 47,700 second-feet); minimum stage recorded, 1.9 feet October 1 (discharge, 620 second-feet).

1911–1920: Maximum stage recorded, 33.3 feet during night of July 9, 1916 (discharge, not determined); minimum stage recorded, 1.0 foot October 8, 1911 (discharge, 165 second-feet).

ICE.—None.

DIVERSIONS.—None.

ACCURACY.—Stage-discharge relation practically permanent. Rating curve well defined between 250 and 5,000 second-feet; extension above 5,000 second-feet based on discharge at crests of floods at Woodbury corrected for difference in drainage area. Operation of water-stage recorder unsatisfactory owing to frequent stopping of clock, but observer read rod gage once daily when clock was not running. Diurnal fluctuation at this station is negligible. Daily discharge ascertained by applying mean daily gage height to rating table. Records good except for extremely high stages.

*Discharge measurements of Flint River near Culloden, Ga., during the years ending Sept. 30, 1919 and 1920.*

| Date. | Made by— | Gage height. | Discharge. | Date. | Made by— | Gage height. | Discharge. |
|---|---|---|---|---|---|---|---|
| 1918. | | *Feet.* | *Sec.-ft.* | 1919. | | *Feet.* | *Sec.-ft.* |
| Oct. 10 | A. H. Condron..... | 1.35 | 2.64 | May 29 | A. H. Condron..... | 2.72 | 1,350 |
| 1919. | | | | Sept. 19 | Warren E Hall and A. H. Condron..... | 2.04 | 703 |
| Feb. 21 | .....do..... | 5.43 | 4,680 | | | | |
| Mar. 26 | .....do..... | 3.50 | 2,150 | 1920. | | | |
| 27 | .....do..... | 3.74 | 2,390 | Feb. 17 | A. H. Condron..... | 4.62 | 3,780 |

*Daily discharge, in second-feet, of Flint River near Culloden, Ga., for the years ending Sept. 30, 1919 and 1920.*

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1918-19. | | | | | | | | | | | | |
| 1 | 420 | 2,340 | 5,380 | 3,100 | 3,100 | 9,280 | 1,800 | 1,100 | 2,460 | 760 | 2,700 | 2,340 |
| 2 | 420 | 1,600 | 4,430 | 4,430 | 2,700 | 6,550 | 1,800 | 1,300 | 2,230 | 690 | 3,240 | 2,010 |
| 3 | 390 | 1,200 | 3,100 | 12,700 | 2,460 | 5,060 | 1,700 | 1,200 | 1,800 | 655 | 3,100 | 1,300 |
| 4 | 360 | 920 | 2,340 | 9,280 | 3,380 | 3,980 | 1,700 | 1,100 | 1,500 | 515 | 2,230 | 1,100 |
| 5 | 360 | 800 | 1,800 | 6,720 | 3,380 | 4,430 | 1,900 | 1,200 | 1,400 | 550 | 11,300 | 1,010 |
| 6 | 360 | 725 | 1,500 | 4,900 | 2,830 | 7,740 | 1,800 | 1,600 | 1,200 | 550 | 6,720 | 1,010 |
| 7 | 330 | 655 | 1,300 | 3,680 | 2,580 | 8,420 | 1,800 | 2,010 | 1,100 | 1,010 | 3,680 | 920 |
| 8 | 275 | 655 | 1,200 | 3,100 | 2,460 | 5,870 | 1,700 | 2,010 | 1,010 | 5,700 | 2,230 | 920 |
| 9 | 275 | 655 | 1,200 | 3,100 | 2,340 | 13,100 | 1,700 | 2,010 | 920 | 7,060 | 5,700 | 920 |
| 10 | 275 | 655 | 1,200 | 2,960 | 2,340 | 15,600 | 1,600 | 1,800 | 920 | 4,740 | 4,280 | 880 |
| 11 | 275 | 620 | 1,200 | 2,700 | 2,010 | 15,200 | 2,120 | 1,600 | 920 | 3,240 | 5,700 | 880 |
| 12 | 275 | 585 | 1,200 | 2,340 | 2,010 | 10,000 | 2,700 | 1,400 | 1,010 | 2,700 | 7,400 | 690 |
| 13 | 300 | 585 | 1,100 | 2,230 | 2,010 | 5,380 | 2,580 | 1,200 | 920 | 2,010 | 3,830 | 2,230 |
| 14 | 300 | 585 | 2,460 | 2,120 | 4,130 | 3,830 | 2,460 | 2,010 | 880 | 1,600 | 1,600 | 920 |
| 15 | 300 | 585 | 4,740 | 2,010 | 5,700 | 3,240 | 2,010 | 1,800 | 840 | 1,500 | 1,600 | 1,010 |
| 16 | 300 | 725 | 3,830 | 1,900 | 4,130 | 2,960 | 1,700 | 1,700 | 725 | 2,460 | 1,400 | 920 |
| 17 | 330 | 1,100 | 3,100 | 2,230 | 4,430 | 3,980 | 2,700 | 1,400 | 800 | 5,380 | 840 | 880 |
| 18 | 300 | 920 | 2,460 | 4,900 | 2,700 | 7,740 | 2,830 | 1,200 | 2,580 | 4,130 | 6,720 | 800 |
| 19 | 330 | 920 | 1,800 | 5,060 | 2,230 | 6,040 | 2,340 | 1,100 | 2,010 | 3,830 | 4,580 | 690 |
| 20 | 330 | 840 | 2,010 | 4,900 | 2,120 | 4,740 | 2,460 | 1,600 | 1,500 | 5,060 | 3,980 | 3,830 |
| 21 | 330 | 840 | 10,400 | 4,430 | 4,740 | 3,530 | 1,700 | 1,400 | 1,400 | 6,720 | 1,300 | 1,500 |
| 22 | 360 | 800 | 22,400 | 3,240 | 6,040 | 3,100 | 1,500 | 1,010 | 1,700 | 4,130 | 2,230 | 1,100 |
| 23 | 390 | 760 | 31,700 | 2,960 | 6,550 | 2,700 | 1,500 | 1,010 | 1,200 | 10,700 | 1,700 | 920 |
| 24 | 480 | 880 | 24,200 | 3,100 | 22,600 | 2,460 | 1,400 | 840 | 1,400 | 26,600 | 2,830 | 840 |
| 25 | 2,120 | 1,200 | 18,100 | 5,380 | 27,700 | 2,230 | 1,300 | 920 | 1,300 | 38,900 | 2,700 | 760 |
| 26 | 1,900 | 1,400 | 13,800 | 12,900 | 27,300 | 2,120 | 1,200 | 920 | 1,100 | 18,800 | 2,340 | 760 |
| 27 | 1,800 | 1,700 | 7,060 | 9,100 | 13,200 | 2,340 | 1,200 | 920 | 1,010 | 10,900 | 2,010 | 760 |
| 28 | 1,400 | 4,280 | 4,280 | 6,720 | 12,900 | 2,340 | 1,200 | 1,400 | 920 | 7,400 | 1,700 | 690 |
| 29 | 1,200 | 6,550 | 3,240 | 5,540 | ..... | 2,120 | 1,100 | 1,300 | 880 | 4,580 | 1,400 | 690 |
| 30 | 1,300 | 6,040 | 2,700 | 4,130 | ..... | 2,120 | 1,100 | 1,300 | 840 | 2,830 | 2,010 | 620 |
| 31 | 2,960 | ..... | 2,340 | 3,380 | ..... | 2,010 | ..... | 2,010 | ..... | 2,700 | 2,580 | ..... |
| 1919-20. | | | | | | | | | | | | |
| 1 | 620 | 1,010 | 1,600 | 1,800 | 4,280 | 5,220 | 13,600 | 5,540 | 1,900 | 1,010 | 1,200 | 1,600 |
| 2 | 655 | 1,700 | 1,500 | 1,700 | 4,280 | 2,340 | 16,700 | 3,530 | 1,900 | 1,100 | 1,300 | 1,300 |
| 3 | 655 | 2,120 | 1,400 | 1,700 | 15,200 | 2,230 | 17,400 | 12,300 | 1,800 | 1,400 | 1,900 | 2,700 |
| 4 | 880 | 1,600 | 1,400 | 1,700 | 19,400 | 2,340 | 15,200 | 24,400 | 1,800 | 1,200 | 5,380 | 4,280 |
| 5 | 1,010 | 1,400 | 1,200 | 1,600 | 17,700 | 4,430 | 10,200 | 19,200 | 2,230 | 1,100 | 6,210 | 2,340 |
| 6 | 920 | 1,200 | 1,200 | 1,600 | 13,800 | 4,280 | 6,720 | 13,100 | 3,680 | 1,200 | 3,830 | 2,010 |
| 7 | 880 | 1,100 | 1,200 | 2,010 | 10,500 | 3,530 | 5,060 | 8,250 | 2,830 | 1,200 | 3,980 | 1,600 |
| 8 | 760 | 1,010 | 5,540 | 3,240 | 6,720 | 2,960 | 4,130 | 5,870 | 2,230 | 1,300 | 3,380 | 1,300 |
| 9 | 690 | 920 | 20,100 | 3,980 | 4,740 | 2,580 | 4,130 | 4,900 | 1,900 | 1,600 | 2,830 | 2,120 |
| 10 | 760 | 1,010 | 34,500 | 4,580 | 3,830 | 2,460 | 5,700 | 4,740 | 1,700 | 1,300 | 3,830 | 2,230 |
| 11 | 1,200 | 1,010 | 45,500 | 3,830 | 4,280 | 2,460 | 5,060 | 3,380 | 1,600 | 4,280 | 4,280 | 2,460 |
| 12 | 1,300 | 5,220 | 40,700 | 3,100 | 4,580 | 3,240 | 4,430 | 2,960 | 1,500 | 3,380 | 4,130 | 1,800 |
| 13 | 1,010 | 2,460 | 30,000 | 2,700 | 6,380 | 17,400 | 4,580 | 23,100 | 1,500 | 2,010 | 5,870 | 1,400 |
| 14 | 920 | 2,230 | 19,200 | 2,460 | 5,700 | 7,910 | 3,530 | 17,200 | 1,400 | 2,340 | 6,380 | 1,200 |
| 15 | 840 | 2,120 | 10,900 | 2,340 | 4,900 | 6,040 | 3,100 | 7,740 | 1,300 | 2,340 | 5,220 | 1,100 |
| 16 | 800 | 1,900 | 7,060 | 2,460 | 4,130 | 5,540 | 3,680 | 6,040 | 1,200 | 3,100 | 5,380 | 1,010 |
| 17 | 880 | 1,500 | 5,060 | 5,060 | 3,680 | 18,300 | 4,430 | 4,580 | 1,200 | 4,580 | 5,540 | 1,010 |
| 18 | 1,900 | 1,300 | 4,130 | 5,380 | 3,240 | 42,400 | 4,430 | 3,830 | 1,200 | 7,400 | 7,570 | 1,010 |
| 19 | 1,700 | 1,200 | 3,380 | 4,900 | 3,100 | 31,900 | 5,380 | 3,680 | 1,300 | 12,000 | 7,740 | 920 |
| 20 | 1,600 | 1,100 | 3,100 | 4,130 | 2,960 | 23,100 | 3,380 | 3,530 | 1,400 | 9,460 | 5,870 | 880 |
| 21 | 1,300 | 1,100 | 2,830 | 3,380 | 2,700 | 18,300 | 2,960 | 3,240 | 2,010 | 6,720 | 3,830 | 840 |
| 22 | 1,400 | 1,010 | 2,700 | 2,830 | 2,580 | 12,000 | 2,830 | 2,830 | 2,010 | 7,570 | 2,580 | 800 |
| 23 | 7,060 | 1,010 | 2,460 | 2,580 | 2,830 | 7,740 | 2,700 | 2,580 | 2,010 | 6,380 | 2,120 | 800 |
| 24 | 7,060 | 1,010 | 2,340 | 2,580 | 2,960 | 5,220 | 2,830 | 2,340 | 1,700 | 4,900 | 1,900 | 1,100 |
| 25 | 3,240 | 1,010 | 2,230 | 6,380 | 2,960 | 4,280 | 4,130 | 2,230 | 1,900 | 3,100 | 1,700 | 1,010 |
| 26 | 2,120 | 1,010 | 2,120 | 14,500 | 2,580 | 3,980 | 3,100 | 2,460 | 1,600 | 2,120 | 1,500 | 1,400 |
| 27 | 1,700 | 1,100 | 2,010 | 15,200 | 2,340 | 5,060 | 8,590 | 2,830 | 1,300 | 1,700 | 1,300 | 1,300 |
| 28 | 1,500 | 1,100 | 2,010 | 14,500 | 2,230 | 8,080 | 11,400 | 3,100 | 1,100 | 1,500 | 2,230 | 1,010 |
| 29 | 1,300 | 1,100 | 1,900 | 12,500 | 5,220 | 20,600 | 10,200 | 2,580 | 1,100 | 1,300 | 2,700 | 2,120 |
| 30 | 1,100 | 1,200 | 1,800 | 8,760 | ..... | 25,500 | 8,590 | 2,230 | 1,010 | 1,200 | 2,230 | 3,100 |
| 31 | 1,010 | ..... | 1,800 | 5,700 | ..... | 23,100 | ..... | 1,900 | ..... | 1,200 | 2,010 | ..... |

NOTE.—Discharge for following days when gage did not operate obtained from readings of rod gage: Oct. 1-9 and Dec. 26-31, 1918; Jan. 1 to Feb. 20, Mar. 1, Apr. 1, June 13 to July 23, and July 27 to Oct. 8, Oct. 17-25, and Dec. 9-16, 1919; Sept. 1-7, Sept. 24 and 25, 1920. Maximum gage heights Dec. 23, 1918, and Dec. 11, 1919, obtained by level from flood marks made by observer. Discharge Dec. 21-25, 1918, and July 24-26, 1919, estimated from graphs plotted from all available data.

*Monthly discharge of Flint River near Culloden, Ga., for the years ending Sept. 30, 1919 and 1920.*

[Drainage area, 2,000 square miles.]

| Month. | Discharge in second-feet. | | | | Run-off in inches. |
|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square mile. | |
| 1918–19. | | | | | |
| October | 2,960 | 275 | 669 | 0.334 | 0.39 |
| November | 6,550 | 585 | 1,400 | .700 | .78 |
| December | 31,700 | 1,100 | 6,050 | 3.02 | 3.48 |
| January | 12,900 | 1,900 | 4,690 | 2.34 | 2.70 |
| February | 27,700 | 2,010 | 6,430 | 3.22 | 3.35 |
| March | 15,600 | 2,010 | 5,490 | 2.74 | 3.16 |
| April | 2,830 | 1,100 | 1,820 | .910 | 1.02 |
| May | 2,010 | 840 | 1,400 | .700 | .81 |
| June | 2,580 | 725 | 1,280 | .640 | .71 |
| July | 38,900 | 515 | 6,080 | 3.04 | 3.50 |
| August | 11,300 | 840 | 3,410 | 1.70 | 1.96 |
| September | 3,830 | 620 | 1,130 | .565 | .63 |
| The year | 38,900 | 275 | 3,320 | 1.66 | 22.49 |
| 1919–20. | | | | | |
| October | 7,060 | 620 | 1,570 | .785 | .90 |
| November | 5,220 | 920 | 1,460 | .730 | .81 |
| December | 45,500 | 1,200 | 8,480 | 4.24 | 4.89 |
| January | 15,200 | 1,600 | 4,810 | 2.40 | 2.77 |
| February | 19,400 | 2,230 | 5,860 | 2.93 | 3.16 |
| March | 42,400 | 2,230 | 10,500 | 5.25 | 6.05 |
| April | 17,400 | 2,700 | 6,610 | 3.30 | 3.68 |
| May | 24,400 | 1,900 | 6,650 | 3.32 | 3.83 |
| June | 3,680 | 1,010 | 1,710 | .855 | .95 |
| July | 12,000 | 1,010 | 3,269 | 1.63 | 1.88 |
| August | 7,740 | 1,200 | 3,740 | 1.87 | 2.16 |
| September | 4,280 | 800 | 1,590 | .795 | .89 |
| The year | 45,500 | 620 | 4,700 | 2.35 | 31.97 |

**FLINT RIVER AT ALBANY, GA.**

LOCATION.—At Dougherty County highway bridge in Albany, 700 feet below Atlantic Coast Line Railroad bridge and 2 miles downstream from mouth of Muckafoonee Creek.

DRAINAGE AREA.—5,000 square miles.

RECORDS AVAILABLE.—April 10, 1893, to September 30, 1920 (United States Weather Bureau gage heights). Discharge measurements were begun by the Geological Survey in 1901 and determinations of daily discharge have been made since January 1, 1902.

GAGE.—Chain gage, installed at the bridge April 20, 1904; read once daily by D. W. Brosnan. Original staff gage washed out in 1898. It was again damaged in 1902, and on June 18 of that year a new gage was installed by the United States Weather Bureau at a datum 0.75 foot lower than that of the former gage. All gage heights published for 1902 by the United States Weather Bureau and the United States Geological Survey refer to the new datum. Present gage conforms with the United States Weather Bureau gage.

DISCHARGE MEASUREMENTS.—Fairly accurate measurements can be obtained at the section at the Atlantic Coast Line bridge, although it is very rough, and train switching in the yard interferes with the work. The section at the Georgia Northern Railway bridge, 1 mile above, at which measurements are sometimes made, is considered better, especially for medium and low stages.

CHANNEL AND CONTROL.—Channel at and below gage may shift slightly, but control is practically permanent. The river overflows both banks, but only under the approaches to the bridge.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year ending September 30, 1919, 27.8 feet at 8 a. m. March 3 (discharge, 47,200 second-feet); minimum stage recorded, −1.0 foot at 7 a. m. October 12–14 (discharge, 1,840 second-feet).

Maximum stage recorded during year ending September 30, 1920, 26.2 feet April 5 (discharge, 44,000 second-feet); minimum stage recorded, 0.9 foot at 7 a. m. September 24 (discharge, 2,680 second-feet).

1902–1920: Maximum stage recorded, 30.3 feet at 7 a. m. March 21, 1913 (discharge, 53,700 second-feet); minimum stage recorded, −1.1 feet October 9–12, 1911 (discharge, 1,110 second-feet).

ICE.—Stage-discharge relation not affected by ice.

DIVERSIONS.—None.

REGULATION.—Power developments on Muckalee Creek, which joins Flint River about 2 miles above the station, causes considerable diurnal fluctuation, especially at low stages. The flow is probably also affected by other power plants farther up the river.

ACCURACY.—Stage-discharge relation practically permanent. Rating curve well defined between 1,800 and 50,000 second-feet. Gage read to tenths once daily. Daily discharge ascertained by applying daily gage height to rating table. Records fair; discharge for low stages as determined from one reading of gage per day may be somewhat in error owing to fluctuations in stage caused by operation of power plants on tributary streams above the station.

The following discharge measurement was made by C. G. Paulsen:

October 12, 1918: Gage height, −0.97 foot; discharge, 1,840 second-feet.

*Daily discharge, in second-feet, of Flint River at Albany, Ga., for the years ending Sept. 30, 1916–1920.*

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1915–16. | | | | | | | | | | | | |
| 1 | 2,020 | 3,320 | 2,550 | 5,500 | 3,700 | 5,960 | 4,690 | 2,320 | 2,180 | 2,220 | 25,600 | 3,700 |
| 2 | 1,980 | 2,620 | 2,490 | 7,280 | 4,120 | 5,840 | 4,120 | 2,220 | 2,050 | 2,430 | 19,300 | 3,410 |
| 3 | 2,180 | 2,490 | 2,430 | 10,400 | 5,260 | 7,040 | 4,010 | 2,180 | 2,020 | 2,550 | 13,600 | 3,230 |
| 4 | 2,490 | 2,430 | 2,380 | 13,900 | 7,640 | 8,000 | 3,900 | 2,180 | 1,980 | 2,750 | 10,700 | 3,060 |
| 5 | 2,220 | 2,380 | 2,320 | 17,200 | 8,980 | 8,980 | 3,800 | 2,130 | 1,950 | 3,060 | 8,980 | 3,410 |
| 6 | 2,820 | 2,320 | 2,320 | 19,100 | 10,700 | 9,500 | 4,230 | 2,090 | 1,950 | 2,900 | 8,360 | 3,140 |
| 7 | 3,060 | 2,320 | 2,320 | 18,700 | 11,500 | 9,500 | 4,230 | 2,090 | 1,950 | 2,750 | 8,240 | 3,230 |
| 8 | 4,460 | 2,270 | 2,270 | 14,700 | 12,500 | 8,980 | 4,010 | 2,090 | 1,950 | 4,120 | 8,000 | 2,900 |
| 9 | 5,500 | 2,220 | 2,180 | 8,240 | 12,800 | 8,480 | 4,010 | 2,050 | 1,950 | 18,600 | 9,110 | 3,060 |
| 10 | 5,960 | 2,220 | 2,220 | 5,040 | 11,500 | 8,240 | 4,010 | 2,050 | 1,920 | 31,400 | 9,760 | 2,900 |
| 11 | 5,260 | 2,220 | 2,320 | 4,580 | 8,000 | 8,120 | 4,230 | 2,020 | 2,050 | 41,600 | 8,720 | 2,750 |
| 12 | 4,340 | 2,220 | 2,430 | 4,340 | 5,840 | 8,240 | 4,340 | 1,980 | 2,050 | 37,200 | 7,040 | 2,680 |
| 13 | 3,500 | 2,270 | 2,430 | 4,230 | 5,380 | 8,240 | 4,120 | 2,020 | 1,890 | 36,200 | 5,610 | 3,060 |
| 14 | 2,820 | 2,430 | 2,380 | 4,230 | 5,150 | 7,760 | 4,010 | 1,980 | 1,920 | 41,000 | 5,150 | 2,820 |
| 15 | 2,680 | 2,680 | 2,620 | 4,580 | 4,920 | 6,320 | 3,600 | 1,950 | 2,050 | 45,800 | 4,690 | 3,410 |
| 16 | 2,430 | 2,320 | 3,800 | 5,610 | 4,690 | 5,040 | 3,500 | 1,950 | 1,890 | 46,200 | 4,580 | 3,600 |
| 17 | 3,140 | 2,270 | 3,060 | 6,920 | 4,920 | 4,800 | 3,410 | 2,020 | 1,920 | 44,000 | 5,380 | 4,340 |
| 18 | 4,800 | 2,270 | 2,900 | 7,520 | 5,040 | 4,460 | 3,230 | 1,980 | 2,270 | 39,600 | 5,840 | 4,460 |
| 19 | 5,040 | 2,620 | 3,140 | 7,040 | 4,920 | 4,230 | 3,140 | 1,980 | 2,900 | 34,400 | 6,680 | 4,460 |
| 20 | 4,920 | 3,700 | 3,900 | 6,080 | 4,580 | 4,120 | 3,060 | 1,950 | 3,140 | 27,800 | 6,080 | 3,900 |
| 21 | 3,230 | 3,320 | 5,840 | 5,840 | 4,120 | 4,120 | 3,060 | 1,950 | 3,410 | 22,500 | 4,800 | 3,410 |
| 22 | 3,230 | 2,820 | 7,160 | 5,260 | 3,900 | 3,900 | 2,620 | 1,980 | 3,600 | 18,900 | 4,580 | 2,980 |
| 23 | 4,460 | 2,820 | 8,480 | 4,920 | 3,800 | 3,600 | 2,620 | 1,980 | 2,750 | 17,900 | 4,230 | 2,900 |
| 24 | 4,920 | 2,680 | 10,800 | 4,920 | 3,800 | 3,600 | 2,680 | 1,980 | 2,220 | 18,900 | 3,140 | 2,750 |
| 25 | 4,920 | 2,620 | 12,800 | 4,690 | 4,010 | 3,600 | 2,620 | 2,180 | 2,050 | 20,000 | 3,320 | 2,820 |
| 26 | 6,800 | 2,490 | 15,800 | 4,690 | 4,120 | 3,500 | 2,750 | 2,750 | 2,270 | 26,600 | 3,060 | 2,270 |
| 27 | 7,400 | 2,430 | 16,400 | 4,460 | 4,690 | 3,500 | 2,750 | 3,700 | 2,130 | 34,600 | 2,820 | 2,380 |
| 28 | 8,000 | 2,430 | 13,500 | 4,230 | 5,150 | 3,500 | 2,430 | 3,320 | 2,180 | 36,800 | 2,750 | 2,380 |
| 29 | 6,800 | 2,490 | 5,840 | 4,120 | 6,080 | 3,800 | 2,380 | 2,900 | 2,130 | 36,000 | 2,900 | 2,320 |
| 30 | 4,010 | 2,620 | 4,690 | 3,800 | ..... | 4,460 | 2,320 | 2,380 | 2,220 | 33,600 | 3,230 | 2,320 |
| 31 | 3,500 | ..... | 5,150 | 3,500 | ..... | 5,150 | ..... | 2,270 | ..... | 30,600 | 4,230 | ..... |

*Daily discharge, in second-feet, of Flint River at Albany, Ga., for the years ending Sept. 30, 1916–1920*—Continued.

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1916–17. | | | | | | | | | | | | |
| 1 | 2,320 | 2,090 | 2,380 | 3,700 | 15,000 | 15,500 | 24,200 | 3,900 | 2,750 | 3,500 | 3,140 | 2,980 |
| 2 | 2,380 | 2,090 | 2,620 | 4,230 | 14,200 | 14,300 | 25,400 | 4,120 | 2,820 | 4,010 | 2,900 | 2,980 |
| 3 | 2,020 | 2,180 | 2,980 | 4,340 | 9,760 | 12,200 | 25,400 | 4,010 | 2,750 | 4,690 | 2,620 | 3,060 |
| 4 | 1,980 | 2,130 | 3,500 | 4,120 | 8,240 | 9,760 | 23,600 | 3,800 | 2,620 | 4,460 | 2,550 | 3,600 |
| 5 | 2,130 | 2,130 | 3,230 | 3,230 | 7,760 | 10,800 | 19,600 | 4,460 | 2,490 | 5,150 | 3,060 | 4,010 |
| 6 | 2,130 | 2,130 | 3,230 | 3,320 | 8,360 | 15,500 | 16,300 | 5,610 | 2,380 | 5,040 | 5,150 | 4,120 |
| 7 | 2,180 | 2,090 | 3,060 | 3,600 | 8,000 | 19,500 | 13,700 | 6,560 | 2,320 | 5,720 | 7,880 | 3,230 |
| 8 | 2,130 | 2,180 | 2,900 | 4,010 | 7,280 | 22,900 | 13,600 | 7,280 | 2,270 | 5,610 | 8,480 | 3,230 |
| 9 | 2,050 | 2,270 | 2,680 | 4,230 | 6,560 | 27,600 | 17,100 | 7,160 | 2,320 | 4,690 | 9,500 | 2,680 |
| 10 | 1,980 | 2,270 | 2,750 | 4,120 | 6,080 | 31,600 | 19,600 | 6,320 | 2,380 | 3,600 | 10,200 | 2,380 |
| 11 | 1,980 | 2,220 | 3,060 | 3,900 | 5,040 | 33,200 | 22,700 | 5,720 | 2,220 | 3,410 | 10,000 | 2,490 |
| 12 | 1,980 | 2,130 | 4,010 | 3,600 | 4,800 | 31,800 | 24,400 | 5,150 | 2,130 | 3,410 | 9,240 | 2,320 |
| 13 | 2,050 | 2,050 | 4,800 | 3,230 | 4,800 | 26,800 | 23,800 | 4,690 | 2,680 | 3,060 | 8,240 | 2,320 |
| 14 | 2,220 | 2,050 | 5,040 | 3,230 | 4,920 | 19,600 | 20,700 | 4,230 | 3,140 | 2,430 | 7,520 | 2,490 |
| 15 | 2,020 | 2,130 | 5,040 | 3,320 | 4,920 | 14,000 | 16,900 | 3,700 | 2,820 | 2,430 | 5,500 | 2,430 |
| 16 | 2,020 | 2,320 | 4,580 | 3,500 | 5,040 | 9,500 | 13,000 | 3,700 | 2,490 | 2,550 | 4,340 | 2,380 |
| 17 | 1,980 | 2,380 | 4,120 | 3,230 | 4,690 | 8,480 | 10,200 | 3,230 | 2,750 | 2,550 | 4,340 | 2,320 |
| 18 | 2,020 | 2,220 | 3,800 | 4,010 | 6,440 | 7,760 | 8,720 | 3,060 | 3,230 | 2,430 | 5,150 | 2,180 |
| 19 | 2,020 | 2,180 | 3,600 | 4,230 | 9,240 | 7,640 | 7,760 | 2,900 | 2,820 | 2,620 | 5,840 | 2,090 |
| 20 | 2,090 | 2,180 | 3,600 | 5,150 | 12,200 | 7,040 | 7,040 | 2,750 | 2,620 | 2,620 | 6,440 | 2,180 |
| 21 | 2,220 | 2,130 | 3,320 | 5,720 | 15,000 | 6,920 | 6,440 | 3,320 | 2,180 | 4,460 | 7,280 | 2,180 |
| 22 | 2,900 | 2,090 | 3,320 | 6,320 | 18,600 | 7,040 | 6,080 | 2,680 | 2,270 | 6,560 | 7,880 | 2,180 |
| 23 | 4,010 | 2,270 | 3,320 | 6,440 | 22,300 | 6,800 | 5,720 | 2,550 | 2,180 | 7,280 | 8,000 | 2,180 |
| 24 | 3,410 | 2,320 | 3,230 | 6,800 | 22,500 | 7,520 | 5,150 | 2,430 | 2,220 | 7,160 | 9,110 | 2,180 |
| 25 | 2,750 | 2,320 | 3,140 | 8,600 | 21,100 | 8,980 | 5,150 | 2,680 | 2,320 | 6,440 | 8,240 | 2,130 |
| 26 | 2,430 | 2,550 | 3,410 | 10,000 | 19,100 | 10,000 | 4,800 | 2,980 | 2,550 | 5,380 | 6,320 | 2,270 |
| 27 | 2,270 | 2,680 | 3,500 | 12,100 | 17,900 | 13,600 | 4,460 | 2,900 | 2,680 | 5,040 | 4,120 | 2,380 |
| 28 | 2,270 | 2,680 | 3,500 | 12,600 | 16,800 | 19,500 | 4,580 | 2,750 | 2,380 | 4,580 | 3,060 | 2,900 |
| 29 | 2,220 | 2,490 | 4,010 | 13,000 | ..... | 24,000 | 4,230 | 2,550 | 2,620 | 4,340 | 3,060 | 3,800 |
| 30 | 2,130 | 2,380 | 3,600 | 14,200 | ..... | 24,600 | 3,900 | 2,620 | 2,900 | 4,800 | 2,980 | 5,150 |
| 31 | 2,130 | ..... | 3,600 | 15,500 | ..... | 24,400 | ..... | 2,620 | ..... | 3,700 | 2,680 | ..... |
| 1917–18. | | | | | | | | | | | | |
| 1 | 5,150 | 2,380 | 2,430 | 3,230 | 7,280 | 4,690 | 2,820 | 8,720 | 2,050 | 3,060 | 5,380 | 2,620 |
| 2 | 6,560 | 2,320 | 2,900 | 3,230 | 7,640 | 4,120 | 2,820 | 9,890 | 2,020 | 2,900 | 6,560 | 2,620 |
| 3 | 7,760 | 2,320 | 3,230 | 3,500 | 8,720 | 4,010 | 2,980 | 11,100 | 2,090 | 2,750 | 6,560 | 2,620 |
| 4 | 8,360 | 2,320 | 2,620 | 2,820 | 11,500 | 4,010 | 3,060 | 11,600 | 2,270 | 1,950 | 5,840 | 2,900 |
| 5 | 8,850 | 2,270 | 2,490 | 2,620 | 12,900 | 3,700 | 2,980 | 11,900 | 2,380 | 2,020 | 6,440 | 3,230 |
| 6 | 9,370 | 2,220 | 2,490 | 2,680 | 15,200 | 3,600 | 3,060 | 11,900 | 2,270 | 2,050 | 6,920 | 3,410 |
| 7 | 8,850 | 2,270 | 2,380 | 2,620 | 16,800 | 3,600 | 3,060 | 10,800 | 2,320 | 2,130 | 6,560 | 3,410 |
| 8 | 6,200 | 2,220 | 2,320 | 3,140 | 17,100 | 3,700 | 3,140 | 8,480 | 2,380 | 2,130 | 6,560 | 3,700 |
| 9 | 4,800 | 2,220 | 2,430 | 3,600 | 17,100 | 3,410 | 2,820 | 5,610 | 2,620 | 2,380 | 5,500 | 3,500 |
| 10 | 2,680 | 2,380 | 2,490 | 3,500 | 14,600 | 3,410 | 3,320 | 4,690 | 2,750 | 2,270 | 5,150 | 3,410 |
| 11 | 2,620 | 2,320 | 2,430 | 3,600 | 11,400 | 3,500 | 4,580 | 3,900 | 2,550 | 2,320 | 4,460 | 3,320 |
| 12 | 2,680 | 2,270 | 3,060 | 4,120 | 8,000 | 3,230 | 5,840 | 4,460 | 2,490 | 2,220 | 3,800 | 3,320 |
| 13 | 2,550 | 2,180 | 3,140 | 4,460 | 6,320 | 3,140 | 7,160 | 3,140 | 2,490 | 2,090 | 3,410 | 2,900 |
| 14 | 2,550 | 2,320 | 2,820 | 5,040 | 6,200 | 3,600 | 7,640 | 2,900 | 2,550 | 2,050 | 3,060 | 2,550 |
| 15 | 2,380 | 2,180 | 2,820 | 6,320 | 6,200 | 3,060 | 7,760 | 3,060 | 2,750 | 2,020 | 2,620 | 2,380 |
| 16 | 2,320 | 2,180 | 3,060 | 7,040 | 6,560 | 3,060 | 6,200 | 3,140 | 2,680 | 2,020 | 2,550 | 2,180 |
| 17 | 2,320 | 2,220 | 2,980 | 8,240 | 6,440 | 2,900 | 3,900 | 3,230 | 2,490 | 1,980 | 2,750 | 2,090 |
| 18 | 2,380 | 2,180 | 3,140 | 8,850 | 6,440 | 3,060 | 3,410 | 3,230 | 2,320 | 1,950 | 3,800 | 2,180 |
| 19 | 2,430 | 2,130 | 3,060 | 9,630 | 6,680 | 3,230 | 3,230 | 3,800 | 2,430 | 1,980 | 5,380 | 1,980 |
| 20 | 2,490 | 2,180 | 2,680 | 9,500 | 6,920 | 3,320 | 3,060 | 4,230 | 2,220 | 2,180 | 4,800 | 1,920 |
| 21 | 2,380 | 2,320 | 2,490 | 9,500 | 7,760 | 3,060 | 3,600 | 3,900 | 2,220 | 2,270 | 3,600 | 1,890 |
| 22 | 2,220 | 2,550 | 2,680 | 8,600 | 6,920 | 2,980 | 3,900 | 2,900 | 2,220 | 2,270 | 3,230 | 1,890 |
| 23 | 2,220 | 2,550 | 2,620 | 7,040 | 6,440 | 3,140 | 3,900 | 2,490 | 2,180 | 2,380 | 3,320 | 1,890 |
| 24 | 2,270 | 2,680 | 2,430 | 6,320 | 6,200 | 3,060 | 4,340 | 2,320 | 2,090 | 3,230 | 2,900 | 2,020 |
| 25 | 2,180 | 2,900 | 2,320 | 6,200 | 6,200 | 3,600 | 3,410 | 2,270 | 2,180 | 4,010 | 2,550 | 2,130 |
| 26 | 2,180 | 3,230 | 2,750 | 6,560 | 5,610 | 3,410 | 3,230 | 2,270 | 2,180 | 4,230 | 2,320 | 2,090 |
| 27 | 2,380 | 2,900 | 2,900 | 6,560 | 5,040 | 2,900 | 3,600 | 2,270 | 2,220 | 3,600 | 2,220 | 2,050 |
| 28 | 2,220 | 2,550 | 3,140 | 6,560 | 4,580 | 3,060 | 4,690 | 2,270 | 2,270 | 3,410 | 2,270 | 2,050 |
| 29 | 2,180 | 2,270 | 3,500 | 6,320 | ..... | 3,140 | 6,800 | 2,270 | 2,490 | 3,410 | 2,380 | 2,050 |
| 30 | 2,220 | 2,320 | 3,410 | 5,960 | ..... | 2,980 | 7,400 | 2,130 | 2,750 | 3,560 | 2,380 | 2,180 |
| 31 | 2,270 | ..... | 3,500 | 6,440 | ..... | 2,900 | ..... | 2,130 | ..... | 4,230 | 2,490 | ..... |

*Daily discharge, in second-feet, of Flint River at Albany, Ga., for the years ending Sept. 30, 1916–1920*—Continued.

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1918-19. | | | | | | | | | | | | |
| 1 | 2,090 | 3,230 | 10,200 | 27,400 | 16,600 | 40,400 | 7,880 | 3,800 | 7,760 | 4,690 | 38,400 | 7,520 |
| 2 | 2,090 | 3,140 | 12,200 | 23,600 | 16,000 | 45,000 | 7,520 | 3,900 | 8,980 | 4,340 | 34,200 | 6,800 |
| 3 | 2,220 | 3,410 | 12,900 | 18,400 | 14,600 | 47,200 | 6,920 | 4,230 | 9,890 | 3,500 | 27,200 | 7,640 |
| 4 | 2,220 | 4,120 | 12,900 | 20,200 | 11,900 | 46,200 | 6,680 | 4,230 | 11,200 | 3,320 | 20,500 | 7,640 |
| 5 | 2,020 | 3,900 | 12,500 | 22,700 | 10,200 | 42,600 | 6,560 | 4,230 | 12,500 | 3,060 | 18,600 | 6,920 |
| 6 | 1,980 | 3,060 | 11,600 | 24,000 | 8,850 | 37,600 | 6,560 | 4,580 | 11,500 | 3,230 | 17,700 | 6,080 |
| 7 | 1,980 | 2,620 | 10,200 | 22,500 | 9,760 | 31,600 | 6,560 | 5,500 | 10,000 | 2,820 | 17,200 | 5,610 |
| 8 | 2,050 | 2,620 | 8,850 | 21,600 | 9,890 | 26,000 | 6,560 | 5,840 | 8,240 | 2,820 | 18,200 | 5,150 |
| 9 | 1,980 | 2,490 | 5,960 | 21,300 | 9,500 | 21,800 | 6,560 | 6,320 | 7,040 | 2,900 | 20,900 | 4,690 |
| 10 | 1,980 | 2,430 | 5,380 | 20,400 | 9,500 | 20,700 | 6,440 | 6,440 | 6,080 | 3,900 | 22,000 | 4,460 |
| 11 | 1,950 | 2,380 | 5,260 | 19,100 | 8,850 | 22,000 | 6,440 | 6,200 | 5,380 | 5,150 | 24,400 | 4,230 |
| 12 | 1,840 | 2,320 | 5,040 | 15,800 | 7,880 | 22,000 | 6,440 | 5,840 | 4,690 | 6,440 | 28,200 | 4,010 |
| 13 | 1,840 | 2,270 | 4,690 | 12,800 | 7,400 | 20,000 | 7,040 | 5,500 | 4,010 | 9,370 | 31,800 | 3,800 |
| 14 | 1,840 | 2,270 | 4,800 | 11,400 | 7,400 | 20,200 | 7,760 | 4,690 | 4,120 | 10,400 | 35,800 | 3,500 |
| 15 | 1,860 | 2,220 | 5,260 | 10,200 | 7,760 | 21,600 | 8,000 | 4,690 | 4,580 | 10,800 | 37,000 | 4,460 |
| 16 | 1,860 | 2,180 | 5,260 | 8,850 | 8,850 | 22,200 | 8,000 | 5,150 | 5,040 | 9,630 | 36,000 | 5,150 |
| 17 | 1,980 | 2,180 | 7,040 | 8,850 | 9,500 | 22,200 | 8,000 | 5,150 | 4,800 | 8,000 | 32,200 | 4,690 |
| 18 | 1,950 | 2,270 | 9,110 | 8,850 | 10,200 | 21,300 | 7,760 | 4,920 | 4,340 | 6,560 | 27,600 | 4,460 |
| 19 | 1,920 | 2,430 | 10,300 | 9,500 | 10,800 | 18,600 | 7,760 | 4,580 | 4,460 | 7,040 | 23,200 | 4,010 |
| 20 | 1,980 | 2,750 | 11,200 | 10,200 | 10,800 | 15,800 | 7,760 | 4,230 | 4,690 | 9,760 | 17,200 | 4,230 |
| 21 | 1,980 | 2,820 | 11,500 | 10,800 | 10,700 | 14,700 | 7,880 | 4,010 | 4,690 | 12,200 | 14,200 | 4,690 |
| 22 | 2,020 | 2,750 | 11,800 | 11,400 | 10,800 | 14,300 | 7,160 | 4,340 | 4,800 | 13,900 | 11,800 | 5,150 |
| 23 | 2,020 | 2,620 | 16,600 | 11,400 | 13,200 | 14,000 | 6,560 | 4,920 | 5,040 | 15,200 | 10,000 | 5,720 |
| 24 | 2,050 | 2,680 | 22,000 | 11,100 | 15,000 | 13,900 | 5,610 | 4,800 | 4,690 | 15,000 | 9,240 | 6,320 |
| 25 | 2,050 | 2,900 | 26,400 | 10,900 | 17,200 | 12,600 | 5,260 | 4,800 | 4,230 | 17,400 | 8,720 | 5,960 |
| 26 | 2,050 | 3,800 | 27,800 | 10,200 | 27,000 | 10,300 | 4,920 | 5,380 | 4,010 | 24,600 | 8,480 | 5,150 |
| 27 | 2,430 | 4,460 | 31,400 | 10,500 | 38,600 | 9,110 | 4,690 | 5,380 | 4,340 | 29,800 | 8,480 | 4,230 |
| 28 | 3,900 | 5,840 | 35,600 | 11,100 | 40,400 | 8,850 | 4,690 | 5,840 | 4,460 | 31,800 | 9,240 | 3,900 |
| 29 | 4,120 | 7,280 | 37,600 | 12,500 | ..... | 8,720 | 4,460 | 6,560 | 5,500 | 35,200 | 9,240 | 3,600 |
| 30 | 3,600 | 8,720 | 37,800 | 13,600 | ..... | 8,240 | 4,120 | 8,240 | 5,500 | 38,200 | 9,240 | 3,140 |
| 31 | 3,410 | ..... | 35,400 | 15,500 | ..... | 7,880 | ..... | 8,000 | ..... | 39,800 | 8,720 | ..... |
| 1919-20. | | | | | | | | | | | | |
| 1 | 3,140 | 4,010 | 3,410 | 4,800 | 16,600 | 7,880 | 16,600 | 14,300 | 7,040 | 3,700 | 3,600 | 5,960 |
| 2 | 3,140 | 3,230 | 3,700 | 4,690 | 18,000 | 7,400 | 18,000 | 14,600 | 6,560 | 3,320 | 3,900 | 5,260 |
| 3 | 3,600 | 4,010 | 3,900 | 4,690 | 18,900 | 7,160 | 26,400 | 15,300 | 6,080 | 2,980 | 3,500 | 4,800 |
| 4 | 4,010 | 4,120 | 3,900 | 4,580 | 18,600 | 6,680 | 35,000 | 17,400 | 5,840 | 3,060 | 3,500 | 4,230 |
| 5 | 4,010 | 3,900 | 3,700 | 4,460 | 16,900 | 6,800 | 43,800 | 19,300 | 5,720 | 3,060 | 4,580 | 5,840 |
| 6 | 3,800 | 4,800 | 3,500 | 4,340 | 15,200 | 7,400 | 42,400 | 20,200 | 6,320 | 3,230 | 6,560 | 7,160 |
| 7 | 3,800 | 4,580 | 3,500 | 4,340 | 14,200 | 8,240 | 40,400 | 20,400 | 7,520 | 3,410 | 7,880 | 8,000 |
| 8 | 3,800 | 4,120 | 3,900 | 4,120 | 15,800 | 8,850 | 37,600 | 24,600 | 7,640 | 3,230 | 9,370 | 7,760 |
| 9 | 3,500 | 3,900 | 3,500 | 4,340 | 20,900 | 9,630 | 34,600 | 28,200 | 7,640 | 3,410 | 10,000 | 6,680 |
| 10 | 3,060 | 3,600 | 3,600 | 5,040 | 22,700 | 9,500 | 31,000 | 30,600 | 7,520 | 3,500 | 9,890 | 5,260 |
| 11 | 3,230 | 3,500 | 5,260 | 5,840 | 22,300 | 8,600 | 26,000 | 28,800 | 6,560 | 4,010 | 8,720 | 4,230 |
| 12 | 3,410 | 3,140 | 6,560 | 6,800 | 20,000 | 7,640 | 22,300 | 24,600 | 5,840 | 4,690 | 8,480 | 4,580 |
| 13 | 3,230 | 3,410 | 8,720 | 6,800 | 19,300 | 8,480 | 17,700 | 18,700 | 5,260 | 4,460 | 9,110 | 5,260 |
| 14 | 3,060 | 3,500 | 14,200 | 7,400 | 18,200 | 10,800 | 15,500 | 14,400 | 4,690 | 5,720 | 9,240 | 5,150 |
| 15 | 3,230 | 4,120 | 24,600 | 6,800 | 17,200 | 12,500 | 14,200 | 11,100 | 4,230 | 6,320 | 9,500 | 4,580 |
| 16 | 3,140 | 4,690 | 33,800 | 6,080 | 16,600 | 13,500 | 13,700 | 10,500 | 4,010 | 5,380 | 10,000 | 4,230 |
| 17 | 3,600 | 5,040 | 38,800 | 5,840 | 15,200 | 16,900 | 14,000 | 11,600 | 4,010 | 4,920 | 10,200 | 3,700 |
| 18 | 2,820 | 4,580 | 39,200 | 6,320 | 14,400 | 18,600 | 14,300 | 14,900 | 3,900 | 5,150 | 10,200 | 3,320 |
| 19 | 3,060 | 4,120 | 36,800 | 6,320 | 13,600 | 18,600 | 14,300 | 17,700 | 4,010 | 6,320 | 10,000 | 3,060 |
| 20 | 3,320 | 3,800 | 31,200 | 7,040 | 12,200 | 17,400 | 13,900 | 17,400 | 5,150 | 7,520 | 9,370 | 2,900 |
| 21 | 3,600 | 3,410 | 23,200 | 7,520 | 10,400 | 19,100 | 13,600 | 14,700 | 6,080 | 8,360 | 9,370 | 2,750 |
| 22 | 4,230 | 3,320 | 14,200 | 8,000 | 9,500 | 26,600 | 13,000 | 11,100 | 6,320 | 8,980 | 9,760 | 2,750 |
| 23 | 4,120 | 3,140 | 8,720 | 7,760 | 8,850 | 30,600 | 11,900 | 9,500 | 6,080 | 10,500 | 10,300 | 2,750 |
| 24 | 4,120 | 3,060 | 7,160 | 7,640 | 8,360 | 37,400 | 10,000 | 8,480 | 6,320 | 12,200 | 10,500 | 2,680 |
| 25 | 5,260 | 3,230 | 6,080 | 7,160 | 8,720 | 36,400 | 9,240 | 7,880 | 5,720 | 13,000 | 9,370 | 2,750 |
| 26 | 6,800 | 3,140 | 5,840 | 6,800 | 8,720 | 33,200 | 8,720 | 8,000 | 5,380 | 13,000 | 6,440 | 2,980 |
| 27 | 7,400 | 3,230 | 5,720 | 7,040 | 8,720 | 27,400 | 8,720 | 8,480 | 4,920 | 11,900 | 4,800 | 3,060 |
| 28 | 7,880 | 3,060 | 5,380 | 8,360 | 8,600 | 20,700 | 12,300 | 9,240 | 4,800 | 10,300 | 4,230 | 3,600 |
| 29 | 8,000 | 2,900 | 5,150 | 9,500 | 8,240 | 16,000 | 14,300 | 9,110 | 4,230 | 7,280 | 4,230 | 3,700 |
| 30 | 5,610 | 2,750 | 4,920 | 10,900 | ..... | 14,900 | 15,300 | 8,720 | 4,010 | 4,690 | 4,690 | 3,320 |
| 31 | 5,260 | ..... | 4,800 | 13,600 | ..... | 15,300 | ..... | 7,880 | ..... | 3,600 | 5,260 | ..... |

*Monthly discharge of Flint River at Albany, Ga., for the years ending Sept. 30, 1916–1920.*

[Drainage area, 5,000 square miles.]

| Month. | Discharge in second-feet. | | | | Run-off in inches. |
|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square mile. | |
| 1915–16. | | | | | |
| October | 8,000 | 1,980 | 4,160 | 0.832 | 0.96 |
| November | 3,700 | 2,220 | 2,540 | .508 | .57 |
| December | 16,400 | 2,180 | 5,130 | 1.03 | 1.19 |
| January | 19,100 | 3,500 | 7,280 | 1.46 | 1.68 |
| February | 12,800 | 3,700 | 6,270 | 1.25 | 1.35 |
| March | 9,500 | 3,500 | 5,950 | 1.19 | 1.37 |
| April | 4,690 | 2,320 | 3,460 | .692 | .77 |
| May | 3,700 | 1,950 | 2,210 | .442 | .51 |
| June | 3,600 | 1,890 | 2,230 | .446 | .50 |
| July | 46,200 | 2,220 | 24,600 | 4.92 | 5.67 |
| August | 25,600 | 2,750 | 7,110 | 1.42 | 1.64 |
| September | 4,460 | 2,270 | 3,140 | .628 | .70 |
| The year | 46,200 | 1,890 | 6,210 | 1.24 | 16.91 |
| 1916–17. | | | | | |
| October | 4,010 | 1,980 | 2,270 | .454 | .52 |
| November | 2,680 | 2,050 | 2,240 | .448 | .50 |
| December | 5,040 | 2,380 | 3,510 | .702 | .81 |
| January | 15,500 | 3,230 | 6,050 | 1.21 | 1.40 |
| February | 22,500 | 4,690 | 11,000 | 2.20 | 2.29 |
| March | 33,200 | 6,800 | 16,100 | 3.22 | 3.71 |
| April | 25,400 | 3,900 | 13,500 | 2.70 | 3.01 |
| May | 7,280 | 2,430 | 3,950 | .790 | .91 |
| June | 3,230 | 2,130 | 2,540 | .508 | .57 |
| July | 7,280 | 2,430 | 4,310 | .862 | .99 |
| August | 10,200 | 2,550 | 5,960 | 1.19 | 1.37 |
| September | 5,150 | 2,090 | 2,760 | .552 | .62 |
| The year | 33,200 | 1,980 | 6,140 | 1.23 | 16.70 |
| 1917–18. | | | | | |
| October | 9,370 | 2,180 | 3,810 | .762 | .88 |
| November | 3,230 | 2,130 | 2,380 | .476 | .53 |
| December | 3,500 | 2,320 | 2,800 | .560 | .65 |
| January | 9,630 | 2,620 | 5,610 | 1.12 | 1.29 |
| February | 17,100 | 4,580 | 8,880 | 1.78 | 1.85 |
| March | 4,690 | 2,900 | 3,370 | .674 | .78 |
| April | 7,760 | 2,820 | 4,260 | .852 | .95 |
| May | 11,900 | 2,130 | 5,060 | 1.01 | 1.16 |
| June | 2,750 | 2,020 | 2,360 | .472 | .53 |
| July | 4,230 | 1,950 | 2,610 | .522 | .60 |
| August | 6,920 | 2,220 | 4,120 | .824 | .95 |
| September | 3,700 | 1,890 | 2,550 | .510 | .57 |
| The year | 17,100 | 1,890 | 3,960 | .792 | 10.74 |
| 1918–19. | | | | | |
| October | 4,120 | 1,840 | 2,230 | .446 | .51 |
| November | 8,720 | 2,180 | 3,270 | .654 | .73 |
| December | 37,800 | 4,690 | 15,000 | 3.00 | 3.46 |
| January | 27,400 | 8,850 | 15,100 | 3.02 | 3.48 |
| February | 40,400 | 7,400 | 13,500 | 2.70 | 2.81 |
| March | 47,200 | 7,880 | 22,200 | 4.44 | 5.12 |
| April | 8,000 | 4,120 | 6,620 | 1.32 | 1.47 |
| May | 8,240 | 3,800 | 5,240 | 1.05 | 1.21 |
| June | 12,500 | 4,010 | 6,220 | 1.24 | 1.38 |
| July | 39,800 | 2,820 | 12,600 | 2.52 | 2.90 |
| August | 38,400 | 8,480 | 20,500 | 4.10 | 4.73 |
| September | 7,640 | 3,140 | 5,100 | 1.02 | 1.14 |
| The year | 47,200 | 1,840 | 10,700 | 2.14 | 28.94 |
| 1919–20. | | | | | |
| October | 8,000 | 2,820 | 4,200 | .840 | .97 |
| November | 5,040 | 2,750 | 3,710 | .742 | .83 |
| December | 39,200 | 3,410 | 11,800 | 2.36 | 2.72 |
| January | 13,600 | 4,120 | 6,610 | 1.32 | 1.52 |
| February | 22,700 | 8,240 | 14,700 | 2.94 | 3.17 |
| March | 37,400 | 6,680 | 15,800 | 3.16 | 3.64 |
| April | 43,800 | 8,720 | 20,300 | 4.06 | 4.53 |
| May | 30,600 | 7,880 | 15,400 | 3.08 | 3.55 |
| June | 7,640 | 3,900 | 5,650 | 1.13 | 1.26 |
| July | 13,000 | 2,980 | 6,170 | 1.23 | 1.42 |
| August | 10,500 | 3,500 | 7,630 | 1.53 | 1.76 |
| September | 8,000 | 2,680 | 4,410 | .882 | .98 |
| The year | 43,800 | 2,680 | 9,690 | 1.94 | 26.35 |

## ESCAMBIA RIVER BASIN.

### CONECUH RIVER AT BECK, ALA.

LOCATION.—At Simmons Bridge at Beck, Covington County, 8 miles west of Andalusia, Ala., a station on Central of Georgia and Louisville & Nashville railroads, and 12 miles downstream from mouth of Patsaliga Creek.

DRAINAGE AREA.—1,290 square miles.

RECORDS AVAILABLE.—August 24, 1904, to December 31, 1919, when station was discontinued.

GAGE.—Chain gage attached to upstream side of wagon bridge; read once daily to tenths, except Sundays, by C. E. Raley.

DISCHARGE MEASUREMENTS.—Made from bridge.

CHANNEL AND CONTROL.—Channel cut in soft bedrock; practically permanent. Banks subject to overflow at very high stages. Location of control not known.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year ending September 30, 1919, 34.5 feet at 8 a. m. December 26 (discharge, 18,200 second-feet); minimum stage, 1.1 feet at 8 a. m. October 10 (discharge, 233 second-feet).

1904–1919: Maximum stage (no gage height) March 18, 1913 (discharge, 26,000 second-feet, estimated by comparison with Pea River at Pera, Ala.); minimum stage, 0.7 foot October 4, 1904 (discharge, 187 second-feet).

ICE.—None.

DIVERSIONS.—None.

REGULATION.—The flow may at times be affected by logging operations and by small mills some distance upstream.

ACCURACY.—Stage-discharge relation practically permanent. Rating curve fairly well defined between 225 and 7,000 second-feet above which it is extended. Gage read to tenths once daily. Daily discharge ascertained by applying daily gage height to rating table. Records fair.

The following discharge measurement was made by C. G. Paulsen:
May 9, 1919: Gage height, 6.21 feet; discharge, 2,180 second-feet.

*Daily discharge, in second-feet, of Conecuh River at Beck, Ala., for the period Oct. 1, 1918, to Dec. 31, 1919.*

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1918–19. | | | | | | | | | | | | |
| 1 | 313 | 2,480 | 4,580 | 5,550 | 6,630 | 13,000 | 4,700 | 1,040 | 2,480 | 650 | 2,540 | 2,810 |
| 2 | 295 | 2,210 | 4,190 | 4,870 | 5,720 | 13,200 | 4,360 | 1,040 | 2,540 | 617 | 2,700 | 2,540 |
| 3 | 278 | 2,240 | 4,470 | 6,290 | 4,810 | 13,400 | 3,470 | 955 | 2,590 | 617 | 2,460 | 2,210 |
| 4 | 278 | 2,270 | 4,980 | 6,120 | 3,520 | 11,700 | 2,700 | 934 | 2,590 | 585 | 2,210 | 1,940 |
| 5 | 278 | 1,890 | 5,210 | 5,780 | 3,630 | 8,230 | 2,270 | 914 | 2,540 | 585 | 2,860 | 1,590 |
| 6 | 262 | 1,780 | 4,530 | 5,440 | 3,240 | 6,750 | 2,160 | 1,080 | 2,480 | 554 | 2,700 | 1,260 |
| 7 | 247 | 1,490 | 4,030 | 5,210 | 2,910 | 6,010 | 2,050 | 1,300 | 2,160 | 524 | 2,430 | 1,170 |
| 8 | 262 | 1,350 | 3,230 | 4,980 | 2,700 | 5,150 | 1,830 | 1,400 | 2,460 | 617 | 2,210 | 1,080 |
| 9 | 262 | 757 | 2,430 | 5,780 | 2,640 | 6,120 | 1,780 | 1,730 | 2,750 | 720 | 3,800 | 955 |
| 10 | 233 | 704 | 2,000 | 5,440 | 2,590 | 7,090 | 1,680 | 1,940 | 2,320 | 757 | 4,250 | 874 |
| 11 | 247 | 650 | 1,780 | 4,700 | 2,480 | 7,830 | 2,590 | 1,790 | 1,890 | 996 | 4,700 | 795 |
| 12 | 247 | 617 | 1,540 | 4,060 | 2,320 | 8,800 | 2,590 | 1,640 | 1,590 | 650 | 5,440 | 684 |
| 13 | 321 | 585 | 1,440 | 3,410 | 2,210 | 9,830 | 2,400 | 1,540 | 1,730 | 840 | 6,240 | 720 |
| 14 | 395 | 496 | 2,100 | 3,020 | 3,020 | 8,860 | 2,210 | 1,300 | 1,080 | 1,040 | 5,440 | 702 |
| 15 | 373 | 496 | 2,420 | 2,810 | 3,630 | 7,150 | 1,890 | 1,080 | 957 | 955 | 5,660 | 684 |
| 16 | 373 | 496 | 2,750 | 1,940 | 3,440 | 5,810 | 4,360 | 996 | 834 | 834 | 5,320 | 650 |
| 17 | 352 | 457 | 2,700 | 2,640 | 3,240 | 4,470 | 3,690 | 874 | 795 | 2,430 | 4,700 | 585 |
| 18 | 313 | 418 | 2,430 | 3,240 | 3,020 | 6,800 | 3,350 | 834 | 757 | 1,210 | 4,080 | 496 |
| 19 | 332 | 496 | 2,050 | 3,080 | 2,810 | 6,180 | 2,970 | 795 | 757 | 1,830 | 3,300 | 469 |
| 20 | 414 | 585 | 2,370 | 2,910 | 3,190 | 5,270 | 2,920 | 757 | 720 | 1,660 | 2,860 | 617 |
| 21 | 496 | 834 | 6,920 | 2,700 | 5,610 | 5,150 | 2,860 | 720 | 720 | 1,490 | 2,540 | 746 |
| 22 | 914 | 757 | 8,340 | 2,540 | 5,660 | 4,980 | 2,700 | 684 | 685 | 2,480 | 2,100 | 874 |
| 23 | 1,260 | 757 | 9,770 | 2,810 | 5,240 | 5,060 | 2,430 | 650 | 650 | 1,830 | 1,890 | 834 |
| 24 | 1,440 | 1,050 | 11,400 | 2,750 | 4,810 | 5,150 | 2,160 | 650 | 650 | 1,730 | 3,350 | 757 |
| 25 | 1,680 | 1,350 | 15,400 | 2,640 | 16,500 | 4,530 | 1,780 | 1,300 | 617 | 1,830 | 4,810 | 684 |
| 26 | 1,730 | 2,480 | 18,200 | 3,620 | 8,970 | 4,250 | 1,440 | 1,940 | 585 | 2,320 | 4,360 | 650 |
| 27 | 2,320 | 3,470 | 14,700 | 4,590 | 8,970 | 3,910 | 1,280 | 1,210 | 684 | 2,400 | 4,250 | 617 |
| 28 | 2,910 | 4,470 | 13,200 | 7,030 | 9,880 | 4,140 | 1,120 | 1,080 | 757 | 2,480 | 4,140 | 543 |
| 29 | 2,540 | 4,640 | 10,800 | 6,240 | ..... | 4,640 | 1,040 | 2,750 | 704 | 2,590 | 3,970 | 469 |
| 30 | 2,370 | 4,980 | 8,460 | 5,440 | ..... | 4,500 | 996 | 2,640 | 650 | 2,540 | 3,750 | 443 |
| 31 | 2,910 | ..... | 6,690 | 5,840 | ..... | 4,360 | ..... | 2,430 | ..... | 2,430 | 3,280 | ..... |

*Daily discharge, in second-feet, of Conecuh River at Beck, Ala., for the period Oct. 1, 1918 to Dec. 31, 1919*—Continued.

| Day. | Oct. | Nov. | Dec. | Day. | Oct. | Nov. | Dec. | Day. | Oct. | Nov. | Dec. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1919. | | | | 1919. | | | | 1919. | | | |
| 1 | 443 | 720 | 2,750 | 11 | 443 | 4,030 | 996 | 21 | 469 | 996 | 5,550 |
| 2 | 418 | 1,220 | 2,860 | 12 | 430 | 3,190 | 834 | 21 | 554 | 914 | 6,180 |
| 3 | 418 | 1,730 | 1,890 | 13 | 418 | 2,910 | 720 | 23 | 650 | 874 | 5,440 |
| 4 | 418 | 1,590 | 1,590 | 14 | 395 | 2,540 | 608 | 24 | 757 | 834 | 4,750 |
| 5 | 443 | 1,540 | 1,590 | 15 | 395 | 2,430 | 496 | 25 | 955 | 795 | 3,520 |
| 6 | 469 | 1,440 | 1,080 | 16 | 395 | 2,180 | 10,500 | 26 | 1,060 | 914 | 2,860 |
| 7 | 443 | 1,490 | 1,120 | 17 | 373 | 1,940 | 9,200 | 27 | 1,170 | 1,080 | 2,370 |
| 8 | 418 | 1,640 | 1,170 | 18 | 373 | 1,300 | 7,090 | 28 | 1,120 | 1,040 | 2,150 |
| 9 | 395 | 1,840 | 1,120 | 19 | 408 | 1,120 | 6,350 | 29 | 1,040 | 996 | 1,940 |
| 10 | 395 | 2,050 | 1,040 | 20 | 443 | 1,040 | 4,920 | 30 | 996 | 1,870 | 1,830 |
| | | | | | | | | 31 | 834 | | 1,730 |

NOTE.—Gage not read on Sundays; discharge interpolated.

*Monthly discharge of Conecuh River at Beck, Ala., for the period Oct. 1, 1918, to Dec. 31, 1919.*

[Drainage area, 1,290 square miles.]

| Month. | Discharge in second-feet. | | | | Run-off in inches. |
|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square mile. | |
| 1918–19. | | | | | |
| October | 2,910 | 233 | 860 | 0.667 | 0.77 |
| November | 4,980 | 418 | 1,580 | 1.22 | 1.36 |
| December | 18,200 | 1,440 | 5,970 | 4.63 | 5.34 |
| January | 7,030 | 1,940 | 4,310 | 3.34 | 3.85 |
| February | 16,500 | 2,210 | 4,760 | 3.69 | 3.84 |
| March | 13,400 | 3,910 | 6,850 | 5.31 | 6.12 |
| April | 4,700 | 996 | 2,460 | 1.91 | 2.13 |
| May | 2,750 | 650 | 1,290 | 1.00 | 1.15 |
| June | 2,750 | 585 | 1,420 | 1.10 | 1.23 |
| July | 2,590 | 524 | 1,380 | 1.07 | 1.23 |
| August | 6,240 | 1,890 | 3,690 | 2.86 | 3.30 |
| September | 2,810 | 443 | 982 | .761 | .85 |
| The year | 18,200 | 233 | 2,960 | 2.29 | 31.17 |
| 1919. | | | | | |
| October | 1,170 | 373 | 579 | .449 | .52 |
| November | 4,030 | 720 | 1,610 | 1.25 | 1.40 |
| December | 10,500 | 496 | 3,100 | 240 | 2.77 |

## MOBILE RIVER BASIN.

### CARTECAY RIVER NEAR CARTECAY, GA.

LOCATION.—At wooden bridge on Ellijay-Dahlonega highway, 1 mile below Licklog Creek, 2 miles northwest of Cartecay, Gilmer County, 6 miles southeast of Ellijay, and 7 miles upstream from point where Cartecay and Ellijay rivers unite to form Coosawattee River.

DRAINAGE AREA.—90 square miles (measured on topographic map).

RECORDS AVAILABLE.—July 1, 1904, to December 31, 1905; May 4, 1907, to November 2, 1907; December 12, 1918, to September 30, 1920.

GAGE.—Vertical staff in two sections, installed December 13, 1918; lower section, 0 to 10 feet, is attached to a large birch tree on right bank 25 feet below bridge; upper section 10 to 13.5 feet, attached to left bank pier of bridge. Gage used 1904 to 1907 was a vertical staff attached to the bridge. Relation between datum of the two gages not known as bench marks were destroyed when bridge was rebuilt.

DISCHARGE MEASUREMENTS.—Made from downstream side of wooden wagon bridge just above gage.

CHANNEL AND CONTROL.—Channel straight; cross-section rocky and uneven but probably permanent; current very swift. Control is a rock ledge across bed of stream 500 feet below gage; permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year ending September 30, 1919, 13.3 feet at 7 p. m. May 7 (discharge, 6,490 second-feet, estimated); minimum stage, 1.8 feet on September 28–30 (discharge, 142 second-feet).

Maximum stage recorded during year ending September 30, 1920, 11.0 feet at 8 a. m. August 15 (discharge, 4,650 second-feet); minimum stage, 1.8 feet on October 1–3 (discharge, 142 second-feet).

1904–5; 1907; 1919–20: Maximum stage recorded, 13.3 feet at 7 p. m. May 7, 1919 (discharge, 6,490 second-feet, estimated); minimum stage 0.6 foot referred to old gage, October 20 and 26, 1904 (discharge, 56 second-feet).

ICE.—Not enough ice to affect stage-discharge relation.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent during 1919 and 1920. Rating curve fairly well defined between 76 and 800 second-feet; extended above 800 second-feet. Gage read to tenths once daily. Daily discharge ascertained by applying daily gage height to rating table. Records fair except those for stages above 1,000 second-feet which are subject to error.

*Discharge measurements of Cartecay River near Cartecay, Ga., during the years ending Sept. 30, 1919 and 1920.*

| Date. | Made by— | Gage height. | Discharge. | Date. | Made by— | Gage height. | Discharge. |
|---|---|---|---|---|---|---|---|
| 1918 | | *Feet.* | *Sec.-ft.* | 1920 | | *Feet.* | *Sec.-ft.* |
| Nov. 28 | O. P. Hall | 3.80 | 723 | Jan. 21 | A. H. Condron | 2.38 | 247 |
| Dec. 12 | A. H. Condron | 2.00 | 185 | 21 | do | 2.38 | 244 |
| 1919 | | | | | | | |
| Apr. 6 | do | 2.55 | 339 | | | | |
| June 12 | do | 2.20 | 233 | | | | |

*Daily discharge, in second-feet, of Cartecay River near Cartecay, Ga., for the years ending Sept. 30, 1919 and 1920.*

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1918–19. | | | | | | | | | | | | |
| 1 | | | | 460 | 300 | 428 | 332 | 492 | 272 | 244 | 198 | 220 |
| 2 | | | | 652 | 300 | 364 | 332 | 364 | 272 | 244 | 220 | 198 |
| 3 | | | | 652 | 300 | 332 | 332 | 300 | 272 | 220 | 220 | 198 |
| 4 | | | | 460 | 332 | 300 | 332 | 300 | 272 | 220 | 198 | 198 |
| 5 | | | | 396 | 300 | 460 | 332 | 300 | 272 | 220 | 198 | 178 |
| 6 | | | | 364 | 300 | 588 | 300 | 300 | 244 | 524 | 198 | 178 |
| 7 | | | | 332 | 272 | 588 | 300 | 1,060 | 244 | 272 | 198 | 178 |
| 8 | | | | 300 | 272 | 620 | 300 | 724 | 244 | 244 | 220 | 178 |
| 9 | | | | 332 | 300 | 980 | 300 | 460 | 244 | 272 | 220 | 178 |
| 10 | | | | 300 | 300 | 940 | 300 | 428 | 244 | 244 | 220 | 178 |
| 11 | | | | 300 | 272 | 940 | 364 | 396 | 244 | 220 | 220 | 178 |
| 12 | | | 178 | 272 | 272 | 460 | 364 | 364 | 220 | 198 | 272 | 220 |
| 13 | | | 178 | 272 | 332 | 460 | 364 | 364 | 220 | 198 | 198 | 198 |
| 14 | | | 198 | 272 | 460 | 428 | 332 | 364 | 220 | 198 | 198 | 178 |
| 15 | | | 460 | 272 | 364 | 396 | 332 | 332 | 220 | 198 | 198 | 178 |
| 16 | | | 796 | 244 | 300 | 428 | 588 | 332 | 220 | 198 | 198 | 178 |
| 17 | | | 460 | 300 | 300 | 396 | 460 | 300 | 220 | 198 | 198 | 178 |
| 18 | | | 332 | 332 | 300 | 460 | 396 | 300 | 272 | 220 | 198 | 178 |
| 19 | | | 272 | 300 | 272 | 396 | 364 | 300 | 244 | 396 | 178 | 178 |
| 20 | | | 272 | 300 | 272 | 396 | 332 | 300 | 220 | 332 | 178 | 198 |
| 21 | | | 460 | 272 | 332 | 332 | 332 | 300 | 220 | 460 | 178 | 160 |
| 22 | | | 4,510 | 272 | 1,670 | 332 | 332 | 300 | 220 | 396 | 178 | 160 |
| 23 | | | 688 | 652 | 588 | 332 | 332 | 300 | 220 | 272 | 178 | 160 |
| 24 | | | 652 | 460 | 556 | 332 | 332 | 300 | 460 | 220 | 244 | 160 |
| 25 | | | 460 | 396 | 492 | 332 | 300 | 272 | 396 | 220 | 244 | 160 |
| 26 | | | 396 | 428 | 460 | 832 | 300 | 300 | 460 | 300 | 220 | 160 |
| 27 | | | 364 | 460 | 428 | 620 | 300 | 300 | 396 | 300 | 178 | 160 |
| 28 | | | 364 | 364 | 428 | 460 | 300 | 300 | 332 | 272 | 178 | 142 |
| 29 | | | 300 | 332 | ..... | 396 | 300 | 300 | 244 | 244 | 178 | 142 |
| 30 | | | 300 | 332 | ..... | 364 | 300 | 272 | 244 | 198 | 460 | 142 |
| 31 | | | 300 | 332 | ..... | 332 | ..... | 272 | ..... | 198 | 244 | ..... |

*Daily discharge, in second-feet, of Cartecay River near Cartecay, Ga., for the years ending Sept. 30, 1919 and 1920*—Continued.

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1919–20. | | | | | | | | | | | | |
| 1 | 142 | 160 | 220 | 220 | 364 | 332 | 620 | 492 | 428 | 396 | 428 | 428 |
| 2 | 142 | 220 | 198 | 220 | 332 | 332 | 3,050 | 460 | 428 | 460 | 364 | 428 |
| 3 | 142 | 178 | 178 | 220 | 556 | 332 | 904 | 524 | 428 | 588 | 332 | 460 |
| 4 | 198 | 178 | 178 | 198 | 832 | 364 | 1,920 | 524 | 460 | 364 | 332 | 428 |
| 5 | 160 | 178 | 178 | 198 | 588 | 588 | 980 | 492 | 428 | 300 | 332 | 428 |
| 6 | 160 | 178 | 178 | 198 | 492 | 428 | 760 | 492 | 428 | 524 | 300 | 428 |
| 7 | 160 | 160 | 300 | 244 | 428 | 428 | 724 | 428 | 364 | 524 | 300 | 428 |
| 8 | 160 | 160 | 556 | 300 | 396 | 364 | 652 | 460 | 364 | 364 | 332 | 460 |
| 9 | 160 | 160 | 2,810 | 300 | 332 | 364 | 980 | 428 | 332 | 364 | 396 | 980 |
| 10 | 160 | 160 | 904 | 244 | 332 | 364 | 760 | 428 | 332 | 364 | 1,160 | 620 |
| 11 | 160 | 272 | 460 | 220 | 396 | 428 | 620 | 396 | 332 | 300 | 904 | 492 |
| 12 | 160 | 272 | 688 | 220 | 364 | 940 | 588 | 396 | 332 | 300 | 620 | 460 |
| 13 | 178 | 220 | 492 | 220 | 428 | 492 | 588 | 1,110 | 332 | 300 | 620 | 460 |
| 14 | 178 | 198 | 428 | 220 | 364 | 460 | 588 | 556 | 332 | 300 | 1,570 | 428 |
| 15 | 178 | 198 | 300 | 220 | 364 | 396 | 588 | 492 | 300 | 272 | 3,590 | 428 |
| 16 | 178 | 178 | 272 | 396 | 332 | 428 | 796 | 460 | 300 | 364 | 1,110 | 428 |
| 17 | 178 | 178 | 272 | 492 | 332 | 524 | 588 | 460 | 300 | 332 | 652 | 428 |
| 18 | 178 | 178 | 244 | 364 | 332 | 492 | 556 | 524 | 300 | 524 | 724 | 428 |
| 19 | 178 | 178 | 332 | 272 | 300 | 1,110 | 556 | 492 | 460 | 588 | 460 | 396 |
| 20 | 160 | 160 | 300 | 272 | 300 | 652 | 588 | 460 | 588 | 588 | 1,570 | 396 |
| 21 | 160 | 160 | 272 | 272 | 300 | 492 | 688 | 492 | 396 | 332 | 688 | 396 |
| 22 | 198 | 160 | 244 | 272 | 1,720 | 460 | 556 | 428 | 364 | 332 | 652 | 396 |
| 23 | 364 | 160 | 244 | 300 | 620 | 396 | 556 | 428 | 524 | 332 | 652 | 364 |
| 24 | 272 | 160 | 244 | 1,770 | 492 | 396 | 556 | 428 | 396 | 332 | 588 | 364 |
| 25 | 220 | 160 | 244 | 688 | 428 | 364 | 588 | 428 | 332 | 300 | 556 | 364 |
| 26 | 178 | 178 | 220 | 1,060 | 396 | 620 | 724 | 492 | 332 | 300 | 460 | 332 |
| 27 | 178 | 178 | 220 | 652 | 364 | 428 | 652 | 460 | 332 | 300 | 524 | 332 |
| 28 | 178 | 160 | 220 | 524 | 364 | 980 | 492 | 428 | 332 | 300 | 460 | 332 |
| 29 | 160 | 160 | 220 | 492 | 364 | 832 | 492 | 428 | 332 | 272 | 460 | 332 |
| 30 | 160 | 272 | 220 | 396 | ..... | 620 | 492 | 428 | 332 | 272 | 460 | 332 |
| 31 | 160 | ..... | 220 | 364 | ..... | 492 | ..... | 428 | ..... | 272 | 524 | ..... |

NOTE.—Discharge for Aug. 15, 1920, ascertained from mean gage height determined from graph which was based on one daily reading of gage Aug. 14, 15, and 16.

*Monthly discharge of Cartecay River near Cartecay, Ga., for the years ending Sept. 30, 1919 and 1920.*

[Drainage area, 90 square miles.]

| Month. | Discharge in second-feet. | | | | Run-off in inches. |
|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square mile. | |
| 1918–19. | | | | | |
| December 12–31 | 4,510 | 178 | 597 | 6.63 | 4.93 |
| January | 652 | 244 | 368 | 4.09 | 4.72 |
| February | 1,670 | 272 | 396 | 4.40 | 4.58 |
| March | 980 | 300 | 485 | 5.39 | 6.21 |
| April | 588 | 300 | 339 | 3.77 | 4.21 |
| May | 1,060 | 272 | 364 | 4.04 | 4.66 |
| June | 460 | 220 | 269 | 2.99 | 3.34 |
| July | 524 | 198 | 263 | 2.92 | 3.37 |
| August | 460 | 178 | 213 | 2.37 | 2.73 |
| September | 220 | 142 | 176 | 1.96 | 2.19 |
| 1919–20. | | | | | |
| October | 364 | 142 | 179 | 1.99 | 2.29 |
| November | 272 | 160 | 184 | 2.04 | 2.28 |
| December | 2,810 | 178 | 389 | 4.32 | 4.98 |
| January | 1,770 | 198 | 388 | 4.31 | 4.97 |
| February | 1,720 | 300 | 456 | 5.07 | 5.47 |
| March | 1,110 | 332 | 513 | 5.70 | 6.57 |
| April | 3,050 | 492 | 773 | 8.59 | 9.58 |
| May | 1,110 | 396 | 482 | 5.36 | 6.18 |
| June | 588 | 300 | 375 | 4.17 | 4.65 |
| July | 588 | 272 | 370 | 4.11 | 4.74 |
| August | 3,590 | 300 | 714 | 7.93 | 9.14 |
| September | 980 | 332 | 433 | 4.81 | 5.37 |
| The year | 3,590 | 142 | 438 | 4.87 | 66.22 |

### COOSAWATTEE RIVER AT CARTERS, GA.

LOCATION.—At iron highway bridge at Carters, Murray County, 1,000 feet above Louisville & Nashville Railroad bridge, half a mile below mouth of Talking Rock Creek, and 14 miles below junction of Ellijay and Cartecay rivers.

DRAINAGE AREA.—531 square miles.

RECORDS AVAILABLE.—August 15, 1896, to December 31, 1908; December 20, 1918, to September 30, 1920.

GAGE.—Chain gage attached to downstream side of highway bridge in third panel from right bank. Datum of gage unchanged since its establishment August 15, 1896.

DISCHARGE MEASUREMENTS.—Made from downstream side of highway bridge.

CHANNEL AND CONTROL.—Channel is curved above and below bridge. Current is swift and broken. Banks fairly high but subject to overflow during extremely high stages. Bed of stream mostly rock and gravel.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period December 21, 1918, to September 30, 1919, 19.0 feet at noon December 22 (discharge, 13,300 second-feet); minimum stage, 1.25 feet at 7 a. m. September 30 (discharge, 418 second-feet).

Maximum stage recorded during year ending September 30, 1920, 24.5 feet at 7 a. m. April 2 (discharge, 17,700 second-feet); minimum stage recorded, 1.05 feet at 7 a. m. October 9–11 (discharge, 355 second-feet).

1896–1908; 1919–20: Maximum stage recorded, 28.6 feet at 6 a. m. November 19, 1906 (discharge, not determined); minimum stage recorded, 0.4 foot September 20–22, October 9 to November 3, and November 11–21, 1904 (discharge, 184 second-feet).

ICE.—Practically none.

DIVERSIONS.—None.

REGULATION.—Operation of a few small mills on tributaries probably have no appreciable effect on stage at the gage.

ACCURACY.—Stage-discharge relation practically permanent. Rating curve fairly well defined between 500 and 3,000 second-feet; extended above 6,000 second-feet. Gage read to tenths once daily. Daily discharge ascertained by applying daily gage height to rating table. Records fair except those for stages above 6,000 second-feet which are subject to error.

*Discharge measurements of Coosawattee River at Carters, Ga., during the years ending Sept. 30, 1919 and 1920.*

| Date. | Made by— | Gage height. | Discharge. | Date. | Made by— | Gage height. | Discharge. |
|---|---|---|---|---|---|---|---|
| 1918. | | *Feet.* | *Sec.-ft.* | | | *Feet.* | *Sec.-ft.* |
| Dec. 21 | O. P. Hall | 3.55 | 1,420 | Apr. 17 | A. H. Condron | 4.70 | 2,060 |
| | | | | 17 | ...do | 4.68 | 2,050 |
| 1919. | | | | | | | |
| Mar. 24 | A. H. Condron | 3.60 | 1,470 | 1920. | | | |
| | | | | Feb. 6 | ...do | 4.81 | 2,300 |

*Daily discharge, in second-feet, of Coosawattee River at Carters, Ga., for the years ending Sept. 30, 1919 and 1920.*

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1918–19. | | | | | | | | | | | | |
| 1 | ..... | ..... | ..... | 1,320 | 1,460 | 2,140 | 1,460 | 1,390 | 932 | 1,150 | 775 | 865 |
| 2 | ..... | ..... | ..... | 4,500 | 1,350 | 2,070 | 1,430 | 1,640 | 910 | 1,100 | 715 | 775 |
| 3 | ..... | ..... | ..... | 2,000 | 1,300 | 2,000 | 1,400 | 1,580 | 865 | 1,100 | 655 | 695 |
| 4 | ..... | ..... | ..... | 1,850 | 1,280 | 1,910 | 1,390 | 1,350 | 865 | 1,400 | 635 | 655 |
| 5 | ..... | ..... | ..... | 1,250 | 1,250 | 2,350 | 1,370 | 1,200 | 842 | 1,350 | 615 | 615 |
| 6 | ..... | ..... | ..... | 1,200 | 1,350 | 4,500 | 1,350 | 1,250 | 842 | 3,820 | 595 | 575 |
| 7 | ..... | ..... | ..... | 1,150 | 1,250 | 3,050 | 1,330 | 7,700 | 820 | 1,700 | 575 | 505 |
| 8 | ..... | ..... | ..... | 1,200 | 1,220 | 2,700 | 1,310 | 7,300 | 798 | 1,150 | 865 | 470 |
| 9 | ..... | ..... | ..... | 1,700 | 1,200 | 7,540 | 1,300 | 4,500 | 798 | 1,050 | 615 | 435 |
| 10 | ..... | ..... | ..... | 1,400 | 1,200 | 4,820 | 1,300 | 1,760 | 775 | 1,000 | 575 | 435 |
| 11 | ..... | ..... | ..... | 1,280 | 1,640 | 3,050 | 3,750 | 1,580 | 865 | 910 | 558 | 435 |
| 12 | ..... | ..... | ..... | 1,150 | 2,000 | 2,700 | 1,700 | 1,610 | 820 | 865 | 1,400 | 910 |
| 13 | ..... | ..... | ..... | 1,100 | 4,500 | 2,350 | 1,400 | 1,700 | 798 | 865 | 910 | 505 |
| 14 | ..... | ..... | ..... | 1,080 | 1,700 | 2,350 | 1,340 | 1,760 | 775 | 910 | 695 | 470 |
| 15 | ..... | ..... | ..... | 1,050 | 1,400 | 2,180 | 1,310 | 1,320 | 735 | 865 | 655 | 435 |
| 16 | ..... | ..... | ..... | 1,020 | 1,400 | 2,000 | 2,350 | 1,280 | 715 | 820 | 615 | 435 |
| 17 | ..... | ..... | ..... | 1,400 | 1,350 | 1,940 | 2,180 | 1,220 | 715 | 865 | 595 | 435 |
| 18 | ..... | ..... | ..... | 3,750 | 1,300 | 1,820 | 1,700 | 1,150 | 865 | 910 | 558 | 435 |
| 19 | ..... | ..... | ..... | 1,520 | 1,250 | 1,700 | 1,580 | 1,120 | 775 | 1,150 | 540 | 505 |
| 20 | ..... | ..... | ..... | 1,520 | 1,200 | 1,580 | 1,520 | 1,100 | 735 | 955 | 540 | 505 |
| 21 | ..... | ..... | 1,220 | 1,490 | 3,050 | 1,520 | 1,460 | 1,100 | 715 | 910 | 695 | 470 |
| 22 | ..... | ..... | 12,900 | 1,490 | 6,900 | 1,460 | 1,400 | 1,090 | 932 | 865 | 655 | 470 |
| 23 | ..... | ..... | 1,820 | 2,350 | 4,500 | 1,460 | 1,350 | 1,050 | 865 | 865 | 615 | 505 |
| 24 | ..... | ..... | 1,700 | 1,700 | 3,750 | 1,460 | 1,300 | 1,100 | 865 | 1,150 | 1,150 | 488 |
| 25 | ..... | ..... | 1,640 | 1,760 | 3,050 | 1,430 | 1,250 | 1,100 | 1,580 | 955 | 955 | 488 |
| 26 | ..... | ..... | 1,550 | 6,500 | 2,700 | 4,500 | 1,200 | 1,150 | 1,820 | 865 | 910 | 470 |
| 27 | ..... | ..... | 1,460 | 4,500 | 2,350 | 2,350 | 1,150 | 1,080 | 3,750 | 820 | 865 | 452 |
| 28 | ..... | ..... | 1,380 | 3,050 | 2,210 | 2,000 | 1,140 | 1,020 | 1,200 | 775 | 865 | 435 |
| 29 | ..... | ..... | 1,460 | 2,070 | ..... | 1,760 | 1,130 | 1,000 | 1,180 | 735 | 955 | 435 |
| 30 | ..... | ..... | 1,400 | 1,700 | ..... | 1,580 | 1,100 | 978 | 1,150 | 955 | 1,580 | 418 |
| 31 | ..... | ..... | 1,400 | 1,520 | ..... | 1,520 | ..... | 955 | ..... | 865 | 955 | ..... |
| 1919–20. | | | | | | | | | | | | |
| 1 | 400 | 505 | 910 | 715 | 2,700 | 1,250 | 6,100 | 2,420 | 1,460 | 865 | 820 | 1,350 |
| 2 | 400 | 910 | 865 | 715 | 5,300 | 1,200 | 17,700 | 2,420 | 1,400 | 955 | 955 | 1,250 |
| 3 | 400 | 865 | 888 | 695 | 4,500 | 1,150 | 9,300 | 3,190 | 1,640 | 2,350 | 865 | 2,770 |
| 4 | 370 | 820 | 820 | 695 | 2,840 | 1,400 | 10,100 | 2,490 | 1,580 | 2,000 | 865 | 1,700 |
| 5 | 370 | 695 | 775 | 675 | 2,770 | 3,330 | 7,300 | 2,350 | 1,460 | 1,350 | 820 | 1,580 |
| 6 | 370 | 695 | 1,050 | 655 | 2,350 | 1,700 | 4,900 | 2,210 | 1,350 | 1,300 | 820 | 1,400 |
| 7 | 370 | 655 | 1,050 | 655 | 1,700 | 1,460 | 4,100 | 2,070 | 1,300 | 1,250 | 775 | 1,250 |
| 8 | 370 | 615 | 2,070 | 695 | 1,640 | 1,350 | 3,890 | 2,000 | 1,250 | 1,200 | 735 | 1,150 |
| 9 | 355 | 595 | 9,300 | 955 | 1,520 | 1,300 | 4,660 | 1,940 | 1,200 | 1,350 | 1,150 | 1,700 |
| 10 | 355 | 575 | 7,700 | 910 | 1,460 | 1,460 | 3,960 | 1,880 | 1,150 | 1,400 | 1,400 | 2,000 |
| 11 | 355 | 955 | 2,350 | 910 | 2,630 | 1,640 | 3,260 | 1,880 | 1,150 | 1,300 | 3,750 | 1,820 |
| 12 | 385 | 1,150 | 1,700 | 865 | 2,350 | 2,910 | 3,050 | 1,850 | 1,100 | 1,280 | 2,630 | 1,760 |
| 13 | 400 | 1,100 | 2,350 | 865 | 1,880 | 2,070 | 3,050 | 5,700 | 1,100 | 1,280 | 2,350 | 1,700 |
| 14 | 400 | 1,050 | 2,000 | 842 | 1,700 | 1,580 | 3,750 | 3,050 | 1,050 | 1,280 | 13,300 | 1,880 |
| 15 | 435 | 865 | 1,700 | 842 | 1,580 | 2,000 | 3,400 | 2,770 | 1,020 | 1,300 | 10,100 | 2,000 |
| 16 | 452 | 575 | 1,400 | 1,460 | 1,550 | 4,500 | 3,050 | 2,350 | 1,000 | 1,700 | 6,900 | 1,460 |
| 17 | 470 | 575 | 1,250 | 1,580 | 1,460 | 3,750 | 2,700 | 2,000 | 955 | 1,460 | 3,050 | 1,300 |
| 18 | 505 | 558 | 1,200 | 910 | 1,460 | 2,770 | 2,560 | 1,880 | 910 | 1,300 | 2,700 | 1,250 |
| 19 | 505 | 558 | 1,150 | 865 | 1,400 | 3,680 | 2,420 | 2,210 | 1,200 | 2,070 | 2,630 | 1,150 |
| 20 | 505 | 540 | 1,100 | 865 | 1,350 | 3,330 | 2,350 | 2,070 | 1,150 | 1,940 | 8,500 | 1,150 |
| 21 | 575 | 540 | 1,050 | 865 | 1,300 | 3,190 | 5,700 | 2,000 | 1,200 | 1,760 | 4,500 | 1,100 |
| 22 | 955 | 522 | 1,000 | 842 | 8,100 | 3,050 | 4,500 | 1,880 | 1,300 | 1,580 | 3,890 | 1,050 |
| 23 | 3,330 | 522 | 955 | 1,050 | 9,300 | 2,700 | 3,050 | 1,700 | 1,150 | 1,400 | 3,050 | 1,050 |
| 24 | 1,150 | 505 | 910 | 9,300 | 4,500 | 2,350 | 2,350 | 1,700 | 1,050 | 1,350 | 2,770 | 1,020 |
| 25 | 865 | 505 | 865 | 4,500 | 3,050 | 3,050 | 2,350 | 1,640 | 955 | 1,250 | 2,350 | 1,020 |
| 26 | 615 | 505 | 842 | 3,750 | 2,000 | 3,400 | 2,350 | 2,000 | 910 | 1,200 | 2,210 | 1,000 |
| 27 | 595 | 488 | 820 | 3,050 | 1,700 | 3,050 | 2,700 | 1,940 | 910 | 1,150 | 3,050 | 978 |
| 28 | 575 | 488 | 775 | 2,700 | 1,400 | 3,750 | 2,630 | 1,880 | 955 | 1,100 | 2,350 | 955 |
| 29 | 558 | 488 | 755 | 3,330 | 1,300 | 4,500 | 2,560 | 1,820 | 1,050 | 1,050 | 1,760 | 955 |
| 30 | 540 | 955 | 735 | 2,910 | ..... | 3,190 | 2,490 | 1,700 | 910 | 955 | 1,580 | 932 |
| 31 | 505 | ..... | 735 | 3,050 | ..... | 3,470 | ..... | 1,580 | ..... | 865 | 1,400 | ..... |

*Monthly discharge of Coosawattee River at Carters, Ga., for the years ending Sept. 30, 1919 and 1920.*

[Drainage area, 531 square miles.]

| Month. | Discharge in second-feet. | | | | Run-off in inches. |
|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square mile. | |
| 1918–19. | | | | | |
| December 21–31 | 12,900 | 1,220 | 2,540 | 4.78 | 1.96 |
| January | 6,500 | 1,020 | 1,950 | 3.67 | 4.23 |
| February | 6,900 | 1,200 | 2,110 | 3.97 | 4.13 |
| March | 7,540 | 1,430 | 2,440 | 4.60 | 5.30 |
| April | 3,750 | 1,100 | 1,500 | 2.82 | 3.15 |
| May | 7,700 | 955 | 1,780 | 3.35 | 3.86 |
| June | 3,750 | 715 | 1,010 | 1.90 | 2.12 |
| July | 3,820 | 735 | 1,090 | 2.05 | 2.36 |
| August | 1,580 | 540 | 770 | 1.45 | 1.67 |
| September | 910 | 418 | 524 | .987 | 1.10 |
| 1919–20. | | | | | |
| October | 3,330 | 355 | 595 | 1.12 | 1.29 |
| November | 1,150 | 488 | 679 | 1.28 | 1.43 |
| December | 9,300 | 735 | 1,650 | 3.11 | 3.58 |
| January | 9,300 | 655 | 1,700 | 3.20 | 3.69 |
| February | 9,300 | 1,300 | 2,650 | 4.99 | 5.38 |
| March | 4,500 | 1,150 | 2,570 | 4.84 | 5.58 |
| April | 17,700 | 2,350 | 4,410 | 8.31 | 9.27 |
| May | 5,700 | 1,580 | 2,210 | 4.16 | 4.80 |
| June | 1,640 | 910 | 1,160 | 2.18 | 2.43 |
| July | 2,350 | 865 | 1,370 | 2.58 | 2.97 |
| August | 13,300 | 735 | 3,030 | 5.71 | 6.58 |
| September | 2,770 | 932 | 1,390 | 2.62 | 2.92 |
| The year | 17,700 | 355 | 1,950 | 3.67 | 49.92 |

### OOSTANAULA RIVER AT RESACA, GA.

LOCATION.—At Dixie Highway bridge at Resaca, Gordon County, 400 feet below Nashville, Chattanooga & St. Louis Railroad bridge and 3 miles below junction of Coosawattee and Conasauga rivers to form Oostanaula River.

DRAINAGE AREA.—1,610 square miles (measured on topographic maps).

RECORDS AVAILABLE.—1891 to 1898 (gage heights by U. S. Weather Bureau and discharge measurements by U. S. Geol. Survey); 1894–1904, partial records of gage heights only; continuous records January 1, 1905, to September 30, 1920.

GAGE.—Chain gage attached to downstream handrail of highway bridge. Prior to March 23, 1919, when chain gage was installed, the gage was a rod attached to downstream end of midstream pier of Nashville, Chattanooga & St. Louis Railroad bridge, 400 feet upstream from present gage. Gage read by United States Weather Bureau.

DISCHARGE MEASUREMENTS.—Made from downstream side of steel highway bridge. Prior to 1919 measurements were made from Nashville, Chattanooga & St. Louis Railroad bridge and from a boat, at very low stages.

CHANNEL AND CONTROL.—Bed composed of rock and sand. Right bank high and is not overflowed; left bank is overflowed at very high stages. Control practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year ending September 30, 1919, 21.6 feet December 24 (discharge, 18,300 second-feet); minimum stage, 1.1 feet October 10–12, 14, 15, and 17 (discharge, 375 second-feet).

Maximum stage recorded during year ending September 30, 1920, 32.0 feet April 4 (discharge, 28,700 second-feet); minimum stage, 1.8 feet October 3 (discharge, 570 second-feet).

1896–1920: Maximum stage recorded,[1] 32.0 feet April 4, 1920 (discharge, 28,700 second-feet). Discharge for a stage of 31.7 feet March 15, 1909, as published in previous water-supply papers is considerably too large owing to erroneous extension of rating curve. Minimum stage recorded, 0.95 foot during discharge measurement made September 26, 1904 (discharge, 273 second-feet).

A stage of 36.6 feet on April 1, 1886, is reported by the United States Weather Bureau.

ICE.—None.

DIVERSIONS.—None.

REGULATION.—Practically none from the few small mills upstream.

ACCURACY.—Stage-discharge relation practically permanent. Rating curve well defined between 450 and 8,000 second-feet and extended above 8,000 second-feet; curve differs slightly from that used before October 1, 1918. Gage reads to tenths once daily. Daily discharge ascertained by applying daily gage height to rating table. Records below 9,000 second-feet good; above that stage they should be used with caution.

*Discharge measurements of Oostanaula River at Resaca, Ga., during the years ending Sept. 30, 1919 and 1920.*

[Made by A. H. Condron.]

| Date. | Gage height. | Discharge. |
|---|---|---|
| 1918. | *Feet.* | *Sec.-ft.* |
| Oct. 18 | 1.64 | 514 |
| 1919. | | |
| Mar. 23 | 6.32 | 3,460 |
| Oct. 16 | 2.42 | 802 |

*Daily discharge, in second-feet, of Oostanaula River at Resaca, Ga., for the years ending Sept. 30, 1919 and 1920.*

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1918-19. | | | | | | | | | | | | |
| 1 | 540 | 11,500 | 5,540 | 3,780 | 2,260 | 3,780 | 3,540 | 2,680 | 1,700 | 1,840 | 1,270 | 2,470 |
| 2 | 510 | 6,500 | 4,190 | 3,500 | 2,260 | 3,380 | 3,140 | 2,400 | 1,630 | 1,700 | 1,450 | 2,680 |
| 3 | 480 | 2,330 | 3,860 | 13,600 | 2,190 | 3,060 | 3,140 | 2,400 | 1,630 | 1,570 | 1,570 | 2,260 |
| 4 | 425 | 1,770 | 2,980 | 13,500 | 3,380 | 2,980 | 3,140 | 2,400 | 1,570 | 1,330 | 1,450 | 1,700 |
| 5 | 425 | 1,570 | 2,610 | 11,500 | 3,620 | 3,780 | 3,140 | 2,400 | 1,510 | 8,200 | 1,330 | 1,450 |
| 6 | 450 | 1,330 | 2,330 | 10,600 | 3,620 | 12,600 | 2,980 | 2,260 | 1,450 | 8,800 | 1,330 | 1,330 |
| 7 | 425 | 1,270 | 1,910 | 7,500 | 3,380 | 13,600 | 2,820 | 5,540 | 1,350 | 5,720 | 1,270 | 1,330 |
| 8 | 425 | 1,210 | 1,770 | 5,540 | 3,300 | 12,000 | 2,680 | 10,500 | 1,330 | 4,280 | 1,330 | 1,150 |
| 9 | 425 | 1,040 | 1,630 | 3,860 | 3,220 | 15,600 | 2,610 | 7,100 | 1,270 | 3,140 | 1,270 | 1,040 |
| 10 | 375 | 990 | 1,270 | 2,980 | 2,980 | 16,900 | 2,610 | 3,460 | 1,270 | 2,400 | 1,270 | 890 |
| 11 | 375 | 750 | 1,210 | 2,900 | 2,610 | 13,500 | 3,380 | 2,820 | 1,210 | 2,120 | 1,270 | 890 |
| 12 | 375 | 710 | 1,570 | 2,820 | 2,260 | 11,500 | 6,000 | 2,540 | 1,450 | 1,910 | 1,450 | 840 |
| 13 | 400 | 710 | 1,840 | 2,680 | 4,730 | 9,600 | 4,460 | 2,400 | 1,390 | 1,910 | 1,510 | 840 |
| 14 | 375 | 570 | 2,820 | 1,570 | 9,500 | 5,540 | 3,140 | 4,020 | 1,270 | 1,770 | 1,390 | 840 |
| 15 | 375 | 570 | 10,500 | 1,270 | 10,000 | 4,820 | 3,140 | 3,140 | 1,270 | 1,570 | 1,270 | 795 |
| 16 | 400 | 1,040 | 10,100 | 1,330 | 7,600 | 3,860 | 4,370 | 2,980 | 1,210 | 1,450 | 1,210 | 750 |
| 17 | 375 | 2,980 | 9,500 | 9,900 | 5,540 | 3,780 | 8,100 | 2,400 | 1,210 | 1,450 | 1,150 | 750 |
| 18 | 450 | 3,380 | 8,500 | 8,500 | 4,640 | 8,500 | 5,900 | 2,190 | 1,390 | 2,120 | 1,090 | 710 |
| 19 | 480 | 3,860 | 4,730 | 7,800 | 3,860 | 7,000 | 4,190 | 2,050 | 1,700 | 3,780 | 1,150 | 710 |
| 20 | 450 | 2,260 | 2,610 | 5,540 | 3,380 | 5,000 | 3,380 | 2,050 | 1,570 | 3,140 | 1,090 | 750 |
| 21 | 450 | 1,570 | 3,380 | 4,640 | 7,500 | 3,780 | 3,300 | 2,050 | 1,630 | 3,060 | 1,090 | 750 |
| 22 | 450 | 1,270 | 14,500 | 3,780 | 10,500 | 3,300 | 3,140 | 2,050 | 1,700 | 2,120 | 2,260 | 710 |
| 23 | 540 | 1,510 | 17,300 | 3,060 | 16,400 | 3,380 | 2,900 | 1,980 | 1,910 | 1,700 | 3,540 | 750 |
| 24 | 570 | 1,390 | 18,300 | 5,540 | 16,800 | 3,220 | 2,680 | 1,980 | 2,330 | 1,570 | 3,620 | 710 |
| 25 | 2,260 | 1,570 | 16,500 | 6,500 | 14,500 | 3,140 | 2,540 | 1,910 | 3,060 | 1,450 | 3,780 | 710 |
| 26 | 1,040 | 2,330 | 13,600 | 9,800 | 12,600 | 3,140 | 2,400 | 1,910 | 2,980 | 1,390 | 2,900 | 670 |
| 27 | 2,980 | 2,610 | 10,500 | 12,500 | 10,500 | 6,300 | 2,260 | 1,840 | 7,800 | 1,270 | 2,050 | 670 |
| 28 | 1,210 | 2,610 | 5,540 | 9,500 | 5,540 | 11,300 | 2,190 | 1,840 | 3,940 | 1,330 | 1,570 | 635 |
| 29 | 1,980 | 7,100 | 3,060 | 6,630 | ..... | 9,800 | 2,190 | 1,700 | 3,220 | 1,270 | 1,390 | 600 |
| 30 | 13,500 | 6,500 | 2,610 | 3,780 | ..... | 8,700 | 2,400 | 1,700 | 2,680 | 1,210 | 2,260 | 600 |
| 31 | 15,600 | ..... | 2,470 | 2,680 | ..... | 5,270 | ..... | 1,700 | ..... | 1,210 | 3,300 | ..... |

[1] Gage-height records not obtained during the following periods: May 1 to July 31, 1896; May 1 to October 31, 1899; July 1 to October 31, 1900; May 1 to November 12, 1901, and January 1, 1902, to December 31, 1904.

*Daily discharge, in second-feet, of Oostanaula River at Resaca, Ga., for the years ending Sept. 30, 1919 and 1920*—Continued.

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1919-20. | | | | | | | | | | | | |
| 1 | 600 | 1,040 | 2,540 | 1,570 | 4,820 | 3,140 | 12,000 | 3,940 | 2,190 | 2,050 | 1,450 | 2,980 |
| 2 | 600 | 1,700 | 1,980 | 1,510 | 3,780 | 3,060 | 18,900 | 3,540 | 2,120 | 3,380 | 1,450 | 3,760 |
| 3 | 570 | 1,570 | 1,450 | 1,510 | 3,940 | 3,060 | 25,200 | 5,540 | 2,190 | 12,700 | 1,390 | 4,370 |
| 4 | 600 | 1,270 | 1,090 | 1,450 | 14,700 | 2,980 | 28,700 | 6,000 | 2,470 | 16,500 | 1,390 | 4,280 |
| 5 | 635 | 1,090 | 1,090 | 1,450 | 17,200 | 7,000 | 26,200 | 4,280 | 3,700 | 13,000 | 1,330 | 4,020 |
| 6 | 635 | 1,040 | 1,150 | 1,390 | 15,700 | 8,700 | 23,900 | 3,860 | 3,140 | 4,820 | 1,270 | 3,780 |
| 7 | 600 | 990 | 1,450 | 1,390 | 13,000 | 5,900 | 22,200 | 3,460 | 2,610 | 2,820 | 1,270 | 3,140 |
| 8 | 635 | 890 | 2,260 | 2,400 | 8,200 | 4,190 | 16,300 | 3,380 | 2,260 | 2,610 | 1,210 | 3,460 |
| 9 | 670 | 890 | 10,300 | 2,540 | 4,820 | 3,780 | 9,800 | 3,220 | 2,260 | 2,400 | 3,140 | 4,020 |
| 10 | 635 | 795 | 16,200 | 2,400 | 3,540 | 3,460 | 11,500 | 3,060 | 1,700 | 2,190 | 6,700 | 4,460 |
| 11 | 600 | 1,210 | 17,500 | 2,330 | 4,100 | 3,140 | 9,100 | 2,900 | 1,570 | 3,620 | 13,200 | 3,940 |
| 12 | 600 | 1,630 | 14,300 | 2,190 | 3,940 | 4,910 | 6,300 | 2,820 | 1,570 | 4,100 | 13,100 | 3,780 |
| 13 | 890 | 1,510 | 5,180 | 2,120 | 4,460 | 11,100 | 6,200 | 4,820 | 1,510 | 3,940 | 8,700 | 3,140 |
| 14 | 795 | 1,510 | 4,020 | 2,120 | 4,190 | 11,200 | 5,900 | 12,200 | 1,510 | 3,540 | 13,700 | 3,780 |
| 15 | 670 | 1,390 | 4,820 | 2,050 | 3,780 | 6,900 | 5,090 | 9,900 | 1,570 | 1,700 | 17,100 | 3,940 |
| 16 | 635 | 1,270 | 4,280 | 3,140 | 3,540 | 4,820 | 4,190 | 6,100 | 1,450 | 2,260 | 18,900 | 4,370 |
| 17 | 795 | 1,210 | 3,860 | 5,900 | 3,300 | 5,090 | 6,700 | 3,620 | 1,390 | 1,700 | 20,400 | 3,940 |
| 18 | 795 | 1,090 | 3,140 | 6,200 | 3,140 | 8,900 | 5,090 | 3,140 | 1,630 | 2,050 | 19,100 | 3,460 |
| 19 | 750 | 1,040 | 2,980 | 4,820 | 2,980 | 7,700 | 4,020 | 5,180 | 1,700 | 3,060 | 16,400 | 3,140 |
| 20 | 750 | 1,040 | 3,700 | 4,100 | 2,820 | 12,900 | 3,300 | 4,020 | 1,770 | 4,190 | 11,500 | 2,820 |
| 21 | 710 | 990 | 3,380 | 3,220 | 2,680 | 12,400 | 7,300 | 3,460 | 1,910 | 2,820 | 8,900 | 2,470 |
| 22 | 1,570 | 990 | 2,980 | 2,750 | 5,180 | 8,700 | 10,200 | 3,380 | 1,840 | 2,980 | 5,450 | 2,120 |
| 23 | 6,700 | 1,040 | 2,400 | 2,400 | 14,700 | 5,810 | 6,300 | 2,820 | 2,120 | 2,400 | 6,000 | 1,910 |
| 24 | 8,200 | 990 | 2,260 | 7,700 | 16,200 | 4,370 | 4,910 | 2,680 | 3,060 | 2,260 | 5,360 | 1,770 |
| 25 | 5,900 | 990 | 2,050 | 14,700 | 14,100 | 3,380 | 4,190 | 3,140 | 3,140 | 2,190 | 4,280 | 2,120 |
| 26 | 2,610 | 940 | 2,050 | 16,000 | 10,200 | 5,810 | 4,020 | 3,540 | 2,050 | 2,050 | 3,540 | 2,330 |
| 27 | 2,120 | 990 | 1,910 | 16,100 | 6,500 | 6,100 | 7,700 | 3,300 | 1,910 | 2,050 | 3,700 | 1,910 |
| 28 | 1,700 | 990 | 1,840 | 13,700 | 3,940 | 4,370 | 7,300 | 2,980 | 1,700 | 1,770 | 4,280 | 1,700 |
| 29 | 1,390 | 940 | 1,770 | 8,900 | 3,220 | 12,700 | 5,450 | 2,610 | 1,570 | 1,630 | 5,270 | 1,510 |
| 30 | 1,270 | 1,630 | 1,700 | 6,200 | ..... | 14,000 | 4,190 | 2,400 | 1,570 | 1,510 | 4,640 | 1,450 |
| 31 | 1,090 | ..... | 1,570 | 4,910 | ..... | 10,800 | ..... | 2,260 | ..... | 1,510 | 3,380 | ..... |

*Monthly discharge of Oostanaula River at Resaca, Ga., for the years ending Sept. 30, 1919 and 1920.*

[Drainage area, 1,610 square miles.]

| Month. | Discharge in second-feet. | | | | Run-off in inches. |
|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square mile. | |
| 1918-19. | | | | | |
| October | 15,600 | 375 | 1,580 | 0.981 | 1.13 |
| November | 11,500 | 570 | 2,490 | 1.55 | 1.73 |
| December | 18,300 | 1,210 | 6,100 | 3.79 | 4.37 |
| January | 13,600 | 1,270 | 6,230 | 3.87 | 4.46 |
| February | 16,800 | 2,190 | 6,380 | 3.96 | 4.12 |
| March | 16,900 | 2,980 | 7,160 | 4.45 | 5.13 |
| April | 8,100 | 2,190 | 3,400 | 2.11 | 2.35 |
| May | 10,500 | 1,700 | 2,850 | 1.77 | 2.04 |
| June | 7,800 | 1,210 | 1,990 | 1.24 | 1.38 |
| July | 8,800 | 1,210 | 2,510 | 1.56 | 1.80 |
| August | 3,780 | 1,090 | 1,740 | 1.08 | 1.24 |
| September | 2,680 | 600 | 1,030 | .640 | .71 |
| The year | 18,300 | 375 | 3,620 | 2.25 | 30.46 |
| 1919-20. | | | | | |
| October | 8,200 | 570 | 1,510 | .938 | 1.08 |
| November | 1,700 | 795 | 1,160 | .720 | .80 |
| December | 17,500 | 1,090 | 4,100 | 2.55 | 2.94 |
| January | 16,100 | 1,390 | 4,810 | 2.99 | 3.45 |
| February | 17,200 | 2,680 | 6,990 | 4.34 | 4.68 |
| March | 14,000 | 2,980 | 6,790 | 4.22 | 4.86 |
| April | 28,700 | 3,300 | 10,400 | 6.46 | 7.21 |
| May | 12,200 | 2,260 | 4,110 | 2.55 | 2.94 |
| June | 3,700 | 1,390 | 2,040 | 1.27 | 1.42 |
| July | 16,500 | 1,510 | 3,740 | 2.32 | 2.68 |
| August | 20,400 | 1,210 | 7,340 | 4.56 | 5.26 |
| September | 4,460 | 1,450 | 3,130 | 1.94 | 2.16 |
| The year | 28,700 | 570 | 4,670 | 2.90 | 39.48 |

### COOSA RIVER AT CHILDERSBURG, ALA.

LOCATION.—At Central of Georgia Railroad bridge half a mile west of Childersburg, Talladega County, 35 miles above site of Lock 12, and 75.3 miles above Wetumpka.

DRAINAGE AREA.—8,390 square miles (determined by Alabama Power Co.).

RECORDS AVAILABLE.—February 22, 1914, to September 30, 1920.

GAGE.—Gurley printing water-stage recorder attached to downstream end of second pier from right bank of river, installed on May 5, 1914. Prior to that date readings were taken from a vertical staff gage fastened to upstream side of same pier to which the Gurley gage is now attached. Datum of Gurley gage is about 0.1 foot higher than that of the staff gage. This difference in datum is believed constant since 1914. All records from 1915 to 1920 are referred to datum of Gurley gage. Sea-level elevation of zero of staff gage is 421.00 feet (United States Army Engineers datum).

DISCHARGE MEASUREMENTS.—Made from the bridge.

CHANNEL AND CONTROL.—Channel straight for half a mile below gage. Left bank high; right bank subject to overflow at extreme high stages. Control not well defined; bed of stream probably permanent.

EXTREMES OF DISCHARGE.—Maximum stage during year ending September 30, 1919, from water-stage recorder, 20.7 feet at 6 a. m. October 31, 1918 (discharge, 95,500 second-feet); minimum mean daily stage, 1.3 feet October 9–13, 1918 (discharge, 2,840 second-feet).

Maximum stage during year ending September 30, 1920, from water-stage recorder, 24.0 feet at 6 a. m. December 10, 1919 (discharge, 116,000 second-feet, minimum mean daily stage, 1.4 feet October 7, 1919 (discharge, 3,040 second-feet).

1914–1920: Maximum stage from water-stage recorder, 24.7 feet from 3 to 9 and 11 to 12 p. m. July 11, 1916 (discharge not determined); minimum discharge, 2,370 second-feet, September 20, 1914.

REGULATION.—None.

ACCURACY.—Stage-discharge relation practically permanent. Rating curve well defined between 3,000 and 70,000 second-feet; extended above 70,000 second-feet. Operation of water-stage recorder satisfactory except for periods indicated in footnote to daily-discharge table. Daily discharge ascertained by applying to rating table mean daily gage height obtained by averaging hourly gage height. Records good except those above 70,000 second-feet, which should be used with caution.

The high-water extension of rating curve used prior to October 1, 1918, has been verified up to 70,000 second-feet by two current-meter measurements made in 1919.

COOPERATION.—Gage-height record furnished by Alabama Power Co.

*Discharge measurements of Coosa River at Childersburg, Ala., during the year ending Sept. 30, 1919.*

| Date. | Made by— | Gage height. | Discharge. | Date. | Made by— | Gage height. | Discharge. |
|---|---|---|---|---|---|---|---|
| | | *Feet.* | *Sec.-ft.* | | | *Feet.* | *Sec.-ft.* |
| Oct. 6 | C. G. Paulsen..... | 1.53 | 3,320 | Feb. 26 | A. H. Condron..... | 16.70 | 69,700 |
| Nov. 20 | A. H. Condron..... | 5.96 | 17,300 | Mar. 12 | ....do..... | 15.20 | 63,600 |

NOTE.—No discharge measurements were made during the year ending Sept. 30, 1920.

*Daily discharge, in second-feet, of Coosa River near Childersburg, Ala., for the years ending Sept. 30, 1919 and 1920.*

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1918–19. | | | | | | | | | | | | |
| 1 | 4,620 | 76,800 | 36,100 | 17,700 | 30,800 | 58,200 | 25,800 | 10,200 | 9,190 | 13,300 | 6,180 | 13,000 |
| 2 | 4,380 | 64,000 | 29,000 | 19,600 | 24,500 | 48,400 | 21,600 | 10,200 | 10,900 | 9,850 | 5,900 | 12,600 |
| 3 | 4,150 | 55,300 | 20,400 | 39,700 | 18,100 | 34,600 | 17,400 | 10,200 | 11,600 | 8,240 | 5,900 | 9,850 |
| 4 | 3,690 | 50,100 | 14,800 | 46,600 | 18,500 | 24,500 | 15,500 | 10,900 | 11,600 | 7,040 | 5,630 | 8,240 |
| 5 | 3,250 | 35,000 | 11,900 | 50,700 | 20,400 | 22,800 | 14,800 | 11,200 | 9,850 | 6,750 | 5,630 | 7,330 |
| 6 | 3,250 | 18,000 | 10,900 | 47,200 | 19,300 | 35,600 | 14,400 | 10,500 | 8,550 | 6,180 | 6,180 | 5,630 |
| 7 | 3,250 | 12,000 | 9,190 | 43,900 | 19,300 | 40,200 | 14,000 | 10,500 | 7,630 | 6,180 | 5,900 | 5,110 |
| 8 | 3,040 | 10,000 | 8,870 | 37,100 | 17,700 | 44,400 | 13,700 | 11,200 | 7,330 | 9,190 | 5,900 | 4,620 |
| 9 | 2,840 | 8,000 | 8,500 | 28,600 | 15,900 | 81,400 | 13,300 | 10,500 | 7,040 | 17,000 | 5,900 | 4,620 |
| 10 | 2,840 | 7,330 | 8,000 | 25,000 | 15,500 | 81,400 | 13,300 | 15,100 | 6,460 | 16,600 | 5,900 | 4,380 |
| 11 | 2,840 | 6,750 | 7,500 | 22,800 | 13,700 | 69,800 | 24,500 | 17,700 | 6,180 | 15,900 | 6,460 | 4,150 |
| 12 | 2,840 | 6,460 | 7,000 | 20,800 | 13,700 | 64,000 | 22,800 | 15,100 | 6,180 | 12,200 | 7,930 | 4,150 |
| 13 | 2,840 | 6,180 | 7,000 | 18,500 | 17,700 | 58,800 | 22,800 | 11,900 | 6,750 | 9,190 | 7,040 | 3,920 |
| 14 | 3,040 | 5,900 | 8,000 | 17,400 | 31,200 | 55,900 | 22,000 | 10,900 | 6,460 | 8,550 | 6,180 | 3,920 |
| 15 | 3,040 | 5,630 | 16,200 | 15,900 | 34,600 | 51,300 | 20,000 | 11,600 | 6,180 | 8,550 | 7,930 | 3,920 |
| 16 | 3,040 | 5,370 | 20,400 | 14,870 | 36,100 | 35,600 | 22,400 | 11,900 | 6,180 | 8,550 | 8,550 | 4,150 |
| 17 | 3,040 | 15,900 | 25,000 | 15,100 | 33,100 | 29,400 | 23,200 | 12,200 | 6,180 | 7,630 | 7,330 | 4,380 |
| 18 | 3,040 | 22,400 | 26,800 | 20,400 | 27,200 | 39,700 | 24,100 | 10,500 | 6,180 | 7,040 | 6,180 | 4,150 |
| 19 | 3,250 | 20,400 | 25,000 | 24,500 | 21,600 | 39,200 | 25,000 | 9,190 | 6,460 | 7,330 | 5,630 | 3,690 |
| 20 | 3,690 | 17,400 | 23,700 | 29,000 | 18,100 | 38,100 | 22,000 | 8,550 | 10,500 | 8,240 | 5,370 | 3,690 |
| 21 | 3,470 | 14,800 | 34,600 | 29,900 | 23,200 | 32,200 | 19,300 | 7,930 | 11,200 | 9,190 | 5,110 | 3,470 |
| 22 | 3,250 | 12,200 | 53,000 | 25,800 | 33,600 | 26,300 | 16,200 | 7,930 | 9,190 | 9,520 | 4,860 | 3,470 |
| 23 | 3,250 | 10,900 | 62,900 | 25,800 | 70,400 | 20,800 | 14,000 | 7,930 | 7,930 | 9,850 | 4,860 | 3,470 |
| 24 | 6,180 | 9,190 | 65,200 | 37,100 | 72,100 | 18,100 | 13,000 | 7,930 | 7,330 | 8,240 | 6,460 | 3,250 |
| 25 | 6,460 | 8,870 | 62,900 | 43,900 | 72,100 | 17,000 | 11,900 | 7,930 | 8,240 | 7,330 | 7,930 | 3,250 |
| 26 | 7,330 | 7,930 | 61,100 | 59,400 | 73,300 | 15,900 | 11,200 | 7,630 | 10,500 | 7,040 | 9,520 | 3,690 |
| 27 | 7,930 | 7,930 | 58,800 | 62,900 | 68,100 | 23,200 | 10,900 | 7,630 | 11,600 | 6,460 | 8,550 | 3,690 |
| 28 | 9,190 | 15,900 | 57,600 | 58,200 | 63,400 | 30,400 | 10,500 | 7,930 | 12,600 | 6,180 | 8,550 | 3,470 |
| 29 | 27,200 | 32,200 | 55,900 | 54,700 | ..... | 31,200 | 10,200 | 7,630 | 15,500 | 5,630 | 7,930 | 3,470 |
| 30 | 39,200 | 36,600 | 46,100 | 49,500 | ..... | 32,600 | 9,850 | 7,930 | 16,600 | 6,180 | 7,630 | 3,250 |
| 31 | 91,300 | ..... | 26,800 | 43,900 | ..... | 30,400 | ..... | 8,240 | ..... | 6,180 | 10,900 | ..... |
| 1919–20. | | | | | | | | | | | | |
| 1 | 3,250 | 4,860 | 5,900 | 7,930 | 51,300 | 16,600 | 57,100 | 25,800 | 12,600 | 7,930 | 7,330 | 13,300 |
| 2 | 3,250 | 4,860 | 6,460 | 7,930 | 36,600 | 14,400 | 90,700 | 21,200 | 13,300 | 7,630 | 7,040 | 12,600 |
| 3 | 3,250 | 4,620 | 7,040 | 7,630 | 30,800 | 13,700 | 107,000 | 26,300 | 12,200 | 7,630 | 7,040 | 16,600 |
| 4 | 3,250 | 4,620 | 6,750 | 7,330 | 35,600 | 14,000 | 102,000 | 40,700 | 14,400 | 8,550 | 7,040 | 15,100 |
| 5 | 3,250 | 5,370 | 6,180 | 7,040 | 41,800 | 19,600 | 91,900 | 44,400 | 22,000 | 19,300 | 6,750 | 14,000 |
| 6 | 3,250 | 5,630 | 5,370 | 6,750 | 49,500 | 22,800 | 86,600 | 41,800 | 23,700 | 31,700 | 6,460 | 14,000 |
| 7 | 3,040 | 5,110 | 8,870 | 7,330 | 52,400 | 25,400 | 83,200 | 32,200 | 23,200 | 36,100 | 6,460 | 12,200 |
| 8 | 3,250 | 4,380 | 31,200 | 8,870 | 52,400 | 25,400 | 81,400 | 25,000 | 22,000 | 32,600 | 6,460 | 11,200 |
| 9 | 3,690 | 4,150 | 84,300 | 12,200 | 51,800 | 22,800 | 83,700 | 21,200 | 17,400 | 20,000 | 8,870 | 10,500 |
| 10 | 3,470 | 4,150 | 112,000 | 15,500 | 46,600 | 18,900 | 87,800 | 18,500 | 13,700 | 13,000 | 12,600 | 10,200 |
| 11 | 3,470 | 5,370 | 89,500 | 15,900 | 35,100 | 16,200 | 86,100 | 16,600 | 11,900 | 11,900 | 19,300 | 10,900 |
| 12 | 3,470 | 5,630 | 68,700 | 15,100 | 24,500 | 18,500 | 82,000 | 15,900 | 10,900 | 14,800 | 27,200 | 13,000 |
| 13 | 3,470 | 5,630 | 61,700 | 13,700 | 24,500 | 25,400 | 76,800 | 40,200 | 10,200 | 16,200 | 29,900 | 14,800 |
| 14 | 3,690 | 5,630 | 61,100 | 12,200 | 22,800 | 28,100 | 71,600 | 62,900 | 9,520 | 16,600 | 33,100 | 14,000 |
| 15 | 3,690 | 5,900 | 62,300 | 10,900 | 21,600 | 32,200 | 61,700 | 48,400 | 9,190 | 14,800 | 36,100 | 11,900 |
| 16 | 3,690 | 6,460 | 61,700 | 11,600 | 20,000 | 33,600 | 42,800 | 47,200 | 8,870 | 12,200 | 39,700 | 10,500 |
| 17 | 3,470 | 6,180 | 58,200 | 20,400 | 18,500 | 57,600 | 32,600 | 45,000 | 8,550 | 9,850 | 43,900 | 10,200 |
| 18 | 3,470 | 5,630 | 39,700 | 21,600 | 16,600 | 74,500 | 29,400 | 39,700 | 8,240 | 9,850 | 47,200 | 9,520 |
| 19 | 3,690 | 4,860 | 21,200 | 22,000 | 15,500 | 63,400 | 25,800 | 29,900 | 8,870 | 17,700 | 47,200 | 9,520 |
| 20 | 3,690 | 4,620 | 16,200 | 21,600 | 14,400 | 72,100 | 27,200 | 25,000 | 10,200 | 28,100 | 47,800 | 9,190 |
| 21 | 3,470 | 4,380 | 14,400 | 19,300 | 14,000 | 62,300 | 48,900 | 24,100 | 11,200 | 29,900 | 48,400 | 7,930 |
| 22 | 3,920 | 4,380 | 14,000 | 15,900 | 13,700 | 56,500 | 45,600 | 22,000 | 10,500 | 28,600 | 45,600 | 7,040 |
| 23 | 4,620 | 4,150 | 14,000 | 15,100 | 14,400 | 50,700 | 75,600 | 19,300 | 11,600 | 28,600 | 42,300 | 6,750 |
| 24 | 5,110 | 4,150 | 13,000 | 36,600 | 18,900 | 42,800 | 75,000 | 17,700 | 13,000 | 24,500 | 34,600 | 6,750 |
| 25 | 8,240 | 4,150 | 11,600 | 53,600 | 27,600 | 32,200 | 44,400 | 17,700 | 14,800 | 17,700 | 22,400 | 6,460 |
| 26 | 15,900 | 3,920 | 10,900 | 59,400 | 32,200 | 30,800 | 37,100 | 16,200 | 13,300 | 13,300 | 17,400 | 6,180 |
| 27 | 15,500 | 4,150 | 10,200 | 65,800 | 31,700 | 30,400 | 36,100 | 16,600 | 12,600 | 11,200 | 14,800 | 6,460 |
| 28 | 11,600 | 4,150 | 9,520 | 65,800 | 28,600 | 35,600 | 33,600 | 15,500 | 10,900 | 12,600 | 13,700 | 6,750 |
| 29 | 7,930 | 4,150 | 9,190 | 62,900 | 22,400 | 53,000 | 32,200 | 14,400 | 9,190 | 9,190 | 12,600 | 6,750 |
| 30 | 6,180 | 4,620 | 8,550 | 60,000 | ..... | 47,200 | 30,400 | 13,300 | 8,240 | 8,550 | 15,900 | 6,180 |
| 31 | 5,110 | ..... | 8,240 | 57,100 | ..... | 47,800 | ..... | 13,000 | ..... | 7,930 | 15,100 | ..... |

NOTE.—From October, 1918, to March, 1919, the operation of the water-stage recorder was very poor. Many of the mean daily gage heights for that period are based on two readings daily by observer. As the diurnal fluctuation is not rapid or great, two daily readings give a fairly accurate mean. Discharge, Nov. 5–9 and Dec. 9–14, 1918, estimated by use of gage heights at Lock No. 4 and by comparison with combined discharge of Oostanaula River at Resaca and of Etowah River near Rome, Ga.

*Monthly discharge of Coosa River at Childersburg, Ala., for the years ending Sept. 30, 1919 and 1920.*

[Drainage area, 8,390 square miles.]

| Month. | Discharge in second-feet. | | | | Run-off in inches. |
|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square mile. | |
| 1918–19. | | | | | |
| October | 91,300 | 2,840 | 8,730 | 1.04 | 1.20 |
| November | 76,800 | 5,370 | 20,200 | 2.41 | 2.69 |
| December | 65,200 | 7,000 | 29,300 | 3.49 | 3.89 |
| January | 62,900 | 14,800 | 33,800 | 4.03 | 4.65 |
| February | 73,300 | 13,700 | 33,000 | 3.93 | 4.09 |
| March | 81,400 | 15,900 | 39,700 | 4.73 | 5.45 |
| April | 25,800 | 9,850 | 17,300 | 2.06 | 2.30 |
| May | 17,700 | 7,630 | 10,200 | 1.22 | 1.41 |
| June | 16,600 | 6,180 | 8,940 | 1.07 | 1.19 |
| July | 17,000 | 5,630 | 8,880 | 1.06 | 1.22 |
| August | 10,900 | 4,860 | 6,770 | .807 | .93 |
| September | 13,000 | 3,250 | 5,000 | .596 | .66 |
| The year | 91,300 | 2,840 | 18,400 | 2.19 | 29.68 |
| 1919–20. | | | | | |
| October | 15,900 | 3,040 | 5,040 | .601 | .69 |
| November | 6,460 | 3,920 | 4,860 | .579 | .65 |
| December | 112,000 | 5,370 | 30,300 | 3.61 | 4.16 |
| January | 65,800 | 6,750 | 24,700 | 2.94 | 3.39 |
| February | 52,400 | 13,700 | 29,900 | 3.56 | 3.84 |
| March | 74,500 | 13,700 | 35,600 | 4.24 | 4.89 |
| April | 107,000 | 25,800 | 62,200 | 7.41 | 8.27 |
| May | 62,900 | 13,000 | 27,700 | 3.30 | 3.80 |
| June | 23,700 | 8,240 | 12,900 | 1.54 | 1.72 |
| July | 36,100 | 7,630 | 17,000 | 2.03 | 2.34 |
| August | 48,400 | 6,460 | 23,600 | 2.81 | 3.24 |
| September | 16,600 | 6,180 | 10,300 | 1.23 | 1.37 |
| The year | 112,000 | 3,040 | 23,600 | 2.81 | 38.36 |

### ELLIJAY RIVER AT ELLIJAY, GA.

LOCATION.—At steel highway bridge on Ellijay-Blue Ridge road, half a mile northeast of Gilmer County courthouse in Ellijay, half a mile north of Louisville & Nashville Railroad station, and three-fourths mile upstream from point where Ellijay and Cartecay rivers unite to form Coosawattee River.

DRAINAGE AREA.—90 square miles (measured on topographic map).

RECORDS AVAILABLE.—May 4, 1907, to December 31, 1907, and December 10, 1918, to September 30, 1920.

GAGE.—Gage used in 1907 was a vertical staff fastened to downstream bridge post on right bank. Between 1907 and 1918 the old bridge was replaced by a steel structure and the county officials removed rod from bridge and fastened it to an oak tree on right bank 4 feet above bridge. When station was reestablished December 10, 1918, the rod, as replaced by county officials, was used without changing position or datum. On April 5, 1919, a standard chain gage was installed on upstream side of new steel bridge and adjusted to read with rod.

DISCHARGE MEASUREMENTS.—Made from downstream side of steel bridge half a mile downstream from gage, where section is better than at the bridge where gage is located.

CHANNEL AND CONTROL.—Channel straight for 500 feet above and below gage. Bottom rough with many riffles. Banks subject to overflow at about 11-foot stage. Control formed by rock riffles below gage; probably permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded December 10, 1918, to September 30, 1919, 6.6 feet at 5.30 p. m. March 5 (discharge, 1,660 second-feet); minimum stage, 1.4 feet at 6 p. m. September 29 and 7 a. m. and 6 p. m. September 30 (discharge, 40 second-feet).

Maximum stage recorded during year ending September 30, 1920, 14.1 feet at 9.45 a. m. April 2 (discharge, 4,970 second-feet); minimum stage recorded, 1.4 feet at 7.30 a. m. and 6 p. m. October 1–3 and 10–12 (discharge, 40 second-feet).

1907, and 1919–1920: Maximum stage recorded, that of April 2, 1920; minimum stage, 1.4 feet September 29, 30, October 1–3, and 10–12, 1919 (discharge, 40 second-feet).

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation practically permanent. Rating curve well defined between 70 and 3,420 second-feet. Gage read to half-tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

*Discharge measurements of Ellijay River at Ellijay, Ga., during the years ending Sept. 30, 1919 and 1920.*

| Date. | Made by— | Gage height | Discharge. | Date. | Made by— | Gage height. | Discharge. |
|---|---|---|---|---|---|---|---|
| 1918. | | *Feet.* | *Sec.-ft.* | 1919. | | *Feet.* | *Sec.-ft.* |
| Nov. 27 | O. P. Hall | 1.70 | 96 | June 12 | A. H. Condron | 1.95 | 148 |
| 29 | do | 2.30 | | 1920. | | | |
| Dec. 11 | A. H. Condron | 2.25 | 209 | Jan. 20 | do | 2.30 | 214 |
| 11 | do | 2.24 | 214 | 20 | do | 2.29 | 211 |
| | | | 213 | 26 | do | 4.30 | 826 |
| 1919. | | | | Apr. 2 | do | 9.72 | 2,910 |
| Jan. 16 | do | 2.20 | 204 | | | | |
| Apr. 4 | do | 2.60 | 291 | | | | |

*Daily discharge, in second-feet, of Ellijay River at Ellijay, Ga., for the years ending Sept. 30, 1919 and 1920.*

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1918-19. | | | | | | | | | | | | |
| 1 | | | | 400 | 268 | 400 | 280 | 460 | 166 | 136 | 156 | 96 |
| 2 | | | | 1,070 | 256 | 344 | 268 | 256 | 156 | 116 | 126 | 96 |
| 3 | | | | 720 | 256 | 331 | 268 | 220 | 146 | 116 | 106 | 96 |
| 4 | | | | 430 | 305 | 318 | 280 | 220 | 146 | 116 | 96 | 86 |
| 5 | | | | 400 | 256 | 1,070 | 268 | 220 | 146 | 156 | 96 | 76 |
| 6 | | | | 344 | 244 | 755 | 268 | 232 | 146 | 965 | 96 | 76 |
| 7 | | | | 176 | 220 | 520 | 244 | 860 | 146 | 292 | 96 | 76 |
| 8 | | | | 344 | 220 | 520 | 244 | 755 | 136 | 232 | 136 | 76 |
| 9 | | | | 344 | 244 | 895 | 232 | 430 | 136 | 305 | 112 | 76 |
| 10 | | | 116 | 318 | 220 | 580 | 244 | 372 | 156 | 220 | 100 | 76 |
| 11 | | | 198 | 209 | 220 | 520 | 550 | 305 | 146 | 187 | 96 | 106 |
| 12 | | | 156 | 280 | 220 | 460 | 318 | 292 | 136 | 166 | 232 | 86 |
| 13 | | | 116 | 244 | 460 | 400 | 292 | 344 | 146 | 156 | 126 | 76 |
| 14 | | | 430 | 220 | 400 | 400 | 268 | 280 | 136 | 136 | 106 | 76 |
| 15 | | | 187 | 220 | 331 | 344 | 256 | 268 | 126 | 136 | 96 | 76 |
| 16 | | | 550 | 198 | 280 | 344 | 650 | 244 | 116 | 187 | 80 | 76 |
| 17 | | | 156 | 460 | 268 | 430 | 460 | 244 | 116 | 146 | 96 | 67 |
| 18 | | | 106 | 400 | 244 | 372 | 344 | 232 | 176 | 209 | 92 | 67 |
| 19 | | | 106 | 305 | 244 | 331 | 331 | 209 | 146 | 198 | 86 | 62 |
| 20 | | | 116 | 280 | 256 | 318 | 292 | 292 | 126 | 156 | 86 | 58 |
| 21 | | | 268 | 268 | 318 | 305 | 292 | 232 | 116 | 136 | 176 | 58 |
| 22 | | | 895 | 256 | 1,210 | 292 | 268 | 220 | 136 | 136 | 156 | 58 |
| 23 | | | 344 | 650 | 650 | 292 | 268 | 220 | 136 | 126 | 116 | 58 |
| 24 | | | 187 | 550 | 430 | 292 | 256 | 209 | 331 | 116 | 268 | 58 |
| 25 | | | 176 | 400 | 580 | 280 | 244 | 198 | 209 | 126 | 136 | 58 |
| 26 | | | 176 | 650 | 490 | 268 | 244 | 198 | 232 | 176 | 116 | 58 |
| 27 | | | 116 | 490 | 400 | 580 | 244 | 187 | 198 | 116 | 96 | 58 |
| 28 | | | 116 | 400 | 400 | 372 | 232 | 176 | 187 | 116 | 96 | 58 |
| 29 | | | 116 | 344 | ..... | 331 | 220 | 187 | 166 | 116 | 96 | 44 |
| 30 | | | 187 | 305 | ..... | 305 | 244 | 176 | 136 | 112 | 220 | 40 |
| 31 | | | 268 | 280 | ..... | 292 | ..... | 176 | ..... | 106 | 136 | ..... |

*Daily discharge, in second-feet, of Ellijay River at Ellijay, Ga., for the years ending Sept. 30, 1919 and 1920*—Continued.

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1919–20. | | | | | | | | | | | | |
| 1 | 40 | 116 | 106 | 116 | 280 | 268 | 1,350 | 318 | 220 | 156 | 146 | 268 |
| 2 | 40 | 126 | 86 | 116 | 256 | 244 | 3,620 | 318 | 198 | 268 | 156 | 244 |
| 3 | 40 | 96 | 86 | 116 | 520 | 244 | 1,210 | 318 | 198 | 209 | 136 | 372 |
| 4 | 58 | 86 | 76 | 106 | 650 | 220 | 2,380 | 318 | 280 | 220 | 136 | 268 |
| 5 | 58 | 76 | 96 | 100 | 520 | 344 | 1,140 | 318 | 256 | 198 | 116 | 244 |
| 6 | 58 | 76 | 96 | 106 | 400 | 268 | 930 | 318 | 220 | 176 | 116 | 220 |
| 7 | 58 | 72 | 268 | 187 | 344 | 244 | 790 | 292 | 220 | 166 | 116 | 220 |
| 8 | 58 | 58 | 430 | 232 | 305 | 244 | 615 | 292 | 220 | 156 | 136 | 268 |
| 9 | 49 | 58 | 2,140 | 176 | 268 | 244 | 790 | 268 | 209 | 136 | 220 | 720 |
| 10 | 40 | 58 | 755 | 156 | 268 | 220 | 650 | 268 | 209 | 166 | 430 | 372 |
| 11 | 40 | 187 | 400 | 156 | 256 | 244 | 580 | 268 | 198 | 209 | 520 | 280 |
| 12 | 40 | 156 | 292 | 156 | 244 | 460 | 580 | 280 | 176 | 209 | 305 | 232 |
| 13 | 76 | 126 | 244 | 136 | 292 | 400 | 650 | 790 | 176 | 156 | 1,460 | 344 |
| 14 | 72 | 96 | 318 | 126 | 268 | 400 | 520 | 400 | 176 | 156 | 1,070 | 256 |
| 15 | 58 | 96 | 244 | 126 | 244 | 280 | 490 | 344 | 176 | 156 | 1,660 | 268 |
| 16 | 67 | 86 | 220 | 400 | 220 | 460 | 490 | 318 | 156 | 156 | 755 | 244 |
| 17 | 54 | 86 | 198 | 550 | 198 | 580 | 460 | 318 | 156 | 156 | 650 | 220 |
| 18 | 49 | 76 | 176 | 318 | 198 | 430 | 400 | 400 | 187 | 460 | 1,040 | 220 |
| 19 | 49 | 76 | 268 | 256 | 198 | 460 | 372 | 331 | 198 | 460 | 860 | 209 |
| 20 | 49 | 76 | 244 | 232 | 187 | 650 | 400 | 318 | 244 | 400 | 1,210 | 209 |
| 21 | 58 | 76 | 244 | 232 | 187 | 490 | 580 | 292 | 232 | 292 | 580 | 198 |
| 22 | 176 | 76 | 209 | 209 | 1,980 | 400 | 400 | 268 | 176 | 232 | 860 | 198 |
| 23 | 344 | 62 | 187 | 209 | 650 | 372 | 372 | 268 | 256 | 187 | 580 | 198 |
| 24 | 198 | 58 | 176 | 1,660 | 460 | 344 | 372 | 268 | 220 | 156 | 400 | 318 |
| 25 | 136 | 76 | 166 | 790 | 400 | 344 | 344 | 400 | 198 | 156 | 331 | 220 |
| 26 | 112 | 92 | 156 | 825 | 331 | 650 | 400 | 280 | 166 | 156 | 318 | 198 |
| 27 | 96 | 76 | 156 | 650 | 280 | 460 | 460 | 268 | 156 | 156 | 344 | 198 |
| 28 | 96 | 76 | 156 | 520 | 256 | 720 | 460 | 244 | 156 | 156 | 331 | 198 |
| 29 | 80 | 136 | 136 | 400 | 280 | 860 | 400 | 244 | 156 | 136 | 280 | 176 |
| 30 | 76 | 146 | 116 | 344 | ..... | 550 | 344 | 220 | 156 | 136 | 305 | 176 |
| 31 | 76 | ..... | 116 | 305 | ..... | 430 | ..... | 220 | ..... | 136 | 268 | ..... |

*Monthly discharge of Ellijay River at Ellijay, Ga., for the years ending Sept. 30, 1919 and 1920.*

[Drainage area, 90 square miles.]

| Month. | Discharge in second-feet. | | | | Run-off in inches. |
|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square mile. | |
| 1918–19. | | | | | |
| December 10–31 | 895 | 106 | 231 | 2.57 | 2.10 |
| January | 1,070 | 176 | 386 | 4.29 | 4.95 |
| February | 1,210 | 220 | 353 | 3.92 | 4.08 |
| March | 1,070 | 268 | 428 | 4.76 | 5.49 |
| April | 650 | 220 | 296 | 3.29 | 3.67 |
| May | 860 | 176 | 288 | 3.20 | 3.69 |
| June | 331 | 116 | 157 | 1.74 | 1.94 |
| July | 965 | 106 | 184 | 2.04 | 2.35 |
| August | 268 | 80 | 123 | 1.37 | 1.58 |
| September | 106 | 40 | 71 | .789 | .88 |
| 1919–20. | | | | | |
| October | 344 | 40 | 81 | .90 | 1.04 |
| November | 187 | 58 | 92 | 1.02 | 1.14 |
| December | 2,140 | 76 | 276 | 3.07 | 3.54 |
| January | 1,660 | 100 | 323 | 3.59 | 4.14 |
| February | 1,980 | 187 | 377 | 4.19 | 4.52 |
| March | 860 | 220 | 404 | 4.49 | 5.18 |
| April | 3,620 | 344 | 748 | 8.31 | 9.27 |
| May | 790 | 220 | 315 | 3.50 | 4.04 |
| June | 280 | 156 | 198 | 2.20 | 2.46 |
| July | 460 | 136 | 202 | 2.24 | 2.58 |
| August | 1,660 | 116 | 511 | 5.68 | 6.55 |
| September | 720 | 176 | 259 | 2.88 | 3.21 |
| The year | 3,620 | 40 | 315 | 3.50 | 47.67 |

### ETOWAH RIVER NEAR BALL GROUND, GA.

LOCATION.—At iron highway bridge one-fourth mile below mouth of Longswamp Creek and 3 miles southeast of Ball Ground, Cherokee County, on Ball Ground-Dawsonville road.

DRAINAGE AREA.—466 square miles (measured on topographic maps).

RECORDS AVAILABLE.—May 16, 1907, to September 30, 1915, and November 25, 1918, to September 30, 1920.

GAGE.—Chain gage attached to upstream lower chord of bridge, installed August 18, 1908, to replace vertical staff on left bank 75 feet downstream from bridge. Both gages set to same datum.

DISCHARGE MEASUREMENTS.—Made from upstream side of bridge to which gage is attached.

CHANNEL AND CONTROL.—Channel has rather sharp bend just above bridge; straight below. Left bank not subject to overflow, but right bank is overflowed for 500 feet beyond end of bridge approach. Current rather irregular owing to bend upstream. Control is a rocky riffle 500 feet downstream from gage; practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded November 25, 1918, to September 30, 1919, 25.5 feet at 3 p. m. December 22, 1918 (discharge, 22,200 second-feet); minimum stage recorded, 2.0 feet at 2 p. m. September 29 (discharge, 280 second-feet).

Maximum stage recorded during year ending September 30, 1920, 13.45 feet at 8 a. m. April 21 (discharge, 8,950 second-feet); minimum stage, 2.2 feet at 2 p. m. October 1 (discharge, 330 second-feet).

1907–1915; 1918–1920: Maximum stage recorded, 25.5 feet at 3 p. m. December 22, 1918 (discharge, 22,200 second-feet); minimum stage recorded, 1.4 feet at 6 a. m. July 28, 1914 (discharge, 165 second-feet).

ICE.—None.

DIVERSIONS.—None.

REGULATION.—Operation of a number of small mills upstream may cause slight variations in stage during low water.

ACCURACY.—Stage-discharge relation practically permanent. Rating curve well defined between 360 and 7,000 second-feet; above that point should be used with caution. Gage read to hundredths once daily; oftener in times of floods. Daily discharge ascertained by applying mean daily gage height to rating table. Records good except those for low and high stages which are fair.

*Discharge measurements of Etowah River near Ball Ground, Ga., during the years ending Sept. 30, 1919 and 1920.*

| Date. | Made by— | Gage height. | Discharge. | Date. | Made by— | Gage height. | Discharge. |
|---|---|---|---|---|---|---|---|
| 1918. | | *Feet.* | *Sec.-ft.* | 1920 | | *Feet.* | *Sec.-ft.* |
| Nov. 26 | O. P. Hall | 2.97 | 626 | Apr. 3 | A. H. Condron | 9.55 | 5,120 |
| 30 | do | 4.10 | 1,170 | June 3 | Warren E. Hall and Condron | 4.52 | 1,350 |
| Dec. 13 | A. H. Condron | 3.15 | 694 | | | | |
| 1919. | | | | | | | |
| Apr. 7 | do | 4.60 | 1,460 | | | | |
| Oct. 3 | do | 2.46 | 407 | | | | |

*Daily discharge, in second-feet, of Etowah River near Ball Ground, Ga., for the years ending Sept. 30, 1919 and 1920.*

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1918–19. | | | | | | | | | | | | |
| 1 | ..... | ..... | 970 | 1,700 | 1,580 | 1,820 | 1,580 | 1,640 | 920 | 670 | 530 | 620 |
| 2 | ..... | ..... | 920 | 2,230 | 1,520 | 1,760 | 1,520 | 1,340 | 920 | 720 | 620 | 552 |
| 3 | ..... | ..... | 820 | 2,650 | 1,460 | 1,700 | 1,460 | 1,220 | 870 | 575 | 1,070 | 510 |
| 4 | ..... | ..... | 820 | 2,510 | 1,880 | 1,580 | 1,580 | 1,170 | 920 | 670 | 620 | 472 |
| 5 | ..... | ..... | 770 | 1,580 | 1,640 | 2,650 | 1,580 | 1,120 | 870 | 620 | 530 | 490 |
| 6 | ..... | ..... | 720 | 1,520 | 1,520 | 3,020 | 1,460 | 1,280 | 820 | 1,340 | 670 | 455 |
| 7 | ..... | ..... | 670 | 1,520 | 1,400 | 2,090 | 1,460 | 1,400 | 820 | 870 | 620 | 472 |
| 8 | ..... | ..... | 670 | 1,460 | 1,400 | 2,090 | 1,400 | 1,950 | 770 | 720 | 720 | 405 |
| 9 | ..... | ..... | 670 | 1,400 | 1,340 | 8,300 | 1,400 | 1,120 | 770 | 970 | 530 | 420 |
| 10 | ..... | ..... | 620 | 1,340 | 1,400 | 3,100 | 1,340 | 1,280 | 820 | 820 | 1,170 | 438 |
| 11 | ..... | ..... | 720 | 1,340 | 1,340 | 2,440 | 3,260 | 1,220 | 870 | 870 | 575 | 438 |
| 12 | ..... | ..... | 670 | 1,220 | 1,280 | 2,160 | 1,950 | 1,220 | 770 | 770 | 770 | 620 |
| 13 | ..... | ..... | 770 | 1,170 | 1,580 | 1,950 | 1,640 | 1,120 | 870 | 720 | 670 | 510 |
| 14 | ..... | ..... | 720 | 1,220 | 3,100 | 1,880 | 1,520 | 1,460 | 720 | 670 | 620 | 490 |
| 15 | ..... | ..... | 3,260 | 1,220 | 1,950 | 1,760 | 1,460 | 1,220 | 820 | 670 | 530 | 455 |
| 16 | ..... | ..... | 2,510 | 1,070 | 1,640 | 1,820 | 4,060 | 1,170 | 920 | 575 | 530 | 438 |
| 17 | ..... | ..... | 1,820 | 1,170 | 1,460 | 2,300 | 2,230 | 1,120 | 1,460 | 620 | 455 | 390 |
| 18 | ..... | ..... | 1,400 | 2,370 | 1,460 | 2,160 | 1,700 | 1,120 | 1,020 | 720 | 510 | 405 |
| 19 | ..... | ..... | 1,170 | 1,640 | 1,340 | 1,820 | 1,640 | 1,070 | 870 | 1,070 | 490 | 375 |
| 20 | ..... | ..... | 1,120 | 1,400 | 1,340 | 1,640 | 1,580 | 1,220 | 770 | 1,070 | 360 | 375 |
| 21 | ..... | ..... | 1,760 | 1,340 | 2,020 | 1,580 | 1,520 | 1,070 | 670 | 970 | 620 | 472 |
| 22 | ..... | ..... | 19,500 | 1,280 | 6,400 | 1,520 | 1,460 | 1,070 | 720 | 770 | 870 | 472 |
| 23 | ..... | ..... | 9,710 | 2,720 | 7,400 | 1,580 | 1,400 | 1,020 | 870 | 770 | 575 | 438 |
| 24 | ..... | ..... | 4,860 | 3,580 | 2,650 | 1,580 | 1,400 | 1,020 | 1,580 | 720 | 1,400 | 405 |
| 25 | ..... | 620 | 2,580 | 2,020 | 2,860 | 1,520 | 1,340 | 970 | 1,880 | 720 | 770 | 375 |
| 26 | ..... | 598 | 2,370 | 5,910 | 2,370 | 1,460 | 1,280 | 870 | 3,260 | 1,220 | 620 | 405 |
| 27 | ..... | 620 | 1,880 | 4,540 | 2,020 | 3,580 | 1,220 | 970 | 2,090 | 870 | 510 | 398 |
| 28 | ..... | 2,370 | 1,700 | 2,300 | 1,880 | 2,160 | 1,220 | 920 | 1,070 | 720 | 490 | 292 |
| 29 | ..... | 1,700 | 1,580 | 2,020 | ..... | 1,760 | 1,170 | 1,020 | 1,020 | 620 | 420 | 280 |
| 30 | ..... | 1,170 | 1,460 | 1,700 | ..... | 1,640 | 1,340 | 1,120 | 820 | 620 | 1,340 | 375 |
| 31 | ..... | ..... | 1,400 | 1,640 | ..... | 1,580 | ..... | 970 | ..... | 575 | 820 | ..... |
| 1919–20. | | | | | | | | | | | | |
| 1 | 330 | 490 | 820 | | 1,400 | 1,170 | 3,900 | 1,880 | 1,400 | 1,020 | 820 | 1,280 |
| 2 | 345 | 920 | 620 | | 1,400 | 1,340 | 7,800 | 1,820 | 1,400 | 1,070 | 820 | 1,120 |
| 3 | 420 | 575 | 575 | 700 | 2,860 | 1,220 | 5,730 | 3,020 | 1,400 | 1,340 | 820 | 1,070 |
| 4 | 620 | 530 | 575 | | 8,500 | 1,280 | 6,600 | 2,090 | 1,700 | 1,120 | 770 | 1,120 |
| 5 | 620 | 490 | 530 | | 3,820 | 3,020 | 4,620 | 1,820 | 2,440 | 1,020 | 1,020 | 1,070 |
| 6 | 405 | 455 | 575 | 620 | 1,220 | 1,820 | 3,100 | 2,090 | 1,400 | 1,580 | 770 | 1,020 |
| 7 | 405 | 455 | 1,070 | 770 | 2,160 | 1,520 | 2,790 | 1,820 | 1,340 | 1,220 | 720 | 1,020 |
| 8 | 420 | 455 | 2,020 | 1,820 | 1,880 | 1,460 | 2,510 | 1,820 | 1,340 | 1,020 | 720 | 1,700 |
| 9 | 770 | 420 | 4,700 | 2,020 | 1,760 | 1,340 | 4,860 | 1,700 | 1,280 | 970 | 2,090 | 1,580 |
| 10 | 530 | 438 | 6,800 | 1,580 | 1,700 | 1,340 | 3,740 | 1,700 | 1,220 | 920 | 2,790 | 1,820 |
| 11 | 390 | 670 | 4,300 | 1,120 | 1,580 | 1,460 | 2,650 | 1,580 | 1,220 | 1,220 | 2,650 | 1,340 |
| 12 | 360 | 1,520 | 2,020 | 1,020 | 1,580 | 5,190 | 2,510 | 1,640 | 1,220 | 1,400 | 2,720 | 1,170 |
| 13 | 620 | 670 | 1,700 | 1,020 | 1,700 | 4,380 | 2,650 | 8,100 | 1,170 | 920 | 4,220 | 1,170 |
| 14 | 530 | 970 | 1,950 | 920 | 1,640 | 2,370 | 2,280 | 2,720 | 1,120 | 920 | 7,700 | 1,070 |
| 15 | 455 | 770 | 1,520 | 870 | 1,520 | 2,020 | 2,230 | 2,090 | 1,120 | 970 | 3,420 | 1,020 |
| 16 | 420 | 620 | 1,280 | 920 | 1,580 | 1,820 | 2,370 | 1,880 | 1,120 | 1,340 | 2,650 | 1,020 |
| 17 | 720 | 575 | 1,220 | 1,820 | 1,340 | 3,180 | 3,100 | 1,760 | 1,120 | 1,700 | 1,820 | 970 |
| 18 | 620 | 575 | 1,700 | 1,220 | 1,400 | 2,510 | 2,020 | 2,300 | 1,070 | 1,640 | 2,160 | 920 |
| 19 | 490 | 552 | 1,120 | 1,120 | 1,340 | 5,820 | 2,090 | 2,440 | 1,220 | 1,580 | 2,940 | 920 |
| 20 | 455 | 530 | 1,520 | 1,020 | 1,340 | 3,740 | 2,020 | 1,950 | 2,370 | 1,460 | 3,340 | 870 |
| 21 | 490 | 510 | 1,220 | 1,020 | 1,220 | 4,780 | 8,900 | 2,020 | 2,090 | 1,520 | 2,020 | 820 |
| 22 | 920 | 490 | 1,120 | 1,020 | 4,780 | 1,950 | 2,650 | 1,950 | 1,340 | 1,700 | 1,640 | 820 |
| 23 | 2,650 | 490 | 1,070 | 1,020 | 3,100 | 1,820 | 2,510 | 1,700 | 1,340 | 1,120 | 1,460 | 820 |
| 24 | 1,520 | 490 | 1,020 | 4,860 | 2,300 | 1,820 | 2,090 | 1,640 | 1,580 | 1,020 | 1,400 | 820 |
| 25 | 820 | 490 | 970 | 3,580 | 2,160 | 1,760 | 2,020 | 1,580 | 1,220 | 970 | 1,349 | 1,020 |
| 26 | 670 | 575 | 920 | 4,380 | 1,950 | 3,660 | 2,090 | 1,700 | 1,120 | 920 | 1,220 | 820 |
| 27 | 575 | 575 | 920 | 5,190 | 1,520 | 2,090 | 2,940 | 2,230 | 1,120 | 820 | 1,120 | 820 |
| 28 | 530 | 490 | 870 | 2,720 | 1,460 | 4,540 | 2,440 | 2,440 | 1,020 | 870 | 1,460 | 770 |
| 29 | 510 | 510 | 870 | 2,090 | 1,340 | 6,900 | 2,230 | 1,580 | 1,120 | 820 | 1,460 | 770 |
| 30 | 472 | 1,280 | 820 | 1,820 | ..... | 3,260 | 2,090 | 1,520 | 1,020 | 820 | 1,280 | 820 |
| 31 | 490 | ..... | 750 | 1,640 | ..... | 2,370 | ..... | 1,460 | ..... | 820 | 1,460 | ..... |

NOTE.—Discharge, Dec. 31, 1919, and Jan. 1–5, 1920, estimated by comparison with records of flow near Rome; gage not read.

*Monthly discharge of Etowah River near Ball Ground, Ga., for the years ending Sept. 30, 1919 and 1920.*

[Drainage area, 466 square miles.]

| Month. | Discharge in second-feet. | | | | Run-off in inches. |
|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square mile. | |
| 1918–19. | | | | | |
| November 25–30 | 2,370 | 598 | 1,180 | 2.53 | 0.56 |
| December | 19,500 | 620 | 2,280 | 4.89 | 5.64 |
| January | 5,910 | 1,070 | 1,960 | 4.21 | 4.85 |
| February | 7,400 | 1,280 | 2,120 | 4.55 | 4.74 |
| March | 8,300 | 1,460 | 2,190 | 4.70 | 5.42 |
| April | 4,060 | 1,170 | 1,640 | 3.52 | 3.93 |
| May | 1,950 | 870 | 1,180 | 2.53 | 2.92 |
| June | 3,260 | 670 | 1,050 | 2.25 | 2.51 |
| July | 1,340 | 575 | 784 | 1.68 | 1.94 |
| August | 1,400 | 360 | 678 | 1.45 | 1.67 |
| September | 620 | 280 | 441 | .946 | 1.06 |
| 1919–20. | | | | | |
| October | 2,650 | 330 | 631 | 1.35 | 1.56 |
| November | 1,520 | 420 | 619 | 1.33 | 1.48 |
| December | 6,800 | 530 | 1,500 | 3.22 | 3.71 |
| January | 5,190 | 620 | 1,640 | 3.52 | 4.06 |
| February | 8,500 | 1,220 | 2,120 | 4.55 | 4.91 |
| March | 6,900 | 1,170 | 2,680 | 5.75 | 6.63 |
| April | 8,900 | 2,020 | 3,320 | 7.12 | 7.94 |
| May | 8,100 | 1,460 | 2,130 | 4.57 | 5.27 |
| June | 2,440 | 1,020 | 1,350 | 2.90 | 3.24 |
| July | 1,700 | 820 | 1,160 | 2.49 | 2.87 |
| August | 7,700 | 720 | 1,960 | 4.21 | 4.85 |
| September | 1,820 | 770 | 1,050 | 2.25 | 2.51 |
| The year | 8,900 | 330 | 1,680 | 3.61 | 49.06 |

### ETOWAH RIVER NEAR ROME, GA.

LOCATION.—At Freemans Ferry, a railroad stop on Nashville, Chattanooga & St. Louis Railway branch line from Kingston to Rome, Ga., 1 mile downstream from mouth of Dikes Creek and 5 miles upstream from Rome, Floyd County, where Etowah and Oostanaula rivers unite to form Coosa River.

DRAINAGE AREA.—1,800 square miles.

RECORDS AVAILABLE.—August 17, 1904, to September 30, 1920.

GAGE.—Vertical staff in three sections on left bank 250 feet downstream from ferry; read by R. M. Pattillo and D. F. Ellis.

DISCHARGE MEASUREMENTS.—Made from boat held in place by ferry cable. Measurements can not be made at high water.

CHANNEL AND CONTROL.—Bed composed of rock, boulders, and gravel; practically permanent. Banks subject to overflow at extremely high stages. A shoal immediately below gage forms control.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year ending September 30, 1919, 21.9 feet at midnight December 23 (discharge, 36,200 second-feet); minimum stage, 1.5 feet at 7 a. m. and 6 p. m. October 11–13, 19, and 20 (discharge, 625 second-feet).

Maximum stage recorded during year ending September 30, 1920, 28.0 feet at 7 a. m. December 11 (discharge, 47,200 second-feet); minimum stage recorded, 1.5 feet at 6 p. m. October 2 and 7 a. m. October 3 (discharge, 625 second-feet).

1904–1920: Maximum stage recorded, 28.0 feet at 7 a. m. December 11, 1919 (discharge, 47,200 second-feet); minimum stage recorded, 1.2 feet October 10 and 24, 1904 (discharge, 360 second-feet).

ICE.—Stage-discharge relation not affected by ice.

REGULATION.—The operation of a few sawmills upstream apparently has no effect on flow.

ACCURACY.—Stage-discharge relation permanent. Rating curve fairly well defined below 4,400 second-feet and extended tangent above that point. Gage read to half-tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records fairly good below 4,400 second-feet; determinations above that point subject to error.

*Discharge measurements of Etowah River near Rome, Ga., during the years ending Sept. 30, 1919 and 1920.*

| Date. | Made by— | Gage height. | Discharge. | Date. | Made by— | Gage height. | Discharge. |
|---|---|---|---|---|---|---|---|
| 1918. | | *Feet.* | *Sec.-ft.* | 1919. | | *Feet.* | *Sec.-ft.* |
| Oct. 17 | A. H. Condron | 1.75 | [a] 952 | Jan. 7 | A. H. Condron | 4.06 | 3,920 |
| Dec. 18 | O. P. Hall | 3.66 | [a] 3,690 | Oct. 15 | do | 2.10 | 1,220 |
| 19 | do | 3.31 | [a] 3,180 | 17 | do | 2.00 | 1,110 |

[a] Measurement made from ferry boat. Measured discharge too large because velocity determined at two-tenths of depth was excessive owing to influence of ferry boat.

*Daily discharge, in second-feet, of Etowah River near Rome, Ga., for the years ending Sept. 30, 1919 and 1920.*

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1918–19. | | | | | | | | | | | | |
| 1 | 1,300 | 10,300 | 2,640 | 3,820 | 4,180 | 5,440 | 3,640 | 3,470 | 3,300 | 1,790 | 1,420 | 2,260 |
| 2 | 1,090 | 2,960 | 2,200 | 6,520 | 4,000 | 4,720 | 3,640 | 3,300 | 2,960 | 1,660 | 1,360 | 2,060 |
| 3 | 1,090 | 2,490 | 2,060 | 14,100 | 4,000 | 3,820 | 3,470 | 3,130 | 2,340 | 1,600 | 2,640 | 2,060 |
| 4 | 990 | 2,340 | 2,060 | 10,300 | 4,360 | 3,300 | 3,470 | 2,960 | 2,200 | 1,540 | 1,660 | 1,920 |
| 5 | 895 | 2,200 | 2,060 | 6,700 | 4,360 | 7,240 | 3,470 | 2,800 | 2,200 | 3,640 | 1,540 | 1,790 |
| 6 | 848 | 2,060 | 1,920 | 4,540 | 4,000 | 10,300 | 3,300 | 2,640 | 2,060 | 2,640 | 1,420 | 1,660 |
| 7 | 800 | 2,060 | 1,920 | 4,000 | 4,000 | 8,320 | 3,300 | 2,640 | 2,060 | 1,920 | 1,360 | 1,600 |
| 8 | 755 | 2,060 | 1,790 | 3,820 | 3,820 | 7,240 | 3,300 | 2,960 | 2,060 | 1,790 | 3,130 | 1,540 |
| 9 | 710 | 1,920 | 1,790 | 3,640 | 3,470 | 27,900 | 3,130 | 3,820 | 2,060 | 1,660 | 2,490 | 1,420 |
| 10 | 668 | 1,790 | 1,790 | 3,470 | 3,300 | 27,800 | 2,960 | 3,300 | 1,920 | 1,660 | 1,790 | 1,300 |
| 11 | 625 | 1,790 | 1,660 | 3,300 | 2,960 | 12,800 | 7,780 | 2,960 | 1,920 | 1,790 | 1,540 | 1,200 |
| 12 | 625 | 1,660 | 1,660 | 2,960 | 2,960 | 6,880 | 7,600 | 2,640 | 1,790 | 1,790 | 2,060 | 1,790 |
| 13 | 625 | 1,600 | 1,600 | 2,960 | 4,900 | 5,620 | 4,360 | 2,490 | 1,790 | 1,600 | 1,790 | 1,540 |
| 14 | 990 | 1,540 | 3,130 | 2,960 | 8,500 | 5,260 | 3,640 | 4,360 | 1,790 | 1,540 | 1,480 | 1,540 |
| 15 | 1,200 | 1,540 | 8,320 | 2,800 | 6,160 | 4,900 | 3,470 | 3,470 | 1,790 | 1,540 | 1,360 | 1,480 |
| 16 | 800 | 2,200 | 6,880 | 2,960 | 4,720 | 4,720 | 7,960 | 2,640 | 1,660 | 1,480 | 1,360 | 1,420 |
| 17 | 710 | 2,960 | 4,360 | 3,640 | 4,000 | 9,040 | 9,400 | 2,490 | 2,640 | 1,420 | 2,200 | 1,420 |
| 18 | 668 | 2,340 | 3,640 | 7,240 | 3,640 | 8,680 | 6,160 | 2,490 | 4,000 | 1,420 | 1,920 | 1,300 |
| 19 | 625 | 2,060 | 2,640 | 6,160 | 3,470 | 5,800 | 4,360 | 2,340 | 3,300 | 4,000 | 1,660 | 1,300 |
| 20 | 625 | 1,790 | 2,060 | 4,360 | 3,300 | 4,900 | 4,000 | 2,340 | 2,960 | 3,470 | 1,540 | 1,200 |
| 21 | 1,300 | 1,790 | 4,720 | 3,470 | 5,440 | 4,360 | 3,640 | 2,340 | 3,300 | 2,200 | 1,420 | 1,200 |
| 22 | 1,140 | 1,790 | 23,800 | 3,640 | 15,900 | 4,180 | 3,300 | 2,340 | 3,820 | 1,790 | 1,790 | 1,360 |
| 23 | 990 | 1,660 | 33,900 | 12,300 | 26,300 | 4,000 | 3,130 | 2,340 | 4,720 | 1,790 | 1,790 | 1,480 |
| 24 | 990 | 1,660 | 31,700 | 15,500 | 17,000 | 4,000 | 3,130 | 2,340 | 5,080 | 2,060 | 1,480 | 1,250 |
| 25 | 5,440 | 1,660 | 19,100 | 9,400 | 11,000 | 3,820 | 3,130 | 2,200 | 4,000 | 2,200 | 1,790 | 1,040 |
| 26 | 4,360 | 1,600 | 11,000 | 22,500 | 12,100 | 3,640 | 3,130 | 2,200 | 3,300 | 2,340 | 2,640 | 995 |
| 27 | 2,800 | 1,540 | 7,600 | 20,600 | 8,140 | 5,800 | 3,130 | 2,200 | 5,620 | 2,060 | 1,660 | 800 |
| 28 | 2,340 | 3,470 | 4,720 | 9,400 | 5,800 | 7,780 | 2,960 | 2,060 | 6,340 | 1,790 | 1,540 | 710 |
| 29 | 12,600 | 10,160 | 3,640 | 6,160 | ..... | 5,260 | 2,960 | 2,060 | 3,300 | 1,600 | 1,420 | 710 |
| 30 | 31,000 | 5,440 | 3,300 | 5,260 | ..... | 4,360 | 2,960 | 2,060 | 2,060 | 1,540 | 2,060 | 710 |
| 31 | 30,300 | ..... | 2,960 | 4,540 | ..... | 3,820 | ..... | 2,340 | ..... | 1,480 | 2,800 | ..... |

*Daily discharge, in second-feet, of Etowah River near Rome, Ga., for the years ending Sept. 30, 1919 and 1920*—Continued.

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1919-20. | | | | | | | | | | | | |
| 1 | 668 | 1,090 | 1,420 | 1,660 | 5,080 | 3,130 | 12,600 | 4,720 | 3,470 | 2,340 | 2,060 | 2,960 |
| 2 | 625 | 1,090 | 1,300 | 1,790 | 4,540 | 2,490 | 32,600 | 4,540 | 3,300 | 2,340 | 2,060 | 2,640 |
| 3 | 1,090 | 1,090 | 1,250 | 1,660 | 12,100 | 2,490 | 34,400 | 11,900 | 3,130 | 16,600 | 2,060 | 2,640 |
| 4 | 1,480 | 1,040 | 1,200 | 1,790 | 29,000 | 3,300 | 26,500 | 11,900 | 6,340 | 7,960 | 2,060 | 2,490 |
| 5 | 1,300 | 1,040 | 1,200 | 1,660 | 26,100 | 5,260 | 26,500 | 7,240 | 10,800 | 4,000 | 1,790 | 2,340 |
| 6 | 1,300 | 990 | 1,140 | 1,660 | 17,300 | 4,540 | 24,900 | 5,800 | 7,960 | 3,130 | 1,790 | 2,340 |
| 7 | 1,200 | 990 | 3,130 | 1,790 | 11,600 | 4,000 | 22,700 | 5,440 | 6,160 | 2,800 | 1,920 | 2,340 |
| 8 | 1,200 | 990 | 5,260 | 4,000 | 7,240 | 3,820 | 18,400 | 4,720 | 4,000 | 2,340 | 2,060 | 2,340 |
| 9 | 1,140 | 990 | 30,600 | 4,000 | 5,440 | 3,820 | 20,600 | 4,360 | 3,470 | 2,340 | 4,360 | 2,340 |
| 10 | 1,140 | 1,040 | 40,400 | 3,820 | 4,360 | 3,640 | 19,800 | 4,180 | 3,130 | 2,960 | 7,240 | 2,340 |
| 11 | 1,140 | 2,060 | 46,300 | 3,640 | 4,540 | 3,640 | 11,200 | 4,180 | 3,130 | 4,360 | 9,760 | 2,340 |
| 12 | 1,140 | 2,490 | 31,900 | 2,340 | 5,080 | 5,080 | 7,960 | 4,000 | 2,960 | 3,820 | 15,700 | 2,340 |
| 13 | 1,090 | 2,340 | 25,600 | 2,340 | 5,800 | 14,800 | 7,420 | 12,600 | 2,960 | 3,640 | 11,900 | 2,200 |
| 14 | 1,090 | 2,060 | 11,200 | 2,340 | 5,080 | 11,400 | 7,240 | 20,600 | 2,800 | 3,470 | 11,200 | 3,640 |
| 15 | 1,090 | 1,790 | 5,260 | 2,200 | 4,360 | 5,800 | 6,700 | 11,200 | 2,640 | 3,300 | 11,200 | 4,000 |
| 16 | 1,090 | 1,540 | 4,180 | 2,340 | 4,000 | 4,720 | 6,520 | 7,060 | 2,490 | 5,080 | 10,300 | 2,800 |
| 17 | 1,090 | 1,420 | 3,470 | 4,360 | 3,820 | 11,600 | 6,520 | 5,440 | 2,340 | 4,900 | 11,900 | 2,340 |
| 18 | 1,090 | 1,420 | 3,130 | 4,000 | 3,820 | 13,000 | 5,800 | 6,880 | 2,340 | 4,720 | 16,600 | 2,200 |
| 19 | 1,200 | 1,360 | 2,960 | 3,640 | 4,000 | 12,600 | 5,260 | 6,880 | 2,340 | 5,080 | 15,200 | 2,200 |
| 20 | 1,090 | 1,300 | 2,960 | 2,960 | 3,300 | 18,200 | 4,900 | 5,800 | 3,130 | 7,960 | 13,700 | 2,060 |
| 21 | 990 | 1,250 | 2,800 | 2,340 | 3,130 | 10,800 | 22,900 | 5,080 | 5,800 | 7,240 | 11,600 | 2,060 |
| 22 | 1,040 | 1,200 | 2,640 | 2,340 | 3,300 | 5,620 | 17,000 | 4,720 | 4,720 | 5,440 | 9,760 | 2,060 |
| 23 | 3,300 | 1,200 | 2,640 | 2,340 | 12,800 | 4,900 | 9,400 | 4,540 | 3,640 | 3,470 | 8,860 | 2,060 |
| 24 | 6,520 | 1,140 | 2,490 | 13,700 | 7,240 | 4,720 | 7,420 | 4,360 | 3,300 | 2,340 | 7,960 | 2,340 |
| 25 | 4,360 | 1,090 | 2,340 | 21,300 | 5,620 | 4,900 | 5,800 | 4,180 | 3,130 | 2,340 | 6,880 | 2,200 |
| 26 | 2,340 | 1,090 | 2,340 | 22,000 | 4,540 | 9,760 | 5,080 | 4,000 | 2,960 | 2,340 | 5,440 | 2,340 |
| 27 | 1,600 | 1,040 | 2,200 | 27,400 | 4,000 | 7,600 | 5,440 | 3,820 | 2,800 | 2,200 | 4,000 | 2,200 |
| 28 | 1,360 | 1,090 | 2,200 | 18,800 | 3,470 | 8,320 | 9,400 | 3,820 | 2,640 | 2,060 | 5,260 | 1,920 |
| 29 | 1,250 | 1,480 | 2,060 | 12,300 | 3,470 | 19,800 | 7,060 | 3,640 | 2,490 | 2,060 | 5,440 | 1,790 |
| 30 | 1,200 | 1,540 | 1,920 | 7,600 | ..... | 17,700 | 5,260 | 3,640 | 2,340 | 2,060 | 3,640 | 1,660 |
| 31 | 1,200 | ..... | 1,790 | 5,080 | ..... | 9,040 | ..... | 3,470 | ..... | 2,060 | 2,960 | ..... |

*Monthly discharge of Etowah River near Rome, Ga., for the years ending Sept. 30, 1919 and 1920.*

[Drainage area, 1,800 square miles.]

| Month. | Discharge in second-feet. | | | | Run-off in inches. |
|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square mile. | |
| 1918-19. | | | | | |
| October | 31,000 | 625 | 3,550 | 1.97 | 2.27 |
| November | 10,300 | 1,540 | 2,680 | 1.49 | 1.66 |
| December | 33,900 | 1,600 | 6,540 | 3.63 | 4.18 |
| January | 22,500 | 2,800 | 6,870 | 3.82 | 4.40 |
| February | 26,300 | 2,960 | 6,640 | 3.69 | 3.84 |
| March | 27,900 | 3,300 | 7,280 | 4.04 | 4.66 |
| April | 9,400 | 2,960 | 4,130 | 2.29 | 2.56 |
| May | 4,360 | 2,060 | 2,700 | 1.50 | 1.73 |
| June | 6,340 | 1,660 | 2,940 | 1.63 | 1.82 |
| July | 4,000 | 1,420 | 1,960 | 1.09 | 1.26 |
| August | 3,130 | 1,360 | 1,810 | 1.00 | 1.15 |
| September | 2,200 | 710 | 1,400 | .778 | .87 |
| The year | 33,900 | 625 | 4,030 | 2.24 | 30.40 |
| 1919-20. | | | | | |
| October | 6,520 | 625 | 1,530 | .850 | .98 |
| November | 2,490 | 990 | 1,340 | .744 | .83 |
| December | 46,300 | 1,140 | 8,040 | 4.47 | 5.15 |
| January | 27,400 | 1,660 | 6,100 | 3.39 | 3.91 |
| February | 29,000 | 3,130 | 7,380 | 4.10 | 4.42 |
| March | 19,800 | 2,490 | 7,760 | 4.31 | 4.97 |
| April | 34,400 | 4,900 | 13,400 | 7.44 | 8.30 |
| May | 20,600 | 3,470 | 6,280 | 3.49 | 4.02 |
| June | 10,800 | 2,340 | 3,760 | 2.09 | 2.33 |
| July | 16,600 | 2,060 | 4,090 | 2.27 | 2.62 |
| August | 16,600 | 1,790 | 7,310 | 4.06 | 4.68 |
| September | 4,000 | 1,660 | 2,380 | 1.32 | 1.47 |
| The year | 46,300 | 625 | 5,780 | 3.21 | 43.68 |

### LONGSWAMP CREEK NEAR BALL GROUND, GA.

LOCATION.—At wooden wagon bridge half a mile upstream from mouth of creek that enters Etowah River one-fourth mile above gaging station on that river. Bridge is 2 miles southeast of Ball Ground, Cherokee County.

DRAINAGE AREA.—74 square miles (measured on topographic maps).

RECORDS AVAILABLE.—November 30, 1918, to September 30, 1920.

GAGE.—A vertical rod with enameled face, spiked to downstream post of left-hand bridge bent. Gage read by Miss Effie Wyatt.

DISCHARGE MEASUREMENTS.—Made from downstream side of 3-span open wooden wagon bridge to which gage is attached.

CHANNEL AND CONTROL.—Channel straight for several hundred feet above and below bridge. Bed smooth and sandy; section very shallow at low water; current swift. Control is formed by a gravel and boulder shoal 300 feet downstream. Though gage is only half a mile above junction with Etowah River it is believed that there will seldom, if ever, be backwater from the river, as there seems to be considerable fall on creek below gage.

EXTREMES OF DISCHARGE.—Maximum stage recorded November 30, 1918, to September 30, 1919, 17.5 feet at 7 a. m. December 22 (discharge, 3,540 second-feet); minimum stage recorded, 0.18 foot at 7 a. m. September 26–30 (discharge, 22 second-feet).

Maximum stage recorded during year ending September 30, 1920, 16.7 feet at 7 a. m. December 9 (discharge, 3,310 second-feet); minimum stage recorded, 0.34 foot at 5 p. m. October 3 (discharge, 35 second-feet).

ICE.—None.

DIVERSIONS.—None.

REGULATION.—Though there are one or more small water plants upstream the daily fluctuation seems to be negligible.

ACCURACY.—Stage-discharge relation practically permanent. Rating curve well defined between 30 and 800 second-feet; extended above 800 second-feet on basis of run-off of Etowah River near Ball Ground, Ga. Gage read to hundredths once daily. Daily discharge ascertained by applying daily gage height to rating table. Records good, except those for stages above 800 second-feet which are subject to error.

*Discharge measurements of Longswamp Creek near Ball Ground, Ga., during the years ending Sept. 30, 1919 and 1920.*

| Date. | Made by— | Gage height. | Discharge. | Date. | Made by— | Gage height. | Discharge. |
|---|---|---|---|---|---|---|---|
| 1918. | | *Feet.* | *Sec.-ft.* | 1919. | | *Feet.* | *Sec.-ft.* |
| Nov. 26 | O. P. Hall | 0.75 | 74 | Oct. 2 | A. H. Condron | 0.38 | 37.5 |
| 30 | do | 1.20 | 132 | 3 | do | .51 | 49.9 |
| Dec. 13 | A. H. Condron | .80 | 103 | 1920. | | | |
| 1919. | | | | Apr. 3 | do | 5.00 | 691 |
| Apr. 7 | do | 1.64 | 188 | June 3 | Warren E. Hall and A. H. Condron | 1.85 | 203 |

*Daily discharge, in second-feet, of Longswamp Creek near Ball Ground, Ga., for the years ending Sept. 30, 1919 and 1920.*

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1918-19. | | | | | | | | | | | | |
| 1 | ..... | ..... | 110 | 204 | 217 | 230 | 204 | 230 | 140 | 98 | 70 | 92 |
| 2 | ..... | ..... | 98 | 328 | 191 | 204 | 178 | 191 | 92 | 86 | 76 | 81 |
| 3 | ..... | ..... | 92 | 658 | 204 | 204 | 191 | 165 | 92 | 86 | 81 | 76 |
| 4 | ..... | ..... | 81 | 314 | 230 | 204 | 204 | 165 | 86 | 81 | 76 | 64 |
| 5 | ..... | ..... | 86 | 230 | 178 | 217 | 191 | 152 | 86 | 81 | 70 | 64 |
| 6 | ..... | ..... | 81 | 204 | 178 | 478 | 191 | 191 | 76 | 98 | 64 | 59 |
| 7 | ..... | ..... | 81 | 191 | 165 | 272 | 178 | 178 | 81 | 81 | 70 | 59 |
| 8 | ..... | ..... | 76 | 191 | 146 | 244 | 178 | 178 | 70 | 86 | 86 | 54 |
| 9 | ..... | ..... | 81 | 191 | 178 | 1,420 | 191 | 178 | 81 | 92 | 92 | 54 |
| 10 | ..... | ..... | 81 | 178 | 165 | 478 | 191 | 165 | 81 | 81 | 286 | 54 |
| 11 | ..... | ..... | 104 | 178 | 165 | 342 | 641 | 158 | 76 | 81 | 92 | 49 |
| 12 | ..... | ..... | 86 | 165 | 165 | 272 | 258 | 134 | 70 | 76 | 81 | 191 |
| 13 | ..... | ..... | 92 | 178 | 191 | 258 | 217 | 140 | 92 | 76 | 86 | 59 |
| 14 | ..... | ..... | 92 | 178 | 342 | 258 | 217 | 158 | 76 | 76 | 70 | 49 |
| 15 | ..... | ..... | 342 | 152 | 230 | 244 | 178 | 152 | 86 | 76 | 76 | 44 |
| 16 | ..... | ..... | 462 | 152 | 204 | 230 | 854 | 134 | 110 | 64 | 86 | 47 |
| 17 | ..... | ..... | 230 | 217 | 204 | 230 | 370 | 140 | 140 | 70 | 81 | 38 |
| 18 | ..... | ..... | 191 | 230 | 165 | 286 | 272 | 152 | 98 | 70 | 76 | 34 |
| 19 | ..... | ..... | 178 | 191 | 165 | 244 | 230 | 152 | 92 | 104 | 70 | 30 |
| 20 | ..... | ..... | 158 | 178 | 152 | 230 | 230 | 152 | 92 | 104 | 70 | 30 |
| 21 | ..... | ..... | 944 | 178 | 217 | 230 | 217 | 140 | 86 | 104 | 64 | 26 |
| 22 | ..... | ..... | 3,230 | 152 | 1,440 | 204 | 178 | 134 | 76 | 86 | 98 | 30 |
| 23 | ..... | ..... | 1,380 | 692 | 1,140 | 204 | 191 | 140 | 81 | 116 | 81 | 30 |
| 24 | ..... | ..... | 675 | 446 | 328 | 204 | 178 | 122 | 286 | 81 | 92 | 26 |
| 25 | ..... | ..... | 356 | 272 | 400 | 191 | 178 | 128 | 300 | 92 | 104 | 26 |
| 26 | ..... | ..... | 258 | 1,160 | 300 | 204 | 165 | 128 | 98 | 98 | 81 | 22 |
| 27 | ..... | ..... | 217 | 430 | 244 | 692 | 158 | 128 | 300 | 98 | 81 | 22 |
| 28 | ..... | ..... | 204 | 272 | 217 | 300 | 140 | 110 | 110 | 86 | 70 | 22 |
| 29 | ..... | ..... | 191 | 258 | ..... | 272 | 146 | 104 | 116 | 92 | 70 | 22 |
| 30 | ..... | 128 | 178 | 230 | ..... | 230 | 140 | 116 | 98 | 81 | 224 | 22 |
| 31 | ..... | ..... | 165 | 217 | ..... | 217 | ..... | 104 | ..... | 81 | 104 | ..... |
| 1919-20. | | | | | | | | | | | | |
| 1 | 40 | 54 | 70 | 104 | 204 | 191 | 607 | 258 | 230 | 146 | 116 | 152 |
| 2 | 40 | 92 | 59 | 92 | 178 | 178 | 2,220 | 244 | 217 | 140 | 110 | 146 |
| 3 | 40 | 59 | 59 | 92 | 217 | 165 | 926 | 356 | 140 | 217 | 110 | 152 |
| 4 | 59 | 59 | 59 | 81 | 1,560 | 165 | 980 | 272 | 342 | 230 | 104 | 152 |
| 5 | 40 | 54 | 59 | 76 | 607 | 430 | 710 | 272 | 356 | 152 | 104 | 146 |
| 6 | 40 | 54 | 59 | 76 | 385 | 244 | 446 | 272 | 230 | 146 | 104 | 146 |
| 7 | 44 | 49 | 178 | 110 | 314 | 217 | 430 | 272 | 204 | 178 | 104 | 140 |
| 8 | 40 | 54 | 328 | 230 | 272 | 128 | 370 | 272 | 204 | 152 | 92 | 140 |
| 9 | 104 | 49 | 3,310 | 204 | 244 | 191 | 764 | 272 | 191 | 146 | 217 | 165 |
| 10 | 49 | 49 | 3,260 | 178 | 230 | 191 | 590 | 230 | 178 | 140 | 300 | 286 |
| 11 | 49 | 92 | 462 | 134 | 230 | 178 | 400 | 230 | 178 | 165 | 314 | 178 |
| 12 | 44 | 128 | 258 | 122 | 178 | 191 | 370 | 217 | 165 | 314 | 286 | 152 |
| 13 | 70 | 92 | 178 | 116 | 258 | 692 | 356 | 2,050 | 165 | 146 | 328 | 146 |
| 14 | 59 | 70 | 244 | 104 | 217 | 204 | 328 | 478 | 165 | 140 | 1,460 | 140 |
| 15 | 49 | 70 | 165 | 104 | 204 | 204 | 314 | 356 | 165 | 140 | 590 | 140 |
| 16 | 47 | 64 | 152 | 128 | 191 | 258 | 314 | 314 | 152 | 244 | 370 | 146 |
| 17 | 70 | 59 | 140 | 314 | 178 | 446 | 314 | 300 | 165 | 152 | 272 | 128 |
| 18 | 49 | 59 | 128 | 178 | 178 | 342 | 300 | 300 | 152 | 356 | 272 | 128 |
| 19 | 49 | 59 | 140 | 146 | 178 | 926 | 300 | 342 | 165 | 272 | 286 | 128 |
| 20 | 49 | 59 | 217 | 134 | 165 | 590 | 286 | 300 | 314 | 204 | 836 | 128 |
| 21 | 47 | 59 | 165 | 134 | 165 | 356 | 1,380 | 286 | 204 | 165 | 314 | 116 |
| 22 | 92 | 54 | 146 | 122 | 1,140 | 314 | 328 | 300 | 165 | 300 | 258 | 116 |
| 23 | 191 | 59 | 128 | 122 | 590 | 272 | 446 | 286 | 191 | 178 | 217 | 116 |
| 24 | 204 | 59 | 128 | 890 | 300 | 258 | 286 | 272 | 286 | 152 | 191 | 116 |
| 25 | 81 | 59 | 116 | 574 | 258 | 258 | 272 | 258 | 178 | 146 | 178 | 128 |
| 26 | 70 | 70 | 104 | 764 | 217 | 446 | 286 | 272 | 165 | 140 | 152 | 116 |
| 27 | 59 | 59 | 104 | 782 | 204 | 272 | 400 | 258 | 152 | 140 | 152 | 116 |
| 28 | 59 | 59 | 104 | 370 | 191 | 342 | 314 | 286 | 152 | 134 | 217 | 110 |
| 29 | 59 | 59 | 104 | 286 | 204 | 1,090 | 286 | 258 | 152 | 128 | 244 | 104 |
| 30 | 54 | 104 | 98 | 244 | ..... | 286 | 272 | 230 | 146 | 122 | 178 | 104 |
| 31 | 54 | ..... | 98 | 217 | ..... | 328 | ..... | 230 | ..... | 116 | 178 | ..... |

NOTE.—Discharge, Dec. 21-25, 1918, determined from mean daily gage heights ascertained from graph constructed on basis of one reading of gage per day.

Maximum stage recorded during year ending September 30, 1920, 33.3 feet at noon December 11 determined with level from flood mark shortly after flood (discharge, 104,000 second-feet); minimum stage recorded, 0.2 foot at 7 a.m. and 5 p.m. October 1 (discharge, 580 second-feet).

1900–1920: Maximum stage recorded, 33.3 feet at noon December 11, 1919 (discharge, 104,000 second-feet); minimum stage recorded, −0.2 foot (old gage) October 25–29, 1904 (discharge, 250 second-feet.)

ICE.—Stage-discharge relation not affected by ice.

REGULATION.—Practically none.

ACCURACY.—Stage-discharge relation permannent. Rating curve well defined between 300 and 30,000 second-feet; extended above 30,000 second-feet on basis of crest run-off of Chattahoochee River during flood of December 11, 1919. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

*Discharge measurements of Tallapoosa River at Sturdivant, Ala., during the year ending Sept. 30, 1919.*

[Made by A. H. Condron.]

| Date. | Gage height. | Discharge. |
|---|---|---|
| | *Feet.* | *Sec-ft.* |
| Feb. 27 | 7.35 | 12,100 |
| Mar. 11 | 11.80 | 26,600 |

NOTE.—No discharge measurements were made at this station during the year ending Sept. 30, 1920.

*Daily discharge, in second-feet, of Tallapoosa River at Sturdivant, Ala., for the years ending Sept. 30, 1919 and 1920.*

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1918–19. | | | | | | | | | | | | |
| 1 | 2,880 | 13,900 | 5,220 | 4,000 | 5,220 | 8,000 | 5,010 | 3,310 | 6,900 | 2,270 | 1,680 | 2,500 |
| 2 | 1,770 | 8,440 | 4,190 | 4,190 | 5,010 | 6,690 | 4,800 | 4,000 | 6,900 | 1,860 | 3,310 | 1,860 |
| 3 | 1,340 | 3,640 | 3,310 | 12,500 | 4,800 | 6,060 | 4,590 | 3,470 | 5,430 | 1,680 | 3,020 | 1,590 |
| 4 | 1,260 | 2,750 | 1,960 | 12,300 | 5,640 | 5,640 | 4,390 | 3,020 | 4,190 | 1,590 | 2,270 | 1,420 |
| 5 | 1,110 | 2,160 | 2,620 | 8,220 | 5,640 | 7,340 | 4,800 | 3,020 | 4,390 | 1,770 | 1,860 | 1,340 |
| 6 | 875 | 1,960 | 2,380 | 6,270 | 5,220 | 13,400 | 4,590 | 3,310 | 3,470 | 2,750 | 2,160 | 1,260 |
| 7 | 790 | 1,960 | 2,270 | 5,430 | 4,590 | 9,580 | 4,390 | 3,820 | 2,750 | 2,160 | 1,860 | 1,180 |
| 8 | 790 | 1,770 | 2,160 | 5,430 | 4,390 | 10,800 | 4,190 | 5,430 | 2,380 | 1,860 | 3,470 | 1,180 |
| 9 | 790 | 1,590 | 2,160 | 5,220 | 4,000 | 41,200 | 3,820 | 5,430 | 2,270 | 2,380 | 6,060 | 1,110 |
| 10 | 735 | 1,340 | 2,060 | 4,590 | 4,000 | 39,000 | 4,000 | 4,190 | 2,060 | 3,020 | 5,010 | 1,040 |
| 11 | 708 | 1,680 | 2,060 | 4,590 | 3,820 | 26,400 | 9,340 | 3,310 | 2,060 | 2,750 | 6,690 | 1,040 |
| 12 | 708 | 1,590 | 2,060 | 4,190 | 3,820 | 17,900 | 11,300 | 3,020 | 2,160 | 2,160 | 9,100 | 1,110 |
| 13 | 735 | 1,590 | 2,060 | 3,820 | 6,900 | 8,880 | 7,780 | 2,270 | 2,270 | 1,770 | 2,500 | 1,680 |
| 14 | 1,040 | 1,500 | 3,820 | 3,640 | 15,100 | 7,780 | 5,220 | 2,880 | 2,060 | 1,860 | 3,160 | 1,180 |
| 15 | 1,860 | 1,500 | 8,220 | 3,640 | 8,440 | 7,120 | 4,590 | 2,880 | 1,860 | 4,000 | 6,900 | 1,180 |
| 16 | 1,680 | 1,770 | 6,900 | 3,470 | 6,480 | 6,690 | 7,780 | 2,880 | 1,770 | 3,820 | 3,640 | 1,040 |
| 17 | 1,180 | 6,270 | 5,010 | 4,590 | 5,640 | 11,000 | 7,560 | 2,750 | 1,860 | 3,640 | 2,620 | 910 |
| 18 | 1,590 | 5,010 | 3,470 | 7,120 | 5,010 | 18,600 | 6,690 | 2,500 | 2,500 | 5,640 | 2,060 | 850 |
| 19 | 1,960 | 3,470 | 2,380 | 9,580 | 4,390 | 10,500 | 5,640 | 2,380 | 4,000 | 9,100 | 1,860 | 790 |
| 20 | 1,770 | 2,500 | 2,750 | 7,340 | 4,590 | 8,880 | 5,010 | 2,380 | 3,310 | 8,220 | 1,680 | 790 |
| 21 | 1,680 | 2,160 | 32,800 | 5,850 | 6,270 | 7,120 | 4,190 | 2,270 | 2,160 | 3,820 | 1,860 | 910 |
| 22 | 1,590 | 1,960 | 45,500 | 5,010 | 10,500 | 6,270 | 4,000 | 2,500 | 1,680 | 3,020 | 2,270 | 1,040 |
| 23 | 1,420 | 1,860 | 31,500 | 5,220 | 12,300 | 5,850 | 3,820 | 2,500 | 3,640 | 2,500 | 2,270 | 910 |
| 24 | 2,380 | 2,160 | 28,400 | 8,660 | 10,300 | 5,430 | 3,470 | 2,380 | 3,640 | 2,750 | 3,820 | 850 |
| 25 | 15,400 | 2,620 | 19,900 | 10,500 | 21,600 | 5,220 | 3,310 | 2,270 | 2,880 | 4,590 | 5,850 | 790 |
| 26 | 7,560 | 2,620 | 11,300 | 19,200 | 22,000 | 5,640 | 3,310 | 2,160 | 2,500 | 4,590 | 4,390 | 850 |
| 27 | 5,850 | 2,880 | 7,560 | 19,200 | 12,800 | 9,340 | 3,160 | 2,160 | 2,160 | 4,390 | 2,750 | 790 |
| 28 | 5,430 | 18,300 | 6,270 | 14,800 | 9,340 | 8,880 | 3,160 | 2,750 | 3,160 | 3,640 | 2,060 | 708 |
| 29 | 7,780 | 18,600 | 5,220 | 8,880 | ..... | 7,120 | 3,020 | 3,160 | 3,310 | 2,270 | 1,860 | 655 |
| 30 | 18,600 | 10,100 | 4,000 | 6,900 | ..... | 5,850 | 3,020 | 3,470 | 2,880 | 3,160 | 1,770 | 630 |
| 31 | 20,300 | ..... | 4,190 | 6,060 | ..... | 5,430 | ..... | 6,060 | ..... | 2,060 | 1,960 | ..... |

*Monthly discharge of Longswamp Creek near Ball Ground, Ga., for the years ending Sept. 30, 1919 and 1920.*

[Drainage area, 74 square miles.]

| Month. | Discharge in second-feet. | | | | Run-off in inches. |
|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square mile. | |
| 1918–19. | | | | | |
| December | 3,230 | 76 | 342 | 4.62 | 5.33 |
| January | 1,160 | 152 | 284 | 3.84 | 4.43 |
| February | 1,440 | 146 | 290 | 3.92 | 4.08 |
| March | 1,420 | 191 | 306 | 4.14 | 4.77 |
| April | 854 | 140 | 235 | 3.18 | 3.55 |
| May | 230 | 104 | 149 | 2.01 | 2.32 |
| June | 300 | 70 | 112 | 1.51 | 1.68 |
| July | 116 | 64 | 87 | 1.18 | 1.36 |
| August | 286 | 64 | 91 | 1.23 | 1.42 |
| September | 191 | 22 | 49 | .662 | .74 |
| 1919–20. | | | | | |
| October | 204 | 40 | 65 | .878 | 1.01 |
| November | 128 | 49 | 66 | .892 | 1.00 |
| December | 3,310 | 59 | 349 | 4.72 | 5.44 |
| January | 890 | 76 | 233 | 3.15 | 3.63 |
| February | 1,560 | 165 | 326 | 4.41 | 4.76 |
| March | 1,090 | 165 | 334 | 4.51 | 5.20 |
| April | 2,220 | 272 | 520 | 7.03 | 7.84 |
| May | 2,050 | 217 | 340 | 4.59 | 5.29 |
| June | 356 | 140 | 196 | 2.65 | 2.96 |
| July | 356 | 116 | 177 | 2.39 | 2.76 |
| August | 1,460 | 92 | 279 | 3.77 | 4.35 |
| September | 286 | 104 | 139 | 1.88 | 2.10 |
| The year | 3,310 | 40 | 252 | 3.41 | 46.34 |

## TALLAPOOSA RIVER AT STURDIVANT, ALA.

LOCATION.—2,000 feet above bridge of Central of Georgia Railway one-fourth mile west of Sturdivant, Tallapoosa County, 1 mile below Stowe's ferry, and 5 miles below mouth of Hillabee Creek.

DRAINAGE AREA.—2,460 square miles.

RECORDS AVAILABLE.—July 19, 1900, to September 30, 1920.

GAGE.—Vertical staff, 0–24 feet, on right bank 2,000 feet upstream from bridge; installed August 20, 1906; read by A. L. Stowe. Original gage, a staff attached to pier of railroad bridge and later a chain gage on railroad bridge, was read until July, 1905, when the present gage was substituted for the chain gage because it was impossible to obtain an observer for gage at bridge. From August 21, 1906, to September 30, 1915, readings on the present staff gage were reduced to datum of original gage by means of comparative readings. Since October 1, 1915, gage heights have been obtained from readings on the present staff gage without reference to datum of old gage which has been removed, and a new rating has been made based on present gage datum.

DISCHARGE MEASUREMENTS.—Made from a plank walk resting on lower members of deck of railroad bridge.

CHANNEL AND CONTROL.—Bed rough and rocky; permanent. At extreme high stage water overflows banks but is confined entirely under bridge. Control is a series of rock ledges, shoals, and bluffs below bridge; permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year ending September 30, 1919, 20.3 feet at 5 and 9 p. m. March 9 (discharge, 57,200 second-feet); minimum stage recorded, 0.3 foot at 5 p. m. September 30 (discharge, 630 second-feet).

## MISCELLANEOUS MEASUREMENTS.

*Miscellaneous discharge measurements in South Atlantic and Eastern Gulf of Mexico drainage basins during the years ending Sept. 30, 1919 and 1920.*

**Streams draining into south Atlantic Ocean.**

| Date. | Stream. | Tributary to— | Locality. | Gage height. | Discharge. |
|---|---|---|---|---|---|
| 1920. | | | | *Feet.* | *Sec.-ft.* |
| Apr. 23 | Yadkin River | Pedee River | At U. S. Geol. Survey gaging station at Donnaha, N. C. | 6.1 | 2,440 |
| July 12 | do | do | do | 8.30 | 6,570 |
| 15 | do | do | do | 6.10 | 2,730 |
| Aug. 26 | do | do | do | 12.00 | 13,800 |
| Sept. 11 | do | do | do | 6.22 | 2,170 |
| 1919. | | | | | |
| Aug. 21 | Chattooga River | Tugaloo River | At steel highway bridge 9 miles from Clayton, Ga. | | 466 |
| 22 | Tallulah River | Tugaloo River | Below Burton dam at Burton, Ga. | 1.04 | 259 |
| 25 | do | do | do | 1.00 | 144 |
| 1918. | | | | | |
| Oct. 16 | Sweetwater Creek | Briar Creek | At old Usury millsite, near Thomson, Ga. | | 4.4 |
| Nov. 14 | Little River | Oconee River | At headrace of Putnam Mills & Power Co., near Eatonton, Ga. | 9.64 | 124 |
| 1919. | | | | | |
| Nov. 6 | South Fork of St. Marys River. | St. Marys River | 1½ miles west of MacClenny, Fla. | | 40.2 |

**Streams draining into eastern Gulf of Mexico.**

| | | | | | |
|---|---|---|---|---|---|
| 1919. | | | | | |
| Nov. 7 | Withlacoochee River | Suwanee River | Half a mile west of Owsley, Ga. | 2.17 | 95 |
| 1918. | | | | | |
| Oct. 1 | Chattahoochee River | Apalachicola River | At Clarks Bridge, near Gainesville, Ga. | .74 | 364 |
| 1 | Chestatee River | Chattahoochee River | At Newbridge, Ga | 1.02 | 197 |
| 1920. | | | | | |
| May 31 | North Fork of Peachtree Creek. | do | Near Chamblee, Ga | .26 | 28.7 |
| 1918. | | | | | |
| Oct. 5 | Wehadkee Creek | do | At Wehadkee yarn mills, near Roanoke, Ala. | | 6.4 |
| 1919. | | | | | |
| Nov. 10 | Flint River | Apalachicola River | At steel toll bridge near Roberta, Ga. | | 675 |
| July 11 | Spring Creek | Flint River | Near Bainbridge, Ga | 1.98 | 653 |
| Nov. 22 | do | do | do | .22 | 377 |
| 1918. | | | | | |
| Oct. 11 | Spring Creek | Chipola River | At Blue Spring Power Co.'s plant, near Marianna, Fla. | | 115 |
| 1919. | | | | | |
| Oct. 16 | Etowah River | Coosa River | At Second Ave. Bridge, in Rome, Ga. | | 1,090 |
| Jan. 16 | 61-Gulch Creek | Ellijay River | At Ellijay, Ga | | 6.0 |
| Apr. 4 | do | do | do | | 7.6 |
| 1920. | | | | | |
| Jan. 20 | do | do | do | | 10.5 |
| 26 | do | do | do | | 33.5 |

*Daily discharge, in second-feet, of Tallapoosa River at Sturdivant, Ala., for the years ending Sept. 30, 1919 and 1920*—Continued.

| Day. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1919–20. | | | | | | | | | | | | |
| 1 | 580 | 1,420 | 2,500 | 2,750 | 7,560 | 4,800 | 13,600 | 7,120 | 4,800 | 2,500 | 1,960 | 2,380 |
| 2 | 630 | 1,770 | 2,060 | 2,750 | 6,900 | 4,390 | 27,100 | 6,270 | 4,590 | 2,500 | 1,960 | 2,160 |
| 3 | 655 | 1,960 | 1,770 | 2,500 | 12,800 | 4,190 | 29,800 | 44,800 | 4,590 | 2,500 | 1,860 | 8,660 |
| 4 | 1,180 | 1,420 | 1,590 | 2,500 | 18,300 | 4,590 | 17,900 | 45,900 | 5,640 | 6,270 | 2,880 | 4,800 |
| 5 | 790 | 1,340 | 1,420 | 2,500 | 16,700 | 10,500 | 16,300 | 23,000 | 10,100 | 6,900 | 2,270 | 4,390 |
| 6 | 790 | 1,180 | 1,340 | 2,380 | 14,500 | 8,440 | 10,500 | 19,200 | 11,500 | 4,190 | 2,750 | 2,880 |
| 7 | 850 | 1,110 | 1,420 | 4,000 | 9,820 | 6,900 | 8,660 | 11,500 | 9,820 | 3,020 | 2,620 | 2,380 |
| 8 | 850 | 1,110 | 30,100 | 6,060 | 7,780 | 5,640 | 8,000 | 9,580 | 6,060 | 3,820 | 1,960 | 2,160 |
| 9 | 1,040 | 1,110 | 71,600 | 9,100 | 5,850 | 5,220 | 9,820 | 8,220 | 5,010 | 3,310 | 1,500 | 2,500 |
| 10 | 1,340 | 1,040 | 102,000 | 9,100 | 6,480 | 4,800 | 15,400 | 7,340 | 4,390 | 2,880 | 6,900 | 3,820 |
| 11 | 1,260 | 2,500 | 73,500 | 6,690 | 6,900 | 4,800 | 13,600 | 5,010 | 4,000 | 3,020 | 10,500 | 3,640 |
| 12 | 1,260 | 3,640 | 42,300 | 5,220 | 6,900 | 6,900 | 11,300 | 6,480 | 3,820 | 2,620 | 12,300 | 3,160 |
| 13 | 1,180 | 2,750 | 26,000 | 4,390 | 12,300 | 34,500 | 8,660 | 22,300 | 3,470 | 2,620 | 9,580 | 2,060 |
| 14 | 1,420 | 2,160 | 12,000 | 4,000 | 10,100 | 14,500 | 7,340 | 34,200 | 3,310 | 4,590 | 6,480 | 2,380 |
| 15 | 1,040 | 1,770 | 8,880 | 3,640 | 7,340 | 11,000 | 6,690 | 14,800 | 3,310 | 3,310 | 6,690 | 1,770 |
| 16 | 1,110 | 1,500 | 6,900 | 4,190 | 6,900 | 8,000 | 6,900 | 9,820 | 3,020 | 2,500 | 7,340 | 2,160 |
| 17 | 1,180 | 1,340 | 5,640 | 10,300 | 6,060 | 36,600 | 7,120 | 7,780 | 2,880 | 2,270 | 12,500 | 1,960 |
| 18 | 875 | 1,340 | 4,800 | 8,880 | 5,850 | 52,000 | 7,340 | 7,780 | 2,880 | 2,880 | 9,580 | 1,770 |
| 19 | 1,590 | 1,260 | 4,390 | 6,480 | 5,850 | 32,500 | 7,780 | 8,220 | 3,160 | 7,120 | 7,340 | 1,680 |
| 20 | 1,590 | 1,180 | 4,390 | 5,430 | 5,430 | 34,500 | 7,340 | 9,580 | 10,100 | 6,480 | 6,060 | 1,500 |
| 21 | 910 | 1,180 | 4,390 | 4,800 | 5,220 | 20,600 | 12,800 | 7,340 | 10,100 | 8,880 | 6,480 | 1,500 |
| 22 | 1,040 | 1,180 | 4,000 | 4,190 | 5,430 | 12,500 | 20,900 | 6,900 | 5,850 | 16,300 | 5,010 | 1,420 |
| 23 | 1,420 | 1,110 | 3,640 | 3,470 | 6,060 | 9,580 | 19,900 | 6,060 | 3,640 | 10,300 | 5,640 | 1,420 |
| 24 | 5,640 | 1,110 | 3,310 | 24,300 | 6,480 | 8,220 | 15,400 | 5,850 | 3,640 | 8,220 | 3,640 | 1,340 |
| 25 | 5,640 | 1,110 | 3,160 | 36,200 | 5,640 | 7,780 | 7,340 | 7,340 | 4,000 | 4,590 | 2,750 | 1,340 |
| 26 | 3,310 | 1,340 | 3,160 | 41,200 | 4,590 | 21,300 | 6,900 | 5,220 | 3,160 | 3,020 | 2,500 | 1,340 |
| 27 | 2,380 | 1,590 | 3,020 | 45,500 | 4,590 | 14,200 | 29,100 | 6,060 | 2,880 | 2,500 | 3,310 | 1,340 |
| 28 | 1,770 | 1,500 | 2,880 | 30,100 | 4,590 | 18,600 | 19,200 | 5,640 | 2,750 | 2,380 | 3,020 | 1,340 |
| 29 | 1,420 | 1,420 | 2,880 | 22,000 | 4,590 | 50,900 | 10,500 | 5,010 | 2,620 | 2,270 | 2,750 | 1,340 |
| 30 | 1,770 | 2,620 | 2,750 | 11,500 | ..... | 27,700 | 8,220 | 4,800 | 2,620 | 2,160 | 3,020 | 1,340 |
| 31 | 1,340 | ..... | 2,620 | 8,880 | ..... | 16,700 | ..... | 4,800 | ..... | 2,060 | 2,750 | ..... |

NOTE.—Discharge, Dec. 8–12, 1919, determined from mean daily gage heights obtained from graph constructed on basis of daily readings of gage Dec. 7, 8, and 12, and levels to flood marks fixed by observer Dec. 9, 10, and 11 when water overtopped the gage.

*Monthly discharge of Tallapoosa River at Sturdivant, Ala., for the years ending Sept. 30, 1919 and 1920.*

[Drainage area, 2,460 square miles.]

| Month. | Discharge in second-feet. | | | | Run-off in inches. |
|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square mile. | |
| 1918–19. | | | | | |
| October | 20,300 | 708 | 3,660 | 1.49 | 1.72 |
| November | 18,600 | 1,340 | 4,320 | 1.76 | 1.96 |
| December | 45,500 | 1,960 | 8,510 | 3.46 | 3.99 |
| January | 19,200 | 3,470 | 7,430 | 3.02 | 3.48 |
| February | 22,000 | 3,820 | 7,780 | 3.16 | 3.29 |
| March | 41,200 | 5,220 | 11,100 | 4.51 | 5.20 |
| April | 11,300 | 3,020 | 5,000 | 2.03 | 2.26 |
| May | 6,060 | 2,160 | 3,160 | 1.28 | 1.48 |
| June | 6,900 | 1,680 | 3,090 | 1.26 | 1.41 |
| July | 9,100 | 1,590 | 3,260 | 1.33 | 1.53 |
| August | 9,100 | 1,680 | 3,280 | 1.33 | 1.53 |
| September | 2,500 | 630 | 1,110 | .451 | .50 |
| The year | 45,500 | 630 | 5,140 | 2.09 | 28.35 |
| 1919–20. | | | | | |
| October | 5,640 | 580 | 1,540 | .626 | .72 |
| November | 3,640 | 1,040 | 1,570 | .638 | .71 |
| December | 102,000 | 1,340 | 14,200 | 5.77 | 6.65 |
| January | 45,500 | 2,380 | 10,800 | 4.39 | 5.06 |
| February | 18,300 | 4,590 | 7,850 | 3.19 | 3.44 |
| March | 52,000 | 4,190 | 16,200 | 6.59 | 7.60 |
| April | 29,800 | 6,690 | 13,000 | 5.28 | 5.89 |
| May | 45,900 | 4,800 | 12,100 | 4.92 | 5.67 |
| June | 11,500 | 2,620 | 4,920 | 2.00 | 2.23 |
| July | 16,300 | 2,060 | 4,450 | 1.81 | 2.09 |
| August | 12,500 | 1,500 | 5,030 | 2.04 | 2.35 |
| September | 8,660 | 1,340 | 2,400 | .976 | 1.09 |
| The year | 102,000 | 580 | 7,870 | 3.20 | 43.50 |

# INDEX.