DEPARTMENT OF THE INTERIOR
FRANKLIN K. LANE, Secretary

UNITED STATES GEOLOGICAL SURVEY
GEORGE OTIS SMITH, Director

WATER-SUPPLY PAPER 381

SURFACE WATER SUPPLY OF THE UNITED STATES

1914

PART I. NORTH ATLANTIC SLOPE DRAINAGE BASINS

NATHAN C. GROVER, Chief Hydraulic Engineer
C. C. COVERT, C. H. PIERCE, and G. C. STEVENS, District Engineers

Prepared in cooperation with the States of
MAINE, VERMONT, MASSACHUSETTS, and NEW YORK

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CONTENTS.

ILLUSTRATIONS.

SURFACE WATER SUPPLY OF NORTH ATLANTIC SLOPE DRAINAGE BASINS, 1914.

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 year ending September 30, 1914.

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

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 1888 in connection with special studies of water supply for irrigation. Since the fiscal year ending June 30, 1895, successive sundry 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 ending June 30, 1895–1915.

1895	$12,500
1896	20,000
1897 to 1900, inclusive	50,000
1901 to 1902, inclusive	100,000
1903 to 1906, inclusive	200,000
1907	150,000
1908 to 1910, inclusive	100,000
1911 to 1915, inclusive	150,000

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 15.

Measurements of stream flow have been made at about 3,400 points in the United States [1] and also at many points in Alaska and the Hawaiian Islands. In July, 1914, 1,480 gaging stations were being main-

[1] Stream-gaging stations and publications relating to water resources, 1885–1913, U. S. Geol. Survey Water-Supply Paper 340.

tained 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 the regular 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, miner's inches, and discharge in second-feet per square mile, and (2) those that represent the actual quantity of water, as run-off in depth of 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, acre-feet, and millions of cubic 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 by the use of the factors given in the tables of convenient equivalents (pp. 9–11).

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

An "acre-foot" is equivalent to 43,560 cubic feet and 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.

"Millions of cubic feet" is used to express quantities of water stored in reservoirs, most frequently in connection with studies of flood control.

The following terms used in these reports are not in common use:

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

"Control," "controlling section," and "point of control," terms used to designate the section or sections of the stream below the gage which determine the discharge relation at the gage. It should be

noted that the control may not be the same section or sections at all stages.

The "point of zero flow" for a given gaging station is that point on the gage—the gage height—to which the surface of the river would fall if there were no flow.

CONVENIENT EQUIVALENTS.

The following is a list of convenient equivalents for use in hydraulic computations:

Table for converting discharge in second-feet per square mile into run-off in depth in inches over the area.

Discharge (second feet per square mile).	Run-off (depth in inches).				
	1 day.	28 days.	29 days.	30 days.	31 days.
1	0.03719	1.041	1.079	1.116	1.153
2	.07438	2.083	2.157	2.231	2.306
3	.11157	3.124	3.236	3.347	3.459
4	.14876	4.165	4.314	4.463	4.612
5	.18595	5.207	5.393	5.578	5.764
6	.22314	6.248	6.471	6.694	6.917
7	.26033	7.289	7.550	7.810	8.070
8	.29752	8.331	8.628	8.926	9.223
9	.33471	9.372	9.707	10.041	10.376

NOTE.—For part of a month multiply the run-off for 1 day by the number of days.

Table for converting discharge in second-feet into run-off in acre-feet.

Discharge (second-feet).	Run-off (acre feet.)				
	1 day.	28 days.	29 days.	30 days.	31 days.
1	1.983	55.54	57.52	59.50	61.49
2	3.967	111.1	115.0	119.0	123.0
3	5.950	166.6	172.6	178.5	184.5
4	7.934	222.1	230.1	238.0	246.0
5	9.917	277.7	287.6	297.5	307.4
6	11.90	333.2	345.1	357.0	368.9
7	13.88	388.8	402.6	416.5	430.4
8	15.87	444.3	460.2	476.0	491.9
9	17.85	499.8	517.7	535.5	553.4

NOTE.—For part of a month multiply the run-off for 1 day by the number of days.

Table for converting discharge in second-feet into run-off in millions of cubic feet.

Discharge (second-feet).	Run-off (millions of cubic feet.)				
	1 day.	28 days.	29 days.	30 days.	31 days.
1	0.0864	2.419	2.506	2.592	2.678
2	.1728	4.838	5.012	5.184	5.356
3	.2592	7.257	7.518	7.776	8.034
4	.3456	9.676	10.02	10.37	10.71
5	.4320	12.10	12.53	12.96	13.39
6	.5184	14.51	15.04	15.55	16.07
7	.6048	16.93	17.54	18.14	18.75
8	.6912	19.35	20.05	20.74	21.42
9	.7776	21.77	22.55	23.33	24.10

NOTE.—For part of a month multiply the run-off for 1 day by the number of days.

Table for converting discharge in second-feet into run-off in millions of gallons.

Discharge (second-feet).	Run-off (millions of gallons).				
	1 day.	28 days.	29 days.	30 days.	31 days.
1	0.6463	18.10	18.74	19.39	20.04
2	1.293	36.20	37.48	38.78	40.08
3	1.939	54.30	56.22	58.17	60.12
4	2.585	72.40	74.96	77.56	80.16
5	3.232	90.50	93.70	96.95	100.2
6	3.878	108.6	112.4	116.3	120.2
7	4.524	126.7	131.2	135.7	140.3
8	5.171	144.8	149.9	155.1	160.3
9	5.817	162.9	168.7	174.5	180.4

NOTE.—For part of a month multiply the run-off for 1 day by the number of days.

Table for converting velocity in feet per second into velocity in miles per hour.

[1 foot per second=0.681818 mile per hour, or two-thirds mile per hour, very nearly; 1 mile per hour=1.4666 feet per second. In computing the table the figures 0.68182 and 1.4667 were used.]

Feet per second (units).	Miles per hour for tenths of foot per second.									
	0	1	2	3	4	5	6	7	8	9
0	0.000	0.068	0.136	0.205	0.273	0.341	0.409	0.477	0.545	0.614
1	.682	.750	.818	.886	.995	1.02	1.09	1.16	1.23	1.30
2	1.36	1.43	1.50	1.57	1.64	1.70	1.77	1.84	1.91	1.98
3	2.05	2.11	2.18	2.25	2.32	2.39	2.45	2.52	2.59	2.66
4	2.73	2.80	2.86	2.93	3.00	3.07	3.14	3.20	3.27	3.34
5	3.41	3.48	3.55	3.61	3.68	3.75	3.82	3.89	3.95	4.02
6	4.09	4.16	4.23	4.30	4.36	4.43	4.50	4.57	4.64	4.70
7	4.77	4.84	4.91	4.98	5.05	5.11	5.18	5.25	5.32	5.39
8	5.45	5.52	5.59	5.66	5.73	5.80	5.86	5.93	6.00	6.07
9	6.14	6.20	6.27	6.34	6.41	6.48	6.55	6.61	6.68	6.75

1 second-foot equals 40 California miner's inches (law of March 23, 1901).

1 second-foot equals 38.4 Colorado miner's inches.

1 second-foot equals 40 Arizona miner's inches.

1 second-foot equals 7.48 United States gallons per second; equals 448.8 gallons per minute; equals 646,317 gallons for one day.

1 second-foot for one year (365 days) covers 1 square mile 1.131 feet, or 13.572 inches deep.

1 second-foot for one year (365 days) equals 31,536,000 cubic feet.

1 second-foot equals about 1 acre-inch per hour.

1 second-foot for one year (365 days) equals 724 acre-feet.

1 second-foot for one day equals 86,400 cubic feet.

1,000,000,000 (1 United States billion) cubic feet equals 11,570 second-feet for one day.

1,000,000,000 cubic feet equals 414 second-feet for one 28-day month.

1,000,000,000 cubic feet equals 399 second-feet for one 29-day month.

1,000,000,000 cubic feet equals 386 second-feet for one 30-day month.

1,000,000,000 cubic feet equals 373 second-feet for one 31-day month.

100 California miner's inches equals 18.7 United States gallons per second.

100 California miner's inches for one day equals 4.96 acre-feet.

100 Colorado miner's inches equals 2.60 second-feet.

100 Colorado miner's inches equals 19.5 United States gallons per second.

100 Colorado miner's inches for one day equals 5.17 acre-feet.

100 United States gallons per minute equals 0.223 second-foot.

100 United States gallons per minute for one day equals 0.442 acre-foot.

1,000,000 United States gallons per day equals 1.55 second-feet.
1,000,000 United States gallons equals 3.07 acre-feet.
1,000,000 cubic feet equals 22.95 acre-feet.
1 acre-foot equals 325,850 gallons.
1 inch deep on 1 square mile equals 2,323,200 cubic feet.
1 inch deep on 1 square mile equals 0.0737 second-foot per year.
1 foot equals 0.3048 meter.
1 mile equals 1.60935 kilometers.
1 mile equals 5,280 feet.
1 acre equals 0.4047 hectare.
1 acre equals 43,560 square feet.
1 acre equals 209 feet square, nearly.
1 square mile equals 2.59 square kilometers.
1 cubic foot equals 0.0283 cubic meter.
1 cubic foot of water weighs 62.5 pounds.
1 cubic meter per minute equals 0.5886 second-foot.
1 horsepower equals 550 foot-pounds per second.
1 horsepower equals 76.0 kilogram-meters per second.
1 horsepower equals 746 watts.
1 horsepower equals 1 second-foot falling 8.80 feet.
1½ horsepower equals about 1 kilowatt.

To calculate water power quickly: $\frac{\text{Second-feet} \times \text{fall in feet}}{11}$ = net horsepower on water wheel realizing 80 per cent of theoretical power.

EXPLANATION OF DATA.

The data presented in this report cover the year beginning October 1, 1913, and ending September 30, 1914. At the first of January in most parts of the country a large amount of the precipitation for the preceding three months is stored, either as ground water, in the form of snow, or in lakes. This stored water passes off in the streams during the spring break-up. At the end of September the only stored water available for run-off in the streams is possibly a small amount held in ground storage. Therefore the run-off for a year, beginning with October 1 is practically all derived from precipitation occurring within that year.

For each regular gaging station the following data, so far as available, are given: Description of the station, list of discharge measurements, table of daily gage heights, table of daily discharge, table of monthly and yearly discharge and run-off. For stations located at weirs or dams the gage-height table is usually omitted.

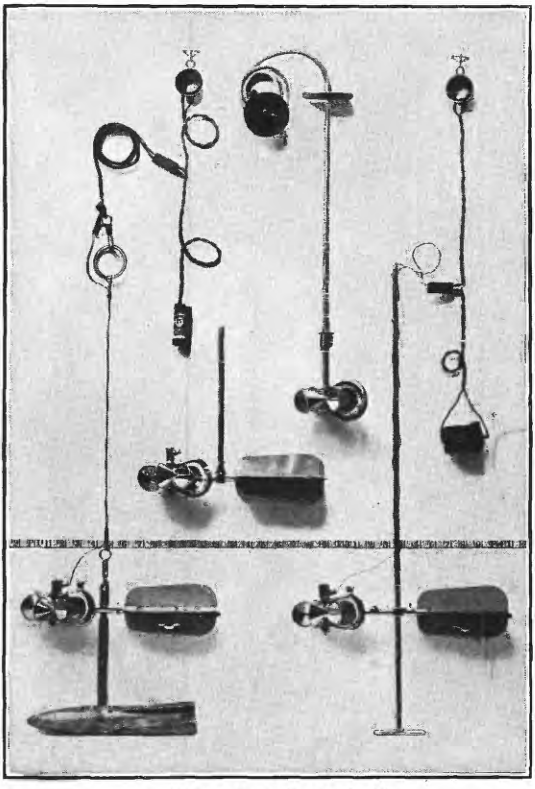
In addition to statements regarding the location and equipment of gaging stations the descriptions give information in regard to any conditions that may affect the constancy of the discharge relation, covering such points as ice, logging, shifting channels, and backwater; also information regarding diversions which decrease the total flow at the gage. Statements are also made regarding the accuracy of the data and computed results.

The table of daily gage height shows the daily fluctuations of the surface of the river as found from the mean of the gage readings taken each day, usually in the morning and in the evening, though at many stations only one reading is made each day. At many stations automatic gages are used, some of which give a continuous record of river stage in the form of a hydrograph and others a record printed at intervals, from which the mean daily gage height can be computed. The gage height given in the table represents the elevation of the surface of the water above the zero of the gage. When the discharge relation is affected by the presence of ice in the streams or by backwater from obstructions, all gage heights are published as recorded, with suitable footnotes. The rating table is not applicable for such periods unless the proper corrections to the gage heights are known and applied. Attention is called to the fact that the zero of the gage is placed at an arbitrary datum, in general somewhat below the lowest known flow, to avoid negative readings.

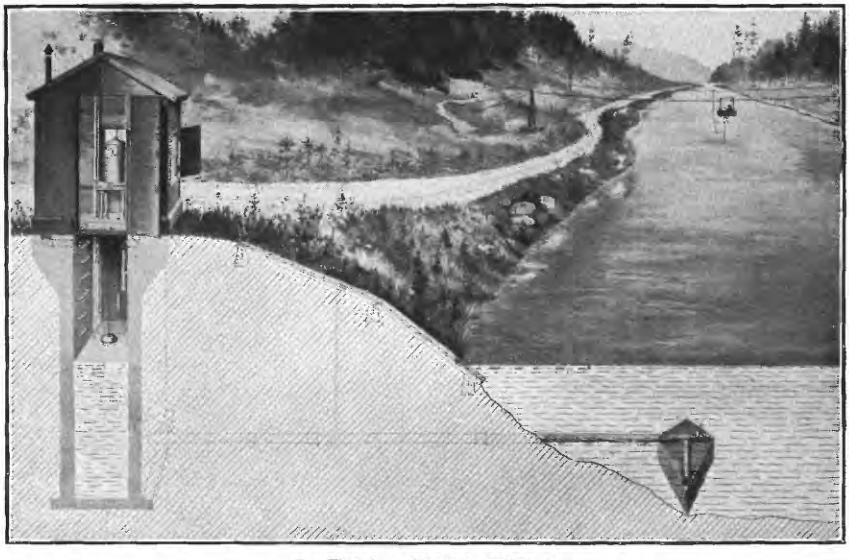
In the tables of daily gage height the use of zeros in the hundredths place indicates the degree of refinement to which the gage was read and to which the mean daily gage height was computed. If a gage is read to tenths or half-tenths once a day or to tenths twice a day, no zeros appear in the hundredths place for any stage. If the gage is read to half-tenths twice a day or to quarter-tenths or hundredths, regardless of the number of readings a day, the gage heights are published to hundredths, and zeros appear in the hundredths place, below a certain limiting stage. This limiting stage is so selected that the average error in the mean daily discharge, resulting from not using the mean daily gage height to hundredths above that stage, shall not be greater than 2 per cent. For automatic gages the allowable average error of the daily discharge has been taken as 1 per cent. The selection of the percentage is arbitrary, but it should be noted that the maximum error will in all cases be twice the average error. In like manner half-tenths are used from the hundredths limit to another higher limit, above which only tenths are used. It is the aim to have the gage height observations at each gaging station recorded to the degree of refinement required by the above method of use, but in practice it is found necessary, in order to avoid confusion in the gage-observer's record, to have the observations for all stages recorded to the degree of refinement required for low stages, which usually necessitates readings to hundredths of a foot.

The discharge measurements and gage heights are the base data from which rating tables, daily discharge tables, and monthly discharge tables are computed.

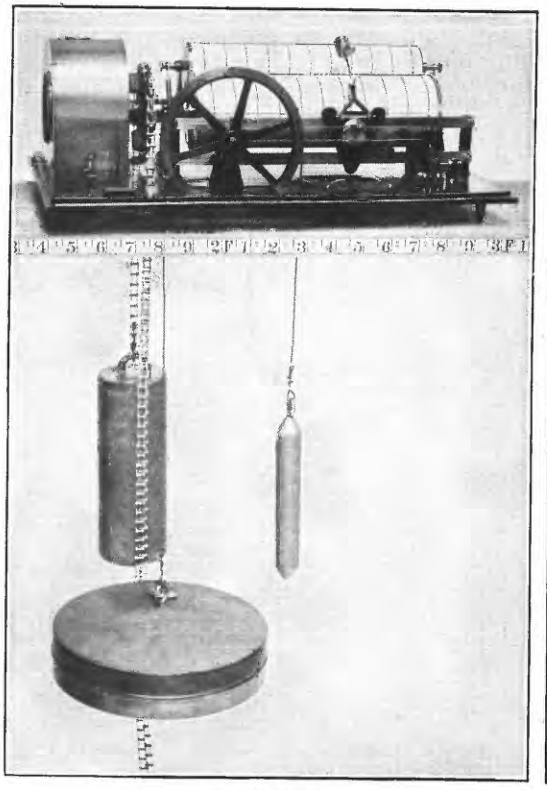
The base data presented in this report, unless otherwise stated in the description of stations, have been collected by the methods com-



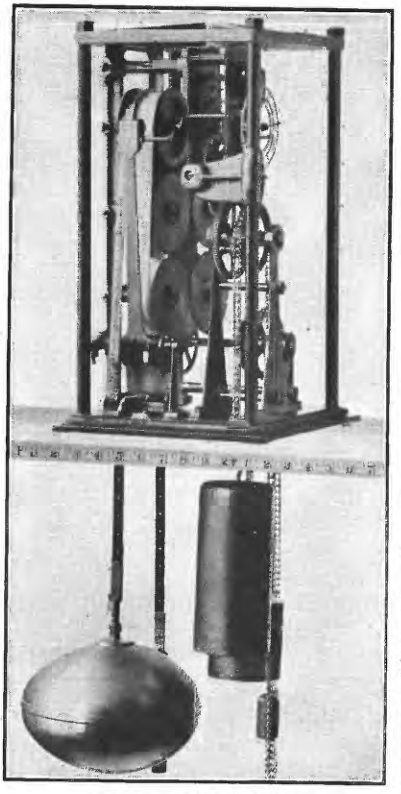
A. PRICE CURRENT METERS.



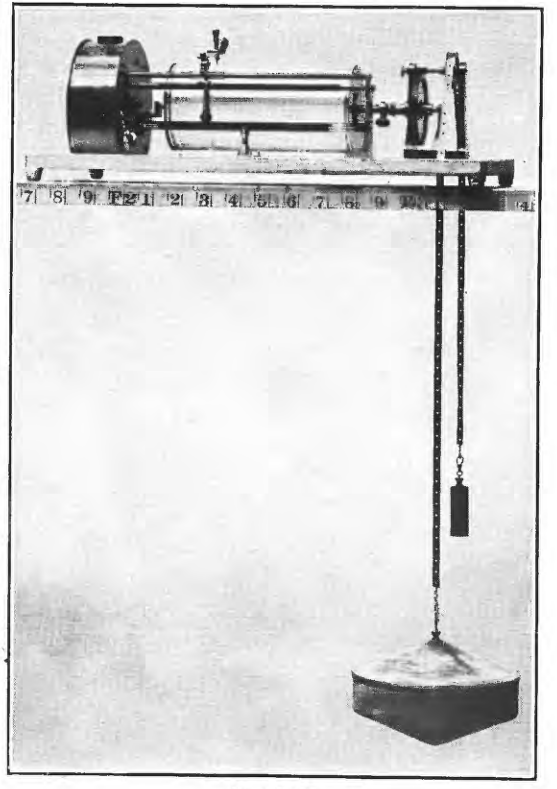
B. TYPICAL GAGING STATION.



A. STEVENS.



B. GURLEY PRINTING.



C. FRIEZ.

WATER-STAGE RECORDERS.

monly used at current-meter gaging stations and described in standard textbooks. (See Pls. I and II.)

The rating table gives, either directly or by interpolation, the discharge in second-feet corresponding to every stage of the river recorded during the period for which it is applicable. It is not published in this report, but can be determined from the tables of daily gage heights and daily discharge by plotting gage heights in feet as ordinates and discharge in second-feet as abscissas.

The table of daily discharge determined from the gage height and rating tables gives the discharge in second-feet corresponding to the means of the gage readings observed each day. At some stations subject to rapid or 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. When such stations are equipped with automatic gages, the true mean daily discharge may be obtained by weighting discharges for parts of the day.

In the table of monthly discharge the column headed "Maximum" gives the mean flow, as determined from the rating table, 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 of "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 the computations for the remaining columns, which are defined on page 8, are based.

ACCURACY OF FIELD DATA AND COMPUTED RESULTS.

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

In order to give engineers and others information regarding the probable accuracy of the computed results, footnotes are added to the daily discharge tables, stating the probable accuracy of the rating tables used, and an accuracy column is inserted in the monthly discharge table. 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" or "approximate," within 15 to 25 per cent. These notes are very general and are based on the plotting of the individual measurements with reference to the mean rating curve.

The accuracy column in the monthly discharge table does not apply to the estimate of maximum or minimum discharge nor to that

for any one day, but to the monthly mean. It is based on the accuracy of the rating curve, the probable reliability of the observer, the number of gage readings per day, the range of the fluctuation in stage, and knowledge of local conditions. In this column A indicates that the mean monthly flow is probably accurate within 5 per cent; B, within 10 per cent; C, within 15 per cent; D, within 25 per cent. Special conditions are covered by footnotes.

Even though the monthly means for any station may represent with a high degree of accuracy the quantity of water flowing past the gage, the figures showing discharge per square mile and depth of run-off in inches may be subject to gross errors which result from including in the measured drainage area large noncontributing districts or omitting estimates of water diverted for irrigation or other use. On this account computations of "second-feet per square mile" and "run-off (depth in inches)" have not been made for streams draining areas in which the annual rainfall is less than 20 inches nor for streams draining areas in which the precipitation exceeds 20 inches if such computations might be uncertain or misleading because of the presence of large noncontributing districts in the measured drainage area, because of the omission of estimates of water diverted for irrigation or other use, or because of artificial control or unusual natural control of the flow of the river above the gaging station. All values of "second-feet per square mile" and "run-off (depth in inches)" previously published by the Survey should be used with care because of possible inherent sources of error not known to the Survey.

In general the base data collected each year by the Survey engineers are published not only to comply with the law but also to afford any engineer the means of analyzing in detail the results of the computations. The table of monthly discharge is so arranged as to give 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 already collected and published.

COOPERATION.

The hydrometric work in Maine was carried on in cooperation with the Maine State Water Storage Commission, William T. Haines, governor, chairman, and Cyrus C. Babb, chief engineer.

Hydrometric work in Vermont and Massachusetts was carried on under a cooperative agreement between the governors of the States and the Director of the United States Geological Survey.

In New York hydrometric work was carried on in cooperation with the State Conservation Commission and also with the State engineer and surveyor.

Financial assistance has been rendered by the New England Power Co., the Turners Falls Power & Electric Co., the Holyoke Water Power Co., the Adirondack Electric Power Corporation, the International Paper Co., the Union Bag & Paper Co., the Finch, Pruyn Paper Co., the Spottsylvania Power Co., the Potomac Electric Power Co., and other power companies in connection with records on streams which they are utilizing.

DIVISION OF WORK.

The data for stations in Maine were collected and prepared for publication under the direction of Cyrus C. Babb, chief engineer, Maine State Water Storage Commission, who was assisted by George C. Danforth, assistant engineer.

For stations in New York and New England outside of Maine the data were collected and prepared for publication under the direction of C. C. Covert, district engineer. The work in New England outside of Maine was supervised by C. H. Pierce. The assistants were O. W. Hartwell, C. S. De Golyer, G. H. Canfield, H. W. Fear, E. D. Burchard, R. M. Adams, W. S. Easterly, R. S. Barnes, M. J. Maguire, and W. A. James.

For stations in the Middle Atlantic States the data were collected and prepared for publication under the direction of G. C. Stevens, district engineer, who was assisted by E. S. Fuller, H. J. Dean, J. G. Mathers, B. J. Peterson, M. I. Walters, E. D. Burchard, A. W. Harrington, J. H. Morgan, and W. A. Elwood.

The records were assembled and reviewed by E. S. Fuller and G. C. Stevens.

GAGING-STATION RECORDS.

ST. JOHN RIVER BASIN.

ST. JOHN RIVER AT FORT KENT, MAINE.

Location.—At suspension footbidge in the town of Fort Kent, a short distance above mouth of Fish River, and about 15 miles below mouth of St. Francis River.

Drainage area.—4,880 square miles. (Does not include 270 square miles of Chamberlain Lake drainage area, which is partly tributary to Penobscot basin. See Water-Supply Paper 281, p. 28.)

Records available.—October 13, 1905, to September 30, 1914. Data also in annual reports Maine State Water Storage Commission.

Gage.—Inclined staff 22 feet long, in two sections, attached to new concrete pier nearest New Brunswick shore of river. Lower part of gage is placed in a groove in the side of the pier; upper part is fastened to downstream end of same pier.

Discharge measurements.—Made from footbridge.

Channel and control.—Practically permanent; both banks high, rocky, cleared, and not subject to overflow except in extreme freshets.

Extremes of discharge.—Maximum stage recorded during year, 18.1 feet, May 11; discharge, 73,000 second-feet. Minimum stage recorded during year, 3 feet, August 12, 13, 14; discharge, 1,060 second-feet.

Winter flow.—Discharge relation affected by ice.

Regulation.—Operation of a few dams on upper headwaters for log driving only slightly affects flow past gage.

Cooperation.—Records furnished by Maine State Water Storage Commission.

No discharge measurements were made during the year.

Daily gage height, in feet, of St. John River at Fort Kent, Maine, for the year ending Sept. 30, 1914.

[A. V. Currie, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	3.65	6.4	5.3	.....	.....	.....	.....	10.0	8.45	4.35	3.5	3.65
2	3.45	5.7	5.3	.....	.....	.....	5.0	10.2	7.85	4.6	3.45	3.8
3	3.4	5.25	5.4	.....	.....	.....	.....	10.85	7.3	4.9	3.4	3.8
4	3.55	5.1	5.45	.....	.....	.....	.....	11.85	7.0	4.8	3.4	3.9
5	3.6	5.0	5.5	.....	.....	4.0	.....	13.25	7.7	4.4	3.4	3.9
6	3.55	4.95	5.6	.....	4.5	.....	.....	14.3	8.1	4.2	3.3	3.9
7	3.5	4.9	5.6	.....	.....	.....	.....	15.5	7.7	4.1	3.45	4.1
8	3.5	4.7	5.5	5.5	.....	.....	.....	16.75	7.2	4.05	3.45	4.55
9	3.4	4.7	5.5	.....	.....	.....	5.6	16.95	6.7	4.0	3.35	4.85
10	3.4	4.6	5.4	.....	.....	.....	.....	17.3	6.3	3.95	3.15	5.15
11	3.4	4.55	5.3	.....	.....	.....	.....	18.1	6.05	3.9	3.1	5.6
12	3.4	4.5	5.15	.....	.....	4.1	.....	17.6	5.95	3.8	3.0	5.7
13	3.4	4.65	4.95	.....	4.5	.....	.....	15.85	5.9	3.8	3.0	5.3
14	3.5	4.65	4.75	.....	.....	.....	5.1	14.8	5.8	3.75	3.0	4.75
15	3.65	4.6	4.6	.....	.....	.....	.....	13.85	5.6	3.7	3.1	4.5
16	3.75	4.6	4.5	4.8	.....	.....	.....	13.15	5.8	3.7	3.2	4.3
17	3.9	4.55	4.45	.....	.....	.....	.....	11.7	6.1	3.7	3.3	4.05
18	4.1	4.5	4.3	.....	.....	.....	5.6	11.4	6.1	3.9	3.4	4.0
19	4.45	4.4	4.15	.....	4.0	4.2	5.65	10.75	6.0	3.75	3.4	3.85
20	4.55	4.5	4 1	.....	.....	.....	5.85	10.65	5.7	3.7	3.25	3.7
21	6.1	5.15	4.1	.....	.....	.....	6.15	10.45	5.5	3.6	3.25	3.6
22	7.2	5.65	4.1	.....	.....	.....	6.7	10.1	5.35	3.6	3.8	3.5
23	7.45	5.9	4.0	4.8	.....	.....	7.35	9.7	5.25	3.6	3.95	3.5
24	6.85	6.4	.....	.....	.....	.....	7.85	10.0	5.1	3.6	3.9	3.5
25	6.4	6.6	.....	.....	.....	.....	8.5	10.0	4.95	3.6	3.8	3.65
26	6.05	6.55	.....	.....	.....	4.8	9.45	9.6	4.75	3.65	3.8	3.9
27	6.05	6.35	.....	.....	3.8	.....	10.25	9.5	4 45	3.85	3.75	4.0
28	6.25	5.9	.....	.....	.....	.....	9.45	9.95	4.35	3.9	3.6	3.9
29	6.45	5.55	4.1	.....	.....	.....	10.2	10.0	4.3	3.75	3.5	3.8
30	6.6	5.4	.....	4.6	.....	.....	10.1	9.35	4.2	3.7	3.4	3.7
31	6.65	.....	.....	.....	.....	.....	.....	8.85	.....	3.6	3.4	.....

NOTE.—Discharge relation Jan. 1 to Apr. 17 seriously affected by ice.

Daily discharge, in second-feet, of St. John River at Fort Kent, Maine, for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Apr.	May.	June.	July.	Aug.	Sept.
1	1,890	9,400	5,770	.....	24,900	17,800	3,260	1,660	1,890
2	1,590	7,010	5,770	.....	25,900	15,200	3,860	1,590	2,140
3	1,520	5,620	6,070	.....	29,100	12,900	4,630	1,520	2,140
4	1,740	5,180	6,220	.....	34,400	11,700	4,370	1,520	2,320
5	1,810	4,900	6,380	.....	42,200	14,500	3,370	1,520	2,320
6	1,740	4,760	6,690	.....	48,500	16,200	2,920	1,390	2,320
7	1,660	4,630	6,690	.....	55,900	14,500	2,710	1,590	2,710
8	1,660	4,110	6,380	.....	64,000	12,500	2,610	1,590	3,740
9	1,520	4,110	6,380	.....	65,300	10,500	2,510	1,460	4,500
10	1,520	3,860	6,070	.....	67,600	9,040	2,420	1,220	5,320
11	1,520	3,740	5,770	.....	73,000	8,170	2,320	1,160	6,690
12	1,520	3,610	5,320	.....	69,600	7,830	2,140	1,060	7,010
13	1,520	3,980	4,760	.....	58,100	7,660	2,140	1,060	5,770
14	1,660	3,980	4,240	.....	51,600	7,330	2,060	1,060	4,240
15	1,890	3,860	3,860	.....	45,800	6,690	1,970	1,160	3,610
16	2,060	3,860	3,610	.....	41,700	7,330	1,970	1,270	3,140
17	2,320	3,740	3,490	.....	33,600	8,340	1,970	1,390	2,610
18	2,710	3,610	3,140	6,690	32,000	8,340	2,320	1,520	2,510
19	3,490	3,370	2,820	6,850	28,600	8,000	2,060	1,520	2,230
20	3,740	3,610	2,710	7,500	28,100	7,010	1,970	1,330	1,970
21	8,340	5,320	2,710	8,520	27,100	6,380	1,810	1,330	1,810
22	12,500	6,850	2,710	10,500	25,400	5,920	1,810	2,140	1,660
23	13,500	7,660	2,510	13,100	23,500	5,620	1,810	2,420	1,660
24	11,100	9,400	2,510	15,200	24,900	5,180	1,810	2,320	1,660
25	9,400	10,100	2,510	18,000	24,900	4,760	1,810	2,140	1,890
26	8,170	9,960	2,510	22,300	23,000	4,240	1,890	2,140	2,320
27	8,170	9,220	2,510	26,100	22,500	3,490	2,230	2 060	2,510
28	8,860	7,660	2,510	22,300	24,700	3,260	2,320	1,810	2,320
29	9,580	6,540	2,710	25,900	24,900	3,140	2,060	1,660	2,140
30	10,100	6,070	2,710	25,400	21,800	2,920	1,970	1,520	1,970
31	10,300	.....	2,710	.....	19,500	.....	1,810	1,520	.....

NOTE.—Discharge determined from a rating curve fairly well defined below 50,000 second-feet, one discharge measurement in 1915 being used to verify it. Discharge estimated Dec. 24–28 and 30–31.

Monthly discharge of St. John River at Fort Kent, Maine, for the year ending Sept. 30, 1914.

[Drainage area, 4,880 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
October	13,509	1,520	4,810	0.98	1.13
November	10,100	3,370	5,660	1.16	1.29
December	6,690	2,510	4,220	.86	.99
April 18–30	26,100	6,690	16,000	3.28	1.59
May	73,000	19,500	38,100	7.81	9.00
June	17,800	2,920	8,550	1.75	1.95
July	4,630	1,810	2,420	.496	.57
August	2,420	1,060	1,570	.322	.37
September	7,010	1,660	2,970	.609	.68

ST. JOHN RIVER AT VAN BUREN, MAINE.

Location.—At new International Bridge at Van Buren, Maine, about 14 miles above Grand Falls, New Brunswick.

Drainage area.—8,270 square miles.

Records available.—May 4, 1908, to September 30, 1914. Data also in annual reports Maine State Water Storage Commission.

Gage.—Gage used since May 6, 1912, painted vertically on second pier from Van Buren end of bridge; zero of gage 407.69 feet above sea level; daily gage heights, 1908 to 1911, read on a vertical rod attached to pier of sawdust carrier of Hammond's mill, about 700 feet below International Bridge, but as published they are reduced to the datum of the bridge gage.

Discharge measurements.—Made from the International Bridge.

Extremes of discharge.—Maximum stage recorded during year, 24.5 feet at 6 a. m. May 12; discharge, 104,000 second-feet. Minimum stage recorded during year, 1.6 feet at 6.30 a. m. August 31, and 6.20 p. m. August 14; discharge, 2,040 second-feet.

Winter flow.—Discharge relation affected by ice.

Regulation.—The little storage above for log driving probably does not affect the discharge.

Cooperation.—Station established by the International Commission, River St. John, but maintained since May 6, 1912, by the Maine State Water Storage Commission, which furnishes the records.

Discharge measurements of St. John River at Van Buren, Maine, during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Oct. 2	Employees of H. S. Ferguson	2.10	3,000
Mar. 10[a]	G. C. Danforth	3.30	2,140

[a] Complete ice cover at gage.

Daily gage height, in feet, of St. John River at Van Buren, Maine, for the year ending Sept. 30, 1914.

[W. H. Scott, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.35	6.40	6.00	4.20	3.40	3.30	3.80	14.10	12.45	4.90	2.05	1.90
2	2.18	6.00	5.80	4.20	3.45	3.30	3.80	14.00	11.60	4.95	1.85	1.95
3	2.10	5.50	5.20	4.10	3.40	3.30	3.80	14.60	10.95	5.25	2.00	2.20
4	2.20	5.15	4.50	4.00	3.45	3.30	3.85	15.70	10.40	5.15	2.10	2.65
5	2.10	4.95	4.00	3.90	3.45	3.30	3.90	17.05	10.50	4.80	2.10	2.50
6	1.95	4.75	4.50	3.85	3.45	3.30	3.90	19.00	11.35	4.50	2.05	2.30
7	2.20	4.58	6.10	3.80	3.45	3.30	3.95	20.80	11.10	4.20	1.90	2.45
8	2.30	4.50	6.00	3.80	3.50	3.30	4.10	22.10	10.55	3.95	1.80	3.30
9	2.15	4.50	6.00	3.80	3.45	3.30	4.30	22.80	9.80	3.75	1.85	4.45
10	2.00	4.48	6.00	3.75	3.50	3.30	4.60	23.40	9.10	3.60	1.70	6.20
11	2.02	4.68	6.00	3.70	3.50	3.30	4.85	24.20	8.55	3.35	1.75	6.20
12	1.98	4.62	6.00	3.70	3.45	3.30	5.05	24.30	8.00	3.60	1.80	5.55
13	1.90	4.70	6.00	3.65	3.45	3.30	5.20	22.90	7.75	3.55	1.65	4.70
14	2.00	4.68	.....	3.60	3.40	3.30	5.20	21.30	7.55	3.25	1.60	4.05
15	2.05	4.50	.....	3.50	3.40	3.30	5.20	20.10	7.35	3.05	1.70	3.60
16	2.10	4.35	.....	3.50	3.40	3.30	5.20	19.20	7.50	3.10	1.80	3.30
17	2.15	4.15	.....	3.45	3.40	3.35	5.30	17.95	7.95	3.05	1.85	2.90
18	2.38	3.95	.....	3.45	3.40	3.35	5.65	16.75	8.05	3.10	1.90	2.60
19	2.68	3.88	.....	3.45	3.40	3.40	6.35	15.95	7.70	3.25	1.90	2.40
20	3.12	4.10	.....	3.40	3.40	3.40	8.25	15.55	7.30	3.15	1.90	2.20
21	4.10	4.40	.....	3.40	3.40	3.45	9.15	15.35	7.05	3.00	1.85	2.10
22	5.60	4.40	.....	3.35	3.40	3.45	9.50	14.90	6.60	3.05	1.95	2.15
23	7.45	4.80	.....	3.30	3.40	3.45	10.35	14.15	6.15	2.95	2.20	2.05
24	7.42	5.70	.....	3.30	3.35	3.40	11.25	14.20	6.10	2.70	2.20	2.00
25	6.70	5.80	.....	3.30	3.35	3.40	12.05	14.45	5.90	2.50	2.55	2.25
26	6.40	5.82	.....	3.30	3.35	3.40	13.35	13.90	5.70	2.40	2.75	2.40
27	6.35	5.68	.....	3.30	3.35	3.45	14.70	13.60	5.35	2.35	2.50	2.30
28	6.85	5.75	.....	3.30	3.35	3.60	16.25	14.20	5.05	2.25	2.20	2.05
29	7.05	5.92	4.30	3.30	.....	3.70	17.30	14.70	4.90	2.15	2.00	2.10
30	6.95	6.00	4.30	3.40	.....	3.80	17.30	14.05	4.75	2.05	1.75	2.20
31	6.75	.....	4.25	3.40	.....	3.80	.....	13.20	.....	2.10	1.70	.....

NOTE.—Discharge relation Nov. 28 to Apr. 30 seriously affected by ice.

Daily discharge, in second-feet, of St. John River at Van Buren, Maine, for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	3,490	13,000	7,540	3,500	2,080	2,770	2,080	43,000	35,200	9,240	2,790	2,530
2	3,160	11,900	7,540	3,350	2,080	2,770	2,080	42,500	31,500	9,370	2,440	2,620
3	3,010	10,600	7,540	3,050	2,080	2,770	1,980	45,500	28,800	10,200	2,700	3,060
4	3,200	9,680	7,250	3,050	2,080	2,770	1,980	51,000	26,600	9,890	2,880	3,940
5	3,010	9,180	6,970	2,910	2,080	2,770	1,880	57,700	27,000	8,980	2,880	3,640
6	2,730	8,700	4,330	3,050	2,080	2,770	1,880	69,000	30,400	8,220	2,790	3,250
7	3,200	8,290	3,990	3,050	2,080	2,770	1,880	79,800	29,400	7,480	2,530	3,540
8	3,390	8,110	3,820	2,910	2,080	2,770	2,520	88,200	27,200	6,880	2,360	5,360
9	3,100	8,110	3,350	2,910	2,080	2,770	2,910	92,700	24,400	6,400	2,440	8,100
10	2,820	8,060	3,350	2,910	2,080	2,770	3,350	96,600	21,800	6,050	2,200	12,800
11	2,860	8,530	4,510	2,910	2,190	2,640	3,820	102,000	20,000	5,480	2,280	12,800
12	2,780	8,390	5,090	2,770	2,190	2,520	3,990	102,000	18,200	6,050	2,360	11,000
13	2,640	8,580	5,290	2,770	2,190	2,520	4,330	93,400	17,400	5,940	2,120	8,720
14	2,820	8,530	5,500	2,640	2,190	2,410	4,510	83,000	16,800	5,250	2,040	7,120
15	2,920	8,110	5,720	2,640	2,190	2,410	4,510	75,600	16,200	4,810	2,200	6,050
16	3,010	7,770	5,290	2,520	2,410	2,520	4,890	70,200	16,600	4,920	2,360	5,360
17	3,100	7,330	4,700	2,300	2,300	2,410	5,090	62,700	18,000	4,810	2,440	4,480
18	3,550	6,890	4,700	2,300	2,300	2,410	5,290	56,200	18,400	4,920	2,530	3,840
19	4,170	6,740	4,890	2,410	2,300	2,410	6,440	52,200	17,200	5,250	2,530	3,440
20	5,090	7,220	4,510	2,410	2,410	2,410	9,790	50,200	16,000	5,030	2,530	3,060
21	7,220	7,880	4,160	2,410	2,520	2,410	10,800	49,200	15,200	4,700	2,440	2,880
22	10,800	7,880	4,330	2,300	2,640	2,410	13,500	47,000	13,900	4,810	2,620	2,970
23	16,200	8,820	4,330	2,300	2,640	2,410	14,700	43,200	12,600	4,590	3,060	2,790
24	16,100	11,100	4,160	2,190	2,640	2,410	16,700	43,500	12,500	4,050	3,060	2,700
25	13,900	11,400	3,990	2,190	2,640	2,410	19,500	44,800	11,900	3,640	3,740	3,160
26	13,000	11,400	3,990	2,190	2,640	2,410	23,000	42,000	11,400	3,440	4,160	3,440
27	12,900	11,000	3,990	2,080	2,640	2,410	26,200	40,600	10,400	3,340	3,640	3,250
28	14,400	7,840	3,500	2,080	2,770	2,190	45,000	43,500	9,630	3,160	3,060	2,790
29	15,000	5,500	3,500	2,080	.....	2,190	50,000	46,000	9,240	2,970	2,700	2,880
30	14,600	7,540	3,500	2,080	.....	2,080	50,000	42,800	8,850	2,790	2,280	3,060
31	14,000	.....	3,500	2,080	.....	2,080	.....	38,600	.....	2,880	2,200	.....

NOTE.—Discharge determined as follows: May 1 to Sept. 30 from a well-defined rating curve verified by two discharge measurements obtained in 1915; Oct. 1 to Nov 27, from a well-defined rating curve; Nov. 28 to Apr. 24, estimated from records at Grand Falls, N. B., about 12 miles below Van Buren, where the flow is not affected by ice; Apr. 25–30, from an ice curve for gage heights at Van Buren.

Monthly discharge of St. John River at Van Buren, Maine, for the year ending Sept. 30, 1914.

[Drainage area, 8,270 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
October	16,200	2,640	6,840	0.827	0.95
November	13,000	5,500	8,800	1.06	1.18
December	7,540	3,350	4,800	.580	.67
January	3,500	2,080	2,590	.313	.36
February	2,770	2,080	2,310	.279	.29
March	2,770	2,080	2,510	.304	.35
April	50,000	1,880	11,500	1.39	1.55
May	102,000	38,600	61,100	7.40	8.53
June	35,200	8,850	19,100	2.31	2.58
July	10,200	2,790	5,660	.684	.79
August	4,160	2,040	2,660	.322	.37
September	12,800	2,530	4,820	.582	.65
The year	102,000	1,880	11,100	1.34	18.27

ST. CROIX RIVER BASIN.

ST. CROIX RIVER NEAR BARING, MAINE.

Location.—At the farm of Fulton Sinclair, 2 miles above Baring.

Drainage area.—1,390 square miles.

Records available.—Discharge measurements in 1914.

Gage.—Chain.

Discharge measurements.—Made from a cable about 400 feet below gage.

Channel and control.—Rock and gravel; discharge relation seriously affected by backwater from the Baring dam.

Extremes of stage.—Maximum stage recorded during year, 13.1 feet at 9 a. m. April 23. Minimum stage recorded during year, 5.4 feet at noon September 27.

Regulation.—The lake system of the St. Croix above the station comprises in the aggregate 83 square miles and is under extensive control by dams used both for log driving and for storage. The paper mill of the St. Croix Paper Co. at Woodland, 4 miles above the station, is run continuously (Sundays and week days) with occasional shutdowns lasting only a few hours.

Cooperation.—Results of discharge measurements furnished by the Maine State Water Storage Commission.

The gage-height record is believed to be valueless because of backwater from Baring dam, and is not published. No determinations of daily or monthly discharges have been made.

Discharge measurements of St. Croix River near Baring, Maine, for 1914.

[Made by G. C. Danforth.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Jan. 30	9.60	1,760	Aug. 9	7.88	866	Oct. 18	7.28	468
May 11	11.20	6,520	Sept. 10	6.30	834	Nov. 11	6.61	940
Aug. 8	8.80	2,590	Oct. 17	7.20	1,170	Nov. 12	6.00	363

MACHIAS RIVER BASIN.

MACHIAS RIVER AT WHITNEYVILLE, MAINE.

Location.—At a wooden highway bridge in the town of Whitneyville, 200 feet below a storage dam, 4 miles above Machias.

Drainage area.—465 square miles.

Records available.—October 17, 1903, to September 30, 1914. Data also in annual reports Maine State Water Storage Commission.

Gage.—Chain installed on the wooden highway bridge October 10, 1911. Prior to October 3, 1905, chain gage on the Washington County railroad bridge, three-fourths of a mile downstream. October 3, 1905, to October 9, 1911, staff gage on highway bridge at datum of present chain gage.

Discharge measurements.—Made from railroad bridge or by wading at a point 200 feet above railroad bridge.

Channel and control.—Practically permanent.

Extremes of discharge.—Maximum stage recorded during year, 10 feet at 5.30 p. m. April 10; approximate discharge computed from extension of rating curve, 5,680 second-feet. Minimum stage recorded during year, 2.8 feet, September 28–30; discharge, 61 second-feet.

Winter flow.—Discharge relation not seriously affected by ice.

Regulation.—Gates in storage dam immediately above station are opened and closed each day during low stages of the river; and considerable fluctuation occurs at such times; some log driving every year and jams of short duration occasionally occur.

Cooperation.—Records furnished by the Maine State Water Storage Commission.

No discharge measurements made during the year.

Daily gage height, in feet, of Machias River at Whitneyville, Maine, for the year ending Sept. 30, 1914.

[Ira S. Albee, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	3.5	4.8	4.3	3.8	5.5	3.9	5.7	6.7	6.2	3.6	4.1	3.9
2	3.4	4.5	4.3	3.8	5.4	5.1	6.6	6.5	6.2	3.6	4.2	3.9
3	3.35	4.4	4.35	3.8	5.3	6.9	7.5	6.4	6.4	3.6	4.2	3.95
4	3.6	4.3	4.4	3.8	5.2	7.5	7.2	6.2	7.0	3.6	4.2	4.0
5	3.8	4.3	4.5	3.8	5.1	7.6	6.6	6.1	8.0	3.6	4.2	4.0
6	3.9	4.4	4.5	3.8	5.0	7.7	5.8	6.0	7.7	3.6	4.2	3.8
7	3.9	4.35	4.6	3.75	5.0	7.3	5.6	6.0	5.9	3.6	4.2	3.5
8	3.8	4.4	6.5	3.7	5.0	6.9	5.6	6.1	5.0	3.65	4.2	3.3
9	3.7	4.7	7.0	3.7	5.0	6.7	7.5	6.2	4.9	3.7	4.1	3.2
10	3.7	5.0	6.1	3.7	5.0	6.5	10.0	6.5	4.8	3.75	4.0	3.2
11	3.7	5.0	5.7	3.7	4.9	6.4	9.7	6.7	4.6	3.8	4.0	3.2
12	3.7	5.1	5.2	3.75	4.8	6.3	8.4	6.9	4.4	3.9	3.95	3.2
13	4.7	5.1	4.8	3.8	4.65	6.1	7.9	7.2	4.3	4.0	3.9	3.2
14	5.3	5.0	4.7	3.9	4.6	5.8	7.4	7.0	4.3	4.0	3.8	3.2
15	6.5	4.9	4.6	4.0	4.5	5.6	6.9	6.8	4.3	4.0	3.7	3.2
16	6.1	4.8	4.4	4.1	4.5	5.5	6.5	6.5	4.2	3.95	3.7	3.15
17	5.5	4.7	4.2	4.2	4.5	5.5	6.0	6.2	4.2	3.8	3.7	3.1
18	5.3	4.6	4.1	4.2	4.3	5.7	6.3	6.1	4.2	3.85	3.7	3.1
19	5.2	4.5	4.0	4.2	4.1	6.1	6.8	6.0	4.1	3.7	3.7	3.1
20	5.1	4.4	4.0	4.1	3.9	6.9	7.4	6.6	4.0	3.6	3.7	3.1
21	5.1	4.6	4.0	4.0	3.8	6.7	9.9	6.6	4.0	3.6	3.7	3.05
22	5.15	4.9	4.0	4.0	3.8	6.4	9.8	6.5	4.0	3.6	3.7	3.0
23	5.2	4.8	4.0	4.0	3.8	6.2	9.1	6.3	3.9	3.65	3.65	2.9
24	5.3	4.7	4.0	4.0	3.9	5.9	8.2	6.2	3.9	3.7	3.6	2.9
25	5.4	4.6	4.0	4.6	3.9	5.6	7.8	6.2	3.9	3.8	3.55	2.9
26	5.5	4.5	4.0	5.0	3.9	5.2	7.3	6.3	3.8	3.9	3.5	2.9
27	6.0	4.4	4.0	5.2	3.9	5.5	6.9	6.3	3.7	3.9	3.5	2.9
28	6.8	4.3	3.9	5.3	3.9	6.0	6.6	6.2	3.6	3.95	3.6	2.8
29	6.4	4.3	3.8	5.4	.....	5.9	6.6	6.2	3.6	4.0	3.7	2.8
30	6.0	4.3	3.8	5.5	.....	5.8	6.6	6.2	3.6	4.0	3.8	2.8
31	5.4	.....	3.8	5.5	.....	5.7	.....	6.2	.....	4.0	3.9	.....

NOTE.—Discharge relation may have been somewhat affected by ice during January and February.

Daily discharge, in second-feet, of Machias River at Whitneyville, Maine, for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	260	937	642	387	1,420	433	1,560	2,380	1,960	300	534	433
2	224	755	642	387	1,350	1,140	2,290	2,200	1,960	300	587	433
3	208	698	670	387	1,280	2,960	3,100	2,120	2,120	300	587	458
4	300	642	698	387	1,210	3,100	2,830	1,960	2,650	300	587	482
5	387	642	755	387	1,140	3,190	2,290	1,880	3,580	300	587	482
6	433	698	755	387	1,070	3,280	1,640	1,800	3,280	300	587	387
7	433	670	814	365	1,070	2,920	1,490	1,800	1,720	300	587	260
8	387	698	2,200	343	1,070	2,560	1,490	1,880	1,070	322	587	191
9	343	875	2,650	343	1,070	2,380	3,100	1,960	1,000	343	534	161
10	343	1,070	1,880	343	1,070	2,200	5,680	2,200	937	365	482	161
11	343	1,070	1,560	343	1,000	2,120	5,350	2,380	814	387	482	161
12	343	1,140	1,210	365	937	2,040	3,980	2,560	698	433	458	161
13	875	1,140	937	387	844	1,880	3,480	2,830	642	482	433	161
14	1,280	1,070	875	433	814	1,640	3,010	2,650	642	482	387	161
15	2,200	1,000	814	482	755	1,490	2,560	2,470	642	482	343	161
16	1,880	937	698	534	755	1,420	2,200	2,200	587	458	343	146
17	1,420	875	587	587	755	1,420	1,800	1,960	587	387	343	132
18	1,280	814	534	587	642	1,560	2,040	1,880	587	410	343	132
19	1,210	755	482	587	534	1,880	2,470	1,800	534	343	343	132
20	1,140	698	482	534	433	2,560	3,010	2,290	482	300	343	132
21	1,140	814	482	482	387	2,380	5,570	2,290	482	300	343	118
22	1,180	1,000	482	482	387	2,120	5,460	2,200	482	300	343	105
23	1,210	937	482	482	387	1,960	4,690	2,040	433	322	322	81
24	1,280	875	482	482	433	1,720	3,780	1,960	433	343	300	81
25	1,350	814	482	814	433	1,490	3,380	1,960	433	387	280	81
26	1,420	755	482	1,070	433	1,210	2,920	2,040	387	433	260	81
27	1,800	698	482	1,210	433	1,420	2,560	2,040	343	433	260	81
28	2,470	642	433	1,280	433	1,800	2,290	1,960	300	458	300	61
29	2,120	642	387	1,350	.....	1,720	2,290	1,960	300	482	343	61
30	1,800	642	387	1,420	.....	1,640	2,290	1,960	300	482	387	61
31	1,350	.....	387	1,420	.....	1,560	.....	1,960	.....	482	433	.....

NOTE.—Discharge determined from a rating curve fairly well defined between 200 and 4,000 second-feet, verified by a discharge measurement made in 1915. No corrections made for effect of ice in January and February.

Monthly discharge of Machias River at Whitneyville, Maine, for the year ending Sept. 30, 1914.

[Drainage area, 465 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
October	2,470	208	1,040	2.24	2.58
November	1,140	642	833	1.79	2.00
December	2,650	387	802	1.72	1.98
January	1,420	343	614	1.32	1.52
February	1,420	387	805	1.73	1.80
March	3,280	433	1,960	4.22	4.86
April	5,680	1,490	3,020	6.49	7.24
May	2,830	1,800	2,120	4.56	5.26
June	3,580	300	1,010	2.17	2.42
July	482	300	378	.813	.94
August	587	260	421	.905	1.04
September	482	61	191	.411	.46
The year	5,680	61	1,100	2.37	32.10

UNION RIVER BASIN.[1]

WEST BRANCH OF UNION RIVER AT AMHERST, MAINE.

Location.—At highway bridge three-fourths mile west of Amherst postoffice on road to Bangor, about a mile below highway bridge at old tannery dam.

Drainage area.—140 square miles.

Records available.—July 25, 1909, to September 30, 1914. Data also in annual reports Maine State Water Storage Commission.

Gage.—Chain, installed June 2, 1910, at same datum as old vertical gage nailed to log abutment.

Discharge measurements.—Made from downstream side of the bridge.

Channel and control.—Gravel, but not liable to change except in unusual flood.

Extremes of discharge.—Maximum stage recorded during year, 12.3 feet, April 21, 23, 24; approximate discharge computed from extension of rating curve, 1,960 second-feet. Minimum stage recorded during year, 4.95 feet on August 26, 27; discharge, 18 second-feet.

Winter flow.—Discharge relation affected by ice.

Regulation.—A few log-driving dams above the station, but the regimen of stream is only slightly affected by them.

Cooperation.—Results furnished by the Maine State Water Storage Commission.

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

February 4, 1914: Gage height, 8.15 feet; discharge, 202 second-feet. Discharge relation affected by ice.

Daily gage height, in feet, of West Branch of Union River at Amherst, Maine, for the year ending Sept. 30, 1914.

[Lewis Watts and Mrs. Emma Sumner, observers.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	6.44	9.26	6.92	7.5	8.2	.....	7.1	11.05	6.3	.....	5.3	5.2
2	6.43	8.95	6.95	7.5	.....	.....	9.0	9.85	6.2	.....	5.3	5.25
3	6.97	8.63	6.82	7.5	.....	9.2	8.95	9.65	6.1	.....	5.3	5.25
4	6.92	8.39	6.81	7.3	8.1	.....	8.5	9.45	6.25	.....	5.25	5.25
5	7.23	8.20	6.80	7.2	.....	.....	8.45	9.3	6.75	.....	5.2	5.2
6	7.11	7.97	6.92	6.9	.....	.....	8.35	9.2	6.55	.....	5.2	5.2
7	7.17	7.77	7.30	.....	.....	9.6	8.3	9.05	6.55	.....	5.2	5.2
8	7.16	7.60	8.19	.....	8.3	.....	8.4	8.9	6.5	.....	5.2	5.25
9	7.05	7.55	7.78	6.8	.....	.....	10.0	9.05	6.5	5.95	5.2	5.3
10	6.93	7.90	8.00	.....	.....	9.45	10.7	9.05	6.4	5.85	5.15	5.35
11	6.86	7.90	7.61	.....	8.2	.....	10.05	8.85	6.35	5.85	5.1	5.3
12	6.99	7.78	8.50	.....	.....	.....	10.25	8.7	6.3	5.8	5.05	5.25
13	7.57	7.60	7.78	6.25	.....	9.1	10.65	8.55	6.2	5.8	4.95	5.2
14	7.67	7.52	7.08	.....	.....	.....	10.3	8.35	6.1	5.7	4.95	5.25
15	7.13	7.50	7.10	.....	8.25	.....	10.2	8.15	6.05	5.65	5.1	5.2
16	8.20	7.39	7.72	.....	.....	.....	10.25	7.95	6.15	5.65	5.15	5.15
17	8.09	7.29	7.56	6.7	.....	8.9	10.25	7.75	6.3	5.6	5.05	5.1
18	8.07	7.21	6.92	.....	7.9	.....	10.05	7.6	6.3	5.6	5.1	5.1
19	7.91	7.10	6.95	.....	.....	.....	10.2	7.45	6.25	5.65	5.1	5.1
20	7.84	7.57	7.26	.....	.....	9.95	11.3	7.3	6.4	5.55	5.1	5.1
21	9.98	7.65	7.15	6.8	.....	.....	12.3	7.2	6.3	5.55	5.1	5.1
22	9.35	7.70	6.92	.....	7.7	.....	12.25	7.1	6.3	5.5	5.15	5.1
23	9.02	7.65	6.99	.....	.....	.....	12.3	7.0	6.2	5.4	5.05	5.1
24	8.86	7.61	7.55	.....	.....	8.95	12.2	6.95	6.1	5.35	5.05	5.1
25	8.86	7.45	7.90	7.5	7.65	.....	11.6	6.8	6.05	5.35	4.95	5.1
26	9.73	7.34	6.98	.....	.....	.....	11.3	6.75	6.95	5.35	4.95	5.1
27	10.54	7.21	7.28	.....	.....	9.05	10.75	6.65	5.9	5.3	4.95	5.15
28	10.17	7.19	7.68	7.8	7.5	.....	10.4	6.6	5.85	5.3	5.05	5.15
29	9.92	7.16	7.76	.....	.....	.....	10.3	6.5	5.85	5.3	5.3	5.1
30	9.72	7.00	7.89	.....	.....	.....	10.2	6.4	5.85	5.3	5.4	5.1
31	9.47	.....	7.69	.....	.....	7.7	.....	6.3	.....	5.3	5.3	.....

NOTE.—Discharge relation affected by ice Jan. 6 to Mar. 30.

[1] Published as "Union River at Amherst, Maine," in Water-Supply Papers 301, 321, and 351.

Daily discharge, in second-feet, of West Branch of Union River at Amherst, Maine, for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	164	814	245	240	210	150	284	1,460	140	78	34	28
2	164	724	254	240	210	150	738	1,020	125	78	34	31
3	254	643	226	240	300	410	724	948	110	78	34	31
4	245	580	226	210	200	450	605	879	132	83	31	31
5	314	532	226	200	290	470	592	830	217	83	28	28
6	284	472	245	160	210	490	568	798	182	83	28	28
7	294	426	325	150	220	500	556	753	182	83	28	28
8	294	392	532	150	230	490	580	710	173	90	28	31
9	274	380	438	150	220	480	1,070	753	173	90	28	34
10	254	461	484	80	220	465	1,330	753	156	78	26	37
11	236	461	392	60	210	430	1,090	696	148	78	23	34
12	264	438	605	40	210	400	1,060	656	140	72	21	31
13	380	392	438	30	210	385	1,310	618	125	72	18	28
14	404	369	284	30	220	370	1,180	568	110	63	18	31
15	294	369	284	40	220	360	1,150	520	103	59	23	28
16	532	347	415	40	200	350	1,060	472	118	59	26	26
17	508	325	380	50	180	340	1,060	426	140	55	21	23
18	496	304	245	50	165	350	1,090	392	140	55	23	23
19	461	284	254	50	160	360	1,150	358	132	59	23	23
20	450	380	314	60	150	575	1,560	325	156	51	23	23
21	1,070	404	294	60	140	500	1,960	304	140	51	23	23
22	846	415	245	70	140	420	1,940	284	140	47	26	23
23	738	404	264	80	140	380	1,960	264	125	40	21	23
24	696	392	380	100	135	400	1,920	254	110	37	21	23
25	696	358	461	120	135	500	1,680	226	103	37	18	23
26	984	336	264	130	130	600	1,560	217	254	37	18	23
27	1,270	304	325	140	130	750	1,350	199	83	34	18	26
28	1,130	304	415	150	120	700	1,220	190	78	34	21	26
29	1,040	294	426	160	.....	600	1,180	173	78	34	34	23
30	966	264	461	180	.....	500	1,150	156	78	34	40	23
31	879	.....	415	200	.....	410	.....	140	.....	34	34	.....

NOTE.—Discharge determined from rating curve well defined between 15 and 1,100 second-feet, a discharge measurement obtained in 1915 being used to verify the curve. Discharge estimated because of ice Jan. 6 to Mar. 30 on basis of one discharge measurement, observer's notes and weather records.

Monthly discharge of West Branch of Union River at Amherst, Maine, for the year ending Sept. 30, 1914.

[Drainage area, 140 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
October	1,270	164	544	3.88	4.47
November	814	264	419	2.99	3.34
December	605	226	347	2.48	2.86
January	240	30	118	.843	.97
February	230	120	183	1.31	1.36
March	750	150	443	3.16	3.64
April	1,960	284	1,160	8.28	9.24
May	1,460	140	527	3.76	4.33
June	254	78	136	.971	1.08
July	90	34	60	.428	.49
August	40	18	26	.186	.21
September	37	23	27	.193	.22
The year	1,960	18	332	2.30	32.21

BRANCH LAKE NEAR ELLSWORTH, MAINE.

Location.—At Branch Pond Lumber Co.'s mill at lower end of Branch Lake, 5 miles northwest of Ellsworth.

Area of lake surface.—4.33 square miles.

Records available.—June 29, 1909, to September 30, 1914.

Gage.—Vertical staff nailed to corner of mill near intake to wheels.

Extremes of stage.—Maximum stage recorded during year, 8.1 feet at noon April 12. Minimum stage recorded during year, 1.5 feet at noon September 27.

Altitude.—Altitude as determined by United States Geological Survey, 236 feet above sea level, which was assumed as height of water surface at time of Union River surveys.[1] In accordance with this assumption the top of the mill pond dam at the lower end of the lake is 240 feet above sea level.

Daily gage height, in feet, of Branch Lake near Ellsworth, Maine, for the year ending Sept. 30, 1914.

[L. H. Cushman, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1		4.95			5.4	5.3						2.9
2											4.3	3.15
3								7.5				
4				5.35								
5	3.15						7.1			4.75		
6	3.1											
7			5.05						6.1			
8					5.5	5.9						
9		4.8									4.1	2.7
10			5.55					7.2				2.9
11				4.25								
12	3.15						8.1			4.7		
13												2.8
14			5.6									2.8
15					5.4	5.9						
16		5.1									4.0	
17								7.0			3.75	
18				5.1								
19	3.5						8.0				3.7	2.3
20												2.1
21			5.5									2.0
22				5.0	5.35	6.1						
23		5.2									2.9	
24								6.75				
25												
26	4.3						8.0			4.4		
27												1.5
28			5.55								3.3	
29									4.8		3.15	
30		5.1										
31								6.3				

[1] U. S. Geol. Survey Water-Supply Paper 281, p. 57, 1912.

BRANCH LAKE STREAM NEAR ELLSWORTH, MAINE.

Location.—At small highway bridge immediately below the sawmill at outlet of Branch Lake, 5 miles northwest of Ellsworth.

Drainage area.—31 square miles.

Records available.—July 1, 1909, to September 30, 1914. Data also in annual reports Maine State Water Storage Commission.

Gage.—Seven-foot staff nailed to right abutment, downstream side of bridge.

Discharge measurements.—Made from highway bridge.

Channel and control.—Gravelly and permanent in natural condition; fills up with sawmill waste, but generally clears itself during spring freshets.

Extremes of discharge.—Maximum stage recorded during year, 5 feet at noon September 9; approximate discharge computed from extension of rating curve, 129 second-feet. Minimum stage recorded during year, 3.7 feet at noon September 10; discharge, 5 second-feet.

Winter flow.—Discharge relation not seriously affected by ice.

Regulation.—Flow from lake regulated in interest of sawmill and power plants of Ellsworth.

Cooperation.—Records furnished by Maine State Water Storage Commission.

Daily gage height, in feet, of Branch Lake Stream near Ellsworth, Maine, for the year ending Sept. 30, 1914.

[L. H. Cushman, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1					4.3	4.3						4.9
2											4.0	3.8
3		4.3						4.8				
4				4.3								
5	4.15						4.3			4.0		
6												
7			4.3									
8					4.3	4.3						
9		4.3									4.1	5.0
10			4.3					4.75				3.7
11				4.3								
12	4.15						4.8			4.0		
13												4.1
14			4.3									3.8
15					4.3	4.3						
16		4.3									4.0	
17								4.75			4.7	
18				4.3								
19	4.2						4.8				5.0	4.75
20												5.0
21			4.3									4.85
22					4.3	4.3					4.85	
23		4.3										
24								4.75				
25				4.3								
26	4.2						4.85			4.0		
27												4.7
28			4.3								4.75	
29						4.3			4.3		4.75	
30		4.3										
31								4.7				

Daily discharge, in second-feet, of Branch Lake Stream near Ellsworth, Maine, for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	30	41	44		44	44						114
2	30	42	44								18	8
3	30	44	44					101				
4	30	44	44	44								
5	30	44	44				44			18		
6	30	44	44									
7	30	44	44									
8	30	44	44		44	44						
9	30	44	44								26	129
10	30	44	44					94				5
11	30	44	44	44								
12	30	44	44				101			18		
13	30	44	44									26
14	30	44	44									8
15	31	44	44		44	44						
16	32	44	44								18	
17	33	44	44					94			88	
18	34	44	44	44								
19	35	44	44				101				129	94
20	35	44	44									129
21	35	44	44									108
22	35	44	44		44	44					108	
23	35	44	44									
24	35	44	44					94				
25	35	44	44	44								
26	35	44	44				108			18		
27	36	44	44									88
28	37	44	44								94	
29	38	44	44			44			44		94	
30	39	44	44									
31	40		44					88				

NOTE.—Discharge determined from a rating curve well defined between 10 and 160 second-feet. Discharge interpolated for days when no gage height was reported, Oct. 1 to Dec. 31.

Monthly discharge of Branch Lake Stream near Ellsworth, Maine, for the year ending Sept. 30, 1914.

[Drainage area, 31 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
October	40	30	33	1.06	1.22
November	44	41	44	1.42	1.58
December	44	44	44	1.42	1.64
January	44	44	44	1.42	1.64
February	44	44	44	1.42	1.48
March	44	44	44	1.42	1.64
April	108	44	88	2.84	3.17
May	101	88	94	3.03	3.49
June	44	44	44	1.42	1.58
July	18	18	18	.580	.67
August	129	18	72	2.32	2.68
September	129	5	71	2.29	2.55
The year	129	5	53.3	1.72	23.34

PENOBSCOT RIVER BASIN.

WEST BRANCH OF PENOBSCOT RIVER AT MILLINOCKET, MAINE.

Location.—At Quakish Lake dam and Millinocket mill of Great Northern Paper Co. at Millinocket.

Drainage area.—1,880 square miles.

Records available.—January 11, 1901, to September 30, 1914. Data also in annual reports Maine State Water Storage Commission.

Gages.—Water-stage recorder at Quakish Lake dam, and gages in the forebay and tailraces at the mill.

Channel and control.—Crest of concrete dam.

Determination of discharge.—The flow is computed by considering the flow over the dam, the flow through the wheels, and the water used from time to time through the log sluices and filters. The wheels were rated at Holyoke, Mass., before being placed in position and were tested later by numerous tube-float and current-meter measurements. When the flow of the river is less than 2,500 second-feet all the water generally flows through the wheels of the mill.

Winter flow.—Discharge relation not seriously affected by ice.

Regulation.—Dams at outlets of North Twin and Chesuncook lakes store water on a surface of about 65 square miles, with a capacity of about 32,000,000,000 cubic feet. Except during the time (usually in August) when excess water has to be supplied for log driving on the river below Millinocket and for a short time during the spring freshet, run-off is regulated by storage. Results corrected for storage.

Cooperation.—Records obtained and computations made by engineers of the Great Northern Paper Co. Since 1912 the company has preferred to furnish estimates of monthly discharge only.

Monthly discharge of West Branch of Penobscot River at Millinocket, Maine, for the year ending Sept. 30, 1914.

[Drainage area, 1,880 square miles.]

Month.	Discharge in second-feet.			Corrected run-off (depth in inches on drainage area).
	Observed mean.	Corrected for storage.		
		Mean.	Per square mile.	
October	2,320	2,620	1.39	1.60
November	2,340	3,020	1.61	1.80
December	2,330	1,930	1.03	1.19
January	2,570	1,230	.654	.75
February	2,710	603	.320	.33
March	2,870	353	.188	.22
April	3,390	4,280	2.28	2.54
May	6,920	14,400	7.66	8.83
June	3,300	2,940	1.56	1.74
July	3,180	1,400	.744	.86
August	3,120	1,030	.548	.63
September	2,540	749	.398	.44
The year	3,140	2,900	1.54	20.93

PENOBSCOT RIVER AT WEST ENFIELD, MAINE.

Location.—At steel highway bridge 1,000 feet below Piscataquis River and a mile below West Enfield.

Drainage area.—6,600 square miles.

Records available.—January 1, 1902, to September 30, 1914. Data also published in annual reports Maine State Water Storage Commission.

Gage.—Friez water-stage recorder on downstream side of left abutment, used after December 10, 1912. Prior to this date a chain on upstream side of bridge at same datum.

Discharge measurements.—Made from bridge.

Channel and control.—Practically permanent; channel at gage broken by four bridge piers.

Winter flow.—Discharge relation affected by ice.

Regulation.—Flow of river since about 1900 largely regulated by storage, principally in the lakes tributary to the West Branch. Dam of International Paper Co. about a mile above station; Piscataquis River is dammed near its mouth. Considerable water is held above these two dams at night. At low stages daily fluctuations in gage heights are caused by variations in wheel-gate openings. Results not corrected for storage.

Cooperation.—Discharge measurements made by students of University of Maine under direction of Prof. H. S. Boardman and by T. W. Clark, hydraulic engineer, Oldtown, Maine. Records furnished by Maine State Water Storage Commission.

Discharge measurements of Penobscot River at West Enfield, Maine, during the year ending Sept. 30, 1914.

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Oct. 2	2.77	4,810	Oct. 28	10.02	36,100	May 13	13.07	56,200
Do	2.77	4,820	Oct. 31	8.43	27,300	Sept. 18	[a] 2.82	4,310
Oct. 8	3.22	5,830	Apr. 24	11.94	48,400	Sept. 26	[a] 2.76	4,030
Do	3.22	5,690	May 13	13.12	56,800			

[a] Discharge relation affected by log jam.

NOTE.—Measurements made by students of University of Maine, under direction of Prof. H. S. Boardman, except that of Sept. 18, which was made by T. W. Clark.

Daily gage height, in feet, of Penobscot River at West Enfield, Maine, for the year ending Sept. 30, 1914.

[T. W. Clark, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.9	7.8	3.75	5.02	7.21	6.26	7.58	13.05	5.55	4.45	3.20	2.95
2	2.85	7.2	3.9	5.04	6.93	6.32	7.87	12.60	5.55	4.45	3.15	2.70
3	3.1	6.9	3.9	4.99	7.22	7.06	7.98	12.55	5.35	4.25	3.25	2.65
4	3.45	6.5	3.9	5.05	7.18	7.58	7.84	12.85	5.50	4.10	3.50	2.80
5	3.65	6.1	3.9	5.15	7.06	7.68	7.66	13.10	6.00	3.90	3.10	2.80
6	3.4	5.75	3.75	5.44	6.86	7.83	7.56	13.40	6.60	3.85	3.10	2.70
7	3.45	5.55	3.55	5.53	6.74	7.88	7.34	13.60	6.35	3.95	3.15	2.60
8	3.15	5.3	4.35	5.43	6.73	7.92	7.62	13.50	5.80	3.80	3.00	2.75
9	3.05	5.15	5.75	5.21	6.52	7.67	8.20	13.50	6.10	3.90	3.15	3.05
10	3.05	5.4	5.4	5.14	6.77	7.82	9.17	14.80	5.50	3.85	2.80	3.15
11	3.0	6.75	5.25	5.18	6.88	7.65	9.85	14.60	4.55	3.70	2.80	3.10
12	2.9	6.3	4.6	5.16	6.93	7.44	10.25	14.10	4.20	3.55	2.95	3.00
13	3.05	5.8	4.55	5.89	6.76	7.38	10.50	13.25	4.65	3.60	3.05	2.85
14	3.25	5.45	4.7	6.28	6.77	7.25	10.55	12.55	4.90	3.65	3.30	2.75
15	3.55	5.25	4.1	6.31	6.73	7.22	10.56	11.85	4.60	3.60	3.10	2.80
16	3.9	5.05	3.65	6.45	6.37	6.87	10.49	11.70	4.75	3.65	2.80	2.80
17	4.3	4.9	3.75	6.43	6.58	7.00	10.25	11.60	5.35	3.55	2.70	2.75
18	4.4	4.9	4.1	6.55	6.85	7.04	10.25	10.90	5.50	3.55	2.80	2.90
19	4.3	4.65	3.95	6.35	6.75	7.18	11.00	10.15	5.35	3.60	2.75	2.95
20	4.4	4.95	3.7	6.55	6.66	7.29	11.00	9.00	5.35	3.55	2.80	2.90
21	7.1	5.55	3.8	7.03	6.64	7.22	12.70	8.45	5.55	3.60	2.90	2.80
22	9.5	5.4	3.7	7.00	6.56	7.20	13.00	8.35	5.50	3.70	2.65	2.85
23	8.0	5.05	3.7	6.89	6.31	6.84	12.20	8.15	5.20	3.60	2.75	2.80
24	7.05	4.95	3.55	6.80	6.46	6.90	11.60	8.40	4.95	3.55	2.80	2.85
25	6.7	4.95	3.5	7.07	6.38	6.91	11.30	8.05	4.75	3.40	2.65	2.85
26	7.15	4.65	3.4	6.80	6.32	6.86	11.10	7.65	4.60	3.35	2.65	2.80
27	9.0	4.45	3.55	7.23	6.34	6.86	10.90	6.85	4.40	3.45	2.50	2.80
28	9.9	4.2	.....	7.62	6.31	7.02	11.80	7.05	4.30	3.65	2.45	2.65
29	9.5	3.9	.....	7.52	.....	7.14	12.80	7.30	4.25	3.50	2.65	2.45
30	9.05	3.8	.....	7.33	.....	7.12	13.20	7.35	4.30	3.35	2.80	2.80
31	8.5	.....	.....	7.35	.....	7.31	.....	6.45	.....	3.25	2.95	.....

NOTE.—Discharge relation Jan. 1 to Apr. 20 affected by ice. Discharge relation July 5 to Sept. 30 affected by backwater from logs.

Daily discharge, in second-feet, of Penobscot River at West Enfield, Maine, for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	5,190	22,000	7,300	6,140	7,170	4,960	11,300	54,800	12,800	9,270	4,600	4,600
2	5,080	19,300	7,710	5,890	6,910	4,730	12,300	51,700	12,800	9,270	4,400	4,400
3	5,650	18,000	7,710	5,890	7,710	6,650	12,600	51,300	12,100	8,680	4,300	3,700
4	6,520	16,400	7,710	5,890	7,710	8,260	12,000	53,400	12,600	8,260	5,200	3,900
5	7,040	14,800	7,710	5,650	7,170	9,120	12,000	55,200	14,400	7,400	5,000	4,100
6	6,390	13,500	7,300	5,650	6,650	9,420	12,000	57,300	16,800	6,900	4,100	4,000
7	6,520	12,800	6,780	6,650	5,890	9,420	11,000	58,800	15,800	6,900	4,300	3,900
8	5,770	12,000	8,980	6,390	5,890	9,420	12,000	58,000	13,700	6,900	4,500	3,900
9	5,540	11,500	13,500	5,890	5,420	9,120	14,100	58,000	14,800	6,600	4,400	4,700
10	5,540	12,300	12,300	5,650	6,140	9,420	18,000	67,300	12,600	6,900	4,600	5,200
11	5,420	17,400	11,800	5,890	6,390	9,420	21,100	65,800	9,570	6,600	3,400	5,200
12	5,190	15,600	9,720	5,890	6,390	9,120	23,000	62,300	8,540	6,600	3,900	4,900
13	5,540	13,700	9,570	5,890	6,390	9,120	24,400	56,300	9,880	6,400	4,400	4,400
14	6,020	12,500	10,000	4,960	6,390	8,830	25,000	51,300	10,700	6,400	4,900	4,000
15	6,780	11,800	8,260	4,960	6,140	8,540	25,000	46,500	9,720	6,400	5,100	3,900
16	7,710	11,100	7,040	4,960	5,420	7,710	24,400	45,400	10,200	6,400	3,900	3,900
17	8,830	10,700	7,300	5,190	4,890	7,980	23,000	44,800	12,100	6,100	3,700	3,700
18	9,120	10,700	8,260	5,420	6,390	7,980	23,000	40,000	12,600	6,000	3,700	3,600
19	8,830	9,880	7,840	5,190	6,390	8,540	31,000	35,100	12,100	6,000	4,100	3,800
20	9,120	10,800	7,170	5,420	6,140	8,830	36,100	28,200	12,100	6,000	3,700	3,600
21	18,800	12,800	7,440	6,390	5,890	8,830	54,300	25,200	12,800	5,700	3,900	3,900
22	31,000	12,300	7,170	6,390	5,890	8,830	54,500	24,700	12,600	6,000	3,800	3,600
23	23,000	11,100	7,170	6,140	5,190	7,710	48,900	23,700	11,600	6,100	3,600	3,600
24	18,600	10,800	6,780	5,890	5,650	8,260	44,800	25,000	10,800	5,900	4,000	3,500
25	17,200	10,800	6,650	6,650	5,420	8,540	42,700	23,200	10,200	5,600	4,000	3,600
26	19,100	9,880	6,390	5,890	5,190	8,540	41,400	21,300	9,720	5,200	3,500	3,600
27	28,200	9,270	6,780	6,910	4,960	8,830	40,000	17,800	9,120	5,400	3,500	3,500
28	33,300	8,540	6,500	7,440	4,960	9,420	46,100	18,600	8,830	5,500	3,100	3,800
29	31,000	7,710	6,500	6,650	.....	9,720	53,100	19,700	8,680	5,600	3,200	3,200
30	28,500	7,440	6,500	6,650	.....	9,720	55,900	19,900	8,830	5,200	4,000	3,600
31	25,500	.....	6,500	7,170	.....	10,300	.....	16,200	.....	4,700	4,400	.....

NOTE.—Discharge determined from a well-defined rating curve, three discharge measurements obtained in 1915 being used to verify the curve. Discharge relation affected by ice Jan. 1 to Apr. 20, and by log jam July 5 to Sept. 30. Discharge for those periods based on comparison with records at Sunk Haze Rips, by using a reduction factor determined by comparison of records under normal conditions.

Monthly discharge of Penobscot River at West Enfield, Maine, for the year ending Sept. 30, 1914.

[Drainage area, 6,600 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
October	33,300	5,080	13,100	1.98	2.28
November	22,000	7,440	12,600	1.91	2.13
December	13,500	6,390	8,010	1.21	1.40
January	7,440	4,960	5,990	.908	1.05
February	7,710	4,960	6,130	.929	.97
March	10,300	4,730	8,560	1.30	1.50
April	55,900	11,000	28,800	4.36	4.87
May	67,300	16,200	41,200	6.24	7.19
June	16,800	8,540	11,600	1.76	1.96
July	9,270	4,700	6,480	.982	1.13
August	5,200	3,100	4,100	.622	.72
September	5,200	3,200	3,980	.603	.67
The year	67,300	3,100	12,600	1.91	25.87

NOTE.—Attention is called to the fact that the monthly discharge in second-feet per square mile and the run-off in depth in inches do not represent the natural flow from the basin because of artificial storage. The yearly discharge and run-off doubtless represent more nearly the natural flow, for probably little stored water is held over from year to year.

EAST BRANCH OF PENOBSCOT RIVER AT GRINDSTONE, MAINE.

Location.—At Bangor & Aroostook Railroad bridge, half a mile south of railroad station at Grindstone, one-eighth mile above Grindstone Falls, and about 8 miles above the mouth at Medway.

Drainage area.—1,100 square miles. Includes 270 square miles of Chamberlain Lake drainage.

Records available.—October 23, 1902, to September 30, 1914. Data also in annual reports Maine State Water Storage Commission.

Gage.—Chain attached to railroad bridge.

Discharge measurements.—Made from railroad bridge.

Channel and control.—Practically permanent; stream confined by abutments of bridge and broken by one pier; velocity of current medium at moderate and high stages, but sluggish at low water.

Extremes of discharge.—Maximum stage recorded during year, 11.9 feet at 7 a. m. May 10; approximate discharge computed from extension of rating curve, 15,100 second-feet. Minimum stage recorded during year, 4 feet, September 21–25; discharge, 185 second-feet.

Winter flow.—Discharge relation affected by ice.

Regulation.—Several dams maintained at outlets of a number of lakes and ponds near source of river and regulated in the interests of log driving. During the summer and fall gates are generally left open. The basin of the East Branch since about 1840 includes about 270 square miles of additional territory draining into Chamberlain Lake that formerly drained into the St. John River basin. This diversion is made through what is known as the Telos canal. Results not corrected for storage and diversions.

Accuracy.—Discharge relation materially affected by backwater from log jams at station and at Grindstone Falls immediately below, and by ice during winter. Results probably fair for moderate and high stages, but uncertain for low stages.

Cooperation.—Records furnished by Maine State Water Storage Commission.

Discharge measurements of East Branch of Penobscot River at Grindstone, Maine, during the year ending Sept. 30, 1914.

[Made by G. C. Danforth.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
Jan 27	[a] 5.30	577
Mar. 12	[a] 5.90	656

[a] Discharge relation affected by ice.

Daily gage height, in feet, of East Branch of Penobscot River at Grindstone, Maine, for the year ending Sept. 30, 1914.

[G. H. Goddard and R. D. Porter, observers.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	4.70	6.88	5.52	.....	.....	.....	.....	9.50	6.20	6.70	5.15	4.50
2	4.60	6.70	5.38	.....	5.30	5.60	.....	9.05	6.45	6.60	5.20	4.50
3	5.28	6.50	5.30	5.40	.....	.....	6.20	9.40	7.30	6.60	5.15	4.50
4	5.25	6.45	5.20	.....	.....	.....	.....	10.10	7.25	6.50	5.20	4.50
5	4.98	6.40	5.12	.....	5.30	.....	.....	10.40	7.75	6.30	5.30	4.50
6	4.90	6.28	5.10	5.30	.....	5.80	6.70	10.40	8.15	6.20	5.20	4.50
7	4.82	6.60	5.10	.....	.....	.....	.....	10.75	7.50	6.15	5.15	4.40
8	4.80	7.00	5.75	.....	.....	.....	.....	10.95	7.45	6.10	5.20	4.50
9	4.80	6.75	5.60	.....	.....	.....	.....	10.90	7.15	6.00	.....	4.50
10	4.80	6.60	5.80	5.30	5.25	6.00	7.00	11.85	6.55	6.00	5.10	4.40
11	4.75	6.50	5.92	.....	.....	.....	.....	11.60	6.00	5.85	5.10	4.40
12	4.72	6.30	5.90	.....	.....	5.90	.....	11.10	6.60	5.80	5.00	4.40
13	4.75	6.22	5.90	5.30	.....	.....	7.40	10.25	7.25	5.75	4.90	4.40
14	4.80	6.20	5.82	.....	5.20	.....	.....	9.80	7.25	5.70	4.80	4.30
15	5.10	6.08	5.78	.....	.....	.....	.....	9.40	7.10	5.80	4.70	4.20
16	5.95	6.00	5.70	.....	.....	5.85	.....	8.90	7.40	5.85	.....	4.20
17	6.10	5.92	5.68	5.30	5.20	.....	8.10	8.50	7.25	5.50	4.70	4.20
18	6.00	5.88	5.55	.....	.....	.....	.....	7.45	7.15	5.75	4.65	4.20
19	6.05	5.80	5.48	5.30	.....	.....	.....	7.30	7.15	5.80	4.60	4.10
20	6.25	5.90	.....	.....	5.20	5.80	9.15	7.20	7.00	5.80	4.50	4.10
21	9.10	6.10	.....	.....	.....	.....	.....	7.30	7.15	5.65	4.50	4.05
22	8.65	6.10	5.30	.....	.....	.....	.....	7.40	7.25	5.65	4.50	4.00
23	7.75	5.98	.....	.....	.....	5.70	.....	7.90	6.95	5.50	4.50	4.00
24	7.25	5.80	.....	5.30	5.20	.....	8.60	8.20	6.95	5.30	4.50	4.00
25	7.10	5.80	.....	.....	.....	.....	.....	8.00	6.85	5.20	4.50	4.00
26	7.40	5.78	5.60	5.35	.....	.....	.....	7.65	7.00	5.20	4.40	4.10
27	8.30	5.72	.....	.....	5.30	6.00	.....	7.45	6.85	5.30	4.40	4.20
28	8.00	5.68	.....	.....	.....	.....	9.10	7.20	6.80	5.20	4.40	4.10
29	7.65	5.65	.....	.....	.....	.....	9.60	7.25	6.65	5.25	4.40	4.10
30	7.35	5.60	5.50	5.30	.....	6.20	9.70	7.25	6.80	5.70	4.50	4.10
31	7.00	.....	.....	.....	.....	.....	.....	7.10	.....	5.55	4.60	.....

NOTE.—Discharge relation Dec. 20 to Apr. 27 seriously affected by ice.

Daily discharge, in second-feet, of East Branch of Penobscot River at Grindstone, Maine, for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	455	3,140	1,020	620	505	455	1,020	8,770	1,960	2,790	715	360
2	405	2,790	920	620	505	505	1,130	7,700	2,360	2,620	750	360
3	830	2,450	830	620	505	505	1,130	8,530	3,890	2,620	715	360
4	790	2,360	750	620	455	560	1,250	10,200	3,800	2,450	750	360
5	620	2,280	680	560	455	620	1,520	11,000	4,800	2,120	830	360
6	560	2,120	680	560	455	620	1,810	11,000	5,660	1,960	750	360
7	505	2,620	680	560	455	620	1,960	11,900	4,290	1,880	715	315
8	505	3,320	1,320	560	405	680	2,120	12,400	4,190	1,810	750	360
9	505	2,880	1,130	560	405	750	2,280	12,300	3,600	1,660	715	360
10	505	2,620	1,380	560	405	750	2,450	14,900	2,540	1,660	680	315
11	480	2,450	1,520	560	405	680	2,790	14,200	1,660	1,450	680	315
12	455	2,120	1,520	560	405	680	3,140	12,800	2,620	1,380	620	315
13	480	1,960	1,520	560	360	680	3,320	10,600	3,800	1,320	560	315
14	505	1,960	1,380	560	360	680	3,700	9,500	3,800	1,250	505	275
15	680	1,810	1,380	560	360	620	4,090	8,530	3,510	1,380	455	240
16	1,590	1,660	1,250	560	360	620	4,490	7,350	4,090	1,450	455	240
17	1,810	1,520	1,250	560	360	620	4,700	6,430	3,800	1,020	455	240
18	1,660	1,520	1,080	560	360	620	5,530	4,190	3,600	1,320	430	240
19	1,740	1,380	1,020	560	360	620	5,990	3,890	3,600	1,380	405	210
20	2,040	1,520	.....	560	360	620	6,890	3,700	3,320	1,380	360	210
21	7,810	1,810	.....	560	360	620	6,660	3,890	3,600	1,190	360	198
22	6,780	1,810	.....	560	360	560	6,430	4,090	3,800	1,190	360	185
23	4,800	1,660	.....	560	360	560	6,210	5,120	3,230	1,020	360	185
24	3,800	1,380	.....	560	360	620	5,990	5,770	3,230	830	360	185
25	3,510	1,380	.....	560	360	680	6,430	5,330	3,050	750	360	185
26	4,090	1,380	.....	560	360	750	6,890	4,600	3,320	750	315	210
27	5,990	1,250	.....	560	360	830	7,350	4,190	3,050	830	315	240
28	5,330	1,250	.....	560	405	920	7,810	3,700	2,960	750	315	210
29	4,600	1,190	.....	560	.....	920	9,010	3,800	2,700	790	315	210
30	3,990	1,130	.....	560	.....	1,020	9,250	3,800	2,960	1,250	360	210
31	3,320	.....	.....	560	.....	2,020	.....	3,510	.....	1,080	405	.....

NOTE.—Discharge determined from a rating curve fairly well defined between 400 and 10,000 second-feet, a discharge measurement made in 1915 being used to check the curve. Mean discharge Dec. 20–31 estimated at 800 second-feet. Discharge Jan. 1 to Apr. 27 estimated from observer's notes, climatologic data, and two discharge measurements.

Monthly discharge of East Branch of Penobscot River at Grindstone, Maine, for the year ending Sept. 30, 1914.

[Drainage area, 1,100 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
October	6,780	405	2,300	2.09	2.41
November	3,320	1,130	1,960	1.78	1.99
December	1,520	.....	997	.906	1.04
January	620	560	568	.516	.59
February	505	360	399	.363	.38
March	1,020	455	678	.616	.71
April	9,250	1,020	4,440	4.04	4.51
May	14,900	3,510	7,670	6.97	8.04
June	5,660	1,660	3,430	3.12	3.48
July	2,790	750	1,460	1.33	1.53
August	830	315	520	.472	.54
September	360	185	271	.246	.27
The year	14,900	185	2,060	1.87	25.49

NOTE.—Attention is called to the fact that the monthly discharge in second-feet per square mile and the run-off in depth in inches do not represent the natural flow from the basin because of artificial storage. The yearly discharge and run-off doubtless represent more nearly the natural flow, for probably little stored water is held over from year to year.

MATTAWAMKEAG RIVER AT MATTAWAMKEAG, MAINE.

Location.—At Maine Central Railroad bridge at village of Mattawamkeag, half a mile above mouth of river.

Drainage area.—1,500 square miles.

Records available.—August 26, 1902, to September 30, 1914. Data also in annual reports Maine State Water Storage Commission.

Gage.—Chain fastened to raiload bridge.

Discharge measurements.—Made from the bridge, which is slightly oblique to the current; low-water measurements made by wading at a point about a mile above station.

Channel and control.—Practically permanent; channel at bridge broken by two piers.

Extremes of discharge.—Maximum stage recorded during year, 12.55 feet, May 10 and 11; approximate discharge computed from extension of rating curve, 20,800 second-feet. Minimum stage recorded during year, 2.7 feet, September 23–26; discharge, 114 second-feet.

Winter flow.—Discharge relation affected by ice.

Regulation.—Dams maintained at outlets of several large lakes and ponds, but the stored water is used only for log driving.

Accuracy.—Discharge relation at times affected by backwater from log jams.

Cooperation.—Records furnished by Maine State Water Storage Commission.

Discharge measurements of Mattawamkeag River at Mattawamkeag, Maine, during the year ending Sept. 30, 1914.

[Made by G. C. Danforth.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
Jan. 28	[a] 6.00	994
Mar. 6	[a] 6.50	1,000

[a] Discharge relation affected by ice.

Daily gage height, in feet, of Mattawamkeag River at Mattawamkeag, Maine, for the year ending Sept. 30, 1914.

[W. T. Mincher, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	4.4	9.3	6.5	.....	.....	.....	.....	11.65	5.85	5.1	3.8	3.3
2	4.4	9.15	6.45	6.85	6.3	6.0	.....	11.65	5.65	4.9	3.8	3.35
3	4.3	8.9	6.4	.....	.....	.....	7.75	11.65	5.65	4.65	3.7	3.3
4	4.2	8.8	6.4	.....	.....	.....	.....	11.75	5.55	4.6	3.7	3.3
5	4.35	8.55	6.4	5.9	.....	.....	.....	11.75	5.95	4.45	3.6	3.3
6	4.4	8.25	6.4	.....	6.3	6.5	7.85	11.75	6.25	4.25	3.6	3.3
7	4.5	8.05	6.4	.....	.....	.....	.....	11.8	6.45	4.0	3.6	3.2
8	4.5	7.85	6.4	.....	.....	.....	.....	11.95	6.25	4.3	3.5	3.3
9	4.5	7.45	6.35	5.7	6.2	7.2	.....	12.15	6.05	4.6	3.5	3.3
10	4.5	7.25	6.85	.....	.....	.....	8.3	12.55	5.9	4.6	3.4	3.3
11	4.4	7.6	7.55	.....	.....	.....	.....	12.55	5.7	4.6	3.4	3.35
12	4.35	7.6	7.3	5.5	.....	.....	.....	12.25	5.7	4.6	3.4	3.5
13	4.6	7.35	7.15	.....	6.1	7.5	8.95	11.95	5.65	4.5	3.45	3.4
14	4.7	7.15	7.0	.....	.....	.....	.....	11.45	4.95	4.5	3.65	3.4
15	4.9	7.2	7.0	.....	.....	.....	8.95	10.95	4.7	4.65	3.7	3.3
16	5.25	7.2	6.9	5.5	6.0	7.5	8.25	10.55	4.9	4.35	3.6	3.2
17	5.45	7.3	6.8	.....	.....	.....	8.05	9.85	5.6	4.2	3.5	3.0
18	5.5	7.2	6.65	.....	.....	.....	7.9	9.15	5.9	4.2	3.5	2.9
19	5.6	7.2	6.4	5.4	.....	.....	7.85	8.45	6.1	4.2	3.5	2.9
20	5.8	7.2	6.3	.....	6.0	7.5	8.45	7.85	6.15	4.3	3.5	2.9
21	5.8	7.2	6.0	.....	.....	.....	9.55	7.65	6.35	4.2	3.5	2.9
22	.....	7.1	5.8	.....	.....	.....	10.05	7.35	6.0	4.2	3.5	2.8
23	.....	7.0	6.2	5.3	6.0	7.5	10.15	7.25	5.75	4.2	3.5	2.7
24	.....	6.9	6.2	.....	.....	.....	10.15	7.15	5.45	4.1	3.4	2.7
25	.....	6.9	6.2	.....	.....	.....	10.15	6.95	5.35	4.0	3.3	2.7
26	.....	6.9	6.2	5.9	.....	.....	10.05	6.65	5.2	3.9	3.3	2.7
27	.....	6.9	6.2	.....	6.0	7.4	10.25	6.55	4.85	3.9	3.3	2.7
28	.....	6.9	6.2	.....	.....	.....	10.45	6.35	4.65	3.9	3.3	2.8
29	.....	6.8	.....	.....	.....	.....	10.95	6.35	4.75	3.9	3.3	2.8
30	9.4	6.7	.....	6.15	.....	7.4	11.55	6.2	4.85	3.8	3.3	2.8
31	9.35	.....	.....	.....	.....	7.45	.....	6.25	.....	3.8	3.3	.....

NOTE.—Discharge relation Jan. 1 to Apr. 14 affected by ice.

Daily discharge, in second-feet, of Mattawamkeag River at Mattawamkeag, Maine, for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1,000	10,800	4,090	3,400	1,100	660	3,160	17,800	2,900	1,820	525	295
2	1,000	10,400	4,000	3,340	1,210	660	3,520	17,800	2,580	1,560	525	314
3	906	9,690	3,900	2,820	1,210	736	3,900	17,800	2,580	1,260	470	295
4	818	9,420	3,900	2,080	1,210	818	4,280	18,200	2,430	1,210	470	295
5	953	8,770	3,900	1,690	1,100	906	4,680	18,200	3,070	1,050	420	295
6	1,000	7,990	3,900	1,560	1,100	1,000	5,080	18,200	3,620	862	420	295
8	1,100	7,480	3,900	1,320	1,100	1,210	5,490	18,300	4,000	660	420	258
8	1,100	6,980	3,900	1,210	1,000	1,440	5,920	18,800	3,620	906	375	295
9	1,100	6,030	3,800	1,210	1,000	1,820	6,360	19,500	3,250	1,210	375	295
10	1,100	5,600	4,780	1,000	1,000	1,820	6,850	20,800	2,980	1,210	334	295
11	1,000	6,360	6,250	906	1,000	1,950	7,860	20,800	2,660	1,210	334	314
12	953	6,360	5,700	818	906	2,080	8,900	19,800	2,660	1,210	334	375
13	1,210	5,810	5,380	818	906	2,220	9,690	18,800	2,580	1,100	354	334
14	1,320	5,380	5,080	818	906	2,220	9,690	17,200	1,620	1,100	445	334
15	1,560	5,490	5,080	818	818	2,220	9,820	15,600	1,320	1,260	470	295
16	2,020	5,490	4,880	818	736	2,220	7,990	14,400	1,560	953	420	258
17	2,290	5,700	4,680	818	736	2,220	7,480	12,300	2,500	818	375	190
18	2,360	5,490	4,380	736	736	2,220	7,100	10,400	2,980	818	375	160
19	2,500	5,490	3,900	736	736	2,220	6,980	8,510	3,340	818	375	160
20	2,820	5,490	3,710	736	736	2,220	8,510	6,980	3,430	906	375	160
21	2,820	5,490	3,160	660	736	2,220	11,500	6,480	3,800	818	375	160
22	3,840	5,280	2,820	660	736	2,220	12,900	5,810	3,160	818	375	134
23	4,860	5,080	3,520	590	736	2,360	13,200	5,600	2,740	818	375	114
24	5,880	4,880	3,520	660	736	2,360	13,200	5,380	2,290	736	334	114
25	6,900	4,880	3,520	736	736	2,360	13,200	4,980	2,150	660	295	114
26	7,920	4,880	3,520	818	660	2,500	12,900	4,380	1,950	590	295	114
27	8,940	4,880	3,520	818	660	2,500	13,400	4,180	1,500	590	295	114
28	9,960	4,880	3,520	818	660	2,500	14,100	3,800	1,260	590	295	134
29	11,000	4,680	3,520	906	.....	2,660	15,600	3,800	1,380	590	295	134
30	11,000	4,480	3,520	1,000	.....	2,660	17,500	3,520	1,500	525	295	134
31	10,900	.....	3,520	1,000	.....	2,820	.....	3,620	.....	525	295	.....

NOTE.—Discharge determined from a fairly well-defined rating curve verified by a discharge measurement made in 1915. Winter discharge estimated from discharge measurements and by comparison with records of adjacent streams.

Monthly discharge of Mattawamkeag River at Mattawamkeag, Maine, for the year ending Sept. 30, 1914.

[Drainage area, 1,500 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
October	11,000	818	3,620	2.41	2.78
November	10,800	4,480	6,320	4.21	4.70
December	6,250	2,820	4,090	2.73	3.15
January	3,400	590	1,170	.780	.90
February	1,210	660	890	.593	.62
March	2,820	660	1,940	1.29	1.49
April	17,500	3,160	9,020	6.01	6.70
May	20,800	3,520	12,300	8.20	9.45
June	4,000	1,260	2,580	1.72	1.92
July	1,820	525	942	.628	.72
August	525	295	378	.252	.29
September	375	114	226	.151	.17
The year	20,800	114	3,640	2.43	32.89

PISCATAQUIS RIVER NEAR FOXCROFT, MAINE.

Location.—At Low's highway bridge, about halfway between Guilford and Foxcroft, three-fourths of a mile above Black Stream and 3 miles below Mill Stream.

Drainage area.—286 square miles.

Records available.—August 17, 1902, to September 30, 1914. Data also in annual reports of the Maine State Water Storage Commission.

Gage.—Staff attached to left abutment of bridge.

Discharge measurements.—At medium and high stages made from the bridge; at low stages by wading either above or below bridge.

Channel and control.—Practically permanent; banks high and overflowed only at extreme floods.

Extremes of discharge.—Maximum stage recorded during year, 8.7 feet at 6.30 a. m. October 21, 6 a. m. May 10, and 7 a. m. April 21; approximate discharge computed from extension of rating curve, 9,240 second-feet. Minimum stage recorded during year, 1.5 feet during September; discharge, 19 second-feet.

Winter flow.—Discharge relation affected by ice during some years.

Regulation.—The stream is used to develop power at several manufacturing plants above station.

Cooperation.—Records furnished by the Maine State Water Storage Commission.

No discharge measurements were made during the year.

Daily gage height, in feet, of Piscataquis River near Foxcroft, Maine, for the year ending Sept. 30, 1914.

[A. F. D. Harlow, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.3	3.65	2.9	3.05	3.45	2.3	3.35	5.9	2.5	2.4	1.7	1.75
2	2.35	3.5	2.75	3.05	3.35	3.0	3.35	5.95	2.5	2.15	1.5	1.75
3	2.6	3.45	2.75	3.05	3.2	4.4	3.7	5.95	2.5	2.1	1.75	1.75
4	2.7	3.45	2.9	2.9	2.9	5.0	3.7	6.15	2.65	2.0	1.9	1.75
5	2.7	3.35	2.9	3.0	2.9	5.0	3.6	6.35	3.05	1.9	2.0	1.85
6	2.7	3.25	2.8	2.75	2.9	5.0	3.3	7.05	2.95	2.05	1.9	1.75
7	2.7	3.2	2.5	2.55	2.9	4.75	3.05	6.7	2.5	2.3	1.9	1.75
8	2.55	3.25	4.15	2.55	3.6	4.2	3.25	6.4	2.5	2.4	1.8	1.8
9	2.55	4.0	3.85	2.5	3.6	4.15	4.35	7.35	2.5	2.3	1.5	1.8
10	2.45	6.15	3.75	2.5	3.55	4.1	5.15	8.35	2.5	2.25	1.65	1.8
11	2.25	5.3	3.6	2.75	3.55	3.95	4.6	6.95	2.35	2.25	1.65	1.8
12	2.05	4.8	3.4	3.1	3.2	3.7	4.7	5.6	2.2	2.1	1.9	1.8
13	2.2	4.4	3.2	3.5	3.15	3.6	4.85	5.1	2.2	2.05	1.9	1.9
14	2.25	4.25	3.15	3.5	3.05	3.6	4.75	4.85	2.1	1.95	1.9	2.1
15	2.25	4.0	3.15	3.4	3.05	3.6	4.75	4.6	2.05	1.95	1.9	2.1
16	2.8	3.8	3.05	3.3	3.05	3.5	4.5	4.45	2.0	2.0	1.9	1.85
17	2.95	3.75	3.15	3.3	2.95	3.25	4.35	4.2	2.25	2.2	1.8	1.7
18	2.95	3.7	3.2	2.85	2.95	3.35	4.6	4.1	2.5	2.1	1.75	1.7
19	2.95	3.65	3.3	3.1	3.25	3.6	5.9	4.1	2.5	2.15	1.7	1.7
20	4.5	3.9	3.3	3.35	3.25	3.6	7.6	4.0	2.55	2.15	1.7	1.5
21	8.25	3.95	2.95	3.25	3.25	3.6	8.45	3.95	2.1	2.2	1.75	1.75
22	6.35	3.9	2.8	3.2	3.25	3.5	7.0	3.95	2.05	2.2	1.9	1.75
23	4.3	3.7	2.25	3.2	3.25	3.3	6.7	3.55	2.05	2.2	1.9	1.75
24	3.85	3.65	2.15	3.1	3.25	3.2	6.2	3.2	2.05	2.2	1.9	1.5
25	5.8	3.65	2.4	2.9	3.15	3.15	5.2	3.2	2.0	2.2	1.7	1.5
26	5.8	3.3	2.55	3.25	3.1	3.05	5.25	3.0	2.0	2.2	1.7	1.65
27	5.8	3.1	2.55	3.35	3.1	3.05	5.4	2.95	1.95	2.2	1.7	1.65
28	5.15	3.0	3.1	3.7	3.1	3.05	5.8	2.8	2.0	2.2	1.7	1.6
29	4.95	3.0	3.15	3.7	.....	3.1	6.8	2.6	2.3	2.05	1.6	1.6
30	4.55	2.9	3.15	3.55	.....	3.2	6.15	2.5	2.4	1.95	1.6	1.6
31	4.1	.....	3.2	3.35	.....	3.2	.....	2.5	.....	1.9	1.8	.....

NOTE.—Discharge relation probably somewhat affected by ice during January, February, and March.

Daily discharge, in second-feet, of Piscataquis River near Foxcroft, Maine, for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	123	898	374	470	746	123	674	3,790	180	148	31	36
2	136	782	292	470	674	437	674	3,880	180	90	19	36
3	220	746	292	470	569	1,620	938	3,880	180	81	36	36
4	267	746	374	374	374	2,350	938	4,240	244	64	51	36
5	267	674	374	437	374	2,350	858	4,610	470	51	64	46
6	267	604	318	292	374	2,350	638	5,940	406	72	51	36
7	267	569	180	200	374	2,020	470	5,270	180	123	51	36
8	200	604	1,350	200	858	1,400	604	4,700	180	148	40	40
9	200	1,210	1,070	180	858	1,350	1,560	6,520	180	123	19	40
10	164	4,240	980	180	820	1,300	2,560	8,530	180	112	28	40
11	112	2,780	858	292	820	1,160	1,840	5,740	136	112	28	40
12	72	2,080	709	502	569	938	1,960	3,260	100	81	51	40
13	100	1,620	569	782	536	858	2,150	2,490	100	72	51	51
14	112	1,460	536	782	470	858	2,020	2,150	81	58	51	81
15	112	1,210	536	709	470	858	2,020	1,840	72	58	51	81
16	318	1,020	470	638	470	782	1,720	1,670	64	64	51	46
17	406	980	536	638	406	604	1,560	1,400	112	100	40	31
18	406	938	569	346	406	674	1,840	1,300	180	81	36	31
19	406	898	638	502	604	858	3,790	1,300	180	90	31	31
20	1,720	1,110	638	674	604	858	7,010	1,210	200	90	31	19
21	8,320	1,160	406	604	604	858	8,730	1,160	81	100	36	36
22	4,610	1,110	318	569	604	782	5,840	1,160	72	100	51	36
23	1,510	938	112	569	604	638	5,270	820	72	100	51	36
24	1,070	898	90	502	604	569	4,340	569	72	100	51	19
25	3,610	898	148	374	536	536	2,640	569	64	100	31	19
26	3,610	638	200	604	502	470	2,710	437	64	100	31	28
27	3,610	502	200	674	502	470	2,940	406	58	100	31	28
28	2,560	437	502	938	502	470	3,610	318	64	100	31	24
29	2,280	437	536	938	.....	502	5,460	220	123	72	24	24
30	1,780	374	536	820	.....	569	4,240	180	148	58	24	24
31	1,300	.....	569	674	.....	569	.....	180	.....	51	40	.....

NOTE.—Discharge determined from a rating curve well defined between 20 and 4,000 second-feet, a discharge measurement made in 1915 being used to verify it. No correction made because of ice.

Monthly discharge of Piscataquis River near Foxcroft, Maine, for the year ending Sept. 30, 1914.

[Drainage area, 286 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
October	8,320	72	1,290	4.51	5.20
November	4,240	374	1,080	3.78	4.22
December	1,350	90	493	1.72	1.98
January	938	180	529	1.85	2.13
February	858	374	566	1.98	2.06
March	2,350	123	974	3.40	3.92
April	8,730	470	2,720	9.51	10.61
May	8,530	180	2,570	8.99	10.36
June	470	58	147	.514	.57
July	148	51	90	.314	.36
August	64	19	39	.136	.16
September	81	19	37	.129	.14
The year	8,730	19	880	3.08	41.71

KENDUSKEAG STREAM NEAR BANGOR, MAINE.

Location.—At highway bridge at Sixmile Falls, about 6 miles northwest of Bangor and 7 miles below Black Stream.

Drainage area.—191 square miles. During freshets a part of the water of Souadabscook Stream finds its way through an artificial cut into Black Stream.

Records available.—September 15, 1908, to September 30, 1914. Data also published in annual reports of Maine State Water Storage Commission.

Gage.—Chain attached to the bridge.

Discharge measurements.—Made from the bridge.

Channel and control.—Practically permanent.

Extremes of discharge.—Maximum stage recorded during year, 9.3 feet at 5.25 p. m. April 21; approximate discharge computed from extension of rating curve. 4,650 second-feet. Minimum stage recorded during year, 1.4 feet on September 23, 24, and 28; discharge, 12 second-feet.

Winter flow.—Discharge relation affected by ice.

Diversions.—A number of years ago an artificial cut was made for log driving through a low divide between Souadabscook Stream and Black Stream, the latter a tributary to the Kenduskeag, entering about 7 miles above the gaging station. During high stages of the Souadabscook part of its waters finds its way through the artificial cut into the Kenduskeag; at low stages of the Souadabscook all the flow continues down its own channel. Black Stream probably sends its waters only, to the Kenduskeag.

Cooperation.—Records furnished by Maine State Water Storage Commission.

Discharge measurements of Kenduskeag Stream near Bangor, Maine, during the year ending Sept. 30, 1914.

[Made by G. C. Danforth.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
Mar. 13	[a] 5.02	461
Apr. 1	[a] 6.02	917

[a] Discharge relation affected by ice.

Daily gage height, in feet, of Kenduskeag Stream near Bangor, Maine, for the year ending Sept. 30, 1914.

[Fred Cort, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.85	3.8	3.6	.....	5.6	4.4	6.0	4.5	2.65	1.85	1.75	1.8
2	1.85	3.5	3.65	.....	.....	.....	.....	4.1	2.5	1.95	1.65	1.7
3	1.9	3.45	3.55	.....	.....	.....	.....	3.95	2.25	2.0	1.8	1.75
4	2.0	3.6	3.4	2.7	.....	.....	.....	3.8	2.4	2.0	1.8	1.7
5	2.05	3.7	3.25	.....	.....	.....	7.2	4.25	2.55	1.85	1.7	1.65
6	2.1	3.75	3.45	.....	.....	.....	.....	4.2	2.9	1.8	1.65	1.7
7	2.2	3.65	3.5	.....	.....	.....	.....	4.1	3.2	1.8	1.6	1.8
8	2.25	3.45	3.6	.....	4.6	6.4	8.4	4.0	3.0	1.7	1.6	1.7
9	2.35	3.3	3.65	.....	.....	.....	8.15	4.7	2.75	1.7	1.55	1.6
10	2.35	3.3	3.45	.....	.....	.....	8.35	5.2	2.5	1.75	1.6	1.6
11	2.2	3.45	3.35	2.9	.....	.....	8.5	4.85	2.3	1.8	1.6	1.6
12	2.2	3.5	3.55	.....	.....	.....	8.3	4.35	2.15	1.8	1.7	1.5
13	2.45	3.6	3.7	.....	.....	5.0	7.55	4.0	2.3	1.7	1.7	1.5
14	2.65	3.45	3.6	.....	.....	.....	6.9	3.7	2.4	1.7	1.75	1.55
15	2.8	3.5	3.7	.....	4.5	.....	6.45	3.45	2.35	1.6	1.8	1.5
16	2.9	3.6	3.75	.....	.....	.....	5.9	3.4	2.4	1.75	1.8	1.5
17	2.8	3.55	3.8	.....	.....	.....	5.35	3.25	2.3	1.8	1.7	1.55
18	2.7	3.6	3.75	3.1	.....	.....	5.75	3.1	2.35	1.7	1.8	1.6
19	2.65	3.7	3.7	.....	.....	.....	6.6	2.85	2.4	1.8	1.8	1.55
20	2.7	3.7	3.55	.....	.....	.....	7.55	2.7	2.3	1.8	1.75	1.5
21	3.05	3.8	3.45	.....	.....	.....	9.05	2.75	2.4	1.75	1.7	1.5
22	3.8	3.65	3.3	.....	4.5	4.8	8.75	2.75	2.35	1.7	1.6	1.5
23	4.2	3.6	3.2	.....	.....	.....	7.7	2.6	2.35	1.7	1.6	1.4
24	4.7	3.45	3.2	.....	.....	.....	5.9	2.45	2.35	1.7	1.5	1.45
25	5.05	3.55	3.2	3.7	.....	.....	5.55	2.6	2.35	1.7	1.6	1.5
26	5.25	3.5	3.15	.....	.....	.....	5.25	2.5	2.05	1.65	1.6	1.5
27	5.75	3.4	3.05	.....	.....	.....	4.9	2.4	2.0	1.7	1.7	1.5
28	5.6	3.4	2.9	.....	.....	.....	4.75	2.4	2.0	1.75	1.75	1.45
29	5.1	3.45	2.85	.....	.....	6.3	4.9	2.4	1.95	1.8	1.85	1.5
30	4.55	3.55	2.85	.....	.....	.....	4.7	2.7	1.9	1.8	1.9	1.5
31	4.15	.....	2.8	.....	.....	.....	.....	2.75	.....	1.8	1.85	.....

NOTE.—Discharge relation Jan. 1 to Apr. 8 seriously affected by ice.

Daily discharge, in second-feet, of Kenduskeag Stream near Bangor, Maine, for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	51	538	465	199	795	276	895	845	188	51	40	45
2	51	431	483	199	700	366	1,180	655	156	64	30	34
3	57	414	448	199	615	465	1,500	596	110	71	45	40
4	71	465	398	199	538	576	1,790	538	137	71	45	34
5	78	501	350	199	465	700	2,180	722	166	51	34	30
6	86	520	414	199	398	845	2,690	700	249	45	30	34
7	102	483	431	199	335	1,000	3,140	655	335	45	25	45
8	110	414	465	177	335	1,120	3,590	615	276	34	25	34
9	128	366	483	177	335	950	3,640	950	211	34	22	25
10	128	366	414	177	335	795	3,820	1,240	156	40	25	25
11	102	414	382	177	335	655	3,960	1,030	119	45	25	25
12	102	431	448	177	305	576	3,770	770	94	45	34	18
13	146	465	501	177	305	465	3,100	615	119	34	34	18
14	188	414	465	177	305	465	2,520	501	137	34	40	22
15	223	431	501	156	305	465	2,140	414	128	25	45	18
16	249	465	520	156	305	465	1,720	398	137	40	45	18
17	223	448	538	156	305	431	1,340	350	119	45	34	22
18	199	465	520	156	305	431	1,610	305	128	34	45	25
19	188	501	501	156	305	431	2,260	236	137	45	45	22
20	199	501	448	156	305	398	3,100	199	119	45	40	18
21	290	538	414	177	305	398	4,500	211	137	40	34	18
22	538	483	366	177	305	398	4,200	211	128	34	25	18
23	700	465	335	199	305	465	3,230	177	128	34	25	12
24	950	414	335	223	305	538	1,720	146	128	34	18	15
25	1,150	448	335	223	305	615	1,470	177	128	34	25	18
26	1,270	431	320	276	305	700	1,270	156	78	30	25	18
27	1,610	398	290	335	305	795	1,060	137	71	34	34	18
28	1,500	398	249	398	305	845	978	137	71	40	40	15
29	1,180	414	236	465	.....	950	1,060	137	64	45	51	18
30	870	448	236	538	.....	950	950	199	57	45	57	18
31	678	.....	223	615	.....	895	.....	211	.....	45	51	.....

NOTE.—Discharge determined from a rating curve well defined between 10 and 1,000 second-feet, a discharge measurement in 1915 being used to verify the curve. Above 2,500 second-feet the rating curve is doubtful and estimates of discharge may be considerably in error. Discharge Jan. 1 to Apr. 8 estimated from climatic records and measurements through the ice.

Monthly discharge of Kenduskeag Stream near Bangor, Maine, for the year ending Sept. 30, 1914.

[Drainage area, 191 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
October	1,610	51	432	2.26	2.61
November	538	366	449	2.35	2.62
December	538	223	404	2.12	2.44
January	615	156	232	1.21	1.40
February	795	305	370	1.94	2.02
March	1,120	276	626	3.28	3.78
April	4,500	895	2,350	12.3	13.72
May	1,240	137	459	2.40	2.77
June	335	57	140	.733	.82
July	71	25	42	.220	.25
August	57	18	35	.183	.21
September	45	12	24	.126	.14
The year	4,500	12	461	2.41	32.78

ST. GEORGE RIVER BASIN.

ST. GEORGE RIVER AT UNION, MAINE.

Location.—200 feet below tailrace of electric plant of Dirigo Power Co., half a mile below outlet of Sennebec Lake, and 1 mile above Union.

Drainage area.—116 square miles.

Records available.—December 11, 1913, to September 30, 1914.

Gage.—Vertical staff gage bolted securely to a tree on left bank.

Discharge measurements.—Made from a cable about 50 feet above gage.

Channel and control.—Rock and gravel.

Extremes of discharge.—Maximum stage recorded during year, 5.4 feet at 8 a. m. April 3; approximate discharge computed from extension of rating curve, 1,060 second-feet. Minimum stage recorded during year, 1.9 feet, September 21–30; discharge, 15 second-feet.

Regulation.—Dam of Dirigo Power Co. is about 1,000 feet above station. On the completion of the electric plant, now in course of construction, the regimen of the stream will be more or less affected by night storage.

Cooperation.—Records furnished by the Maine State Water Storage Commission.

Discharge measurements of St. George River at Union, Maine, for period Sept. 16, 1913, to Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
1913.		*Feet.*	*Sec.-ft.*	1914.		*Feet.*	*Sec.-ft.*
Sept. 16	G. C. Danforth	1.70	7.6	Apr. 9	G. C. Danforth	5.06	896
				May 19	C. C. Babb	3.15	183
1914.				20	do	3.12	170
Jan. 13	C. C. Babb	2.50	63.0	June 16	G. C. Danforth	2.42	55.4
Mar. 3	do	5.25	907	Aug. 1	do	2.05	24.3
4	do	5.25	994	Sept. 24	do	1.90	14.3

Daily gage height, in feet, of St. George River at Union, Maine, for the year ending Sept. 30, 1914.

[W. E. King and G. E. Hills, observers.]

Day.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1		2.73			4.40	3.80	2.60	2.25	2.05	2.15
2		2.71			5.40	3.70	2.55	2.20	2.05	2.15
3		2.70		5.25	5.40	3.60	2.55	2.30	2.05	2.15
4		2.70		5.25	5.20	3.50	2.50	2.30	2.05	2.15
5		2.65		5.20	5.00	3.45	2.75	2.30	2.00	2.15
6		2.62		5.25	4.70	3.40	2.75	2.25	2.00	2.15
7		2.60		5.00	4.55	3.40	2.75	2.25	2.00	2.15
8		2.55		4.80	4.55	3.35	2.70	2.25	2.00	2.15
9		2.55		4.50	5.00	3.55	2.70	2.25	2.00	2.15
10		2.53		4.30	5.30	3.80	2.60	2.25	1.95	2.10
11	3.90	2.50		4.10	5.30	3.80	2.65	2.30	1.95	2.10
12	3.85	2.50		3.90	5.25	3.70	2.60	2.30	1.95	2.10
13	3.70	2.49		3.80	5.10	3.60	2.55	2.30	1.95	2.10
14	3.60			3.60	5.00	3.50	2.50	2.30	1.95	2.00
15	3.50			3.60	4.70	3.40	2.45	2.25	1.95	2.00
16	3.40			3.50	4.60	3.35	2.45	2.25	2.05	2.00
17	3.33			3.40	4.40	3.30	2.45	2.25	2.10	2.00
18	3.35			3.40	4.40	3.25	2.45	2.25	2.10	1.95
19	3.30			3.60	4.40	3.15	2.40	2.25	2.10	1.95
20	3.25			3.70	4.40	2.80	2.40	2.20	2.10	1.95
21	3.13			3.60	5.20	3.20	2.40	2.20	2.10	1.90
22	3.05			3.50	5.10	3.10	2.40	2.20	2.10	1.90
23	3.00			3.40	5.00	3.00	2.35	2.20	2.10	1.90
24	3.06			3.35	4.80	2.90	2.35	2.20	2.10	1.90
25	3.20			3.30	4.60	2.90	2.30	2.20	2.10	1.90
26	3.30			3.30	4.40	2.85	2.30	2.15	2.05	1.90
27	3.20			3.50	4.20	2.25	2.30	2.15	2.05	1.90
28	3.15			3.90	4.05	2.80	2.25	2.15	2.05	1.90
29	3.00			4.10	4.00	2.70	2.25	2.15	2.05	1.90
30	2.90			4.20	3.90	2.65	2.25	2.15	2.10	1.90
31	2.80			4.30		2.65		2.15	2.10	

NOTE.—No records obtained Jan. 14 to Mar. 2.

Daily discharge, in second-feet, of St. George River at Union, Maine, for the year ending Sept. 30, 1914.

Day.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	.....	102	.....	.....	560	340	81	42	25	33
2	.....	95	.....	.....	1,060	311	74	37	25	33
3	.....	95	.....	972	1,060	284	74	46	25	33
4	.....	95	.....	972	945	258	68	46	25	33
5	.....	88	.....	945	838	245	102	46	21	33
6	.....	81	.....	972	689	232	102	42	21	33
7	.....	81	.....	838	622	232	102	42	21	33
8	.....	74	.....	737	622	220	95	42	21	33
9	.....	74	.....	600	838	271	95	42	21	33
10	.....	74	.....	521	1,000	340	81	42	18	29
11	373	68	.....	445	1,000	340	88	46	18	29
12	356	68	.....	373	972	311	81	46	18	29
13	311	68	.....	340	891	284	74	46	18	29
14	284	.....	.....	284	838	258	68	46	18	21
15	258	.....	.....	284	689	232	62	42	18	21
16	232	.....	.....	258	643	220	62	42	25	21
17	220	.....	.....	232	560	208	62	42	29	21
18	220	.....	.....	232	560	196	62	42	29	18
19	208	.....	.....	284	560	174	56	42	29	18
20	196	.....	.....	311	560	110	56	37	29	18
21	174	.....	.....	284	945	185	56	37	29	15
22	154	.....	.....	258	891	164	56	37	29	15
23	145	.....	.....	232	838	145	51	37	29	15
24	154	.....	.....	220	737	127	51	37	29	15
25	185	.....	.....	208	643	127	46	37	29	15
26	208	.....	.....	208	560	118	46	33	25	15
27	185	.....	.....	258	483	42	46	33	25	15
28	174	.....	.....	373	426	110	42	33	25	15
29	145	.....	.....	445	408	95	42	33	25	15
30	127	.....	.....	483	373	88	42	33	29	15
31	110	.....	.....	521	.....	88	.....	33	29	.....

NOTE.—Discharge determined from a rating curve well defined below 1,000 second-feet.

Monthly discharge at St. George River at Union, Maine, for the year ending Sept. 30, 1914.

[Drainage area, 116 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
December 11–31	373	110	210	1.81	2.09
January 1–13	102	68	81.8	.705	.34
February	.....	.....	.....	.....	.....
March 3–31	972	208	452	3.90	4.21
April	1,060	373	727	6.27	7.00
May	340	42	205	1.77	2.04
June	102	42	67	.578	.64
July	46	33	40	.345	.40
August	29	18	24	.207	.24
September	33	15	23	.198	.22

KENNEBEC RIVER BASIN.

MOOSEHEAD LAKE AT EAST OUTLET, MAINE.

Location.—At wharf at east outlet of lake, about 8 miles from Kineo.

Drainage area.—1,240 square miles.

Records available.—April 1, 1895, to September 30, 1914.

Gage.—Staff at end of boat landing; two datums have been used at east outlet; the first or original datum is at elevation 1,011.30 feet above mean sea level and approximately 10 feet below sills of outlet gates; gage is read to this datum; the second, to which all gage readings published to and including 1911 have been referred, is 10 feet higher; that is, the zero is at the sill of the gates. It is believed that low water may go below the sill of the gates (zero of second datum), and therefore gage heights since 1912 are published as read—that is, to original datum.

Regulation.—The lake is regulated to a capacity of 23,735,000,000 cubic feet. The dam at the east outlet is controlled by 35 gates; 15 old gates are at gage height 10 feet (original datum) and 20 gates at gage height 8 feet (original datum). At extreme low stages the flow from the lake is controlled not by the gates but by a bar above the dam at an approximate gage height of 9 feet (original datum). The records show only fluctuations in the level of the lake, and are used in the studies of regulation of the lake and in computing the natural flow of the Kennebec at The Forks station.

Storage capacity.—Approximately equal to a discharge of 124 second-feet for one month (30 days) for each one-tenth foot of depth over the surface of Moosehead Lake.

Cooperation.—Record furnished by the Hollingsworth & Whitney Co.

Daily gage height, in feet, of Moosehead Lake at east outlet, Maine, for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	12.8	.....	15.05	.....	14.2	.....	13.2	15.0	17.55	16.7	.....	.....
2	.....	.....	.....	15.4	.....	13.3	.....	.....	.....	.....	.....	13.4
3	12.65	13.9	15.0	.....	.....	.....	13.25	.....	17.45	16.65	15.2	.....
4	.....	.....	.....	.....	14.1	13.35	.....	15.7	.....	.....	.....	13.35
5	.....	14.0	15.05	15.15	.....	.....	.....	.....	17.45	.....	15.1	.....
6	12.5	.....	.....	.....	14.0	13.4	.....	16.1	.....	16.6	.....	.....
7	.....	14.0	.....	15.1	.....	.....	.....	.....	.....	.....	15.1	13.2
8	12.6	.....	15.15	.....	.....	13.4	13.25	16.5	17.3	16.5	.....	.....
9	.....	.....	.....	15.1	14.0	.....	.....	.....	.....	.....	.....	13.1
10	12.65	14.2	15.3	.....	.....	.....	13.25	.....	17.25	16.4	14.6	.....
11	.....	.....	.....	.....	13.9	13.35	.....	17.0	.....	.....	.....	13.1
12	.....	14.3	15.35	15.05	.....	.....	.....	.....	17.15	16.4	14.6	.....
13	12.6	.....	.....	.....	13.85	13.3	13.25	17.0	.....	.....	.....	.....
14	.....	.....	.....	15.0	.....	.....	.....	.....	.....	16.3	14.4	13.5
15	.....	.....	15.4	.....	13.8	.....	13.25	17.05	17.0	.....	.....	.....
16	12.65	.....	.....	14.9	.....	13.3	.....	.....	.....	16.2	.....	12.9
17	12.6	14.5	.....	.....	.....	.....	13.3	.....	17.0	.....	14.25	.....
18	.....	.....	.....	.....	13.8	13.3	.....	17.3	.....	.....	.....	12.85
19	.....	14.55	15.35	14.8	.....	.....	.....	.....	16.9	.....	14.1	.....
20	12.7	.....	.....	.....	13.7	13.25	13.5	17.45	.....	16.0	.....	.....
21	.....	14.7	.....	14.6	.....	.....	.....	.....	.....	.....	14.0	12.7
22	12.9	.....	15.3	.....	.....	.....	13.8	17.5	16.85	15.75	.....	.....
23	.....	14.8	.....	14.5	13.65	13.25	.....	.....	.....	.....	.....	12.7
24	13.1	.....	15.45	.....	.....	.....	14.5	.....	16.8	15.8	13.8	.....
25	.....	.....	.....	.....	13.4	.....	.....	17.55	.....	.....	.....	12.65
26	.....	14.95	15.45	14.35	.....	13.15	.....	.....	16.8	.....	13.7	.....
27	13.35	.....	.....	.....	13.3	.....	14.5	17.65	.....	15.7	.....	.....
28	.....	14.9	.....	14.3	.....	.....	.....	.....	.....	.....	13.55	12.6
29	13.55	.....	15.4	14.3	.....	.....	14.7	17.6	16.7	15.65	.....	.....
30	.....	.....	.....	.....	.....	13.25	.....	.....	.....	.....	.....	12.45
31	13.85	.....	15.4	.....	.....	.....	.....	.....	.....	15.35	13.5	.....

KENNEBEC RIVER AT THE FORKS, MAINE.

Location.—At wooden highway bridge about 2,000 feet above Dead River.

Drainage area.—1,570 square miles.

Records available.—September 28, 1901, to September 30, 1914. Data also published in annual reports of Maine State Water Storage Commission.

Gages.—Chain on bridge, a vertical staff on timber retaining wall on left bank 75 feet above bridge, and a water-stage recorder on left abutment. Recorder set to read the same as chain gage in low water, but gives lower readings than chain gage in high water.

Discharge measurements.—Made from the bridge.

Channel and control.—Practically permanent.

Extremes of discharge.—Maximum stage recorded during year, 9.75 feet at 6 a. m. May 12; approximate discharge computed from extension of rating curve, 17,000 second-feet. Minimum stage recorded during year, 0.4 foot, August 23–29; discharge, 255 second-feet.

Winter flow.—Discharge relation seriously affected by ice.

Regulation.—Flow regulated by storage in Moosehead Lake. During May, June, and July the operation of Indian Pond for log driving causes great diurnal fluctuation. Records of monthly discharge have been reduced to natural flow by adding or subtracting the amount of water stored in or released from Moosehead Lake.

Cooperation.—Records furnished by Maine State Water Storage Commission.

Discharge measurements of Kennebec River at The Forks, Maine, during the year ending Sept. 30, 1914.

[Made by G. C. Danforth.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
Feb. 10	[a] 3.40	1,830
Mar. 18	[a] 1.95	1,050

[a] Discharge relation affected by ice.

Daily gage height, in feet, of Kennebec River at The Forks, Maine, for the year ending Sept. 30, 1914.

[S. C. Durgin, observer.]

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.
1	.....	1.21	3.0	3.6	3.7	2.1	5.1
2	.....	1.34	3.1	3.5	4.0	2.3	5.2
3	.....	1.40	3.2	3.5	3.0	2.1	5.4
4	.....	1.69	3.3	3.4	2.8	2.0	5.7
5	.....	1.65	3.1	3.3	1.6	2.0	5.9
6	.....	.....	3.2	3.3	1.1	2.0	5.4
7	.....	.....	3.3	3.2	1.1	2.0	5.0
8	.....	.....	3.5	3.2	2.2	2.0	6.8
9	.....	.....	3.1	3.2	2.2	2.2	7.8
10	.....	.....	3.2	3.5	2.2	2.2	9.0
11	.....	1.85	3.2	3.5	2.2	2.5	9.55
12	.....	1.62	3.3	3.5	2.1	2.5	9.75
13	.....	.....	4.0	3.9	2.1	2.5	9.5
14	.....	.....	4.1	3.9	2.1	2.7	8.45
15	.....	.....	4.1	4.1	2.1	2.7	8.4
16	.....	.....	4.0	4.3	1.9	2.7	7.8
17	.....	1.50	4.2	4.4	1.9	2.7	6.4
18	.....	1.90	4.4	4.4	1.8	2.7	6.0
19	1.10	1.95	4.8	4.3	2.2	2.8	6.0
20	1.21	2.15	4.8	4.3	2.6	3.7	.....
21	1.23	2.25	4.6	4.3	2.6	4.5	.....
22	1.19	2.20	4.8	4.0	2.5	4.3	.....
23	1.26	2.10	5.1	4.0	4.5	4.1	.....
24	1.30	2.25	4.9	4.2	2.3	3.8	.....
25	1.23	2.25	4.6	4.2	2.3	3.8	.....
26	1.18	2.20	4.6	4.1	2.2	3.7	.....
27	1.15	2.30	4.9	4.0	2.1	3.7	.....
28	1.22	2.30	4.6	3.8	2.1	3.9	.....
29	1.35	2.90	4.6	.....	2.1	4.7	.....
30	1.15	2.90	4.0	.....	2.1	5.0	.....
31	.....	2.90	3.5	.....	2.1	.....	.....

NOTE.—Gage heights observed on chain gage. Discharge relation Jan. 11 to Apr. 10 seriously affected by ice.

Daily discharge, in second-feet, of Kennebec River at The Forks, Maine, for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Apr.	May.	June.	July.	Aug.	Sept.
1	1,360	918	707	2,460	.....	6,080	4,210	3,180	2,550	3,520
2	1,290	776	798	2,600	.....	6,280	5,010	3,230	2,420	2,110
3	1,090	667	840	2,740	.....	6,690	3,630	2,870	2,860	1,910
4	866	635	1,060	2,880	.....	7,320	4,760	2,860	3,250	1,890
5	729	635	1,030	2,600	.....	7,750	2,670	2,940	3,630	1,790
6	700	602	1,060	2,740	.....	6,690	5,000	3,010	3,250	1,790
7	694	602	1,090	2,880	.....	5,870	4,000	2,940	3,250	1,790
8	646	602	1,120	3,170	.....	9,750	3,990	3,070	3,490	1,790
9	635	613	1,150	2,600	.....	12,100	3,910	2,920	3,200	1,730
10	635	1,600	1,180	2,740	.....	15,100	3,390	2,890	3,340	1,680
11	618	2,200	1,200	.....	1,850	16,500	3,380	2,890	3,090	1,680
12	681	1,800	1,010	.....	1,850	17,000	3,700	3,640	3,360	1,590
13	1,030	1,200	990	.....	1,850	16,400	3,160	3,230	3,510	1,580
14	862	1,000	970	.....	2,080	13,700	3,250	3,410	2,740	1,680
15	667	900	950	.....	2,080	13,600	3,220	3,220	2,890	1,680
16	624	860	930	.....	2,080	12,100	3,210	3,200	2,720	1,570
17	602	800	915	.....	2,080	8,850	3,360	3,360	2,750	1,730
18	681	660	1,240	.....	2,080	7,970	3,400	2,920	2,920	1,770
19	1,130	635	1,280	.....	2,200	7,970	3,140	2,380	2,540	1,670
20	1,470	707	1,480	.....	3,480	5,620	3,130	3,590	2,580	1,850
21	1,660	721	1,580	.....	4,880	5,240	3,490	3,840	2,280	1,490
22	1,610	694	1,530	.....	4,500	5,520	3,060	3,370	2,250	1,460
23	1,240	742	1,430	.....	4,150	5,820	5,020	3,410	2,410	1,360
24	999	770	1,580	.....	3,640	3,320	1,380	3,370	2,470	1,360
25	944	721	1,580	.....	3,640	3,980	2,960	3,180	2,440	1,360
26	1,360	687	1,530	.....	3,480	3,930	2,810	2,390	2,310	1,360
27	2,230	668	1,630	.....	3,480	3,680	2,760	1,860	2,210	1,360
28	2,240	714	1,630	.....	3,810	5,580	2,900	2,710	2,110	1,360
29	1,920	805	2,330	.....	5,260	4,240	3,030	2,610	2,140	1,350
30	1,460	668	2,330	.....	5,870	4,640	3,060	2,840	2,350	1,270
31	1,090	.....	2,330	.....	.....	4,170	.....	2,770	2,180	.....

NOTE.—Discharge Nov. 19 to May 19 determined from a well-defined rating curve applied to the readings of the chain gage. Discharge Oct. 1 to Nov. 18, and May 20 to Sept. 30 determined as the mean of discharges at two-hour intervals as indicated by records of water-stage recorder. Rating curve for recorder determined by means of a curve of relation between readings of chain gage and those of water-stage recorder.

Monthly discharge of Kennebec River at The Forks, Maine, for the year ending Sept. 30, 1914.

[Drainage area, 1,570 square miles.]

Month.	Discharge in second-feet.			Corrected run-off (depth in inches on drainage area).
	Observed mean.	Corrected for storage.		
		Mean.	Per square mile.	
October	1,090	2,270	1.45	1.67
November	853	2,260	1.44	1.61
December	1,310	1,780	1.13	1.30
January	[a] 3,420	2,050	1.31	1.51
February	[a] 1,910	670	.427	.44
March	[a] 1,190	1,070	.682	.79
April	[a] 2,590	4,610	2.94	3.28
May	8,180	11,400	7.26	8.37
June	3,470	2,410	1.54	1.72
July	3,040	1,430	.911	1.05
August	2,760	570	.363	.42
September	1,680	400	.255	.28
The year	2,640	2,590	1.65	22.44

[a] Discharge estimated during winter from climatic data and observed gage heights.

KENNEBEC RIVER AT WATERVILLE, MAINE.

Location.—At dam and mill of Hollingsworth & Whitney Co. at Waterville, 2 miles above Sebasticook River and about 3½ miles above Messalonskee Stream.

Drainage area.—4,270 square miles.

Records available.—March 22, 1892, to September 30, 1914. Data also in annual reports Maine State Water Storage Commission.

Gages.—Rod gages in pond above dam and in tailrace of mill.

Determination of discharge.—Discharge computed from flow over dam, through the logway, and through 18 wheels of the mill. When flow is less than about 3,500 second-feet all the water is used through the wheels.

Winter flow.—As a rule, discharge relation not affected by ice. During most years winter flow passes through wheels of mill.

Regulation.—Numerous power plants and much storage above station. Results not corrected for storage.

Accuracy.—Results fair only, as many wheels are in operation and only one reading a day is made for each wheel; record valuable because of its length and continuity.

Cooperation.—Records obtained and estimates of daily discharge furnished by the Hollingsworth & Whitney Co.

Daily discharge, in second-feet, of Kennebec River at Waterville, Maine, for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2,070	10,400	4,340	3,840	2,840	2,990	7,240	22,500	10,100	3,930	2,960	4,400
2	2,340	8,570	4,420	3,560	4,270	6,570	10,800	22,600	10,400	4,100	2,020	4,250
3	3,020	8,670	4,400	2,940	4,590	8,230	11,800	20,800	11,000	4,170	3,490	4,230
4	9,700	7,090	4,060	1,130	4,550	11,700	10,700	25,100	10,300	2,460	3,920	3,440
5	7,190	7,510	4,380	4,030	4,450	9,610	5,630	28,200	5,000	4,030	3,680	3,800
6	4,980	7,200	4,340	4,100	4,260	6,430	8,390	33,200	8,420	4,780	3,920	1,760
7	4,610	7,010	2,000	3,330	3,880	4,940	8,510	27,300	7,230	4,270	3,940	2,800
8	3,970	4,260	4,550	3,440	2,510	2,060	7,690	27,600	9,500	3,940	4,030	2,340
9	3,180	2,680	9,260	3,350	4,440	3,840	15,300	35,400	6,840	3,610	1,440	3,540
10	2,880	6,200	8,570	3,710	4,140	4,540	39,100	54,300	6,340	4,050	4,290	2,780
11	2,290	23,900	6,030	1,550	3,510	4,720	28,500	48,400	5,730	4,950	4,920	2,690
12	615	16,400	7,660	3,980	2,840	4,640	21,800	45,700	5,030	1,940	5,360	2,440
13	3,360	11,900	4,820	3,720	2,980	4,300	28,200	40,900	5,140	5,750	4,900	547
14	4,520	10,500	1,860	3,150	2,660	4,130	20,900	34,800	3,880	6,000	4,640	2,590
15	3,960	7,590	4,610	2,880	2,070	3,010	17,300	31,500	5,180	5,680	4,330	2,750
16	3,980	6,550	4,140	3,530	3,660	3,930	16,200	27,000	4,590	4,890	4,120	2,510
17	4,360	7,010	3,700	3,220	4,340	3,780	14,000	22,700	4,700	4,410	2,790	2,540
18	4,340	6,270	3,510	415	3,640	3,530	11,500	18,600	4,840	4,820	3,850	2,570
19	3,010	5,520	3,360	4,160	3,670	3,790	18,400	14,600	4,610	2,260	3,740	2,510
20	4,880	6,190	3,360	3,810	3,580	4,340	31,900	17,500	4,320	5,220	3,410	1,110
21	16,400	7,110	604	3,970	3,490	6,110	57,000	12,100	2,260	4,470	3,720	2,650
22	26,400	8,750	3,900	4,020	2,460	2,290	45,200	15,800	4,840	4,020	4,090	2,910
23	17,200	7,490	3,430	3,600	4,330	4,300	31,700	14,700	4,200	4,110	2,060	2,440
24	12,800	7,140	3,550	3,640	3,680	4,030	28,200	14,200	4,140	4,020	4,220	1,310
25	10,300	6,270	565	2,410	3,100	3,850	23,700	10,600	4,830	3,740	4,230	979
26	10,000	5,890	4,330	4,650	3,610	3,840	21,200	14,100	3,230	1,310	3,300	1,820
27	21,300	4,710	3,400	4,700	3,420	4,110	20,900	11,300	3,660	4,270	3,390	926
28	25,100	5,390	1,960	4,400	3,420	4,950	20,200	11,400	1,240	3,900	3,360	2,510
29	15,500	3,960	3,090	4,570	.....	5,180	19,900	10,500	4,310	3,900	3,310	2,010
30	14,700	2,100	2,980	4,440	.....	7,030	25,000	9,750	4,040	3,410	1,880	2,000
31	11,400	.....	2,670	4,260	.....	7,190	.....	8,960	.....	3,660	5,120	.....

Monthly discharge of Kennebec River at Waterville, Maine, for the year ending Sept. 30, 1914.

[Drainage area, 4,270 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
October	26,400	615	8,400	1.97	2.27
November	23,900	2,100	7,670	1.80	2.01
December	9,260	565	4,000	.936	1.08
January	4,700	415	3,500	.819	.94
February	4,590	2,070	3,580	.838	.87
March	11,700	2,060	4,970	1.16	1.34
April	57,000	5,630	20,900	4.89	5.46
May	54,300	8,960	23,600	5.53	6.38
June	11,000	1,240	5,660	1.32	1.47
July	6,000	1,310	4,070	.952	1.10
August	5,360	1,440	3,690	.864	1.00
September	4,400	547	2,500	.586	.65
The year	57,000	415	7,730	1.81	24.57

NOTE.—Attention is called to the fact that the monthly discharge in second-feet per square mile and the run-off in depth in inches do not represent the natural flow from the basin because of artificial storage. The yearly discharge and run-off doubtless represent more nearly the natural flow, for probably little stored water is held over from year to year.

DEAD RIVER AT THE FORKS, MAINE.

Location.—One-eighth mile above farmhouse of Jeremiah Durgin, 1½ miles west of The Forks.

Drainage area.—878 square miles.

Records available.—September 29, 1901, to August 15, 1907; March 16, 1910, to September 30, 1914. Data also in annual reports of Maine State Water Storage Commission.

Gage.—Inclined staff bolted to large bowlder on left bank a short distance from observer's house.

Discharge measurements.—Made from cable 700 feet above gage.

Channel and control.—Practically permanent.

Extremes of discharge.—Maximum stage recorded during year, 6.8 feet at 6.30 a. m. May 10; approximate discharge computed from extension of rating curve, 17,300 second-feet. Minimum stage recorded durng year, 0.6 foot, September 22 to 30; approximate discharge computed from extension of rating curve, 100 second-feet.

Winter flow.—Discharge relation affected by ice.

Regulation.—A number of dams on lakes above; used solely for log driving.

Cooperation.—Records furnished by the Maine State Water Storage Commission.

The following discharge measurement was made by G. C. Danforth: February 11, 1914: Gage height, 1.25 feet; discharge, 375 second-feet. Discharge relation affected by ice.

Daily gage height, in feet, of Dead River at The Forks, Maine, for the year ending Sept. 30, 1914.

[Mrs. Eva M. Forsythe, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.80	2.25	1.68	1.70	.....	.....	.....	3.95	2.15	1.00	0.80	1.45
2	.72	2.08	1.55	2.10	.....	.....	.....	4.10	3.05	1.00	.80	1.10
3	1.15	1.90	1.50	2.20	1.60	3.10	2.10	4.25	2.15	1.00	.80	1.00
4	2.05	1.82	1.50	2.25	.....	.....	.....	4.55	1.55	1.00	.80	.85
5	1.88	1.80	1.50	2.28	.....	.....	.....	5.45	1.70	.90	.80	.80
6	1.60	1.72	1.50	2.30	1.40	2.50	.....	4.90	1.90	.90	.80	.80
7	1.22	1.68	1.50	2.38	.....	.....	1.90	5.05	1.85	.90	.80	.80
8	.98	1.62	1.42	2.48	.....	.....	.....	6.00	1.55	.85	.80	.80
9	.90	1.60	1.28	2.42	.....	.....	.....	6.40	1.45	.85	.80	.80
10	.78	3.15	1.18	2.30	1.30	2.40	2.30	6.55	1.40	.80	.75	.80
11	.85	3.80	1.12	2.25	.....	.....	.....	6.30	1.35	.80	.70	.80
12	1.15	3.35	1.10	.....	.....	.....	.....	6.25	1.35	.70	.75	.80
13	1.38	2.60	1.18	.....	1.30	2.30	.....	5.40	1.35	.75	.70	.80
14	1.48	2.32	1.40	.....	.....	.....	2.60	4.80	1.30	.70	.80	.70
15	1.60	2.22	1.40	.....	.....	.....	.....	4.50	1.20	.70	.80	.70
16	1.68	2.12	1.30	1.80	.....	.....	.....	4.00	1.10	.70	.80	.70
17	1.95	2.00	1.30	.....	1.20	2.30	1.90	4.20	1.10	.70	.95	.80
18	1.85	1.78	1.30	.....	.....	.....	.....	4.65	1.10	.95	.90	.70
19	1.80	1.70	1.30	.....	.....	.....	.....	4.05	1.10	.95	1.00	.80
20	1.88	1.85	1.30	1.75	1.15	2.50	2.55	3.95	1.10	1.00	1.00	.70
21	3.32	2.35	1.30	.....	.....	.....	2.85	4.10	1.10	1.00	1.20	.70
22	3.45	2.32	1.25	.....	.....	.....	4.25	3.10	1.10	.95	1.45	.65
23	2.68	2.40	1.22	1.60	.....	.....	4.55	2.45	1.05	.90	1.45	.60
24	2.22	2.05	1.20	.....	1.05	2.10	4.25	2.70	1.00	.90	1.00	.60
25	1.98	1.82	1.20	.....	.....	.....	3.95	2.30	1.00	.80	1.15	.70
26	2.18	1.70	1.20	.....	.....	.....	3.60	2.00	1.00	.80	1.20	.70
27	3.25	1.65	1.15	1.70	1.05	2.60	3.35	1.95	1.00	.80	1.15	.70
28	3.40	1.52	1.15	.....	.....	.....	3.22	1.95	1.00	.80	1.20	.70
29	3.10	1.50	1.18	.....	.....	.....	3.35	2.15	1.00	.80	1.20	.70
30	2.70	1.58	1.35	1.70	.....	.....	3.60	1.85	1.00	.80	1.15	.60
31	2.45	.....	1.55	.....	.....	2.60	.....	1.95	.....	.80	1.20	.....

NOTE.—Discharge relation affected by ice Jan. 12 to Apr. 19.

Daily discharge, in second-feet, of Dead River at The Forks, Maine, for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Apr.	May.	June.	July.	Aug.	Sept.
1	240	2,120	1,240	1,240	.....	5,980	1,940	415	240	902
2	160	1,830	1,030	1,860	.....	6,460	3,660	415	240	510
3	560	1,540	965	2,030	.....	6,960	1,940	415	240	415
4	1,780	1,420	965	2,120	.....	8,020	1,030	415	240	282
5	1,540	1,390	965	2,200	.....	11,500	1,240	325	240	240
6	1,100	1,270	965	2,200	.....	9,320	1,540	325	240	240
7	610	1,210	965	2,380	.....	9,890	1,460	325	240	240
8	415	1,130	840	2,560	.....	13,800	1,030	282	240	240
9	325	1,100	720	2,380	.....	15,500	902	282	240	240
10	240	3,880	610	2,200	.....	16,200	840	240	200	240
11	282	5,530	510	2,120	.....	15,000	780	240	160	240
12	560	4,340	510	.....	.....	14,800	780	160	200	240
13	840	2,750	610	.....	.....	11,300	780	200	160	240
14	965	2,240	840	.....	.....	8,940	720	160	240	160
15	1,100	2,060	840	.....	.....	7,840	610	160	240	160
16	1,240	1,890	720	.....	.....	6,140	510	160	240	160
17	1,620	1,700	720	.....	.....	6,790	510	160	370	240
18	1,460	1,360	720	.....	.....	8,380	510	370	325	160
19	1,390	1,240	720	.....	.....	6,300	510	370	415	240
20	1,540	1,460	720	.....	2,660	5,980	510	415	415	160
21	4,220	2,290	720	.....	3,240	6,460	510	415	610	160
22	4,580	2,240	665	.....	6,960	3,770	510	370	902	130
23	2,940	2,380	610	.....	8,020	2,470	462	325	902	100
24	2,030	1,780	610	.....	6,960	2,940	415	325	415	100
25	1,700	1,420	610	.....	5,980	2,200	415	240	560	160
26	2,030	1,240	610	.....	4,970	1,700	415	240	610	160
27	4,100	1,170	560	.....	4,340	1,620	415	240	560	160
28	4,460	992	560	.....	3,990	1,620	415	240	610	160
29	3,770	965	610	.....	4,340	1,940	415	240	610	160
30	2,940	1,070	780	.....	4,970	1,460	415	240	560	100
31	2,470	.....	1,030	.....	.....	1,620	.....	240	610	.....

NOTE.—Discharge determined from a rating curve fairly well defined below 16,000 second-feet.

Monthly discharge of Dead River at The Forks, Maine, for the year ending Sept. 30, 1914.

[Drainage area, 878 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
October	4,580	160	1,720	1.96	2.26
November	5,530	965	1,900	2.16	2.41
December	1,240	510	759	.86	.99
January	2,560	.....	a1,460	1.66	1.91
February	.....	.....	a381	.434	.45
March	.....	.....	a1,630	1.86	2.14
April	8,020	.....	a2,990	3.40	3.79
May	16,200	1,460	7,190	8.19	9.44
June	3,660	415	873	.994	1.11
July	415	160	289	.329	.38
August	902	160	389	.443	.51
September	902	100	231	.263	.29
The year	16,200	100	1,660	1.89	25.68

a Discharge during winter estimated from one discharge measurement, climatic data, and comparisons with records on adjacent streams.

SANDY RIVER NEAR FARMINGTON, MAINE.

Location.—At Fairbanks highway bridge, 3 miles above Farmington.

Drainage area.—270 square miles.

Records available.—July 11, 1910, to September 30, 1914. Data also in annual reports of Maine State Water Storage Commission.

Gage.—Chain attached to bridge.

Discharge measurements.—Made from the bridge.

Channel and control.—Practically permanent.

Extremes of discharge.—Maximum stage recorded during year, 10.5 feet at 9 a. m. November 10; approximate discharge computed from extension of rating curve, 8,300 second-feet. Minimum stage recorded during year, 2.2 feet, September 19 and 20; discharge, 38 second-feet.

Winter flow.—Discharge relation affected by ice.

Regulation.—No storage basins above station; the water-power dam at Phillips may slightly affect flow at station.

Accuracy.—Discharge rating for 1914 somewhat uncertain, as the gage was not checked nor were any discharge measurements made during the year.

Cooperation.—Records furnished by Maine State Water Storage Commission.

No discharge measurements made during the year.

Daily gage height, in feet, of Sandy River near Farmington, Maine, for the year ending Sept. 30, 1914.

[L. A. Daggett, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.5	4.2	3.3	.....	.....	.....	4.9	5.6	3.2	2.7	2.4	3.0
2	2.7	4.0	3.3	.....	.....	.....	.....	5.2	3.2	3.0	2.3	2.8
3	6.25	3.7	3.3	.....	.....	.....	.....	5.8	3.1	3.2	2.3	3.0
4	6.0	3.8	3.4	.....	3.1	.....	4.7	6.2	3.2	3.0	2.4	2.8
5	4.7	3.7	3.4	.....	.....	.....	.....	6.5	4.3	2.7	2.4	2.7
6	3.9	3.6	3.2	3.6	.....	.....	.....	6.3	3.7	2.6	2.3	2.6
7	3.8	3.6	3.2	.....	3.1	.....	.....	6.5	3.2	2.6	2.3	2.5
8	3.1	3.5	4.5	.....	.....	.....	4.2	6.1	3.1	2.7	2.3	2.5
9	3.0	3.5	4.5	.....	.....	.....	4.9	8.7	3.0	2.7	3.3	2.5
10	2.9	9.3	3.9	3.5	.....	.....	5.7	8.4	3.0	2.8	3.0	2.4
11	2.9	6.0	3.7	.....	3.7	.....	5.9	6.6	2.9	3.1	2.6	2.4
12	2.9	5.7	3.9	.....	.....	.....	5.9	5.8	2.9	3.7	3.7	2.4
13	3.4	4.4	4.4	.....	.....	.....	5.8	5.0	2.8	3.3	2.9	2.4
14	3.5	4.2	4.0	.....	3.7	.....	4.6	4.7	2.7	2.9	2.7	2.4
15	3.3	4.0	3.8	3.4	.....	.....	4.5	4.5	2.8	2.7	2.6	2.3
16	3.8	3.8	3.7	.....	.....	.....	4.5	4.4	2.8	.....	2.6	2.3
17	3.6	3.7	3.5	3.5	.....	.....	4.4	4.3	2.6	2.7	2.5	2.3
18	3.4	3.7	3.4	.....	3.7	.....	6.4	4.3	2.8	2.6	2.5	2.3
19	3.4	3.6	3.2	.....	.....	.....	6.4	4.3	2.8	2.6	2.5	2.2
20	4.4	5.1	3.2	.....	.....	.....	9.6	4.4	2.7	2.5	2.5	2.2
21	9.05	5.5	3.1	3.5	3.8	.....	9.8	4.3	2.8	2.5	2.5	2.3
22	5.2	5.5	3.9	.....	.....	.....	7.6	4.3	2.7	2.4	2.5	2.4
23	4.4	4.9	3.6	.....	.....	.....	6.1	.....	2.7	2.4	2.5	2.4
24	4.0	4.6	3.9	3.3	.....	.....	5.5	.....	2.6	2.4	2.5	2.4
25	4.2	3.6	4.0	.....	3.7	3.8	5.5	3.3	2.6	2.4	2.4	2.4
26	5.8	3.5	3.9	.....	.....	.....	5.8	3.4	2.6	2.4	2.3	2.4
27	8.3	3.4	4.1	.....	.....	.....	5.6	3.7	2.5	2.4	2.3	2.4
28	5.5	3.2	4.0	4.45	3.7	4.7	5.8	3.7	2.5	2.4	2.3	2.4
29	4.9	3.3	4.0	.....	.....	.....	6.5	3.8	2.5	2.4	2.4	2.5
30	4.6	3.4	3.9	.....	.....	.....	6.1	3.7	2.7	2.4	3.7	2.5
31	4.6	.....	4.0	4.4	.....	4.9	.....	3.6	.....	2.4	3.5	.....

NOTE.—Discharge relation Jan. 1 to Apr. 7 seriously affected by ice.

Daily discharge, in second-feet, of Sandy River near Farmington, Maine, for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Apr.	May.	June.	July.	Aug.	Sept.
1	83	667	283	560	1,730	251	121	67	193
2	121	562	283	570	1,380	251	193	52	143
3	2,420	431	283	580	1,930	221	251	52	193
4	2,140	473	317	590	2,360	251	193	67	143
5	993	431	317	600	2,690	725	121	67	121
6	517	391	251	620	2,470	431	101	52	101
7	473	391	251	640	2,690	251	101	52	83
8	221	353	853	667	2,250	221	121	52	83
9	193	353	853	1,140	5,600	193	121	283	83
10	167	6,500	517	1,830	5,160	193	143	193	67
11	167	2,140	431	2,040	2,800	167	221	101	67
12	167	1,830	517	2,040	1,930	167	431	431	67
13	317	787	787	1,930	1,220	143	283	167	67
14	353	667	562	923	993	121	167	121	67
15	283	562	473	853	853	143	121	101	52
16	473	473	431	853	787	143	121	101	52
17	391	431	353	787	725	101	121	83	52
18	317	431	317	2,580	725	143	101	83	52
19	317	391	251	2,580	725	143	101	83	38
20	787	1,300	251	6,950	787	121	83	83	38
21	6,120	1,640	221	7,250	725	143	83	83	52
22	1,380	1,640	517	4,050	725	121	67	83	67
23	787	1,140	391	2,250	570	121	67	83	67
24	562	923	517	1,640	420	101	67	83	67
25	667	391	562	1,640	283	101	67	67	67
26	1,930	353	517	1,930	317	101	67	52	67
27	5,020	317	613	1,730	431	83	67	52	67
28	1,640	251	562	1,930	431	83	67	52	67
29	1,140	283	562	2,690	473	83	67	67	83
30	923	317	517	2,250	431	121	67	431	83
31	923	.....	562	.....	391	.....	67	353	.....

NOTE.—Discharge determined from a rating curve fairly well-defined between 50 and 2,000 second-feet but poorly defined above 2,000 second-feet.

Monthly discharge of Sandy River near Farmington, Maine, for the year ending Sept. 30, 1914.

[Drainage area, 270 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
October	6,120	83	1,030	3.81	4.39
November	6,500	251	894	3.31	3.69
December	853	221	456	1.69	1.95
January	.....	.....	270	1.00	1.15
February	.....	.....	135	.500	.52
March	.....	.....	405	1.50	1.73
April	7,250	560	1,890	7.00	7.81
May	5,600	283	1,450	5.37	6.19
June	725	83	181	.670	.75
July	431	67	128	.474	.55
August	431	52	119	.441	.51
September	193	38	82	.304	.34
The year	7,250	38	589	2.18	29.58

NOTE.—Monthly estimates for January, February, and March based on observer's notes and weather records and are approximate.

SEBASTICOOK RIVER AT PITTSFIELD, MAINE.

Location.—At steel highway bridge just above Maine Central Railroad bridge in Pittsfield.

Drainage area.—320 square miles.

Records available.—July 27, 1908, to September 30, 1914. Data also in annual reports of Maine State Water Storage Commission.

Gage.—Chain attached to highway bridge.

Discharge measurements.—Made from highway bridge.

Channel and control.—Practically permanent.

Extremes of discharge.—Maximum stage recorded during year, 8.4 feet, April 22; approximate discharge computed from extension of rating curve, 6,380 second-feet. Minimum stage recorded during year, 2.3 feet, on several days in September; approximate discharge computed from extension of rating curve, 30 second-feet.

Winter flow.—Discharge relation not affected by ice, as the rapid fall and proximity of power plant immediately above station tend to keep river open.

Regulation.—Dam of Waverly woolen mill is about 800 feet upstream from station and dam of Sebasticook Power Co. about 5 miles below and 2 miles from Burnham, but fall of stream prevents backwater from lower dam.

Cooperation.—Records furnished by Maine State Water Storage Commission.

No discharge measurements made during year.

Estimates of mean daily and monthly discharge withheld on account of diurnal fluctuation.

Gage height, in feet, and discharge, in second-feet, of Sebasticook River at Pittsfield, Maine, for the year ending Sept. 30, 1914.

Day.	October.						November.					
	A. M.			P. M.			A. M.			P. M.		
	Time.	Gage height.	Discharge.	Time.	Gage height.	Discharge.	Time.	Gage height.	Discharge.	Time.	Gage height.	Discharge.
1	6.00	2.7	125	6.00	2.5	71	6.00	3.7	540	12.00	3.7	540
2	6.00	2.9	193	6.00	3.2	310	9.00	3.7	540	4.00	3.7	540
3	7.00	3.1	270	4.20	3.2	310	6.00	3.7	540	12.00	3.8	600
4	7.10	3.0	230	5.00	3.3	352	6.00	3.7	540	12.00	3.8	600
5	8.00	2.9	193	4.00	3.0	230	6.00	3.8	600	4.00	3.6	485
6	6.00	2.9	193	6.00	2.8	158	6.05	3.6	485	4.20	3.5	438
7	6.00	2.8	158	6.00	2.9	193	6.0	3.5	438	12.00	3.6	485
8	6.05	2.8	158	5.15	3.0	230	6.00	3.5	438	3.00	3.4	395
9	7.00	3.0	230	5.00	3.0	230	9.00	3.4	395	4.00	3.5	438
10	6.30	3.0	230	4.30	3.0	230	6.05	3.4	395	12.00	3.5	438
11	7.30	3.0	230	4.20	2.9	193	6.00	3.5	438	12.00	3.5	438
12	9.00	2.9	193	4.00	2.9	193	6.10	3.7	540	12.40	3.8	600
13	6.00	3.0	230	4.10	2.9	193	6.00	3.9	668	12.00	3.9	668
14	6.00	2.9	193	12.40	2.4	50	6.00	3.9	668	12.10	3.8	600
15	6.00	2.8	158	12.30	3.0	230	6.05	3.8	600	12.40	3.8	600
16	8.00	3.0	230	4.00	2.9	193	9.00	3.7	540	4.00	3.6	485
17	8.20	2.9	193	4.10	3.0	230	6.10	3.7	540	12.00	3.7	540
18	7.30	3.0	230	3.00	3.0	230	6.00	3.7	540	12.00	3.6	485
19	9.00	2.5	71	4.00	2.5	71	6.00	3.7	540	12.00	3.7	540
20	6.00	2.8	158	12.40	2.8	158	6.10	3.7	540	12.00	3.7	540
21	6.00	3.0	230	1.00	3.2	310	6.00	3.7	540	12.10	3.7	540
22	6.00	3.0	230	12.40	3.2	310	6.10	3.6	485	12.00	3.7	540
23	6.00	3.1	270	12.00	3.3	352	9.00	3.6	485	4.00	3.6	485
24	6.00	3.0	230	12.00	3.3	352	6.10	3.6	485	12.00	3.6	485
25	6.00	3.0	230	12.00	3.2	310	6.05	3.7	540	12.00	3.6	485
26	9.00	3.1	270	4.00	3.1	270	6.10	3.5	438	12.00	3.6	485
27	6.00	3.2	310	4.30	3.3	352	8.00	3.5	438	12.00	3.5	438
28	6.50	3.4	395	4.30	3.3	352	6.10	3.4	395	3.00	3.4	395
29	6.00	3.6	485	4.00	3.5	438	6.05	3.4	395	4.00	3.4	395
30	6.05	3.7	540	12.00	3.7	540	9.00	3.4	395	4.00	3.5	438
31	6.00	3.8	600	12.00	3.8	600						

Gage height, in feet, and discharge, in second-feet, of Sebasticook River at Pittsfield, Maine, for the year ending Sept. 30, 1914—Continued.

Day.	December.						January.					
	A. M.			P. M.			A. M.			P. M.		
	Time	Gage height.	Discharge.	Time.	Gage height.	Discharge.	Time.	Gage height.	Discharge.	Time.	Gage height.	Discharge.
1	12.00	3.5	438				11.30	3.1	270			
2	12.00	3.4	395				11.00	3.3	352			
3				12.20	3.3	352	11.00	3.2	310			
4	12.00	3.2	310							12.30	2.8	158
5	12.00	3.2	310				12.00	3.2	310			
6				12.10	3.2	310	12.00	3.3	352			
7				3.00	3.1	270	12.00	3.2	310			
8	12.00	3.6	485				11.00	3.1	270			
9	12.00	3.7	540				11.30	3.2	310			
10	12.00	3.9	668							4.00	3.0	230
11	12.00	3.9	668				12.00	2.9	193			
12				12.45	3.9	668	10.00	3.2	310			
13	11.30	3.9	668							3.00	3.2	310
14	10.00	3.8	600				10.00	3.2	310			
15	12.00	3.8	600				11.00	3.2	310			
16	12.00	3.6	485				12.00	3.2	310			
17	12.00	3.7	540				9.00	3.0	230			
18	12.00	3.6	485				11.00	2.9	193			
19	12.00	3.2	310				11.00	3.2	310			
20	11.30	3.2	310							12.10	3.0	230
21				12.30	3.2	310	12.00	3.2	310			
22				12.45	3.0	230	12.00	3.2	310			
23	11.50	3.4	395							12.20	2.6	97
24	12.00	3.4	395							1.00	2.8	158
25				4.00	3.0	230				1.20	3.0	230
26	11.00	3.3	352							12.10	3.0	230
27	12.00	3.0	230							12.05	3.0	230
28				4.30	3.0	230	12.00	3.2	310			
29	12.00	3.2	310				12.00	3.3	352			
30	12.00	3.1	270				12.00	3.4	395			
31	12.00	3.2	310							2.00	3.2	310

Gage height, in feet, and discharge in second-feet, of Sebasticook River at Pittsfield, Maine, for the year ending Sept. 30, 1914—Continued.

Day.	February.						March.					
	A. M.			P. M.			A. M.			P. M.		
	Time.	Gage height.	Discharge.	Time.	Gage height.	Discharge.	Time.	Gage height.	Discharge.	Time.	Gage height.	Discharge.
1				12.30	3.2	310	12.00	2.9	193			
2	12.00	3.5	438				12.00	3.5	438			
3	12.00	3.4	395				12.00	3.9	668			
4				12.40	3.4	395				12.15	3.7	540
5	12.00	3.0	230							12.10	3.5	438
6	12.00	3.3	352							12.10	3.6	485
7				2.00	3.1	270	9.30	3.7	540			
8	11.00	3.2	310				10.40	3.6	485			
9	12.00	3.3	352				9.30	3.8	600			
10	12.00	3.2	310				12.00	3.7	540			
11	12.00	3.3.	352							12.10	3.7	540
12	12.00	3.2	310				12.00	3.7	540			
13	12.00	3.3	352							12.05	3.6	485
14	11.15	3.1	270				11.00	3.6	485			
15				12.40	3.1	270	9.00	3.5	438			
16	12.00	3.4	395				12.00	3.5	438			
17	12.00	3.4	395							12.05	3.5	438
18	12.00	3.3	352							12.10	3.4	395
19	12.00	3.4	395				12.00	3.5	438			
20	12.00	3.4	395							12.15	3.4	395
21	9.00	3.2	310							4.00	3.4	395
22				1.00	3.0	230	10.20	3.4	395			
23	12.00	3.3	352				12.00	3.5	438			
24	12.00	3.2	310							12.15	3.5	438
25				12.20	2.7	125				12.10	3.3	352
26	12.00	3.2	310							12.10	3.3	352
27	12.00	3.2	310							12.15	3.5	438
28				1.00	2.9	193				4.00	3.5	438
29							10.30	3.6	485			
30							12.00	3.9	668			
31										12.10	3.9	668

Gage height, in feet, and discharge in second-feet, of Sebasticook River at Pittsfield, Maine, for the year ending Sept. 30, 1914—Continued.

Day.	April.						May.					
	A. M.			P. M.			A. M.			P. M.		
	Time.	Gage height.	Discharge.	Time.	Gage height.	Discharge.	Time.	Gage height.	Discharge	Time.	Gage height.	Discharge.
1	12.00	3.9	668				6.10	5.6	2,590	6.00	5.6	2,590
2	12.00	4.3	1,040				6.05	5.4	2,330	4.00	5.3	2,200
3				12.05	4.5	1,250	9.00	5.2	2,080	3.00	5.2	2,080
4				1.00	4.4	1,140	6.00	5.1	1,960	6.00	5.1	1,960
5	10.30	4.4	1,140				6.00	5.0	1,840	6.05	4.9	1,710
6	12.00	4.2	938				6.00	4.9	1,710	6.00	4.8	1,590
7	12.00	4.1	838				6.00	4.8	1,590	7.20	4.8	1,590
8				12.10	4.2	938	6.00	4.7	1,470	7.00	4.7	1,470
9	12.00	4.6	1,360				6.05	4.7	1,470	6.10	4.7	1,470
10	12.00	5.3	2,200				9.00	4.5	1,250	3.00	4.6	1,360
11				1.30	5.6	2,590	6.00	5.1	1,960	6.05	5.1	1,960
12	10.20	5.8	2,860				6.00	5.0	1,840	6.10	4.9	1,710
13	12.00	5.8	2,860				6.00	4.9	1,710	6.05	4.9	1,710
14				12.10	5.8	2,860	6.00	4.8	1,590	6.15	4.7	1,470
15	12.00	5.5	2,460				6.00	4.5	1,250	6.10	3.2	310
16				12.10	5.5	2,460	6.00	3.6	485	6.30	3.9	668
17	12.00	5.4	2,330				9.30	4.0	745	3.00	4.1	838
18				3.10	5.4	2,330	6.00	4.1	838	6.10	4.0	745
19	10.00	5.6	2,590				6.00	4.0	745	6.15	3.8	600
20				12.10	6.2	3,400	6.00	3.7	540	6.05	3.6	485
21	6.00	7.7	5,430	12.00	8.0	5,840	6.00	3.6	485	6.00	3.5	438
22	6.00	8.4	6,380	12.10	8.4	6,380	6.00	3.5	438	6.00	3.7	540
23	6.00	8.0	5,840	12.05	7.9	5,700	6.05	3.6	485	3.00	3.5	438
24	6.05	7.5	5,160	12.10	7.5	5,160	9.00	3.4	395	4.00	3.5	438
25	6.00	6.9	4,350	4.00	6.7	4,070	6.00	3.4	395	6.10	3.4	395
26	9.00	6.6	3,940	4.10	6.4	3,670	6.00	3.3	352	6.10	3.4	395
27	6.00	6.4	3,670	6.05	6.3	3,430	6.05	3.4	395	6.00	3.3	352
28	6.05	6.0	3,130	6.10	5.9	2,990	6.20	3.3	352	7.00	3.2	310
29	6.00	5.7	2,720	6.05	5.7	2,720	6.30	3.2	310	6.10	3.1	270
30	6.00	5.7	2,720	6.10	5.7	2,720	6.00	2.9	193	4.00	2.9	193
31							8.00	2.9	193	3.00	3.0	230

Gage height, in feet, and discharge, in second-feet, of Sebasticook River at Pittsfield, Maine, for the year ending Sept. 30, 1914—Continued.

Day.	June.						July.					
	A. M.			P. M.			A. M.			P. M.		
	Time.	Gage height.	Discharge.	Time.	Gage height.	Discharge.	Time.	Gage height.	Discharge.	Time.	Gage height.	Discharge.
1	12.00	3.0	230	6.00	3.1	270	6.00	2.6	97	6.05	3.2	310
2	6.00	2.7	125	6.05	3.0	230	6.00	2.5	71	6.10	3.3	352
3	6.00	2.6	97	6.20	2.6	97	6.00	2.5	71	6.10	3.0	230
4	6.00	2.6	97	6.10	3.0	230	8.00	2.5	71	3.00	2.5	71
5	6.05	2.7	125	6.00	2.7	125	9.00	2.5	71	4.00	2.6	97
6	6.00	2.6	97	4.00	2.4	50	6.00	2.6	97	6.05	3.1	270
7	10.20	2.4	50	4.00	2.4	50	6.00	2.5	71	6.00	3.1	270
8	6.00	2.4	50	6.05	3.0	230	6.00	2.5	71	6.10	3.0	230
9	6.00	2.6	97	6.10	3.1	270	6.00	2.5	71	6.00	2.9	193
10	6.00	2.4	50	6.10	3.0	230	6.00	2.4	50	6.05	2.9	193
11	6.00	2.8	158	6.05	2.8	158	6.00	2.4	50	3.00	2.5	71
12	6.00	2.5	71	6.00	2.8	158	9.00	2.5	71	4.00	2.5	71
13	7.00	2.4	50	4.00	2.5	71	6.00	2.5	71	6.05	3.0	230
14	9.00	2.5	71	3.00	2.4	50	6.00	2.4	50	6.00	3.0	230
15	6.00	2.4	50	6.00	3.1	270	6.00	2.5	71	6.05	2.9	193
16	6.00	2.5	71	6.05	3.0	230	6.00	2.5	71	6.10	2.9	193
17	6.05	2.6	97	7.30	2.9	193	6.00	2.5	71	6.05	2.9	193
18	6.00	2.6	97	7.20	2.8	158	6.00	2.5	71	4.00	2.5	71
19	6.05	2.6	97	6.00	3.1	270	10.00	2.5	71	4.00	2.5	71
20	6.00	2.6	97	4.00	2.6	97	6.00	2.5	71	6.05	3.0	230
21	9.00	2.6	97	3.20	2.5	71	6.05	2.4	50	6.10	2.9	193
22	6.00	2.5	71	6.00	3.3	352	6.00	2.5	71	6.00	2.9	193
23	6.05	2.6	97	6.05	3.1	270	6.00	2.5	71	6.05	2.8	158
24	6.00	2.6	97	6.10	3.0	230	6.00	2.5	71	4.00	2.7	125
25	6.00	2.5	71	6.00	3.0	230	8.00	2.8	158	3.00	2.5	71
26	6.00	2.5	71	6.00	3.1	270	9.00	2.4	50	4.00	2.4	50
27	6.05	2.5	71	4.00	2.6	97	6.00	2.5	71	6.00	2.8	158
28	9.00	2.5	71	5.00	2.6	97	6.00	2.7	125	6.05	2.8	158
29	6.05	2.5	71	6.10	3.2	310	6.00	2.5	71	6.00	2.6	97
30	6.00	2.6	97	6.00	3.1	270	6.15	2.7	125	4.00	3.0	230
31							6.20	2.7	125	5.00	2.8	158

Gage height, in feet, and discharge, in second-feet, of Sebasticook River at Pittsfield, Maine, for the year ending Sept. 30, 1914—Continued.

Day.	August.						September.					
	A. M.			P. M.			A. M.			P. M.		
	Time.	Gage height.	Discharge.	Time.	Gage height.	Discharge.	Time.	Gage height.	Discharge.	Time.	Gage height.	Discharge.
1	8.00	2.7	125	4.00	2.3	30	6.00	2.5	71	6.05	2.7	125
2	9.00	2.4	50	5.00	2.4	50	6.00	2.5	71	6.05	2.6	97
3	6.00	2.5	71	6.10	2.8	158	6.00	2.5	71	6.00	2.5	71
4	6.00	2.5	71	6.05	2.9	193	7.00	2.5	71	4.00	2.7	125
5	6.00	2.5	71	6.00	2.8	158	8.00	2.6	97	5.00	2.6	97
6	6.00	2.5	71	5.00	2.7	125	10.00	2.5	71	4.00	2.5	71
7	7.00	2.6	97	4.20	2.8	158	6.00	2.5	71	6.05	2.7	125
8	8.00	2.7	125	4.00	2.5	71	6.05	2.5	71	6.00	2.9	193
9	9.00	2.5	71	4.00	2.5	71	6.05	2.5	71	6.00	2.7	125
10	6.00	2.5	71	6.00	3.0	230	6.10	2.5	71	6.00	2.9	193
11	6.00	2.5	71	6.00	3.0	230	6.00	2.4	50	6.00	3.0	230
12	6.00	2.5	71	6.05	3.0	230	6.15	2.4	50	6.00	2.4	50
13	8.00	2.7	125	6.00	3.0	230	9.00	2.4	50	4.00	2.4	50
14	7.00	2.5	71	4.00	3.0	230	6.00	2.4	50	6.05	2.6	97
15	8.00	2.5	71	5.00	2.5	71	6.00	2.4	50	6.05	2.7	125
16	9.00	2.5	71	4.00	2.5	71	6.00	2.5	71	6.10	2.6	97
17	6.00	2.5	71	6.05	3.0	230	6.05	2.5	71	6.00	2.6	97
18	6.00	2.5	71	6.00	3.0	230	6.00	2.4	50	6.15	2.7	125
19	6.00	2.5	71	6.05	2.8	158	8.00	2.5	71	4.00	2.5	71
20	6.00	2.5	71	4.00	2.8	158	9.00	2.4	50	3.00	2.4	50
21	6.00	2.5	71	5.00	2.7	125	6.00	2.4	50	6.00	2.6	97
22	6.00	2.5	71	4.00	2.6	97	6.05	2.5	71	6.05	2.5	71
23	10.00	2.4	50	5.00	2.5	71	6.05	2.5	71	4.00	2.6	97
24	6.00	2.6	97	6.05	2.7	125	6.05	2.5	71	5.00	2.5	71
25	6.00	2.5	71	6.05	2.5	71	6.20	2.5	71	5.00	2.5	71
26	6.00	2.4	50	6.00	2.4	50	7.00	2.5	71	5.00	2.5	71
27	6.45	2.4	50	4.00	2.7	125	9.20	2.4	50	4.00	2.4	50
28	6.00	2.5	71	5.00	2.7	125	6.00	2.4	50	5.00	2.7	125
29	7.00	2.7	125	4.00	2.6	97	6.00	2.5	71	4.20	2.6	97
30	10.30	2.5	71	5.00	2.6	97	6.10	2.6	97	6.00	2.6	97
31	6.00	2.4	50	6.05	2.6	97						

NOTE.—Discharge determined from a rating curve fairly well-defined between 70 and 4,000 second-feet a discharge measurement made in 1915 being used to verify the curve.

COBBOSSEECONTEE STREAM AT GARDINER, MAINE.

Location.—At dam of Gardiner Water Power Co. in Gardiner.

Drainage area.—220 square miles.

Records available.—June 16, 1890, to September 30, 1914.

Gages.—One in pond above dam and one in tailrace of power house.

Determination of flow.—Discharge determined by considering (1) flow over dam, usually nothing except for a short time in the spring, (2) flow through two gates, and (3) flow through a 39-inch Victor wheel installed in 1907. The computations of daily discharge are made by the engineers of the S. D. Warren Co. from tables of discharge based on careful experiments.

Winter flow.—Discharge relation not affected by ice.

Regulation.—The many lakes in the basin are controlled by storage dams and the stream affords a remarkable example of the regularity of flow that can be obtained with proper storage. Except for a short time in the spring no water is wasted. Results not corrected for storage.

Accuracy.—Results considered good for a station of this type.

Cooperation.—Station maintained by the S. D. Warren Co., which furnished the records of daily discharge for publication.

Daily discharge, in second-feet, of Cobbosseecontee Stream at Gardiner, Maine, for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	180	250	270	270	a 0	a 0	799	280	250	250	250	250
2	180	a 0	270	270	270	380	957	280	250	250	a 0	250
3	180	250	270	270	270	683	1,120	a 0	250	250	250	250
4	180	250	270	a 0	270	1,020	1,090	280	250	250	250	250
5	a 0	250	270	270	270	1,050	a1,130	280	250	a 0	250	250
6	180	250	270	270	270	1,020	1,090	250	250	250	250	a 0
7	190	250	a 0	270	270	960	1,090	250	a 0	250	250	250
8	200	250	270	270	a 0	a 961	1,090	250	250	250	250	250
9	200	a 0	270	270	270	872	1,440	250	250	250	a 0	250
10	200	250	270	270	270	846	1,560	a 0	250	250	250	250
11	200	250	270	a 0	270	816	1,540	770	250	250	250	250
12	a 0	250	270	270	270	795	a1,570	1,040	250	a 0	250	250
13	200	250	270	270	270	796	1,570	1,040	250	250	250	a 0
14	200	250	a 0	270	270	768	1,530	983	a 0	250	250	250
15	200	250	270	270	a 0	a 756	1,440	449	250	250	250	250
16	225	a 0	270	270	270	754	1,360	300	250	250	a 0	250
17	250	250	270	270	270	754	1,240	a 0	250	250	250	250
18	250	250	270	a 0	270	754	1,240	250	250	250	250	250
19	a 0	250	270	270	270	774	a1,300	250	250	a 0	250	250
20	250	250	270	270	270	776	1,300	250	250	250	250	a 0
21	250	250	a 90	270	270	710	1,560	250	a 0	250	250	180
22	250	250	270	270	a 0	a 560	1,560	250	250	250	250	180
23	250	a 0	270	270	280	386	1,560	250	250	250	a 0	180
24	250	270	270	270	280	382	1,360	a 0	250	250	250	180
25	250	270	130	a 0	280	381	683	250	250	250	250	180
26	a 0	270	270	270	280	379	a 712	250	250	a 0	250	180
27	250	130	270	270	280	541	705	250	250	250	250	a 0
28	250	270	a 0	270	280	573	713	250	a 0	250	250	180
29	250	270	270	270	.....	a 789	705	250	250	250	250	180
30	250	a 0	270	270	.....	754	545	250	250	250	a 0	180
31	250	.....	270	270	.....	752	.....	a 0	.....	250	250	.....

a Sunday.

Monthly discharge of Cobbosseecontee Stream at Gardiner, Maine, for the year ending Sept. 30, 1914.

[Drainage area, 220 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
October	250	0	192	0.873	1.01
November	270	0	208	.945	1.05
December	270	0	234	1.06	1.22
January	270	0	235	1.07	1.23
February	280	0	234	1.06	1.10
March	1,050	0	700	3.18	3.67
April	1,570	545	1,180	5.36	5.98
May	1,040	0	313	1.42	1.64
June	250	0	217	.986	1.10
July	253	0	218	.991	1.14
August	250	0	209	.950	1.09
September	250	0	196	.891	.99
The year	1,570	0	345	1.57	21.22

NOTE.—Attention is called to the fact that the monthly discharge in second-feet per square mile and the run-off in depth in inches do not represent the natural flow from the basin because of artificial storage. The yearly discharge and run-off doubtless represent more nearly the natural flow, for probably little stored water is held over from year to year.

ANDROSCOGGIN RIVER BASIN.

ANDROSCOGGIN RIVER AT ERROL DAM, N. H.

Location.—At Errol dam, 1 mile above Errol.

Drainage area.—1,095 square miles.

Records available.—January 1, 1905, to September 30, 1914. Data also in annual reports of Maine State Water Storage Commission.

Gage.—Movable rod gage; readings taken daily from sill of deep gate No. 6; elevation of zero of gage or sill of gate, 1,231.3 feet above mean sea level.

Discharge.—Computed from discharge through 14 gates in the dam by means of coefficients determined from a few discharge measurements.[1]

Winter flow.—Discharge relation little affected by ice.

Regulation.—Errol dam controls the storage of Umbagog Lake, the lower of the Rangeley series of lakes, comprising the principal storage of Androscoggin River and amounting to nearly 20 billion cubic feet, and also a recently developed storage site on Magalloway River created by the Aziscohos dam, which amounts to about 9.6 billion cubic feet, thus making the total storage about 29.6 billion cubic feet. Errol dam is located about 5 miles below outlet of Umbagog Lake and about 3.5 miles below mouth of Magalloway River, thus making this stream one of the feeders of Umbagog Lake. Results not corrected for storage.

Cooperation.—Records obtained and computations of daily discharge made under the direction of Walter H. Sawyer, agent for Union Water Power Co.

Daily discharge, in second-feet, of Androscoggin River at Errol dam, N. H., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1,660	811	1,430	1,830	1,790	1,880	1,410	935	1,650	1,290	1,780	1,760
2	1,560	807	1,440	1,830	1,810	1,880	1,310	948	1,670	1,240	1,750	1,780
3	996	1,190	1,500	1,850	1,810	1,450	1,210	1,540	1,730	1,240	1,780	1,630
4	1,380	1,440	1,580	1,820	1,790	1,840	1,180	1,740	1,640	1,220	1,780	1,660
5	1,670	1,430	1,630	1,810	1,790	1,890	1,330	1,930	1,440	1,200	1,780	1,660
6	1,680	1,400	1,710	1,830	1,790	1,770	1,330	2,370	1,490	1,400	1,770	1,640
7	1,610	1,350	1,710	1,840	1,790	1,730	1,340	4,020	1,550	1,520	1,740	1,660
8	1,560	1,320	1,680	1,780	1,810	1,730	1,400	4,050	1,570	1,510	1,660	1,690
9	1,530	1,060	1,500	1,770	1,810	1,710	1,450	5,480	1,620	1,530	1,600	1,720
10	1,540	574	1,830	1,770	1,810	1,720	1,570	6,840	1,650	1,660	1,600	1,740
11	1,540	584	2,180	1,770	1,880	1,770	1,150	7,080	1,690	1,680	1,600	1,700
12	1,310	688	2,080	1,790	1,920	1,700	712	596	1,600	1,300	1,600	1,770
13	1,510	1,210	1,920	1,810	1,920	1,690	1,400	4,610	1,460	1,040	1,580	1,810
14	1,730	1,180	1,840	1,840	1,900	1,670	1,270	3,270	1,470	1,300	1,670	1,810
15	1,720	1,170	1,870	1,860	1,880	1,630	1,130	2,410	1,480	1,420	1,690	1,770
16	1,700	1,370	1,860	1,880	1,880	1,630	1,100	2,000	1,490	1,380	1,720	1,970
17	1,600	1,470	1,960	1,890	1,860	1,550	1,080	1,670	1,490	1,470	1,720	2,070
18	1,570	1,430	2,040	1,880	1,850	1,580	1,060	1,540	1,510	1,620	1,760	1,970
19	1,590	1,380	1,960	1,880	1,830	1,600	978	1,530	1,520	1,820	1,760	1,830
20	1,510	1,370	1,930	1,880	1,790	1,560	930	1,500	1,520	1,890	1,760	1,830
21	1,190	921	1,890	1,880	1,850	1,620	995	1,480	1,520	1,840	1,650	1,850
22	1,110	398	1,760	1,880	1,930	1,660	1,170	1,470	1,470	1,780	1,590	1,880
23	1,160	994	1,810	1,880	1,900	1,700	893	1,420	1,390	1,740	1,570	1,880
24	1,030	1,310	1,820	1,860	1,870	1,710	751	1,390	1,400	1,720	1,610	1,880
25	691	1,500	1,800	1,860	1,840	1,740	762	1,370	1,390	1,770	1,660	1,820
26	696	1,640	1,760	1,880	1,820	1,740	770	1,350	1,360	1,750	1,760	1,910
27	635	1,620	1,800	1,860	1,800	1,560	776	1,320	1,650	1,790	1,780	•1,460
28	604	1,590	1,860	1,840	1,820	1,460	1,370	1,290	1,750	1,800	1,720	1,380
29	608	1,530	1,800	1,810	.....	1,380	1,540	1,610	1,580	1,780	1,560	1,740
30	653	1,430	1,810	1,790	.....	1,400	1,160	1,720	1,380	1,790	1,260	1,700
31	811	.....	1,800	1,770	.....	1,420	.....	1,700	.....	1,830	1,360	.....

[1] See U. S. Geol. Survey Water-Supply Paper 321, p. 61.

Monthly discharge of Androscoggin River at Errol dam, N. H., for the year ending Sept. 30, 1914.

[Drainage area, 1,095 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
October	1,730	604	1,300	1.19	1.37
November	1,640	398	1,210	1.11	1.24
December	2,180	1,430	1,790	1.63	1.88
January	1,890	1,770	1,840	1.68	1.94
February	1,930	1,790	1,840	1.68	1.75
March	1,890	1,380	1,650	1.51	1.74
April	1,570	712	1,150	1.05	1.17
May	7,080	596	2,330	2.13	2.46
June	1,750	1,360	1,540	1.40	1.56
July	1,890	1,040	1,560	1.42	1.64
August	1,780	1,260	1,660	1.52	1.75
September	2,070	1,380	1,760	1.61	1.80
The year	7,080	398	1,640	1.50	20.30

NOTE.—Attention is called to the fact that the monthly discharge in second-feet per square mile and the run-off in depth in inches do not represent the natural flow from the basin because of artificial storage. The yearly discharge and run-off doubtless represent more nearly the natural flow, for probably little stored water is held over from year to year.

ANDROSCOGGIN RIVER AT RUMFORD FALLS, MAINE.

Location.—At dam of Rumford Falls Power Co., at Rumford.

Drainage area.—2,090 square miles.

Records available.—May 18, 1892, to September 30, 1914. Data also in annual reports Maine State Water Storage Commission.

Gages.—One in pond above dam; another in tailrace of power house.

Discharge.—Computed from discharge over the dam, using the customary Francis weir formula with modified coefficient, and the quantities passing through the various wheels of the power house, which have been thoroughly rated.

Winter flow.—Discharge relation little affected by ice.

Regulation.—Storage in Rangeley system of lakes at headwaters of Androscoggin River, aggregating about 29.6 billion cubic feet, is largely under complete control. The stored water is regulated in the interests of the water-power users below and is under such excellent management that this is one of the best water-power streams in the country. Results not corrected for storage.

Cooperation.—Records obtained and computations made by Mr. Charles A. Mixer, engineer, Rumford Falls Power Co.

Daily discharge, in second-feet, of Androscoggin River at Rumford Falls, Maine, for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1,850	3,240	2,570	2,300	2,680	2,710	3,450	7,950	2,280	2,500	1,970	2,300
2	2,520	2,820	2,550	2,250	2,640	5,370	4,930	6,590	2,400	2,420	1,760	2,070
3	7,180	2,880	2,560	2,270	2,420	5,930	4,570	6,530	2,400	2,560	2,280	2,050
4	3,880	2,770	2,620	2,340	2,320	4,720	3,600	8,420	2,510	1,870	2,120	2,040
5	2,790	2,770	2,790	2,500	2,320	4,010	2,830	10,100	2,960	1,790	2,000	1,880
6	2,580	2,710	2,670	2,450	2,300	3,610	2,940	11,000	2,830	2,150	1,960	1,920
7	2,350	2,660	2,210	2,380	2,320	3,420	2,980	10,500	2,120	2,250	1,910	1,550
8	2,280	2,590	3,320	2,410	2,280	2,960	2,820	10,300	2,450	2,400	1,940	1,970
9	2,210	6,930	2,810	2,430	2,230	3,080	5,120	15,100	2,480	2,330	1,720	2,050
10	2,110	22,000	2,430	2,430	2,240	2,830	6,010	16,100	2,370	2,210	2,050	1,890
11	2,020	9,450	2,970	2,280	2,170	2,730	5,080	14,300	2,360	2,230	2,050	1,890
12	2,160	5,160	2,500	2,140	2,060	2,680	5,320	12,500	2,220	3,080	2,160	1,970
13	2,760	4,030	2,980	2,020	2,010	2,680	5,380	10,200	2,200	2,950	2,110	1,630
14	2,450	3,590	3,020	1,930	2,110	2,650	4,300	8,330	1,860	2,520	1,930	1,730
15	2,530	3,240	2,960	2,060	2,020	2,110	4,130	6,670	2,130	2,140	1,920	1,910
16	2,750	2,720	2,680	2,190	1,920	2,610	4,120	5,680	1,160	2,070	1,600	1,700
17	2,910	2,870	2,770	2,290	2,070	2,640	3,980	4,320	2,110	2,000	2,000	1,680
18	2,780	2,990	2,940	2,240	2,060	2,650	4,740	4,410	2,150	2,100	1,890	1,800
19	2,410	2,950	2,240	2,200	2,100	2,580	9,870	4,350	2,120	1,740	1,920	1,660
20	6,500	3,820	2,230	2,510	2,060	2,540	21,500	4,270	2,180	2,070	1,970	1,580
21	13,800	3,750	2,460	2,370	2,070	2,460	23,900	4,080	1,920	2,010	1,950	1,760
22	5,870	3,170	2,570	2,330	2,000	2,280	13,700	3,920	2,250	1,950	1,950	1,820
23	4,020	2,770	2,360	2,290	1,930	2,510	9,570	3,750	2,170	1,900	1,860	1,660
24	3,040	2,580	1,880	2,240	2,010	2,460	7,260	3,160	2,120	1,900	1,870	1,750
25	3,370	2,770	2,010	2,410	1,990	2,440	6,430	3,340	2,110	1,910	1,870	1,850
26	3,680	2,770	2,250	2,580	1,960	2,490	6,050	3,140	2,090	1,650	1,850	1,710
27	6,400	2,760	2,340	2,610	1,980	3,060	6,030	3,100	1,990	1,950	1,750	1,710
28	4,730	2,520	2,060	2,680	2,000	4,530	6,850	2,690	1,630	1,910	1,920	1,840
29	3,860	2,590	2,050	2,590	.....	4,130	9,650	2,510	2,140	1,890	1,870	1,890
30	3,560	2,400	2,280	2,630	.....	3,930	10,100	2,360	2,130	2,000	3,170	1,680
31	3,420	.....	2,330	2,720	.....	3,430	.....	1,900	.....	2,050	2,740	.....

MAGALLOWAY RIVER AT AZISCOHOS DAM, MAINE.

Location.—At the Aziscohos dam, about 15 miles above the mouth.

Drainage area.—215 square miles.

Records available.—January 1, 1912, to September 30, 1914.

Gage.—Vertical staff in two sections, the lower attached to one of the concrete buttresses of the dam, and the upper on the concrete gate tower.

Determination of discharge.—Discharge determined from readings of gate openings. Gates have been rated by current-meter measurements.

Regulation.—The capacity of the storage reservoir above the dam is 9,593,000,000 cubic feet, and the reservoir is regulated for power interests below. The operation of the gates is planned to maintain as nearly as possible a constant flow at Berlin, N. H. Results not corrected for storage.

Cooperation.—Discharge computed and furnished for publication by Walter H. Sawyer, agent, Union Water Power Co., Lewiston, Maine.

Monthly discharge of Androscoggin River at Rumford Falls, Maine, for the year ending Sept. 30, 1914.

[Drainage area, 2,090 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
October	13,800	1,850	3,700	1.77	2.04
November	22,000	2,400	4,010	1.92	2.14
December	3,320	1,880	2,530	1.21	1.40
January	2,720	1,930	2,360	1.13	1.30
February	2,680	1,920	2,150	1.03	1.07
March	5,930	2,110	3,170	1.51	1.74
April	23,900	2,820	6,910	3.31	3.69
May	16,100	1,900	6,820	3.26	3.76
June	2,960	1,860	2,230	1.07	1.19
July	3,080	1,650	2,140	1.02	1.18
August	3,170	1,600	2,000	.956	1.10
September	2,300	1,550	1,830	.876	.98
The year	23,900	1,550	3,330	1.59	21.59

NOTE.—Attention is called to the fact that the monthly discharge in second-feet per square mile and the run-off in depth in inches do not represent the natural flow from the basin because of artificial storage. The yearly discharge and run-off doubtless represent more nearly the natural flow, for probably little stored water is held over from year to year.

Monthly discharge of Magalloway River at Aziscohos Dam, Maine, for January, 1912, to September, 1914.

[Drainage area, 215 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
1912.					
January			227	1.06	1.22
February			98.1	.456	.47
March			72.0	.335	.39
April			76.2	.354	.40
May			191	.888	1.02
June			421	1.96	2.19
July			378	1.76	2.03
August			378	1.76	2.03
September			590	2.74	3.06
1912-13.					
October			490	2.28	2.63
November			906	4.21	4.70
December			1,290	6.00	6.92
January	1,320	78	695	3.23	3.72
February	1,440	1,100	1,200	5.58	5.81
March	1,610	55	310	1.44	1.66
April	706	78	237	1.10	1.23
May	1,580	94	502	2.33	2.69
June	1,420	93	549	2.55	2.84
July	2,200	45	977	4.54	5.23
August	89	43	84	.391	.45
September	1,500	86	1,090	5.07	5.66
The year			690	3.21	43.54
1913-14.					
October	1,400	143	913	4.25	4.90
November	1,180	151	309	1.44	1.61
December	1,940	204	1,380	6.42	7.40
January	913	422	667	3.10	3.57
February	422	43	322	1.50	1.56
March	344	46	69	.321	.37
April	70	53	60	.279	.31
May	149	70	94	.437	.50
June	1,010	80	199	.926	1.03
July	605	99	140	.651	.75
August	100	80	91	.423	.49
September	104	57	89	.414	.46
The year	1,940	43	365	1.70	22.95

NOTE.—Attention is called to the fact that the monthly discharge in second-feet per square mile and the run-off in depth in inches do not represent the natural flow from the basin because of artificial storage. The yearly discharge and run-off doubtless represent more nearly the natural flow, for probably little stored water is held over from year to year.

LITTLE ANDROSCOGGIN RIVER NEAR SOUTH PARIS, MAINE.

Location.—At left end of an old dam at Bisco Falls, 200 feet below highway bridge and 5 miles above South Paris.

Drainage area.—75 square miles.

Records available.—September 14, 1913, to September 30, 1914.

Gage.—Chain on left bank installed April 16, 1914. Original gage, a vertical staff, was destroyed by ice March 2, 1914. From March 18 to April 9, 1914, a chain gage on a footbridge was used. All gages referred to same datum and were at practically same location.

Discharge measurements.—Made from highway bridge above gage or by wading.

Channel and control.—At low and medium stages flow is through opening at left of old stone dam. Opening was enlarged by flood of April 9, 1914. Water flows over dam at gage height 5.86 feet.

Extremes of discharge.—Maximum stage recorded during year, 8.9 feet at 7 a. m., April 21; approximate discharge computed from extension of rating curve, 1,720 second-feet. Minimum stage recorded during year, 0.7 foot at 6 p. m. August 16; discharge, 1 second-foot.

Winter flow.—Discharge relation not seriously affected by ice.

Regulation.—Some storage in lakes above station.

Cooperation.—Records furnished by Maine State Water Storage Commission.

Estimates of discharge withheld for additional data.

Discharge measurements of Little Androscoggin River near South Paris, Maine, during the period Sept. 8, 1913, to Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
1913.		*Feet.*	*Sec.-ft.*	1914.		*Feet.*	*Sec.-ft.*
Sept. 8	G. C. Danforth	0.74	2.71	Feb. 7	G. C. Danforth	2.40	72.0
Oct. 3	C. C. Babb	5.20	324	Apr. 22	do	6.86	695
8	G. C. Danforth	1.96	51.4	23	do	6.35	470
9	do	1.86	42.2	May 1	do	5.67	310
9	do	2.25	71.0	July 17	do	1.40	12.1
16	do	2.98	117	29	do	1.40	16.8
17	do	3.10	131	Aug. 20	do	.98	2.90
17	do	3.00	124				
21	do	6.55	496				
22	do	4.85	306				

Daily gage height, in feet, of Little Androscoggin River near South Paris, Maine, for the period Sept. 14, 1913, to Sept. 30, 1914.

[G. A. Jackson, observer.]

Day.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	.....	1.9	3.25	2.95	1.95	2.5	.....	5.0	6.2	2.0	1.6	1.2	1.9
2	.....	2.05	2.9	2.9	2.0	2.6	.....	7.5	5.35	2.0	1.7	1.0	1.6
3	.....	5.0	2.55	2.65	2.05	2.3	.....	6.0	4.7	1.9	1.8	1.3	1.4
4	.....	2.9	2.9	2.6	1.9	1.9	.....	5.5	4.9	2.1	1.5	1.3	1.3
5	.....	2.5	2.5	2.55	2.05	2.0	.....	4.9	5.0	3.1	1.6	1.3	1.3
6	.....	2.1	2.5	2.5	2.0	.....	.....	4.7	5.2	3.0	1.7	1.2	1.1
7	.....	2.0	2.5	2.65	2.0	2.25	.....	4.5	4.45	2.8	1.7	1.0	1.1
8	.....	2.05	2.35	5.3	1.95	2.1	.....	4.3	3.9	.....	1.6	.9	1.3
9	.....	2.0	3.15	4.3	2.1	2.2	.....	7.1	7.1	2.0	1.6	.9	1.0
10	.....	1.9	6.75	3.55	2.1	2.0	.....	.....	6.1	2.1	1.55	.9	1.2
11	.....	1.9	5.9	3.4	1.9	2.0	.....	.....	5.1	2.0	1.5	.9	1.3
12	.....	2.05	4.7	3.05	1.9	2.0	.....	.....	4.8	1.8	1.5	1.0	1.3
13	.....	2.6	4.3	2.95	1.9	2.0	.....	.....	4.4	1.8	1.6	1.0	.9
14	1.1	2.4	3.8	2.5	2.0	.....	.....	.....	4.0	1.4	1.7	.9	.9
15	1.0	2.9	3.75	2.6	2.05	2.0	.....	.....	3.4	1.7	1.7	.9	.9
16	1.35	3.0	3.45	2.5	2.05	2.0	.....	5.5	3.3	1.7	1.7	.7	1.0
17	1.25	3.0	3.35	2.5	2.1	.....	.....	5.7	3.0	1.7	1.3	1.0	1.4
18	1.8	2.8	3.1	2.5	1.8	.....	3.4	5.9	3.3	1.45	1.2	1.0	1.4
19	1.75	2.75	3.0	2.5	1.9	.....	3.4	6.6	3.2	1.6	1.2	.....	1.4
20	1.7	3.2	4.15	2.5	1.9	.....	3.2	7.65	3.0	1.6	1.5	1.1	1 4
21	1.75	6.7	3.9	2.4	1.9	.....	2.8	8.45	2.8	1.4	1.6	1.3	1.6
22	3.75	4.6	3.4	2.4	1.9	.....	.....	6.85	2.8	1.7	1.5	1.3	1.5
23	4.75	3.45	3.2	2.35	1.9	.....	2.6	6.3	3.0	1.6	1.2	1.0	1.4
24	3.25	3.0	3.1	2.3	1.9	.....	2.7	5.5	2.4	1.5	1.5	.9	1.6
25	2.6	3.3	3.0	2.0	2.8	.....	2.8	5.1	3.1	1.6	1.3	1.1	1.6
26	1.75	4.4	2.9	2.1	3.0	.....	3.2	5.0	3.0	1 6	1.2	1.1	1.4
27	2.0	5.8	2.9	2.05	2.9	.....	3.8	6.05	2.9	1.5	1.4	.9	1.2
28	1.65	4.65	2.9	2.05	2.95	.....	6.0	6.1	2.6	1.2	1.1	1.0	1.4
29	1.7	4.0	2.9	2.1	2.8	.....	5.8	6.1	2.4	1.35	1.4	1.3	1 4
30	1.9	5.0	2.9	2.05	2.5	.....	5.5	6.1	2.1	1.6	1.3	1.65	1.4
31	.....	3.6	.....	2.05	2.5	.....	5.3	.....	2.0	.....	1.2	2.1	.....

NOTE.—No readings Feb. 17 to Mar. 2 when gage was taken out by ice. Chain gage destroyed by flood on Apr. 9.

PRESUMPSCOT RIVER BASIN.

PRESUMPSCOT RIVER AT OUTLET OF SEBAGO LAKE, MAINE.

Location.—At outlet dam at Sebago Lake and the hydroelectric plant at Eel Weir Falls, 1 mile below lake outlet.

Drainage area.—436 square miles.

Records available.—January 1, 1887, to September 30 1914. Data also in annual reports Maine State Water Storage Commission. Results of a recomputation of all data from 1887 to 1911 are published in the second of these reports.

Gages.—On bulkhead of gatehouse at outlet dam and in forebay and tailrace of power plant.

Discharge.—Prior to March, 1904, discharge determined from records of opening of gates in dam. Since March, 1904, flow from lake has been recorded by three Allen meters, one on each of three pairs of 30-inch Hercules wheels; wheels and recording meters checked by current-meter measurements, brake tests of wheels, and electrical readings of the generator output.

Winter flow.—Discharge relation not affected by ice.

Regulation.—Sebago Lake, with an area of 46 square miles, is under complete control for storage. Results not corrected for storage.

Cooperation.—Entire record furnished by the S. D. Warren Co.

Daily discharge, in second-feet, of Presumpscot River at outlet of Sebago Lake, Maine, for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	665	682	668	678	a 622	a 195	553	540	698	672	695	676
2	655	a 395	670	670	672	402	387	440	643	447	a 358	732
3	665	842	667	676	655	472	333	a 318	662	594	744	722
4	662	820	663	a 237	607	505	338	645	605	247	634	726
5	a 163	752	675	684	674	453	a 262	653	660	a 117	714	736
6	665	838	567	493	658	483	496	530	403	353	730	a 367
7	665	750	a 212	676	674	532	532	626	a 405	328	738	628
8	665	667	538	674	a 260	a 222	436	626	656	305	693	716
9	665	a 217	638	646	560	645	380	572	467	333	a 255	748
10	665	603	672	633	612	565	475	a 132	500	342	665	762
11	663	735	667	a 308	614	610	450	543	660	337	636	743
12	a 210	755	672	643	690	632	a 138	658	688	a 290	645	718
13	663	670	625	688	696	673	523	636	620	743	676	a 398
14	662	670	a 235	686	618	612	520	605	a 308	703	665	696
15	663	663	667	633	a 367	a 217	532	576	615	698	610	722
16	662	a 223	675	750	633	665	643	553	645	756	a 280	724
17	665	667	673	566	596	496	540	a 132	676	740	743	762
18	672	672	667	a 353	728	468	341	700	603	695	746	742
19	a 222	610	677	653	686	513	a 157	690	672	a 383	703	722
20	675	815	668	585	680	565	502	712	500	758	710	a 375
21	548	667	a 202	668	615	538	420	660	a 288	762	753	717
22	623	597	678	662	a 347	a 235	524	625	653	758	698	672
23	670	a 240	673	664	592	626	457	440	696	786	a 367	770
24	675	672	665	558	670	614	666	a 323	624	758	682	708
25	577	675	600	a 212	720	572	670	748	664	720	742	726
26	a 310	672	343	473	682	428	a 230	633	645	a 273	772	783
27	417	602	470	582	692	445	512	650	574	754	754	a 330
28	427	667	a 235	628	586	518	485	584	a 260	745	770	712
29	673	567	670	660	.....	a 283	457	660	702	748	686	714
30	675	a 113	672	664	.....	377	520	694	666	706	a 313	748
31	672	.....	672	655	.....	450	.....	a 168	.....	734	653	.....

a Sunday.

Monthly discharge of Presumpscot River at outlet of Sebago Lake, Maine, for the year ending Sept. 30, 1914.

[Drainage area, 436 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
October	675	163	586	1.34	1.54
November	842	113	617	1.42	1.58
December	678	202	583	1.34	1.54
January	750	212	592	1.36	1.57
February	728	260	614	1.41	1.47
March	673	195	484	1.11	1.28
April	670	138	449	1.03	1.15
May	748	132	550	1.26	1.45
June	702	260	582	1.33	1.48
July	786	117	567	1.30	1.50
August	772	255	639	1.47	1.70
September	783	330	676	1.55	1.73
The year	842	113	578	1.33	17.99

NOTE.—Attention is called to the fact that the monthly discharge in second-feet per square mile and the run-off in depth in inches do not represent the natural flow from the basin because of artificial storage. The yearly discharge and run-off doubtless represent more nearly the natural flow, for probably little stored water is held over from year to year.

SACO RIVER BASIN.

SACO RIVER AT WEST BUXTON, MAINE.

Location.—At hydroelectric plant of Portland Electric Co., at West Buxton.

Drainage area.—1,550 square miles.

Records available.—October 19, 1907, to September 30, 1914. Data also in annual reports Maine State Water Storage Commission.

Gages.—One in pond above dam; another in tailrace of power house.

Channel and control.—Crest of concrete dam about 300 feet long.

Discharge.—Flow over dam and through rated wheels of power plant determined by means of hourly gage readings.

Winter flow.—Discharge relation not affected by ice.

Regulation.—Dams on numerous but comparatively small lakes in basin above station. Storage regulation probably affects regimen of stream but not to extent that obtains in other basins in Maine where natural storage facilities are better and more fully developed.

Cooperation.—Records furnished by Cumberland County Power & Light Co.

Daily discharge, in second-feet, of Saco River at West Buxton, Maine, for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1,810	5,240	2,980	1,410	2,420	929	6,940	10,900	3,340	1,190	1,030	1,470
2	1,680	4,720	2,740	1,520	2,870	4,980	8,700	10,200	2,950	1,410	957	1,250
3	1,930	4,860	2,690	1,590	2,580	8,700	9,760	9,620	2,690	1,730	1,300	1,190
4	2,410	4,500	2,530	1,420	2,570	9,470	9,600	9,310	2,630	1,480	1,350	1,270
5	2,630	4,150	2,630	1,890	2,580	9,210	8,990	8,770	2,860	1,730	1,260	1,130
6	3,340	3,910	2,480	1,710	2,580	8,500	8,720	8,560	3,060	2,130	1,190	1,030
7	3,370	3,650	2,150	1,540	2,460	7,680	7,790	8,340	2,680	1,840	1,060	835
8	3,170	3,760	3,550	1,660	2,050	7,250	7,540	8,220	3,090	1,830	981	1,140
9	2,880	3,110	3,450	1,860	2,600	7,300	8,740	8,960	2,650	1,820	822	1,250
10	2,770	4,920	3,280	1,530	2,350	6,900	9,400	9,200	1,920	1,580	1,130	865
11	2,460	5,010	3,110	1,380	2,530	6,520	9,560	9,400	3,680	1,640	1,200	640
12	2,000	6,130	3,100	2,030	2,230	6,210	9,400	9,420	4,510	1,420	1,210	553
13	2,560	6,710	2,640	1,620	1,850	5,880	9,690	9,370	1,400	1,560	1,220	917
14	2,430	6,800	2,130	1,500	1,760	5,440	9,080	9,190	1,200	1,530	1,180	1,010
15	2,070	6,670	2,630	1,520	1,350	5,000	8,450	8,660	1,680	1,480	933	715
16	2,090	6,070	2,310	1,180	1,740	5,110	8,130	7,760	1,890	1,540	898	772
17	2,290	6,010	2,510	1,200	1,710	4,460	8,340	7,200	1,760	1,460	1,310	811
18	2,170	5,530	2,710	1,010	1,470	4,990	8,350	6,880	1,560	1,260	1,320	820
19	1,960	5,030	2,890	1,620	1,500	4,870	8,140	6,480	1,430	964	1,150	930
20	2,750	4,810	2,680	1,710	1,490	4,690	8,880	6,110	1,510	1,410	1,130	840
21	2,760	4,540	2,230	1,560	1,440	4,420	10,800	5,630	1,080	1,240	1,310	773
22	3,340	4,320	2,670	1,450	1,060	4,000	13,400	5,340	1,310	1,370	1,010	857
23	4,620	3,520	2,380	1,420	1,410	4,070	16,000	5,090	1,390	1,090	909	745
24	4,810	4,380	1,870	1,380	1,400	3,440	15,900	4,560	1,420	1,030	1,180	896
25	4,480	3,860	1,590	1,320	1,390	3,620	14,400	4,760	1,300	961	946	905
26	4,840	3,660	2,290	2,400	1,380	3,990	13,000	4,410	1,290	907	800	864
27	5,880	3,410	1,840	2,160	1,360	5,120	12,900	4,200	1,260	1,300	679	898
28	5,910	3,420	1,590	2,260	1,280	5,960	12,600	3,980	916	1,020	628	835
29	5,660	3,140	1,820	2,430	.....	6,080	11,900	3,610	1,320	1,150	743	786
30	5,640	2,430	1,610	2,400	.....	6,600	12,300	3,520	1,260	990	904	749
31	5,620	.....	1,560	2,620	.....	6,750	.....	3,180	.....	1,000	1,610	.....

Monthly discharge of Saco River at West Buxton, Maine, for the year ending Sept. 30, 1914.

[Drainage area, 1,550 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
October	5,910	1,680	3,300	2.13	2.46
November	6,800	2,430	4,610	2.97	3.31
December	3,550	1,560	2,470	1.59	1.83
January	2,620	1,010	1,690	1.09	1.26
February	2,870	1,070	1,910	1.23	1.28
March	9,470	929	5,750	3.71	4.28
April	16,000	6,940	10,250	6.62	7.39
May	10,900	3,180	7,120	4.59	5.29
June	4,510	920	2,040	1.32	1.47
July	2,130	907	1,390	.896	1.03
August	1,610	628	1,080	.696	.80
September	1,470	553	920	.594	.66
The year	16,000	553	3,550	2.29	31.06

MERRIMACK RIVER BASIN.

MERRIMACK RIVER AT LAWRENCE, MASS.

Location.—At dam of Essex Company, in Lawrence.

Drainage area.—Total of Merrimack River Basin above Lawrence, 4,663 square miles. Net drainage area, exclusive of diverted parts of Nashua River, Sudbury River, and Lake Cochituate Basins, 4,452 square miles.

Records available.—January 1, 1880, to September 30, 1914.

Computations of discharge.—Accurate record kept of flow over dam and through various wheels and gates. Flow includes water wasted into the Merrimack from the Nashua, Sudbury, and Cochituate drainage basins. Estimates of this waste furnished by the Metropolitan Water and Sewerage Board of Boston and subtracted from quantity measured at Lawrence to obtain net flow from net drainage area of 4,452 square miles.

Diversions.—Practically the entire flow of South Branch of Nashua River, Sudbury River, and Lake Cochituate is diverted for use by Metropolitan water district of Boston.

Regulation.—Flow regulated to some extent by storage in Lake Winnepesaukee. Low-water flow affected by operation of various power plants above Lawrence.

Storage.—Several reservoirs in basin. It is estimated that the water surface is about 3.5 per cent of entire drainage area.

Accuracy.—Records obtained with great care and considered good.

Cooperation.—Record furnished by R. A. Hale, principal assistant engineer of Essex Company; form changed to climatic year by engineers of United States Geological Survey.

Daily discharge, in second-feet, of Merrimack River at Lawrence, Mass., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1,939	3,910	5,071	3,974	4,683	3,222	22,560	26,292	5,953	2,878	1,393	4,106
2	2,102	3,516	4,142	3,738	5,863	11,610	24,260	22,902	3,770	3,006	124	3,675
3	2,724	5,332	3,973	2,626	5,189	25,200	31,072	18,683	3,603	3,037	2,214	3,142
4	1,899	4,226	4,125	1,830	6,056	32,600	28,823	17,110	3,596	630	2,264	2,793
5	1,439	3,845	4,490	4,807	7,324	30,750	23,094	16,528	4,087	1,945	2,389	1,877
6	3,986	3,612	3,256	4,084	7,005	28,890	20,545	18,386	4,423	4,017	2,531	1,373
7	3,211	3,634	3,715	3,825	5,609	23,360	17,628	20,322	5,496	3,177	2,360	1,655
8	2,873	2,458	6,435	3,786	5,029	19,397	16,730	19,438	5,771	3,287	1,393	3,244
9	2,333	1,301	7,992	3,821	6,448	16,720	18,783	17,059	5,049	3,172	175	2,831
10	2,625	4,980	8,310	2,614	5,354	15,785	24,844	16,307	4,061	3,154	2,128	2,641
11	2,021	10,092	7,062	1,723	4,751	12,938	24,915	16,487	3,963	1,982	2,127	2,290
12	260	9,799	6,273	4,733	4,622	11,331	21,411	14,787	3,562	2,099	2,100	1,317
13	688	7,054	4,607	3,299	4,207	10,128	20,844	14,504	2,279	4,396	2,184	140
14	3,084	5,808	4,259	3,139	2,932	8,976	19,866	16,131	1,171	3,848	2,140	2,243
15	3,058	4,295	6,059	3,037	2,163	8,637	17,744	16,221	4,595	3,458	1,449	2,233
16	3,183	3,371	5,026	2,793	4,771	8,533	16,686	14,327	3,007	2,701	144	2,210
17	2,933	5,402	4,615	2,207	3,921	8,545	17,308	12,322	2,601	2,420	2,334	2,158
18	2,155	4,377	4,677	541	3,805	8,775	17,322	11,541	2,935	1,572	2,460	2,066
19	371	3,642	4,688	3,410	3,680	9,939	17,635	10,493	3,034	427	2,462	1,234
20	2,995	3,685	2,763	2,825	3,883	9,012	19,289	9,926	2,059	2,706	2,435	186
21	3,731	4,030	2,024	2,918	2,709	7,318	28,823	9,429	603	2,780	2,407	2,079
22	5,228	3,818	5,136	3,142	2,480	7,275	37,144	8,894	3,828	2,724	1,564	2,059
23	6,568	3,695	4,234	3,277	3,298	8,156	29,322	8,053	2,978	2,575	585	1,968
24	5,136	5,341	4,022	2,236	5,147	6,885	21,401	7,338	2,680	2,456	3,269	1,993
25	3,322	4,373	2,435	1,484	3,396	7,093	17,157	8,079	2,737	1,710	2,827	1,946
26	4,333	3,773	6,024	4,562	3,342	7,354	15,161	6,672	2,765	131	2,761	1,163
27	8,190	1,350	3,973	4,311	3,642	10,679	19,768	5,975	1,816	2,322	2,567	137
28	8,083	4,725	3,290	4,810	2,573	18,627	26,938	5,382	435	2,266	2,446	1,696
29	7,579	2,818	5,510	4,877	.....	26,545	27,340	5,366	2,938	2,269	1,569	1,648
30	6,402	2,288	4,476	5,188	.....	27,742	26,282	3,824	2,951	2,197	402	1,635
31	5,649	.....	4,112	5,182	.....	24,470	.....	4,106	.....	2,322	3,134	.....

NOTE.—Discharge determined from records of flow over dam and through wheels of power plant. Estimates of quantities wasted from Sudbury and Nashua drainage basins based on data furnished by Metropolitan Water and Sewerage Board, of Boston.

Weekly discharge, in second-feet, of Merrimack River at Lawrence, Mass., for the year ending Sept. 30, 1914.

Arranged in calendar order.		Arranged in order of magnitude.				
Week ending Sunday—	Measured at Lawrence (total drainage area, 4,663 square miles).	Week ending Sunday—	Measured at Lawrence (total drainage area, 4,663 square miles).	Wasting into Merrimack from diverted drainage basins (211 square miles).	From net drainage area of 4,452 square miles.	Per square mile of net drainage area.
Oct. 5	2,120	Sept. 27	1,621	8	1,613	0.362
12	2,473	Aug. 16	1,753	10	1,743	.392
19	2,210	Sept. 20	1,761	8	1,753	.394
26	4,473	Aug. 2	1,842	12	1,830	.411
Nov. 2	6,193	9	1,904	14	1,890	.425
9	3,487	Sept. 13	2,017	8	2,009	.451
16	6,486	Aug. 23	2,035	29	2,006	.451
23	4,093	Oct. 5	2,120	18	2,102	.472
30	3,524	July 26	2,155	8	2,147	.482
Dec. 7	4,110	Oct. 19	2,210	19	2,191	.492
14	6,420	Aug. 30	2,263	12	2,251	.506
21	4,265	June 28	2,463	8	2,455	.551
28	4,159	Oct. 12	2,473	12	2,461	.553
Jan. 4	3,752	July 5	2,484	23	2,461	.553
11	3,523	19	2,689	20	2,669	.600
18	2,821	June 21	2,691	8	2,683	.603
25	2,756	Jan. 25	2,756	95	2,661	.598
Feb. 1	4,802	18	2,821	87	2,734	.614
8	6,011	Sept. 6	2,871	8	2,863	.643
15	4,354	July 12	2,984	20	2,964	.666
22	3,607	Nov. 9	3,487	32	3,455	.776
Mar. 1	3,517	Mar. 1	3,517	210	3,307	.743
8	24,544	Jan. 11	3,523	100	3,423	.769
15	12,074	Nov. 30	3,524	57	3,467	.779
22	8,485	Feb. 22	3,607	112	3,495	.785
29	12,177	June 14	3,694	6	3,688	.828
Apr. 5	26,003	Jan. 4	3,752	99	3,653	.821
12	20,694	Nov. 23	4,093	46	4,047	.909
19	18,201	Dec. 7	4,110	67	4,043	.908
26	24,042	28	4,159	117	4,042	.908
May 3	24,029	21	4,265	54	4,211	.946
10	17,879	Feb. 15	4,354	107	4,247	.954
17	14,968	June 7	4,418	23	4,395	.987
24	9,382	Oct. 26	4,473	38	4,435	.996
31	5,629	Feb. 1	4,802	222	4,580	1.029
June 7	4,418	May 31	5,629	49	5,580	1.253
14	3,694	Feb. 8	6,011	219	5,792	1.301
21	2,691	Nov. 2	6,193	63	6,130	1.377
28	2,463	Dec. 14	6,420	72	6,348	1.426
July 5	2,484	Nov. 16	6,486	47	6,439	1.446
12	2,984	Mar. 22	8,485	151	8,334	1.872
19	2,689	May 24	9,382	88	9,294	2.088
26	2,155	Mar. 15	12,074	240	11,834	2.658
Aug. 2	1,842	29	12,177	123	12,054	2.708
9	1,904	May 17	14,968	280	14,688	3.299
16	1,753	10	17,879	262	17,617	3.957
23	2,035	Apr. 19	18,201	253	17,948	4.031
30	2,263	12	20,694	360	20,334	4.567
Sept. 6	2,871	May 3	24,029	333	23,696	5.323
13	2,017	Apr. 26	24,042	194	23,848	5.357
20	1,761	Mar. 8	24,544	544	24,000	5.391
27	1,621	Apr. 5	26,003	335	25,668	5.765
Weekly average...	6,710	.....	6,710	102	6,608	1.484

Monthly discharge of Merrimack River at Lawrence, Mass., for the year ending Sept. 30, 1914.

Month.	Mean discharge in second-feet.				Run-off.		Rainfall in inches.
	Measured at Lawrence (total drainage area, 4,663 square miles).	Wasting into Merrimack from diverted drainage basins (211 square miles).	From net drainage area of 4,452 square miles.	Per square mile of net drainage area.	Depth in inches on drainage area.	Per cent of rainfall.	
October	3,552	30	3,522	0.791	0.912	15.7	5.81
November	4,352	45	4,307	.967	1.079	46.5	2.32
December	4,735	79	4,656	1.046	1.206	42.0	2.87
January	3,381	115	3,266	.734	.846	28.4	2.98
February	4,424	157	4,267	.958	.998	35.6	2.80
March	14,722	275	14,447	3.245	3,741	84.4	4.43
April	22,356	300	22,056	4.954	5.527	105.3	5.25
May	12,996	175	12,821	2.880	3.320	143.7	2.31
June	3,292	11	3,281	.737	.822	39.1	2.10
July	2,505	17	2,488	.559	.644	18.7	3.45
August	1,946	16	1,930	.434	.500	12.1	4.12
September	1,991	8	1,983	.445	.496	127.2	.39
The year	6,688	102	6,586	1.479	20.091	51.7	38.83

NOTE.—Attention is called to the fact that the monthly discharge in second-feet per square mile and the run-off in depth in inches do not represent the natural flow from the basin because of artificial storage. The yearly discharge and run-off doubtless represent more nearly the natural flow, for probably little stored water is held over from year to year.

SOUHEGAN RIVER AT MERRIMACK, N. H.

Location.—At head of Atherton Falls, below Stony Branch, about a mile from the McElwain Co.'s mill in Merrimack, and about 1½ miles above junction of Souhegan and Merrimack rivers.

Drainage area.—168 square miles.

Records available.—July 13, 1909, to September 30, 1914.

Gage.—Since October 15, 1913, Gurley water-stage recorder on left bank about 350 feet above falls, referred to hook gage in the well; prior to April 11, 1911, vertical staff on left bank 40 feet above falls; April 12, 1911, to October 14, 1913, chain gage at location of present gage. All gages referred to same datum.

Discharge measurements.—Made by wading below falls at low stages and from cable at high stages.

Channel and control.—Control formed by head of Atherton Falls; practically permanent.

Extremes of discharge.—Maximum stage recorded during year (automatic gage), 7.84 feet at 2 a. m., March 3; approximate discharge computed from extension of rating curve, 4,000 second-feet. Minimum stage recorded during year (automatic gage), 1.96 feet, 10 to 12 p. m., September 28; discharge, 21 second-feet.

Maximum stage recorded 1909–1914: 7.84 feet, March 3, 1914; approximate discharge, 4,000 second-feet. Minimum stage recorded: 1.92 feet, October 17, 1911; mean discharge for day, 16 second-feet.

Winter flow.—Discharge relation not seriously affected by ice.

Regulation.—Flow regulated by storage in 4 reservoirs, total capacity about 60 million cubic feet. Diurnal distribution of flow affected by operation of mills at Milford, about 8 miles above.

Accuracy.—Results good.

Cooperation.—Automatic gage maintained and gage-height records furnished by the W. H. McElwain Co

Discharge measurements of Souhegan River at Merrimack, N. H., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Oct. 14	G. H. Canfield	2.53	84	July 27	R. S. Barnes	2.09	27.7
Feb. 21[a]	C. C. Covert	2.94	202	Sept. 21	do	2.08	27.5

[a] Measurement made through complete ice cover. Control section open and apparently no effect from backwater.

Daily gage height, in feet, of Souhegan River at Merrimack, N. H., for the year ending Sept. 30, 1914.

[T. H. Watkins, observer.]

Date.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.34	3.11	2.84	2.90	4.1	3.15	4.8	4.6	2.67	2.40	.....	2.25
2	2.33	2.95	2.98	2.71	3.80	6.1	6.2	4.25	2.75	2.51	.....	2.27
3	3.74	2.94	3.12	2.90	3.48	7.20	5.6	4.0	2.70	2.57	.....	2.30
4	3.26	2.96	3.36	2.01	3.42	6.2	4.65	3.84	2.69	2.56	.....	.....
5	3.18	2.94	3.23	3.05	3.72	5.7	4.45	3.88	2.99	2.50	.....	2.32
6	2.78	2.91	3.14	3.10	3.50	5.15	4.3	4.8	2 96	2.38	.....	2.26
7	2.64	2.84	3.04	3.00	3.48	4.5	4.1	4.5	2.70	2.51	2.23	.....
8	2.54	2.78	4.05	2.92	3.26	4.3	4.3	4.1	2.66	2.64	.....	2.10
9	2.53	2.77	3.87	2.90	3.20	4.45	5.4	3.99	2.70	2.68	.....	2.12
10	2.54	4.15	3.61	2.95	3.17	4.35	5.3	3.78	2.69	2.57	.....	2.10
11	2.59	3.83	3.47	2.78	3.12	4.35	4.7	3.70	2.58	.....	.....	2.07
12	2.51	3.42	3.58	2.78	3.30	4.0	4.45	3.60	2.57	.....	.....	2.10
13	2.52	3.26	3.16	2.12	2.77	3.93	4.45	4.4	2.52	2.58	.....	2.06
14	2.66	3.17	3.06	2.50	3.10	3.72	4.25	4.6	2.46	2.62	2.23	2.04
15	2.55	3.17	3.14	2.40	2.65	3.42	4.15	4.1	2.38	.....	2.20	2.08
16	2.59	3.03	3.08	.....	2.80	.....	4.1	4.8	2.48	2.36	2.21	2.11
17	2.62	2.97	3.04	.....	2.82	.....	4.2	4.6	2.48	2.42	2.14	2.13
18	2.62	3.05	3.06	.....	2.82	.....	4.7	3.54	2.44	2.26	2.12	2.11
19	2.44	3.02	2.93	.....	3.15	3.88	4.6	3.48	2.46	2.30	2.15	2.08
20	2.56	3.01	2.76	.....	3.08	3.52	4.6	3.42	2 51	2.25	2.17	2.08
21	3.43	3.06	2.80	.....	2.99	3.42	4.7	3.31	2.38	2.32	2.22	2.07
22	3.24	3.02	2.87	2.60	2.90	3.30	4.35	3.25	2.34	2.35	2.29	2.11
23	3.00	2.90	2.89	.....	2.97	3.28	4.0	3.21	2.41	2.32	2.40	2.05
24	2.88	2.80	2.99	2.48	2.95	3.31	3.81	3.06	2.39	2.35	2.42	2.07
25	2.94	2.87	3.27	2.75	2.97	3.35	3.69	3.01	2.37	.....	2.42	2.09
26	4.4	2.80	3.18	3.28	2.97	3.76	3.71	3.06	2.37	.....	2.28	2.07
27	4.2	2.75	3.19	3.32	2.97	5.35	6.0	3.01	2.32	.....	2.24	2.07
28	3.73	2.70	2.86	3.35	2.95	7.1	6.4	2.91	2.35	.....	2.24	2.01
29	3.48	2.80	2.86	3.35	.....	6.4	5.2	2.84	2.30	.....	2.28	1.98
30	3.32	2.80	2.98	3.40	.....	5.0	4.9	2.74	2.37	.....	2.34	2.03
31	3.20	.....	.....	4.35	.....	4.7	.....	2.67	.....	.....	2.22	.....

NOTE.—Gage-height records Oct. 1–14, Jan. 1 to Feb. 19, Mar. 19 to Apr. 13, July 11–12, 14–31, and Aug. 1 to Sept. 13 taken from observer's readings on staff gage. All other gage heights are means of 24-hour values obtained by Gurley water-stage recorder.

Daily discharge, in second-feet, of Souhegan River at Merrimack, N. H., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	55	264	169	190	780	280	1,240	1,100	117	60	43	40
2	54	207	218	128	600	2,310	2,400	870	140	82	43	42
3	567	204	268	190	440	3,350	1,880	720	125	94	43	45
4	337	211	380	24	410	2,400	1,140	624	122	92	43	46
5	303	204	315	242	560	1,960	995	648	221	80	43	48
6	155	193	276	260	450	1,520	900	1,240	211	57	43	41
7	115	169	239	225	440	1,030	780	1,030	125	82	38	35
8	92	149	750	197	330	900	900	780	115	110	38	28
9	90	146	642	190	300	995	1,720	714	125	120	38	30
10	92	810	505	207	288	930	1,640	590	122	94	38	28
11	103	618	435	149	268	930	1,170	550	96	95	38	27
12	85	410	490	149	350	720	995	500	94	95	38	28
13	87	330	284	30	146	678	995	960	84	96	38	26
14	121	288	246	80	260	560	870	1,100	72	105	38	25
15	90	288	276	60	112	410	810	780	57	80	35	27
16	98	235	253	100	155	500	780	1,240	76	54	36	29
17	105	214	239	100	162	500	840	1,100	76	64	31	30
18	105	242	246	100	162	500	1,170	470	68	41	30	29
19	68	232	200	100	280	648	1,100	440	72	45	32	27
20	92	228	143	100	253	460	1,100	410	82	40	33	27
21	415	246	155	100	221	410	1,170	355	57	48	37	27
22	320	232	179	100	190	350	930	325	51	52	44	29
23	225	190	186	100	214	340	720	305	62	48	60	26
24	183	155	221	76	207	355	606	246	58	52	64	27
25	204	179	335	140	214	375	545	228	55	47	64	28
26	960	155	292	340	214	580	555	246	55	47	43	27
27	840	140	296	365	214	1,680	2,220	228	48	47	39	27
28	565	125	176	375	207	3,250	2,580	193	52	47	39	24
29	440	155	176	375	.....	2,580	1,560	169	45	47	43	22
30	360	155	218	400	.....	1,400	1,320	137	55	47	51	25
31	300	.....	200	930	.....	1,170	.....	117	.....	47	37	.....

NOTE.—Discharge determined from a well-defined rating curve, except for days for which gage height is not recorded, when it was estimated.

Monthly discharge of Souhegan River at Merrimack, N. H., for the year ending Sept. 30, 1914.

[Discharge area, 168 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
October	960	54	246	1.46	1.68
November	810	125	246	1.46	1.63
December	750	143	291	1.73	1.99
January	930	24	197	1.17	1.35
February	780	112	301	1.79	1.86
March	3,350	280	1,100	6.55	7.55
April	2,580	545	1,190	7.08	7.90
May	1,240	117	594	3.54	4.08
June	221	45	91.3	.543	.61
July	120	40	68.2	.406	.47
August	64	30	41.3	.246	.28
September	48	22	30.7	.183	.20
The year	3,350	22	366	2.18	29.60

NOTE.—Attention is called to the fact that the monthly discharge in second-feet per square mile and the run-off in depth in inches do not represent the natural flow from the basin because of artificial storage. The yearly discharge and run-off doubtless represent more nearly the natural flow, for probably little stored water is held over from year to year.

SOUTH BRANCH OF NASHUA RIVER BASIN (WACHUSETT DRAINAGE BASIN) NEAR CLINTON, MASS.

Drainage area.—The area of the basin has been artificially changed at times in connection with the water-supply systems of the Metropolitan district. From 1896 to 1907, 119 square miles; 1908 to 1913, 118.19 square miles; 1914 to 1915, 108.84 square miles.

Records available.—July, 1896, to September, 1914.

Determination of discharge.—South Branch of Nashua River has been utilized in the water-supply development for the Metropolitan district of Boston.

The flow is affected by storage in Wachusett reservoir and several ponds. Investigations of the water supply have been made by the Metropolitan Water and Sewerage Board since July, 1896. Since 1897 the estimates of discharge have been corrected for gain or loss in the reservoir and ponds, so that the record shows approximately the natural flow of the stream.

The yield per squre mile is the yield of the drainage area including the water surfaces. For the years 1897 to 1902, inclusive, the water surface amounted to 2.2 per cent of the total area; 1903, 2.4 per cent; 1904, 3.6 per cent; 1905, 4.1 per cent; 1906, 5.1 per cent; 1907, 6 per cent; 1908–1915, 7 per cent.

Cooperation.—Complete record for the calendar years furnished by the Metropolitan Water and Sewerage Board of Boston and changed to the climatic year by engineers of the Geological Survey.

Yield and rainfall in South Branch of Nashua River basin (Wachusett drainage) near Clinton, Mass., for the year ending Sept. 30, 1914, and summary for the years ending Sept. 30, 1897–1914.

Month.	Yield.			Rainfall in inches.
	Second-feet per square mile.	Depth in inches on drainage area.	Per cent of rainfall.	
1914.				
October	1.049	1.209	20.1	6.02
November	1.021	1.139	43.9	2.59
December	1.478	1.704	62.5	2.73
January	1.532	1.765	52.0	3.40
February	1.827	1.903	53.2	3.58
March	4.853	5.595	129.1	4.33
April	4.012	4.476	91.2	4.91
May	2.629	3.031	100.6	3.01
June	.491	.547	27.4	2.00
July	.510	.588	15.0	3.92
August	.404	.465	10.3	4.50
September	−.018	−.020	−14.0	.15
The year	1.652	22.402	54.5	41.14
1897–1914.				
October	.844	.973	27.3	3.57
November	1.245	1.389	40.7	3.41
December	1.851	2.134	51.9	4.11
January	1.836	2.116	58.2	3.64
February	2.098	2.198	59.0	3.72
March	4.175	4.814	109.9	4.38
April	3.371	3.761	95.6	3.94
May	1.874	2.160	62.6	3.45
June	1.124	1.254	35.3	3.55
July	.577	.666	17.0	3.92
August	.580	.669	16.0	4.17
September	.524	.585	16.2	3.61
The year	1.722	22.719	50.0	45.47

NOTE.—Figures in the summary for 1897–1914 represent average quantities.

SUDBURY RIVER AND LAKE COCHITUATE BASINS NEAR FRAMINGHAM AND COCHITUATE, MASS.

Drainage area.—The areas of Sudbury River and Lake Cochituate basins have been artificially changed at times in connection with the water-supply systems of the Metroplitan district. Area of Sudbury basin from 1875 to 1878, inclusive, 77.8 square miles; 1879–80, 78.2 square miles; 1881–1915, 75.2 square miles; area of Cochituate basin from 1863 to 1909, inclusive, 18.87 square miles; 1910, 17.8 square miles; 1911 to 1915, 17.58 square miles.

Record available.—Sudbury River basin, January, 1875, to September, 1914; Lake Cochituate basin, January, 1863, to September, 1915. Sudbury River and Lake Cochituate have been studied by the engineers of the city of Boston, the State board of health of Massachusetts, and the Metropolitan Water and Sewerage Board; records of rainfall have been kept in the Sudbury basin since 1875 and in the Cochituate basin since 1852, but Cochituate records prior to 1872 are of doubtful accuracy.

Regulation.—The greater part of the flow from these basins is controlled by storage reservoirs constructed by the city of Boston and the Metropolitan Water and Sewerage Board. Lake Cochituate, which drains into Sudbury River a short distance below Framingham, is controlled as a storage reservoir by the Metropolitan Water Works. In the Sudbury River basin the water surfaces exposed to evaporation have been increased from time to time by the construction of additional storage reservoirs. From 1875 to 1878, inclusive, the water surface amounted to 1.9 per cent of the total area; from 1879 to 1884, to 3 per cent; 1885 to 1893, to 3.4 per cent; 1894 to 1897, to 3.9 per cent; 1898 and subsequent years, 6.5 per cent.

Determination of discharge.—In determining the run-off of the Sudbury and Cochituate drainage basins the water diverted for the municipal supply of Framingham, Natick, and Westboro, which discharge their sewerage outside the basins, is taken into consideration; the results, however, are probably less accurate since the sewerage diversion works were constructed. The public water and sewerage works were installed in these towns as follows:

Dates of installation of water and sewerage works in Framingham, Natick, and Westboro.

Town.	Water supply.	Sewerage works.
Framingham	1885	1889
Natick	1874	1896
Westboro	1879	1892

Water from the Wachusett drainage basin passes into the reservoirs in the Sudbury basin and must be measured to determine the yield of the Sudbury basin; the accuracy of the estimates of the Sudbury water supply during months of low yield in years subsequent to 1897 is impaired by the errors unavoidable in the measurement of large quantities of water.

Cooperation.—Complete records for calendar years furnished by the Metropolitan Water and Sewerage Board of Boston; changed to the climatic year by engineers of the Geological Survey.

Yield and rainfall in Sudbury River basin near Framingham, Mass., for the year ending Sept. 30, 1914, and summary for the years ending Sept. 30, 1876–1914.

Month.	Yield.			Rainfall in inches.
	Second-feet per square mile.	Depth in inches on drainage area.	Per cent of rainfall.	
1914.				
October	0.749	0.863	15.6	5.53
November	.743	.828	31.3	2.65
December	1.132	1.305	41.1	3.18
January	1.405	1.619	42.1	3.85
February	1.561	1.625	39.9	4.07
March	4.686	5.404	118.1	4.57
April	3.640	4.061	79.6	5.10
May	2.398	2.765	89.7	3.08
June	.007	.008	.4	1.90
July	.165	.190	5.5	3.44
August	.241	.277	7.3	3.82
September	— .210	— .234	— 79.8	.29
The year	1.379	18.711	45.1	41.48
1876–1914.				
October	.678	.782	19.9	3.92
November	1.205	1.345	35.2	3.82
December	1.539	1.775	46.4	3.82
January	1.876	2.163	52.9	4.09
February	2.603	2.734	66.0	4.14
March	4.358	5.025	113.4	4.43
April	3.070	3.425	96.2	3.56
May	1.660	1.914	57.8	3.31
June	.721	.804	27.9	2.88
July	.231	.266	7.5	3.54
August	.336	.387	10.3	3.86
September	.349	.389	11.5	3.38
The year	1.603	21.009	47.0	44.75

NOTE.—Figures in the summary represent average quantities.

Yield and rainfall in Lake Cochituate basin near Cochituate, Mass., for the year ending Sept. 30, 1914, and summary for the years ending Sept. 30, 1864–1914.

Month.	Yield.			Rainfall in inches.
	Second-feet per square mile.	Depth in inches on drainage area.	Per cent of rainfall.	
1914.				
October	0.863	1.00	17.2	5.80
November	.757	.84	37.9	2.23
December	1.329	1.53	50.2	3.05
January	1.566	1.80	51.1	3.53
February	1.629	1.70	41.3	4.11
March	4.831	5.57	126.3	4.41
April	3.392	3.78	76.8	4.93
May	2.208	2.55	94.0	2.71
June	.216	.24	15.2	1.59
July	.276	.32	10.0	3.17
August	.208	.24	6.6	3.62
September	— .148	— .16	— 6.1	.27
The year	1.430	19.41	49.2	39.42
1864–1914.				
October	.835	.96	23.3	4.14
November	1.185	1.32	33.1	4.00
December	1.420	1.64	45.8	3.58
January	1.691	1.95	50.3	3.88
February	2.317	2.43	62.2	3.91
March	3.365	3.88	88.8	4.38
April	2.580	2.88	82.5	3.49
May	1.490	1.72	47.7	3.61
June	.690	.77	26.2	2.94
July	.369	.43	11.7	3.69
August	.576	.66	16.1	4.10
September	.619	.69	19.8	3.48
The year	1.423	19.33	42.8	45.20

NOTE.—Figures in summary represent average quantities.

CONNECTICUT RIVER BASIN.

CONNECTICUT RIVER AT ORFORD, N. H.

Location.—At covered highway bridge between Orford, N. H., and Fairlee, Vt., approximately 10 miles downstream (by river) from mouth of Waits River.

Drainage area.—3,100 square miles; revised value.

Records available.—August 6, 1900, to September 30, 1914.

Gage.—Chain attached to upstream side of bridge.

Discharge measurements.—Open-water measurements made from downstream side of the bridge or from cable.

Channel and control.—Channel wide and deep, with gravelly bottom; control for low stages slightly shifting.

Extremes of discharge.—Maximum stage recorded during year, 28.2 feet at 7 a. m. April 22; approximate discharge computed from extension of rating curve, 45,000 second-feet. Minimum stage recorded during year, 3 feet at 6 p. m. August 28 and 6 p. m. September 22; discharge, 880 second-feet. Discharge of 880 second-feet also occurred under ice conditions on February 15.

Maximum stage recorded 1900–1914: 33.4 feet at 12 noon March 28, 1913; approximate discharge computed from extension of rating curve, 60,000 second-feet. Minimum discharge: 288 second-feet, September 28, 1908.

Winter flow.—Discharge relation seriously affected by ice, usually from December to March, but the relation remains unusually constant during each period.

Regulation.—A special study by means of temporary installation of a water-stage recorder during September and October, 1914, showed no appreciable effect from operation of any power plants above station.

Accuracy.—Rating curve fairly well defined and estimates for open-water periods considered good.

Discharge measurements of Connecticut River at Orford, N. H., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 5	W. S. Easterly	5.42	1,580	Feb. 4	W. S. Easterly	6.44	1,940
16	do	4.89	1,190	23	C. C. Covert	5.22	1,060

NOTE.—Measurements made under complete ice cover about 500 feet above gage. Discharge relation affected by ice.

Daily gage height, in feet, of Connecticut River at Orford, N. H., for the year ending Sept. 30, 1914.

[F. H. Gardner, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	4.0	8.4	5.6	5.4	6.4	5.3	13.8	18.8	6.0	4.0	3.8	5.4
2	3.1	7.7	5.8	5.2	6.6	7.0	16.6	16.3	5.8	4.4	4.2	5.2
3	3.4	6.8	5.9	5.1	6.0	10.2	17.8	15.1	6.0	5.2	3.5	4.8
4	4.0	6.6	6.0	5.2	6.2	11.5	15.6	14.6	6.0	5.8	3.6	4.5
5	4.3	6.1	6.2	5.8	6.4	11.0	12.8	15.6	7.1	5.7	3.9	4.2
6	4.8	6.0	6.0	5.6	6.2	10.0	10.5	16.9	7.4	5.6	4.4	4.4
7	4.8	5.8	6.0	5.4	6.0	9.4	8.8	17.1	6.7	5.6	4.7	4.4
8	4.6	5.8	6.0	5.2	5.8	8.8	8.7	16.4	6.2	5.0	4.6	4.2
9	4.2	5.9	6.9	5.4	5.8	8.3	13.3	15.6	6.0	4.6	3.7	4.4
10	3.6	7.8	7.8	5.6	5.8	7.9	15.1	15.8	5.7	5.1	3.6	4.1
11	3.8	9.1	9.0	5.4	5.5	7.6	13.9	15.6	5.2	5.4	3.8	3.8
12	4.2	8.6	8.9	5.3	5.2	7.4	14.1	15.0	4.8	5.2	3.7	4.4
13	4.7	7.6	8.8	5.0	5.1	7.0	14.2	13.8	4.6	4.9	4.0	4.4
14	5.0	7.2	8.6	4.8	5.0	6.9	12.7	12.2	4.4	5.0	4.0	4.2
15	5.0	6.5	8.2	4.9	4.9	6.8	11.7	11.2	4.2	5.3	3.9	4.0
16	5.0	6.0	7.8	5.0	5.0	6.9	11.7	10.3	4.0	4.8	3.7	3.9
17	4.8	5.8	7.5	5.0	5.0	7.2	11.5	9.7	4.1	4.4	3.2	3.7
18	4.8	5.8	7.1	5.1	5.0	8.2	11.8	9.2	4.1	4.1	3.3	3.3
19	4.8	5.6	6.8	5.0	5.1	8.8	13.9	9.0	4.1	4.3	3.4	3.2
20	4.8	5.7	6.2	5.0	5.1	8.7	20.3	8.9	4.1	4.2	3.4	3.6
21	6.8	7.1	6.0	5.0	5.0	8.2	26.9	8.6	4.4	4.0	3.6	3.5
22	7.7	8.6	6.0	5.0	5.0	8.0	27.9	8.2	4.6	4.1	3.6	3.2
23	7.4	8.2	5.8	5.0	5.2	7.8	26.1	8.0	4.4	4.0	3.8	3.2
24	6.6	7.3	5.7	5.0	5.0	7.4	22.6	7.6	4.4	4.0	4.0	3.4
25	6.0	6.9	5.6	5.0	5.2	7.2	17.9	7.3	4.4	3.8	4.0	3.2
26	6.9	6.7	5.4	5.4	5.1	7.3	15.0	7.4	4.2	3.6	4.2	3.5
27	8.8	6.4	5.4	5.4	5.0	9.0	15.5	7.4	4.0	3.4	3.8	3.8
28	10.2	6.0	5.6	5.8	5.0	13.0	15.9	7.2	4.2	3.5	3.1	4.3
29	9.6	5.8	5.4	5.8	.....	13.9	16.4	7.0	4.3	3.4	3.2	4.4
30	8.6	5.6	5.4	6.1	.....	14.2	18.8	6.6	4.0	3.8	4.2	4.4
31	8.4	.....	5.4	6.3	.....	14.2	.....	6.2	.....	4.1	5.3	.....

NOTE.—Discharge relation affected by ice Dec. 21 to Apr. 4. Gage heights represent mean of two readings a day taken at 7 a. m. and 6 p. m. in summer, and 7 a. m. and 5 p. m. in winter.

Daily discharge, in second-feet, of Connecticut River at Orford, N. H., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1,500	6,100	2,850	1,360	1,950	1,100	11,200	24,200	3,270	1,500	1,360	2,650
2	930	5,200	3,050	1,290	2,030	2,290	17,000	19,100	3,050	1,790	1,640	2,470
3	1,100	4,050	3,160	1,220	1,640	6,100	20,100	16,800	3,270	2,470	1,160	2,110
4	1,500	3,930	3,270	1,360	1,790	7,740	16,800	15,900	3,270	3,050	1,220	1,870
5	1,710	3,380	3,490	1,790	1,870	7,040	12,600	17,800	4,500	2,950	1,430	1,640
6	2,110	3,270	3,270	1,640	1,790	5,840	9,030	20,300	4,840	2,850	1,790	1,790
7	2,110	3,050	3,270	1,500	1,640	4,840	6,630	20,700	4,040	2,850	2,030	1,790
8	1,950	3,050	3,270	1,360	1,500	3,270	6,500	19,300	3,490	2,290	1,950	1,640
9	1,640	3,160	4,160	1,500	1,500	3,710	13,500	17,800	3,270	1,950	1,290	1,790
10	1,220	5,330	5,330	1,640	1,500	3,270	16,800	18,200	2,950	2,380	1,220	1,570
11	1,360	7,040	6,900	1,500	1,220	2,850	14,600	17,800	2,470	2,650	1,360	1,360
12	1,640	6,360	6,760	1,430	1,040	2,650	15,000	16,600	2,110	2,470	1,290	1,790
13	2,030	5,080	6,630	1,160	980	2,470	15,200	14,400	1,950	2,200	1,500	1,790
14	2,290	4,610	6,360	1,100	980	2,290	12,500	11,600	1,790	2,290	1,500	1,640
15	2,290	3,820	5,840	1,160	880	2,290	10,800	10,100	1,640	2,560	1,430	1,500
16	2,290	3,270	5,330	1,160	930	2,290	10,800	8,740	1,500	2,110	1,290	1,430
17	2,110	3,050	4,960	1,220	980	2,560	10,500	7,880	1,570	1,790	980	1,290
18	2,110	3,050	4,500	1,290	930	3,600	11,000	7,180	1,570	1,570	1,040	1,040
19	2,110	2,850	4,050	1,290	980	4,160	14,600	6,900	1,570	1,710	1,100	980
20	2,110	2,950	3,490	1,290	980	4,050	27,400	6,760	1,570	1,640	1,100	1,220
21	4,050	4,500	3,160	1,290	980	3,710	42,000	6,360	1,790	1,500	1,220	1,160
22	5,200	6,360	2,950	1,220	930	3,490	44,300	5,840	1,950	1,570	1,220	980
23	4,840	5,840	2,650	1,220	1,040	3,050	40,100	5,580	1,790	1,500	1,360	980
24	3,930	4,720	2,470	1,220	980	2,750	32,300	5,080	1,790	1,500	1,500	1,100
25	3,270	4,160	2,290	1,220	1,040	2,560	22,300	4,720	1,790	1,360	1,500	980
26	4,160	4,040	2,030	1,360	980	2,650	16,600	4,840	1,640	1,220	1,640	1,160
27	6,630	3,710	1,870	1,360	930	4,610	17,600	4,840	1,500	1,100	1,360	1,360
28	8,600	3,270	1,950	1,640	980	9,770	18,400	4,610	1,640	1,160	930	1,710
29	7,740	3,050	1,640	1,640	.....	11,300	19,300	4,380	1,710	1,100	980	1,790
30	6,360	2,850	1,570	1,790	.....	12,000	24,200	3,930	1,500	1,360	1,640	1,790
31	6,100	.....	1,500	1,950	.....	11,800	.....	3,490	.....	1,570	2,560	.....

NOTE.—Discharge determined from a rating curve well defined below 30,000 second-feet. Discharge Dec. 21 to Apr. 5 estimated from discharge measurements and temperature records.

Monthly discharge of Connecticut River at Orford, N. H., for the year ending Sept. 30, 1914.

[Drainage area, 3,100 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
October	8,600	930	3,130	1.01	1.16	A.
November	7,040	2,850	4,170	1.35	1.51	A.
December	6,900	1,500	3,680	1.19	1.37	A.
January	1,950	1,100	1,390	.448	.52	B.
February	2,030	880	1,250	.403	.42	B.
March	12,000	1,100	4,580	1.48	1.71	C.
April	44,300	6,500	18,300	5.90	6.58	C.
May	24,200	3,490	11,300	3.65	4.21	A.
June	4,840	1,500	2,360	.761	.85	A.
July	3,050	1,100	1,940	.626	.72	A.
August	2,560	930	1,410	.455	.52	B.
September	2,650	980	1,550	.500	.56	B.
The year	44,300	880	4,600	1.48	20.13	

CONNECTICUT RIVER AT SUNDERLAND, MASS.

Location.—At the five-span steel highway bridge at Sunderland, on the road leading to South Deerfield, about 18 miles in a direct line and 24 miles by river above dam at Holyoke. Deerfield River enters the Connecticut from the west about 8 miles above station.

Drainage area.—8,000 square miles. Revised value.

Records available.—March 31, 1904, to September 30, 1914. From 1880 to 1899 records were obtained at Holyoke, Mass.

Gage.—Chain on highway bridge.

Discharge measurements.—Made from highway bridge.

Channel and control.—Channel deep, with bottom of coarse gravel and alluvial deposits. Control at low stages not well defined but practically permanent. At high stages the control is evidently the crest of the dam at Holyoke.

Extremes of discharge.—Maximum stage recorded during year, 26.4 feet at 6 p. m., April 21; approximate discharge computed from extension of rating curve, 85,900 second-feet. Minimum stage recorded during year, 0.6 foot at 7 a. m., September 28; approximate discharge computed from extension of rating curve, 700 second-feet.

Maximum stage during 1904–1914, 30.7 feet during the night of March 28, 1913, determined by leveling from flood marks; approximate discharge computed from extension of rating curve, 101,000 second-feet. Minimum stage recorded, 0.6 foot, September 28, 1914; approximate discharge computed from extension of rating curve, 700 second-feet.

Winter flow.—Discharge relation seriously affected by ice.

Regulation.—Flow affected by operation of dams at Vernon, Vt., Turners Falls, Mass., and on Deerfield River, Millers River, and other tributaries.

Accuracy.—Results good.

Discharge measurements of Connecticut River at Sunderland, Mass., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 17	R. S. Barnes	[a] 4.20	4,700	Apr. 30	C. H. Pierce	18.69	58,400
Mar. 5	do	[b] 13.42	26,400	Aug. 20	do	2.22	2,530

[a] Discharge relation affected by ice.
[b] Made through complete ice cover; discharge relation affected.

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Daily gage height, in feet, of Connecticut River at Sunderland, Mass., for the year ending Sept. 30, 1914.

[V. Lawer, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.8	5.5	3.7	4.8	6.6	.....	14.4	19.4	4.5	3.0	3.1	5.0
2	2.7	5.1	5.0	4.9	6.3	5.8	17.8	17.4	4.8	3.3	2.1	5.2
3	2.6	5.0	5.0	5.0	7.8	.....	19.6	15.4	4.7	3.1	2.3	4.7
4	2.6	5.2	5.0	4.1	7.3	12.6	16.6	14.2	4.6	2.2	2.9	3.7
5	2.1	5.0	4.4	3.8	7.0	13.2	14.2	13.7	4.4	2.2	2.7	3.0
6	1.4	4.4	4.2	4.7	5.8	12.6	12.6	15.4	5.4	2.8	2.6	2.2
7	3.4	4.2	3.8	4.7	6.2	11.6	11.6	15.2	5.9	5.1	3.1	2.1
8	3.2	4.0	5.8	4.9	5.3	10.3	12.1	14.6	4.4	4.9	2.8	2.5
9	3.4	3.1	7.3	4.8	5.0	9.7	16.7	13.9	4.9	4.3	1.8	3.0
10	3.0	11.4	6.2	4.8	6.0	9.2	19.0	13.9	5.3	4.4	2.0	3.2
11	2.8	8.4	5.4	4.6	5.9	8.7	17.2	11.0	5.0	4.6	2.8	2.9
12	2.0	7.8	5.7	4.1	5.6	8.5	18.1	11.8	4.5	4.1	3.0	2.8
13	1.9	7.0	5.3	4.8	5.5	8.7	17.9	12.8	4.0	3.5	2.9	2.7
14	2.8	5.4	4.3	5.5	5.4	8.9	16.2	13.1	2.6	4.2	2.7	2.7
15	3.2	5.8	4.3	5.3	.....	8.0	14.9	11.9	2.7	4.2	2.8	2.8
16	3.4	6.1	5.2	5.0	.....	7.2	14.4	10.5	3.6	3.7	1.6	3.0
17	3.0	4.1	5.3	4.2	.....	8.8	13.8	9.9	3.4	3.8	1.9	3.0
18	3.0	4.4	5.1	4.1	.....	9.0	14.0	7.6	3.1	3.1	2.4	3.0
19	2.0	4.8	5.0	3.1	5.7	9.6	16.0	8.2	3.2	2.1	2.6	3.4
20	1.9	4.2	6.3	4.3	.....	9.8	21.7	7.8	3.0	2.4	2.4	2.5
21	3.3	4.6	5.0	4.3	.....	9.5	26.0	7.3	2.3	3.4	2.7	1.4
22	3.4	4.8	4.2	4.5	.....	8.4	25.8	7.2	2.5	3.1	3.2	2.5
23	5.1	5.6	4.2	4.7	3.9	8.7	24.0	7.2	3.3	3.1	2.4	2.2
24	4.9	5.6	4.3	4.6	.....	9.0	21.7	7.6	2.9	2.9	2.3	2.2
25	5.4	5.7	3.2	4.8	.....	9.0	19.2	5.1	3.0	2.7	3.2	2.3
26	6.5	5.1	3.2	5.4	4.7	9.0	16.8	5.9	3.0	1.7	3.0	2.2
27	7.8	4.6	4.4	5.9	.....	9.0	16.4	5.0	2.8	2.1	2.9	1.6
28	7.9	4.6	4.6	5.6	.....	16.5	17.3	4.6	2.1	3.1	2.8	1.2
29	7.4	5.2	5.4	5.4	.....	18.1	17.2	5.4	2.2	3.0	2.4	2.2
30	6.8	3.7	5.7	6.2	.....	15.9	18.6	5.4	3.1	2.9	2.7	2.1
31	6.2	.....	5.3	7.0	.....	14.2	.....	4.2	.....	2.9	4.2	.....

NOTE.—Daily gage height is mean of two readings a day taken at about 7 a. m., and 6 p. m. Discharge relation Dec. 29 to Mar. 30 affected by ice.

Daily discharge, in second-feet, of Connecticut River at Sunderland, Mass., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	3,330	9,240	4,990	.....	42,600	60,800	6,720	3,670	3,850	7,910
2	3,170	8,160	7,910	.....	55,500	54,200	7,420	4,210	2,320	8,420
3	3,020	7,910	7,910	.....	61,500	46,700	7,180	3,850	2,580	7,180
4	3,020	8,420	7,910	.....	51,400	41,800	6,950	2,450	3,500	4,990
5	2,320	7,910	6,490	.....	41,800	39,800	6,490	2,450	3,170	3,670
6	1,530	6,490	6,050	.....	35,300	46,700	8,960	3,330	3,020	2,450
7	4,400	6,050	5,200	.....	31,200	45,900	10,400	8,160	3,850	2,320
8	4,030	5,620	10,100	.....	33,200	43,500	6,490	7,660	3,330	2,870
9	4,400	3,850	15,000	.....	51,800	40,600	7,660	6,270	1,960	3,670
10	3,670	30,400	11,300	.....	59,500	40,600	8,690	6,490	2,200	4,030
11	3,330	18,800	8,960	.....	53,600	28,800	7,910	6,950	3,330	3,500
12	2,200	16,700	9,810	.....	56,500	32,000	6,720	5,830	3,670	3,330
13	2,080	14,000	8,690	.....	55,900	36,100	5,620	4,590	3,500	3,170
14	3,330	8,960	6,270	.....	49,900	37,300	3,020	6,050	3,170	3,170
15	4,030	10,100	6,270	.....	44,700	32,400	3,170	6,050	3,330	3,330
16	4,400	11,000	8,420	.....	42,600	26,800	4,790	4,990	1,740	3,670
17	3,670	5,830	8,690	.....	40,200	24,400	4,400	5,200	2,080	3,670
18	3,670	6,490	8,160	.....	41,000	16,000	3,850	3,850	2,720	3,670
19	2,200	7,420	7,910	.....	49,200	18,100	4,030	2,320	3,020	4,400
20	2,080	6,050	11,700	.....	68,400	16,700	3,670	2,720	2,720	2,870
21	4,210	6,950	7,910	.....	82,600	15,000	2,580	4,400	3,170	1,530
22	4,400	7,420	6,050	.....	81,900	14,700	2,870	3,850	4,030	2,870
23	8,160	9,520	6,050	.....	76,000	14,700	4,210	3,850	2,720	2,450
24	7,660	9,520	6,270	.....	68,400	16,000	3,500	3,500	2,580	2,450
25	8,960	9,810	4,030	.....	60,200	8,160	3,670	3,170	4,030	2,580
26	12,300	8,160	4,030	.....	52,200	10,400	3,670	1,850	3,670	2,450
27	16,700	6,950	6,490	.....	50,700	7,910	3,330	2,320	3,500	1,740
28	17,000	6,950	6,950	.....	53,900	6,950	2,320	3,850	3,330	1,330
29	15,300	8,420	.....	.....	53,600	8,960	2,450	3,670	2,720	2,450
30	13,300	4,990	.....	.....	58,200	8,960	3,850	3,500	3,170	2,320
31	11,300	.....	.....	41,800	.....	6,050	.....	3,500	6,050	.....

NOTE.—Discharge determined from rating curve well defined below 60,000 second-feet. Above 60,000 second-feet the Holyoke dam introduces an unknown backwater effect and estimates of daily discharge are somewhat uncertain. Discharge Dec. 29 to Mar. 30 estimated from discharge measurements and climatic records, and by comparison with records at Orford, N. H., and Charlemont, Mass.

Monthly discharge of Connecticut River at Sunderland, Mass., for the year ending Sept. 30, 1914.

[Drainage area, 8,000 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
October	17,000	1,530	5,910	0.739	0.85	A.
November	30,400	3,850	9,270	1.16	1.29	A.
December	15,000	4,030	7,530	.941	1.08	A.
January	.....	.....	3,650	.456	.53	D.
February	.....	.....	3,170	.396	.41	D.
March	.....	.....	15,300	1.91	2.20	D.
April	82,600	31,200	53,400	6.68	7.45	B.
May	60,800	6,050	27,300	3.41	3.93	A.
June	10,400	2,320	5,220	.652	.73	A.
July	8,160	1,850	4,340	.542	.62	A.
August	6,050	1,740	3,160	.395	.46	A.
September	8,420	1,330	3,480	.435	.49	A.
The year	.....	.....	11,800	1.48	20.04	

PASSUMPSIC RIVER NEAR ST. JOHNSBURY, VT.

Location.—At suspension footbridge just below dam of Pierce's mills, about 2 miles below mouth of Sheldon Branch, 4 miles above mouth of Moose River, and 5 miles from St. Johnsbury.

Drainage area.—237 square miles.

Records available.—May 26, 1909, to September 30, 1914. A station was established June 29, 1903, on Passumpsic River at St. Johnsbury Center, but was discontinued November 30 of the same year because of backwater from dam at St. Johnsbury.

Gage.—Staff in two sections; low-water section, a vertical staff bolted to ledge just above bridge; high-water section, an inclined staff bolted to ledge just below bridge.

Discharge measurements.—Made from downstream side of bridge or by wading.

Channel and control.—Channel composed of gravel and ledge rock; control practically permanent.

Extremes of discharge.—Maximum stage recorded during year, 11 feet at 7 a. m. April 21; approximate discharge computed from extension of rating curve, 5,700 second-feet. Zero flow recorded on mornings of August 7 and 14; water held back by mills.

Maximum stage during 1909–1914, 14.8 feet during night of March 27, 1913 (determined by leveling from flood marks); discharge not computed. Minimum stage recorded, zero flow at various times due to water being held back by mills.

Winter flow.—Discharge relation affected by ice.

Regulation.—Flow slightly affected by operation of Pierce's mills just above station and by other mills farther upstream. During August and September, 1914, a portable automatic gage was used to study the effect of diurnal fluctuation. It was found that while two gage readings a day gave occasional errors for individual days, there was practically no error in the determination of mean monthly discharge.

Accuracy.—Results good.

Discharge measurements of Passumpsic River near St. Johnsbury, Vt., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 27	C. S. De Golyer	1.98	261	Sept. 12	R. S. Barnes	1.45	145
Aug. 16	C. C. Covert	.98	40.8				

Daily gage height, in feet, of Passumpsic River near St. Johnsbury, Vt., for the year ending Sept. 30, 1914.

[Joseph Cox, observer.]

Day.	Oct.	Nov.	Dec.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.41	1.85	1.75	.....	2.5	4.9	1.75	1.9	1.25	1.49
2	1.28	1.85	1.8	.....	3.2	4.3	1.7	2.05	1.1	1.48
3	1.46	1.75	1.9	.....	2.5	4.7	1.6	2.05	1.5	.....
4	1.5	1.75	2.1	.....	2.1	5.0	1.9	1.8	1.55	1.46
5	1.34	1.8	1.9	.....	2.15	5.5	2.4	1.6	1.42	1.37
6	1.34	1.7	1.8	.....	1.9	5.1	2.0	1.7	1.39	1.29
7	1.29	1.6	1.65	.....	1.85	4.6	1.75	1.6	.....	1.7
8	1.32	1.6	2.8	.....	2.2	4.0	1.7	1.75	2.2	1.75
9	1.30	1.65	2.0	.....	5.7	3.9	1.65	2.1	1.6	1.6
10	1.30	1.9	2.1	.....	3.7	3.6	1.6	1.7	1.38	1.55
11	1.36	1.9	2.0	.....	3.2	3.3	1.55	1.6	1.43	1.46
12	1.48	1.75	2.0	.....	4.1	3.0	1.5	1.7	1.48	1.38
13	1.8	1.6	1.8	.....	3.4	2.8	1.48	1.55	1.30	1.36
14	1.6	1.7	1.8	.....	3.0	2.8	1.42	1.38	.....	1.34
15	1.55	1.6	1.75	.....	3.1	2.7	1.48	1.42	.....	1.30
16	1.48	1.5	1.7	.....	3.7	2.5	1.44	1.34	1.10	1.28
17	1.42	1.5	1.8	.....	3.3	2.4	1.55	1.29	1.32	1.25
18	1.34	1.55	1.75	.....	4.2	2.3	1.5	1.30	.....	1.12
19	1.38	1.6	1.7	.....	6.4	2.25	1.46	1.39	.....	1.20
20	1.74	3.2	1.6	.....	9.8	2.2	1.75	1.36	1.26	.72
21	3.5	2.5	1.6	.....	9.4	2.15	1.7	1.29	1.28	1.24
22	2.2	2.05	1.6	.....	5.8	2.15	1.55	1.28	1.55	1.25
23	1.8	1.9	1.75	.....	5.0	2.15	1.46	1.05	1.36	1.12
24	1.7	1.9	1.6	.....	4.4	2.3	1.40	1.10	.....	1.28
25	1.9	1.9	1.65	.....	5.0	2.1	1.7	1.10	1.16	1.5
26	2.8	1.8	1.7	.....	5.1	2.0	1.49	1.10	1.14	1.6
27	2.9	1.65	.....	3.1	5.2	1.9	1.41	1.31	1.08	1.5
28	2.3	1.55	.....	3.6	5.8	1.95	1.36	1.24	1.09	1.9
29	2.15	1.7	.....	4.2	6.7	1.8	1.55	1.28	1.27	1.65
30	2.25	1.7	.....	3.6	6.0	1.7	1.8	1.32	.....	1.6
31	2.2	.....	.....	3.0	.....	1.8	.....	1.41	1.7	.....

NOTE.—Discharge relation Dec. 27 to Mar. 31 affected by ice. No gage readings obtained Dec. 27 to Mar. 26.

Daily discharge, in second-feet, of Passumpsic River near St. Johnsbury, Vt., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Apr.	May.	June.	July.	Aug.	Sept.
1	111	216	189	420	1,410	189	230	80	128
2	85	216	202	670	1,120	176	275	55	125
3	122	189	230	420	1,310	152	275	130	123
4	130	189	290	290	1,460	230	202	141	121
5	97	202	230	305	1,710	390	152	113	106
6	97	176	202	230	1,510	260	176	107	88
7	87	152	164	216	1,260	189	152	107	179
8	93	152	530	320	1,000	176	189	320	186
9	89	164	260	1,820	950	164	290	152	149
10	89	230	290	870	830	152	176	105	146
11	101	230	260	670	710	141	152	115	122
12	126	189	260	1,040	600	130	176	126	105
13	202	152	202	750	530	126	141	89	101
14	152	176	202	600	530	111	105	78	97
15	141	152	189	640	500	126	111	68	89
16	126	130	176	870	420	117	97	58	85
17	113	130	202	710	390	141	87	93	80
18	97	141	189	1,080	360	130	89	90	58
19	105	152	176	2,240	340	122	107	86	71
20	186	670	152	4,640	320	189	101	83	13
21	790	420	152	4,320	305	176	87	86	78
22	320	275	152	1,880	305	141	85	139	80
23	202	230	189	1,460	305	122	48	102	58
24	176	230	152	1,170	360	109	55	84	85
25	230	230	164	1,460	290	176	55	65	130
26	530	202	176	1,510	260	128	55	63	152
27	560	164	.....	1,560	230	111	91	53	130
28	360	141	.....	1,880	245	101	78	54	230
29	305	176	.....	2,420	202	141	85	94	164
30	340	176	.....	2,000	176	202	93	138	152
31	320	.....	.....	.....	202	.....	111	181	.....

NOTE.—Discharge determined from a fairly well-defined rating curve. Mean discharge Dec. 27–31 estimated at 152 second-feet. No estimates of discharge made for rest of winter.

Monthly discharge of Passumpsic River near St. Johnsbury, Vt., for the year ending Sept. 30, 1914.

[Drainage area, 237 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
October	560	85	209	0.882	1.02	A.
November	670	130	208	.878	.98	A.
December	530	152	205	.865	1.00	A.
April	4,640	216	1,280	5.40	6.02	B.
May	1,710	176	650	2.74	3.16	A.
June	390	101	161	.679	.76	A.
July	290	48	133	.561	.65	A.
August	320	53	105	.443	.51	B.
September	230	13	114	.481	.54	B.

MILLERS RIVER AT ERVING, MASS.

Location.—At chair factory at Erving, Mass., about 7 miles above confluence of Millers River with the Connecticut. Below all important tributaries.

Drainage area.—368 square miles.

Records available.—August 1 to September 30, 1914.

Gage.—Vertical staff nailed to downstream end of factory; read twice daily.

Discharge measurements.—Made by wading about half a mile below gage.

Channel and control.—Coarse gravel and bowlders; probably permanent.

Extremes of stage.—Maximum stage recorded during August and September, 2.44 feet at 8 a. m. August 7. Zero flow August 8, 9, 10, 15, and 16; water held back by mills.

Regulation.—Flow affected by operation of power plants at Athol, Orange, Wendell Depot, and Erving.

Accuracy.—Results good.

Discharge measurements of Millers River at Erving, Mass., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
July 24	R. S. Barnes	[a] 1.68	146	Aug. 21	C. H. Pierce	2.07	226
28	do	[a] 1.80	138	Sept. 22	R. S. Barnes	1.97	204

[a] Determined from reference point.

Gage height, in feet, and discharge, in second-feet, of Millers River at Erving, Mass., for the year ending Sept. 30, 1914.

Day.	August.				September.			
	A. M.		P. M.		A. M.		P. M.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	1.96	205	1.41	58	1.98	213	1.87	173
2	[a] 1.56	87	.....	(b)	2.00	220	1.91	187
3	1.95	202	1.84	163	2.01	224	1.80	150
4	2.00	220	1.81	153	2.04	236	1.87	173
5	2.01	224	1.80	150	1.97	209	1.86	170
6	2.01	224	1.80	150	[a] 1.22	31	.....	(b)
7	2.37	385	2.01	224	1.25	35	1.69	118
8	1.98	213	.....	0	1.65	108	1.81	153
9	(a)	0	.....	0	1.71	124	1.75	136
10	.....	0	1.53	81	1.75	136	1.72	127
11	1.40	56	1.57	89	1.18	27	1.70	121
12	1.99	216	1.83	160	1.24	34	1.27	37
13	2.03	232	1.84	163	[a] 1.15	24	.....	(b)
14	2.05	240	1.72	127	1.95	202	1.85	166
15	2.08	252	.....	0	1.96	205	1.92	190
16	(a)	0	.....	0	1.95	202	1.93	194
17	1.95	202	1.98	213	1.99	216	1.73	130
18	2.00	220	1.77	141	1.96	205	1.82	157
19	1.91	187	1.76	138	1.95	202	1.66	111
20	2.01	224	1.90	183	[a] .99	8	.....	(b)
21	2.03	232	2.40	400	1.95	202	1.89	180
22	2.24	320	2.28	340	1.97	209	1.67	114
23	[a] 1.95	202	.....	(b)	1.95	202	1.68	116
24	2.28	340	2.04	236	1.96	205	1.86	170
25	2.07	248	1.80	150	1.99	216	1.91	187
26	1.96	205	1.97	209	2.01	224	1.73	130
27	2.03	232	1.96	205	[a] .96	5	.....	(b)
28	1.95	202	1.81	153	1.96	205	1.47	69
29	2.00	220	1.73	130	1.87	173	1.28	39
30	[a] 1.35	48	.....	(b)	.95	4	1.72	127
31	2.02	282	2.25	325	.....	.....	.....	.....

[a] Sunday.

[b] Gage read in morning only. Afternoon discharge taken as mean of discharge for preceding and following mornings in computing monthly values.

NOTE.—Gage readings made at about 8 a. m. and 4 p. m. Discharge determined from a rating curve fairly well defined below 1,800 second-feet, several discharge measurements made subsequent to Sept. 30, 1914, being used to determine the curve.

Monthly discharge of Millers River at Erving, Mass., for the year ending Sept. 30, 1914.

[Drainage area, 368 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
August			160	0.435	0.50	B.
September			125	.340	.38	B.

NOTE.—Monthy values obtained by applying a reduction factor of 0.9 to means from twice-a-day readings. This factor was determined by a comparative study of results subsequent to installation of a water stage recorder.

DEERFIELD RIVER AT CHARLEMONT, MASS.

Location.—One mile below village of Charlemont.

Drainage area.—362 square miles.

Records available.—June 19, 1913, to September 30, 1914.

Gage.—Gurley water-stage recorder on left bank, referenced to gage datum by means of a hook gage inside the well. An inclined staff gage is used for auxiliary readings.

Discharge measurements.—Made from cable or by wading.

Channel and control.—Channel covered with coarse gravel and bowlders; fairly uniform section.

Extremes of discharge.—Maximum stage recorded during year (automatic gage) 10 feet at 5 a. m. April 20; approximate discharge from extension of rating curve, 18,200 second-feet. Minimum stage recorded during year (automatic gage), 1.35 feet at 5.30 p. m., September 21; discharge, 23 second-feet.

Maximum stage recorded during 1913–14, 13.6 feet during high water of March 27–28, 1913 (determined by leveling from flood marks). It is not known if the channel was entirely free from obstruction at that time. Minimum stage recorded, 1.35 feet, September 21, 1914; discharge, 23 second-feet.

Winter flow.—Discharge relation affected by ice.

Regulation.—Flow regulated by storage reservoir at Somerset, Vt., and affected by operation of several mills above station. Results corrected for storage at Somerset from data furnished by the company operating the reservoir.

Accuracy.—Results good.

Discharge measurements of Deerfield River at Charlemont, Mass., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Oct. 28	C. S. De Golyer	3.58	1,480	Feb. 17	R. S. Barnes	[a] 4.09	398
28	do	3.39	1,230	Mar. 6	do	[a] 4.92	1,000
29	do	2.98	827	28	C. H. Pierce	7.61	9,950
Jan. 7	R. S. Barnes	[a] 3.01	229	29	do	5.31	4,250
14	W. S. Easterly	[a] 3.01	207	29	do	5.08	3,660
19	R. S. Barnes	[a] 3.15	246	June 9	R. S. Barnes	2.01	211
30	do	[a] 4.04	709				

[a] Made through ice cover, discharge relation affected.

Daily gage height, in feet, of Deerfield River at Charlemont, Mass., for the year ending Sept. 30, 1914.

[Arthur Rhodes and Albert Anthony, observers.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1	1.79	2.40	2.40	3.5	4.2	3.8	4.3	4.45	1.88	2.08	.....
2	2.17	2.27	2.42	3.25	4.0	6.45	6.45	4.15	1.98	1.90	.....
3	2.08	2.34	2.54	3.40	3.85	6.45	4.95	4.15	1.86	.....	.....
4	2.06	2.22	2.86	3.39	3.9	5.55	4.05	4.2	2.01	.....	.....
5	1.95	2.36	2.69	3.27	3.95	5.0	3.65	4.6	2.85	.....	.....
6	1.78	2.25	2.66	3.23	3.9	4.9	3.41	5.1	2.54	.....	.....
7	1.77	2.18	2.98	3.17	3.9	4.7	3.40	4.3	2.24	.....	.....
8	1.59	2.20	4.65	3.11	3.8	4.5	4.2	3.75	1.96	.....	.....
9	1.77	8.0	3.48	3.04	3.7	4.35	7.2	3.55	1.99	.....	.....
10	1.88	6.35	3.08	3.08	3.7	4.15	4.95	3.30	2.03	.....	.....
11	1.78	3.6	2.92	2.96	3.7	4.05	4.45	3.10	1.88	2.52	.....
12	1.80	3.38	2.67	2.61	3.6	3.95	5.2	2.98	1.85	2.38	.....
13	2.06	3.04	2.68	2.78	3.41	3.9	4.9	4.7	1.83	.....	.....
14	2.11	2.89	2.66	2.89	3.6	3.8	4.45	4.1	1.58	.....	.....
15	1.95	2.91	2.70	3.00	3.65	3.75	4.7	3.5	2.39	.....	2.52
16	1.82	2.78	2.54	3.02	3.55	3.6	4.4	3.18	2.42	.....	2.71
17	1.84	2.65	2.55	3.08	4.05	3.7	4.1	2.88	2.48	.....	2.85
18	1.80	2.59	2.52	3.20	3.9	5.15	4.8	2.79	2.12	.....	2.71
19	1.78	2.57	2.37	3.06	3.85	4.95	7.1	2.67	1.79	.....	2.66
20	2.18	3.36	2.22	3.17	3.8	4.85	9.6	2.60	1.62	.....	2.80
21	3.35	3.35	2.33	3.22	3.9	4.45	6.9	2.53	1.98	.....	3.06
22	2.58	2.91	2.41	3.23	3.8	4.3	5.1	2.49	2.38	.....	.....
23	2.30	2.72	2.37	3.17	3.75	4.2	5.1	2.41	2.54	.....	.....
24	2.15	2.63	2.29	3.35	3.7	4.05	4.6	2.30	2.54	.....	.....
25	2.96	2.56	2.34	4.10	3.8	3.75	4.5	2.04	2.32	.....	.....
26	4.9	2.47	2.32	4.05	3.65	3.9	4.7	2.20	2.18	.....	.....
27	4.9	2.40	2.22	4.05	3.7	5.3	5.2	2.28	2.00	.....	.....
28	3.5	2.34	2.26	4.1	3.7	7.4	5.55	2.14	1.82	.....	.....
29	2.92	2.30	3.6	4.05	.....	5.3	5.35	2.07	1.89	.....	.....
30	2.70	2.35	3.9	4.1	.....	4.3	5.8	2.01	2.12	.....	.....
31	2.53	.....	3.75	4.25	.....	4.05	.....	1.91	.....	.....	.....

NOTE.—Gage heights Oct. 13–22, Nov. 3–13, Jan. 13–18, Feb. 10–16, 18–28, Mar. 1–5, 16–20, Apr. 21–30, May 10–18, 24–31, June 1–7, 11–30, July 1–2, 11–12, and Aug. 15–21 determined from two daily readings on staff gage. Gage heights for all other days previous to July 2 represent the mean of 24 hourly records on automatic gage. Discharge relation affected by ice Dec. 29 to Mar. 26.

Daily discharge, in second-feet, of Deerfield River at Charlemont, Mass., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	121	435	435	245	790	222	2,400	2,630	154	245	318	369
2	294	352	448	179	630	3,070	6,780	2,180	196	162	406	240
3	245	396	528	297	490	3,070	3,480	2,180	147	257	717	106
4	235	322	760	326	490	1,740	2,040	2,250	210	304	688	158
5	184	409	633	297	490	1,110	1,530	2,870	753	194	565	403
6	118	340	612	297	455	1,010	1,260	3,760	528	995	677	335
7	115	299	854	297	420	790	1,250	2,400	334	740	486	149
8	70	310	2,960	271	326	630	2,250	1,650	188	701	281	413
9	115	11,000	1,340	245	245	525	8,790	1,420	201	516	508	451
10	154	6,520	942	245	245	388	3,480	1,150	220	521	687	399
11	118	1,470	806	200	222	326	2,630	960	154	514	781	362
12	124	1,230	619	82	158	271	3,950	854	143	422	884	362
13	235	906	626	122	93	245	3,390	3,040	135	179	633	279
14	260	782	612	158	158	200	2,630	2,110	68	157	378	216
15	184	798	640	200	179	200	3,040	1,360	429	112	514	362
16	132	700	528	200	122	122	2,550	1,030	448	426	648	248
17	139	605	535	222	388	158	2,110	775	487	439	753	207
18	124	563	514	271	297	1,220	3,210	708	266	295	648	79
19	118	549	416	204	245	1,010	8,520	619	121	266	612	61
20	299	1,210	322	255	245	915	15,700	570	76	582	715	48
21	1,200	1,200	390	271	297	630	7,980	521	196	654	924	30
22	556	798	442	271	245	490	3,760	494	422	728	517	32
23	370	655	416	222	200	420	3,760	442	528	711	299	33
24	282	591	364	297	179	355	2,870	370	528	477	466	33
25	838	542	396	830	222	200	2,710	225	383	276	633	40
26	3,390	480	383	790	158	870	3,040	310	299	397	610	58
27	3,390	435	322	750	179	4,150	3,950	358	205	738	634	69
28	1,360	396	346	790	179	9,340	4,660	277	132	746	357	39
29	806	370	326	750	.....	4,150	4,250	240	158	762	353	58
30	640	402	297	790	.....	2,400	5,210	210	266	758	909	73
31	521	.....	297	870	.....	2,040	.....	166	.....	498	584	.....

NOTE.—Discharge determined from a well-defined rating curve. Discharge subsequent to July 2, except for periods covered by two readings a day, determined from hourly gage heights. Discharge during winter determined from discharge measurements and hydrograph comparisons.

Monthly discharge of Deerfield River at Charlemont, Mass., for the year ending Sept. 30, 1914.

[Drainage area, 362 square miles.]

Month.	Observed discharge (second-feet).			Gain or loss in storage at Somerset, Vt. (millions of cubic feet).	Discharge without storage (second-feet).		Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.		Mean.	Per square mile.		
October	3,390	70	540	+148	595	1.64	1.89	A.
November	11,000	299	1,170	+361	1,310	3.62	4.04	A.
December	2,960	297	616	+107	657	1.81	2.09	A.
January	870	82	363	+ 61.4	387	1.07	1.23	B.
February	790	93	298	+ 29.6	311	.859	.89	B.
March	9,340	122	1,360	+181	1,430	3.95	4.55	B.
April	15,700	1,250	4,120	+819	4,430	12.2	13.61	A.
May	3,760	166	1,230	+445	1,390	3.84	4.43	A.
June	753	68	279	−245	182	.503	.56	A.
July	995	112	477	−631	250	.691	.80	A.
August	924	281	587	−909	244	.674	.78	A.
September	451	30	190	−339	65	.180	.20	A.
The year	15,700	30	935	+ 38.3	936	2.59	35.07	

NOTE.—The increase (+) or decrease (−) of water held in storage at Somerset, Vt., during the month has been computed by engineers of the United States Geological Survey from records of reservoir gage heights and from storage table furnished by the company operating the reservoir.

WARE RIVER AT GIBBS CROSSING, MASS.

Location.—Between highway bridge and electric railway bridge at point known as Gibbs Crossing, about 3 miles below Ware. Muddy Brook, with a drainage area of about 30 square miles, enters from right at Ware. Beaver Brook, with a drainage area of about 29 square miles, enters from right about 2½ miles below station.

Drainage area.—201 square miles.

Records available.—August 20, 1912, to September 30, 1914.

Gage.—Barrett & Lawrence water-stage recorder on right bank just above highway bridge, referenced to gage datum by means of a hook gage inside the well. An inclined staff gage is used for auxiliary readings.

Discharge measurements.—Made from upstream side of electric railway bridge or by wading.

Channel and control.—Channel rough, but practically permanent. A large amount of aquatic vegetation in the channel during the summer months, but none at the control.

Extremes of discharge.—Maximum open-water stage recorded during year (automatic gage), 5.9 feet at 6 p. m. March 2; discharge, 2,770 second-feet. Minimum stage recorded during year (automatic gage), 1.22 feet at 6 p. m. September 27; discharge, 5.8 second-feet.

Maximum open-water stage recorded 1912–1914, 5.9 feet March 2, 1914; discharge, 2,770 second-feet. A gage height of 7.04 was recorded at 1.30 a. m. March 2, 1914, but channel was probably somewhat obstructed by ice at that time. Minimum stage recorded, 1.22 feet, September 27, 1914; discharge, 5.8 second-feet.

Winter flow.—Discharge relation seriously affected by ice.

Regulation.—Flow affected by operation of mills, which at low stages causes a large variation in discharge when mills are in operation, and a low discharge on Sundays and holidays.

Accuracy.—Results good.

Discharge measurements of Ware River at Gibbs Crossing, Mass., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 3	R. S. Barnes	[a] 2.32	160	Feb. 28	C. H. Pierce	[a] 2.88	99.0
15	do	[a] 3.93	169	Apr. 1	do	3.62	1,030
15	do	[a] 3.63	135	2	do	3.93	1,390
24	do	[a] 3.48	329	8	R. S. Barnes	3.57	959
25	do	[a] 3.70	748	Aug. 18	C. H. Pierce	1.42	22.0
Feb. 11	do	[a] 2.92	370	18	do	1.42	19.7
27	do	[a] 3.98	237				

[a] Discharge relation affected by ice.

Daily discharge, in second-feet, of Ware River at Gibbs Crossing, Mass., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	70	182	163	140	764	1,700	986	818	174	115	26	92
2	74	178	163	128	692	2,610	1,220	668	188	121	16	85
3	62	173	163	116	532	2,130	1,350	566	149	93	40	36
4	59	213	163	116	448	1,820	1,120	565	144	55	55	37
5	15	178	163	153	420	1,530	929	671	129	43	58	53
6	84	160	163	128	368	1,320	837	1,030	161	122	59	28
7	76	153	174	116	320	1,040	766	1,000	100	197	59	38
8	76	84	539	105	256	837	862	838	158	147	60	74
9	73	134	537	105	256	720	1,360	758	176	149	60	66
10	46	310	350	76	256	607	1,430	684	122	127	60	72
11	42	348	325	76	218	525	1,160	653	122	166	60	40
12	36	283	283	95	153	438	986	641	90	160	60	18
13	97	249	242	76	140	418	877	925	76	176	60	15
14	90	224	202	85	168	368	768	1,010	53	127	60	52
15	86	180	267	85	200	337	692	856	113	124	68	58
16	123	186	264	85	276	505	766	710	118	91	37	62
17	113	200	209	85	236	647	836	610	110	68	70	19
18	50	216	176	76	153	698	797	614	114	34	64	17
19	43	221	186	95	183	596	745	499	85	23	69	10
20	145	194	134	53	183	513	764	397	77	63	54	14
21	171	211	131	85	105	414	896	353	42	82	106	60
22	156	140	177	85	236	358	863	356	107	122	136	53
23	85	135	236	76	320	369	763	293	115	99	109	56
24	88	197	192	85	256	353	671	224	115	101	120	18
25	168	234	261	727	116	382	595	288	121	42	126	20
26	749	200	383	593	95	524	636	274	94	28	119	28
27	676	188	315	393	76	898	1,040	236	56	106	76	8.1
28	571	181	226	256	168	1,480	970	260	44	91	27	56
29	430	110	262	368	.....	1,740	914	249	129	90	28	33
30	328	190	299	448	.....	1,360	884	156	118	101	51	37
31	267	.....	217	626	.....	1,080	.....	128	.....	46	112	.....

NOTE.—Discharge determined from a well-defined rating curve by averaging the discharge for 4-hour periods. Discharge Dec. 1–6 and Aug. 8–14 estimated by comparison with records on adjacent streams. Discharge for January and February, when discharge relation was affected by ice, determined from gage heights corrected for backwater effect, by means of 8 discharge measurements and weather records.

Monthly discharge of Ware Rivr at Gibbs Crossing, Mass., for the year ending Sept. 30, 1914.

[Drainage area, 201 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
October	749	15	166	0.826	0.95	A.
November	348	84	192	.955	1.07	A.
December	539	131	244	1.21	1.40	B.
January	727	53	185	.920	1.06	C.
February	764	76	271	1.35	1.41	C.
March	2,610	337	913	4.54	5.23	A.
April	1,430	595	916	4.56	5.09	A.
May	1,030	128	559	2.78	3.20	A.
June	188	42	113	.562	.63	A.
July	197	23	100	.498	.57	A.
August	136	16	67.9	.338	.39	A.
September	92	8.1	41.8	.208	.23	A.
The year	2,610	8.1	315	1.57	21.23	

SWIFT RIVER AT WEST WARE, MASS.

Location.—Just below wooden dam opposite West Ware station of Athol branch of Boston & Albany Railroad, about 6 miles by river downstream from Enfield.

Drainage area.—191 square miles.

Records available.—July 15, 1910, to September 30, 1914.

Gage.—Barrett & Lawrence water-stage recorder on left bank about 1,000 feet below dam, referenced to gage datum by means of hook gage inside the well. Prior to August 25, 1912, a chain gage on footbridge 400 feet below dam.

Discharge measurements.—Made from cable about 50 feet above gage or by wading.

Channel and control.—Gravel and alluvial deposits; some aquatic vegetation in channel during summer. Control practically permanent at ordinary stages; at high stages the dam at Bondsville probably becomes the control.

Extremes of discharge.—Maximum stage recorded during year (automatic gage), 7.42 feet at 10 p. m. March 29; discharge, 1,560 second-feet. Minimum stage recorded (automatic gage), 1.36 feet at 5 p. m. September 22; discharge, 22 second-feet.

Maximum open-water stage recorded 1910–1914, 7.38 feet (chain gage) at 11 a. m. March 31, 1912; discharge, 2,000 second-feet. A gage height of 9.58 feet was recorded by chain gage at 11 a. m. March 17, 1912, but channel was probably somewhat obstructed by ice. Minimum stage recorded, 1.36 feet September 22, 1914; discharge, 22 second-feet.

Winter flow.—Discharge relation affected by ice.

Regulation.—Operation of mills at Enfield, 6 miles above station, affects distribution of flow at low and medium stages but has only slight effect when mean daily discharge is over 200 second-feet. The diurnal fluctuation is somewhat equalized however, by pondage above dam at West Ware, which has not been used for power for several years.

Accuracy.—Results good.

Discharge measurements of Swift River at West Ware, Mass., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 3	R. S. Barnes	2.40	150	Feb. 27	C. H. Pierce	[a]2.57	152
15	do	[a]2.10	82.9	Aug. 17	do	1.76	63.0
24	do	[a]2.10	61.1	17	do	1.80	65.0
Feb. 11	do	[a]2.99	209				

[a] Partial ice cover at gage; discharge relation affected.

Daily gage height, in feet, of Swift River at West Ware, Mass., for the year ending Sept. 30, 1914.

[R. L. Shaw, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.40	4.5	3.36	5.5	4.5	2.65	2.10	.....	1.96
2	2.31	4.6	5.2	5.6	4.3	2.61	2.22	.....	1.95
3	2.40	4.2	6.2	6.1	4.0	2.58	2.21	.....	1.90
4	2.38	3.9	6.7	5.9	3.85	2.58	2.14	.....	1.80
5	2.32	3.75	6.5	5.4	4.0	2.63	2.10	.....	2.05
6	2.28	3.5	5.9	4.9	4.6	2.61	2.15	.....	1.90
7	2.32	3.40	5.1	4.7	4.9	2.61	2.21	.....	1.82
8	2.33	3.21	4.4	4.8	4.8	2.59	2.21	.....	1.73
9	2.31	3.20	3.9	5.7	4.5	2.51	2.21	.....	1.71
10	2.32	3.08	3.6	6.6	4.3	2.42	2.19	.....	1.71
11	2.24	2.94	3.40	6.2	4.05	2.32	2.14	.....	1.69
12	2.20	2.78	3.26	5.6	4.0	2.29	2.32	.....	1.57
13	2.56	2.71	3.16	5.1	4.5	2.28	2.33	.....	1.51
14	2.37	2.50	3.04	4.7	4.9	2.22	2.34	.....	1.65
15	2.18	2.65	3.07	4.45	4.9	2.18	2.31	.....	1.65
16	2.16	.....	3.26	4.5	4.6	2.16	2.31	.....	1.75
17	.....	.....	3.65	4.6	4.2	2.14	2.36	1.79	.....
18	.....	.....	3.9	4.6	3.95	2.12	2.37	1.78	1.70
19	.....	2.57	3.95	4.7	3.75	2.18	2.28	1.81	1.67
20	.....	2.58	3.75	4.6	3.6	2.31	2.08	1.90	1.65
21	.....	2.55	3.46	4.8	3.48	2.25	1.98	2.13	1.62
22	.....	.....	3.33	5.1	3.38	2.20	1.95	2.39	1.50
23	.....	.....	3.15	4.8	3.27	2.10	1.92	2.52	1.51
24	2.10	.....	3.16	4.5	3.17	2.15	1.91	2.54	1.55
25	3.03	.....	3.16	4.2	3.07	2.17	1.89	2.43	1.57
26	2.90	.....	3.48	4.25	3.01	2.08	1.88	2.32	1.58
27	2.97	2.57	4.25	4.9	2.97	1.92	.....	2.21	1.49
28	3.14	2.55	5.7	5.0	3.02	.....	.....	2.11	1.54
29	3.15	.....	7.2	4.9	2.95	.....	.....	2.08	1.49
30	3.37	.....	7.1	4.7	2.84	.....	.....	2.08	1.53
31	3.9	.....	6.2	.....	2.74	.....	.....	2.01	.....

NOTE.—Discharge relation Jan. 2 to Feb. 28 affected by ice.

Daily discharge, in second-feet, of Swift River at West Ware, Mass., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	45	176	156	152	605	385	980	695	210	107	45	86
2	55	150	164	133	620	893	1,010	639	202	127	45	85
3	60	127	168	152	519	1,190	1,160	558	196	125	40	78
4	55	116	164	152	441	1,340	1,100	518	196	113	40	66
5	45	109	154	133	402	1,280	951	558	206	107	40	100
6	95	102	144	124	340	1,100	807	723	202	115	40	78
7	95	100	150	124	315	864	751	807	202	125	40	68
8	85	88	255	124	265	667	779	779	198	125	40	58
9	76	117	328	124	265	531	1,040	695	182	125	40	55
10	52	152	325	124	228	450	1,310	639	164	121	40	55
11	52	176	287	108	193	396	1,190	572	145	113	40	53
12	25	186	240	100	162	359	1,010	558	139	145	40	40
13	47	172	209	93	152	333	864	695	137	147	40	34
14	62	156	193	93	116	302	751	807	127	149	40	48
15	64	146	172	93	142	310	681	807	120	143	40	48
16	58	140	164	86	142	359	695	723	117	143	45	60
17	51	133	168	86	142	464	723	612	113	152	65	57
18	41	131	160	79	142	531	723	544	110	154	64	54
19	23	126	152	73	133	544	751	490	120	137	67	51
20	82	134	131	73	142	490	723	450	143	104	78	48
21	119	138	129	67	142	412	779	418	132	89	112	45
22	114	126	133	67	142	377	864	391	123	85	158	33
23	111	122	127	61	142	330	779	361	107	81	184	34
24	112	133	188	61	152	333	695	335	115	79	188	38
25	193	117	260	228	152	333	612	310	118	77	166	40
26	328	109	300	193	152	418	626	294	104	76	145	41
27	431	93	292	204	152	626	807	284	81	80	125	32
28	436	97	235	252	152	1,040	835	297	100	80	109	37
29	365	124	223	252	.....	1,490	807	280	100	80	104	32
30	285	142	186	302	.....	1,460	751	253	100	80	104	36
31	218	.....	174	441	.....	1,190	.....	230	.....	80	94	.....

NOTE.—Discharge determined from a well-defined rating curve. Discharge for Oct. 1–8, June 28–30, and July 27 to Aug. 16, when there were lapses in the automatic-gage records, estimated by comparison with records on adjacent streams. Discharge during winter determined from gage heights corrected for back-water effect by means of 4 discharge measurements and weather records.

Monthly discharge of Swift River at West Ware, Mass., for the year ending Sept. 30, 1914.

[Drainage area, 191 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
October	436	23	125	0.654	0.75	B.
November	186	88	131	.685	.76	A.
December	328	127	198	1.04	1.20	A.
January	441	61	140	.733	.85	C.
February	620	116	238	1.25	1.30	C.
March	1,490	302	671	3.51	4.05	B.
April	1,310	612	852	4.46	4.98	B.
May	807	230	527	2.76	3.18	B.
June	210	81	144	.754	.84	B.
July	154	76	112	.586	.68	B.
August	188	40	78	.408	.47	C.
September	100	32	53	.277	.31	B.
The year	1,490	23	272	1.42	19.37	

QUABOAG RIVER AT WEST BRIMFIELD, MASS.

Location.—At two-span highway bridge just west of West Brimfield station of Boston & Albany Railroad.

Drainage area.—150 square miles.

Records available.—August 23, 1909, to September 30, 1914.

Gage.—Barrett & Lawrence water-stage recorder at downstream end of center pier of bridge, referenced to gage datum by means of a hook gage inside of well. Vertical staff is used for auxiliary readings. Prior to August 19, 1912, a vertical staff on upstream side of right abutment of bridge at same datum as present gage.

Discharge measurements.—Made from highway bridge or by wading near bridge.

Channel and control.—Stream bed covered with bowlders, gravel, and alluvial deposits; control practically permanent.

Extremes of discharge.—Maximum open-water stage recorded during year (automatic gage), 4.3 feet at 12 p. m. March 1; discharge, 1,270 second-feet. A gage height of 5.4 feet was recorded at 9.30 p. m., March 1, but channel was probably somewhat obstructed by ice. Minimum stage recorded during year (automatic gage), 1.53 feet at 1 p. m. September 25; discharge, 6.5 second-feet.

Maximum open-water stage recorded 1909–1914, 4.9 feet at 8.15 a. m. March 1, 1910; discharge, 1,660 second-feet. It is possible that channel was not entirely clear of ice at that time. Minimum stage recorded, 1.4 feet, September 17–18, 1910; discharge, 2.5 second-feet.

Winter flow.—Discharge relation affected by ice.

Regulation.—Flow affected by operation of power plants at West Warren, 3 miles above station, which at low stages causes a large variation in discharge on days when mills run and a low discharge on Sundays and holidays.

Accuracy.—Results good.

Discharge measurements of Quaboag River at West Brimfield, Mass., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 5	R. S. Barnes	[a] 2.51	180	Mar. 1	R. S. Barnes	[a] 3.05	182
16	do	[a] 2.56	153	Apr. 2	C. H. Pierce	3.73	839
26	do	[a] 3.95	287	Aug. 18	do	2.25	95.0
Feb. 12	do	[a] 2.84	193	19	do	1.87	28.8
28	do	[a] 3.20	155				

[a] Discharge relation affected by ice.

Daily gage height, in feet, of Quaboag River at West Brimfield, Mass., for the year ending Sept. 30, 1914.

[Mrs. W. E. Holland, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	3.05	.....	3.32	2.46	2.19	2.02	2.04
2	4.1	3.62	3.26	2.44	2.44	2.03	2.07
3	4.0	3.59	3.22	2.42	2.48	2.14	2.03
4	4.05	3.54	3.22	2.45	2.30	2.16	1.88
5	3.98	3.52	.....	2.43	2.28	2.10	1.93
6	3.96	3.44	3.48	2.45	2.37	2.06	1.92
7	3.82	3.47	3.42	.....	2.41	1.95	1.93
8	3.70	3.48	3.38	2.36	2.37	2.08	1.95
9	3.58	3.61	3.37	2.30	2.30	1.99	1.86
10	3.41	3.57	3.34	2.22	2.47	2.10	1.80
11	3.35	3.56	3.28	2.22	.....	2.05	1.77
12	3.25	3.48	3.30	2.17	.....	2.08	1.84
13	3.16	3.41	3.53	2.11	.....	2.00	1.66
14	3.08	3.40	3.46	2.18	2.34	1.92	1.96
15	3.03	3.36	3.40	2.18	2.28	.....	1.93
16	3.06	3.48	3.37	2.16	2.28	.....	1.96
17	3.11	3.40	3.31	2.23	2.29	.....	1.89
18	3.12	3.37	3.28	.....	2.26	.....	1.88
19	3.03	3.34	3.21	2.10	2.04	2.17	1.90
20	2.97	3.32	3.16	2.11	2.17	2.08	1.83
21	2.93	3.32	3.10	2.02	2.14	2.20	2.00
22	2.96	3.28	3.06	2.30	2.17	2.19	1.87
23	2.90	3.21	2.98	2.10	2.14	2.12	1.96
24	2.86	3.20	2.90	2.23	2.15	2.24	1.94
25	2.76	3.19	2.90	2.14	2.18	2.16	1.68
26	2.94	3.30	2.86	2.16	2.02	2.10	1.89
27	3.06	3.38	2.81	2.18	2.11	2.06	1.70
28	3.40	3.35	2.73	2.00	2.10	2.05	2.13
29	3.46	3.36	2.68	2.33	2.07	2.02	2.23
30	3.48	3.39	2.61	2.16	2.10	2.02	2.19
31	3.49	.....	2.52	.....	2.10	2.10	.....

NOTE.—Discharge relation affected by ice Jan. 6 to Mar. 1.

Daily discharge, in second-feet, of Quaboag River at West Brimfield, Mass., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	48	166	135	183	270	176	733	575	163	91	58	61
2	62	158	131	211	270	1,110	777	537	157	157	59	67
3	68	161	122	193	293	1,040	756	513	151	169	81	59
4	36	159	119	157	293	1,080	723	513	160	118	85	37
5	41	132	120	160	293	1,030	709	598	154	113	73	44
6	72	130	120	145	293	1,010	654	682	160	136	65	43
7	53	131	142	130	270	914	675	640	146	148	47	44
8	50	116	210	118	230	831	682	614	133	136	69	47
9	52	161	188	118	176	750	770	607	118	118	53	34
10	51	260	223	105	176	633	743	588	98	166	73	28
11	34	199	214	105	176	594	736	549	98	160	63	25
12	49	177	179	105	160	531	682	562	87	160	69	32
13	69	130	174	105	160	477	633	715	75	160	55	14
14	54	148	174	105	160	433	627	668	89	128	43	49
15	45	141	174	118	145	407	601	627	89	113	61	44
16	34	134	218	145	145	423	682	607	85	113	61	49
17	40	144	202	145	145	450	627	568	101	115	61	38
18	43	133	202	130	130	455	607	549	87	108	61	37
19	33	131	171	130	130	407	588	507	73	61	87	40
20	81	145	189	118	130	375	575	477	75	87	69	31
21	74	146	170	105	118	355	575	444	58	81	94	55
22	72	139	173	105	118	370	549	423	118	87	91	35
23	66	135	170	73	118	340	507	380	73	81	77	49
24	67	135	233	94	105	320	501	340	101	83	103	46
25	150	114	227	391	105	275	495	340	81	89	85	16
26	245	105	249	193	94	360	562	320	85	58	73	38
27	265	104	212	176	94	423	614	297	89	75	65	18
28	234	90	241	176	94	627	594	262	55	73	63	79
29	219	124	285	176	.....	668	601	242	125	67	58	101
30	215	135	290	176	.....	682	620	214	85	73	58	91
31	192	.....	266	176	.....	689	.....	183	.....	73	73	.....

NOTE.—Discharge determined from a well-defined rating curve. Oct. 1 to Jan. 5, mean daily discharge computed by averaging the discharge for four-hour periods. Discharge during winter season, Jan. 6 to Mar. 1, determined from gage heights corrected for backwater by means of 6 discharge measurements and weather records.

Monthly discharge of Quaboag River at West Brimfield, Mass., for the year ending Sept. 30, 1914.

[Drainage area, 150 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
October	265	33	90.8	0.605	0.70	A.
November	260	90	143	.953	1.06	A.
December	290	119	191	1.27	1.46	A.
January	391	73	147	.980	1.13	C.
February	293	94	175	1.17	1.22	D.
March	1,110	275	588	3.87	4.46	A.
April	777	495	640	4.27	4.76	A.
May	682	183	488	3.25	3.75	A.
June	163	55	106	.707	.79	A.
July	169	58	110	.733	.85	A.
August	103	43	68.8	.459	.53	A.
September	101	14	45.0	.300	.33	A.
The year	1,110	14	233	1.55	21.04	

WESTFIELD RIVER AT KNIGHTVILLE, MASS.

Location.—At single-span steel highway bridge known locally as Pitcher Bridge, in Knightville, 1 mile north of outlet of Norwich Lake, and about 3 miles above confluence with Middle Branch of Westfield River.

Drainage area.—162 square miles.

Records available.—August 26, 1909, to September 30, 1914.

Gage.—Chain attached to downstream side of highway bridge.

Discharge measurements.—Made from highway bridge or by wading.

Channel and control.—Channel rough, covered with bowlders and ledge rock; not likely to change.

Extremes of discharge.—Maximum stage recorded during year, 7.8 feet at 7.30 a. m. March 28; approximate discharge computed from extension of rating curve, 4,160 second-feet. Minimum stage recorded, 0.75 foot at 5 p. m. September 28, 5 p. m. September 29, and 7 a. m. September 30; discharge, 10 second-feet.

Maximum open-water stage recorded 1909–1914, 8.9 feet, March 27, 1913; approximate discharge, 5,100 second-feet. A gage height of 9.4 feet was recorded at 9.15 a. m. January 22, 1910, but channel was probably obstructed by ice at that time. Minimum stage recorded, 0.60 foot, August 10, 1913; discharge, 4 second-feet.

Winter flow.—Discharge relation affected by ice.

Regulation.—Flow not seriously affected by regulation.

Accuracy.—Results fair.

The following discharge measurement was made by C. H. Pierce:

August 14, 1914: Gage height, 0.99 foot; discharge, 23.9 second-feet. Measuring conditions unfavorable.

Daily gage height, in feet, of Westfield River at Knightville, Mass., for the year ending Sept. 30, 1914.

[C. S. Burr, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.02	1.84	2.2	2.0	.....	3.9	3.4	1.53	1.28	0.92	1.26
2	1.27	1.81	2.35	1.90	4.6	5.5	3.0	1.48	1.59	.90	1.16
3	1.52	1.75	2.4	2.15	3.9	4.2	2.9	1.46	1.64	.85	1.12
4	1.46	1.71	2.55	2.2	3.4	3.7	2.7	1.72	1.54	.88	1.04
5	1.36	1.68	2.45	2.1	3.0	3.4	3.2	2.05	1.36	.95	1.03
6	1.22	1.68	2.25	2.15	2.8	3.4	4.0	1.14	1.44	.90	.95
7	1.10	1.66	3.4	2.35	2.55	3.7	3.1	1.52	1.60	.92	.88
8	1.11	1.68	3.2	2.1	2.45	4.0	2.95	1.46	1.66	.90	.90
9	1.10	4.4	2.7	1.98	2.4	5.4	2.75	1.42	1.62	.86	.86
10	1.12	4.6	2.4	1.90	2.3	4.2	2.65	1.38	1.49	.79	.82
11	1.11	3.3	2.35	1.92	2.25	4.0	2.5	1.36	1.46	.80	.85
12	1.40	2.7	2.25	1.90	2.2	4.2	2.6	1.30	1.42	1.14	.90
13	1.66	2.5	2.2	.....	2.25	4.1	4.7	1.26	1.40	1.12	.86
14	1.48	2.45	2.3	.....	2.3	3.8	3.4	1.17	1.28	1.00	.82
15	1.37	2.3	2.35	.....	2.2	3.6	3.0	1.10	1.20	.96	.80
16	1.23	2.3	2.2	.....	2.4	3.6	2.75	1.34	1.08	.86	.86
17	1.20	2.25	2.15	.....	2.8	3.4	2.6	1.30	1.02	.82	.81
18	1.11	2.2	2.1	.....	3.1	4.0	2.5	1.24	1.18	.86	.82
19	1.06	2.2	1.96	.....	2.65	4.6	2.4	1.20	1.08	1.02	.82
20	1.40	2.8	1.90	.....	2.55	4.6	2.25	1.32	1.04	1.23	.81
21	2.2	2.5	2.0	.....	2.4	4.4	2.1	1.32	1.05	1.28	.80
22	1.56	2.3	2.0	.....	2.3	3.8	2.1	1.20	1.02	2.25	.80
23	1.38	2.2	1.99	.....	2.3	3.4	2.05	1.18	1.06	1.52	.79
24	1.38	2.1	2.2	.....	2.3	3.1	1.99	1.20	1.00	1.28	.79
25	2.3	2.1	2.25	.....	2.3	3.0	1.85	1.12	1.00	1.24	.82
26	4.0	2.05	2.2	.....	2.95	3.9	1.90	1.12	.98	.96	.82
27	4.0	2.05	1.98	.....	5.2	4.2	1.87	1.05	.96	.96	.78
28	2.75	2.05	1.80	.....	7.4	3.7	1.79	1.15	.96	.96	.78
29	2.4	2.35	1.85	.....	4.7	3.5	1.68	1.20	.92	2.05	.76
30	2.0	2.3	1.89	.....	3.9	3.7	1.65	1.32	.97	2.10	.78
31	2.0	.....	1.92	.....	3.6	.....	1.60	.....	.94	1.46	.....

NOTE.—Daily gage height is the mean of two readings made at about 7 a. m. and 5 p. m. Discharge relation affected by ice Dec. 29 to Mar. 1. No records obtained Jan. 13 to Mar. 1.

Daily discharge, in second-feet, of Westfield River at Knightville, Mass., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	30	164	280	.....	1,240	920	95	58	22	55
2	56	156	342	1,710	2,350	675	87	106	20	44
3	94	141	365	1,240	1,440	620	84	116	16	39
4	84	131	435	920	1,120	510	134	97	19	32
5	68	125	388	675	920	795	226	68	24	31
6	50	125	300	565	920	1,310	139	80	20	24
7	37	121	920	435	1,120	735	94	108	22	19
8	38	125	795	388	1,310	648	84	121	20	20
9	37	1,570	510	365	2,280	538	77	112	17	17
10	39	1,710	365	320	1,440	485	71	88	12	14
11	38	855	342	300	1,310	410	68	84	13	16
12	74	510	300	280	1,440	460	60	77	41	20
13	121	410	280	300	1,380	1,780	55	74	39	17
14	87	388	320	320	1,180	920	45	58	28	14
15	70	320	342	280	1,050	675	37	48	25	13
16	52	320	280	365	1,050	538	66	35	17	17
17	48	300	262	565	920	460	60	30	14	14
18	38	280	245	735	1,310	419	53	46	17	14
19	33	280	198	485	1,710	365	48	35	30	14
20	74	565	180	435	1,710	300	63	32	52	14
21	280	410	210	365	1,570	245	63	32	58	13
22	101	320	210	320	1,180	245	48	30	300	13
23	71	280	207	320	920	228	46	33	94	12
24	71	245	280	320	735	207	48	28	58	12
25	320	245	300	320	675	166	39	28	53	14
26	1,310	228	280	648	1,240	180	39	26	25	14
27	1,310	228	204	2,130	1,440	172	32	25	25	12
28	538	228	153	3,840	1,120	151	42	25	25	12
29	365	342	.....	1,780	985	125	48	22	226	11
30	280	320	.....	1,240	1,120	118	63	26	245	12
31	210	.....	.....	1,050	.....	108	.....	23	84	.....

NOTE.—Discharge determined from a well-defined rating curve. No estimates made for winter period.

Monthly discharge of Westfield River at Knightville, Mass., for the year ending Sept. 30, 1914.

[Drainage area, 162 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
October	1,310	30	194	1.20	1.38	B.
November	1,710	121	381	2.35	2.62	B.
December 1–28	920	153	332	2.05	2.14	B.
March 2–31	3,840	280	767	4.73	5.28	C.
April	2,350	675	1,270	7.84	8.75	C.
May	1,780	108	500	3.09	3.56	B.
June	226	32	70.5	.435	.49	B.
July	121	22	57.1	.352	.41	B.
August	300	12	53.6	.331	.38	B.
September	55	11	19.1	.118	.13	C.

WESTFIELD RIVER NEAR WESTFIELD, MASS.

Location.—About a mile below Big Brook, 2 miles below Westfield Little River, and 3 miles below Westfield.

Drainage area.—496 square miles.

Records available.—June 27 to September 30, 1914.

Gage.— Gurley electric water-stage recorder on right bank, referenced to gage datum by means of a hook gage inside of well. Inclined staff used for auxiliary readings.

Discharge measurements.—Made from cable or by wading about one-half mile below gage.

Channel and control.—Riffle of bowlders about 200 feet below gage forms control at low and medium stages. At high stages control is probably formed by crest of dam at Mittineague, 3 miles below station.

Extremes of discharge.—Maximum stage recorded June 27 to September 30, 1914, 4.20 feet at 8 a. m. July 8; discharge, 530 second-feet. Minimum stage recorded, 3.02 feet at 9 a. m. September 24; discharge, 46 second-feet.

Winter flow.—Discharge relation affected by ice.

Diversions.—Water diverted from Westfield Little River and carried to Springfield for municipal use.

Regulation.—Distribution of flow affected by operation of power plants at a number of dams above station, the nearest being at Westfield.

Discharge measurements of Westfield River near Westfield, Mass., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-feet.*			*Feet.*	*Sec.-feet.*
June 27	R. S. Barnes	3.48	184	Sept. 7	R. S. Barnes	3.17	122
July 22	do	3.37	165	24	C. H. Pierce	3.10	67
Aug. 19	C. H. Pierce	3.22	117				

Daily gage height, in feet, and discharge, in second-feet, of Westfield River, near Westfield, Mass., for the year ending Sept. 30, 1914.

Day.	June.		July.		Aug.		Sept.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1			3.48	212	3.37	168		
2			3.83	352	3.31	144		
3			3.69	296	3.26	126		
4			3.50	220	3.26	126		
5			3.40	180	3.48	212		
6			3.58	252	3.24	119	3.22	112
7			3.74	316	3.24	119	3.14	84
8			4.13	495	3.28	133		
9			3.90	380	3.47	208		
10			3.56	244	3.33	152		
11			3.33	152	3.24	119		
12			3.30	140	3.24	119		
13			3.37	168	3.30	140		
14			3.42	188	3.36	164		
15			3.46	204	3.31	144		
16			3.36	164	3.53	232		
17			3.33	152	3.31	144		
18			3.47	208	3.24	119		
19			3.29	136	3.28	133		
20			3.26	126	3.46	204		
21			3.25	122	3.70	300		
22			3.30	140				
23			3.35	160			3.10	70
24			3.61	264			3.12	77
25			3.43	192			3.12	77
26			3.35	160			3.10	70
27	3.48	212	3.39	176			3.12	77
28	3.40	180	3.43	192			3.12	77
29	3.49	216	3.43	192			3.08	64
30	3.52	228	3.34	156			3.08	64
31			3.27	129				

NOTE.—Discharge determined from a well-defined rating curve, several measurements obtained in 1915 being used to define the curve.

MIDDLE BRANCH OF WESTFIELD RIVER AT GOSS HEIGHTS, MASS.

Location.—At highway bridge in Goss Heights, about 1½ miles above village of Huntington, and half a mile above confluence of Middle and North branches of Westfield River.

Drainage area.—53 square miles.

Records available.—July 14, 1910, to September 30, 1914.

Gage.—Barrett & Lawrence water-stage recorder on upstream side of bridge abutment on right bank, referenced to gage datum by means of a hook gage inside of well. Inclined staff is used for auxiliary readings. Prior to September 8, 1912, a chain gage on upstream side of bridge was used.

Discharge measurements.—Made from highway bridge or by wading.

Channel and control.—Coarse gravel and bowlders; somewhat shifting.

Extremes of discharge.—Maximum stage recorded during year (automatic gage), 5.34 feet at 12.30 a. m. April 9; approximate discharge computed from extension of rating curve, 2,560 second-feet. Minimum stage recorded during year (automatic gage), 0.78 foot at 4 a. m. September 20; discharge, 0.3 second-foot.

Maximum open-water stage recorded 1910–1914, 5.38 feet at 3 p. m. March 27, 1913; approximate discharge, 2,600 second-feet. A gage height of 7.2 feet was recorded at 5.30 p. m. February 28, 1913, but channel was obstructed by ice at that time. Minimum stage recorded, 0.78 foot, September 20, 1914; discharge, 0.3 second-foot.

Winter flow.—Discharge relation seriously affected by ice.

Regulation.—Flow somewhat affected by operation of small power plant about 2 miles above station.

Accuracy.—Results good.

Discharge measurements of Middle Branch of Westfield River at Goss Heights, Mass., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 2	R. S. Barnes	[a] 1.62	45.1	Apr. 3	C. H. Pierce	2.52	440
12	do	[b] 1.58	45.3	3	do	2.52	428
23	do	[b] 1.99	33.8	7	R. S. Barnes	2.00	221
Feb. 10	do	[b] 2.66	58	May 25	do	1.37	52
26	do	[b] 2.53	36.1	Aug. 13	C. H. Pierce	.98	5.6

[a] Partial ice cover; discharge relation affected.
[b] Complete ice cover; discharge relation affected.

Daily gage height, in feet, of Middle Branch of Westfield River at Goss Heights, Mass., for the year ending Sept. 30, 1914.

[Monroe Rising, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.04	1.36	1.76	1.65	3.71	2.75	2.50	2.10	1.20	1.00	0.91	0.98
2	1.25	1.32	1.77	1.58	3.28	3.5	3.30	1.95	1.18	1.10	.95	.96
3	1.29	1.32	1.80	1.86	3.06	.....	2.55	1.88	1.18	1.14	.95	.92
4	1.20	1.29	1.83	1.80	3.05	2.20	2.25	1.82	1.22	1.08	.95	.92
5	1.12	1.28	1.77	1.77	3.05	1.94	2.10	2.25	1.31	1.04	.95	.92
6	1.13	1.26	1.72	1.66	2.78	1.72	2.00	2.60	1.25	1.00	.94	.88
7	1.11	1.24	2.05	1.76	2.83	.....	2.10	2.20	1.18	1.08	.93	.90
8	1.10	1.31	2.31	1.64	2.74	1.69	2.82	2.02	1.19	1.20	.92	.83
9	1.07	3.42	1.97	1.65	2.62	1.65	3.75	1.95	1.18	1.08	.91	.85
10	1.03	3.02	1.92	1.65	2.62	1.57	2.65	1.85	1.17	1.02	.92	.85
11	1.07	2.29	1.89	1.47	2.57	1.67	2.50	1.79	1.12	1.00	.93	.84
12	1.19	2.04	1.86	1.58	2.44	1.61	2.70	1.95	1.10	1.00	.95	.84
13	1.30	1.93	1.81	1.58	2.43	1.55	2.50	2.95	1.09	1.00	.96	.82
14	1.21	1.87	1.78	1.68	2.55	.....	2.25	2.30	1.08	1.00	.94	.81
15	1.16	1.86	1.74	1.80	2.65	1.45	2.25	2.05	1.09	1.00	.93	.80
16	1.14	1.82	1.71	1.86	2.66	1.56	2.20	1.95	1.12	1.00	.91	.80
17	1.12	1.81	1.68	1.91	2.67	1.74	2.35	1.85	1.10	1.00	.90	.80
18	1.09	1.79	1.62	1.93	2.68	1.96	2.70	1.79	1.10	.98	.91	.81
19	1.07	1.78	1.59	1.92	2.73	1.77	2.90	1.74	1.09	.96	.91	.80
20	1.28	1.98	1.77	1.89	2.75	1.63	3.10	1.69	1.09	.94	.95	.79
21	1.48	1.94	1.84	1.98	2.72	.....	2.85	1.63	1.09	.92	1.30	.80
22	1.31	1.85	1.65	1.97	2.72	1.70	2.35	1.60	1.05	1.01	1.35	.80
23	1.24	1.78	1.48	1.97	2.65	1.70	2.15	1.53	.96	1.01	1.18	.80
24	1.18	1.70	1.57	2.05	2.63	1.63	2.00	1.49	.96	.91	1.08	.80
25	1.72	1.68	1.58	2.78	2.61	1.53	1.92	1.40	.95	.92	1.02	.81
26	3.08	1.69	1.55	3.11	2.58	1.65	2.50	1.32	.90	.91	.98	.84
27	2.57	1.65	1.60	3.35	2.54	3.04	2.65	1.30	.91	.90	.91	.85
28	1.83	1.60	1.80	3.31	.....	.....	2.38	1.31	.95	.90	.93	.85
29	1.62	1.69	1.91	3.19	.....	2.91	2.24	1.25	1.01	.90	.94	.85
30	1.51	1.77	1.84	3.37	.....	2.31	2.30	1.23	1.05	.90	1.05	.88
31	1.43	.....	1.75	3.68	.....	2.21	.....	1.22	.....	.91	1.04	.....

NOTE.—Discharge relation Dec. 27 to Mar. 1 affected by ice.

Daily discharge, in second-feet, of Middle Branch of Westfield River at Goss Heights, Mass., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	8.4	49	146	51	530	80	426	256	23	6.4	2.9	5.6
2	30	41	149	38	314	1,040	905	204	21	12	4.4	4.8
3	36	41	158	99	221	667	451	182	21	16	4.4	3.2
4	23	36	167	87	211	294	314	164	26	11	4.4	3.2
5	14	35	149	80	201	201	256	314	40	8.4	4.4	3.2
6	15	32	135	57	114	135	221	476	30	6.4	4.0	2.0
7	13	29	238	80	119	131	256	294	21	11	3.6	2.6
8	12	39	339	53	90	127	599	228	22	23	3.2	1.0
9	10	984	211	57	55	117	1,220	204	21	11	2.9	1.4
10	7.9	723	194	57	49	97	503	173	20	7.4	3.2	1.4
11	10	330	185	27	39	122	426	155	14	6.4	3.6	1.2
12	21	235	176	45	20	107	530	204	12	6.4	4.4	1.2
13	38	198	161	38	19	92	426	678	11	6.4	4.8	.8
14	24	179	152	47	36	80	314	335	11	6.4	4.0	.6
15	18	176	140	61	55	67	314	238	11	6.4	3.6	.5
16	16	164	132	63	59	94	294	204	14	6.4	2.9	.5
17	14	161	124	63	61	140	357	173	12	6.4	2.6	.5
18	12	155	109	59	63	208	530	155	12	5.6	2.9	.6
19	10	152	102	49	75	149	647	141	11	4.8	2.9	.5
20	35	214	149	36	80	112	775	127	11	4.0	4.4	.4
21	75	201	170	45	75	121	617	112	11	3.2	38	.5
22	39	173	117	36	75	130	357	104	8.9	6.9	47	.5
23	29	152	75	30	59	130	275	87	4.8	6.9	20	.5
24	20	130	97	38	55	112	221	78	4.8	2.9	11	.5
25	135	124	99	221	51	87	195	57	4.4	3.2	7.4	.6
26	762	127	92	335	45	117	426	42	2.6	2.9	5.6	1.2
27	461	117	85	426	38	736	503	38	2.9	2.6	2.9	1.4
28	167	104	75	402	59	695	370	40	4.4	2.6	3.6	1.4
29	109	127	67	335	.....	653	310	30	6.9	2.6	4.0	1.4
30	82	149	61	402	.....	339	335	28	8.9	2.6	8.9	2.0
31	63	.....	55	530	.....	298	.....	26	.....	2.9	8.4	.....

NOTE.—Discharge determined from a rating curve fairly well defined below 1,200 second-feet. Discharge Dec. 27 to Mar. 1 determined from gage heights corrected for backwater effect by means of 5 discharge measurements and climatic data.

Monthly discharge of Middle Branch of Westfield River at Goss Heights, Mass., for the year ending Sept. 30, 1914.

[Drainage area, 53 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
October	762	7.9	74.5	1.41	1.63	B.
November	984	29	179	3.38	3.77	A.
December	339	55	139	2.62	3.02	A.
January	530	27	127	2.40	2.77	B.
February	530	19	102	1.92	2.00	B.
March	1,040	67	241	4.55	5.25	B.
April	1,220	195	446	8.42	9.39	A.
May	678	26	179	3.38	3.90	A.
June	40	2.6	14.1	.266	.30	B.
July	23	2.6	6.81	.129	.15	B.
August	47	2.6	7.43	.140	.16	B.
September	5.6	.4	1.51	.028	.03	C.
The year	1,220	.4	126	2.38	32.37	

WESTFIELD LITTLE RIVER NEAR WESTFIELD,[1] MASS.

Location.—At diversion dam of Springfield waterworks, in town of Russell, 3 miles below confluence of Pebble and Borden brooks, and about 3 miles west of Westfield; originally (July, 1905, to December, 1909) a short distance below Borden Brook, near Cobble Mountain.

Drainage area.—48 square miles at present site; 43 square miles at original site.

Records available.—July 13, 1905, to December 31, 1909; March 1, 1910, to September 30, 1914.

Determination of discharge.—High-water flow determined from continuous record of head on concrete diversion dam (crest length, 155.4 feet), for which coefficients have been deduced from experiments at Cornell University; low-water flow—less than 163 second-feet—determined from continuous record of head on a 12-foot sharp-crested weir without end contractions, the crest being 2.55 feet below that of dam. Water diverted to city of Springfield is measured by a 54-inch Venturi meter using continuous record chart. Daily record corrected for storage in a reservoir on Borden Brook about 5 miles above station. Owing to the time required for water to reach the dam and the natural storage along the stream, and the fact that no allowance is made for evaporation and seepage from the reservoir, the record as corrected does not represent exactly the natural flow of the stream at all times.

At original site below Borden Brook (used 1905 to 1909), discharge was determined by methods commonly employed at current-meter gaging stations. From August, 1906, to September, 1907, a 30-foot weir was maintained a short distance below gage.[2]

Extremes of discharge.—Maximum discharge for 24 hours recorded during year: 1,490 second-feet, March 28. Minimum discharge apparently 0.0 second-foot at various times when water released from reservoir was equal to or greater than total flow at diversion dam.

Maximum discharge for 24 hours 1910–1914: 1,490 second-feet, March 28, 1914.

Diversions.—Record of water diverted at station for municipal supply of Springfield included in records as published.

Cooperation.—Data collected and compiled under direction of E. E. Lockridge, chief engineer, Board of Water Commissioners, Springfield, Mass.

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[1] Formerly described as near Blanford, Mass.

[2] Results obtained by weir and current-meter methods are compared in U. S. Geol. Survey Water-Supply Papers 201, pp. 105–110, and 241, pp. 164–168.

Daily discharge, in second-feet, of Westfield Little River near Westfield, Mass., for the year ending, Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	9.7	50	110	44	247	129	306	163	15	15	2.8	1.7
2	65	51	96	37	165	736	530	129	17	19	16	3.6
3	31	45	102	48	107	360	316	117	18	41	11	.....
4	19	42	79	44	123	274	265	102	19	19	10	15
5	15	31	73	40	120	182	212	299	26	15	.....	12
6	13	28	52	34	89	165	173	229	10	14	.....	11
7	7.3	35	224	34	80	147	194	215	14	16	.....	.....
8	5.2	66	252	35	69	122	441	155	23	53	.....	.....
9	5.6	649	155	35	50	85	747	136	20	33	3.9	.....
10	6.9	485	93	34	44	89	340	113	19	23	.....	.....
11	19	226	97	25	42	78	271	84	22	22	.....	.....
12	35	149	76	26	32	59	330	146	21	17	.....	1.2
13	38	115	75	23	54	65	323	373	6.0	5.0	.3	.....
14	19	90	72	26	48	63	214	224	.....	2.8	.4	.....
15	18	94	54	19	65	62	195	152	4.3	7.1	18	.9
16	27	87	55	19	49	73	242	113	25	.4	12	3.5
17	14	59	61	47	60	142	370	99	20	6.7	.....	2.0
18	14	81	57	60	60	177	411	79	19	10	.....	2.3
19	7.0	95	42	46	55	128	369	70	20	17	2.0	2.5
20	40	144	33	28	43	98	453	60	20	13	3.0	1.2
21	60	111	41	26	38	81	450	57	10	.....	17	2.2
22	26	105	49	27	34	66	292	43	4.2	1.5	15	2.3
23	28	87	45	26	33	69	214	42	2.4	7.6	14	2.2
24	36	62	66	46	29	63	147	35	.2	8.1	.....	2.8
25	201	62	81	150	27	66	134	34	.....	8.4	.....	2.0
26	872	45	64	84	27	217	385	31	.....	20	2.3	2.4
27	801	51	63	70	27	720	427	29	.....	12	.8	.....
28	314	50	35	75	27	1,490	257	25	5.0	.....	.6	.....
29	168	126	48	81	.....	598	206	22	18	.....	19	.....
30	106	124	41	219	.....	317	171	20	16	1.4	19	.....
31	80	.....	49	259	.....	274	.....	16	.....	2.7	.....	.....

NOTE.—For days for which no discharge estimates are shown the quantity of water released from storage was apparently equal to or greater than the total flow at the diversion dam.

Monthly discharge of Westfield Little River near Westfield, Mass., for the year ending Sept. 30, 1914.

[Drainage area, 48.0 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
October	872	5.2	100	2.08	2.40	
November	649	28	115	2.39	2.67	
December	252	33	78.7	1.64	1.89	
January	259	19	57.0	1.19	1.37	
February	247	27	65.9	1.37	1.43	
March	1,490	59	232	4.83	5.57	
April	747	134	313	6.52	7.28	
May	373	16	110	2.29	2.64	
June	26	.....	13.1	.273	.30	
July	53	.....	13.2	.275	.32	
August	19	.....	5.39	.112	.13	
September	15	.....	2.36	.049	.05	
The year	1,490	.....	92.1	1.92	26.05	

BORDEN BROOK NEAR WESTFIELD, MASS.[1]

Location.—At outlet of Borden Brook reservoir in town of Granville, 2 miles above confluence of Borden and Pebble brooks, and about 8 miles west of Westfield.

Drainage area.—8 square miles.

Records available.—January 1, 1910, to September 30, 1914.

Determination of discharge.—Discharge determined from continuous record of head on a 5-foot sharp-crested weir without end contractions. Daily records corrected for storage in reservoir, but as no allowance is made for evaporation and seepage they show only approximately the natural flow.

Extremes of discharge.—Maximum discharge for 24 hours recorded during year: 255 second-feet, March 27. Minimum discharge of 0.0 second-foot at various times when the decrease in the amount of water held in storage was equal to or greater than total quantity measured at weir.

Maximum discharge for 24 hours recorded 1910–1914: 294 second-feet, October 21, 1911.

Cooperation.—Data collected and compiled under the direction of E. E. Lockridge, chief engineer, Board of Water Commissioners, Springfield, Mass.

Daily discharge, in second-feet, of Borden Brook near Westfield, Mass., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.
1	.....	.....	22	8.6	34	94	102	30	.....	.....
2	.....	11	11	7.2	48	82	99	16	.....	.....
3	.....	9.3	22	6.7	29	56	64	20	.....	22
4	.....	9.3	11	6.7	30	54	60	16	.....	.....
5	.....	.....	11	7.2	26	48	38	85	.....	.....
6	.....	.....	.....	7.6	24	30	40	75	.....	.....
7	.....	9.3	87	7.2	11	33	44	39	.....	.....
8	.....	29	43	6.2	16	29	172	30	.....	11
9	.....	161	32	5.8	14	15	132	35	.....	11
10	.....	80	.....	6.4	3.5	22	85	37	.....	.....
11	14	40	22	6.3	9.7	19	66	17	.....	.....
12	5.8	20	22	4.2	6.7	6.9	65	64	.....	.....
13	9.3	20	11	2.8	21	14	62	55	.....	3.0
14	.....	9.3	11	.....	14	13	39	40	.....	.....
15	.....	20	.....	.....	9.5	16	44	28	.....	7.1
16	9.3	20	11	.....	.....	24	44	19	.....	.4
17	.....	.....	11	8.6	5.5	37	78	21	.....	6.7
18	.....	20	9.3	4.2	7.2	26	76	16	.....	.....
19	8.2	20	9.3	3.9	6.7	26	73	14	.....	.....
20	27	31	.....	4.3	6.7	24	116	12	.....	.....
21	18	11	.....	6.6	6.2	13	82	11	.....	.....
22	18	22	9.3	5.8	5.4	19	45	8.2	.....	.....
23	27	20	9.3	5.0	5.0	17	42	4.3	.....	.....
24	34	11	9.3	16	5.0	16	23	4.6	.....	.....
25	92	11	19	20	5.4	16	43	3.9	.....	.....
26	221	.....	9.3	20	5.8	65	76	3.9	.....	.....
27	113	9.3	19	19	5.8	255	76	3.9	.....	.....
28	47	11	2.7	17	5.4	218	53	3.1	5.0	.....
29	47	32	18	16	.....	117	39	.....	.4	.....
30	27	31	9.5	38	.....	66	29	.....	.....	.....
31	27	.....	9.5	47	.....	68	.....	.....	.....	.....

NOTE.—For days for which no discharge estimates are shown the quantity of water released from storage was apparently equal to or greater than that passing over the weir.

[1] Formerly described as near Blandford, Mass.

Monthly discharge of Borden Brook near Westfield, Mass., for the year ending Sept. 30, 1914.

[Drainage area, 8.0 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
October	221	0.0	24.0	3.00	3.46
November	161	.0	22.2	2.78	3.10
December	87	.0	14.8	1.85	2.13
January	47	.0	10.1	1.26	1.45
February	48	.0	13.1	1.64	1.71
March	255	6.9	49.6	6.20	7.15
April	172	23	66.9	8.36	9.33
May	85	.0	23.0	2.88	3.32
June	5.0	.0	.18	.022	.02
July	22	.0	1.97	.246	.28
August	.0	.0	.00	.000	.00
September	.0	.0	.00	.000	.00
The year	255	.0	18.8	2.35	31.95

FARMINGTON RIVER[1] NEAR NEW BOSTON, MASS.

Location.—At highway bridge one-fourth mile below Clam River and about 1 mile south of New Boston.

Drainage area.—92.7 square miles.

Records available.—May 27, 1913, to September 30, 1914.

Gage.—Barrett & Lawrence water-stage recorder installed June 11, 1913, on left bank at downstream side of bridge, referenced to gage datum by means of a hook gage inside of well. Vertical staff attached to bridge abutment is used for auxiliary readings.

Discharge measurements.—Made from cable 120 feet below gage or by wading.

Channel and control.—Rocky and filled with bowlders.

Extremes of discharge.—Maximum stage recorded during year (automatic gage), 7.64 feet at 4.30 p. m. October 26, 1913; approximate discharge computed from extension of rating curve, 3,200 second-feet. Minimum stage recorded (automatic gage), 2.30 feet at 5 p. m. October 9, 1913; discharge, 6.6 second-feet.

Maximum stage recorded 1913–14, 7.64 feet, October 26, 1913; approximate discharge, 3,200 second-feet. Minimum stage recorded, 2.22 feet at 3 p. m. August 27, 1913; discharge, 4.4 second-feet.

Winter flow.—Discharge relation affected by ice.

Regulation.—Flow affected by storage in Otis reservoir about 5 miles above New Boston, and by operation of a wood-working shop just above station.

Accuracy.—Results only fair for October to December and during winter; results good after April, 1914.

[1] Formerly known as West Branch of Farmington River.

Discharge measurements of Farmington River near New Boston, Mass., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Oct. 9	R. S. Barnes	2.30	6.6	Mar. 31	C. H. Pierce	4.70	520
9	do	2.70	29.6	31	do	4.96	630
15	do	2.96	42.4	Apr. 9	R. S. Barnes	6.15	1,540
15	do	2.95	41.8	9	do	5.60	1,120
15	do	2.98	43.9	9	do	5.00	644
Jan. 6	do	[a] 3.38	75.1	May 24	do	3.36	100
13	do	[a] 3.55	87.4	24	do	3.38	102
28	do	[a] 5.31	128	Aug. 15	C. H. Pierce	3.38	104
Feb. 13	do	[a] 4.34	162	Sept. 10	R. S. Barnes	3.45	141
Mar. 4	do	[a] 7.5	345				

[a] Discharge relation affected by ice.

Daily gage height, in feet, of Farmington River near New Boston, Mass., for the year ending Sept. 30, 1914.

[Sherwood and Rundle, observers.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.75	3.58	3.75	3.35	5.6	.....	4.9	4.3	3.08	3.42	3.44	3.30
2	2.98	3.48	3.66	3.45	5.65	.....	5.5	4.2	3.05	3.14	3.44	3.29
3	2.95	3.40	3.63	3.32	4.8	7.9	5.05	4.0	3.05	2.97	3.43	3.05
4	2.85	3.35	.....	3.25	4.75	7.7	4.65	3.95	3.25	2.93	3.41	2.42
5	2.79	3.35	3.51	3.25	4.6	7.5	4.4	4.6	3.30	3.38	3.42	2.37
6	2.65	3.25	3.45	3.45	4.3	6.8	4.25	5.25	3.15	3.42	3.42	2.37
7	2.63	3.11	3.90	3.25	4.3	6.4	4.35	4.8	3.03	3.42	3.40	.....
8	2.65	3.15	.....	3.10	4.1	6.1	5.2	4.5	2.98	3.18	3.38	.....
9	2.60	5.02	.....	3.02	4.1	5.7	5.9	4.3	3.08	2.93	3.40	.....
10	2.60	5.35	.....	3.07	4.05	5.35	5.2	4.15	3.02	2.88	3.42	.....
11	2.60	4.60	3.70	3.18	3.85	5.15	4.9	4.05	2.98	3.00	3.41	3.45
12	3.15	4.15	3.65	3.25	.....	5.25	5.05	4.25	2.95	3.35	3.40	3.55
13	3.18	3.85	3.55	3.45	4.2	5.25	4.8	4.95	2.91	2.95	3.43	.....
14	2.95	3.78	3.49	.....	4.75	5.15	4.5	4.65	2.91	3.35	3.38	.....
15	2.88	3.70	3.47	.....	4.85	4.85	4.4	4.4	2.98	3.31	3.36	3.41
16	2.83	3.65	3.40	.....	.....	5.2	4.4	4.2	3.35	3.32	3.35	3.41
17	2.75	3.60	3.38	.....	.....	5.4	4.55	4.05	3.40	3.30	3.38	3.42
18	2.80	3.65	3.30	.....	.....	5.2	4.65	3.95	3.40	3.05	3.38	3.44
19	2.95	3.77	3.33	4.25	.....	4.5	4.7	3.7	3.40	3.33	3.38	3.42
20	3.13	4.30	3.28	.....	.....	4.0	4.9	3.6	3.48	3.45	3.38	.....
21	3.32	4.05	3.27	.....	.....	3.95	4.9	3.55	3.46	3.35	3.36	.....
22	3.03	3.90	3.25	.....	4.95	3.85	4.65	3.45	3.41	3.38	3.35	.....
23	2.93	3.75	3.18	.....	.....	3.75	4.35	3.41	3.40	3.38	.....	.....
24	2.85	3.58	3.35	4.15	.....	3.60	4.1	3.35	3.40	3.50	.....	.....
25	3.84	3.61	.....	4.82	.....	3.55	4.2	3.31	3.39	3.47	.....	3.39
26	5.78	3.48	3.35	5.05	.....	4.2	5.2	3.23	3.38	3.47	.....	3.38
27	5.80	3.35	3.27	5.35	.....	5.5	4.8	3.21	3.38	3.43	.....	2.59
28	4.84	3.30	3.35	5.3	.....	6.5	4.45	3.20	3.41	3.39	.....	2.42
29	4.30	3.75	3.35	5.15	.....	5.6	4.1	3.19	3.42	3.44	3.50	3.10
30	3.98	3.92	3.35	5.6	.....	5.05	4.15	3.15	3.43	3.48	.....	3.30
31	3.75	.....	3.32	5.7	.....	4.9	.....	3.12	.....	3.48	3.32	.....

NOTE.—Discharge relatiou Jan. 6 to Mar. 20 affected by ice. Gage heights Aug. 29 and Sept. 11–12, 15–19 are observer's readings as water-stage recorder was not in operation.

Daily discharge, in second-feet, of Farmington River near New Boston, Mass., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	32	121	156	84	.....	600	337	63	107	110	90
2	51	104	137	99	.....	980	302	60	70	110	88
3	48	91	131	80	.....	680	238	60	51	108	60
4	40	84	120	71	.....	478	224	84	47	106	12
5	35	84	109	71	.....	375	455	90	102	107	9.6
6	26	71	99	.....	.....	320	805	71	107	107	9.6
7	24	56	191	.....	.....	356	550	58	107	105	30
8	26	60	250	.....	.....	770	415	52	75	102	50
9	22	594	200	.....	.....	1,310	337	63	47	105	70
10	22	744	160	.....	.....	770	286	56	42	107	91
11	18	425	145	.....	.....	600	254	52	54	106	112.
12	60	264	135	.....	.....	680	320	49	98	105	131
13	63	179	116	.....	.....	550	625	45	49	108	122
14	42	163	105	.....	.....	415	478	45	98	102	114
15	37	145	102	.....	.....	375	375	52	91	99	106
16	33	135	91	.....	.....	375	302	98	93	98	106
17	28	125	88	.....	.....	435	254	105	90	102	107
18	31	135	77	.....	.....	478	224	105	60	102	110
19	42	160	81	.....	.....	500	162	105	94	102	107
20	58	315	75	.....	238	600	141	118	112	102	107
21	80	232	73	.....	224	600	131	114	98	99	106
22	49	191	71	.....	198	478	112	106	102	98	106
23	40	156	63	.....	173	356	106	105	102	100	105
24	34	121	84	.....	141	269	98	105	122	104	104
25	177	127	84	.....	131	302	91	104	116	108	104
26	940	104	84	.....	302	770	81	102	116	112	102
27	950	84	73	.....	980	550	78	102	108	116	21
28	521	77	84	.....	1,900	395	77	106	104	120	12
29	315	156	84	.....	1,060	269	76	107	110	122	65
30	213	196	84	.....	680	286	71	108	118	108	90
31	156	.....	80	.....	600	.....	67	.....	118	93	.....

NOTE.—Discharge determined as follows: Oct. 1–10, from a well-defined rating curve; Oct. 11 to Jan. 5, from a curve fairly well defined below 200 second-feet; Mar. 20 to Sept. 30, from a rating curve well defined below 1,600 second-feet. Discharge during winter estimated from discharge measurements and climatic records. Discharge Jan. 6–31 estimated, 94 second-feet; Mar. 1 to 19, 317 second-feet. Discharge Dec. 4, 8–10, and 25 estimated by comparison with records at adjacent stations, and interpolated for days for which gage heights are not recorded during August and September.

Monthly discharge of Farmington River near New Boston, Mass., for the year ending Sept. 30, 1914.

[Drainage area, 92.7 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
October	350	18	136	1.47	1.70	C
November	744	56	183	1.97	2.20	C
December	a 250	63	111	1.20	1.38	C
January	.....	.....	80.0	.863	.99	D
February	.....	.....	a 130	1.40	1.46	D
March	.....	.....	408	4.40	5.07	C
April	1,310	269	531	5.73	6.39	C
May	805	67	260	2.80	3.23	B
June	114	45	83.0	.895	1.00	A
July	122	42	90.6	.978	1.13	A
August	122	93	106	1.14	1.31	C
September	131	9.6	81.6	.880	.98	C
The year	1,900	9.6	183	1.97	26.84	

a Estimated.

NOTE.—Attention is called to the fact that the monthly discharge in second-feet per square mile and the run-off depth in inches do not represent the natural flow from the basin because of artificial storage. The yearly discharge and run-off doubtless represent more nearly the natural flow, for probably little stored water is held over from year to year.

HOUSATONIC RIVER BASIN.

HOUSATONIC RIVER NEAR GREAT BARRINGTON, MASS.

Location.—At highway bridge about one-fourth mile northeast of Van Deusenville station of New York, New Haven & Hartford Railroad (Berkshire division) and 2 miles north of Great Barrington.

Drainage area.—280 square miles.

Records available.—May 17, 1913, to September 30, 1914.

Gage.—Inclined staff attached to concrete anchorages on downstream side of left abutment of highway bridge; vertical high-water section attached to bridge abutment.

Discharge measurements.—Made from upstream side of highway bridge or by wading.

Channel and control.—Bed composed of sand and gravel; control practically permanent.

Extremes of discharge.—Maximum stage recorded during year, 7.9 feet at 7.30 a. m. March 29; approximate discharge computed from extension of rating curve, 5,200 second-feet. Zero flow recorded on morning of August 11; water held back by mills.

Maximum stage recorded 1913–14, 7.9 feet, March 29, 1914; approximate discharge, 5,200 second-feet. Zero flow recorded on morning of August 11, 1914.

Winter flow.—Discharge relation affected by ice.

Regulation.—Flow not seriously affected by dam of a paper mill about a mile above station, as mill runs continuously throughout the 24 hours.

Accuracy.—Results fair.

Discharge measurements of Housatonic River near Great Barrington, Mass., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Oct. 18	R. S. Barnes	1.48	159	Mar. 20	C. H. Pierce	2.88	837
19	do	.74	13.7	Apr. 16	R. S. Barnes	3.96	1,590
Mar. 3	do	3.38	1,170	17	do	4.00	1,680
3	C. H. Pierce	3.27	1,130	Aug. 16	O. W. Hartwell	1.19	80
19	do	3.12	996	Sept. 27	R. S. Barnes	.66	12.4

Daily gage height, in feet, of Housatonic River near Great Barrington, Mass., for the year ending Sept. 30, 1914.

[Martin Love, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.40	1.8	1.8	1.75	2.3	4.5	3.5	2.0	1.7	1.20	1.36
2	1.40	1.15	2.1	1.7	2.65	5.1	3.4	2.0	1.65	1.15	1.41
3	1.34	1.8	2.4	1.75	3.1	6.1	2.9	1.8	1.6	1.25	1.5
4	1.24	1.65	2.0	2.15	2.85	5.4	2.85	1.8	1.35	1.6	1.5
5	1.04	1.5	2.05	2.1	3.2	5.2	3.0	1.9	1.05	1.6	1.6
6	1.6	1.75	2.1	1.75	3.0	3.8	4.0	1.85	1.28	1.42	1.05
7	1.29	1.85	2.0	2.15	2.8	3.7	3.8	1.8	1.9	1.30	1.38
8	1.35	1.49	2.4	2.1	2.65	4.1	3.4	1.8	1.9	.75	1.6
9	1.44	1.04	3.2	2.3	2.3	6.2	3.2	1.85	1.8	1.02	1.45
10	1.6	3.0	2.6	2.0	2.55	7.0	2.9	1.8	2.05	.90	1.5
11	1.48	3.4	2.55	2.0	2.45	6.6	2.75	1.9	1.9	1.15	1.41
12	.88	3.2	2.55	1.75	2.35	5.0	3.0	2.0	1.5	1.5	1.6
13	1.24	2.65	2.5	1.75	2.25	4.8	3.8	1.42	1.55	1.5	1.05
14	1.7	2.4	2.15	1.8	2.05	4.5	3.8	1.45	1.7	1.55	1.75
15	1.40	2.3	2.1	1.26	2.05	4.2	3.7	1.6	1.7	1.42	1.5
16	1.40	2.15	2.35	1.6	2.05	4.1	3.5	1.6	1.75	1.25	1.6
17	1.20	1.8	2.3	1.55	2.0	5.4	2.8	1.7	1.7	1.30	1.41
18	1.18	2.2	2.1	.....	2.65	4.0	2.95	1.7	1.5	1.46	1.6
19	.80	2.2	2.1	.....	3.3	4.0	2.6	1.8	1.11	1.55	1.35
20	.99	2.35	2.05	.....	3.3	4.8	2.6	1.20	1.8	1.5	.89
21	1.7	2.35	1.8	.....	2.6	6.0	2.6	1.8	1.55	1.6	1.20
22	1.45	2.25	2.0	.....	1.95	5.7	2.55	2.0	1.7	2.05	1.5
23	1.39	2.1	2.15	.....	2.25	5.0	2.35	2.05	1.55	1.35	1.41
24	1.6	1.8	2.05	.....	2.3	3.8	2.1	1.65	1.45	2.0	1.49
25	1.8	2.1	1.5	.....	2.4	3.8	1.9	1.6	1.42	1.75	1.49
26	2.7	1.95	2.15	.....	3.0	3.8	2.25	1.75	.75	1.55	1.28
27	3.9	2.1	2.35	.....	5.0	4.0	2.15	1.15	1.20	1.48	1.00
28	3.3	1.9	1.76	.....	7.3	4.0	2.45	1.5	1.38	1.75	1.31
29	3.1	2.2	1.92	.....	7.8	4.0	2.05	1.00	1.45	1.32	1.36
30	2.2	1.8	1.78	.....	6.6	3.7	1.65	1.75	1.55	.80	1.30
31	2.1	.....	1.85	.....	5.0	.....	1.9	.....	1.48	1.28	.....

NOTE.—Gage heights determined from two readings a day taken at about 7 a. m. and 5 p. m. River frozen over Jan. 18 to Feb. 28; observations discontinued.

Daily discharge, in second-feet, of Housatonic River near Great Barrington, Mass., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	135	255	255	240	470	2,060	1,260	335	225	85	125
2	135	75	375	225	670	2,560	1,190	335	210	122	138
3	120	255	520	240	980	3,460	840	255	195	97	165
4	95	210	335	397	805	2,830	805	255	122	195	165
5	54	165	355	375	1,050	2,650	910	295	56	195	195
6	195	240	375	240	910	1,500	1,660	275	105	141	56
7	107	275	335	397	770	1,420	1,500	255	295	110	130
8	122	162	520	375	670	1,740	1,190	255	295	17	195
9	147	54	1,050	470	470	3,550	1,050	275	255	51	150
10	195	910	640	335	610	4,300	840	255	355	34	165
11	159	1,190	610	335	550	3,920	735	295	295	75	138
12	31	1,050	610	240	495	2,470	910	335	165	165	195
13	95	670	580	240	445	2,300	1,500	141	180	165	56
14	225	520	397	255	355	2,060	1,500	150	225	180	240
15	135	470	375	106	355	1,820	1,420	195	225	141	165
16	135	397	495	195	355	1,740	1,260	195	240	97	195
17	85	255	470	180	335	1,830	770	225	225	110	138
18	81	420	375	.....	670	1,660	875	225	165	153	195
19	22	420	375	.....	1,120	1,660	640	255	67	180	122
20	47	495	355	.....	1,120	2,300	640	85	255	165	32
21	225	495	255	.....	640	3,370	640	255	180	195	85
22	150	445	335	.....	315	3,100	610	335	225	355	165
23	132	375	397	.....	445	2,470	495	355	180	122	138
24	195	255	355	.....	470	1,500	375	210	150	335	162
25	255	375	165	.....	520	1,500	295	195	141	240	162
26	700	315	397	.....	910	1,500	445	240	17	180	105
27	1,580	375	495	.....	2,470	1,660	397	75	85	159	48
28	1,120	295	240	.....	4,580	1,660	550	165	130	240	112
29	980	420	295	.....	5,070	1,660	355	48	150	115	125
30	420	255	255	.....	3,920	1,420	210	240	180	22	110
31	378	.....	275	.....	2,470	.....	295	.....	159	105	.....

NOTE.—Discharge determined from a rating curve well defined below 2,000 second-feet, but not defined for high stages. Discharge estimates Oct. 1 to Dec. 31 supersede those published in U. S. Geological Survey Water-Supply Paper 351, p. 105

Monthly discharge of Housatonic River near Great Barrington, Mass., for the year ending Sept. 30, 1914.

[Drainage area, 280 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
October	1,580	22	273	0.975	1.12	B.
November	1,190	54	403	1.44	1.61	B.
December	1,050	165	415	1.48	1.71	B.
January 1–17	470	100	285	1.02	.64	B.
March	5,070	315	1,130	4.04	4.66	C.
April	4,300	1,420	2,390	8.18	9.13	C.
May	1,660	210	844	3.01	3.47	B.
June	355	48	234	.835	.93	B.
July	355	17	186	.664	.77	B.
August	355	17	147	.525	.61	B.
September	240	32	139	.496	.55	B.

HOUSATONIC RIVER AT GAYLORDSVILLE, CONN.

Location.—At covered wooden highway bridge at Gaylordsville, about 2 miles below Tenmile River.

Drainage area.—1,020 square miles.

Records available.—October 24, 1900, to September 30, 1914.
Gage.—Chain attached to bridge.
Discharge measurements.—Made from a cable 1¼ miles below gage.
Channel and control.—Large bowlders and rocks; channel probably somewhat shifting. At high stages dam at Milford, Conn., 7 miles below station, may cause backwater at gage.
Winter flow.—Discharge relation affected by ice for short periods.
Regulation.—Flow affected by the operation of a power plant a mile above the station.
Cooperation.—Gage heights furnished by the Weather Bureau and private parties.

Estimates withheld for additional data.

Daily gage height, in feet, of Housatonic River at Gaylordsville, Conn., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	3.0	5.3	5.0	4.8	6.3	3.9	8.0	6.3	4.8	3.8	3.3	3.5
2	3.9	4.8	5.1	4.7	6.0	5.6	7.8	6.3	4.8	4.2	3.2	3.3
3	4.6	4.9	5.1	4.5	5.7	5.7	7.8	5.8	4.6	3.8	3.5	3.2
4	4.2	4.7	5.1	4.4	5.7	5.7	7.8	5.7	4.1	3.4	3.6	3.5
5	3.9	4.5	4.9	4.4	5.6	5.5	7.6	5.6	4.9	3.1	3.6	3.4
6	3.9	4.6	4.8	4.4	5.7	5.4	6.7	7.0	4.8	3.7	3.6	3.4
7	3.9	4.5	4.4	4.5	5.2	5.2	6.7	7.0	4.2	3.4	3.4	3.5
8	3.6	4.6	5.6	4.5	4.9	4.8	6.6	6.6	4.6	4.6	3.5	3.5
9	3.4	4.5	5.5	4.6	4.6	5.2	7.6	6.5	4.6	4.6	2.7	3.0
10	3.7	5.7	5.3	4.4	4.6	5.0	7.6	6.1	4.5	4.1	3.5	3.4
11	3.7	5.6	5.3	3.9	4.7	5.0	8.0	6.1	4.2	3.8	3.0	3.5
12	3.5	5.6	4.9	4.3	4.6	5.0	7.6	5.9	4.0	3.4	3.5	3.3
13	4.4	5.6	4.9	3.9	4.5	4.9	7.5	6.6	4.0	4.0	3.7	2.5
14	4.0	5.2	4.9	3.9	4.5	5.0	7.0	6.5	3.7	3.6	3.2	3.4
15	4.0	5.1	5.1	3.8	3.8	4.8	6.8	6.5	4.0	4.1	3.5	3.5
16	3.8	4.9	5.0	3.9	4.4	5.0	6.8	6.1	3.8	4.0	2.8	3.4
17	3.9	5.1	4.9	3.8	4.6	5.9	7.0	6.0	4.1	4.0	3.0	3.5
18	3.6	5.1	5.2	3.7	4.5	6.9	7.0	5.9	3.6	3.6	3.1	3.5
19	3.4	5.1	5.0	3.8	4.4	6.7	7.0	5.6	3.5	2.8	3.4	3.5
20	3.9	5.2	4.7	3.7	4.4	6.2	6.7	5.6	3.8	3.6	3.7	2.6
21	4.1	5.5	4.7	3.9	4.3	5.6	6.9	5.1	3.5	3.6	3.9	3.0
22	3.9	5.3	5.0	4.1	3.9	5.2	7.0	5.4	4.0	3.7	3.3	3.1
23	3.9	4.8	4.9	4.0	4.4	5.2	7.3	5.1	3.6	3.4	3.6	3.1
24	4.1	4.9	5.0	4.2	4.3	5.1	7.3	5.9	4.1	3.4	3.5	3.1
25	5.2	4.8	5.0	6.0	4.2	5.2	7.0	5.8	4.1	3.6	3.4	3.1
26	6.1	4.9	5.0	5.5	4.2	6.0	6.6	5.8	4.0	3.1	3.5	3.1
27	7.8	4.6	4.9	5.3	4.2	8.0	6.8	4.9	3.8	3.8	3.4	2.6
28	7.0	4.9	4.9	5.2	4.2	9.5	6.5	5.0	3.1	3.7	3.5	3.1
29	6.2	4.6	4.8	3.5	.....	10.2	6.5	5.0	4.0	3.6	3.4	3.1
30	5.9	5.1	4.9	5.5	.....	10.0	6.6	4.7	3.6	3.6	3.6	3.1
31	5.4	.....	4.9	5.5	.....	8.5	.....	4.1	.....	3.6	3.4	.....

NOTE.—Gage read once daily at about 8 a. m. Discharge relation probably not seriously affected by ice.

POMPERAUG RIVER AT BENNETTS BRIDGE, CONN.

Location.—Just above New York & New England Railroad bridge, about 1,100 feet above mouth, one-fourth mile north of Bennetts Bridge, and a mile east of Sandy Hook railroad station.
Drainage area.—89.3 square miles.
Records available.—July 30, 1913, to September 30, 1914.
Gage.—Inclined staff on right bank.
Discharge measurements.—Made from cable at gage or by wading about 250 feet above gage.
Channel and control.—Channel composed of coarse gravel, bowlders, and alluvial deposits. Control formed by large rocks about 100 feet below gage.

Extremes of discharge.—Maximum stage recorded during year, 7.4 feet at 10 a. m. March 2; discharge, 2,520 second-feet. Minimum stage recorded, 0.68 foot at 7 a. m. and 6.30 p. m. September 20; discharge, 7.7 second-feet.

Maximum stage recorded 1913–14, 7.4 feet, March 2, 1914; discharge, 2,520 second-feet. Minimum stage recorded, 0.68 foot, September 20, 1914; discharge, 7.7 second-feet.

Winter flow.—Discharge relation affected by ice.

Regulation.—Flow slightly affected by operation of power plants at South Britain, 2½ miles above station.

Accuracy.—Results good.

Discharge measurements of Pomperaug River at Bennetts Bridge, Conn., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Oct. 16	R. S. Barnes	1.59	39.7	Nov. 3	A. J. Ellis	2.66	237
17	do	1.58	39.2	Jan. 14	R. S. Barnes	a2.90	21.6
17	do	1.58	38.6	27	do	a2.40	53.8
27	A. J. Ellis	4.71	801	Mar. 2	do	6.80	2,080
28	do	3.80	482	2	do	6.33	1,750
28	do	3.78	472	Aug. 16	C. H. Pierce	1.22	25.7
29	do	3.46	382	16	do	1.22	25.3
29	do	3.44	380	Sept. 11	R. S. Barnes	1.10	20.3
29	do	3.44	381				
31	do	3.00	276				

a Discharge relation affected by ice.

Daily gage height, in feet, of Pomperaug River at Bennetts Bridge, Conn., for the year ending Sept. 30, 1914.

[W. H. Ingram, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.31	2.9	2.55	2.26	3.9	2.9	2 9	2.65	1.70	1.46	1.40	1.18
2	2.6	2.8	2.48	2.16	2.95	6.3	3.45	2.5	1.82	2.35	1.34	1.16
3	2.16	2.7	2.44	2.22	2.7	4.2	3.05	2.38	1.67	2.00	1.32	1.15
4	1.80	2.65	2.38	2.29	2.7	4.0	2.8	2.35	1.88	1.70	1.38	1.14
5	1.64	2.6	2.36	2.36	2.6	3.6	2.65	3.25	2.28	1.55	1.34	1.09
6	1.56	2.5	2.32	2.16	2.45	3.35	2.6	4.0	1.81	1.46	1.31	1.08
7	1.50	2.46	2.41	2.14	2.46	2.9	2.55	3.4	1.62	1.59	1.26	1.05
8	1.51	2.41	3.2	2.15	2.40	2.6	2.65	2.9	1.65	2.00	1.20	1.11
9	1.49	3.35	2.7	2.19	2.28	2.6	3.5	2.85	1.55	1.75	1.19	1.08
10	1.46	3.7	2.55	2.25	2.6	2.42	2.95	2.75	1.58	1.54	1.24	1.06
11	1.45	3.1	2.55	2.15	2.19	2.31	2.8	2.6	1.65	1.48	1.75	1.05
12	2.05	2.9	2.46	2.18	2.42	2.18	2.7	3.0	1.52	1.59	1.54	1.05
13	2.05	2.8	2.40	2.9	3.05	2.09	2.6	3.45	1.45	1.46	1.38	.99
14	1.76	2.8	2.42	2.9	2.7	2.19	2.48	3.1	1.31	1.38	1.31	1.02
15	1.64	2.75	2.42	2.5	2.55	2.55	2.42	2.8	1.39	2.05	1.29	.91
16	1.60	2.7	2.32	2.22	2.45	3.15	3.4	2.6	1.54	2.02	1.22	.90
17	1.51	2.95	2.32	2.21	2.18	3.4	2.9	2.5	1.55	1.72	1.21	.88
18	1.49	2.85	2.29	2.02	2.11	3.2	2.6	2.44	1.34	1.68	1.19	.89
19	1.49	2.7	2.19	2.08	2.15	2.9	2.5	2.32	1.29	1.50	1.22	.89
20	1.70	2.9	2.10	2.04	2.12	2.55	2.5	2.28	1.65	1.42	1.56	.68
21	2.20	2.75	2.18	2.40	2.12	2.25	2.8	2.24	1.49	1.36	1.51	.96
22	1.85	2.65	2.5	2.19	2.00	2.29	2.65	2.14	1.56	1.31	2.02	.89
23	1.64	2.6	2.44	2.02	2.12	2.24	2.5	2.06	1.64	1.40	1.54	1.05
24	1.68	2.5	3.6	3.5	2.00	2.31	2.38	1.99	1.51	1.38	1.40	.96
25	4.6	2.48	2.8	4.3	1.91	2.5	2.31	1.92	1.42	1.31	1.30	.81
26	6.0	2.44	3.1	2.6	1.96	3.1	3.5	1.85	1.38	1.28	1.25	.84
27	5.2	2.39	2.7	2.44	2.12	3.5	3.35	1.81	1.34	1.26	1.20	1.09
28	3.9	2.35	2.42	2.6	2.16	4.6	3.0	1.76	1.31	1.32	1.21	1.61
29	3.45	2.75	2.36	2.7	.....	4.6	2.9	1.66	1.38	1.71	1.25	1.69
30	3.2	2.65	2.30	2.7	.....	3.8	2.8	1.51	1.48	1.64	1.25	1.64
31	3.0	.....	2.29	3.8	.....	3.1	.....	1.39	.....	1.51	1.22	.....

NOTE.—Gage read twice daily at about 7 a. m. and 6 p. m. Discharge relation Jan. 12 to Mar. 1 affected by ice, and Sept. 27-30 by construction of a temporary dam on control.

Daily discharge, in second-feet, of Pomperaug River at Bennetts Bridge, Conn., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	24	250	180	125	.....	250	200	62	41	36	24
2	190	230	166	109	1,730	385	170	74	144	32	23
3	109	210	158	118	610	280	149	59	95	31	22
4	58	200	146	130	550	230	144	81	62	35	22
5	43	190	143	143	430	200	325	133	48	32	20
6	38	170	136	109	355	190	550	73	41	31	19
7	34	162	152	105	250	180	370	54	51	28	18
8	35	152	310	107	190	200	250	57	95	25	20
9	34	355	210	113	190	400	240	48	67	24	19
10	32	460	180	124	156	260	220	50	47	27	19
11	32	290	180	107	138	230	190	57	42	67	18
12	92	250	162	.....	118	210	270	46	51	47	18
13	92	230	150	.....	106	190	385	40	41	35	17
14	54	230	154	.....	120	166	290	31	35	31	18
15	43	220	154	.....	180	156	230	35	101	30	14
16	40	210	136	.....	300	370	190	47	97	26	14
17	35	260	136	.....	370	250	170	48	64	26	13
18	34	240	130	.....	310	190	159	32	60	24	14
19	34	210	113	.....	250	170	139	30	44	26	14
20	48	250	99	.....	180	170	133	57	38	49	7.7
21	115	220	112	.....	128	230	127	43	34	45	16
22	64	200	170	.....	134	200	113	49	31	97	14
23	43	190	158	.....	127	170	102	56	36	47	18
24	46	170	430	.....	138	149	94	45	35	36	16
25	760	166	230	.....	170	138	85	38	31	30	11
26	1,520	158	290	.....	290	400	78	35	29	28	12
27	1,040	148	210	.....	400	355	73	32	28	25	.....
28	520	141	154	.....	760	270	68	31	31	26	.....
29	385	220	143	.....	760	250	58	35	63	28	.....
30	310	200	132	.....	490	230	45	42	56	28	.....
31	270	.....	130	.....	290	.....	35	.....	45	26	.....

NOTE.—Discharge determined from a rating curve well defined below 2,600 second-feet. Mean discharge Sept. 27-30 estimated at 12 second-feet; Jan. 12-31, 95 second-feet; Mar. 1, 152 second-feet. Discharge during winter determined from discharge measurements and climatic records.

Monthly discharge of Pomperaug River at Bennetts Bridge, Conn., for the year ending Sept. 30, 1914.

[Drainage area, 89.3 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
October	1,520	24	199	2.23	2.57	A.
November	460	141	219	2.45	2.73	A.
December	430	99	173	1.94	2.24	A.
January	.....	.....	103	1.15	1.33	B.
February	.....	.....	[a] 49.9	.559	.58	C.
March	1,730	106	335	3.75	4.32	A.
April	400	138	236	2.64	2.94	A.
May	550	35	182	2.04	2.35	A.
June	133	30	50.7	.568	.63	B.
July	144	28	54.3	.608	.70	B.
August	97	24	34.8	.390	.45	B.
September	24	7.7	16.3	.183	.20	C.
The year	1,730	7.7	140	1.57	21.04	

[a] Estimated.

HUDSON RIVER BASIN.

HUDSON RIVER AT NORTH CREEK, N. Y.

Location.—At highway bridge in village of North Creek, immediately above mouth of North Creek, which enters from the right.

Drainage area.—804 square miles.

Records available.—September 21, 1907, to September 30, 1914. Data also in annual reports of State engineer and surveyor and State of New York Conservation Commission.

Gage.—Chain on highway bridge.

Discharge measurements.—Made from highway bridge.

Channel and control.—Heavy gravel; practically permanent.

Extremes of discharge.—Maximum stage recorded during year, 9.75 feet at 6 p.m. April 20; discharge, 18,900 second-feet. Minimum stage recorded, 2.25 feet at 7 p. m. June 15 and 7.40 a. m. June 19; discharge, 248 second-feet.

Maximum stage recorded 1907–1914, 12 feet, evening of March 27, 1913; discharge, 30,000 second-feet. Minimum stage recorded, 2.05 feet at 7.05 a. m. September 30, 1913; discharge, 168 second-feet.

Winter flow.—Discharge relation affected by ice.

Regulation.—Natural flow affected by storage in Indian Lake and other reservoirs in upper Hudson River Basin in connection with log driving. Results not corrected for storage.

Accuracy.—Results good.

Discharge measurements of Hudson River at North Creek, N. Y., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Dec. 31	C. S. De Golyer	a 2.78	479	Mar. 9	R. S. Barnes	a 4.46	728
Jan. 13	do	a 3.37	442	Apr. 28	C. S. De Golyer	6.11	6,380
26	do	a 3.93	656	May 4	do	4.79	3,460
Feb. 3	R. S. Barnes	a 4.08	814	4	do	4.77	3,540
16	W. S. Easterly	a 4.20	687	Sept. 14	E. D. Burchard	3.12	1,100

a Discharge relation affected by ice.

Daily gage height, in feet, of Hudson River at North Creek, N. Y., for the year ending Sept. 30, 1914.

[Gordon Alexander, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.5	3.5	2.8	.....	4.1	4.3	4.4	6.7	2.6	4.6	2.85	3.2
2	2.65	3.5	2.75	.....	4.1	4.4	4.6	6.3	2.6	5.5	2.85	3.05
3	2.9	3.05	2.8	.....	4.1	4.4	4.6	4.7	2.6	4.1	2.85	2.9
4	3.0	2.7	2.85	.....	4.0	4.5	4.4	4.6	2.5	3.3	2.85	2.75
5	2.95	2.6	2.9	.....	4.0	4.4	4.3	5.3	2.75	3.55	2.8	2.6
6	2.9	2.55	2.8	.....	4.0	4.5	3.95	5.2	2.65	4.5	2.8	2.6
7	2.8	2.55	2.8	.....	4.1	4.5	3.7	5.8	2.7	3.95	2.8	2.6
8	2.75	2.46	3.0	.....	4.0	4.5	3.8	5.3	2.7	2.85	3.0	2.6
9	2.7	3.4	3.05	.....	4.0	4.5	4.8	4.2	2.6	2.8	3.1	2.6
10	2.7	6.0	3.3	.....	4.0	4.5	4.8	5.2	2.7	2.7	3.0	3.0
11	2.7	5.6	3.1	.....	4.0	4.5	4.7	4.4	2.5	2.7	3.0	3.1
12	2.7	5.3	2.95	.....	4.0	4.5	4.5	4.2	2.46	3.4	3.0	3.05
13	2.7	4.3	3.0	3.4	4.0	4.5	4.3	3.55	2.42	3.55	3.0	3.05
14	2.7	3.9	2.9	3.65	4.2	4.4	4.0	3.1	2.38	3.15	3.0	3.1
15	2.65	3.7	2.9	3.8	4.2	4.5	4.3	3.5	2.28	3.0	3.0	3.1
16	2.6	3.5	2.9	3.9	4.2	4.5	4.3	3.4	2.75	2.9	3.0	3.1
17	2.6	3.3	2.8	3.9	4.2	4.5	4.6	3.15	2.75	2.9	3.0	3.05
18	2.6	3.15	2.8	3.85	4.2	4.5	4.9	3.65	2.40	3.0	3.0	3.05
19	2.55	3.0	2.65	3.8	4.3	4.5	6.4	3.05	2.28	3.1	3.0	3.0
20	2.75	3.3	2.65	3.85	4.5	4.5	9.4	3.0	2.45	3.1	3.1	3.0
21	3.25	4.2	2.9	3.9	4.5	4.5	8.9	3.75	2.35	3.1	3.15	3.0
22	3.45	4.1	3.15	3.9	4.5	4.4	7.8	2.9	2.42	3.0	3.15	3.0
23	3.4	3.8	3.15	3.9	4.5	4.4	6.8	3.05	2.38	3.0	3.15	3.0
24	3.25	3.55	2.95	3.9	4.4	4.3	6.0	4.5	2.30	2.95	3.15	3.0
25	3.0	3.4	2.65	3.95	4.4	4.4	5.7	2.85	2.30	2.95	3.15	3.0
26	3.05	3.45	2.6	3.95	4.4	4.4	5.8	3.45	2.40	2.9	3.1	3.0
27	3.45	3.15	2.55	3.95	4.4	4.6	6.4	3.4	2.6	2.9	3.1	3.0
28	3.35	3.05	2.38	4.0	4.4	5.2	7.0	4.3	2.65	2.9	3.1	3.0
29	3.15	2.85	2.6	4.0	.....	5.9	7.3	2.9	2.7	2.9	3.15	3.0
30	3.1	2.95	2.75	3.95	.....	6.0	7.6	2.75	2.8	2.9	3.15	3.0
31	3.05	.....	2.75	4.0	.....	5.2	.....	2.5	.....	2.9	3.6	.....

NOTE.—Discharge relation affected by ice Dec. 29 to Mar. 31.

Daily discharge, in second-feet, of Hudson River at North Creek, N. Y., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	385	1,390	600	480	832	600	2,910	8,330	450	3,290	642	1,000
2	485	1,390	560	480	832	685	3,290	7,220	450	5,200	642	832
3	685	832	600	480	814	685	3,290	3,480	450	2,360	642	685
4	780	520	642	480	780	732	2,910	3,290	385	1,120	642	560
5	732	450	685	480	780	732	2,720	4,740	560	1,460	600	450
6	685	418	600	480	732	732	2,100	4,520	485	3,100	600	450
7	600	418	600	480	780	780	1,680	5,930	520	2,100	600	450
8	560	361	780	480	780	780	1,840	4,740	520	642	780	450
9	520	1,250	832	480	732	732	3,080	2,540	450	600	885	450
10	520	6,430	1,120	470	640	780	3,680	4,520	520	520	780	780
11	520	5,440	885	460	642	780	3,480	2,910	385	520	780	885
12	520	4,740	732	450	600	732	3,100	2,540	361	1,250	780	832
13	520	2,720	780	442	642	732	2,720	1,460	337	1,460	780	832
14	520	2,010	685	450	685	732	2,180	885	314	942	780	885
15	485	1,680	685	560	732	780	2,720	1,390	261	780	780	885
16	450	1,390	685	642	687	780	2,720	1,250	560	685	780	885
17	450	1,120	600	642	685	780	3,290	942	560	685	780	832
18	450	942	600	600	732	780	3,880	1,600	325	780	780	832
19	418	780	485	560	732	780	7,490	832	261	885	780	780
20	560	1,120	485	600	885	780	17,300	780	355	885	885	780
21	1,060	2,540	685	642	885	732	15,300	1,760	298	885	942	780
22	1,320	2,360	942	642	885	685	11,600	685	337	780	942	780
23	1,250	1,840	942	642	780	685	8,620	832	314	780	942	780
24	1,060	1,460	732	642	732	642	6,430	3,100	270	733	942	780
25	780	1,250	485	685	732	642	5,680	642	270	733	942	780
26	832	1,320	450	656	685	685	5,930	1,320	325	685	885	780
27	1,320	942	418	685	685	780	7,490	1,250	450	685	885	780
28	1,180	832	314	732	642	1,000	9,200	2,720	485	685	885	780
29	942	642	361	732	.....	1,390	10,100	685	520	685	942	780
30	885	732	457	685	.....	1,920	11,000	560	600	685	942	780
31	832	.....	479	732	.....	2,450	.....	385	.....	685	1,530	.....

NOTE.—Discharge determined from a well-defined rating curve. Discharge Dec. 29 to Mar. 31 estimated from discharge measurements and climatic records.

Monthly discharge of Hudson River at North Creek, N. Y., for the year ending Sept. 30, 1914.

[Drainage area, 804 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
October	1,320	385	720	0.896	1.03	A.
November	6,430	361	1,640	2.04	2.28	A.
December	1,120	314	642	.799	.92	B.
January	732	442	570	.709	.82	B.
February	885	600	741	.922	.96	B.
March	2,450	600	855	1.06	1.22	B.
April	17,300	1,680	5,610	6.98	7.79	A.
May	8,330	385	2,510	3.12	3.60	A.
June	600	261	413	.512	.57	B.
July	5,200	520	1,200	1.49	1.72	C.
August	1,530	600	822	1.02	1.18	A.
September	1,000	450	744	.925	1.03	A.
The year	17,300	261	1,370	1.70	23.12	

HUDSON RIVER AT THURMAN, N. Y.

Location.—At Delaware & Hudson Railroad bridge at Thurman, about 950 feet below highway bridge on road to Warrensburg, about 2,000 feet below Schroon River, and about 13 miles above Sacandaga River, which enters from the right.

Drainage area.—1,550 square miles.

Records available.—September 1, 1907, to September 30, 1914. Data also in annual reports of State engineer and surveyor and State of New York Conservation Commission.

Gage.—Chain gage on railroad bridge.

Discharge measurements.—Made from the bridge.

Channel and control.—Sand and gravel; likely to shift. Logs occasionally accumulate at control and around bridge piers.

Extremes of discharge.—Maximum stage recorded during year, 9.93 feet at 6.15 p. m. April 20; discharge, 27,200 second-feet. Minimum stage recorded, 2.21 feet at 4 p. m. June 14; discharge, 359 second-feet.

Minimum stage recorded 1907–1914, 12.5 feet during late evening of March 27, 1913 (determined by leveling from flood marks); approximate discharge, 46,000 second-feet. Minimum stage recorded, 2.12 feet at 8.55 a. m. and 6.20 p. m. September 30, 1913; discharge, 290 second-feet.

Winter flow.—Discharge relation seriously affected by ice.

Regulation.—Flow affected by storage at Indian Lake and by operation of mills on Schroon River. Results not corrected for storage.

Accuracy.—Results fair.

Cooperation.—Gage-height record for December furnished by United States Weather Bureau.

Discharge measurements of Hudson River at Thurman, N. Y., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Oct. 3	G. H. Canfield	2.68	860	May 6	C. S. De Golyer	5.86	9,380
Apr. 23	W. S. Easterly	7.85	17,300				

Daily gage height, in feet, of Hudson River at Thurman, N. Y., for the year ending Sept. 30, 1914.

[S. H. Spencer, observer.]

Day.	Oct.	Nov.	Dec.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.42	3.1	2.90	6.5	7.3	3.0	3.05	2.63	3.15
2	2.58	3.3	3.1	6.3	6.8	2.94	4.5	2.58	2.79
3	2.74	3.1	3.0	6.0	6.1	2.97	3.7	2.86	2.84
4	2.86	2.92	3.0	5.5	5.6	2.86	2.49	2.86	2.83
5	2.84	2.63	3.0	5.2	5.5	3.0	2.44	2.80	2.78
6	2.84	2.82	3.0	5.0	5.6	3.0	2.62	2.81	2.52
7	2.74	2.80	3.1	4.8	6.0	2.82	3.05	2.78	2.66
8	2.66	2.70	3.2	4.9	5.4	2.82	2.81	2.76	2.68
9	2.61	2.52	3.4	5.4	4.6	2.84	2.78	2.67	2.62
10	2.60	5.6	3.4	5.6	4.6	2.88	2.75	2.84	2.90
11	2.54	5.1	3.4	5.7	4.4	3.0	2.70	2.94	2.94
12	2.60	4.5	3.1	5.8	4.7	2.91	2.90	2.92	3.0
13	2.58	4.1	3.3	5.6	4.1	3.0	3.1	2.90	2.96
14	2.54	3.8	3.3	5.4	4.7	2.43	2.86	2.78	3.0
15	2.54	3.65	3.2	5.5	4.0	2.72	2.88	2.90	2.94
16	2.54	3.35	3.1	5.6	4.5	2.85	2.78	2.76	2.90
17	2.51	3.3	3.1	5.8	3.7	3.1	2.66	2.87	2.84
18	2.54	3.3	3.1	6.1	4.3	3.0	2.78	2.84	2.94
19	2.48	3.1	3.0	7.2	3.75	2.92	2.79	2.88	2.92
20	2.88	3.3	2.90	9.3	3.6	2.95	3.00	2.86	2.81
21	3.2	3.8	3.0	9.7	4.4	2.34	2.93	3.0	2.94
22	3.25	3.95	3.2	8.8	3.3	2.80	2.86	3.05	2.70
23	3.35	3.75	2.90	7.9	3.4	2.85	2.80	2.88	2.70
24	3.25	3.6	3.2	7.2	3.9	2.81	2.76	3.05	2.69
25	3.1	3.5	2.70	6.7	3.35	2.96	2.72	2.88	2.82
26	3.55	3.35	3.3	6.8	3.5	2.78	2.62	2.98	2.79
27	3.5	3.3	3.8	6.9	3.7	2.84	2.81	2.90	2.86
28	3.45	3.2	4.0	6.9	4.1	2.54	2.76	2.93	2.78
29	3.4	3.15	4.2	7.2	3.3	2.96	2.75	3.1	2.76
30	3.25	3.0	4.3	7.8	3.05	3.0	2.76	3.3	2.74
31	3.15	.....	4.5	.....	3.55	.....	2.62	3.4	.....

NOTE.—Gage heights for April are the means of three or four observations per day. Other gage heights are the means of two observations per day. No records obtained for January, February, and March.

Daily discharge, in second-feet, of Hudson River at Thurman, N. Y., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Apr.	May.	June.	July.	Aug.	Sept.
1	562	1,550	1,200	11,700	14,900	1,370	1,460	809	1,640
2	746	1,940	1,550	11,000	12,900	1,270	5,000	746	1,030
3	956	1,550	1,370	9,860	10,200	1,320	2,840	1,140	1,100
4	1,140	1,230	1,370	8,100	8,440	1,140	639	1,140	1,090
5	1,100	809	1,370	7,100	8,100	1,370	584	1,040	1,010
6	1,100	1,070	1,370	6,470	8,440	1,370	796	1,060	674
7	956	1,040	1,550	5,870	9,860	1,070	1,460	1,010	848
8	848	900	1,740	6,170	7,760	1,070	1,060	984	874
9	783	674	2,150	7,760	5,290	1,100	1,010	861	796
10	770	8,440	2,150	8,440	5,290	1,170	970	1,100	1,200
11	698	6,780	2,150	8,790	4,710	1,370	900	1,270	1,270
12	770	5,000	1,550	9,140	5,580	1,220	1,200	1,230	1,370
13	746	3,860	1,940	8,440	3,860	1,370	1,550	1,200	1,300
14	698	3,080	1,940	7,760	5,580	573	1,140	1,010	1,370
15	698	2,720	1,740	8,100	3,590	928	1,170	1,200	1,270
16	698	2,040	1,550	8,440	5,000	1,120	1,010	984	1,200
17	662	1,940	1,550	9,140	2,840	1,550	848	1,150	1,100
18	698	1,940	1,550	10,200	4,420	1,370	1,010	1,100	1,270
19	628	1,550	1,370	14,500	2,960	1,230	1,030	1,170	1,230
20	1,170	1,940	1,200	24,100	2,600	1,280	1,370	1,140	1,060
21	1,740	3,080	1,370	26,100	4,710	480	1,250	1,370	1,270
22	1,840	3,460	1,740	21,600	1,940	1,040	1,140	1,460	900
23	2,040	2,960	1,200	17,500	2,150	1,120	1,040	1,170	900
24	1,840	2,600	1,740	14,500	3,330	1,060	984	1,460	887
25	1,550	2,370	900	12,500	2,040	1,300	928	1,170	1,070
26	2,480	2,040	970	12,900	2,370	1,010	796	1,340	1,030
27	2,370	1,940	910	13,300	2,840	1,100	1,060	1,200	1,140
28	2,260	1,740	770	13,300	3,860	698	984	1,250	1,010
29	2,150	1,640	830	14,500	1,940	1,300	970	1,550	984
30	1,840	1,370	930	17,000	1,460	1,370	984	1,940	956
31	1,640	.....	930	.....	2,480	.....	796	2,150	.....

NOTE—Discharge determined from a well-defined rating curve. Discharge Dec. 29–31 and mean discharge for January, February, and March estimated by adding 10 per cent to the sum of discharges of Hudson River at North Creek and Schroon River at Riverbank.

Monthly discharge of Hudson River at Thurman, N. Y., for the year ending Sept. 30, 1914.

[Drainage area, 1,550 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
October	2,480	562	1,230	0.794	0.92	B.
November	8,440	674	2,440	1.57	1.75	A.
December	2,150	900	1,440	.929	1.07	B.
January	.....	.....	994	.641	.74	C.
February	.....	.....	1,130	.729	.76	C.
March	.....	.....	1,350	.871	1.00	C.
April	26,100	5,870	11,800	7.61	8.49	A.
May	14,900	1,460	5,210	3.36	3.87	A.
June	1,550	480	1,160	.748	.83	B.
July	5,000	584	1,230	.794	.92	B.
August	2,150	746	1,210	.781	.90	B.
September	1,640	674	1,090	.703	.78	B.
The year	26,100	480	2,520	1.63	22.03	

HUDSON RIVER AT SPIER FALLS, N. Y.

Location.—Half a mile below Spier Falls dam, about 11½ miles below Sacandaga River, and about 11 miles by road southwest of Glens Falls, N. Y.

Drainage area.—2,800 square miles.

Records available.—October 7, 1912, to September 30, 1914. Data also in annual reports of State engineer and surveyor and State of New York Conservation Commission.

Gage.—Gurley simplex water-stage recorder referenced to a hook gage inside of well. Inclined staff used for auxiliary readings.

Discharge measurements.—Made from a cable about 1,000 feet below gage.

Channel and control.—Coarse gravel and bowlders; practically permanent.

Extremes of discharge.—Maximum stage recorded during year (automatic gage), 15.33 feet at 12.05 a. m. April 21; discharge, 52,200 second-feet. Minimum stage recorded (automatic gage), 0.67 foot at 8 a. m. October 12; discharge, 76 second-feet.

Maximum stage recorded 1912–1914 (automatic gage), 18.59 feet at 12.25 a. m. March 28, 1913; discharge, 89,100 second-feet. Minimum stage recorded: 0.06 foot September 15, 1912; discharge, 5.7 second-feet. Power plant was shut down at that time and flow of river stored in its pond.

Winter flow.—Discharge relation occasionally affected by ice.

Regulation.—Flow affected by operation of the Spier Falls dam, which resulted in low discharge on Sunday, and by storage in Indian Lake. Results not corrected for storage.

Accuracy.—Results considered excellent except when discharge relation is affected by ice. Rating curve well defined; daily discharge determined by averaging hourly discharge to overcome effect of operation of Spier Falls dam.

Discharge measurements of Hudson River at Spier Falls, N. Y., during the year ending Sept. 30, 1913–1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
1913		*Feet.*	*Sec.-ft.*	1914		*Feet.*	*Sec.-ft.*
Mar. 29	J. G. Mathers	16.46	[a] 58,100	Apr. 24	C. S. DeGolyer	[b] 11.75	[c] 32,600
1914				24	W. S. Easterly	[b] 11.65	[a] 32,000
Mar. 12	W. S. Easterly	3.34	2,350	June 9	C. H. Pierce	3.50	2,720
Apr. 21	O. W. Hartwell	15.12	[a] 51,900				

[a] Surface velocity observed and coefficient of 0.80 used to reduce to mean velocity.
[b] Staff-gage reading.
[c] Velocity observed at 0.2 depth and coefficient of 0.82 used to reduce to mean velocity.

NOTE.—Result for measurement of Mar. 29, 1913, supersedes that published in Water Supply Paper 351, p. 114.

Daily discharge, in second-feet, of Hudson River at Spier Falls, N. Y., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	792	3,350	3,210	1,860	1,940	943	14,000	29,900	2,620	1,260	1,130	3,670
2	755	2,860	2,610	1,860	2,480	2,180	16,900	26,700	2,450	4,710	1,000	2,740
3	957	3,220	2,800	1,500	2,190	1,490	18,200	20,000	2,210	3,420	1,230	2,400
4	1,260	2,420	2,570	698	2,180	1,830	18,500	17,500	2,150	1,940	1,330	2,340
5	906	2,510	2,680	1,710	2,120	1,290	18,200	16,100	2,300	1,370	1,280	2,140
6	1,760	2,420	2,940	1,930	2,460	1,590	15,100	17,300	1,880	1,720	1,200	1,560
7	1,380	2,070	2,550	1,740	1,890	1,670	12,900	15,800	1,660	1,640	1,260	1,430
8	1,160	1,750	5,100	1,730	1,770	1,280	13,500	15,000	2,270	1,850	1,190	2,280
9	1,320	1,560	5,670	1,470	2,560	2,000	21,900	12,000	2,010	1,960	1,100	2,060
10	1,230	13,300	5,080	1,830	2,280	1,790	23,100	10,600	2,060	1,980	1,430	1,930
11	1,050	16,000	4,890	1,270	1,800	1,510	22,700	9,480	1,550	1,720	1,730	1,500
12	442	13,700	3,380	1,670	1,070	1,630	21,700	8,270	1,980	1,420	1,380	1,410
13	1,230	11,100	3,250	1,610	1,430	1,520	20,100	9,050	1,950	2,170	1,440	1,300
14	1,230	8,780	3,690	1,250	1,840	2,030	18,000	9,300	1,390	2,420	1,420	2,240
15	1,240	7,070	3,650	1,010	1,340	1,350	17,800	9,130	1,840	2,060	1,140	1,660
16	1,240	5,610	3,260	1,290	1,320	1,520	18,500	8,080	1,720	1,760	615	1,520
17	1,190	4,700	3,160	1,220	1,390	1,710	17,600	7,600	1,270	1,920	1,430	1,500
18	1,240	3,750	3,160	1,510	1,480	2,030	20,600	6,320	1,570	1,640	1,430	1,560
19	401	3,360	2,990	1,800	1,420	2,600	26,000	6,150	1,800	1,320	1,300	1,600
20	1,550	3,450	2,510	1,460	1,570	2,130	38,500	4,850	1,460	1,930	1,250	1,250
21	2,180	4,820	1,600	1,540	1,310	2,060	50,100	4,510	1,280	1,930	1,810	1,520
22	3,300	6,080	2,690	1,420	1,620	1,250	47,700	4,700	1,190	1,480	1,740	1,550
23	3,580	5,440	2,810	1,420	1,210	2,560	41,300	3,480	950	1,300	1,120	1,560
24	3,210	5,050	2,660	1,580	1,350	2,110	34,200	3,680	1,050	1,400	2,220	1,580
25	3,000	4,230	2,510	1,860	1,470	1,760	27,900	4,260	982	1,230	1,990	1,480
26	4,080	3,820	2,360	1,840	1,380	1,770	26,900	3,070	1,090	1,340	1,510	1,750
27	5,370	3,540	2,080	2,030	1,350	2,570	26,500	3,770	1,430	1,560	1,380	1,140
28	5,200	3,220	830	1,840	1,720	5,820	26,300	3,600	756	1,300	2,010	1,730
29	4,580	3,040	1,860	1,970	.....	9,000	26,800	3,880	951	1,330	1,650	1,350
30	4,070	2,220	1,620	1,740	.....	10,500	30,400	2,800	1,640	1,310	3,710	1,290
31	3,600	.....	2,650	1,640	.....	11,800	.....	2,670	.....	1,280	4,190	.....

NOTE.—Discharge determined from a well-defined rating curve by taking the average of 24 hourly estimates for each day, except Feb. 13 to Mar. 9 when discharge relation was affected by ice, and discharge was determined from power-house records. Discharge estimated Nov. 17–18, Dec. 24–26, and May 3.

Monthly discharge of Hudson River at Spier Falls, N. Y., for the year ending Sept. 30, 1914.

[Drainage area, 2,800 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
October	5,370	a 401	2,080	0.743	0.86	A.
November	16,000	a 1,560	5,150	1.84	2.05	A.
December	5,670	a 830	2,990	1.07	1.23	A.
January	2,030	a 698	1,590	.568	.65	A.
February	2,560	1,070	1,710	.611	.64	B.
March	11,800	a 943	2,750	.982	1.13	A.
April	50,100	12,900	24,400	8.71	9.72	A.
May	29,900	a 2,670	9,660	3.45	3.98	A.
June	2,620	a 756	1,650	.589	.66	A.
July	4,710	1,230	1,800	.643	.74	A.
August	4,190	a 615	1,570	.561	.65	A.
September	3,670	a 1,140	1,770	.632	.71	A.
The year	50,100	a 401	4,750	1.70	23.02	

a Sunday.

HUDSON RIVER AT MECHANICVILLE, N. Y.

Location.—At Duncan dam of West Virginia Pulp & Paper Co., in Mechanicville about 3,700 feet above Anthony Kill, 1¼ miles below Hoosic River, and 19 miles above Mohawk River.

Drainage area.—4,500 square miles.

Records available.—1890 to September 30, 1914. Data also in annual reports of State engineer and surveyor and State of New York Conservation Commission.

Gage.—Water-stage recorder referred to a vertical staff showing depth of water over crest of dam.

Computation of discharge.—Discharge determined from a rating curve based on United States Geological Survey coefficients for dams of ogee section and continuous record of the run of wheels in adjoining paper mill. Prior to summer of 1910 discharge determined from two daily gage readings on crest of dam.

Extremes of discharge.—Maximum discharge recorded 1888–1914, 120,000 second-feet at 6 a. m. March 28, 1913.[1] The plant is occasionally shut down and the flow of the river stored in the pond, so that the discharge below the plant becomes practically zero.

Diversions.—Water diverted above station for Champlain canal. No correction made for diversion.

Regulation.—Flow affected by operation of dams above station, which often results in low discharge on Sunday.

Cooperation.—Records computed and furnished by R. P. Bloss, engineer, West Virginia Pulp & Paper Co.

Daily discharge, in second-feet, of Hudson River at Mechanicville, N. Y., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1,143	5,005	5,607	3,632	8,183	881	27,337	30,433	5,342	1,209	1,141	4,925
2	1,511	2,470	4,101	2,631	5,845	1,684	37,606	35,674	3,696	1,502	584	4,287
3	1,259	5,138	4,254	2,590	5,046	4,032	30,541	27,746	3,624	5,506	1,930	3,220
4	998	4,487	3,968	859	5,220	4,413	26,330	23,920	4,155	3,500	1,179	2,725
5	750	3,224	4,564	1,945	5,847	4,129	28,308	19,824	2,877	3,395	1,175	3,171
6	1,442	3,559	4,568	1,823	4,551	4,126	23,501	23,346	3,836	1,958	1,217	1,800
7	1,438	3,693	1,479	1,887	4,566	3,844	20,712	21,359	2,778	3,342	1,053	2,607
8	1,820	3,279	8,240	2,161	3,246	1,066	30,356	18,598	3,339	1,665	963	1,706
9	1,174	1,433	7,194	2,115	3,746	3,981	42,298	18,233	3,587	2,558	462	2,825
10	1,192	10,169	7,534	2,399	4,033	3,986	35,189	14,315	2,284	2,177	1,322	1,559
11	1,043	19,215	7,200	920	4,006	4,146	30,042	14,072	2,822	2,417	883	2,825
12	980	16,085	6,431	3,249	3,211	2,572	31,924	12,492	2,430	2,415	1,757	1,557
13	1,689	13,419	4,655	2,243	2,116	2,742	28,511	15,545	2,588	2,474	1,039	546
14	1,257	11,964	4,706	2,293	2,192	4,036	25,611	12,983	1,016	2,862	1,050	1,712
15	1,271	9,445	7,358	2,169	876	849	24,362	13,381	2,225	2,860	1,057	2,766
16	1,296	3,106	5,544	1,875	1,767	4,359	22,612	10,654	2,457	2,482	938	1,846
17	1,315	7,871	4,778	1,718	1,769	11,040	25,045	7,425	2,459	1,591	1,027	1,656
18	1,283	6,617	5,517	927	1,767	8,683	26,922	9,023	1,905	1,938	930	1,053
19	560	5,847	5,614	1,235	1,755	7,125	29,690	7,741	1,165	1,144	2,104	1,054
20	1,647	4,896	4,429	1,472	1,861	5,837	52,639	6,901	2,684	1,788	1,226	1,097
21	1,469	5,768	4,261	1,631	1,861	4,928	57,498	6,071	968	2,410	1,265	1,587
22	2,140	1,195	5,143	1,488	865	3,505	64,788	6,160	1,644	2,407	2,475	1,416
23	4,447	4,434	3,862	1,562	2,041	3,687	50,945	5,701	1,588	2,015	950	1,094
24	3,756	7,470	4,805	1,655	2,003	5,256	41,109	4,131	1,471	1,461	1,290	1,106
25	3,783	6,034	4,152	940	2,087	6,120	35,016	6,009	1,328	1,323	2,203	1,143
26	4,309	5,404	3,960	2,785	1,818	12,371	32,000	4,774	1,199	949	2,563	970
27	10,553	5,263	4,460	3,003	1,822	21,685	32,424	4,998	970	1,205	1,804	900
28	9,203	5,147	2,005	3,142	1,773	27,672	30,052	5,006	404	1,972	1,059	1,166
29	7,024	3,241	3,025	3,659	.....	22,200	31,626	4,973	1,888	1,264	2,576	2,203
30	6,738	3,463	4,349	5,827	.....	21,607	35,824	4,924	1,043	1,247	952	1,376
31	5,753	.....	2,364	5,798	.....	19,804	.....	4,042	.....	1,277	4,898	.....

NOTE.—Flash boards on dam Dec. 1 to Mar. 2. Flash boards partially gone Mar. 3 to Apr. 3, records not accurate. Discharge estimated Aug. 23, by U. S. Geol. Survey.

[1] The highest known flood prior to this time occurred in Apr., 1869; calculated discharge, 70,000 second-feet. See Water-Supply Paper 65, p. 51, and Report of United States Board of Engineers on Deep Waterways, pt. 1, pp. 377-380.

Monthly discharge of Hudson River at Mechanicville, N. Y., for the year ending Sept. 30, 1914.

[Drainage area, 4,500 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area.)
	Maximum.	Minimum.	Mean.	Per square mile.	
October	10,553	a 560	2,720	0.604	0.70
November	19,215	1,195	6,280	1.40	1.56
December	8,240	a 1,479	4,840	1.08	1.24
January	5,827	a 859	2,310	.513	.59
February	8,183	a 865	3,070	.682	.71
March	27,672	a 849	7,500	1.67	1.92
April	64,788	20,712	33,700	7.49	8.36
May	35,674	a 4,042	12,900	2.87	3.31
June	5,342	a 404	2,330	.518	.58
July	5,506	a 949	2,140	.476	.55
August	4,898	a 462	1,450	.322	.37
September	4,925	a 546	1,930	.429	.48
The year	64,788	a 404	6,750	1.50	20.37

a Sunday.

CEDAR RIVER NEAR INDIAN LAKE, N. Y.

Location.—At steel highway bridge on road leading to Blue Mountain Lake, about 2 miles west of Indian Lake village, 8 miles by river above Rock River, 10 miles by river below Cedar River Flow (Wakely dam), and about 12 miles above mouth of river.

Drainage area.—85 square miles.

Records available.—July 15, 1911, to September 30, 1914. Data also in annual reports of State engineer and surveyer and State of New York Conservation Commission.

Gage.—Chain on highway bridge; read once daily.

Discharge measurements.—Made from the bridge or by wading.

Channel and control.—Coarse gravel and small bowlders; practically permanent.

Extremes of discharge.—Maximum stage recorded during year, 12.0 feet at 1 p. m. April 20; discharge approximately 3,600 second-feet. Minimum stage recorded, 2.5 feet at 1 p. m. September 22; discharge, 20 second-feet.

Maximum stage recorded 1911–1914, 12.0 feet at 1 p. m. April 20, 1914; discharge, 3,600 second-feet. Minimum stage recorded, 2.4 feet at 1 p. m. September 7, 1913; discharge, 14 second-feet.

Winter flow.—Discharge relation seriously affected by ice; observations suspended.

Regulation.—Flow affected by storage in Cedar Lake and Cedar River Flow. Storage in Cedar River Flow used principally during the logging season.

Accuracy.—Results fair except for months during which extreme fluctuations are caused by logging operations.

Discharge measurements of Cedar River near Indian Lake, N. Y., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 30	C. S. De Golyer	10.4	2,910	May 2	C. S. De Golyer	9.76	2,420
May 1	do	4.72	401				

Daily gage height, in feet, of Cedar River near Indian Lake, N. Y., for the year ending Sept. 30, 1914.

[Chauncey Hill, observer.]

Day.	Oct.	Nov.	Dec.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.6	6.9	3.5	.....	5.6	3.2	10.9	2.6	3.7
2	2.7	5.3	3.3	.....	10.0	3.1	3.2	2.6	3.8
3	3.4	3.8	3.6	.....	6.0	2.8	2.8	2.6	3.6
4	3.2	3.35	3.5	.....	6.0	3.05	2.8	2.6	3.2
5	2.8	3.4	3.4	.....	10.0	3.15	2.7	2.6	3.2
6	2.75	3.3	3.4	.....	7.0	3.0	2.6	2.6	3.4
7	2.7	3.3	3.4	.....	.....	2.8	2.9	2.6	3.6
8	2.7	3.4	3.6	.....	.....	2.9	2.95	2.6	3.25
9	2.75	5.7	5.6	.....	.....	3.0	2.8	2.6	3.2
10	2.8	8.7	5.6	.....	.....	2.8	2.7	2.8	3.15
11	2.6	8.5	6.1	.....	.....	2.8	3.0	2.9	3.1
12	2.8	8.0	6.5	.....	3.5	2.7	4.3	2.7	3.1
13	2.85	7.0	6.4	.....	4.1	2.75	4.0	2.6	3.05
14	2.8	4.0	6.3	.....	3.8	2.65	4.1	2.6	3.0
15	2.8	3.9	5.5	.....	3.7	2.7	4.0	2.6	3.0
16	2.7	3.7	5.5	5.8	3.7	2.7	3.7	2.6	3.0
17	2.7	3.5	5.4	4.8	3.6	2.65	3.65	2.6	2.9
18	2.75	3.45	5.4	4.6	4.0	2.6	3.4	2.6	2.7
19	2.7	3.5	5.0	6.1	3.6	2.6	3.0	4.2	2.6
20	3.6	5.3	5.1	12.0	3.2	2.8	2.9	4.3	2.6
21	5.9	4.8	.....	10.0	3.2	2.7	3.0	5.0	2.55
22	4.5	4.3	.....	6.0	3.15	2.6	2.9	5.2	2.5
23	4.0	4.4	.....	3.9	5.9	2.6	2.7	4.8	2.55
24	3.95	4.5	.....	4.0	4.1	2.6	2.8	5.3	2.8
25	4.0	5.5	.....	8.0	5.6	2.55	2.6	3.2	2.9
26	4.2	3.6	.....	3.0	5.5	2.6	2.7	3.0	2.7
27	4.2	3.4	.....	3.0	4.3	2.6	2.65	3.05	2.8
28	4.4	3.35	.....	10.0	3.15	2.8	2.6	4.0	2.7
29	4.0	3.4	.....	6.6	2.8	3.4	2.6	5.0	2.7
30	4.3	3.3	.....	10.0	9.5	3.0	2.65	5.0	2.8
31	4.4	.....	.....	.....	8.2	.....	2.7	4.0	.....

NOTE.—Discharge relation affected by ice Dec. 9 to Apr. 15; extreme fluctuations in stage caused by logging operations.

Daily discharge, in second-feet, of Cedar River near Indian Lake, N. Y., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Apr.	May.	June.	July.	Aug.	Sept.
1	26	1,170	128	.....	668	84	3,050	26	164
2	33	570	98	.....	2,600	72	84	26	184
3	112	184	146	.....	810	41	41	26	146
4	84	105	128	.....	810	66	41	26	84
5	41	112	112	.....	2,600	78	33	26	84
6	37	98	112	.....	1,210	61	26	26	112
7	33	98	112	.....	.....	41	51	26	146
8	33	112	146	.....	.....	51	56	26	91
9	37	702	.....	.....	.....	61	41	26	84
10	41	1,970	.....	.....	.....	41	33	41	78
11	26	1,870	.....	.....	.....	41	61	51	72
12	41	1,640	.....	.....	128	33	296	33	72
13	46	1,210	.....	.....	248	37	226	26	66
14	41	226	.....	.....	184	30	248	26	61
15	41	204	.....	.....	164	33	226	26	61
16	33	164	.....	738	164	33	164	26	61
17	33	128	.....	422	146	30	155	26	51
18	37	120	.....	370	226	26	112	26	33
19	33	128	.....	848	146	26	61	272	26
20	146	570	.....	3,600	84	41	51	296	26
21	774	422	.....	2,600	84	33	61	478	23
22	344	296	.....	810	78	26	51	538	20
23	226	320	.....	215	774	26	33	422	23
24	215	344	.....	226	248	26	41	570	41
25	226	634	.....	1,640	668	23	26	84	51
26	272	146	.....	61	634	26	33	61	33
27	272	112	.....	61	296	26	30	66	41
28	320	105	.....	2,600	78	41	26	226	33
29	226	112	.....	1,040	41	112	26	478	33
30	296	98	.....	2,600	2,350	61	30	478	41
31	320	.....	.....	.....	1,730	.....	33	226	.....

NOTE.—Discharge determined from a fairly well defined rating curve. No estimates of winter discharge. Mean discharge May 7-11 estimated at 410 second-feet.

Monthly discharge of Cedar River near Indian Lake, N. Y., for the year ending Sept. 30, 1914.

[Drainage area, 85 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
October	774	26	143	1.68	1.94	B.
November	1,970	98	466	5.48	6.11	B.
December 1-8	146	98	123	1.45	.43	
April 16-30	3,600	61	1,190	14.0	7.81	D.
May	2,600	41	620	7.29	8.40	C.
June	112	23	44.2	.520	.58	B.
July	3,050	26	176	2.07	2.39	D.
August	570	26	152	1.79	2.06	C.
September	184	20	68.3	.804	.90	C.

INDIAN LAKE RESERVOIR NEAR INDIAN LAKE, N. Y.

Location.—At dam at outlet of Indian Lake, about 2 miles south of Indian Lake village, about 7½ miles above the mouth of Indian River and about 23½ miles above the village of North Creek.

Drainage area.—131 square miles, including about 9.3 square miles of water surface of Indian Lake at the elevation of spillway of dam.

Records available.—Records of stage and gate openings July 22, 1900, to September 30, 1914. Data also in annual reports of the State engineer and surveyor, State Water Supply Commission, and State of New York Conservation Commission.

Gage.—Elevation of water surface in reservoir determined by a chain gage at the dam. Prior to November 17, 1911, a staff gage was used or readings were obtained by measuring down from a bench mark.

Storage dam.—The masonry storage dam was completed in 1899 and replaced a lumbering dam at the sam site. The spillway is in 5 sections, having a total effective length of 88.7 feet, a mean crest elevation of 33.38 feet above reservoir gage datum, and 1,650 feet above mean sea level. There are two logways, one 15 feet wide with bottom at elevation 24.12 feet reservoir gage datum, the other 14 feet wide with bottom at elevation 32.48 feet reservoir gage datum. The discharge at ordinary stages is through one or both of two 5-foot circular sluice gates, controlled independently, and taking water from separate wells in the gatehouse.

Determination of discharge.—Discharge over the spillway is determined by means of a rating curve based on experiments made in the hydraulic laboratory of Cornell University.[1] Rating curves for the sluice gates have been determined from current-meter measurements at the gaging station on Indian River three-fourths mile below the dam. The results are withheld for further study.

Extremes of stage.—Maximum stage recorded, 38.8 feet, March 28, 1913. Minimum stage recorded, 2 feet, March 9–18, 1907, and January 3–17, 1910.

Daily gage height, in feet, of Indian Lake near Indian Lake, N. Y., for the year ending Sept. 30, 1914.

[Lester Sevarie, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	12.45	12.5	18.2	20.3	16.05	10.6	9.25	28.95	33.5	32.85	30.45	22.65
2	12.25	12.55	18.25	20.3	15.9	10.45	9.8	29.5	33.5	32.95	30.15	22.8
3	12.1	12.65	18.3	20.35	15.8	10.3	10.3	29.95	33.55	33.0	29.85	23.0
4	12.0	12.7	18.4	20.35	15.7	10.15	10.7	30.4	33.6	33.05	29.6	23.2
5	11.9	12.8	18.5	20.3	15.5	9.95	11.0	31.0	33.7	33.1	29.4	23.35
6	11.7	12.9	18.6	20.25	15.3	9.85	11.3	31.65	33.75	33.1	29.1	23.5
7	11.55	12.95	18.7	20.2	15.1	9.65	11.5	32.15	33.75	33.2	28.7	23.55
8	11.35	13.0	19.0	20.15	14.9	9.45	11.85	32.5	33.8	33.25	28.4	23.6
9	11.2	13.55	19.2	20.1	14.75	9.3	12.4	32.75	33.8	33.3	28.05	23.35
10	11.0	14.6	19.3	20.05	14.5	9.2	12.95	32.95	33.8	33.4	27.7	23.15
11	10.8	15.15	19.4	20.0	14.35	9.0	13.4	33.15	33.85	33.65	27.4	22.95
12	10.6	15.6	19.5	19.75	14.2	8.9	13.8	33.25	33.85	33.95	27.05	22.75
13	10.45	15.7	19.7	19.5	14.05	8.8	14.15	33.5	33.85	34.05	26.7	22.35
14	10.3	15.8	19.8	19.35	13.95	8.6	14.4	33.7	33.8	34.1	26.35	22.1
15	10.1	15.9	19.9	19.15	13.8	8.4	14.75	33.85	33.8	34.1	26.0	21.8
16	9.95	16.05	20.0	18.95	13.65	8.2	15.1	33.95	33.8	34.05	25.65	21.45
17	9.75	16.2	20.05	18.75	13.5	8.0	15.5	34.05	33.8	34.0	25.4	21.45
18	9.55	16.3	20.1	18.55	13.3	7.8	16.0	34.1	33.75	33.75	25.1	20.8
19	9.45	16.4	20.15	18.35	13.0	7.6	17.05	34.1	33.75	33.55	24.8	20.5
20	9.6	16.7	20.2	18.1	12.75	7.4	19.4	34.1	33.75	33.25	24.5	20.2
21	10.0	17.0	20.05	17.95	12.5	7.3	21.2	34.1	33.75	33.0	24.2	19.85
22	10.25	17.2	19.85	17.8	12.2	7.2	22.2	34.1	33.75	32.8	24.0	19.6
23	10.6	17.4	19.65	17.65	11.95	7.1	23.05	34.1	33.75	32.6	23.95	19.25
24	10.65	17.6	19.75	17.5	11.65	7.0	23.65	34.1	33.75	32.35	23.4	18.95
25	10.9	17.7	19.8	17.3	11.4	6.9	24.2	34.1	33.75	32.1	23.1	18.55
26	11.2	17.75	19.95	17.1	11.2	6.8	24.8	33.85	33.65	31.9	22.85	18.2
27	11.5	17.8	20.05	16.95	11.0	6.9	25.5	33.7	33.45	31.65	22.55	17.9
28	11.75	17.9	20.1	16.75	10.75	7.4	26.4	33.5	33.3	31.35	22.25	17.55
29	12.15	18.0	20.15	16.6	.....	7.8	27.3	33.4	33.2	31.1	22.3	17.25
30	12.3	18.1	20.2	16.4	.....	8.3	28.35	33.45	33.05	30.9	22.35	16.85
31	12.4	.....	20.25	16.2	.....	8.8	.....	33.45	.....	30.65	22.45	.....

[1] See U. S. Geol. Survey Water-Supply Paper 200.

Gate openings, in feet, of Indian Lake Reservoir near Indian Lake, N. Y., for the year ending Sept. 30, 1914.

Date.	Sluice gate A open.	Sluice gate B open.
	Feet.	*Feet.*
Oct. 1–19	.....	5.0
Dec. 21–23	.....	5.0
Jan. 4–Mar. 26	.....	5.0
Feb. 18–24	2.5	.....
Feb. 25	1.5	.....
Feb. 26–28	1.0	.....
May 25–28	.....	5.0
June 25–30	.....	2.5
July 17–Aug. 30	.....	5.0
Aug. 6–30	1.67	.....
Sept. 8–30	.....	5.0
Sept. 12–22	1.67	.....
Sept. 23–30	5.0	.....

INDIAN RIVER NEAR INDIAN LAKE, N. Y.

Location.—About three-quarters of a mile below dam at outlet of Indian Lake, 1 mile above Big Brook, 2 miles south of Indian Lake village, and 6½ miles above the mouth.

Drainage area.—132 square miles.

Records available.—July 1, 1912, to June 30, 1914, when station was discontinued; also miscellaneous measurements in 1911. Data also in annual reports of State engineer and surveyor and State of New York Conservation Commission.

Gage.—Vertical staff on right bank in a pool about 150 feet above the rapids which form the control.

Discharge measurements.—Made from a cable about 75 feet below the gage or by wading.

Channel and control.—Rough and rocky; practically permanent.

Extremes of discharge.—Maximum stage recorded during year, 3.2 feet at 5 p. m. May 26; discharge, 684 second-feet.

Maximum stage recorded 1912–1914, 7.8 feet at 4 p. m. March 28, 1913; discharge approximately 3,460 second-feet. Practically no flow when gates at Indian Lake are closed.

Winter flow.—Discharge relation not seriously affected by ice because of proximity of reservoir.

Regulation.—Flow controlled by storage in Indian Lake. Results not corrected for storage.

Accuracy.—Rating curve well defined; results excellent except at extreme low stages and on days when changes are made in outlet gates of reservoir.

Discharge measurements of Indian River near Indian Lake, N. Y., during the year ending Sept. 30, 1914.

[Made by C. S. De Golyer.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Apr. 30	2.50	416	May 1	0.46	14.8	May 1	3.86	957

Daily gage height, in feet, of Indian River near Indian Lake, N. Y., for the year ending Sept. 30, 1914.

[Lester Sevarie, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.
1	2.3	0.1	0.1	0.05	2.4	2.35	0.20	0.45	0.50
2	2.3	.1	.1	.05	2.4	2.3	.20	.45	.50
3	2.3	.1	.1	.69	2.4	2.25	.20	.50	.55
4	2.3	.1	.1	2.6	2.4	2.25	.20	.50	.62
5	2.25	.1	.1	2.6	2.4	2.25	.20	.55	.68
6	2.25	.1	.15	2.6	2.35	2.2	.20	.60	.70
7	2.25	.1	.15	2.6	2.35	2.2	.20	.60	.75
8	2.25	.1	.2	2.6	2.35	2.15	.30	.60	.80
9	2.2	.1	.2	2.6	2.35	2.15	.30	.60	.80
10	2.2	.1	.2	2.5	2.35	2.15	.30	.65	.80
11	2.15	.1	.15	2.5	2.35	2.15	.30	.65	.82
12	2.15	.1	.15	2.5	2.35	2.15	.25	.70	.82
13	2.15	.15	.15	2.5	2.35	2.15	.25	.70	.82
14	2.1	.15	.1	2.5	2.35	2.15	.25	.90	.82
15	2.1	.15	.1	2.5	2.35	2.15	.25	1.10	.80
16	2.05	.15	.1	2.5	2.35	2.15	.25	1.20	.80
17	2.05	.15	.1	2.5	2.3	2.1	.25	1.30	.78
18	2.0	.15	.1	2.5	2.45	2.1	.25	1.35	.78
19	2.0	.15	.1	2.45	2.8	2.1	.30	1.40	.75
20	.05	.15	.1	2.45	2.8	2.1	.40	1.40	.75
21	.05	.15	2.6	2.45	2.8	2.1	.40	1.40	.75
22	.05	.15	2.6	2.45	2.7	2.1	.40	1.40	.75
23	.05	.15	2.6	2.45	2.7	2.05	.35	1.45	.75
24	.05	.15	.1	2.45	2.7	2.05	.35	1.45	.75
25	.05	.1	.1	2.45	2.6	2.05	.35	2.2	.95
26	.05	.1	.1	2.45	2.5	2.0	.35	3.2	2.35
27	.1	.1	.1	2.45	2.45	.97	.35	1.47	2.3
28	.1	.1	.1	2.4	2.4	.10	.40	3.0	2.3
29	.1	.1	.1	2.4	.....	.05	.....	1.11	2.3
30	.1	.1	.05	2.4	.....	.05	.55	.48	2.3
31	.1	.....	.05	2.4	.....	.05	.....	.48	.....

NOTE.—Gage heights observed at about 4 p. m. Gates at Indian Lake changed Dec. 20 and 23 after the gage was read.

Daily discharge, in second-feet, of Indian River near Indian Lake, N. Y., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.
1	353	1.0	1.0	0.5	385	369	2	12	15
2	353	1.0	1.0	.5	385	353	2	12	15
3	353	1.0	1.0	30	385	338	2	15	18
4	353	1.0	1.0	453	385	338	2	15	24
5	338	1.0	1.0	453	385	338	2	18	29
6	338	1.0	1.5	453	369	322	2	22	31
7	338	1.0	1.5	453	369	322	2	22	36
8	338	1.0	2.0	453	369	307	5	22	41
9	322	1.0	2.0	453	369	307	5	22	41
10	322	1.0	2.0	418	369	307	5	26	41
11	307	1.0	1.5	418	369	307	5	26	43
12	307	1.0	1.5	418	369	307	3.5	31	43
13	307	1.5	1.5	418	369	307	3.5	31	43
14	292	1.5	1.0	418	369	307	3.5	53	43
15	292	1.5	1.0	418	369	307	3.5	80	41
16	278	1.5	1.0	418	369	307	3.5	95	41
17	278	1.5	1.0	418	353	292	3.5	111	39
18	264	1.5	1.0	418	402	292	3.5	120	39
19	264	1.5	1.0	402	526	292	5	129	36
20	.5	1.5	114	402	526	292	9	129	36
21	.5	1.5	453	402	526	292	9	129	36
22	.5	1.5	453	402	489	292	9	129	36
23	.5	1.5	340	402	489	278	7	138	36
24	.5	1.5	1.0	402	489	278	7	138	36
25	.5	1.0	1.0	402	453	278	7	322	60
26	.5	1.0	1.0	402	418	264	7	322	369
27	1.0	1.0	1.0	402	402	62	7	142	353
28	1.0	1.0	1.0	385	385	1	9	603	353
29	1.0	1.0	1.0	385	.....	.5	14	82	353
30	1.0	1.0	.5	385	.....	.5	18	14	353
31	1.0	.....	.5	385	.....	.5	.....	14	.....

NOTE.—Discharge determined from a rating curve well defined between 15 and 1,300 second-feet. Figures or Dec. 20 and 23 are weighted averages of discharge before and after change of gates at Indian Lake.

Monthly discharge of Indian River near Indian Lake, N. Y., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Accuracy.
	Maximum.	Minimum.	Mean.	
October	353	0.5	194	A.
November	1.5	1.0	1.2	A.
December	453	.5	44.9	A.
January	453	.5	376	A.
February	526	353	409	A.
March	369	.5	260	A.
April	18.5	2	5.6	B.
May	603	12	97.5	A.
June	369	15	89.4	A.

SCHROON RIVER AT RIVERBANK, N. Y.

Location.—At highway bridge at Riverbank, 1 mile below Tumblehead Falls, 3½ miles below outlet of Brant Lake, 9 miles below Schroon Lake, and about 9 miles north of Warrensburg.

Drainage area.—534 square miles.

Records available.—September 2, 1907, to September 30, 1914. Data also in annual reports of State engineer and surveyor and State of New York Conservation Commission.

Gage.—Chain on highway bridge.

Discharge measurements.—Made from the bridge.

Channel and control.—Gravel; slightly shifting.

Extremes of discharge.—Maximum stage recorded during year: 9.25 feet at 8 a. m. April 22; discharge, 9,550 second-feet. Minimum stage recorded: 1.20 feet at 8 a. m. October 1; discharge, 79 second-feet.

Maximum stage recorded 1907–1914: 10.7 feet at 5 p. m. March 28, 1913; discharge, approximately 13,500 second-feet. Minimum stage recorded: 0.85 foot at 5 p. m. October 17, 1909; discharge, 28 second-feet.

Winter flow.—Discharge relation somewhat affected by ice.

Regulation.—Flow affected by storage in Schroon and Brant lakes. Results not corrected for storage.

Accuracy.—Results good except for winter and periods during which log jams occur.

Discharge measurements of Schroon River at Riverbank, N. Y., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Oct. 2	G. H. Canfield	1.36	114	Mar. 10	R. S. Barnes	[a] 2.35	294
2	do	1.36	113	31	O. W. Hartwell	[b] 3.49	908
Jan. 1	C. S. De Golyer	[a] 2.50	347	Apr. 22	W. S. Easterly	9.18	7,290
14	do	[a] 2.88	349	May 5	C. S. De Golyer	5.78	3,440
27	do	[a] 2.41	297	5	do	5.76	3,360
Feb. 4	R. S. Barnes	[a] 2.15	320	Sept. 15	E. D. Burchard	1.89	280
17	W. S. Easterly	[a] 2.40	278				

[a] Discharge relation affected by ice. [b] Discharge relation affected by log jams.

Daily gage height, in feet, of Schroon River at Riverbank, N. Y., for the year ending Sept. 30, 1914.

[J. H. Roberts, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.22	1.8	2.4	2.35	1.8	2.3	3.9	6.8	3.1	2.2	1.47	1.55
2	1.36	1.8	2.4	2.9	2.1	2.5	4.4	6.7	2.35	2.25	1.5	1.55
3	1.34	1.8	2.3	2.85	2.1	2.5	4.7	6.3	2.3	2.3	1.55	1.6
4	1.30	1.85	2.3	[a] 2.5	2.05	2.5	4.7	6.0	2.3	1.55	1.5	1.55
5	1.30	1.9	2.3	2.4	2.1	2.45	4.8	5.8	2.7	1.6	1.5	1.55
6	1.35	1.85	2.3	2.5	2.05	2.5	4.7	5.6	2.3	1.55	1.5	1.65
7	1.35	1.85	2.25	2.5	2.1	2.45	4.6	5.4	2.3	1.6	1.48	1.55
8	1.34	1.85	2.6	2.3	2.1	2.5	4.8	5.1	2.35	1.6	1.48	1.5
9	1.39	1.9	2.35	2.35	2.6	2.5	5.4	4.9	2.75	1.55	1.45	1.65
10	1.38	2.0	2.4	2.3	2.3	2.3	5.7	4.7	2.4	1.55	1.46	1.75
11	1.30	2.05	2.55	2.85	2.15	2.25	6.0	4.2	2.9	1.5	1.44	1.85
12	1.30	2.15	2.45	2.8	2.4	2.3	6.0	3.9	3.0	1.5	1.45	1.9
13	1.40	2.15	2.5	2.85	2.3	2.3	5.9	4.0	2.85	1.6	1.46	1.75
14	1.42	2.15	2.5	3.0	2.2	2.25	5.7	4.0	2.45	1.6	1.45	1.85
15	1.45	1.8	2.5	2.9	2.0	2.2	5.7	4.1	3.10	1.55	1.45	1.85
16	1.45	2.15	2.45	2.4	2.2	2.1	5.7	4.1	3.20	1.6	1.40	1.85
17	1.40	2.2	2.45	2.5	2.5	2.0	5.8	4.0	2.60	1.6	1.43	1.9
18	1.45	2.2	2.45	2.8	2.4	2.1	5.9	4.0	2.55	1.6	1.41	1.85
19	1.45	2.2	2.4	2.7	2.3	2.1	6.3	4.0	2.35	1.55	1.44	1.85
20	1.65	2.3	2.3	2.6	2.2	2.1	7.5	3.4	2.30	1.55	1.46	1.8
21	1.7	2.4	2.3	2.6	2.2	2.2	9.1	3.1	1.55	1.55	1.5	1.85
22	1.6	2.45	2.35	2.7	2.35	2.05	9.2	3.6	2.35	1.55	1.48	1.85
23	1.6	2.5	2.3	2.6	2.1	2.1	8.6	3.2	2.35	1.55	1.5	1.8
24	1.6	2.5	2.25	2.45	2.3	2.15	8.0	3.2	2.25	1.55	1.48	1.75
25	1.7	2.55	2.3	2.4	2.2	2.1	7.6	3.1	2.35	1.6	1.44	1.8
26	1.75	2.5	2.35	2.5	2.3	2.15	7.1	3.1	2.25	1.5	1.45	1.8
27	1.8	2.5	2.3	2.5	2.3	2.25	7.0	3.1	1.40	1.6	1.46	1.8
28	2.15	2.5	2.5	2.4	2.3	2.65	6.9	3.3	1.65	1.55	1.39	1.75
29	2.45	2.45	2.5	2.35	.....	2.85	6.8	2.9	2.15	1.5	1.55	1.7
30	2.4	2.4	2.55	2.3	.....	3.2	6.9	2.65	2.05	1.5	1.5	1.7
31	2.1	.....	2.45	2.0	.....	3.6	.....	2.65	.....	1.5	1.6	.....

NOTE.—Discharge relation affected by ice Dec. 30 to Jan. 31, and Feb. 2 to Mar. 15; by log jam, Mar. 31 and Apr. 20–25.

Daily discharge, in second-feet, of Schroon River at Riverbank, N. Y., for the year ending, Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	83	230	450	347	230	.....	1,380	4,940	810	370	138	159
2	112	230	450	495	.....	.....	1,850	4,790	430	390	146	159
3	108	230	410	468	.....	.....	2,170	4,200	410	410	159	172
4	99	246	410	430	.....	.....	2,170	3,780	410	159	146	159
5	99	262	410	410	.....	.....	2,280	3,510	590	172	146	159
6	110	246	410	394	.....	.....	2,170	3,250	410	159	146	186
7	110	246	390	378	.....	.....	2,060	3,000	410	172	141	159
8	108	246	410	378	.....	.....	2,280	2,640	430	172	141	146
9	119	262	430	382	.....	.....	3,000	2,400	615	159	134	186
10	117	296	450	370	.....	.....	3,380	2,170	450	159	136	215
11	99	314	518	362	.....	.....	3,780	1,660	695	146	131	246
12	99	351	472	355	.....	.....	3,780	1,380	750	146	134	262
13	121	351	495	351	.....	.....	3,640	1,470	668	172	136	215
14	126	351	495	349	.....	.....	3,380	1,470	472	172	134	246
15	134	230	495	347	.....	.....	3,380	1,560	810	159	134	246
16	134	351	472	.....	.....	332	3,380	1,560	870	172	121	246
17	121	370	472	.....	.....	296	3,510	1,470	540	172	128	262
18	134	370	472	.....	.....	332	3,640	1,470	518	172	124	246
19	134	370	450	.....	.....	332	4,200	1,470	430	159	131	246
20	186	410	410	.....	.....	332	5,420	1,000	410	159	136	230
21	200	450	410	.....	.....	370	7,050	810	159	159	146	246
22	172	472	430	.....	.....	312	7,250	1,140	430	159	141	246
23	172	495	410	.....	.....	332	6,660	870	430	159	146	230
24	172	495	390	.....	.....	351	6,110	870	390	159	141	215
25	200	518	410	.....	.....	332	5,760	810	430	172	131	230
26	215	495	430	.....	.....	351	5,420	810	390	146	134	230
27	230	495	410	.....	.....	390	5,260	810	121	172	136	230
28	351	495	390	.....	.....	565	5,100	935	186	159	119	215
29	472	472	390	.....	.....	668	4,940	695	351	146	159	200
30	450	450	390	.....	.....	723	5,100	565	314	146	146	200
31	332	.....	370	.....	.....	935	.....	565	.....	146	172	.....

NOTE.—Discharge determined from a well defined rating curve, except as follows: Dec. 30 to Jan. 15, estimated from discharge measurements and temperature records; Jan. 16–31, estimated at 284 second-feet, Feb. 2–28, at 291 second-feet, and Mar. 1–15, at 308 second-feet; Mar. 31 and Apr. 20–25, estimated as given from hydrograph studies.

Monthly discharge of Schroon River at Riverbank, N. Y., for the year ending Sept. 30, 1914.

[Drainage area, 534 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
October	472	83	172	0.322	0.37	A.
November	518	230	360	.674	.75	A.
December	518	370	432	.809	.93	A.
January	495	.....	334	.626	.72	B.
February	.....	.....	282	.528	.55	C.
March	935	.....	373	.699	.80	B.
April	7,250	1,380	3,980	7.45	8.31	A.
May	4,920	565	1,870	3.51	4.05	A.
June	870	121	478	.895	1.00	A.
July	410	146	183	.343	.40	B.
August	172	119	139	.261	.30	B.
September	262	146	213	.399	.44	B.
The year	7,250	83	733	1.37	18.62	

SACANDAGA RIVER NEAR HOPE, N. Y.

Location.—About 1½ miles below junction of East and West branches, 3½ miles above post office at Hope, 4 miles below Wells, and 12 miles above Northville.

Drainage area.—494 square miles.

Records available.—September 15, 1911, to September 30, 1914. Data also in annual reports of State engineer and surveyor and State of New York Conservation Commission.

Gage.—Staff in two sections—the lower inclined, the upper vertical.

Discharge measurements.—Made from cable or by wading.

Channel and control.—Rocky; practically permanent.

Extremes of discharge.—Maximum stage recorded during year, 8.35 feet at 7.20 a. m. April 20; discharge 15,200 second-feet. Minimum stage recorded, 1.40 feet, October 1 and August 6, 7, and 8; discharge, 45 second-feet.

Maximum stage recorded, 1911–1914: 10 feet at 5.30 p. m. March 27, 1913; discharge, 24,800 second-feet. Minimum stage recorded, 1.17 feet at 7.55 a. m. September 20, 1913; discharge, 20 second-feet.

Winter flow.—Discharge relation affected by ice.

Accuracy.—Results good for open-water season.

Discharge measurements of Sacandaga River near Hope, N. Y., during the year ending Sept. 30, 1914.

[Made by C. S. de Golyer.]

	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
Sept. 28	1.78	137
30	1.74	122

Daily gage height, in feet, of Sacandaga River near Hope, N. Y., for the year ending Sept. 30, 1914.

[Melvin Willis, observer.]

Day.	Oct.	Nov.	Dec.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.58	2.9	2.8	4.4	5.9	2.5	1.85	1.66	2.7
2	1.94	2.8	2.75	5.2	5.6	2.42	1.82	1.65	2.6
3	2.44	2.65	2.8	.....	4.9	2.35	1.95	1.60	2.9
4	2.16	2.7	2.85	4.4	4.9	2.5	1.88	1.59	2.75
5	2.00	2.7	2.85	4.4	4.8	2.65	1.80	1.45	2.55
6	1.84	2.65	2.8	4.0	4.6	2.48	2.08	1.40	2.45
7	1.86	2.55	3.05	3.9	4.6	2.40	2.18	1.40	2.5
8	1.79	2.5	4.2	5.1	4.1	2.5	2.5	1.42	2.42
9	1.74	5.7	3.5	6.4	4.2	2.48	2.48	1.45	2.25
10	1.70	6.2	3.5	5.4	4.3	2.34	2.38	1.45	2.18
11	1.68	4.8	3.45	5.0	4.2	2.26	2.38	1.50	2.12
12	1.75	4.4	3.1	4.9	4.4	2.22	2.55	1.52	2.05
13	1.76	4.0	3.15	4.6	4.2	2.12	2.38	1.45	2.00
14	1.74	3.8	3.1	4.6	4.4	2.09	2.20	1.50	1.95
15	1.68	3.6	3.05	4.8	4.3	1.99	2.15	1.55	1.88
16	1.62	3.45	2.95	4.9	4.2	1.96	2.12	1.53	1.85
17	1.72	3.3	2.85	5.0	3.8	2.02	2.08	1.50	1.88
18	1.57	3.2	2.8	5.8	3.4	1.88	2.10	1.51	1.85
19	1.64	3.1	2.55	7.1	3.6	1.85	2.02	1.55	1.78
20	2.75	3.8	2.7	8.3	3.15	1.92	1.94	1.62	1.75
21	4.0	3.8	2.6	7.6	3.15	1.86	1.90	2.12	1.75
22	3.3	3.6	2.55	6.6	3.0	1.80	1.92	2.21	1.72
23	3.0	3.5	2.65	6.4	3.0	1.76	1.88	1.96	1.70
24	2.85	3.4	2.55	5.8	2.9	1.68	1.90	1.90	1.72
25	3.6	3.3	2.5	5.6	3.1	1.70	1.86	1.88	1.80
26	4.0	3.15	2.5	6.1	3.0	1.65	1.82	1.80	1.80
27	3.9	3.0	2.5	6.1	2.8	1.62	1.78	1.70	1.80
28	3.6	2.9	.....	6.1	2.75	1.60	1.74	1.80	1.79
29	3.4	2.9	2.3	6.4	2.7	2.00	1.70	3.3	1.75
30	3.3	2.85	.....	6.3	2.85	1.90	1.70	3.7	1.72
31	3.1	.....	2.75	.....	2.6	.....	1.70	3.0	.....

NOTE.—Discharge relation affected by ice Dec. 30–31. No records obtained, January to March.

Daily discharge, in second-feet, of Sacandaga River near Hope, N. Y., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Apr.	May.	June.	July.	Aug.	Sept.
1	92	740	666	2,560	6,070	456	160	101	590
2	212	666	632	4,230	5,250	411	150	98	520
3	440	566	666	3,460	3,540	374	197	85	740
4	303	598	703	2,560	3,540	456	171	83	625
5	235	598	703	2,560	3,330	555	143	53	488
6	174	566	666	1,920	2,930	445	248	45	428
7	182	504	860	1,780	2,930	400	291	45	456
8	157	474	2,230	3,990	2,070	456	456	48	411
9	140	5,520	1,290	7,530	2,230	445	445	53	324
10	127	6,930	1,290	4,730	2,390	369	390	53	291
11	121	3,330	1,240	3,760	2,230	329	390	63	265
12	144	2,560	900	1,920	2,560	310	488	67	236
13	147	1,920	945	2,930	2,230	265	390	53	216
14	140	1,650	900	2,930	2,560	252	300	63	197
15	121	1,400	860	3,330	2,390	212	278	73	171
16	103	1,240	780	3,540	2,230	201	265	69	160
17	134	1,090	703	3,760	1,650	224	248	63	171
18	89	990	666	5,790	1,190	171	256	65	160
19	109	900	504	9,900	1,400	160	224	73	137
20	632	1,650	598	15,000	955	186	193	90	127
21	1,920	1,650	534	11,800	955	164	178	265	127
22	1,090	1,400	504	8,160	820	143	186	305	118
23	820	1,290	566	7,530	820	130	171	201	112
24	703	1,190	504	5,790	740	106	178	178	118
25	1,400	1,090	474	5,250	910	112	164	171	143
26	1,920	945	474	6,640	820	98	150	143	143
27	1,780	820	474	6,640	660	90	137	112	143
28	1,400	740	420	6,640	625	85	124	143	140
29	1,190	740	367	7,530	590	216	112	1,090	127
30	1,090	703	367	7,230	700	178	112	1,520	118
31	900	.....	367	.....	520	.....	112	820	.....

NOTE.—Discharge determined from two well-defined rating curves, one used Oct. 1 to Dec. 29, the other Apr. 1 to Sept. 30. Discharge estimated Dec. 30–31, and April 3.

Monthly discharge of Sacandaga River near Hope, N. Y., for the year ending Sept. 30, 1914.

[Drainage area, 494 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
October	1,920	89	581	1.18	1.36	A.
November	6,930	474	1,480	3.00	3.35	A.
December	2,230	367	737	1.49	1.72	A.
April	15,000	1,780	5,380	10.9	12.16	B.
May	6,070	520	1,990	4.03	4.65	A.
June	555	85	267	.540	.60	A.
July	488	112	236	.478	.55	A.
August	1,520	45	203	.411	.47	B.
September	740	112	267	.540	.60	A.

SACANDAGA RIVER AT HADLEY, N. Y.

Location.—About half a mile west of railroad station at Hadley, a mile above mouth of river, and 4½ miles below site of proposed storage dam at Conklingville.

Drainage area.—1,060 square miles.

Records available.—January 1, 1911, to September 30, 1914; September 13, 1907, to December 31, 1910, at upper bridge station; September 24, 1909, to midsummer of 1911, at lower bridge station. Data also in annual reports of State engineer and surveyor and State of New York Conservation Commission.

Gage.—Barrett & Lawrence water-stage recorder referenced to gage datum by a hook gage inside of well. A vertical staff gage is used for auxiliary readings.

Discharge measurements.—Made from a cable about 30 feet above gage or by wading about three-fourths mile above gage.

Extremes of discharge.—Maximum stage recorded during year (automatic gage) 10.22 feet at 8 p. m. April 21; discharge, 20,800 second-feet. Minimum stage recorded (automatic gage), 2.42 feet at 2 a. m. August 13; discharge, 111 second-feet.

Maximum stage recorded 1911–1914 (automatic gage), 12.36 feet from 11 a. m. to 12 m. March 28, 1913; discharge, approximately 35,500 second-feet. Minimum stage recorded (automatic gage), 2.25 feet, all day September 16, 1913; discharge 61 second-feet.

Winter flow.—Discharge relation seriously affected by ice.

Accuracy.—Results good.

Discharge measurements of Sacandaga River at Hadley, N. Y., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Dec. 30	C. S. De Golyer	4.67	894	Feb. 2	R. S. Barnes	4.59	1,130
Jan. 12	do	3.93	566	24	do	4.72	736
17	do	4.44	547	Mar. 11	do	4.19	686
28	do	4.28	659				

NOTE.—Discharge relation affected by ice for all of the above measurements.

Daily gage height, in feet, of Sacandaga River at Hadley, N. Y., for the year ending Sept. 30, 1914.

[J. F. Kelly, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.69	4.3	4.05	4.55	4.55	3.65	6.65	7.7	3.65	3.12	2.60	4.32
2	2.73	4.1	4.0	4.85	4.55	4.40	6.9	7.5	3.55	2.95	2.63	4.02
3	2.97	3.9	4.0	4.8	4.55	4.75	7.1	7.2	3.46	2.98	2.61	3.88
4	3.4	3.85	4.1	4.55	4.41	4.38	7.4	6.75	3.47	3.00	2.59	3.91
5	3.3	3.8	4.15	4.35	4.55	4.18	7.4	6.55	3.63	3.00	2.55	3.80
6	3.15	3.8	4.15	4.43	4.7	4.08	6.9	6.45	3.75	2.98	2.54	3.61
7	3.05	3.75	4.2	4.30	4.45	4.05	6.45	6.35	3.64	3.03	2.50	3.48
8	2.95	3.7	5.1	4.14	4.48	4.01	6.45	6.15	3.56	3.43	2.48	3.42
9	2.88	4.5	5.4	4.05	4.5	3.98	7.2	5.9	3.57	3.55	2.48	3.35
10	2.83	6.5	5.2	3.99	4.45	3.98	7.9	5.75	3.59	3.41	2.46	3.23
11	2.80	7.0	5.0	3.95	4.5	3.95	7.9	5.55	3.50	3.33	2.45	3.15
12	2.76	7.0	4.5	3.91	4.55	3.88	7.6	5.4	3.38	3.39	2.43	3.08
13	2.75	6.6	4.45	3.95	4.5	3.85	7.3	5.55	3.28	3.40	2.44	3.01
14	2.76	6.2	4.5	4.26	4.55	3.82	7.1	5.7	3.21	3.32	2.45	2.97
15	2.76	5.8	4.4	4.5	.....	3.75	6.95	5.75	3.15	3.20	2.46	2.93
16	2.72	5.4	4.25	4.6	.....	3.90	6.95	5.65	3.10	3.10	2.46	2.84
17	2.72	5.0	4.2	4.38	.....	4.20	6.95	5.45	3.07	3.08	2.48	2.83
18	2.71	4.7	4.15	4.40	5.45	4.35	7.0	5.2	3.02	3.03	2.47	2.82
19	2.72	4.5	3.95	4.55	5.2	4.38	7.5	4.95	2.97	3.01	2.49	2.79
20	2.92	4.6	3.65	4.38	4.9	4.5	8.6	4.7	2.95	2.97	2.53	2.77
21	4.15	5.1	3.75	4.30	4.85	4.55	9.9	4.45	2.94	2.91	2.71	2.75
22	4.35	5.2	3.8	4.35	4.75	4.36	10.0	4.35	2.95	2.86	2.95	2.73
23	4.5	5.0	3.65	4.44	4.65	4.32	9.3	4.25	2.95	2.84	3.15	2.71
24	4.15	4.8	3.5	4.32	4.55	4.24	8.6	4.15	2.92	2.84	3.08	2.70
25	4.25	4.7	3.65	4.25	4.48	4.15	8.0	4.02	2.83	2.84	2.92	2.69
26	5.0	4.5	3.6	4.65	4.25	4.18	7.7	3.98	2.75	2.83	2.86	2.70
27	5.5	4.35	3.7	4.65	3.85	4.65	7.6	4.03	2.78	2.79	2.83	2.71
28	5.4	4.2	4.25	4.29	3.70	5.55	7.6	3.91	2.78	2.75	2.80	2.72
29	5.1	4.1	4.7	4.13	.....	6.1	7.6	3.82	2.80	2.70	3.14	2.74
30	4.8	4.1	4.7	4.19	.....	6.35	7.7	3.75	2.83	2.69	4.55	2.73
31	4.6	.....	4.6	4.26	.....	6.5	.....	3.78	.....	2.63	4.75	.....

NOTE.—Discharge relation affected by ice Dec. 25 to Mar. 31.

Daily discharge, in second-feet, of Sacandaga River at Hadley, N. Y., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	214	1,500	1,220	778	1,060	552	6,260	9,500	821	436	176	1,530
2	232	1,270	1,160	698	1,090	1,220	6,980	8,820	738	339	189	1,180
3	350	1,060	1,160	864	1,110	1,630	7,580	7,880	668	355	180	1,040
4	622	1,010	1,270	864	956	1,220	8,500	6,540	675	366	172	1,060
5	552	956	1,330	910	1,110	1,010	8,500	5,980	804	366	157	956
6	455	956	1,330	1,010	1,060	864	6,980	5,720	910	355	153	787
7	395	910	1,380	864	1,010	738	5,720	5,460	812	383	138	683
8	339	864	2,710	738	1,060	660	5,720	4,960	746	645	131	637
9	302	1,760	3,270	660	1,060	587	7,880	4,360	754	738	131	587
10	278	5,850	2,890	622	1,010	552	10,200	4,020	770	630	124	506
11	263	7,280	2,540	587	.....	519	10,200	3,580	698	573	121	455
12	245	7,280	1,760	552	.....	486	9,160	3,270	608	615	114	412
13	240	6,120	1,700	552	.....	455	8,180	3,580	539	622	118	372
14	245	5,080	1,760	587	.....	424	7,580	3,900	493	566	121	349
15	245	4,130	1,630	587	.....	395	7,130	4,020	455	486	124	328
16	227	3,270	1,440	660	.....	486	7,130	3,790	424	424	124	283
17	227	2,540	1,380	519	.....	698	7,130	3,370	407	412	131	277
18	222	2,050	1,330	519	.....	821	7,280	2,890	378	383	128	272
19	227	1,760	1,110	622	.....	864	8,820	2,460	350	372	135	258
20	323	1,900	821	519	.....	956	12,900	2,050	339	350	149	250
21	1,330	2,710	910	455	.....	1,010	19,000	1,700	334	317	222	240
22	1,570	2,890	956	486	.....	821	19,500	1,570	339	292	339	232
23	1,760	2,540	821	552	.....	778	16,000	1,440	339	283	455	222
24	1,330	2,210	698	552	622	738	12,900	1,330	323	283	412	218
25	1,440	2,050	660	587	622	660	10,600	1,180	278	283	323	214
26	2,540	1,760	660	910	587	698	9,500	1,140	240	278	292	218
27	3,470	1,570	738	956	552	956	9,160	1,190	254	258	278	222
28	3,270	1,380	821	660	552	1,630	9,160	1,070	254	240	263	227
29	2,710	1,270	864	552	.....	2,710	9,160	976	263	218	449	236
30	2,210	1,270	864	587	.....	3,900	9,500	910	278	214	1,830	232
31	1,900	.....	864	622	.....	5,330	.....	938	.....	189	2,130	.....

NOTE.—Discharge determined from a well-defined rating curve. Discharge Dec. 25 to Mar. 31 determined from discharge measurements, climatic records, and comparisons with records at stations on Hudson River. Discharge Feb. 11–23 estimated at 771 second-feet.

Monthly discharge of Sacandaga River at Hadley, N. Y., for the year ending Sept. 30, 1914.

[Drainage area, 1,060 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
October	3,470	214	959	0.905	1.04	A.
November	7,280	864	2,570	2.42	2.70	A.
December	3,270	660	1,360	1.28	1.48	B.
January	1,010	455	666	.628	.72	B.
February	.....	.....	839	.792	.82	C.
March	5,330	395	1,110	1.05	1.21	B.
April	19,500	5,720	9,480	8.94	9.97	A.
May	9,500	910	3,540	3.34	3.85	A.
June	910	240	510	.481	.54	A.
July	738	189	396	.374	.43	A.
August	2,130	114	316	.298	.34	A.
September	1,530	214	482	.455	.51	A.
The year	19,500	114	1,840	1.74	23.61	

WEST BRANCH OF SACANDAGA RIVER AT BLACKBRIDGE, NEAR WELLS, N. Y.

Location.—At highway bridge known as Blackbridge, 2 miles above junction of East and West branches of Sacandaga River, and about 3 miles west of Wells.

Drainage area.—211 square miles.

Records available.—March 14, 1911, to September 30, 1914. Data also in annual reports of State engineer and surveyor and State of New York Conservation Commission.

Gage.—Chain on upstream side of highway bridge.

Discharge measurements.—Made from the bridge or by wading.

Channel and control.—Rocky; slightly shifting during floods.

Extremes of stage.—Maximum stage recorded during year, 9.20 feet at 8 a. m. April 20. Minimum stage recorded, 2.30 feet at 2.30 p. m. June 30.

Maximum stage recorded 1911–1914, 11.5 feet at 4 p. m. March 27, 1913 (discharge approximately 29,000 second-feet). Minimum stage recorded, 2.30 feet September 17, 1913 (discharge, 3 second-feet.

Winter flow.—Discharge relation seriously affected by ice.

Regulation.—Flow slightly affected by storage dams used for logging in spring.

Accuracy.—Results good up to December, 1913.

Discharge measurements of West Branch of Sacandaga River at Blackbridge, near Wells, N. Y., during the year ending Sept. 30, 1914.

[Made by C. S. De Golyer.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
Sept. 29	2.80	60.8
29	2.79	57.1

Daily gage height, in feet, of West Branch of Sacandaga River at Blackbridge, near Wells, N. Y., for the year ending Sept. 30, 1914.

[Cornelius De Groff, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.72	4.3	3.9	3.9	5.15	6.8	3.32	2.88	2.55	3.8
2	3.41	4.1	3.9	4.3	5.45	6.0	3.30	2.92	2.62	3.9
3	3.8	4.0	3.85	4.7	6.2	6.2	3.25	2.90	2.58	4.3
4	3.65	4.5	3.8	4.55	6.0	5.4	3.40	2.72	2.52	4.3
5	3.40	4.1	3.85	4.2	5.6	6.0	3.6	2.82	2.52	4.25
6	3.26	3.95	3.8	4.2	5.35	5.6	3.5	3.22	2.55	4.0
7	3.18	3.9	3.7	4.3	5.1	5.35	3.40	3.5	2.45	3.8
8	3.10	3.8	5.15	4.3	6.5	5.15	3.6	3.7	2.45	3.7
9	3.05	6.2	4.75	4.1	7.2	5.05	3.6	3.6	2.45	3.5
10	2.95	6.4	4.65	3.9	5.8	5.15	3.45	3.6	2.40	3.42
11	2.91	5.9	4.5	.....	5.1	5.15	3.32	3.7	3.40	3.32
12	2.90	5.6	4.35	.....	6.2	5.4	3.30	3.55	2.50	3.25
13	3.00	5.15	4.3	.....	5.8	5.9	3.20	3.5	2.45	3.20
14	2.90	5.1	4.2	.....	5.7	5.45	3.10	3.32	2.45	3.20
15	2.68	5.4	4.1	.....	5.8	5.3	3.12	3.32	2.55	3.5
16	2.66	4.65	4.35	.....	5.8	5.3	3.00	3.05	2.60	3.00
17	2.80	4.5	4.0	.....	5.9	5.0	2.90	3.05	2.60	2.95
18	2.84	4.45	3.9	.....	6.2	4.75	2.90	3.22	2.60	2.95
19	2.82	4.3	3.7	.....	7.5	4.55	2.90	3.12	2.55	2.80
20	4.2	5.2	3.7	.....	9.1	4.4	2.95	3.00	2.52	2.85
21	5.15	5.3	3.7	.....	8.4	4.2	2.90	2.72	3.42	2.82
22	4.9	5.0	3.6	.....	7.9	4.1	2.82	2.60	3.45	2.75
23	4.4	5.35	3.7	.....	7.2	4.0	2.80	2.62	3.12	2.85
24	4.3	4.75	3.65	.....	7.0	3.9	2.80	2.92	3.15	2.85
25	5.3	4.6	3.55	.....	7.2	3.8	2.72	2.65	3.12	2.90
26	5.45	4.45	3.55	.....	7.0	3.75	2.70	3.15	2.90	2.80
27	5.25	4.3	3.42	.....	7.2	3.7	2.65	3.55	2.82	2.82
28	4.65	4.2	3.5	.....	7.0	3.7	2.68	3.02	2.95	2.90
29	4.9	4.3	3.40	.....	7.3	3.6	2.52	2.75	4.8	2.85
30	4.6	4.2	3.5	.....	7.2	3.48	2.32	2.70	4.2	2.70
31	4.5	.....	3.8	.....	.....	3.40	.....	2.68	4.0	.....

NOTE.—Discharge relation affected by ice Dec. 31, to Mar. 31. No records obtained Jan. 11 to Mar. 31.

Daily discharge, in second-feet, of West Branch of Sacandaga River at Blackbridge, near Wells, N. Y., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Apr.	May.	June.	July.	Aug.	Sept.
1	28	414	251	965	2,330	130	66	44	255
2	122	326	251	1,100	1,580	126	70	48	290
3	218	287	234	1,760	1,760	116	68	46	450
4	176	517	218	1,580	1,100	147	54	43	450
5	120	326	234	1,260	1,580	203	62	43	428
6	96	269	218	1,100	1,260	171	30	44	325
7	83	251	189	900	1,100	147	43	40	272
8	72	218	968	2,040	965	197	225	40	225
9	65	2,120	667	2,750	835	197	197	40	171
10	52	2,430	604	1,420	965	159	197	37	152
11	47	1,720	517	900	965	130	225	37	130
12	46	1,380	439	1,760	1,100	126	184	42	116
13	58	968	414	1,420	1,500	107	171	40	107
14	46	926	368	1,340	1,100	92	126	40	107
15	24	1,180	326	1,420	1,040	95	126	44	171
16	23	604	439	1,420	1,040	79	86	47	79
17	36	517	287	1,500	835	68	111	47	74
18	40	490	251	1,760	688	68	102	47	74
19	38	414	189	3,080	578	68	95	44	60
20	368	1,010	189	5,140	500	74	79	43	64
21	968	1,090	189	4,190	405	68	54	152	62
22	770	846	163	3,560	365	62	47	159	56
23	464	1,140	189	2,750	325	60	48	95	64
24	414	667	176	2,530	290	60	70	100	64
25	1,090	573	152	2,750	255	54	50	95	68
26	1,230	490	152	2,530	240	53	100	68	68
27	1,050	414	124	2,750	225	50	184	62	62
28	604	368	140	2,530	225	52	82	74	68
29	770	414	120	2,860	197	43	56	715	64
30	573	368	140	2,750	166	34	53	405	53
31	517	.....	140	.....	147	.....	52	325	.....

NOTE.—Discharge determined as follows: Oct. 1 to Dec. 30, from a well-defined rating curve; discharge Dec. 31, estimated; Apr. 1 to Sept. 30, from a fairly well-defined rating curve.

Monthly discharge of West Branch of Sacandaga River at Blackbridge, near Wells, N. Y., for the year ending Sept. 30, 1914.

[Drainage area, 211 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
October	1,230	23	329	1.56	1.80	A.
November	2,430	218	758	3.59	4.00	A.
December	968	120	288	1.36	1.57	A.
April	5,140	900	2,130	10.10	11.20	C.
May	2,330	147	828	3.92	4.52	B.
June	203	34	101	.479	.53	B.
July	225	30	100	.474	.55	B.
August	715	37	100	.474	.55	B.
September	450	53	154	.730	.81	B.

HOOSIC RIVER NEAR EAGLE BRIDGE, N. Y.

Location.—Half a mile below Walloomsac River and 1½ miles above Owlkill Creek and Eagle Bridge.

Drainage area.—512 square miles.

Records available.—August 13, 1910, to September 30, 1914; September 25, 1903, to December 31, 1908, at Buskirk, 4 miles below present station. Data also in annual reports of State engineer and surveyor and State of New York Conservation Commission.

Gage.—Inclined staff on left bank. Prior to August 17, 1914, chain gage 400 feet above present location. Temporary chain gage used May 22 to August 16, 1914.

Discharge measurements.—Made from cable half a mile below gage or by wading.

Channel and control.—Gravel; somewhat shifting.

Extremes of discharge.—At maximum stage observer is unable to reach gage. Minimum stage recorded during year, 6.5 feet at 7.30 a. m. October 18; discharge, 46 second-feet.

Minimum stage recorded 1910–1914, 6.1 feet at 5 p. m. September 14, 1913; discharge, practically zero.

Winter flow.—Discharge relation affected by ice.

Regulation.—Flow affected by storage on Walloomsac River and at Hoosic Falls about 2 miles above gage.

Accuracy.—Results good. Low estimates of discharge may be somewhat in error because of regulation.

Discharge measurements of Hoosic River near Eagle Bridge, N. Y., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 15	R. S. Barnes	10.12	1,640	Aug. 17	C. S. DeGolyer	[b]3.31	152
22	C. S. DeGolyer	[a]9.16	790				

[a] Temporary chain gage. [b] Inclined staff gage. Temporary chain gage read 7.73 feet.

Daily gage height, in feet, of Hoosic River near Eagle Bridge, N. Y., for the year ending Sept. 30, 1914.

[Mrs. Vashti Russell, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	6.88	8.1	8.3	7.55	.....	10.8	11.1	8.55	7.95	7.62	3.65
2	6.90	7.65	8.05	7.9	.....	.....	10.7	8.45	7.95	7.62	3.55
3	7.00	7.85	8.0	8.0	.....	11.8	10.5	8.4	8.05	7.42	3.52
4	7.00	7.9	7.8	7.5	.....	10.6	10.4	8.35	7.90	7.48	3.40
5	6.82	7.6	8.1	8.05	.....	10.2	10.7	9.2	7.98	7.60	3.26
6	7.18	7.6	8.0	8.0	.....	9.8	10.8	8.85	9.1	7.60	2.99
7	6.98	7.5	8.0	7.7	.....	9.8	10.6	8.35	8.4	7.45	3.02
8	6.85	7.4	9.9	7.8	.....	11.3	10.3	8.5	8.7	7.70	3.29
9	6.92	7.8	9.1	7.65	.....	.....	10.1	8.55	8.5	7.45	3.35
10	6.92	11.1	8.8	7.75	.....	11.8	10.0	8.3	8.8	7.40	3.12
11	6.88	9.3	8.8	7.6	.....	11.0	10.1	8.25	8.5	7.45	3.32
12	6.52	8.7	8.6	8.2	.....	11.4	10.0	8.25	8.25	7.65	3.06
13	7.38	8.4	8.5	8.5	.....	11.0	11.4	8.1	8.4	7.60	2.99
14	7.7	8.3	8.7	8.5	.....	10.5	10.9	7.60	8.2	7.72	3.10
15	6.98	8.4	8.6	8.4	.....	10.6	10.6	8.2	8.0	7.72	3.12
16	7.05	8.15	8.45	9.0	.....	10.6	.....	8.35	7.85	7.42	3.22
17	6.90	8.25	8.4	9.0	12.7	11.4	.....	8.3	7.85	3.31	3.20
18	6.85	8.0	8.4	.....	10.3	.....	.....	7.95	8.0	3.34	3.14
19	6.55	8.0	8.3	.....	9.1	.....	.....	8.0	7.72	3.48	2.98
20	7.15	8.7	8.15	.....	8.6	.....	.....	7.80	7.95	3.08	2.90
21	8.1	8.8	8.0	.....	8.3	.....	.....	7.60	7.98	3.64	2.88
22	7.8	8.5	8.3	.....	8.2	12.1	9.1	8.1	7.72	4.05	3.25
23	7.8	8.2	8.0	.....	8.45	11.6	9.0	8.05	7.72	3.52	3.12
24	7.55	8.4	8.1	.....	8.25	11.1	8.8	7.85	7.88	3.52	3.01
25	7.8	8.2	8.0	.....	8.9	10.9	8.85	7.78	7.65	3.52	3.34
26	8.9	8.2	8.2	.....	11.3	11.4	8.8	7.60	7.48	3.40	2.78
27	10.5	7.8	7.8	.....	12.8	11.6	8.7	7.62	7.65	3.42	2.98
28	9.1	8.4	7.7	.....	.....	11.5	8.7	7.38	7.68	3.28	3.06
29	8.6	8.1	8.2	.....	12.5	11.4	8.6	7.90	7.68	3.38	3.38
30	8.3	8.05	8.05	.....	11.2	11.9	8.25	8.0	7.65	3.82	3.26
31	8.05	.....	8.0	.....	10.8	.....	8.4	.....	7.65	3.92	.....

NOTE.—Discharge relation Jan. 13 to Mar. 16 affected by ice. Chain gage was undermined about Apr. 26 and settled gradually until May 21 when it was washed out. Gage heights May 22 to Aug. 16 observed on a temporary chain gage. Gage heights Aug. 17 to Sept. 30 observed on new inclined staff gage.

Daily discharge, in second-feet, of Hoosic River near Eagle Bridge, N. Y., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	112	620	745	332	.....	2,880	2,000	460	215	125	244
2	116	378	590	505	.....	6,520	1,640	412	215	125	212
3	140	478	560	560	.....	4,120	1,480	390	248	84	204
4	140	505	450	310	.....	2,670	1,400	368	200	96	173
5	98	355	620	590	.....	2,280	1,640	820	224	120	142
6	189	355	560	560	.....	1,910	1,730	618	760	120	92
7	135	310	560	400	.....	1,910	1,560	368	390	90	97
8	105	270	2,000	450	.....	3,460	1,320	435	535	145	148
9	121	230	1,320	378	.....	6,860	1,160	460	435	90	162
10	121	3,220	1,090	425	.....	4,120	1,090	345	590	80	115
11	112	1,480	1,090	355	.....	3,100	1,160	325	435	90	155
12	48	1,020	950	680	.....	3,580	1,090	325	325	132	104
13	262	810	880	.....	.....	3,100	2,280	265	390	120	92
14	400	745	1,020	.....	.....	2,570	1,820	120	305	150	111
15	135	810	950	.....	.....	2,670	1,560	305	230	150	115
16	.152	650	845	.....	.....	2,670	.....	368	185	84	134
17	116	712	810	.....	5,530	2,380	.....	345	185	152	130
18	105	560	810	.....	2,380	2,670	.....	215	230	159	119
19	52	560	745	.....	1,310	3,580	.....	230	150	193	91
20	180	1,020	650	.....	950	6,360	.....	170	215	108	79
21	620	1,090	560	.....	745	6,520	.....	120	224	240	76
22	450	880	745	.....	680	4,560	760	265	150	428	140
23	450	680	560	.....	845	3,840	700	248	150	204	115
24	332	810	620	.....	712	3,220	590	185	194	204	96
25	450	680	560	.....	1,160	2,990	618	165	132	204	159
26	1,160	680	680	.....	3,460	3,580	590	120	96	173	64
27	2,570	450	450	.....	5,700	2,470	535	125	132	178	91
28	1,320	810	400	.....	6,860	2,380	535	76	140	146	104
29	950	620	680	.....	5,200	2,280	485	200	140	168	168
30	745	590	590	.....	3,340	2,780	325	230	132	310	142
31	590	.....	560	.....	2,880	.....	390	.....	132	360	.....

NOTE.—Discharge Oct. 1 to May 15 determined from a rating curve well defined between 200 and 6,000 second-feet and fairly well defined below 200 second-feet. Mean discharge Mar. 1–16 estimated at 760 second-feet; May 16–21 at 1,090 second-feet. Discharge May 22 to Aug. 16 determined from a poorly defined rating curve. Discharge Aug. 17 to Sept. 30 determined from a fairly well defined rating curve. No estimate made Jan. 13 to Feb. 28.

Monthly discharge of Hoosic River near Eagle Bridge, N. Y., for the year ending Sept. 30, 1914.

[Drainage area, 512 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
October	2,570	48	402	0.785	0.90	B.
November	1,480	230	746	1.46	1.63	A.
December	2,000	400	763	1.49	1.72	A.
January 1–12	680	310	462	.902	.40	
March	6,860	.....	1,740	3.40	3.92	C.
April	6,860	1,910	3,470	6.78	7.57	B.
May	2,280	325	1,130	2.21	2.55	C.
June	820	76	303	.572	.66	C.
July	760	96	261	.510	.59	C.
August	360	80	162	.316	.36	B.
September	244	64	129	.252	.28	B.

MOHAWK RIVER AT BARGE CANAL LOCK 7, N. Y.[a]

Location.—At Lock 7 of Barge canal, 1 mile above Stony Creek and Vischer Ferry, about 7 miles below Schenectady, and about 11 miles above the mouth.

Drainage area.—3,400 square miles.

Records available.—June 24, 1913, to September 30, 1914. Data also in reports of State engineer and surveyor and State of New York Conservation Commission.

Gage.—Gurley printing water-stage recorder showing head on crest of spillway; located in a corner of the basin near upper end of Barge canal lock. Inclined staff at foot of an old bridge abutment, about 100 feet above Vischer Ferry, read June 24 to December 16, 1913, and May 24 to June 2, 1914; staff gage in masonry of outer lock wall just above upper gates, read March 30 to May 23, 1914; datum of staff gage 12.15 feet lower than that of water stage recorder.

Discharge measurements.—Made by wading below dam at low water. No provision for measurements at medium and high stages.

Channel and control.—At the ferry, coarse gravel; practically permanent. At the dam the control is the crest of the spillway.

Diversions.—Water is diverted into Erie canal at temporary lock in north end of dam, but diversion is not included in record of automatic gage. Measurements of diversion have been made at Bridge 48, about a mile downstream, and are given in the table below, but no allowance for this diversion has been made in computing the flow.

Regulation.—Flow affected by operation of dams upstream.

Accuracy.—Results good for low stages.

Discharge measurements of Mohawk River at Barge canal Lock 7, N. Y., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.		Discharge.	Date.	Made by—	Gage height.		Discharge.
		At lock.	At ferry.				At lock.	At ferry.	
		Feet.	*Feet.*	*Sec.-ft.*			*Feet.*	*Feet.*	*Sec.-ft.*
Nov. 5	De Golyer and Barnes	.....	3.40	2,070	June 15	Hartwell and Barnes	0.44	3.14	1,260
7	....do	.....	3.51	2,250	Aug. 24	....do	.49	.....	1,830
18	Canfield and Barnes	.....	4.20	4,420	Sept. 9	Hartwell and Adams	.47	3.20	1,630
Jan. 21	R. S. Barnes	0.48	3.74	1,920	15	Pierce and Adams	.29	2.70	601
Mar. 2[b]	De Golyer and Easterly	.51	4.60	1,670	24	Hartwell, Barnes, and Adams	.26	2.74	645
16[b]	....do	.67	4.48	2,880					

[a] Formerly known as Mohawk River at Vischer Ferry.

[b] Made through complete ice cover below dam. Discharge relation for old gage at ferry was affected, but that for gage at dam was not affected.

Discharge measurements of Erie canal at Barge canal Lock 7, N. Y., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.[a]	Discharge.	Date.	Made by—	Gage height.[a]	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Oct. 15	C. S. De Golyer	1.46	366	July 27	M. J. Maguire	1.87	543
15	do	1.42	290	27	do	1.66	378
Nov. 5	R. S. Barnes	3.27	300	Aug. 3	do	2.10	302
7	do	3.58	270	10	do	1.38	412
18	do	1.29	354	17	do	1.66	422
June 15	M. J. Maguire	1.60	349	24	do	1.30	360
22	do	1.54	437	31	do	1.56	336
29	do	1.81	399	Sept. 7	do	1.76	428
July 6	do	1.44	308	13	do	1.50	418
13	do	1.66	420	24	R. S. Barnes	1.48	350
20	do	1.59	417				

[a] Distance to water surface from reference point on bridge.

Daily gage height, in feet, of Mohawk River at Barge canal Lock 7, N. Y., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	3.02	3.5	3.75	0.54	1.40	.....	15.5	13.95	3.09	0.30	0.25	0.72
2	2.98	3.55	4.3	.50	1.34	0.51	15.6	13.9	3.08	.34	.24	.58
3	3.00	3.40	4.4	.48	1.15	.....	15.2	13.5	.42	.35	.25	.55
4	3.10	3.44	4.2	.48	1.09	.....	14.8	13.4	.46	.33	.26	.63
5	3.46	3.36	3.85	.49	1.05	.....	14.2	13.55	.42	.31	.26	.60
6	3.35	3.28	3.65	.48	1.06	.....	14.0	13.4	.40	.30	.26	.52
7	3.22	3.5	5.0	.47	1.08	.....	13.8	13.6	.44	.35	.25	.41
8	3.22	3.24	4.9	.48	1.03	.....	13.9	13.85	.50	.39	.25	.41
9	2.89	3.5	5.8	.49	.94	.....	16.2	13.75	.53	.40	.24	.48
10	3.05	12.2	4.5	.49	.87	.....	15.1	13.6	.61	.42	.25	.43
11	2.95	10.0	4.5	.44	.82	.....	14.7	13.6	.53	.42	.25	.42
12	2.89	7.0	4.1	.49	.73	.....	14.5	13.7	.49	.51	.23	.30
13	2.98	5.6	4.2	.39	.69	.....	14.6	13.8	.48	.46	.23	.24
14	2.99	5.0	4.2	.....	.70	.....	14.1	13.9	.40	.35	.24	.24
15	2.91	5.1	4.8	.....	.68	.....	14.0	13.75	.42	.38	.22	.29
16	2.92	4.8	4.4	.....	.61	.67	14.2	13.45	.35	.36	.21	.32
17	2.97	4.4	.87	.....	.55	.....	14.2	13.25	.33	.40	.20	.31
18	2.96	4.1	.71	.....	.....	.....	14.3	13.0	.28	.39	.....	.29
19	2.94	4.1	.66	.....	.....	.....	14.4	12.9	.26	.26	.....	.30
20	2.98	4.5	.59	.....	.....	.....	15.1	12.8	.24	.27	.....	.32
21	3.13	6.1	.57	.48	.....	.....	16.0	12.8	.29	.27	.....	.29
22	5.5	5.7	.57	.48	.....	.....	14.9	12.7	.28	.27	.....	.26
23	4.8	5.1	.53	.49	.....	.....	14.5	12.7	.28	.28	.....	.28
24	4.4	4.4	.53	.52	.....	.....	14.1	3.35	.27	.28	.45	.28
25	3.9	4.1	.60	.51	.....	.....	14.0	3.04	.25	.28	.....	.26
26	4.0	4.4	.53	.50	.....	.....	14.2	3.26	.27	.26	.....	.26
27	4.8	4.0	.41	.54	.....	.....	14.0	3.23	.31	.27	.....	.27
28	5.1	3.9	.38	.59	.....	.....	13.75	3.26	.33	.27	.....	.26
29	4.3	3.8	.48	.65	.....	.....	14.2	3.20	.40	.28	.....	.25
30	4.2	3.6	.50	.84	.....	15.9	14.1	3.29	.32	.28	.....	.23
31	4.1	.....	.55	1.27	.....	15.3	.....	3.05	.....	.28	.....	.....

NOTE.—Gage heights observed as follows: Oct. 1 to Dec. 16, and May 24 to June 2 on inclined gage at Vischer Ferry; Mar. 30 to May 23, on gage in concrete at lock; Dec. 17 to Feb. 17 and June 3 to Sept. 30, on automatic gage above dam. Gage-height record Feb. 18 to Mar. 29 lost when gage was carried out by ice.

Daily discharge, in second-feet, of Mohawk River at Barge canal Lock 7, N. Y., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	986	2,230	2,980	2,130	10,100	.....	39,200	15,600	1,370	710	510	3,520
2	900	2,380	4,760	1,850	9,440	1,670	41,000	14,900	1,340	900	470	2,410
3	940	1,950	5,110	1,710	7,500	.....	34,100	10,100	1,340	950	510	2,200
4	1,170	2,060	4,420	1,710	6,900	.....	27,600	9,000	1,580	850	550	2,800
5	2,120	1,840	3,280	1,780	6,500	.....	18,900	10,600	1,340	750	550	2,560
6	1,820	1,630	2,670	1,710	6,600	.....	16,200	9,000	1,220	710	550	1,990
7	1,470	2,230	7,380	1,640	6,800	.....	13,600	11,200	1,460	950	510	1,280
8	1,470	1,520	6,980	1,710	6,300	.....	14,900	14,200	1,850	1,160	510	1,280
9	722	2,230	10,700	1,780	5,460	.....	52,100	13,000	2,060	1,220	470	1,710
10	1,060	.....	5,470	1,780	4,830	.....	32,400	11,200	2,640	1,340	510	1,400
11	840	.....	5,470	1,460	4,380	.....	26,100	11,200	2,060	1,340	510	1,340
12	722	.....	4,090	1,780	3,600	.....	23,100	12,400	1,780	1,920	440	710
13	900	9,840	4,420	1,160	3,280	.....	24,600	13,600	1,710	1,580	440	470
14	920	7,380	4,420	.....	3,360	.....	17,500	14,900	1,220	950	470	470
15	760	7,780	6,590	.....	3,200	.....	16,200	13,000	1,340	1,100	410	670
16	780	6,590	5,110	.....	2,640	2,880	18,900	9,600	950	1,000	380	800
17	880	5,110	4,830	.....	2,200	.....	18,900	7,500	850	1,220	350	750
18	860	4,090	3,440	.....	.....	.....	20,300	5,100	630	1,160	.....	670
19	820	4,090	3,040	.....	.....	.....	21,700	4,200	550	550	.....	710
20	900	5,470	2,480	.....	.....	.....	32,400	3,360	470	590	.....	800
21	1,240	12,000	2,340	1,710	.....	.....	48,300	3,360	670	590	.....	670
22	9,420	10,300	2,340	1,710	.....	.....	29,200	2,560	630	590	.....	550
23	6,590	7,780	2,060	1,780	.....	.....	23,100	2,560	630	630	.....	630
24	5,110	5,110	2,060	1,990	.....	.....	17,500	2,040	590	630	1,520	630
25	3,440	4,090	2,560	1,920	.....	.....	16,200	1,250	510	630	.....	550
26	3,760	5,110	2,060	1,850	.....	.....	18,900	1,800	590	550	.....	550
27	6,590	3,760	1,280	2,130	.....	.....	16,200	1,720	750	590	.....	590
28	7,780	3,440	1,100	2,480	.....	.....	13,000	1,800	850	590	.....	550
29	4,760	3,130	1,710	2,960	.....	.....	18,900	1,640	1,220	630	.....	510
30	4,420	2,520	1,850	4,560	.....	46,400	17,500	1,870	800	630	.....	440
31	4,090	.....	2,200	8,700	.....	35,800	.....	1,270	.....	630	.....	.....

NOTE.—Discharge Oct. 1 to Dec. 16, and May 24 to June 2, determined from a rating curve well defined below 6,000 second-feet. Mean discharge Nov. 10–12 estimated at 24,500 second-feet from an extension of the rating curve. Discharge for rest of year determined from a rating curve fairly well defined below 2,500 second-feet and extended above that point by use of formulas. Mean discharge estimated by comparison with records of adjacent stations as follows: Jan. 14–20, 1,740 second-feet; Feb. 18–28, 1,490 second-feet; Mar., 8,000 second-feet; Aug. 18–31, 1,390 second-feet. The estimate for Nov. 10–12 and daily values for Dec. 17–31 supersede those published in Water-Supply Paper 351.

Monthly discharge of Mohawk River at Barge canal Lock 7, N. Y., for the year ending Sept. 30, 1914.

[Drainage area, 3,400 square miles.]

Month.	Discharge in second-feet.			Accuracy.
	Maximum.	Minimum.	Mean.	
October	9,420	722	2,520	B.
November	.....	1,520	6,640	C.
December	10,700	1,100	3,840	B.
January	8,700	1,160	2,130	B.
February	10,100	.....	3,910	C.
March	.....	.....	8,000	D.
April	52,100	13,000	24,300	C.
May	15,600	1,270	7,600	B.
June	2,640	470	1,170	A.
July	1,920	550	892	A.
August	.....	.....	891	B.
September	3,520	440	1,140	A.
The year	.....	.....	5,260	

ALPLAUS KILL NEAR CHARLTON, N. Y.

Location.—At highway bridge about half a mile southwest of Charlton.

Drainage area.—24.9 square miles.

Records available.—August 12, 1913, to September 30, 1914. Data also in annual reports of State engineer and surveyor and State of New York Conservation Commission.

Gage.—Gurley printing water-stage recorder on left bank just above bridge, referenced to gage datum by a hook gage inside of well. A vertical staff on upstream corner of left abutment of the bridge is used for auxiliary readings.

Discharge measurements.—Made from bridge or by wading. Original V notch was rated by a number of volumetric measurements.

Channel and control.—A low weir 43 feet long was constructed between abutments of bridge. Average height of its crest, 2.6 feet above bed of stream. Crest of weir was formed by a steel plate with a rectangular notch 36 inches long and 9 inches deep and a V notch in the center of the rectangular notch. Weir carried out by ice March 28, 1914, and replaced in August by a lower concrete weir of the same form except that rectangular notch was made only 0.2 foot deep.

Extremes of discharge.—Maximum stage during year (water stage recorder): 13.65 feet at 10.45 a. m. March 28, 1914 (weir in damaged condition); discharge, 915 second-feet. Minimum discharge practically zero August 7–21.

Winter flow.—Crest of weir was kept free from ice so that discharge relation was not seriously affected.

Regulation.—Some diurnal fluctuation is caused during the spring months by operation of a gristmill a short distance upstream.

Accuracy.—Results excellent except for months for which the discharge was partially estimated.

Discharge measurements of Alplaus Kill near Charlton, N. Y., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Dec. 16	C. S. De Golyer	11.44	18.9	May 1	O. W. Hartwell	10.04	63
31	R. S. Barnes	11.42	18.7	1	do	10.05	65
31	do	11.42	18.8	27	R. S. Barnes	9.58	23.6
Mar. 28	O. W. Hartwell	13.53	863	27	do	9.56	20.3
28	do	13.46	874	June 1	do	9.07	1.56
28	do	13.33	785	1	do	9.06	1.67
29	do	11.80	390	July 23	C. H. Pierce	8.85	.10
29	do	11.62	350	23	do	8.85	.12
29	do	11.58	346	Sept. 2	R. S. Barnes	9.55	.55
29	do	11.50	342	2	do	9.66	3.83
Apr. 4	C. S. De Golyer	10.70	152	2	do	9.64	2.16
4	do	10.78	170				

NOTE.—Gage heights corresponding to measurements made during December indicate head on original weir; from March to July, on weir in damaged condition; first measurement on Sept. 2, on new concrete weir before removal of forms; second and third measurements on Sept. 2, on new concrete weir.

Daily gage height, in feet, of Alplaus Kill near Charlton, N. Y., for the year ending Sept. 30, 1914.

[Mrs. E. B. Litts, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	10.48	10.82	11.50	11.08	11.66	11.03	11.40	10.07	9.09	9.18	8.79	9.56
2	10.59	10.62	11.53	10.86	11.65	11.35	12.05	9.88	9.02	9.24	.....	9.58
3	10.76	10.61	11.46	11.06	11.72	11.37	10 98	9.75	9.00	9.26	8.80	9.56
4	10.60	10.95	11.41	10.92	11.61	11.39	10.73	9.68	9.30	9.20	.....	9.55
5	10.51	10.66	11.36	11.09	11.61	11.44	10.70	10.09	9.35	9.05	.....	9.51
6	10.50	10.92	11.31	10.91	11.56	11.35	10.63	10.21	9.19	9.20	.....	9.50
7	10.52	10.72	11.44	11.07	.....	11.33	10.39	9.81	9.11	9.42	.....	9.48
8	10.49	10.80	11.64	11.18	.....	11.33	11.39	9.70	9.20	9.60	.....	9.50
9	10.54	11.62	11.41	10.91	11.38	11.31	11.31	9.66	9.22	9.36	.....	9.56
10	10.60	11.78	11.41	11.16	.....	11.33	10.78	9.63	9.13	9.27	.....	9.48
11	10.47	11.50	.....	11.14	.....	11.36	10.64	9.56	9.05	9.20	8.80	9.50
12	10.41	11.42	.....	11.22	.....	11.27	10.96	9.70	8.99	9.13	.....	9.46
13	10.46	11.36	.....	.....	.....	11.24	10.54	10.73	8.95	9.06	.....	9.29
14	10.48	11.40	.....	.....	.....	11.28	10.38	10.01	8.93	9.01	.....	9.20
15	10.51	11.39	.....	.....	.....	11.25	10.39	9.76	8.91	9.06	.....	9.18
16	10.56	11.37	11.42	.....	.....	11.36	10.67	9.63	8.89	8.97	.....	9.34
17	10.48	11.32	11.41	.....	.....	11.54	10.63	9.56	8.88	9.02	.....	9.45
18	10.38	11.24	11.38	10.76	11.05	11.98	10.38	9.52	8.87	8.93	8.82	9.46
19	10.37	11.22	11.17	10.75	.....	11.70	10.33	9.50	8.87	8.88	.....	9.45
20	.....	11.71	11.05	10.76	.....	11.73	11.32	9.46	8.93	8.86	.....	9.30
21	.....	11.52	11.03	10.80	.....	11.66	10.98	9.44	8.90	8.85	.....	9.16
22	.....	11.45	11.16	10.91	.....	11.58	10.26	9.40	8.89	8.84	.....	9.10
23	10.96	11.42	10.89	10.83	.....	11.54	9.98	9.38	8.87	8.85	9.44	9.08
24	10.70	11.38	11.00	10.84	11.00	11.48	9.85	9.35	8.87	8.90	9.47	9.25
25	10.84	11.36	11.06	10.94	10.98	11.47	9.78	9.33	8.86	8.83	9.41	9.43
26	11.32	11.26	11.15	10.99	10.97	11.87	10.87	9.36	8.83	8.86	9.33	9.39
27	11.45	11.27	10.91	11.20	10.99	13.2	10.48	9.35	8.82	8.83	9.31	9.33
28	11.29	11.10	11.16	11.31	11.00	.....	11.12	9.25	8.92	8.80	9.42	9.42
29	11.16	11.06	11.28	11.39	.....	11.85	10.58	9.19	9.45	8.81	9.51	9.34
30	11.16	11.31	11.34	11.47	.....	11.38	10.74	9.23	9.31	8.81	9.66	9.25
31	10.95	.....	11.18	11.55	.....	11.55	.....	9.18	.....	8.81	9.63	.....

NOTE.—Gage heights are means of 24 hourly values for each day, except Aug. 3, 11, and 18, when staff gage was read. Timber weir carried out by ice Mar. 28; replaced by concrete weir Aug. 20–22. Gage heights indicate head on old weir in damaged condition Mar. 28 to Aug. 19; on concrete weir before forms were removed, Aug. 23 to Sept. 1, and on concrete weir in final condition, Sept. 2–30. Recorder not in operation on days for which gage heights are missing.

Daily discharge, in second-feet, of Alplaus Kill near Charlton, N. Y., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.33	2.75	27.3	5.48	48.0	4.91	299	67	2.0	4.0	0.1	0.60
2	.92	1.12	30.8	3.14	46.6	13.3	459	47	1.0	5.9	.1	.98
3	2.21	1.05	22.9	5.24	57.0	14.7	206	36	.8	6.6	.1	.85
4	.98	4.04	18.0	3.74	41.0	16.3	159	30	8.1	4.6	.....	.79
5	.46	1.40	14.0	5.60	41.0	20.9	154	69	10	1.3	.....	.56
6	.41	3.74	10.7	3.64	34.4	13.3	143	83	4.3	4.6	.....	.51
7	.51	1.88	20.9	5.36	.....	11.9	108	41	2.4	14	.....	.41
8	.37	2.57	45.2	6.67	.....	11.9	297	31	4.6	24	.....	.51
9	.62	42.4	18.0	3.64	15.5	10.7	278	28	5.2	11	.....	.85
10	.98	66.4	18.0	6.43	.....	11.9	168	26	2.8	7.0	.....	.41
11	.29	27.3	.....	6.19	.....	14.0	144	22	1.3	4.6	.....	.51
12	.15	18.9	.....	7.15	.....	8.5	202	31	.7	2.8	.....	.33
13	.25	14.0	.....	.....	.....	7.41	129	159	.5	1.5	.....	.07
14	.33	17.1	.....	.....	.....	9.0	106	60	.4	.9	.....	.03
15	.46	16.3	.....	.....	.....	7.54	108	36	.3	1.5	.....	.02
16	.73	14.7	18.9	.....	.....	14.0	150	26	.2	.6	.....	.11
17	.33	11.3	18.0	.....	.....	33.2	143	22	.2	1.0	.....	.29
18	.12	7.41	15.5	2.21	5.13	101	106	19	.1	.4	.....	.33
19	.11	7.15	6.55	2.13	.....	54.0	99	18	.1	.2	.....	.29
20	.....	55.5	5.13	2.21	.....	58.5	281	16	.4	.1	.....	.08
21	.....	29.6	4.91	2.57	.....	48.0	206	15	.2	.1	.....	.02
22	.....	21.9	6.43	3.64	.....	37.0	90	13	.2	.1	.....	.01
23	4.14	18.9	3.44	2.84	.....	32.0	57	12	.1	.1	.16	.00
24	1.71	15.5	4.58	2.94	4.58	25.1	46	10	.1	.2	.21	.05
25	2.94	14.0	5.24	3.94	4.36	24.0	40	9.4	.1	.1	.13	.22
26	11.3	8.0	6.31	4.47	4.25	81.3	184	11	.1	.1	.07	.15
27	21.9	8.5	3.64	6.91	4.47	325	120	10	.1	.1	.06	.10
28	9.5	5.72	6.43	10.7	4.58	780	235	6.2	.3	.1	.14	.19
29	6.43	5.24	9.00	16.3	.....	408	135	4.3	15	.1	.36	.11
30	6.43	10.7	12.6	24.0	.....	294	161	5.5	8.5	.1	1.24	.05
31	4.04	.....	6.67	33.2	.....	335	.....	4.0	.....	.1	1.03	.....

NOTE.—Discharge determined from four well-defined rating curves applicable as follows: Oct. 1 to Mar. 27, original weir in good condition; Mar. 29 to Aug. 19, original weir in damaged condition; Aug. 23 to Sept. 1, new concrete weir before forms were removed; Sept. 2–30, concrete weir in final condition. Discharge estimated as follows: Oct. 20–22, 0.11 second-feet; Dec. 11–15, 18 second-feet; Jan. 13–17, 4.0 second-feet; Feb. 7–8, 24 second-feet; Feb. 10–18, 9.8 second-feet; Feb. 19–23, 4.9 second-feet; Aug. 4–6 and 22, 0.1 second-foot; Aug. 7–21, 0.0 second-foot. Discharge Mar. 28 determined from discharge measurements.

Monthly discharge of Alplaus Kill near Charlton, N. Y., for the year ending Sept. 30, 1914.

[Drainage area, 24.9 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
October	21.9	0.11	2.56	0.103	0.11	A.
November	66.4	1.05	15.2	.613	.68	A.
December	45.2	3.44	14.5	.582	.67	A.
January	33.2	.....	6.46	.259	.30	B.
February	57.0	.....	16.5	.663	.69	B.
March	780	4.91	91.2	3.66	4.22	A.
April	459	40.0	167	6.71	7.49	A.
May	159	4.0	31.2	1.25	1.44	A.
June	15.0	.1	2.3	.092	.10	B.
July	24.0	.1	3.2	.129	.15	B.
August	1.24	0	.132	.005	.01	
September	.98	.00	.314	.013	.01	A.
The year	780	0	29.1	1.17	15.87	

KINDERHOOK CREEK AT ROSSMAN, N. Y.

Location.—At highway bridge at Rossman, 1 mile above Claversack Creek and 9 miles by road above Hudson.

Drainage area.—331 square miles.

Records available.—March 17, 1906, to May 1, 1914, when station was discontinued. Data also in annual reports of State engineer and surveyor and State of New York Conservation Commission.

Discharge measurements.—Made from highway bridge.

Channel and control.—Rock and gravel.

Extremes of discharge.—Maximum stage recorded 1906–1914, 34.56 feet during a measurement on January 22, 1910; discharge, 11,000 second-feet. The minimum flow is practically zero during low-water season, when entire flow of creek is stored at power plant above station.

Winter flow.—Discharge relation seriously affected by ice.

Regulation.—Low-water flow practically controlled by storage in several small lakes and by operation of power plants and paper mills above station. A portable automatic gage was set up near the regular gage and records were obtained August 3 to 12 and November 30 to December 5, 1912, and May 31 to June 10, 1913. A study of the records from this gage indicates that two gage readings a day give fairly good results when the discharge exceeds 100 second-feet.

Accuracy.—Results fair.

No discharge measurements were made during the year.

Daily gage height, in feet, of Kinderhook Creek at Rossman, N. Y., for the year ending Sept. 30, 1914.

[Lester Allen, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.
1	26.14	27.02	27.30	27.22	28.5	.....	29.9	28.6
2	26.32	26.92	27.32	27.16	28.3	.....	31.0	.....
3	26.26	26.82	27.23	26.92	28.0	.....	30.2	.....
4	26.02	26.70	27.27	27.04	28.0	.....	29.5	.....
5	26.10	26.70	27.26	27.25	28.1	.....	28.9	.....
6	26.52	26.85	27.25	27.15	27.7	.....	28.6	.....
7	26.20	26.62	27.08	27.28	27.6	.....	28.6	.....
8	26.48	26.71	27.32	27.28	27.45	27.7	29.2	.....
9	26.10	26.48	27.27	27.27	27.5	27.55	32.1	.....
10	26.23	26.94	27.26	26.98	27.6	27.48	30.3	.....
11	26.01	27.48	27.23	27.28	27.27	27.32	29.4	.....
12	26.32	27.38	27.06	27.14	27.38	27.02	29.3	.....
13	26.08	27.20	27.20	.....	27.12	27.08	29.2	.....
14	26.25	27.11	27.31	.....	27.05	26.82	28.7	.....
15	26.44	27.38	27.49	.....	27.12	26.98	28.5	.....
16	26.80	27.15	27.55	.....	27.09	27.02	28.7	.....
17	26.58	27.16	27.28	.....	.....	28.35	28.8	.....
18	26.44	27.28	27.26	.....	.....	29.9	28.6	.....
19	26.10	27.18	27.18	.....	.....	28.6	28.7	.....
20	26.51	27.28	27.05	.....	.....	28.1	29.7	.....
21	26.54	27.55	27.20	.....	.....	27.75	31.6	.....
22	26.62	27.36	27.21	.....	.....	27.75	29.9	.....
23	26.68	27.25	27.05	.....	.....	27.6	29.1	.....
24	26.52	27.27	27.19	.....	.....	28.0	28.8	.....
25	26.66	27.29	27.22	.....	.....	28.8	28.5	.....
26	26.82	27.27	27.22	.....	.....	31.6	28.9	.....
27	28.00	27.22	27.31	.....	.....	32.6	29.1	.....
28	27.65	27.28	27.30	27.8	.....	33.3	28.6	.....
29	27.47	27.23	27.08	28.5	.....	31.3	28.5	.....
30	27.32	27.30	27.05	28.7	.....	30.2	28.7	.....
31	27.22	.....	27.02	28.5	.....	29.7	.....	.....

NOTE.—Discharge relation affected by ice Jan. 13–27 and Feb. 17 to Mar. 7.

Daily discharge, in second-feet, of Kinderhook Creek at Rossman, N. Y., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.
1	.....	233	359	320	1,250	.....	2,860	1,340
2	.....	195	370	292	1,070	.....	4,510	.....
3	.....	160	325	195	826	.....	3,280	.....
4	.....	122	344	241	826	.....	2,340	.....
5	.....	122	339	334	906	.....	1,640	.....
6	.....	170	334	288	602	.....	1,340	.....
7	.....	100	257	349	534	.....	1,340	.....
8	.....	125	370	349	441	602	1,980	.....
9	.....	.....	344	344	470	502	6,400	.....
10	.....	202	339	217	534	458	3,430	.....
11	.....	458	325	349	344	370	2,210	.....
12	.....	401	249	283	401	233	2,090	.....
13	.....	310	310	.....	274	257	1,980	.....
14	.....	270	364	.....	245	160	1,440	.....
15	.....	401	464	.....	274	217	1,250	.....
16	153	288	502	.....	261	233	1,440	.....
17	.....	280	349	.....	.....	1,120	1,540	.....
18	.....	349	339	.....	.....	2,860	1,340	.....
19	.....	301	301	.....	.....	1,340	1,440	.....
20	.....	349	245	.....	.....	906	2,590	.....
21	.....	502	310	.....	.....	638	5,510	.....
22	100	391	315	.....	.....	638	2,860	.....
23	116	334	245	.....	.....	534	1,860	.....
24	.....	344	306	.....	.....	826	1,540	.....
25	111	354	320	.....	.....	1,540	1,250	.....
26	160	344	320	.....	.....	5,510	1,640	.....
27	826	320	364	.....	.....	7,300	1,860	.....
28	568	349	359	673	.....	8,600	1,340	.....
29	453	325	257	1,250	.....	5,000	1,250	.....
30	370	359	245	1,440	.....	3,280	1,440	.....
31	320	.....	233	1,250	.....	2,590	.....	.....

NOTE.—Discharge determined from a poorly defined rating curve. On account of diurnal fluctuation, estimates of daily discharge below 100 second-feet are withheld. Mean discharge estimated by comparison with records of near-by streams as follows: Jan. 13–27, 269 second-feet; Feb. 17–28, 173 second-feet; Mar. 1–7, 53 second-feet.

Monthly discharge of Kinderhook Creek at Rossman, N. Y., for the year ending Sept. 30, 1914.

[Drainage area, 331 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
November	502	.....	284	0.858	0.96	C.
December	502	233	326	.985	1.14	C.
January	1,440	.....	394	1.19	1.37	C.
February	1,250	.....	405	1.22	1.27	C.
March	8,600	160	1,670	5.05	5.82	C.
April	6,400	1,250	2,230	6.74	7.52	B.

DELAWARE RIVER BASIN.

EAST BRANCH OF DELAWARE RIVER AT FISH EDDY, N. Y.

Location.—At New York, Ontario & Western Railway bridge at Fish Eddy, 5½ miles above confluence of East and West branches of Delaware River.

Drainage area.—790 square miles.

Records available.—November 19, 1912, to September 30, 1914. Records were obtained at Hancock, about 4 miles below, October 14, 1902, to December 31, 1912. Data also in annual reports of State engineer and surveyor and State of New York Conservation Commission.

Gage.—Vertical staff in three sections on piers of railroad bridge. A high-water section on right abutment of highway bridge 250 feet upstream was used for gage heights above 6 feet previous to July, 1913.

Discharge measurements.—Made from the highway bridge 250 feet above railroad bridge or by wading.

Channel and control.—Coarse gravel; slightly shifting.

Extremes of dscharge.—Maximum stage recorded during year, 15.41 feet at 4.20 p. m. March 28; discharge approximately 30,000 second-feet. Minimum stage recorded, 1.78 feet at 4.50 p. m. September 30; discharge, 129 second-feet.

Maximum stage 1912–1914, 17.4 feet during the afternoon of March 27, 1913 (determined by leveling from flood marks); approximate discharge, 33,500 second-feet. Minimum stage recorded, 1.65 feet at 8.45 a. m. September 18, 1913; discharge, 99 second-feet.

Winter flow.—Discharge relation somewhat affected by ice.

Accuracy.—Results fair.

Discharge measurements of East Branch of Delaware River at Fish Eddy, N. Y., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Oct. 28	R. S. Barnes	4.37	1,820	Feb. 19	R. S. Barnes	a 5.51	618
Jan. 5	C. S. De Golyer	3.01	601	Mar. 20	do	a 6.11	760
5	do	3.02	623	Apr. 2	do	9.40	10,800
20	do	a 3.86	399	21	C. C. Covert	9.70	11,100
29	do	a 4.26	816	22	do	7.91	7,360
Feb. 2	do	a 5.32	2,410	Sept. 21	C. S. De Golyer	1.90	163

a Discharge relation affected by ice.

Daily gage height, in feet, of East Branch of Delaware River at Fish Eddy, N. Y., for the year ending Sept. 30, 1914.

[John Fininegan, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.4	3.5	4.4	3.1	.....	4.7	9.8	.....	2.6	2.25	2.15	2.7
2	2.85	3.45	4.4	2.7	5.3	4.6	10.8	.....	2.5	2.5	2.05	2.8
3	2.85	3.45	4.5	3.05	5.1	4.6	9.8	.....	2.5	2.45	2.05	2.75
4	2.55	3.4	4.4	3.2	4.8	4.5	12.5	.....	2.8	2.3	2.0	2.7
5	2.5	3.4	4.3	3.0	4.8	4.5	12.6	.....	3.3	2.2	1.95	2.5
6	2.4	3.35	4.3	2.6	4.8	4.5	11.7	.....	2.8	2.35	1.95	2.45
7	2.35	3.35	4.6	2.6	4.6	4.6	10.7	.....	2.6	2.55	1.9	2.4
8	2.35	3.4	4.5	2.85	4.5	4.6	10.0	.....	3.25	2.55	1.9	2.3
9	2.3	8.8	4.8	2.8	4.4	4.6	9.8	.....	3.35	2.55	1.9	2.25
10	2.25	10.1	5.0	2.65	3.3	4.5	9.5	5.1	2.9	2.65	1.95	2.2
11	2.2	7.4	.....	2.6	4.0	4.5	9.2	4.9	2.7	2.55	1.95	2.15
12	2.15	6.8	.....	2.7	4.5	4.4	9.1	4.8	2.6	3.0	2.6	2.1
13	2.15	6.2	.....	3.8	5.2	4.4	9.1	4.7	2.45	2.6	2.5	2.05
14	2.05	5.5	.....	4.0	6.5	4.4	9.0	5.0	2.4	2.4	2.3	2.05
15	2.15	5.0	.....	4.2	6.2	4.4	8.9	6.2	2.3	2.45	2.15	2.0
16	2.3	4.9	.....	4.3	5.8	4.3	9.0	5.8	2.35	2.45	2.05	1.95
17	2.35	4.8	.....	.....	5.7	4.8	8.9	5.1	2.3	2.4	2.00	1.95
18	2.3	4.8	.....	.....	5.7	4.9	8.9	4.4	2.25	2.55	2.05	1.95
19	2.3	4.7	.....	.....	5.6	5.5	8.9	3.9	2.2	2.5	2.45	1.95
20	3.6	4.7	.....	3.8	5.5	6.3	10.4	3.8	2.3	2.55	3.25	1.95
21	4.7	4.6	.....	3.7	5.3	7.1	10.2	3.7	2.3	2.5	4.7	1.9
22	4.6	4.6	.....	3.6	5.3	6.1	8.7	3.6	2.3	2.5	4.7	1.95
23	4.3	4.6	.....	3.5	5.2	5.4	7.0	3.5	2.25	2.4	3.7	1.8
24	.....	4.8	.....	3.45	5.0	5.4	6.8	3.3	2.35	2.5	3.4	1.85
25	.....	5.0	.....	3.4	4.9	5.6	6.6	3.2	2.4	2.5	3.15	1.8
26	.....	4.8	.....	3.35	4.9	6.3	.....	3.2	2.25	2.35	2.9	1.8
27	5.1	4.6	.....	3.35	4.8	10.2	.....	3.1	2.15	2.25	2.75	1.9
28	4.3	4.5	.....	3.25	4.8	14.8	.....	3.05	2.25	2.3	2.75	1.85
29	3.8	4.4	.....	4.2	.....	13.2	.....	3.0	2.3	2.3	2.8	1.8
30	3.6	4.4	.....	5.2	.....	10.0	.....	2.95	2.3	2.25	3.0	1.8
31	3.6	.....	.....	.....	.....	8.8	.....	2.9	.....	2.25	2.8	.....

NOTE.—Discharge relation affected by ice Jan. 11 to Mar. 26.

Daily discharge, in second-feet, of East Branch of Delaware River at Fish Eddy, N. Y., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	330	950	1,850	670	2,890	.....	11,500	.....	412	274	239	456
2	530	910	1,850	456	2,460	.....	14,400	.....	370	370	206	504
3	530	910	1,960	640	2,080	.....	11,500	.....	370	350	206	480
4	391	870	1,850	730	1,740	.....	19,600	.....	504	292	190	456
5	370	870	1,740	610	1,850	.....	20,000	.....	800	256	176	370
6	330	835	1,740	412	1,630	.....	17,100	.....	504	311	176	350
7	311	835	2,080	412	1,220	.....	14,100	.....	412	391	161	330
8	311	870	1,960	530	1,040	.....	12,000	.....	765	391	161	292
9	292	10,200	2,330	504	870	.....	11,500	.....	835	391	161	274
10	274	13,400	2,600	434	730	.....	10,800	2,640	556	434	176	256
11	256	6,950	.....	330	583	.....	10,100	2,390	456	391	176	239
12	239	5,650	.....	292	434	.....	9,920	2,270	412	610	412	222
13	239	4,500	.....	292	456	.....	9,920	2,150	350	412	370	206
14	206	3,340	.....	256	870	.....	9,700	2,510	330	330	292	206
15	239	2,600	.....	350	835	.....	9,480	4,200	292	350	239	190
16	292	2,470	.....	504	800	.....	9,700	3,600	311	350	206	176
17	311	2,330	.....	556	765	.....	9,480	2,640	292	330	190	176
18	292	2,330	.....	530	730	.....	9,480	1,810	274	391	206	176
19	292	2,200	.....	456	670	434	9,480	1,290	256	370	350	176
20	1,040	2,200	.....	391	583	870	13,200	1,200	292	391	765	176
21	2,200	2,080	.....	330	504	1,630	12,600	1,110	292	370	2,150	161
22	2,080	2,080	.....	311	480	800	9,040	1,030	292	370	2,150	176
23	1,740	2,080	.....	256	434	391	5,600	950	274	330	1,110	134
24	1,220	2,330	.....	239	350	370	5,220	800	311	370	870	148
25	1,130	2,600	.....	222	330	480	4,860	730	330	370	700	134
26	1,320	2,330	.....	222	330	2,460	.....	730	274	311	556	134
27	2,740	2,080	.....	239	311	12,600	.....	670	239	274	480	161
28	1,740	1,960	.....	239	274	27,900	.....	640	274	292	480	148
29	1,220	1,850	.....	800	.....	22,000	.....	610	292	292	504	134
30	1,040	1,850	.....	2,200	.....	12,000	.....	583	292	274	610	134
31	1,040	.....	.....	3,660	.....	9,260	.....	556	.....	274	504	.....

NOTE.—Discharge determined from two fairly well-defined rating curves, applicable Oct. 1 to Jan. 10 and Mar. 17 to Sept. 30. Discharge Jan. 11 to Mar. 26 estimated from discharge measurements and climatic records. Mean discharge Mar. 1–18 estimated at 432 second-feet. Mean discharge estimated from a study of records at adjacent stations as follows: Dec. 11–31, 1,600 second-feet; Apr. 26–30, 6,700 second-feet; May 1–9, 2,400 second-feet.

Monthly discharge of East Branch of Delaware River at Fish Eddy, N. Y., for the year ending Sept. 30, 1914.

[Drainage area, 790 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
October	2,740	206	792	1.00	1.15	C.
November	13,400	835	2,880	3.65	4.07	D.
December	.....	.....	1,730	2.19	2.52	D.
January	3,660	222	583	.738	.85	B.
February	2,890	274	937	1.19	1.24	C.
March	27,900	370	3,210	4.06	4.68	D.
April	20,000	.....	10,500	13.3	14.83	C.
May	.....	556	1,830	2.32	2.68	B.
June	835	239	389	.492	.55	B.
July	610	256	352	.446	.51	B.
August	2,150	161	489	.619	.72	B.
September	504	134	239	.303	.34	B.
The year	27,900	134	1,980	2.51	34.14	

DELAWARE RIVER AT PORT JERVIS, N. Y.

Location.—At toll bridge at Port Jervis, 1 mile above Neversink River, and 6 miles below Mongaup River.

Drainage area.—3,250 square miles.

Records available.—October 12, 1904, to September 30, 1914. Data also in annual reports of State engineer and surveyor, and State of New York Conservation Commission.

Gage.—Staff gage in two sections—the lower section inclined and located about 30 feet downstream from left abutment, the upper section vertical and attached to down-stream end of left abutment. Prior to June 20, 1914, a chain gage on the bridge was used. Gage read twice daily after July 1, 1914.

Discharge measurements.—Made from highway bridge or by wading.

Channel and control.—Gravel; slightly shifting.

Extremes of discharge.—Maximum stage recorded during year, 16 feet at 8 a. m. March 28; discharge, 92,700 second-feet. Minimum stage recorded, 1.13 feet at 3 p. m. September 22; discharge, 410 second-feet.

Maximum stage recorded 1904–1914, 16 feet at 8 a. m. March 28, 1914; discharge, 92,700 second-feet. Minimum stage recorded, 0.60 foot at 8 a. m. September 22 and 23, 1908; discharge, 175 second-feet.

Winter flow.—Discharge relation somewhat affected by ice.

Accuracy.—Results good.

Cooperation.—Gage heights furnished by United States Weather Bureau.

The following discharge measurement was made by C. S. De Golyer:
September 19, 1914: Gage height, 1.40 feet; discharge, 550 second-feet.

Daily gage height, in feet, of Delaware River at Port Jervis, N. Y., for the year ending Sept. 30, 1914.

[Jacob Miller, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.4	2.6	3.3	3.1	5.8	.....	8.8	5.5	2.5	2.25	1.95	2.3
2	1.8	2.3	3.2	2.9	6.5	.....	8.7	5.0	2.4	2.25	1.9	2.2
3	2.2	2.1	3.1	2.8	5.3	.....	9.3	4.7	2.3	2.25	1.8	2.15
4	1.6	2.1	3.1	2.7	5.0	.....	7.8	4.5	2.3	2.15	1.7	2.2
5	1.4	2.1	3.1	2.6	4.9	.....	7.0	4.2	3.1	2.05	1.65	2.2
6	1.6	2.1	3.0	2.6	4.8	.....	6.5	4.9	3.0	2.0	1.49	2.1
7	1.6	2.1	3.0	2.6	4.2	.....	5.8	5.9	2.8	2.15	1.5	1.95
8	1.6	2.1	3.9	2.4	4.2	.....	6.0	5.2	2.6	2.1	1.5	1.9
9	1.6	2.8	3.9	2.7	4.1	.....	11.0	5.0	3.1	2.35	1.46	1.8
10	1.6	9.7	3.7	2.4	4.1	.....	9.0	4.9	2.8	2.45	1.45	1.75
11	1.5	7.3	3.7	2.3	4.1	.....	6.7	4.5	2.8	3.0	1.48	1.7
12	1.6	6.1	3.4	2.1	2.8	.....	6.7	4.6	2.5	3.5	1.8	1.55
13	1.8	5.3	3.4	2.1	2.3	.....	6.6	6.5	2.3	3.3	2.05	1.55
14	1.7	4.7	3.3	.....	2.3	.....	6.0	6.5	2.2	3.0	2.05	1.48
15	1.5	4.6	3.4	.....	.....	.....	5.6	6.1	2.1	2.7	1.95	1.5
16	1.5	4.3	3.3	.....	.....	.....	5.6	5.9	2.0	2.6	1.8	1.55
17	1.5	4.1	3.3	3.2	.....	.....	6.0	5.4	2.0	2.4	1.65	1.5
18	1.5	3.8	3.2	3.1	.....	.....	5.8	5.0	2.0	2.55	1.65	1.39
19	1.5	4.2	3.2	.....	.....	.....	5.4	4.5	1.9	2.9	1.7	1.33
20	1.6	4.0	3.1	.....	.....	.....	5.5	4.4	1.8	2.7	1.95	1.28
21	2.5	3.9	3.1	.....	.....	.....	9.1	4.4	1.9	2.5	2.8	1.24
22	4.0	3.8	2.9	.....	.....	.....	8.4	4.1	1.8	2.2	4.1	1.15
23	3.4	3.5	2.9	.....	.....	.....	7.9	3.4	1.8	2.1	3.1	1.24
24	3.4	3.4	3.1	.....	.....	4.9	6.0	3.2	2.5	2.15	3.0	1.36
25	3.6	3.2	3.3	.....	.....	4.6	5.7	3.1	2.2	2.1	2.85	1.21
26	3.6	3.1	3.3	.....	.....	4.1	5.7	2.9	2.0	2.2	2.6	1.23
27	4.0	3.1	3.1	.....	.....	7.7	7.2	2.9	2.0	2.15	2.7	1.22
28	3.4	3.1	3.2	.....	.....	16.0	6.4	3.1	1.9	2.05	2.25	1.17
29	3.3	3.3	3.2	.....	.....	14.2	5.9	2.8	1.9	2.15	2.15	1.15
30	3.0	3.4	2.8	.....	.....	9.2	5.6	2.4	2.1	2.2	2.1	1.20
31	2.8	.....	2.7	.....	.....	9.2	.....	2.6	.....	2.05	2.25	.....

NOTE.—Discharge relation affected by ice Jan. 14–31 and Feb. 15 to Mar. 23.

Daily discharge, in second-feet, of Delaware River at Port Jervis, N. Y., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	600	2,230	3,830	3,320	13,500	.....	33,500	12,100	2,040	1,610	1,180	1,690
2	990	1,690	3,570	2,860	17,400	.....	32,700	9,780	1,860	1,610	1,110	1,530
3	1,530	1,380	3,320	2,640	11,100	.....	37,300	8,520	1,690	1,610	990	1,460
4	780	1,380	3,320	2,430	9,780	.....	26,000	7,730	1,690	1,460	880	1,530
5	600	1,380	3,320	2,230	9,350	.....	20,500	6,620	3,320	1,310	830	1,530
6	780	1,380	3,080	2,230	8,930	.....	17,400	9,350	3,080	1,240	676	1,380
7	780	1,380	3,080	2,230	6,620	.....	13,500	14,100	2,640	1,460	685	1,180
8	780	1,380	5,600	1,860	6,620	.....	14,600	10,700	2,230	1,380	685	1,110
9	780	2,640	5,600	2,430	6,270	.....	50,900	9,780	3,320	1,780	651	990
10	780	40,400	4,970	1,860	6,270	.....	35,000	9,350	2,640	1,950	642	935
11	685	22,500	4,970	1,690	6,270	.....	18,600	7,730	2,640	3,080	668	880
12	780	15,100	4,100	1,380	2,640	.....	18,600	8,120	2,040	4,380	990	732
13	990	11,100	4,100	1,380	1,690	.....	18,000	17,400	1,690	3,830	1,310	732
14	880	8,520	3,830	.....	1,690	.....	14,600	17,400	1,530	3,080	1,310	668
15	685	8,120	4,100	.....	.....	.....	12,500	15,100	1,380	2,430	1,180	685
16	685	6,980	3,830	.....	.....	.....	12,500	14,100	1,240	2,230	990	732
17	685	6,270	3,830	.....	.....	.....	14,600	11,600	1,240	1,860	830	685
18	685	5,280	3,570	.....	.....	.....	13,500	9,780	1,240	2,140	830	592
19	685	6,620	3,570	.....	.....	.....	11,600	7,730	1,110	2,860	880	548
20	780	5,930	3,320	.....	.....	.....	12,100	7,350	990	2,430	1,180	511
21	2,040	5,600	3,320	.....	.....	.....	35,800	7,350	1,110	2,040	2,640	483
22	5,930	5,280	2,860	.....	.....	.....	30,500	6,270	990	1,530	6,270	422
23	4,100	4,380	2,860	.....	.....	.....	26,800	4,100	990	1,380	3,320	483
24	4,100	4,100	3,320	.....	.....	9,350	14,600	3,570	2,040	1,460	3,080	570
25	4,670	3,570	3,830	.....	.....	8,120	13,000	3,320	1,530	1,380	2,750	462
26	4,670	3,320	3,830	.....	.....	6,270	13,000	2,860	1,240	1,530	2,230	476
27	5,930	3,320	3,320	.....	.....	25,300	21,800	2,860	1,240	1,460	2,430	469
28	4,100	3,320	3,570	.....	.....	92,700	16,800	3,320	1,110	1,310	1,610	436
29	3,830	3,830	3,570	.....	.....	77,200	14,100	2,640	1,110	1,460	1,460	422
30	3,080	4,100	2,640	.....	.....	36,500	12,500	1,860	1,380	1,530	1,380	455
31	2,640	.....	2,430	.....	.....	36,500	.....	2,230	.....	1,310	1,610	.....

NOTE.—Discharge determined from a fairly well defined rating curve. Discharge estimated because of ice, by comparison with records at adjacent stations, as follows: Jan. 14–31, 3,250 second-feet; Feb. 15–28, 4,000 second-feet; Mar. 1–23, 5,000 second-feet.

Monthly discharge of Delaware River at Port Jervis, N. Y., for the year ending Sept. 30, 1914.

[Drainage area, 3,250 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
October	5,930	600	1,970	0.606	0.70	B.
November	40,400	1,380	6,420	1.98	2.21	B.
December	5,600	2,430	3,690	1.14	1.31	B.
January	.....	.....	2,820	.868	1.00	C.
February	17,400	.....	5,860	1.80	1.87	C.
March	92,700	.....	13,100	4.03	4.65	C.
April	50,900	11,600	20,900	6.43	7.17	A.
May	17,400	1,860	8,220	2.53	2.92	A.
June	3,320	990	1,740	.536	.60	B.
July	4,380	1,240	1,940	.597	.69	B.
August	6,270	642	1,530	.471	.54	B.
September	1,690	422	826	.254	.28	B.
The year	92,700	422	5,730	1.76	23.94	

DELAWARE RIVER AT RIEGELSVILLE, N. J.

Location.—At toll suspension bridge between Riegelsville, N. J., and Riegelsville, Pa., 600 feet above Musconetcong River, and 9 miles below Lehigh River.

Drainage area.—6,430 square miles.

Records available.—July 3, 1906, to September 30, 1914.

Gage.—Chain on bridge.

Discharge measurements.—Made from bridge.

Channel and control.—Large bowlders; practically permanent.

Extremes of discharge.—Maximum stage recorded during year, 23.4 feet, March 29; discharge, 130,000 second-feet. Minimum stage recorded during year, 2 feet, on several days in September; discharge, 1,500 second-feet.

Maximum stage[1] recorded 1906–1914, 25 feet, March 28, 1913; approximate discharge, 144,000 second-feet. Minimum stage recorded, 1.8 feet, September 1, 1907; discharge, 1,200 second-feet.

Winter flow.—Discharge relation not seriously affected by ice.

Diversions.—250 to 300 second-feet of water diverted from Lehigh River near its mouth each year from about the last of March to the middle of December by the Delaware division of the Pennsylvania canal. Results at Riegelsville corrected for diversion. (See footnote to monthly discharge table.)

Accuracy.—Results good.

Daily gage height, in feet, of Delaware River at Riegelsville, N. J., for the year ending Sept. 30, 1914.

[John H. Deemer, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.6	4.3	4.9	4.5	9.7	4.1	13.4	8.1	3.8	3.1	3.5	2.8
2	4.1	4.1	4.9	4.2	9.8	3.6	13.4	7.6	3.7	3.6	3.2	2.95
3	3.9	4.0	4.6	4.3	8.6	3.6	13.8	6.9	3.6	3.8	3.3	2.95
4	3.7	3.8	4.5	4.6	7.7	3.9	12.5	6.5	3.6	3.6	3.1	2.85
5	3.4	3.7	4.4	4.9	7.4	4.2	10.7	6.3	3.9	3.4	2.95	2.75
6	3.2	3.6	4.3	4.8	7.2	4.5	9.4	7.8	4.3	3.3	2.9	2.8
7	3.0	3.5	4.4	4.5	6.8	4.2	8.8	9.1	4.1	3.5	2.8	2.8
8	2.9	3.4	5.2	4.5	6.4	4.0	8.4	8.0	4.0	4.2	2.8	2.65
9	2.9	4.6	6.0	4.4	5.4	4.1	11.5	7.3	3.9	3.9	2.9	2.55
10	2.8	11.2	5.9	4.3	5.1	3.9	15.5	7.2	4.0	3.8	2.75	2.45
11	2.8	12.8	5.4	4.3	5.1	3.8	11.8	6.8	4.0	4.2	2.8	2.4
12	3.1	9.5	5.1	3.9	4.0	3.7	10.3	6.9	3.8	4.4	3.1	2.4
13	3.3	7.9	4.9	3.1	3.7	3.8	9.6	8.1	3.5	4.6	3.0	2.3
14	3.1	6.9	4.8	2.9	4.0	3.9	9.0	10.0	3.3	4.4	3.0	2.35
15	3.0	6.5	4.8	3.3	3.7	4.3	8.2	8.8	3.2	4.4	3.0	2.25
16	2.9	6.3	4.7	3.4	4.0	5.4	8.3	8.2	3.1	4.2	2.9	2.2
17	2.8	6.4	4.6	3.7	4.1	6.0	8.6	7.5	3.0	4.0	2.85	2.25
18	2.8	6.0	4.5	3.5	4.2	7.5	8.4	6.9	2.9	3.8	2.6	2.25
19	2.6	5.8	4.3	3.6	4.3	6.4	8.0	6.4	2.9	4.6	2.6	2.15
20	3.1	5.7	4.2	3.7	4.2	6.6	7.8	6.0	3.4	3.8	2.6	2.15
21	4.0	5.6	4.0	3.4	4.2	6.3	9.9	5.8	2.9	3.7	2.95	2.1
22	4.6	5.5	4.1	3.9	4.1	6.2	12.5	5.4	3.0	3.5	3.5	2.1
23	5.0	5.4	4.2	3.8	4.1	5.7	10.4	5.0	2.95	3.3	4.4	2.05
24	4.4	5.1	5.3	4.3	3.8	5.5	8.9	4.8	3.4	3.2	4.1	2.0
25	5.2	4.9	5.2	6.5	3.7	5.6	7.9	4.6	3.4	3.3	3.6	2.0
26	6.4	4.8	6.4	4.6	3.8	6.3	8.5	4.5	3.4	3.6	3.2	2.1
27	6.7	4.6	6.2	4.5	3.9	8.3	11.1	4.4	3.2	3.6	3.1	2.0
28	6.1	4.6	5.5	4.4	4.0	18.3	10.4	4.7	33.1	3.6	2.95	2.0
29	5.4	4.6	5.0	4.6	.....	23.4	9.1	4.5	3.3	4.1	2.9	2.0
30	4.9	4.7	4.6	4.7	.....	18.4	8.4	4.2	3.4	3.8	2.85	2.0
31	4.6	.....	4.5	5.6	.....	14.9	.....	4.0	.....	3.7	2.8	.....

NOTE.—No water flowing in Delaware division of Pennsylvania canal Dec. 16 to Mar. 22. Water turned in canal Mar. 23. Canal bank failed during following high water. Water turned in again Apr. 5.

[1] It has been estimated that the flood of October 10–11, 1903, reached a stage of 41.5 feet at Riegelsville with a corresponding discharge of 275,000 second-feet.

Daily discharge, in second-feet, of Delaware River at Riegelsville, N. J., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2,600	7,190	9,160	7,830	30,400	6,560	53,900	22,100	5,650	3,750	4,800	3,030
2	6,560	6,560	9,160	6,870	31,000	5,080	53,900	19,700	5,360	5,080	4,000	3,380
3	5,950	6,250	8,160	7,190	24,500	5,080	56,700	16,700	5,080	5,650	4,260	3,380
4	5,360	5,650	7,830	8,160	20,200	5,950	47,700	15,000	5,080	5,080	3,750	3,140
5	4,530	5,360	7,510	9,160	18,800	6,870	36,300	14,200	5,950	4,530	3,380	2,920
6	4,000	5,080	7,190	8,820	18,000	7,830	28,800	20,700	7,190	4,260	3,260	3,030
7	3,500	4,800	7,510	7,830	16,300	6,870	25,600	27,100	6,560	4,800	3,030	3,030
8	3,380	4,530	10,200	7,830	14,600	6,250	23,500	21,600	6,250	6,870	3,030	2,700
9	3,260	8,160	13,100	7,510	10,900	6,560	44,200	18,400	5,950	5,950	3,260	2,500
10	3,140	39,300	12,700	7,190	9,840	5,950	69,000	18,000	6,250	5,650	2,920	2,300
11	3,030	49,700	10,900	7,190	9,840	5,650	43,100	16,300	6,250	6,870	3,030	2,200
12	3,750	29,300	9,840	5,950	6,250	5,360	33,900	16,700	5,650	7,510	3,750	2,200
13	4,260	21,100	9,160	3,750	5,360	5,650	29,900	22,100	4,800	8,160	3,500	2,010
14	3,750	16,700	8,820	3,260	6,250	5,950	26,600	32,100	4,260	7,510	3,500	2,100
15	3,500	15,000	8,820	4,260	5,360	7,190	22,600	25,600	4,000	7,510	3,500	1,920
16	3,260	14,200	8,490	4,530	6,250	10,900	23,000	22,600	3,750	6,870	3,260	1,830
17	3,030	14,600	8,160	5,360	6,560	13,100	24,500	19,300	3,500	6,250	3,140	1,920
18	3,030	13,100	7,830	4,800	6,870	19,300	23,500	16,700	3,260	5,650	2,600	1,920
19	2,700	12,400	7,190	5,080	7,190	14,600	21,600	14,600	3,260	8,160	2,600	1,740
20	3,750	12,000	6,870	5,360	6,870	15,400	20,700	13,100	4,530	5,650	2,600	1,740
21	6,250	11,600	6,250	4,530	6,870	14,200	31,600	12,400	3,260	5,360	3,380	1,660
22	8,160	11,200	6,560	5,950	6,560	13,900	47,700	10,900	3,500	4,800	4,800	1,660
23	9,500	10,900	6,870	5,650	6,560	12,000	34,500	9,500	3,380	4,260	7,510	1,580
24	7,510	9,840	10,500	7,190	5,650	11,200	26,100	8,820	4,530	4,000	6,560	1,500
25	10,200	9,160	10,200	15,000	5,360	11,600	21,100	8,160	4,530	4,260	5,080	1,500
26	14,600	8,820	14,600	8,160	5,650	14,200	24,000	7,830	4,530	5,080	4,000	1,660
27	15,800	8,160	13,900	7,830	5,950	23,000	38,700	7,510	4,000	5,080	3,750	1,500
28	13,500	8,160	11,200	7,510	6,250	90,000	34,500	8,490	3,750	5,080	3,380	1,500
29	10,900	8,160	9,500	8,160	.....	30,000	27,100	7,830	4,260	6,560	3,260	1,500
30	9,160	8,490	8,160	8,490	.....	90,700	23,500	6,870	4,530	5,650	3,140	1,500
31	8,160	.....	7,830	11,600	.....	64,600	.....	6,250	.....	5,360	3,030	.....

NOTE.—Discharge determined from a well-defined rating curve.

Monthly discharge of Delaware River at Riegelsville, N. J., for the year ending Sept. 30, 1914.

[Drainage area, 6,430 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
October	15,800	2,600	6,130	0.992	1.14	A.
November	49,700	4,530	12,800	2.04	2.28	A.
December	14,600	6,250	9,170	1.44	1.66	A.
January	15,000	3,260	7,030	1.09	1.26	A.
February	31,000	5,360	11,100	1.73	1.80	A.
March	130,000	5,080	20,700	3.22	3.71	A.
April	69,200	20,700	33,900	5.30	5.91	A.
May	32,100	6,250	15,700	2.49	2.87	A.
June	7,190	3,260	4,760	.779	.87	A.
July	8,160	3,750	5,720	.928	1.07	A.
August	7,510	2,600	3,710	.616	.71	A.
September	3,380	1,500	2,140	.372	.41	B.
The year	130,000	1,500	11,100	1.74	23.69	

NOTE.—To allow for water diverted by the canal, 250 second-feet was added to computed mean discharge Oct. 1 to Dec. 15, 1913, Mar. 23 to 28, and Apr. 5 to Sept. 30, 1914, before computing discharge per square mile; first three columns of table therefore indicate actual quantity of water in the river; the two remaining columns represent the total run-off from drainage area above Riegelsville including the discharge of the canal.

BEAVER KILL AT COOKS FALLS, N. Y.

Location.—At covered highway bridge in Cooks Falls.

Drainage area.—236 square miles.

Records available.—July 25, 1913, to September 30, 1914. Data also in annual reports of State engineer and surveyor and State of New York Conservation Commission.

Gage.—Vertical staff in two sections bolted to rock on left bank under the bridge.

Discharge measurements.—Made from highway bridge or by wading.

Channel and control.—Coarse gravel, bowlders, and solid ledge; practically permanent.

Extremes of stage.—Maximum stage recorded during year: 10.9 feet at 5 p. m. March 28. Minimum stage recorded: 0.8 foot at 5 p. m. September 19.

Maximum stage recorded 1913–14: 10.9 feet at 5 p. m. March 28, 1914. Minimum stage recorded: 0.8 foot at 5 p. m. September 19, 1914.

Winter flow.—Discharge relation occasionally affected by ice.

Accuracy.—Results good.

Discharge measurements of Beaver Kill at Cooks Falls, N. Y., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 2	R. S. Barnes	7.30	3,670
Sept. 21	C. S. De Golyer	1.00	62

Daily gage height, in feet, of Beaver Kill at Cooks Falls, N. Y., for the year ending Sept. 30, 1914.

[J. L. Rosa, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.30	2.15	2.75	1.60	.....	5.85	3.80	1.58	1.45	1.28	1.72
2	2.32	1.95	2.62	1.75	.....	7.35	3.45	1.48	1.85	1.18	1.60
3	2.15	2.10	2.55	1.95	.....	6.00	3.28	1.45	1.70	1.12	1.68
4	1.82	2.10	2.48	2.05	.....	5.05	3.12	2.05	1.38	1.12	1.65
5	1.58	2.00	2.40	.....	.....	4.55	4.15	2.20	1.28	1.00	1.58
6	1.50	2.00	2.30	.....	.....	4.15	4.80	1.92	1.60	1.02	1.42
7	1.50	2.15	3.25	.....	.....	4.15	3.95	1.75	1.70	1.02	1.38
8	1.58	2.10	4.65	.....	.....	7.65	3.58	2.40	1.70	1.02	1.32
9	1.88	9.05	3.50	.....	.....	8.45	3.45	2.25	1.82	.92	1.28
10	1.68	7.10	3.12	.....	.....	6.05	3.25	1.92	1.78	1.50	1.18
11	1.65	5.05	2.95	.....	.....	5.45	3.12	1.75	1.72	2.40	1.15
12	1.75	4.25	2.80	.....	.....	5.80	3.60	1.55	2.00	1.72	1.05
13	1.80	3.98	2.70	.....	.....	5.40	4.45	1.52	1.72	1.48	1.00
14	1.55	3.70	2.80	.....	.....	4.85	3.70	1.42	1.50	1.40	.98
15	1.45	3.50	2.80	.....	.....	4.85	3.35	1.32	1.60	1.42	.95
16	1.45	3.15	2.70	.....	.....	5.05	3.15	1.32	1.55	1.22	.90
17	1.45	3.05	2.75	.....	.....	5.10	3.05	1.30	1.48	1.42	.92
18	1.75	3.05	2.75	.....	.....	4.95	2.95	1.25	2.60	1.45	.92
19	1.85	3.25	2.52	.....	.....	5.30	2.78	1.32	1.90	2.65	.82
20	4.25	3.45	1.95	.....	.....	8.05	2.50	1.50	1.68	2.48	.95
21	6.15	3.15	2.25	.....	.....	6.85	2.32	1.32	1.50	4.20	.90
22	3.90	2.98	2.25	.....	.....	5.40	2.25	1.52	1.55	3.50	.90
23	2.75	2.95	2.30	.....	.....	4.75	2.22	1.42	1.42	2.70	.95
24	3.65	2.80	2.50	.....	.....	4.25	2.18	1.75	1.55	2.38	1.10
25	5.70	2.65	2.52	.....	3.45	4.10	2.12	1.55	1.52	2.22	1.00
26	4.90	2.48	2.55	.....	4.70	5.60	2.00	1.38	1.38	1.98	.98
27	4.10	2.35	2.05	.....	7.25	4.80	2.08	1.32	1.40	1.88	1.00
28	3.60	2.30	1.95	.....	10.40	4.30	2.05	1.45	1.42	1.80	.95
29	3.15	2.85	1.75	.....	8.00	4.10	1.92	1.50	1.38	1.80	.95
30	2.90	2.95	1.65	.....	6.65	4.15	1.82	1.42	1.40	2.02	1.00
31	2.50	.....	1.50	.....	6.20	.....	1.68	.....	1.38	1.82	.....

NOTE.—Discharge relation affected by ice about Jan. 1 to Mar. 24.

Daily discharge, in second-feet, of Beaver Kill at Cooks Falls, N. Y., from July 25, 1913, to Sept. 30, 1914.

Day.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1		47	59	114	339	565		2,400	1,040	182	147	110	208
2		49	64	387	278	490		3,760	830	154	249	90	182
3		39	51	339	323	490		2,560	780	147	208	80	208
4		37	41	235	323	455		1,800	690	308	132	80	195
5		32	51	182	293	421		1,520	1,270	355	110	61	182
6		32	47	158	293	387		1,270	1,660	263	182	64	140
7		278	49	158	339	735		1,270	1,150	222	208	64	132
8		114	47	182	323	1,520		3,950	930	421	208	64	118
9		73	41	263	5,420	880		4,760	830	371	235	51	110
10		64	39	208	3,490	690		2,560	735	263	235	158	90
11		59	32	195	1,800	645		2,090	690	222	208	421	85
12		51	30	222	1,270	565		2,400	930	170	293	208	68
13		51	26	235	1,150	525		2,090	1,390	158	208	154	61
14		49	23	170	980	565		1,660	980	140	158	136	59
15		44	23	147	880	565		1,660	830	118	182	140	55
16		39	23	147	735	525		1,800	735	118	170	98	49
17		49	24	147	645	565		1,870	645	114	154	140	51
18		49	34	222	645	565		1,800	645	104	490	147	51
19		49	44	249	735	455		2,020	565	118	263	490	41
20		47	44	1,270	830	278		4,350	455	158	208	455	55
21		39	51	2,720	735	371		3,220	387	118	158	1,270	49
22		39	1,700	1,090	645	371		2,090	371	158	170	880	49
23		59	472	565	645	387		1,660	355	140	140	525	55
24		94	263	930	565	455		1,270	355	222	170	421	76
25	85	68	182	2,320	490	455	830	1,210	323	170	158	355	61
26	68	49	147	1,730	455	490	1,590	2,240	293	132	132	293	59
27	64	44	114	1,210	404	308	3,580	1,660	323	118	136	263	61
28	61	90	110	930	387	278	7,080	1,330	308	147	140	235	55
29	61	85	90	735	565	222	4,350	1,210	263	158	132	235	55
30	55	85	64	605	645	195	3,050	1,270	235	140	136	293	61
31	47	76		455		158	2,720		208		132	235	

NOTE.—Discharge determined from a fairly well defined rating curve.

Monthly discharge of Beaver Kill at Cooks Falls, N. Y., for the years ending Sept. 30, 1913–14.

[Drainage area, 236 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
1912–13.						
August	278	32	63.9	0.271	0.31	A.
September	1,700	23	133	.564	.63	A.
1913–14.						
October	2,720	114	597	2.53	2.92	B.
November	5,420	278	888	3.76	4.20	B.
December	1,520	158	502	2.13	2.46	B.
April	4,760	1,210	2,160	9.15	10.21	C.
May	1,660	208	684	2.90	3.34	B.
June	421	104	187	.792	.88	B.
July	490	110	189	.801	.92	B.
August	1,270	51	265	1.12	1.29	B.
September	208	41	90.7	.384	.43	A.

WEST BRANCH OF DELAWARE RIVER AT HALE EDDY, N. Y.

Location.—At highway bridge 400 feet west of Erie Railroad station in Hale Eddy, 8 miles below power dam of Deposit Electric Co., and 8¼ miles above junction with East Branch of Delaware River.

Drainage area.—611 square miles.

Records available.—November 15, 1912, to September 30, 1914. Data also in annual reports of State engineer and surveyor and State of New York Conservation Commission.

Gage.—Vertical staff in four sections attached to rocks near right abutment and to the abutment.

Discharge measurements.—Made from the highway bridge of by wading.

Channel and control.—Coarse gravel and bowlders. Control is about three-fourths mile below gage and is practically permanent.

Extremes of discharge.—Maximum stage recorded during year, 14.6 feet at 5 p. m. March 28; discharge, 21,300 second-feet. Minimum stage recorded, 1 foot at 6 p. m. September 21; discharge, 34 second-feet.

Maximum stage recorded [1] 1912–1914, 15.3 feet at 5 p. m. March 27, 1913; discharge, approximately 25,000 second-feet. Minimum stage recorded, 1 foot at 6 p. m. September 21, 1913; discharge, 34 second-feet.

Winter flow.—Discharge relation seriously affected by ice.

Accuracy.—Results good.

Discharge measurements of West Branch of Delaware River at Hale Eddy, N. Y., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 6	C. S. De Golyer	[a]4.85	394	Mar. 21	R. S. Barnes	[a]5.30	304
21	do	[a]4.97	248	Apr. 1	do	8.26	5,820
30	do	[a]6.39	1,510	22	C. C. Covert	7.91	5,450
Feb. 2	do	5.34	2,300	Sept. 22	C. S. De Golyer	1.78	99
19	R. S. Barnes	[a]4.94	644	22	do	1.78	102

[a] Discharge relation affected by ice.

Daily gage height, in feet, of West Branch of Delaware River at Hale Eddy, N. Y., for the year ending Sept. 30, 1914.

[William Seeley, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.45	2.15	3.3	2.55	7.4	4.1	8.0	5.0	2.3	2.1	2.1	2.7
2	1.5	2.2	3.2	4.6	5.4	4.4	8.8	4.6	2.5	2.1	1.9	2.6
3	1.5	2.05	3.1	4.9	4.7	4.4	7.8	4.3	2.7	2.1	1.8	2.95
4	1.5	2.0	3.0	4.8	4.8	4.4	6.5	4.1	2.7	2.1	1.8	2.95
5	1.5	2.0	3.1	4.0	4.8	4.6	6.1	4.9	2.7	2.0	1.8	2.65
6	1.5	1.95	2.95	4.6	3.4	4.6	5.6	6.3	2.55	2.2	1.6	2.5
7	1.48	2.0	3.2	4.2	3.8	4.6	5.4	5.3	2.65	2.5	1.6	2.5
8	1.48	1.95	4.3	3.6	3.4	4.4	7.8	4.8	2.6	2.7	1.7	2.3
9	1.4	4.6	4.2	3.6	2.65	4.4	11.2	4.6	3.2	2.85	2.0	2.3
10	1.42	7.6	3.5	3.4	2.6	4.2	8.2	4.4	2.8	3.6	2.1	2.1
11	1.38	5.6	3.6	5.0	2.8	4.2	6.9	4.0	2.7	3.7	2.0	2.1
12	1.3	4.8	3.4	5.3	2.35	3.8	6.6	4.7	2.35	3.6	1.9	2.05
13	1.4	4.6	3.4	5.1	2.6	3.8	6.0	7.1	2.2	3.2	1.8	2.0
14	1.4	4.6	3.5	5.2	3.6	3.7	5.4	6.2	2.05	3.0	1.8	1.95
15	1.45	4.4	3.5	5.0	4.2	3.4	5.2	5.6	2.0	2.9	1.8	1.9
16	1.45	4.0	3.4	5.2	4.8	3.7	5.7	5.4	2.15	2.7	1.8	1.85
17	1.4	3.9	3.2	5.0	4.8	5.0	5.6	4.7	2.0	2.55	1.8	1.9
18	1.35	3.9	3.2	5.0	4.8	6.6	5.3	4.3	1.9	2.7	1.9	1.75
19	1.4	3.8	3.1	4.9	5.0	6.4	5.2	4.0	1.8	3.1	3.4	1.9
20	2.5	4.0	2.6	4.8	5.0	5.6	8.7	3.8	2.0	2.7	3.2	1.8
21	4.0	4.2	2.85	4.9	4.8	5.4	9.8	3.6	2.0	2.5	4.1	1.8
22	3.8	3.9	2.75	4.6	4.8	5.2	7.8	3.4	2.1	2.5	4.9	1.8
23	2.7	3.8	2.75	4.6	4.7	4.9	6.4	3.2	1.95	2.6	4.0	1.75
24	2.5	3.7	3.4	4.7	4.6	4.6	5.6	3.0	1.95	2.8	3.5	1.7
25	2.65	3.6	3.2	4.8	4.5	4.4	5.2	2.9	2.0	2.7	3.4	1.8
26	2.6	3.6	3.2	5.0	4.3	7.4	5.6	2.7	1.8	2.5	3.1	1.65
27	2.8	3.5	2.75	4.9	4.2	11.4	5.9	2.75	1.8	2.3	2.75	1.8
28	2.7	3.4	2.4	5.0	4.2	14.2	5.6	2.7	1.95	2.2	2.65	1.7
29	2.55	3.2	2.5	5.4	.....	11.5	5.1	2.56	2.2	2.1	2.7	1.7
30	2.4	3.6	2.6	6.5	.....	9.4	5.4	2.45	2.2	2.1	3.0	1.7
31	2.3	.....	2.8	6.1	.....	8.4	.....	2.3	.....	2.1	2.85	.....

NOTE.—Discharge relation affected by ice Jan. 2 to Mar. 25.

[1] The observer states that on Oct. 10, 1893, the water rose to an elevation indicated by a nail in a tree near the gage. This nail is at gage height 20.3 feet. No data available indicating whether present rating table is applicable to this gage height.

Daily discharge, in second-feet, of West Branch of Delaware River at Hale Eddy, N. Y., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	66	220	820	395	4,550	.....	5,520	2,060	280	200	200	470
2	70	240	760	260	2,330	.....	6,770	1,740	370	200	138	420
3	70	182	700	420	1,740	.....	5,230	1,500	470	200	115	610
4	70	165	640	348	1,900	.....	3,560	1,350	470	200	115	610
5	70	165	700	302	1,900	.....	3,120	1,980	470	165	115	445
6	70	152	610	260	880	.....	2,610	3,340	395	240	81	370
7	68	165	760	240	1,140	.....	2,420	2,330	445	370	81	370
8	68	152	1,500	240	880	.....	5,230	1,900	420	470	96	280
9	61	1,740	1,420	220	420	.....	11,900	1,740	760	552	165	280
10	63	4,950	940	220	395	.....	5,820	1,580	525	1,000	200	200
11	59	2,610	1,000	280	280	.....	4,040	1,280	470	1,070	165	200
12	53	1,900	880	395	126	.....	3,680	1,820	302	1,000	138	182
13	61	1,740	880	302	70	.....	3,010	4,290	240	760	115	165
14	61	1,740	940	325	96	.....	2,420	3,230	182	640	115	152
15	66	1,580	940	260	280	.....	2,240	2,610	165	580	115	136
16	66	1,280	880	348	525	.....	2,710	2,420	220	470	115	126
17	61	1,210	760	260	580	.....	2,610	1,820	165	395	115	138
18	57	1,210	760	260	552	2,610	2,330	1,500	138	470	138	106
19	61	1,140	700	220	640	1,586	2,240	1,280	115	700	880	138
20	370	1,280	420	182	640	470	6,610	1,140	165	470	760	115
21	1,280	1,420	552	220	580	325	8,630	1,000	165	370	1,350	115
22	1,140	1,210	498	138	525	260	5,230	880	200	370	1,980	115
23	470	1,140	498	115	498	200	3,450	760	152	420	1,280	106
24	370	1,070	880	152	470	182	2,610	640	152	525	940	96
25	445	1,000	760	165	395	220	2,240	580	165	470	880	115
26	420	1,000	760	240	.....	4,680	2,610	470	115	370	700	88
27	525	940	498	325	.....	12,400	2,910	498	115	280	498	115
28	470	880	325	552	.....	21,000	2,610	470	152	240	445	96
29	395	760	370	760	.....	12,700	2,150	395	240	200	470	96
30	325	1,000	420	1,580	.....	7,830	2,420	348	240	200	640	96
31	280	.....	525	3,120	.....	6,130	.....	280	.....	200	552	.....

NOTE.—Discharge determined from a well-defined rating curve. Discharge estimated because of ice, from discharge measurements and temperature records, as follows: Jan. 2 to Feb. 25 as in table; Feb. 26–28, 463 second-feet; Mar. 1–17, 681 second-feet.

Monthly discharge of West Branch of Delaware River at Hale Eddy, N. Y., for the year ending Sept. 30, 1914.

[Drainage area, 611 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
October	1,280	53	249	0.408	0.47	B.
November	4,950	152	1,140	1.87	2.09	A.
December	1,500	325	745	1.22	1.41	A.
January	3,120	115	423	.692	.80	B.
February	4,550	70	849	1.39	1.45	B.
March	21,000	182	2,650	4.34	5.00	B.
April	11,900	2,150	3,960	6.48	7.23	A.
May	4,290	280	1,520	2.49	2.87	A.
June	760	115	282	.462	.52	B.
July	1,070	165	445	.728	.84	B.
August	1,980	81	442	.723	.83	B.
September	610	88	218	.357	.40	B.
The year	21,000	53	1,080	1.77	23.91	

NEVERSINK RIVER AT GODEFFROY, N. Y.

Location.—At suspension bridge half a mile east of post office at Godeffroy, half a mile below Brasher Kill, and 8 miles above the mouth.

Drainage area.—314 square miles.

Records available.—August 4 to October 9, 1903, and August 21, 1909, to April 30, 1914, when station was discontinued. Data also in annual reports of State engineer and surveyor.

Gage.—Chain on downstream side of left-hand cable tower of bridge; prior to August 1, 1910, staff gages at about same location.

Discharge measurements.—Made from bridge or by wading.

Channel and control.—Sand and gravel; probably shifting.

Extremes of discharge.—Maximum stage recorded 1909–1914, 9.3 feet at 6 p. m. March 27, 1913. Minimum stage recorded, 1.7 feet at 5 p. m. July 21, 1911; discharge practically zero.

Regulation.—Flow seriously affected by operation of power plants above station, especially the plant at Roses Point, which supplies electric light and power to Port Jervis and Middletown.

The following discharge measurement was made by C. C. Covert:
April 23, 1914: Gage height, 4.78 feet; discharge, 1,470 second-feet.

Estimates withheld for additional data.

Gage height, in feet, of Neversink River at Godeffroy, N. Y., for the year ending Sept. 30, 1914.

[Frank Zock, observer.]

Day.	October.		November.		December.		March.		April.	
	A. M.	P. M.	A. M.	P. M.	A. M.	P. M.	A. M.	P. M.	A. M.	P. M.
1	2.95	3.0	3.95	3.85	4.0	4.15	.....	.....	5.85	5.85
2	3.95	4.5	3.65	3.55	4.0	4.0	.....	.....	6.25	6.45
3	4.25	3.5	3.45	3.5	4.15	4.0	.....	.....	5.95	5.65
4	3.35	3.2	3.5	3.45	4.1	4.15	.....	.....	5.4	5.25
5	3.0	3.15	3.45	3.35	4.0	4.0	.....	.....	5.2	5.0
6	3.15	3.2	.....	.....	3.95	3.7	.....	.....	4.85	4.8
7	3.25	3.1	.....	.....	3.6	3.6	.....	.....	4.75	4.8
8	3.15	3.05	.....	.....	3.9	3.8	.....	.....	4.9	5.45
9	3.0	3.1	.....	.....	3.95	4.15	.....	.....	7.45	6.2
10	3.15	3.2	.....	.....	4.0	4.0	.....	.....	5.55	5.25
11	2.95	3.3	.....	.....	3.75	3.55	.....	.....	5.2	5.15
12	3.15	3.35	4.65	4.5	3.5	3.5	.....	.....	5.2	5.1
13	3.3	3.25	4.45	4.3	3.5	3.55	.....	.....	5.15	5.0
14	3.2	3.4	4.25	4.35	3.5	3.65	.....	.....	4.75	4.65
15	3.25	3.35	4.0	4.05	3.65	3.45	.....	.....	4.7	4.65
16	3.4	3.3	4.0	4.1	3.4	3.4	.....	.....	4.75	4.85
17	3.3	3.15	4.0	4.15	3.5	3.5	3.6	3.5	4.8	4.75
18	3.2	3.25	4.15	4.0	3.5	3.45	3.65	3.45	4.75	4.75
19	3.15	3.0	4.0	3.95	3.3	3.25	.....	.....	4.7	4.78
20	3.6	4.0	4.0	4.0	3.2	3.1	.....	.....	5.75	5.8
21	5.0	4.6	4.05	4.15	3.1	3.0	.....	.....	6.1	5.4
22	4.6	4.6	3.95	3.9	3.1	3.15	.....	.....	5.0	4.8
23	5.15	4.5	3.8	3.7	3.3	3.3	.....	.....	4.78	4.7
24	4.95	5.25	3.65	3.5	3.4	3.25	.....	.....	4.5	4.7
25	5.15	5.1	3.5	3.4	3.4	3.45	.....	.....	4.35	4.75
26	5.0	4.95	3.5	3.5	3.6	3.65	.....	.....	5.1	5.85
27	4.65	4.35	3.7	3.6	3.8	3.8	.....	.....	5.3	5.05
28	4.25	4.15	3.6	3.5	3.8	3.85	7.5	7.9	4.9	4.8
29	4.1	4.05	4.0	3.9	3.9	3.8	7.0	6.5	4.72	4.72
30	4.0	4.1	4.15	3.95	3.8	3.9	6.25	6.05	4.7	4.6
31	4.0	4.05	.....	.....	3.8	3.85	5.65	5.6	.....	.....

NOTE.—Gage heights observed at about 7 a. m. and 5.30 p. m. No observations made Jan. 1 to Mar. 16,

NESHAMINY CREEK BELOW FORKS, PA.

Location.—A short distance below the junction of Big and Little Neshaminy creeks.
Records available.—1884 to 1913.
Drainage area.—139 square miles.
Gage.—Automatic register.
Discharge measurements.—Discharge at high stages determined from a curve developed from current-meter measurements; lower part of rating curve developed from the computed discharge over a weir.
Accuracy.—Discharge rating curve well defined.
Cooperation.—Records obtained and furnished by Philadelphia Bureau of Water, Department of Public Works, under the personal supervision of John E. Codman.

Daily discharge, in second-feet, of Neshaminy Creek below Forks, Pa., for 1912–13.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1912.												
1	286.0	256.5	41.5	13.0	16.2	15.0	41.0	144.0	94.0	300.0	148.5	97.5
2	499.5	159.0	38.0	13.2	14.0	223.0	33.5	294.0	128.0	210.5	122.0	91.5
3	773.0	130.0	35.5	12.7	12.5	88.0	30.0	154.5	249.0	159.0	111.0	104.5
4	282.5	112.5	33.0	11.7	12.0	36.5	28.0	84.0	158.0	139.5	109.0	234.0
5	214.0	100.5	32.0	11.7	11.0	23.7	28.0	84.0	125.0	125.0	109.0	221.0
6	190.5	106.0	51.0	11.5	10.2	22.0	25.0	87.5	256.7	125.0	111.0	79.5
7	188.0	110.0	61.0	11.5	11.2	19.5	20.0	1,696.5	223.0	105.0	122.0	76.0
8	194.5	416.0	42.5	11.5	11.0	31.5	17.5	1,302.6	139.0	105.0	136.5	108.0
9	170.5	392.0	30.0	11.2	9.5	59.5	16.5	278.0	114.0	105.0	133.5	105.5
10	139.0	246.5	26.0	11.0	9.5	25.0	18.0	197.0	94.0	105.0	130.0	163.5
11	125.0	171.5	24.0	13.0	1,253.0	17.5	19.0	165.0	92.5	105.0	133.0	112.5
12	113.5	148.0	23.5	13.5	146.5	14.0	21.0	140.5	100.0	96.5	126.0	113.0
13	109.0	128.5	22.5	12.0	74.5	12.0	20.2	127.0	115.0	106.5	120.0	4,073.2
14	111.0	103.5	20.7	33.0	36.5	12.5	17.7	199.5	112.5	134.5	134.5	398.7
15	108.0	103.5	21.2	42.5	29.5	12.0	16.7	203.5	99.0	144.0	149.0	3,999.9
16	101.0	178.0	22.0	24.5	27.5	12.0	16.0	122.0	77.0	144.0	174.0	1,458.0
17	154.0	217.5	30.0	16.2	21.2	12.0	14.2	107.0	68.0	144.0	269.0	444.5
18	449.3	145.0	29.5	21.2	37.7	11.5	12.0	99.0	67.0	157.0	492.0	371.5
19	896.5	95.0	21.0	27.5	112.0	13.7	13.7	92.5	756.0	485.0	785.5	346.5
20	502.0	81.5	20.0	23.5	484.0	14.0	15.5	87.5	273.0	733.5	679.5	1,092.6
21	190.0	69.5	19.0	44.0	92.0	12.0	13.5	81.0	122.5	521.0	2,534.0	452.5
22	167.0	62.0	19.0	51.5	107.0	12.0	13.5	75.0	121.0	323.0	2,439.8	340.0
23	162.0	58.0	17.5	29.0	53.5	12.0	2,948.0	72.5	101.5	271.0	230.0	471.2
24	137.5	55.0	16.5	20.5	36.0	672.5	3,631.1	644.2	165.0	278.5	175.5	3,008.0
25	114.0	57.0	16.5	18.5	32.0	1,386.2	947.5	369.5	247.2	286.0	166.0	1,313.0
26	106.0	55.0	16.0	16.7	25.0	393.5	255.0	188.5	291.5	274.5	895.0	483.0
27	131.5	48.0	16.7	12.2	17.5	159.0	166.0	146.5	1,101.0	263.0	2,519.6	339.0
28	158.0	42.5	17.5	12.0	16.0	88.5	128.5	123.0	1,346.0	242.5	363.6	303.0
29	163.0	62.0	16.7	23.0	18.5	62.0	104.0	111.0	762.0	219.0	211.0	2,056.2
30	500.2	69.5	14.7	25.5	19.2	49.0	99.0	99.5	1,400.0	214.5	.....	751.0
31	.....	49.0	.....	17.0	16.2	.....	89.0	.....	1,796.0	188.5	.....	371.5

Daily discharge, in second-feet, of Neshaminy Creek below Forks, Pa., for 1912–13— Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1913.												
1	204	197	79	18	526	7	3,486	107	115	708	277	336
2	158	172	64	16	712	7	1,069	102	95	533	166	222
3	142	140	53	16	75	7	312	96	90	2,294	144	174
4	142	121	49	13	34	56	139	96	87	523	144	165
5	178	112	46	1,164	23	94	90	88	85	293	144	146
6	173	107	44	660	25	36	78	83	82	247	144	147
7	129	98	44	85	659	18	70	77	132	288	170	126
8	108	88	44	37	109	17	58	90	243	562	170	102
9	98	81	41	26	36	15	50	2,167	124	379	144	95
10	95	76	36	36	27	14	46	643	88	208	131	114
11	168	71	34	45	22	11	45	236	92	246	152	947
12	2,710	62	32	35	19	12	2,245	183	92	300	113	314
13	985	53	28	28	16	10	389	156	82	266	119	202
14	468	52	30	25	18	12	183	144	72	195	119	1,477
15	358	48	31	16	17	13	123	135	72	163	119	1,165
16	2,594	44	26	17	16	12	102	426	72	177	119	747
17	705	48	24	16	13	12	95	718	70	750	88	352
18	368	50	21	16	14	11	83	273	62	483	85	239
19	273	46	20	16	14	14	83	193	58	371	77	200
20	221	39	22	13	13	19	155	170	60	221	66	1,966
21	187	39	26	12	11	177	172	154	58	270	73	658
22	165	64	26	13	11	532	125	140	56	243	128	385
23	150	375	26	13	13	104	81	129	315	221	259	259
24	150	995	26	69	13	36	89	119	776	495	136	228
25	140	455	24	45	12	25	2,499	107	376	334	94	205
26	120	131	22	15	11	21	718	103	1,840	226	94	268
27	715	107	47	14	11	16	354	98	387	579	556	1,642
28	2,639	223	56	29	11	15	225	96	204	463	1,608	597
29	370	247	41	23	11	15	180	135	155	327	.....	332
30	298	129	31	25	13	15	152	138	129	290	.....	285
31	.....	97	.....	18	10	.....	133	.....	109	191	.....	248

Monthly discharge of Neshaminy Creek below Forks, Pa., for 1912–13.

[Drainage area, 139 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
1912.					
January	734	96	220	1.58	1.82
February	2,530	109	477	3.43	3.70
March	4,070	76	759	5.46	6.30
April	896	101	248	1.78	1.99
May	416	42	130	.935	1.08
June	61	14.7	26.5	.191	.21
July	52	11.0	19.9	.143	.16
August	1,250	9.5	89.4	.643	.74
September	1,390	11.5	117	.842	.94
October	3,630	12.0	284	2.04	2.35
November	1,700	72	253	1.82	2.03
December	1,800	67	348	2.50	2.88
The year	4,070	9.5	247	1.78	24.20
1913.					
January	2,290	163	414	2.98	3.44
February	1,610	66	201	1.45	1.51
March	1,970	95	462	3.32	3.83
April	2,710	95	507	3.65	4.07
May	995	39	147	1.06	1.22
June	79	20	36.4	.262	.29
July	1,160	12	83.0	.597	.69
August	712	10	81.1	.583	.67
September	532	7	45.1	.324	.36
October	3,490	45	440	3.17	3.66
November	2,170	77	247	1.78	1.99
December	1,840	56	203	1.46	1.68
The year	3,490	7	240	1.73	23.41

NOTE.—Values for 1912 supersede those published in Water-Supply Paper 321.

TOHICKON CREEK AT POINT PLEASANT, PA.

Location.—About one-eighth mile above the mouth of the creek.

Records available.—1883 to 1913, except 1900.

Drainage area.—102 square miles.

Gage.—Automatic register.

Discharge measurements.—High stage determined from a curve developed from current-meter measurements. The lower part of the rating curve has been developed from the computed discharge over a weir.

Accuracy.—Discharge rating curve well defined.

Cooperation.—Records obtained and furnished by the Philadelphia Bureau of Water, Department of Public Works, under the personal supervision of John E. Codman.

Daily discharge, in second-feet, of Tohickon Creek at Point Pleasant, Pa., for 1912–13.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1912.												
1	99.0	58.7	161.5	200.0	341.0	15.3	8.7	33.2	5.3	35.4	373.5	48.3
2	93.0	53.1	113.2	151.0	156.0	10.3	7.4	11.8	6.6	32.6	369.0	98.3
3	74.1	50.9	82.7	286.0	94.7	12.4	5.8	11.3	6.6	26.8	380.5	510.5
4	53.2	48.7	70.0	166.5	70.8	14.5	5.5	6.0	10.6	20.0	91.0	226.5
5	58.1	46.3	50.9	102.0	58.9	12.2	5.7	9.6	12.4	20.0	59.2	123.5
6	58.1	44.0	53.4	80.7	62.9	10.6	5.2	13.3	10.9	18.9	50.9	205.5
7	58.1	44.0	56.8	82.7	79.0	16.3	4.4	9.1	11.3	15.3	1,265.9	289.5
8	58.1	44.0	56.8	110.5	601.9	16.3	3.8	5.4	7.8	16.3	1,488.7	142.0
9	58.1	41.5	104.0	102.5	492.5	16.6	3.6	5.3	24.2	15.0	353.5	82.9
10	53.4	39.0	147.5	70.0	213.5	17.2	3.2	410.5	34.1	12.8	160.5	59.3
11	48.7	34.8	130.0	58.0	117.5	17.2	2.8	316.0	25.3	12.4	114.0	56.1
12	48.7	30.6	632.1	50.4	77.3	15.7	2.8	56.9	18.3	11.8	89.3	49.6
13	48.7	30.6	3,297.5	47.8	68.7	10.6	3.2	26.8	17.2	8.2	76.2	48.7
14	53.4	26.8	545.0	48.2	68.0	6.8	5.8	26.0	14.7	7.4	102.0	48.7
15	58.1	23.1	3,800.0	52.1	58.8	8.0	10.1	26.0	5.9	9.8	122.0	46.3
16	56.1	23.1	2,459.0	63.0	60.3	8.0	8.4	21.1	11.2	9.2	93.2	46.3
17	50.0	20.0	619.5	279.0	502.0	7.5	4.8	14.4	11.1	8.9	65.1	43.7
18	47.3	201.9	323.0	614.5	161.5	8.6	5.6	7.8	5.7	9.0	54.4	40.0
19	452.9	671.0	296.5	816.0	70.5	8.3	6.5	7.2	8.3	8.2	51.8	437.5
20	822.0	1,297.0	940.5	318.0	46.5	6.7	5.9	16.1	16.7	6.0	46.3	373.0
21	687.5	1,669.5	482.0	135.5	33.2	6.9	6.3	22.7	14.7	8.4	41.5	133.0
22	547.0	1,843.0	213.0	102.0	24.2	7.5	12.2	19.2	5.7	11.6	43.5	84.0
23	491.0	599.0	244.0	111.5	22.0	6.5	12.0	17.5	8.1	1,786.1	43.0	74.7
24	462.5	260.0	2,131.5	100.5	31.0	6.1	6.0	18.4	97.6	2,465.2	788.0	66.6
25	460.0	302.5	1,469.5	70.0	28.7	6.0	9.5	12.3	2,123.0	1,055.0	662.0	70.9
26	407.0	545.0	480.5	59.9	18.3	8.1	6.9	7.4	794.0	297.5	205.0	81.3
27	304.5	1,715.5	239.0	56.8	18.1	8.4	6.7	8.1	198.0	139.0	120.5	267.7
28	163.0	767.5	192.5	108.4	16.4	6.4	6.1	6.1	82.8	87.0	79.5	432.0
29	68.8	261.5	1,532.0	121.0	15.0	20.0	4.8	5.2	39.3	63.3	60.5	351.0
30	65.0	.....	649.0	628.0	15.0	16.1	5.2	6.3	40.1	51.3	50.4	2,308.3
31	64.3	.....	305.5	.....	20.6	.....	7.9	6.3	.....	43.0	.....	2,761.0
1913.												
1	984	105	349	101	137	35	10	244	3	924	39	60
2	616	105	176	71	97	32	8	141	2	430	39	44
3	2,468	105	109	56	71	21	4	16	3	287	39	39
4	911	95	79	47	58	26	12	14	7	120	44	39
5	273	95	80	71	48	17	16	10	35	59	31	39
6	181	107	89	55	44	17	10	127	8	39	31	39
7	197	107	89	49	41	18	9	392	7	26	26	112
8	383	107	89	41	32	9	8	34	23	22	29	344
9	435	118	66	35	27	15	9	26	10	22	1,901	136
10	144	118	45	31	28	10	73	16	5	22	768	62
11	140	107	504	240	20	9	29	15	4	21	251	55
12	371	107	389	1,880	23	8	14	8	7	937	121	58
13	368	107	185	953	20	7	15	7	8	220	76	48
14	114	77	2,078	518	20	6	15	6	7	106	61	39
15	74	91	1,943	279	20	7	14	6	4	60	53	39
16	94	87	1,462	2,294	20	4	14	5	5	47	229	39
17	622	87	401	686	17	6	8	4	6	37	477	37
18	661	87	195	158	10	5	7	5	5	29	226	37
19	385	79	137	119	21	6	9	7	8	22	126	39
20	178	73	1,770	103	10	4	6	5	6	577	92	39
21	157	57	650	83	10	6	3	3	55	463	76	30
22	145	133	368	58	12	5	4	4	176	158	66	26
23	145	297	180	53	18	5	4	3	37	71	62	216
24	356	148	124	50	420	7	5	4	12	109	60	1,091
25	301	98	97	49	215	5	3	3	11	2,250	44	436
26	189	49	131	44	82	3	2	5	8	1,099	32	1,962
27	222	354	1,843	384	54	5	6	3	8	359	24	648
28	241	1,063	325	1,836	124	5	3	3	7	164	28	245
29	139	.....	107	312	201	5	3	3	4	90	48	114
30	104	.....	107	186	95	7	4	4	7	64	68	87
31	106	.....	115	.....	53	.....	4	4	.....	48	.....	72

Monthly discharge of Tohickon Creek at Point Pleasant, Pa., for 1912–13

[Drainage area, 102 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
1912.					
January	822	47	196	1.92	2.21
February	1,840	20	372	3.65	3.94
March	3,800	51	706	6.92	7.98
April	816	48	173	1.70	1.90
May	602	15	118	1.16	1.34
June	20	6.0	11.0	.108	.12
July	12.2	2.8	6.22	.061	.07
August	410	5.2	37.5	.368	.42
September	2,120	5.3	122	1.20	1.34
October	2,470	6.0	204	2.00	2.31
November	1,490	42	250	2.45	2.73
December	2,760	40	310	3.04	3.50
The year	3,800	2.8	209	2.05	27.86
1913.					
January	2,470	74	378	3.71	4.28
February	1,060	49	149	1.46	1.52
March	2,080	45	461	4.52	5.21
April	2,290	31	361	3.54	3.95
May	420	10	66.1	.648	.75
June	35	3	10.5	.103	.11
July	73	2	10.7	.105	.12
August	392	3	36.4	.357	.41
September	176	2	16.3	.160	.18
October	2,250	21	287	2.81	3.24
November	1,900	24	172	1.69	1.89
December	1,960	26	202	1.98	2.28
The year	2,470	2	180	1.76	23.94

NOTE.—Values for 1912 supersede those published in Water-Supply Paper 321.

SCHUYLKILL RIVER NEAR PHILADELPHIA, PA.

Location.—At Fairmount dam, near Philadelphia.

Records available.—1898 to 1912.

Drainage area.—1,920 square miles.

Discharge measurements.—Computed daily discharge represents the total flow of the river as determined from the amount wasted over the flashboards at Fairmount Dam, the pumpage from the river, the leakage, and the quantity used for power at Fairmount.

Diversions.—Except for a small amount of water drawn from the Delaware, the entire water supply for the city of Philadelphia is taken from the Schuylkill.

Cooperation.—Records obtained and furnished by the Philadelphia Bureau of Water, Department of Public Works, under the personal supervision of John E. Codman.

Daily discharge, in second-feet, of Schuylkill River near Philadelphia, Pa., for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3,569	1,300	1,682	6,801	3,623	1,038	396	518	721	1,371	1,265	996
2	3,569	1,283	2,493	5,701	2,755	800	312	555	1,079	1,023	1,617	996
3	2,160	1,033	1,923	5,511	2,336	562	396	555	1,032	870	1,617	1,427
4	2,745	929	1,549	4,853	2,336	1,026	480	555	2,648	796	1,265	2,077
5	2,739	929	1,549	4,111	2,149	1,026	459	555	1,267	869	1,133	1,513
6	1,623	1,033	1,390	3,774	1,785	872	396	480	1,130	640	1,261	1,921
7	963	1,033	1,236	3,391	1,973	1,415	1,100	381	1,160	859	3,495	2,709
8	975	929	1,390	3,211	2,755	1,571	956	356	1,266	575	9,310	2,164
9	1,114	929	1,923	3,107	3,623	1,167	699	356	560	575	3,668	1,632
10	1,530	578	2,276	2,890	3,173	844	586	377	396	331	2,622	1,313
11	1,675	512	2,276	2,779	2,567	784	396	4,809	325	331	2,622	1,231
12	1,675	578	2,091	2,779	2,151	559	956	2,894	325	827	2,258	1,356
13	1,575	522	29,540	2,591	2,151	415	1,183	1,888	325	1,009	1,815	1,153
14	1,459	522	14,273	2,374	2,091	394	1,257	1,618	325	751	1,992	1,007
15	2,718	578	15,423	2,374	2,336	394	1,257	2,176	325	350	1,902	950
16	2,568	578	35,101	2,374	2,336	394	1,257	1,409	325	572	1,489	1,114
17	1,143	578	14,369	2,374	6,120	698	468	823	334	308	1,336	1,114
18	1,143	634	7,988	3,243	5,748	668	667	1,252	368	327	1,182	1,114
19	1,408	1,267	6,223	5,786	2,336	479	699	1,252	676	535	1,062	2,366
20	2,423	1,721	7,085	6,361	2,336	479	372	1,888	442	329	998	3,398
21	2,945	2,053	6,223	4,686	2,336	311	412	1,888	442	435	998	2,118
22	2,365	17,480	5,123	4,111	1,972	311	464	1,618	400	435	998	1,725
23	1,910	19,310	6,283	3,981	1,609	311	562	1,618	394	4,253	1,024	1,471
24	1,910	8,796	12,273	3,663	1,609	311	740	1,888	540	7,891	1,796	1,435
25	2,020	3,215	9,843	3,108	1,532	311	425	1,618	13,452	7,416	2,737	1,435
26	1,910	2,571	8,193	2,535	1,450	311	380	1,016	6,392	4,079	1,929	1,435
27	1,290	9,837	6,433	2,374	1,413	321	380	727	3,062	2,609	1,335	2,234
28	1,190	13,620	4,863	2,374	1,289	395	380	727	2,010	2,103	1,193	3,404
29	1,290	7,325	10,198	2,502	1,217	479	312	920	1,409	1,748	1,062	3,030
30	1,457	.....	12,188	2,779	1,143	585	321	920	976	1,440	998	10,356
31	1,290	.....	8,603	.....	1,099	.....	396	920	.....	752	.....	19,353

Monthly discharge of Schuylkill River near Philadelphia, Pa., for 1912.

[Drainage area, 1,920 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
January	3,570	963	1,880	0.979	1.13
February	19,300	512	3,510	1.83	1.97
March	35,100	1,240	7,810	4.07	4.69
April	6,800	2,370	3,620	1.89	2.11
May	6,120	1,100	2,370	1.23	1.42
June	1,570	311	641	.334	.37
July	1,260	312	615	.320	.37
August	4,810	356	1,240	.646	.74
September	13,500	325	1,470	.766	.85
October	7,890	308	1,500	.781	.90
November	9,310	998	1,930	1.01	1.13
December	19,400	950	2,570	1.34	1.54
The year	35,100	308	2,430	1.27	17.22

NOTE.—These monthly values supersede those published in Water Supply Paper 321.

PERKIOMEN CREEK NEAR FREDERICK, PA.

Location.—About 12 miles above the mouth of the creek and above the East Branch.

Records available.—1884 to 1913.

Drainage area.—152 square miles.

Gage.—Automatic register.

Discharge measurements.—Discharge at high stages determined from a curve developed from current-meter measurements; lower part of rating curve developed from the computed discharge over a weir.

Accuracy.—Discharge rating curve well defined.

Cooperation.—Records obtained and furnished by Philadelphia Bureau of Water, Department of Public Works, under the personal supervision of John E. Codman.

Daily discharge, in second-feet, of Perkiomen Creek near Frederick, Pa., for 1912–13.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1912												
1	222.5	168.0	207.5	334.0	355.0	103.5	52.5	92.7	37.6	116.5	172.5	90.5
2	196.0	162.0	150.0	297.5	227.0	75.5	43.8	115.0	90.8	98.5	439.0	140.5
3	173.0	152.0	128.0	529.5	177.0	83.5	47.5	70.0	109 5	92.5	316.0	480.0
4	167.0	142.0	116.5	276.5	153.0	104.0	44.2	59.0	71.9	85.5	126.5	216.5
5	171.0	149.0	101.5	216.0	136.0	91.0	40.1	47.2	47.3	78.0	104.5	165.0
6	168.0	149.0	88.0	197.0	140.0	81.0	33.7	62.7	44.8	77.0	93.5	372.6
7	188.0	142.0	111.0	190.0	157.0	198.0	36.8	63.8	57.5	73.0	865.0	298.0
8	203.0	144.5	148.0	282.0	414.0	152.0	35.4	32.9	120.0	64.0	1,065.5	190.0
9	198.0	147.0	244.5	217.0	421.5	106.0	31.3	23.2	141.5	55.7	498.0	153.0
10	198.0	147.0	253.5	173.0	263.0	76.0	32.3	45.6	89.0	53.7	236.5	125.0
11	183.0	147.0	177.5	158.0	186.0	47.7	30.0	666.0	62.5	66.0	171.0	119.0
12	168.0	151.5	1,226.0	149.0	166.0	35.5	168.5	174.0	51.9	72.5	146.0	118.0
13	178.0	151.5	4,670.3	135.0	201.0	38.1	81.0	111.0	43.2	60.9	129.0	100.5
14	188.0	147.0	530.0	138.0	205.0	40.7	130.0	84.0	40.6	51.9	296.6	84.5
15	188.0	147.0	5,196.2	148.0	160.5	47.6	49.5	367.0	35.7	51.3	221.5	82.0
16	188.0	157.5	1,979.2	151.0	1,248.0	44.1	43.7	110.0	37.3	40.1	149.0	93.5
17	188.0	178.0	584.0	216.0	1,053.5	50.8	51.3	65.1	43.7	40.1	123.0	98.5
18	188.0	254.0	455.5	384.5	381.0	61.0	60.4	55.1	46.6	40.7	123.0	92.0
19	357.3	461.0	410.0	636.3	264.5	61.0	65.0	320.0	70.8	38.1	115.0	650.6
20	946.6	691.0	882.0	341.5	212.0	51.2	58.3	134.0	100.5	34.6	96.0	314.0
21	614.0	1,399.0	508.0	234.0	182.0	47.6	62.3	83.5	80.4	39.2	94.0	218.5
22	407.0	3,658.2	418.0	204.0	161.0	54.3	151.0	73.5	39.6	45.4	94.0	140.0
23	366.0	343.0	436.0	234.0	126.5	48.3	100.0	193.0	36.5	1,727.5	93.0	119.0
24	366.0	408.0	2,123.0	206.5	111.5	38.6	69.4	118.0	1,488,9	1,007.0	556.2	111.5
25	335.5	347.0	1,361.5	162.0	120.0	41.6	54.3	71.6	3,783.3	622.0	388.0	115.5
26	305.0	513.2	594.5	152.0	117.0	51.2	51.9	67.1	472.0	299.5	187.5	136.5
27	292.0	2,824.6	404.0	172.0	93.0	75.0	45.2	113.5	326.5	204.5	152.0	368.5
28	254.5	572.5	371.0	190.0	80.0	79.0	39.1	64.0	233.5	154.0	124.5	518.8
29	233.0	278.0	1,990.5	188.0	118.5	63.0	38.0	53.0	161.0	129.0	113.0	358.5
30	212.0	.....	924.8	480.2	152.5	57.8	38.1	49.4	133.0	110.5	102.5	3,068.8
31	181.0	.....	420.5	.....	139.0	.....	37.5	43.2	.....	95.5	.....	2,073.0
1913												
1	817	275	350	224	374	114	44	27	26	407	89	98
2	535	221	221	173	332	105	43	30	22	544	68	84
3	2,627	202	142	156	287	98	43	38	26	293	67	89
4	662	230	154	156	247	79	38	39	26	134	74	87
5	419	216	159	195	217	74	41	38	31	83	68	82
6	327	180	162	190	203	77	64	42	41	53	66	79
7	343	162	114	141	188	70	77	183	131	46	62	258
8	534	168	99	118	168	64	64	143	164	42	58	420
9	476	148	114	107	154	66	43	84	13	39	348	173
10	278	119	134	104	147	67	160	45	58	44	450	118
11	330	106	651	184	136	54	128	33	53	41	181	100
12	511	106	328	2,981	126	53	78	29	43	325	120	87
13	427	106	262	1,084	126	56	62	32	43	203	111	84
14	250	96	2,723	514	118	46	66	37	39	115	103	77
15	207	100	1,910	393	112	44	57	35	35	76	92	80
16	288	117	1,079	2,853	116	43	46	32	35	68	180	87
17	701	140	455	775	109	44	41	28	35	57	356	74
18	599	132	327	404	105	46	37	24	35	52	210	70
19	499	102	286	300	111	46	37	19	33	33	149	66
20	288	96	1,899	243	107	48	36	21	32	620	120	66
21	288	123	905	205	92	56	37	31	42	347	109	60
22	399	204	465	181	125	65	32	30	362	165	96	67
23	393	339	307	165	332	56	26	26	137	112	80	139
24	439	167	267	165	1,021	48	33	26	72	140	77	924
25	377	105	255	154	313	50	25	26	72	1,490	79	456
26	273	96	405	132	188	43	23	32	77	625	75	2,426
27	316	270	4,947	786	188	46	31	35	47	325	62	573
28	370	886	998	2,902	427	50	34	30	25	198	58	296
29	370	.....	536	407	321	54	33	26	23	152	103	200
30	478	.....	427	327	178	52	35	28	22	120	124	172
31	380	.....	403	.....	134	.....	30	32	.....	105	.....	156

Monthly discharge of Perkiomen Creek near Frederick, Pa., for 1912–13.

[Drainage area, 152 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
1912.					
January	947	167	265	1.74	2.01
February	3,660	142	494	3.25	3.50
March	5,200	88	878	5.78	6.66
April	636	135	246	1.62	1.81
May	1,250	80	256	1.68	1.94
June	198	36	70.2	.462	.52
July	168	30	58.8	.387	.45
August	666	23	117	.770	.89
September	3,780	36	270	1.78	1.99
October	1,730	35	185	1.22	1.41
November	1,070	93	246	1.62	1.81
December	3,070	82	362	2.38	2.74
The year	5,200	23	287	1.89	25.73
1913.					
January	2,630	207	490	3.22	3.71
February	886	96	186	1.22	1.27
March	4,950	99	693	4.56	5.26
April	2,980	104	557	3.66	4.08
May	1,020	92	219	1.44	1.66
June	114	43	60.5	.398	.44
July	160	23	49.8	.328	.38
August	183	19	41.3	.272	.31
September	362	22	60.0	.395	.44
October	1,490	33	228	1.50	1.73
November	450	58	128	.842	.94
December	2,430	60	250	1.64	1.89
The year	4,950	19	248	1.63	22.11

NOTE.—Values for 1912 supersede those published in Water Supply Paper 321.

SUSQUEHANNA RIVER BASIN.

SUSQUEHANNA RIVER AT CONKLIN, N. Y.

Location.—At highway bridge just below Conklin, 5 miles below Big Snake Creek and 8 miles above Chenango River.

Drainage area.—2,350 square miles.

Records available.—November 13, 1912, to September 30, 1914. Records were obtained at Binghamton, 8 miles below, July 31, 1901, to December 31, 1912. Date also in annual reports of State engineer and surveyor and State of New York Conseruatio Commission.

Gage.—Staff in two sections on left bank—the lower section inclined, the upper vertical—attached to left abutment.

Discharge measurements.—Made from the bridge or by wading.

Channel and control.—Coarse gravel and bowlders.

Extremes of discharge.—Maximum stage recorded during year, 17.45 feet at 5 p. m. March 30; discharge, 47,000 second-feet. Minimum stage recorded, 1.62 feet at 7.30 a. m. October 5; discharge, 163 second-feet.

Maximum stage recorded 1901–1914, 19.74 feet at the former station in Binghamton, N. Y., at 7.40 a. m. March 2, 1902; discharge, approximately 62,500 second-feet. Minimum stage recorded, 1.32 feet at 8.20 a. m. and 4 p. m. September 16, 1913; discharge, 106 second-feet.

Winter flow.—Discharge relation somewhat affected by ice.

Accuracy.—Results good.

Discharge measurements of Susquehanna River at Conklin, N. Y., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 8	C. S. De Golyer	a 3.13	1,130	Mar. 30	R. S. Barnes	16.42	41,000
23	do	a 3.46	917	Apr. 4	do	11.92	21,900
Feb. 1	do	8.40	10,700	June 11	C. S. De Golyer	3.93	1,820
21	R. S. Barnes	a 5.20	885	Sept. 18	do	2.67	630
Mar. 10	C. C. Covert	a 6.36	1,200	23	H. W. Fear	2.43	488
25	R. S. Barnes	a 5.31	1,090				

a Discharge relation affected by ice.

Daily gage height, in feet, of Susquehanna River at Conklin, N. Y., for the year ending Sept. 30, 1914.

[Daniel Ames, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.72	2.85	4.5	3.6	8.3	4.6	13.2	7.7	3.35	3.5	2.8	4.7
2	1.82	2.8	4.4	3.45	7.7	4.6	12.6	7.5	3.3	3.25	2.8	4.1
3	1.88	2.8	4.3	3.25	6.3	4.4	13.0	6.4	3.25	3.25	2.8	4.5
4	1.82	2.65	4.2	3.3	6.1	4.5	11.7	6.0	3.2	2.65	2.75	4.9
5	1.69	2.65	4.2	3.35	5.9	4.5	9.4	5.9	3.45	2.6	2.75	4.3
6	1.75	2.65	4.1	3.35	5.7	4.5	8.3	8.8	3.5	3.1	2.75	3.9
7	1.85	2.6	4.1	3.15	5.2	4.5	7.8	7.8	3.45	3.25	2.7	3.7
8	1.91	2.5	4.6	3.15	4.6	4.5	9.6	6.7	4.1	3.2	2.75	3.6
9	1.86	3.0	4.0	3.05	4.0	4.4	13.6	6.3	4.5	3.5	2.6	3.35
10	1.91	7.1	4.7	3.2	4.0	4.3	13.6	6.1	4.6	4.5	2.6	3.3
11	1.86	7.6	4.5	3.2	4.0	4.2	10.5	5.7	4.0	4.8	2.55	3.2
12	1.86	6.3	4.4	3.25	4.4	4.2	9.4	6.4	3.6	5.2	2.7	3.1
13	1.85	5.4	4.3	3.9	5.2	4.1	8.8	9.0	3.9	5.4	4.0	3.05
14	1.85	5.1	4.3	3.9	5.3	4.1	8.1	9.3	3.2	4.9	3.6	2.9
15	1.82	5.3	4.3	3.8	5.4	4.1	7.6	7.7	3.1	4.6	3.2	2.8
16	1.88	5.3	4.3	3.8	5.5	4.2	8.4	6.5	3.0	4.2	3.05	2.75
17	1.89	5.1	4.2	3.8	5.6	4.7	8.6	6.1	2.95	3.8	3.0	2.7
18	1.88	5.0	4.1	3.6	5.5	5.8	8.2	5.7	2.95	6.1	2.9	2.65
19	1.92	4.8	4.0	3.6	5.5	7.3	7.8	5.3	2.9	6.3	3.2	2.6
20	2.2	4.7	3.9	3.5	5.4	7.2	10.8	5.3	2.9	4.1	5.3	2.55
21	4.2	5.4	3.7	3.6	5.3	6.3	13.1	4.8	2.9	3.8	5.8	2.55
22	4.2	5.3	3.7	3.5	5.2	6.0	12.6	4.5	2.95	3.6	6.8	2.46
23	3.8	4.9	3.7	3.45	5.1	5.8	10.3	4.4	2.95	3.5	5.7	2.42
24	3.5	4.7	4.3	3.4	5.0	5.5	8.4	4.3	2.95	3.45	4.7	2.55
25	3.15	4.6	4.0	3.7	4.9	5.3	7.5	4.1	3.0	3.7	4.5	2.6
26	3.15	4.6	4.0	3.8	4.7	7.6	7.5	3.9	3.0	3.6	4.1	2.75
27	3.2	4.5	4.0	3.8	4.7	11.8	9.0	4.0	2.95	3.4	3.8	2.7
28	3.15	4.4	3.6	4.0	4.6	17.0	8.2	3.9	2.9	3.25	3.6	2.65
29	3.15	4.3	3.3	4.4	.....	17.4	7.5	3.9	3.4	3.15	3.45	2.5
30	3.05	4.4	3.7	5.4	.....	17.3	7.7	3.5	3.3	3.25	3.8	2.5
31	2.95	.....	3.8	7.1	.....	14.6	.....	3.45	.....	3.0	4.6	.....

NOTE.—Discharge relation affected by ice Jan. 13 to Mar. 26.

Daily discharge, in second-feet, of Susquehanna River at Conklin, N. Y., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	192	828	2,690	1,500	10,500	.....	27,200	9,500	1,200	1,350	740	2,990
2	226	790	2,540	1,350	9,000	.....	24,800	9,000	1,150	1,100	740	2,070
3	249	790	2,390	1,170	5,720	.....	26,400	6,400	1,100	1,100	740	2,670
4	226	685	2,240	1,210	5,280	.....	21,500	5,500	1,060	635	705	3,330
5	182	685	2,240	1,260	4,840	.....	14,000	5,280	1,300	600	705	2,360
6	202	685	2,100	1,260	4,430	.....	11,000	12,300	1,350	970	705	1,810
7	238	652	2,100	1,080	3,500	.....	9,740	9,740	1,300	1,100	670	1,570
8	262	590	2,840	1,080	2,540	1,350	14,600	7,100	2,070	1,060	705	1,460
9	241	948	1,970	991	1,600	1,260	28,900	6,170	2,670	1,350	600	1,200
10	262	8,040	3,000	1,120	1,170	1,170	28,900	5,720	2,830	2,670	600	1,150
11	241	9,240	2,690	1,120	866	1,120	17,400	4,840	1,940	3,160	565	1,060
12	241	6,170	2,540	1,170	805	1,080	14,000	6,400	1,460	3,860	670	970
13	238	4,230	2,390	.....	1,170	991	12,300	12,800	1,810	4,230	1,940	930
14	238	3,680	2,390	.....	1,170	948	10,500	13,700	1,060	3,330	1,460	810
15	226	4,040	2,390	.....	1,210	948	9,240	9,500	970	2,830	1,060	740
16	249	4,040	2,390	.....	1,210	1,080	11,300	6,630	890	2,210	930	705
17	253	3,680	2,240	.....	1,210	1,600	11,800	5,720	850	1,690	890	670
18	249	3,500	2,100	.....	1,170	3,000	10,800	4,840	850	5,720	810	635
19	266	3,160	1,970	.....	1,120	6,170	9,740	4,040	810	6,170	1,060	600
20	413	3,000	1,840	948	1,030	4,840	18,400	4,040	810	2,070	4,040	565
21	2,240	4,230	1,600	991	948	2,840	26,800	3,160	810	1,690	5,060	565
22	2,240	4,040	1,600	948	866	1,970	24,800	2,670	850	1,460	7,330	506
23	1,720	3,330	1,600	907	754	1,600	16,800	2,510	850	1,350	4,840	482
24	1,400	3,000	2,390	790	685	1,260	11,300	2,360	850	1,300	2,990	565
25	1,080	2,840	1,970	1,120	652	1,080	9,000	2,070	890	1,570	2,670	600
26	1,080	2,840	1,970	1,210	.....	6,630	9,000	1,810	890	1,460	2,070	705
27	1,120	2,690	1,970	1,210	.....	21,800	12,800	1,940	850	1,250	1,690	670
28	1,080	2,540	1,500	1,450	.....	44,700	10,800	1,810	810	1,100	1,460	635
29	1,080	2,390	1,210	1,970	.....	46,700	9,000	1,810	1,250	1,020	1,300	530
30	991	2,540	1,600	3,680	.....	46,200	9,500	1,350	1,150	1,100	1,690	530
31	907	.....	1,720	7,560	.....	33,200	.....	1,300	.....	890	2,830	.....

NOTE.—Discharge determined from two well-defined rating curves—one used Oct. 1 to Mar. 31 and the other Apr. 1 to Sept. 30. Discharge estimated because of ice, from discharge measurements and climatic records, as follows: Jan. 20 to Feb. 25 and Mar. 8–26 as in table; Jan. 13–19, 1,140 second-feet; Feb. 26–28, 945 second-feet; Mar. 1–7, 1,330 second-feet.

Monthly discharge of Susquehanna River at Conklin, N. Y., for the year ending Sept. 30, 1914.

[Drainage area, 2,350 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
October	2,240	182	640	0.272	0.31	A.
November	9,240	590	3,000	1.28	1.43	A.
December	3,000	1,210	2,130	.910	1.05	A.
January	7,560	790	1,450	.617	.71	B.
February	10,500	652	2,370	1.01	1.05	B.
March	46,700	948	7,830	3.33	3.84	B.
April	28,900	9,000	15,700	6.68	7.45	A.
May	13,700	1,300	5,550	2.36	2.72	A.
June	2,830	810	1,220	.519	.58	A.
July	6,170	600	1,980	.843	.97	A.
August	7,330	565	1,750	.745	.86	A.
September	3,330	482	1,140	.485	.54	A.
The year	46,700	182	3,730	1.59	21.51	

CHENANGO RIVER NEAR CHENANGO FORKS, N. Y.

Location.—About 1½ miles below Tioughnioga River, 2 miles by road below Chenango Forks post office, and 11½ miles above Binghamton and the mouth.

Drainage area.—1,420 square miles.

Records available.—November 11, 1912, to September 30, 1914. Records were obtained at Binghamton July 31, 1901, to December 31, 1911. Data also in annual reports of State engineer and surveyor and State of New York Conservation Commission.

Gage.—Inclined staff on left bank.

Discharge measurements.—Made from a cable near gage or by wading.

Channel and control.—Sand, gravel, and small cobblestones; practically permanent.

Extremes of discharge.—Maximum stage recorded during year, 14 feet at noon March 28; discharge, 37,000 second-feet. Minimum stage recorded, 2.30 feet at 5.30 p. m. October 10; discharge, 132 second-feet.

Maximum stage recorded 1901–1914, 22.8 feet at the former station in Binghamton, N. Y., at 8 a. m. March 2, 1902; discharge, approximately 36,100 second-feet. Minimum stage recorded, 4.6 feet at the former station in Binghamton at 8 a. m. August 28, 1909; discharge, 10 second-feet.

Winter flow.—Discharge relation somewhat affected by ice.

Diversions.—The run-off from 30 square miles at head of Chenango River and from 18.2 square miles on Tioughnioga River is stored in reservoirs and diverted to the Erie Canal, and is not included in the following table. These two areas have been subtracted from the total area of 1,468 square miles.

Accuracy.—Results good.

Discharge measurements of Chenango River near Chenango Forks, N. Y., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Oct. 29	R. S. Barnes	3.12	670	Mar. 20	C. S. De Golyer	[a] 5.61	2,080
Jan. 7	C. S. De Golyer	3.34	842	23	R. S. Barnes	[a] 5.24	1,880
7	do	3.40	915	29	do	12.91	31,500
22	do	[a] 3.98	788	29	do	12.50	29,400
24	do	[a] 3.94	750	Apr. 3	do	9.58	17,200
31	do	6.43	6,100	4	do	7.60	10,300
Feb. 20	R. S. Barnes	[a] 5.50	814	July 26	C. S. De Golyer	3.55	1,090
Mar. 9	C. C. Covert	[a] 4.60	830				

[a] Discharge relation affected by ice.

Daily gage height, in feet, of Chenango River near Chenango Forks, N. Y., for the year ending Sept. 30, 1914.

[Mrs. Ella Ingraham, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.4	3.1	4.0	3.6	8.0	4.4	9.9	5.4	3.3	3.5	2.75	4.2
2	2.42	2.95	3.8	3.4	6.7	4.35	10.2	5.0	3.6	3.25	2.72	4.0
3	2.42	2.94	3.6	3.4	5.9	4.35	9.6	4.6	3.5	3.0	2.65	5.0
4	2.38	2.85	3.5	3.4	6.0	4.35	7.9	4.45	3.4	3.2	2.8	4.9
5	2.4	2.92	3.5	3.4	5.7	4.4	7.0	4.7	3.2	2.95	2.82	4.15
6	2.45	2.95	3.4	3.4	5.1	4.5	6.4	6.2	3.2	2.9	2.72	3.85
7	2.42	2.88	3.4	3.4	4.7	4.5	6.2	5.1	3.2	2.9	2.7	3.7
8	2.45	2.8	3.7	3.3	4.4	4.6	8.8	4.5	3.7	2.9	2.78	3.6
9	2.48	2.92	4.2	3.3	4.0	4.6	11.1	4.6	3.8	2.95	2.75	3.4
10	2.32	4.05	3.7	3.4	4.5	4.6	9.2	4.35	3.5	3.1	2.7	3.3
11	2.38	5.1	3.65	3.4	5.4	4.45	7.8	4.3	3.4	2.9	2.88	3.25
12	2.35	4.9	3.7	3.45	5.9	4.4	7.6	4.5	3.2	2.9	3.1	3.2
13	2.48	5.6	3.4	3.8	5.4	4.4	7.1	8.2	3.1	2.9	3.0	3.1
14	2.48	5.0	3.6	3.6	5.4	4.4	6.6	6.8	3.0	2.9	2.88	3.05
15	2.4	4.2	3.9	3.4	5.4	4.4	6.5	5.6	2.95	2.9	2.82	3.0
16	2.45	3.95	3.6	3.35	5.4	4.5	7.2	5.1	2.82	2.9	2.8	2.95
17	2.34	4.1	3.6	3.65	5.4	4.8	7.0	4.7	2.9	2.9	2.7	2.91
18	2.42	3.95	3.6	4.05	5.5	5.6	6.7	4.45	2.9	3.35	2.8	2.86
19	2.48	3.8	3.45	4.05	5.5	5.8	6.6	4.25	2.9	3.6	2.95	2.85
20	2.58	3.75	3.3	3.9	5.4	5.5	8.2	4.1	2.9	3.1	3.0	2.82
21	3.5	3.9	3.2	3.6	5.4	5.4	8.6	3.95	2.95	3.0	5.7	2.82
22	3.8	4.3	3.4	4.0	5.2	5.4	7.6	3.8	3.0	2.98	5.4	2.8
23	3.8	4.05	3.55	4.0	5.0	5.2	6.6	3.75	2.92	2.92	4.45	2.82
24	3.7	4.3	3.85	4.0	5.0	5.0	5.9	3.7	2.9	2.98	4.1	2.92
25	3.5	4.2	3.9	4.0	4.9	5.0	5.4	3.6	2.9	3.1	3.8	2.88
26	3.4	3.9	3.8	4.0	4.8	6.4	6.4	3.55	2.85	3.2	3.6	2.9
27	3.3	3.8	3.5	4.0	4.7	11.5	6.8	3.5	2.8	2.95	3.45	2.84
28	3.3	3.6	3.3	4.0	4.6	13.1	6.1	3.5	2.85	2.82	3.3	2.8
29	3.2	3.7	3.4	4.6	.....	13.1	5.7	3.4	5.2	2.75	3.7	2.8
30	3.1	3.9	3.6	6.7	.....	11.3	5.9	3.4	4.1	2.75	4.7	2.85
31	3.05	.....	3.7	6.4	.....	10.3	.....	3.35	.....	2.8	4.5	.....

NOTE.—Discharge relation affected by ice Jan. 6 to Mar. 26.

Daily discharge, in second-feet, of Chenango River near Chenango Forks, N. Y., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	178	660	1,780	1,200	10,600	660	18,600	4,390	850	1,080	381	2,100
2	188	531	1,470	960	6,830	616	19,800	3,550	1,200	800	361	1,780
3	188	523	1,200	960	4,840	616	17,400	2,790	1,080	572	316	3,550
4	168	453	1,080	960	5,070	616	11,200	2,520	960	750	416	3,350
5	178	507	1,080	960	4,390	660	8,500	2,970	750	531	431	2,020
6	203	531	960	905	3,160	750	6,830	6,310	750	491	361	1,540
7	188	476	960	905	2,440	800	6,310	3,750	750	491	348	1,330
8	203	416	1,330	800	1,940	850	14,200	2,610	1,330	491	402	1,200
9	219	507	2,100	800	1,330	830	23,400	2,790	1,470	531	381	960
10	141	1,860	1,330	850	1,080	800	15,800	2,360	1,080	660	348	850
11	168	3,750	1,260	905	850	660	10,900	2,270	960	491	476	800
12	155	3,350	1,330	.....	750	616	10,300	2,610	750	491	660	750
13	219	4,840	960	.....	660	616	8,800	12,100	660	491	572	660
14	219	3,550	1,200	.....	750	616	7,370	7,930	572	491	476	616
15	178	2,100	1,620	.....	705	616	7,100	4,840	531	491	431	572
16	203	1,700	1,200	.....	750	705	9,100	3,750	431	491	416	531
17	150	1,940	1,200	.....	750	1,020	8,500	2,970	491	491	348	499
18	188	1,700	1,200	.....	800	2,180	7,650	2,520	491	905	416	461
19	219	1,470	1,020	850	800	2,520	7,370	2,180	491	1,200	531	453
20	274	1,400	850	705	750	1,940	12,100	1,940	491	660	572	431
21	1,080	1,620	750	438	660	1,780	13,400	1,700	531	572	5,070	431
22	1,470	2,270	960	788	531	1,780	10,300	1,470	572	555	4,390	416
23	1,470	1,860	1,140	800	416	1,780	7,370	1,400	507	507	2,520	431
24	1,330	2,270	1,540	800	381	1,940	5,550	1,330	491	555	1,940	507
25	1,080	2,100	1,620	800	453	2,180	4,390	1,200	491	660	1,470	476
26	960	1,620	1,470	800	453	5,800	6,830	1,140	453	750	1,200	491
27	850	1,470	1,080	800	555	24,200	7,930	1,080	416	531	1,020	446
28	850	1,200	850	800	705	31,000	6,050	1,080	453	431	850	416
29	750	1,330	960	1,470	.....	33,000	5,070	960	3,960	381	1,330	416
30	660	1,620	1,200	3,550	.....	24,200	5,550	960	1,940	381	2,970	453
31	616	.....	1,330	6,830	.....	20,200	.....	905	.....	416	2,610	.....

NOTE.—Discharge determined from a well-defined rating curve. Discharge estimated because of ice, from discharge measurements and climatic records, as follows: Jan. 6–11, Jan. 19 to Mar. 26, as in table; Jan. 12–18, 568 second-feet.

Monthly discharge of Chenango River near Chenango Forks, N. Y., for the year ending Sept. 30, 1914.

[Drainage area, 1,420 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
October	1,470	141	482	0.339	0.39	B.
November	4,840	416	1,650	1.16	1.29	A.
December	2,100	750	1,230	.866	1.00	A.
January	6,830	.....	1,080	.761	.88	B.
February	10,600	416	1,910	1.35	1.41	B.
March	33,000	616	5,370	3.78	4.36	B.
April	23,400	4,390	10,100	7.13	7.96	A.
May	12,100	905	2,920	2.06	2.38	A.
June	3,960	416	863	.608	.68	B.
July	1,200	381	592	.417	.48	B.
August	5,070	316	1,100	.775	.89	A.
September	3,550	416	965	.680	.76	B.
The year	33,000	141	2,350	1.65	22.48	

CHEMUNG RIVER AT CHEMUNG, N. Y.

Location.—At new highway bridge about midway between Chemung, N. Y., and Willawana, Pa., half a mile upstream from State line and about 10 miles above mouth.

Drainage area.—2,440 square miles.

Records available.—September 11, 1903, to Septemper 30, 1914. Data also in the annual reports of the State engineer and surveyor and the State of New York conservation commission.

Gage.—Tape gage on the new highwaybridge.

Discharge measurements.—Made from the bridge.

Channel and control.—Sand and gravel; somewhat shifting.

Extremes of stage.—Maximum stage recorded during the year, 16.85 feet at 6 a. m. March 29; discharge not computed. Minimum stage recorded, 1.72 feet at 5 p. m. October 1; discharge, 112 second-feet.

Maximum stage recorded 1903–1914, 16.85 feet at 6 a. m. March 29, 1914; discharge not computed. Minimum stage recorded, 1.47 feet at 7 a. m. August 14, 1911; discharge, 49 second-feet.

Winter flow.—Discharge relation affected by ice.

Accuracy.—Results fair October to December, 1913.

Discharge measurements of Chemung River at Chemung, N. Y., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 24	R. S. Barnes	4.30	2,560	Sept. 24	H. W. Fear	2.01	274
31	do	11.40	25,400	24	C. S. De Golyer	1.99	252

Daily gage height, in feet, of Chemung River at Chemung, N. Y., for the year ending Sept. 30, 1914.

[D. L. Orcutt, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.76	3.5	3.2	.....	11.0	.....	9.1	4.7	3.25	2.35	1.96	2.85
2	1.85	3.3	3.1	.....	7.5	.....	10.2	4.4	3.1	2.30	1.96	2.75
3	2.35	3.15	3.1	.....	6.5	.....	9.7	4.1	3.0	2.24	1.96	3.9
4	2.25	3.05	3.05	4.3	7.0	.....	7.8	3.9	2.95	2.20	1.90	4.2
5	2.14	2.9	2.9	4.2	7.1	.....	6.8	4.2	3.2	2.18	1.93	3.6
6	2.08	2.85	2.9	.....	5.7	.....	6.1	11.4	3.25	2.16	1.92	3.3
7	2.00	2.75	2.85	.....	5.2	.....	5.8	8.9	3.1	2.14	1.87	3.0
8	1.96	2.75	2.95	.....	4.8	.....	10.6	6.8	2.95	2.12	1.89	2.8
9	1.94	3.4	3.2	.....	3.9	.....	11.6	7.5	2.85	2.12	2.39	2.7
10	1.91	10.6	2.95	.....	3.7	.....	8.8	8.3	2.95	2.20	2.46	2.6
11	1.86	6.7	2.5	.....	3.7	.....	7.8	6.7	2.8	2.24	2.21	2.48
12	1.90	5.3	2.75	.....	.....	.....	7.2	9.2	2.75	2.46	2.12	2.43
13	1.88	4.8	2.8	.....	.....	.....	6.5	15.1	2.65	2.46	2.08	2.36
14	2.07	4.8	2.95	.....	.....	.....	5.9	12.3	2.6	2.36	2.09	2.32
15	2.07	5.2	2.9	.....	.....	.....	5.6	8.4	2.5	2.32	2.12	2.26
16	2.06	4.7	2.9	.....	.....	.....	8.3	6.9	2.49	2.38	2.02	2.20
17	1.92	4.7	2.85	.....	.....	8.1	9.0	6.0	2.42	2.8	2.06	2.16
18	1.91	4.5	2.8	.....	.....	9.2	7.8	5.4	2.36	2.9	2.01	2.12
19	1.89	4.2	2.75	.....	.....	6.2	6.9	5.0	2.34	2.48	2.8	2.08
20	2.29	4.1	2.6	.....	.....	5.6	6.6	4.6	2.38	2.24	3.7	2.04
21	3.7	4.0	2.7	.....	.....	5.0	7.7	4.4	2.38	2.21	5.1	2.05
22	3.9	3.9	2.7	.....	.....	4.8	6.5	4.1	2.42	2.12	6.0	2.04
23	3.25	3.7	2.65	.....	.....	4.5	5.9	3.9	2.40	2.09	4.3	1.98
24	2.95	3.6	3.1	.....	.....	4.3	5.3	3.7	2.38	2.06	3.6	2.00
25	2.85	3.45	3.8	.....	.....	4.7	4.9	3.6	2.32	2.04	3.5	1.98
26	5.0	3.4	3.7	.....	.....	10.1	5.4	3.45	2.31	2.04	3.4	2.03
27	7.4	3.25	3.1	.....	.....	14.3	6.0	3.7	2.29	2.04	3.1	2.02
28	5.2	3.2	3.1	.....	.....	16.0	5.4	5.1	2.28	2.06	2.9	2.00
29	4.4	3.15	3.15	.....	.....	15.5	5.0	4.3	2.32	2.06	2.7	1.95
30	4.0	3.15	3.2	11.8	.....	11.4	5.0	3.8	2.42	2.04	2.9	1.96
31	3.7	.....	3.25	10.5	.....	11.2	.....	3.45	.....	2.05	2.95	.....

NOTE.—Discharge relation affected by ice Jan. 21–29 and Feb. 12 to Mar. 16.

Daily discharge, in second-feet, of Chemung River at Chemung, N. Y., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	126	1,380	1,060	.....	16,500	3,600	1,310	495	239	895
2	160	1,160	960	.....	20,600	3,040	1,140	460	239	808
3	400	1,010	960	.....	18,600	2,520	1,040	419	239	2,200
4	345	910	910	.....	12,000	2,200	990	392	204	2,690
5	290	770	770	.....	8,900	2,690	1,250	379	222	1,760
6	260	730	770	.....	6,870	25,400	1,310	366	216	1,370
7	220	655	730	.....	6,070	15,800	1,140	352	189	1,040
8	204	655	815	.....	22,200	8,900	990	339	199	850
9	196	1,270	1,060	.....	26,200	11,000	895	339	523	765
10	184	21,600	815	.....	15,400	13,700	990	392	575	685
11	164	7,840	490	.....	12,000	8,600	850	419	399	590
12	180	4,400	655	.....	10,100	16,800	808	575	339	552
13	172	3,360	690	.....	8,010	41,000	725	575	313	502
14	255	3,360	815	.....	6,330	29,000	685	502	320	474
15	255	4,180	770	.....	5,570	14,000	605	474	339	433
16	250	3,170	770	.....	13,700	9,200	598	516	276	392
17	188	3,170	730	12,100	16,200	6,600	545	850	301	366
18	184	2,800	690	16,000	12,000	5,090	502	940	269	339
19	176	2,310	655	6,550	9,200	4,210	488	590	850	313
20	365	2,160	550	5,060	8,300	3,410	516	419	1,900	288
21	1,620	2,020	620	3,760	11,600	3,040	516	399	4,420	295
22	1,880	1,880	620	3,360	8,010	2,520	545	339	6,600	288
23	1,110	1,620	585	2,800	6,330	2,200	530	320	2,860	251
24	815	1,500	960	2,470	4,860	1,900	516	301	1,760	263
25	730	1,320	1,750	3,170	4,000	1,760	474	288	1,620	251
26	3,760	1,270	1,620	19,600	5,090	1,560	467	288	1,490	282
27	9,900	1,110	960	39,500	6,600	1,900	453	288	1,140	276
28	4,180	1,060	960	48,000	5,090	4,420	446	301	940	263
29	2,630	1,010	1,010	42,800	4,210	2,860	474	301	765	234
30	2,020	1,010	1,060	25,400	4,210	2,050	545	288	940	239
31	1,620	.....	1,110	24,600	.....	1,560	.....	295	990	.....

NOTE.—Discharge determined from two well defined rating curves, one used Oct. 1 to Mar. 28, the other Mar. 29 to Sept. 30.

Monthly discharge of Chemung River at Chemung, N. Y., for the year ending Sept. 30, 1914.

[Drainage ares, 2,440 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
October	9,900	126	1,120	0.459	0.53	A.
November	21,600	655	2,690	1.10	1.23	A.
December	1,750	550	868	.356	.41	B.
April	26,200	4,000	10,500	4.30	4.80	A.
May	41,000	1,560	8,150	3.34	3.85	A.
June	1,310	446	745	.305	.34	A.
July	940	288	426	.175	.20	A.
August	6,600	189	1,020	.418	.48	A.
September	2,690	234	665	.273	.30	A.

PATUXENT RIVER BASIN.

PATUXENT RIVER NEAR BURTONSVILLE, MD.

Location.—At Columbia turnpike bridge, 1½ miles northeast of Burtonsville, and about 4 miles northwest of Laurel.

Drainage area.—127 square miles.

Records available.—July 21, 1911, to June 15, 1912 (records furnished by United States Engineer Office); July 21, 1913, to September 30, 1914.

Gage.—Stevens water-stage recorder referred to a staff gage in three sections on left bank about 100 feet below highway bridge. Prior to July 23, 1914, a vertical staff fastened to left side of bridge pier and read once daily. Datum of automatic gage 1.29 feet below that of staff gage.

Discharge measurements.—Made from bridge or by wading.

Channel and control.—Banks overflow at stage of about 10 feet; control is a gravel bar about 300 feet below bridge; current is swift under bridge but sluggish below bridge to control; discharge measurements during 1911 to 1914 indicate that control remained practically permanent.

Extremes of discharge.—Maximum stage recorded during year, 5.6 feet at 8.30 a. m. April 26; discharge, 1,320 second-feet. Minimum stage recorded during year (automatic gage), 1.50 feet at 1 a. m. July 29; discharge, 14 second-feet.

Maximum stage recorded 1911–1914, 12.45 feet,[1] August 31, 1911; approximate discharge, 3,870 second-feet. Minimum stage recorded, 0.18 foot,[a] August 25, 1911; discharge, 6 second-feet.

Winter flow.—Discharge relation affected by ice.

Accuracy.—Results fair previous to installation of recorder, as stream fluctuates rapidly and one gage reading daily may not be an accurate index of the mean daily flow. Results good after installation of recorder.

Discharge measurements of Patuxent River near Burtonsville, Md., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.		Discharge.	Date.	Made by—	Gage height.		Discharge.
		Old gage.	New gage.				Old gage.	New gage.	
		Feet.	*Feet.*	*Sec.-ft.*			*Feet.*	*Feet.*	*Sec.-ft.*
Jan. 4	G. C. Stevens	3.25	.....	618	July 2	E. D. Burchard	1.1	2.42	126
6	do	1.53	.....	208	16	G. C. Stevens	.52	1.84	44.3
Feb. 25	do	[b]1.75	.....	116	21	E. D. Burchard	[c].48	1.80	36.5
June 9	Stevens and Burchard	.65	.....	68.0	22	G. C. Stevens	.40	1.70	28.8
30	E. D. Burchard	.78	.....	76.2	Aug. 4	do	.34	1.63	23.2
July 1	G. C. Stevens	.54	1.84	47.9	31	E. D. Burchard	.....	2.06	75.9

[a] Gage height referred to datum of staff gage.
[b] Discharge relation affected by ice.
[c] Gage height not accurately determined.

Daily gage height, in feet, of Patuxent River near Burtonsville, Md., for the year ending Sept. 30, 1914.

[Columbus Brashears, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.50	0.65	0.70	0.75	1.0	1.7	1.05	1.1	0.75	0.54	1.69	1.99
2	.75	.60	.70	.75	1.0	1.7	1.05	1.05	.75	1.5	1.64	1.95
3	1.25	.60	.70	1.95	.95	1.65	1.0	1.05	.75	.70	1.65	1.92
4	.70	.60	.65	3.4	.95	2.0	1.0	1.0	.75	.....	1 62	1.89
5	.65	.60	.65	1.8	.95	2.0	1.0	1.8	.72	.....	1.62	1.85
6	.60	.60	.65	1.55	.95	2.0	.95	1.4	.75	.....	1.65	1.84
7	.55	.60	.65	1.25	1.8	2.5	.90	1.1	.75	.58	1.63	1.84
8	.60	.60	.80	1.05	.90	.....	1.0	1.45	.65	.59	1.60	1.83
9	.55	.80	.75	1.0	.85	2.0	1.0	1.2	.91	.55	1.57	1.80
10	.55	.88	.75	1.0	.80	1.5	.95	1.15	1.0	.54	1.59	1.82
11	.55	.75	.70	1.0	.80	1.1	.90	1.05	.90	.....	2.65	1.83
12	.60	.65	.70	.90	.80	1.0	.90	1.05	.75	.....	2 67	1.93
13	.60	.60	.65	.80	1.1	1.0	.90	1.1	.65	.53	1.93	1.90
14	.55	.60	.65	.80	2.5	1.55	.85	1.1	.60	.53	1.78	1.86
15	.55	.60	.65	1.0	2.5	1.9	1.1	1.05	.60	.53	1.81	1.79
16	.50	1.45	.60	1.0	2.0	2.0	1.0	.95	.60	.52	1.73	1.79
17	.50	1.6	.60	1.0	1.9	2.1	.95	.90	.60	.44	1.70	1.76
18	.55	.....	.60	1.0	1.8	1.9	.90	.90	.60	.....	1.66	1.77
19	.60	.....	.60	.95	2.6	1.55	.85	.90	.60	.....	1.67	1.78
20	.90	.....	.60	.90	2.3	1.4	1.05	.95	.60	.42	1.62	1.73
21	.80	.75	.60	.85	2.0	1.2	1.0	.90	.60	.43	1.67	1.75
22	.65	.70	1.05	.80	1.6	1.1	.90	.85	.60	.41	1.74	1.73
23	.60	.70	.85	.75	1.55	1.2	.90	.80	.80	1.70	1.62	1.72
24	.60	.65	.80	.75	1.65	1.2	.90	.75	.75	1.69	1.66	1.75
25	1.6	.60	.85	2.0	1.7	1.1	.90	.75	1.0	1 70	2.18	1.84
26	.55	.60	2.7	1.2	1.6	1.05	5.6	.75	.70	1.70	3.04	1.82
27	.75	.60	1.1	.95	1.6	1.0	2.0	.75	.65	1.73	1.99	1.77
28	.70	.65	.90	.90	1.6	1.05	1.5	.80	.70	1.69	2.16	1.79
29	.70	.75	.85	.88	.....	1.05	1.2	.75	.81	1.65	4.0	1.71
30	.70	.70	.80	.85	.....	1.0	1.1	.80	.51	1.67	3.30	1.76
31	.70	.....	.80	.91	.....	1.0	.....	.80	.....	1.68	2.15	.....

NOTE.—Discharge relation affected by ice Jan. 15–18 and Feb. 13 to Mar. 7. Gage heights Oct. 1 to July 31 observed on old staff gage. Readings July 23 to Sept. 30 are from the water-stage recorder.

Daily discharge, in second-feet, of Patuxent River near Burtonsville, Md., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	43	64	72	80	118	110	126	134	80	49	28	63
2	80	57	72	80	118	110	126	126	80	203	24	58
3	158	57	72	295	110	110	118	126	80	72	25	54
4	72	57	64	660	110	140	118	118	80	68	22	50
5	64	57	64	263	110	160	118	263	75	62	22	45
6	57	57	64	212	110	200	110	185	80	58	25	44
7	50	57	64	158	263	350	102	134	80	54	23	44
8	57	57	87	126	102	350	118	194	64	56	21	43
9	50	87	80	118	94	306	118	150	104	50	19	39
10	50	99	80	118	87	203	110	142	118	49	20	42
11	50	80	72	118	87	134	102	126	102	48	187	43
12	57	64	72	102	87	118	102	126	80	48	186	55
13	57	57	64	87	85	118	102	134	64	47	55	51
14	50	57	64	87	85	212	94	134	57	47	37	46
15	50	57	64	90	85	284	134	126	57	47	40	38
16	43	194	57	90	85	306	118	110	57	46	32	38
17	43	222	57	100	100	329	110	102	57	35	29	35
18	50	176	57	100	120	284	102	102	57	34	26	36
19	57	141	57	110	250	212	94	102	57	33	26	37
20	102	115	57	102	200	185	126	110	57	32	22	32
21	87	80	57	94	160	150	118	102	57	33	26	34
22	64	72	126	87	100	134	102	94	57	30	33	32
23	57	72	94	80	90	150	102	87	87	29	22	31
24	57	64	87	80	100	150	102	80	80	28	26	34
25	222	57	94	306	110	134	102	80	118	29	91	44
26	50	57	474	150	100	126	1,320	80	72	29	252	42
27	80	57	134	110	100	118	306	80	64	32	63	36
28	72	64	102	102	100	126	203	87	72	28	88	38
29	72	80	94	99	.....	126	150	80	88	25	476	30
30	72	72	87	94	.....	118	134	87	44	26	325	35
31	72	.....	87	104	.....	118	.....	87	.....	27	86	.....

NOTE.—Discharge determined as follows: Oct. 1 to July 22, from a rating curve well defined between 10 and 1,000 second-feet; July 23 to Sept. 30, from a rating curve well defined below 700 second-feet. Discharge Jan. 15–18 and Feb. 13 to Mar. 8, estimated, because of ice, from observer's notes, climatic records, and a discharge measurement; Aug. 11, 12, 26, 29, and 30, determined by averaging hourly discharges; for days for which gage heights are not recorded in November and July, discharge interpolated.

Monthly discharge of Patuxent River near Burtonsville, Md., for the year ending Sept. 30, 1914.

[Drainage area, 127 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
October	222	43	69.2	0.545	0.63	B.
November	222	57	82.9	.653	.73	B.
December	474	57	89.5	.705	.81	B.
January	660	80	142	1.12	1.29	B.
February	263	85	117	.921	.96	C.
March	350	110	183	1.44	1.66	B.
April	1,320	94	163	1.28	1.43	B.
May	263	80	119	.937	1.08	A.
June	118	44	74.2	.584	.65	A.
July	203	25	46.9	.369	.43	A.
August	476	19	76.0	.598	.69	A.
September	63	30	41.6	.328	.37	A.
The year	1,320	19	100	.787	10.73	

POTOMAC RIVER BASIN.

POTOMAC RIVER AT POINT OF ROCKS, MD.

Location.—At the steel highway bridge at Point of Rocks, about one-third mile below Catoctin Creek, and about 6 miles above Monocacy River.

Drainage area.—9,650 square miles.

Records available.—February 17, 1895, to September 30, 1914.

Gage.—Chain, attached to bridge, read once daily. Datum constant since September 2, 1902; prior to this date datum was 0.45 foot higher than at present. Sea level elevation of gage datum is 200.54 feet.

Discharge measurements.—Made from the bridge.

Channel and control.—Practically permanent. The control is a ledge a few hundred feet below the station, the ledge extending completely across the river except for one relatively unimportant channel.

Extremes of discharge.—Maximum stage recorded during year: 11.4 feet at 1.30 p. m. March 19; discharge, 67,200 second-feet. Minimum stage recorded during year: 0.38 foot on September 10; discharge, 540 second-feet.

Maximum stage recorded 1895–1914: 29 feet on March 2, 1902; discharge, 219,000 second-feet. Minimum stage recorded: 0.38 foot on September 10, 1914; discharge, 540 second-feet.

Winter flow.—Discharge relation seldom affected by ice.

Diversions.—The Chesapeake & Ohio canal parallels the Potomac on the Maryland side. The average discharge of the canal is 75 to 100 second-feet. The discharge is not included in the following tables.

Accuracy.—Results excellent except at extreme low water, when measuring conditions are not good.

No discharge measurements made during the year.

Daily gage height, in feet, of Potomac River at Point of Rocks, Md., for the year ending Sept. 30, 1914.

[G. H. Hickman, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.15	2.5	2.2	3.0	6.4	3.0	4.8	4.9	1.9	1.6	0.79	1.25
2	.....	2.1	1.95	.....	7.9	2.9	4.6	4.5	1.85	1.5	.87	1.05
3	1.75	2.1	2.0	3.3	6.7	2.9	4.5	4.0	1.5	1.4	1.15	1.05
4	1.45	1.95	2.0	7.1	5.4	2.2	4.4	3.7	1.4	1.45	1.25	1.0
5	1.2	1.7	2.1	8.7	4.8	3.3	4.4	3.4	1.35	1.3	.92	.98
6	1.4	1.6	2.0	6.7	4.2	3.1	4.2	4.3	1.3	1.35	.65	.91
7	1.1	1.55	2.5	5.6	4.9	2.9	4.1	5.5	1.35	1.45	.60	.79
8	1.05	1.45	3.2	4.9	4.8	3.2	4.0	4.9	1.3	1.45	.49	.70
9	1.05	1.75	4.1	4.8	4.7	3.2	4.2	3.1	1.35	1.45	.76	.49
10	1.1	8.9	3.8	4.4	4.6	3.2	4.3	4.6	1.5	1.4	.87	.38
11	1.05	9.7	3.1	.....	4.1	3.1	4.6	4.0	1.45	1.35	.98	.42
12	.84	5.9	2.7	6.2	3.9	3.2	3.8	3.9	1.35	1.15	.93	.69
13	1.95	4.4	2.6	5.7	2.9	3.2	3.6	3.6	1.25	1.35	.87	.64
14	1.8	3.2	2.5	5.6	2.5	3.3	3.3	3.3	1.15	1.2	.84	.60
15	1.6	3.3	2.4	4.1	2.2	3.6	3.0	3.0	1.15	1.15	.80	.56
16	1.4	4.5	2.2	3.6	2.3	3.4	4.1	2.7	1.15	1.05	.83	.71
17	1.35	6.2	2.2	3.5	2.5	9.1	8.2	2.6	1.05	2.2	.78	.65
18	1.4	6.2	1.95	3.5	2.5	10.6	7.1	2.6	1.2	2.7	.64	.64
19	.93	5.4	1.9	3.2	2.4	11.4	6.2	2.4	1.25	1.8	.92	.56
20	1.25	5.6	1.8	3.1	3.0	8.5	5.1	2.2	1.25	1.7	.76	.59
21	1.5	4.4	1.75	2.8	5.2	6.8	4.9	2.0	1.35	1.6	.82	.63
22	2.5	3.4	1.9	3.2	6.1	5.4	4.7	2.0	1.4	1.4	.85	.69
23	2.9	2.8	2.0	6.4	5.1	5.1	5.5	1.9	1.5	1.1	.71	.57
24	2.7	2.4	2.0	5.2	4.3	4.8	5.0	1.9	1.55	.98	.79	.71
25	2.6	3.5	1.95	5.4	3.9	4.4	4.2	1.95	1.55	1.2	.86	.76
26	4.5	2.6	2.1	.....	3.5	4.3	5.5	1.7	1.25	1.3	1.15	.67
27	8.4	2.3	5.7	6.9	3.6	4.6	8.2	1.4	1.9	1.1	1.05	.63
28	5.9	2.2	4.9	5.7	3.5	4.4	9.6	1.6	1.6	.96	.98	.57
29	4.4	2.1	4.4	5.1	.....	.....	6.7	1.5	1.7	.71	1.15	.53
30	3.4	2.1	3.8	5.0	.....	6.0	5.9	1.6	1.95	.58	1.4	.66
31	2.8	.....	3.4	5.3	.....	5.1	.....	1.5	.....	.93	1.5	.....

Daily discharge, in second-feet, of Potomac River at Point of Rocks, Md., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2,380	6,920	5,750	9,070	28,800	9,070	18,600	19,200	4,670	3,700	1,460	2,660
2	3,270	5,380	4,840	10,000	39,200	8,620	17,400	16,800	4,500	3,390	1,660	2,120
3	4,160	5,380	5,020	10,500	30,800	8,620	16,800	14,100	3,390	3,090	2,380	2,120
4	3,240	4,840	5,020	33,500	22,300	5,750	16,300	12,500	3,090	3,240	2,660	1,990
5	2,520	4,010	5,380	45,300	18,600	10,500	16,300	11,000	2,940	2,800	1,790	1,940
6	3,090	3,700	5,020	30,800	15,200	9,530	15,200	15,700	2,800	2,940	1,120	1,760
7	2,250	3,540	6,920	23,600	19,200	8,620	14,600	22,900	2,940	3,240	1,010	1,460
8	2,120	3,240	10,000	19,200	18,600	10,000	14,100	19,200	2,800	3,240	769	1,240
9	2,120	4,170	14,600	18,600	18,000	10,000	15,200	9,530	2,940	3,240	1,390	769
10	2,250	46,800	13,000	16,300	17,400	10,000	15,700	17,400	3,390	3,090	1,660	540
11	2,120	53,200	9,530	21,900	14,600	9,530	17,400	14,100	3,240	2,940	1,940	622
12	1,580	25,500	7,750	27,500	13,500	10,000	13,000	13,500	2,940	2,380	1,810	1,220
13	4,840	16,300	7,330	24,200	8,620	10,000	12,000	12,000	2,660	2,940	1,660	1,100
14	4,330	10,000	6,920	23,600	6,920	10,500	10,500	10,500	2,380	2,520	1,580	1,010
15	3,700	10,500	6,520	14,600	5,750	12,000	9,070	9,070	2,380	2,380	1,480	922
16	3,090	16,800	5,750	12,000	6,130	11,000	14,600	7,750	2,380	2,120	1,560	1,260
17	2,940	27,500	5,750	11,500	6,920	48,400	41,500	7,330	2,120	5,750	1,440	1,120
18	3,090	27,500	4,840	11,500	6,920	60,600	33,500	7,330	2,520	7,750	1,100	1,100
19	1,810	22,300	4,670	10,000	6,520	67,200	27,500	6,520	2,660	4,330	1,790	922
20	2,660	23,600	4,330	9,530	9,070	43,700	20,400	5,750	2,660	4,010	1,390	988
21	3,390	16,300	4,170	8,180	21,100	31,500	19,200	5,020	2,940	3,700	1,440	1,080
22	6,920	11,000	4,670	10,000	26,800	22,300	18,000	5,020	3,090	3,090	1,610	1,220
23	8,620	8,180	5,020	28,800	20,400	20,400	22,900	4,670	3,390	2,250	1,260	944
24	7,750	6,520	5,020	21,100	15,700	18,600	19,800	4,670	3,540	1,940	1,460	1,260
25	7,330	11,500	4,840	22,300	13,500	16,300	15,200	4,840	3,540	2,520	1,640	1,390
26	16,800	7,330	5,380	27,200	11,500	15,700	22,900	4,010	2,660	2,800	2,380	1,170
27	43,000	6,130	24,200	32,100	12,000	17,400	41,500	3,090	4,670	2,250	2,120	1,080
28	25,500	5,750	19,200	24,200	11,500	16,300	52,400	3,700	3,700	1,890	1,940	944
29	16,300	5,380	16,300	20,400	.....	21,200	30,800	3,390	4,010	1,260	2,380	856
30	11,000	5,380	13,000	19,800	.....	26,100	25,500	3,700	4,840	966	3,090	1,150
31	8,180	.....	11,000	21,700	.....	20,400	.....	3,390	.....	1,810	3,390	.....

NOTE.—Discharge determined from a rating curve well defined except at extreme low stages.

Monthly discharge of Potomac River at Point of Rocks, Md., for the year ending Sept. 30, 1914.

[Drainage area, 9,650 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
October	43,000	1,580	6,850	0.710	0.82	A.
November	53,200	3,240	13,500	1.40	1.56	A.
December	24,200	4,170	8,120	.841	.97	A.
January	45,300	8,180	20,000	2.07	2.39	A.
February	39,200	5,750	15,900	1.65	1.72	A.
March	67,200	5,750	19,300	2.00	2.31	A.
April	52,400	9,070	20,900	2.17	2.42	A.
May	22,900	3,090	9,600	.995	1.15	A.
June	4,840	2,120	3,190	.330	.37	A.
July	7,750	966	3,020	.313	.36	A.
August	3,390	769	1,750	.181	.21	A.
September	2,660	540	1,270	.132	.15	B.
The year	67,200	540	10,200	1.06	14.43	

MONOCACY RIVER NEAR FREDERICK, MD.

Location.—At county bridge on toll road leading from Frederick to Mount Pleasant, Md., about 3,000 feet below Tuscarora Creek (entering from the right) and about 2,000 feet above Israel Creek (entering from the left).

Drainage area.—660 square miles.

Records available.—August 4, 1896, to September 30, 1914.

Gage.—Chain attached to downstream side of right span of the bridge; read once daily; oftener during floods.

Discharge measurements.—Made from the bridge or by wading.

Channel and control.—Banks lined with trees and brush; overflow at high stages. Control composed of gravel and bowlders; shifting during extreme floods.

Extremes of discharge.—Maximum stage recorded during year, 15.2 feet at 9.15 a. m. February 1; discharge, 9,600 second-feet. Minimum stage recorded during year, 3.85 feet several days during September; discharge, 43 second-feet.

Maximum stage recorded 1896–1914, 24.1 feet at 6.30 a. m. February 16, 1908; discharge, 19,200 second-feet. Minimum stage recorded, 3.54 feet, several days in October, 1910; discharge, 15 second-feet.

Winter flow.—Discharge relation affected by ice only during severe winters.

Accuracy.—Results fair on account of lack of discharge measurements at high stages and during periods when channel shifted.

No discharge measurements were made during the year.

Daily gage height, in feet, of Monocacy River near Frederick, Md., for the year ending Sept. 30, 1914.

[Eugene L. Derr, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	7.8	5.15	5.15	5.9	14.2	5.2	6.2	5.9	4.65	4.45	4.15	4.55
2	8.7	4.95	5.05	6.0	10.1	5.3	6.1	5.9	4.85	4.35	4.15	4.35
3	5.85	4.85	4.95	6.8	7.0	6.4	6.1	5.8	4.75	4.35	4.15	4.35
4	5.35	4.85	4.95	12.8	6.7	6.4	6.0	5.8	4.65	4.35	4.05	4.25
5	4.85	4.75	4.85	12.2	6.5	6.4	5.7	6.3	4.65	4.25	4.05	4.15
6	4.55	4.75	4.85	10.3	6.5	6.2	5.5	6.8	4.75	4.25	4.05	4.15
7	4.35	4.65	8.0	9.8	6.5	5.6	5.4	6.8	4.75	4.95	4.05	4.15
8	4.35	4.65	7.8	7.8	6.8	5.8	5.4	7.4	4.65	4.55	4.00	4.05
9	4.25	5.15	6.2	7.1	6.2	5.7	5.5	9.0	4.65	4.45	3.95	3.95
10	4.25	5.75	5.95	6.7	7.7	5.5	5.5	7.2	4.65	4.45	4.45	3.95
11	4.55	5.25	5.75	6.4	7.5	5.4	5.7	6.7	4.65	9.6	4.45	3.95
12	4.95	5.15	5.55	6.2	7.3	5.3	56.6	6.7	4.65	6.8	4.45	3.95
13	4.75	5.05	5.35	5.9	7.2	5.2	5.5	6.8	4.55	4.65	4.25	3.95
14	4.35	4.95	5.25	6.9	7.1	5.5	5.5	6.7	4.45	4.65	4.25	3.95
15	4.25	4.95	5.15	6.7	7.1	7.5	7.8	6.5	4.35	4.95	4.25	3.95
16	4.15	6.8	5.05	6.0	7.1	12.5	10.4	6.3	4.25	4.95	4.45	3.95
17	4.15	8.0	4.95	5.6	7.1	12.6	8.2	5.5	4.25	9.4	4.45	3.85
18	4.15	5.95	4.85	5.5	7.1	13.5	6.7	5.4	4.25	5.95	4.25	3.85
19	4.15	5.85	4.85	5.5	7.1	9.8	6.3	5.2	4.25	5.85	4.05	3.85
20	4.45	5.65	4.75	5.5	6.3	7.8	6.8	5.1	4.15	5.35	3.95	3.85
21	4.85	5.35	4.75	5.4	6.2	7.0	7.8	5.1	4.15	4.55	3.95	3.85
22	4.95	5.25	4.75	5.4	5.6	6.9	6.4	5.0	4.15	4.25	3.95	3.85
23	4.85	5.15	6.4	5.4	5.5	6.8	5.9	4.9	4.55	4.25	3.95	3.85
24	4.75	4.95	10.8	5.9	5.5	6.7	5.8	4.8	4.55	4.15	3.95	3.85
25	13.6	4.85	10.2	10.1	5.5	6.5	5.8	4.8	4.45	4.15	7.2	4.35
26	12.2	4.75	13.6	8.4	5.5	6.5	10.9	4.8	4.75	4.15	5.95	4.15
27	9.2	4.75	8.8	6.3	5.5	6.4	8.1	4.8	4.95	4.05	4.65	3.95
28	8.2	4.75	8.0	6.2	5.2	6.3	7.1	4.8	5.45	4.05	4.65	3.95
29	5.85	5.25	6.8	6.2	.....	6.3	6.4	4.8	5.35	4.25	8.0	3.85
30	5.55	5.15	5.95	6.5	.....	6.2	6.1	4.8	4.45	4.25	5.65	3.85
31	5.25	.....	5.55	10.4	.....	6.2	.....	4.7	.....	4.15	5.15	.....

NOTE.—Discharge relation affected by ice Jan. 14–16 and Feb. 10 to Mar. 6.

Daily discharge, in second-feet, of Monocacy River near Frederick, Md., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2,220	432	432	805	8,520	.....	983	805	243	182	101	212
2	3,040	350	390	863	4,380	.....	922	805	312	153	101	153
3	777	312	350	1,390	1,540	.....	922	749	276	153	101	153
4	522	312	350	7,050	1,320	.....	863	749	243	153	78	126
5	312	276	312	6,440	1,180	.....	695	1,050	243	126	78	101
6	212	276	312	4,560	1,180	.....	593	1,390	276	126	78	101
7	158	243	2,400	4,090	1,180	643	545	1,390	276	350	78	101
8	153	243	2,220	2,220	1,390	749	545	1,880	243	212	68	78
9	126	432	983	1,620	983	695	593	3,330	243	182	59	59
10	126	722	834	1,320	.....	593	593	1,700	243	182	182	59
11	212	476	722	1,110	.....	545	695	1,320	243	3,900	182	59
12	350	432	618	983	.....	498	643	1,320	243	1,390	182	59
13	276	390	522	805	.....	453	593	1,390	212	243	126	59
14	153	350	476	760	.....	593	593	1,320	182	243	126	59
15	126	350	432	720	.....	1,960	2,220	1,180	153	350	126	59
16	101	1,390	390	680	.....	6,740	4,660	1,050	126	350	182	59
17	101	2,400	350	643	.....	6,840	2,580	593	126	3,710	182	43
18	101	834	312	593	.....	7,780	1,320	545	126	834	126	43
19	101	777	312	593	.....	4,090	1,050	453	126	777	78	43
20	182	669	276	593	.....	2,220	1,390	411	101	522	59	43
21	312	522	276	545	.....	1,540	2,220	411	101	212	59	43
22	350	476	276	545	.....	1,470	1,110	370	101	126	59	43
23	312	432	1,110	545	.....	1,390	805	331	212	126	59	43
24	276	350	5,040	805	.....	1,320	749	294	212	101	59	43
25	7,890	312	4,470	4,380	.....	1,180	749	294	182	101	1,700	153
26	6,440	276	7,890	2,760	.....	1,180	5,140	294	276	101	834	101
27	3,520	276	3,140	1,050	.....	1,110	2,490	294	350	78	243	59
28	2,580	276	2,400	983	.....	1,050	1,620	294	569	78	243	59
29	777	476	1,390	983	.....	1,050	1,110	294	522	126	2,400	43
30	618	432	834	1,180	.....	983	922	294	182	126	669	43
31	476	.....	618	4,660	.....	983	.....	259	.....	101	432	.....

NOTE.—Discharge determined from a rating curve well defined between 50 and 140 second-feet and fairly well defined above 140 second-feet except at extremely high stages. Discharge estimated because of ice, from observer's notes and climatic records, as follows: Jan. 14–16, as in table; Feb. 10–16, 850 second-feet; Feb. 17–21, 750 second-feet; Feb. 22–24, 550 second-feet; Feb. 25–28, 350 second-feet; Mar. 1–6, 450 second-feet.

Monthly discharge of Monocacy River near Frederick, Md., for the year ending Sept. 30, 1914.

[Drainage area, 660 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
October	7,890	101	1,060	1.61	1.86	B.
November	2,480	243	516	.782	.87	B.
December	7,890	276	1,300	1.97	2.27	B.
January	7,050	545	1,820	2.76	3.18	B.
February	8,520	.....	1,230	1.86	1 94	D.
March	7,780	.....	1,620	2.45	2.82	C.
April	5,140	545	1,330	2.02	2.25	B.
May	3,330	259	866	1.31	1.51	B.
June	569	101	231	.350	.39	B.
July	3,900	78	497	.753	.87	B.
August	2,400	59	292	.442	.51	B.
September	212	43	76.6	.116	.13	A.
The year	8,520	43	905	1.37	18.60	

OCCOQUAN CREEK NEAR OCCOQUAN, VA.

Location.—At Frank Davis's farm, about 1 mile above Beaverdam Creek and about 4½ miles upstream and northwest of Occoquan.

Drainage area.—546 square miles.

Records available.—February 14, 1913, to September 30, 1914.

Gage.—Friez water-stage recorder on left bank, installed April 27, 1913; referred to an inclined staff on left bank about 150 feet upstream. Previous to that date, a temporary vertical staff on opposite bank.

Discharge measurements.—Made from cable about 75 feet below automatic gage, or by wading.

Channel and control.—Gravel and large rocks; control practically permanent. Point of zero flow at 0.4 foot gage height.

Extremes of discharge.—Maximum stage recorded during year, 13.8 feet at 11 a. m. January 4; discharge, 9,540 second-feet. Minimum stage recorded during year, 1.5 feet on September 30; discharge, 13 second-feet.

Maximum stage recorded 1913–14, 18.16 feet at 8 a. m. April 13, 1913, determined by levels to stake set by observer; discharge, 15,900 second-feet. Minimum stage recorded, 1.39 feet, September 13–18, 1913; discharge, 9.7 second-feet.

Winter flow.—Discharge relation affected by ice.

Accuracy.—Rating curve well defined. Results excellent except at extremely high and low stages.

Discharge measurements of Occoquan Creek near Occoquan, Va., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 4	J. G. Mathers	13.20	8,730	Feb. 21	B. J. Peterson	[b] 4.65	647
5	do	9.70	4,580	Mar. 11	Peterson and Morgan	7.28	2,380
9	Mathers and Harrington	4.30	623	May 6	B. J. Peterson	4.92	874
15	Peterson and Walters	[a] 2.91	187	Sept. 23	J. H. Morgan	1.60	13.9
26	B. J. Peterson	5.41	1,120	24	J. G. Mathers	1.57	15.5
Feb. 14	do	[b] 3.52	256				
20	do	[b] 4.48	598				

[a] No ice on control, and very little along shores between gage and control.
[b] Discharge relation affected by ice.

Daily gage height, in feet, of Occoquan Creek near Occoquan, Va., for the year ending Sept. 30, 1914.

[Sadie Bradley, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	6.0	2.28	2.52	3.11	8.2	4.25	3.71	3.86	2.28	2.86	1.92	2.32
2	3.21	2.20	2.47	3.06	4.85	4.7	4.1	3.61	2.20	2.54	1.84	2.09
3	3.04	2.15	2.43	5.55	4.2	4.4	3.89	3.48	2.24	2.35	.....	2.03
4	2.52	2.10	2.40	12.9	3.98	4.8	3.71	3.34	2.27	2.28	1.78	1.99
5	2.22	2.05	2.33	9.3	3.75	5.95	3.45	3.64	2.48	2.44	.....	2.28
6	2.07	2.00	2.26	6.4	3.72	5.0	3.30	4.65	2.43	4.55	.....	2.09
7	1.92	2.00	2.27	5.15	7.4	4.7	3.20	3.76	2.48	4.2	1.78	1.92
8	1.82	2.00	2.29	4.55	5.5	5.75	3.22	3.42	2.43	3.33	.....	1.77
9	1.80	2.10	2.35	4.25	4.25	6.5	4.6	3.34	2.23	3.22	.....	.....
10	1.80	3.01	2.35	4.0	3.89	6.1	3.86	3.37	2.25	2.61	.....	.....
11	1.79	2.88	2.24	3.68	3.83	7.1	3.48	3.12	2.19	2.78	1.70	1.64
12	1.74	2.59	2.19	3.40	3.65	5.3	3.28	3.05	2.11	2.73	1.99	.....
13	1.83	2.43	2.15	3.03	3.26	4.85	3.16	2.93	2.05	2.51	2.54	.....
14	2.04	2.34	2.13	3.15	3.49	5.45	3.03	2.98	2.00	4.6	2.38	1.70
15	1.93	2.23	2.11	2.90	3.32	8.45	4.05	3.19	1.99	3.63	2.10	.....
16	1.88	2.60	2.05	2.83	3.37	8.4	7.9	2.93	2.01	2.94	2.01	.....
17	1.83	5.1	2.07	2.86	3.27	6.9	5.25	2.79	1.99	2.62	1.89	.....
18	1.80	3.64	2.06	2.86	3.13	7.3	4.35	2.72	1.97	4.5	.....	1.62
19	1.82	3.15	2.07	2.80	3.35	6.0	4.0	2.67	1.92	3.21	.....	1.62
20	1.90	2.92	2.06	2.79	4.45	5.0	5.4	2.62	1.97	2.52	.....	.....
21	2.58	2.74	2.07	2.82	4.6	4.7	7.3	2.61	2.02	2.29	2.33	.....
22	2.34	2.56	2.08	2.88	4.2	5.05	4.95	2.63	2.77	2.24	3.20	1.60
23	2.13	2.49	2.08	2.80	4.1	5.4	4.3	2.52	2.49	2.12	2.20	.....
24	2.07	2.38	3.21	2.80	3.86	4.85	3.95	2.43	2.65	2.02	1.88	1.57
25	3.79	2.29	3.92	8.1	3.57	4.3	3.75	2.32	2.69	1.99	.....	1.62
26	5.8	2.26	9.6	5.6	3.41	4.0	7.4	2.27	2.83	1.99	.....	1.64
27	3.71	2.21	6.0	4.45	3.37	3.87	7.6	2.29	2.71	2.38	.....	1.60
28	3.04	2.23	4.2	4.1	3.56	3.79	5.0	2.30	4.7	2.13	1.87	1.57
29	2.73	2.31	3.69	3.80	.....	3.94	4.35	2.33	6.6	2.03	4.45	1.54
30	2.51	2.46	3.47	3.60	.....	3.74	4.2	2.33	3.74	1.95	3.16	1.50
31	2.38	.....	3.22	5.2	.....	3.95	.....	2.34	.....	1.92	2.69	.....

NOTE.—Discharge relation affected by ice Feb. 11 to Mar. 4 and Mar. 8. Gage heights Aug. 4, 7, and 11, and Sept. 11, 14, 18, 19, 22, and 24–30, represent one reading a day made by the observer.

Daily discharge, in second-feet, of Occoquan Creek near Occoquan, Va., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1,460	70	103	226	3,160	520	398	446	70	167	35	75
2	252	60	96	213	840	655	530	368	60	106	30	49
3	208	55	90	1,200	565	585	456	329	65	78	28	44
4	103	50	85	8,340	488	770	398	287	68	70	27	40
5	62	46	76	4,180	410	1,430	320	377	97	91	27	70
6	47	41	67	1,730	401	915	275	748	90	702	27	49
7	35	41	68	990	2,490	770	249	413	97	565	27	35
8	29	41	71	702	1,170	1,280	254	311	90	284	26	26
9	28	50	78	582	582	1,800	725	287	64	254	24	24
10	28	200	78	495	456	1,520	446	296	66	118	23	21
11	27	172	65	389	420	2,250	329	228	59	150	22	19
12	24	114	59	305	300	1,060	270	210	51	140	40	20
13	30	90	55	206	180	840	239	183	46	102	106	21
14	45	77	53	236	245	1,140	206	194	41	725	82	22
15	36	64	51	176	210	3,380	512	246	40	374	50	21
16	33	116	46	161	215	3,340	2,900	183	42	185	42	20
17	30	965	47	167	215	2,100	1,040	152	40	120	33	19
18	28	377	46	167	195	2,410	620	138	39	680	30	18
19	29	236	47	154	230	1,460	495	129	35	252	26	18
20	34	180	46	152	595	915	1,120	120	39	103	22	17
21	113	142	47	158	640	770	2,410	118	43	71	76	17
22	77	110	48	172	505	940	890	121	148	65	249	17
23	53	98	48	154	440	1,120	600	103	98	52	60	16
24	47	82	252	154	315	840	478	90	125	43	33	16
25	422	71	467	3,070	230	600	410	75	132	40	32	18
26	1,340	67	4,480	1,220	235	495	2,490	68	161	40	32	19
27	398	61	1,460	660	255	450	2,650	71	136	82	32	17
28	208	64	565	530	310	422	915	72	770	53	32	16
29	140	73	392	425	.....	474	620	76	1,870	44	660	15
30	102	94	326	365	.....	407	565	76	407	38	239	13
31	82	.....	254	1,020	.....	478	.....	77	.....	35	132	.....

NOTE.—Discharge determined from a well-defined rating curve. Discharge for days when discharge relation was affected by ice, estimated from discharge measurements and climatic records. Discharge interpolated for days for which gage heights are not recorded, except Aug. 18–20, when it was estimated.

Monthly discharge of Occoquan Creek near Occoquan, Va., for the year ending Sept. 30, 1914.

[Drainage area, 546 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
October	1,460	24	179	0.328	0.38	A.
November	965	41	130	.238	.27	A.
December	4,480	46	312	.571	.66	A.
January	8,340	152	926	1.70	1.96	A.
February	3,160	180	582	1.07	1.11	B.
March	3,380	407	1,170	2.14	2.47	A.
April	2,900	206	794	1.45	1.62	A.
May	748	68	213	.390	.45	A.
June	1,870	35	170	.311	.35	A.
July	725	35	188	.344	.40	A.
August	660	22	74.3	.136	.16	B.
September	75	13	26.4	.048	.05	B.
The year	8,340	13	396	.725	9.88	

RAPPAHANNOCK RIVER BASIN.

RAPPAHANNOCK RIVER NEAR FREDERICKSBURG, VA.

Location.—About 3½ miles above Fredericksburg and 1½ miles above dam of Spottsylvania Power Co.

Drainage area.—1,590 square miles.

Records available.—September 19, 1907, to September 30, 1914.

Gage.—Vertical staff installed November 4, 1913, to replace chain gage under the cable, used February 20, 1908, to October 31, 1913, when it was destroyed. Original gage, a vertical staff, was destroyed February 14, 1908. Same datum and practically same location for all gages. Gage read twice daily.

Discharge measurements.—Made from cable at the gage. At extremely low water measurements can be made by wading or from a bridge over the power canal.

Channel and control.—Practically permanent. Current sluggish at extremely low water.

Extremes of discharge.—Maximum stage recorded during year, 9 feet at 3 p. m. January 4; discharge, 25,700 second-feet. Minimum stage recorded during year, 0.3 foot at 3 p. m. August 21; discharge, 72 second-feet.

Maximum stage recorded 1907–1914, 10.2 feet at 9 a. m. April 13, 1913; discharge, 32,000 second-feet. Minimum stage recorded, 0.3 foot at 3 p. m. August 21, 1914, discharge, 72 second-feet.

Winter flow.—Discharge relation not often affected by ice.

Accuracy.—Results good.

No discharge measurements made during year.

Daily gage height, in feet, of Rappahannock River near Fredericksburg, Va., for the year ending Sept. 30, 1914.

[J. W. Franklin, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.68	.....	1.5	1.9	4.8	2.5	2.25	2.6	1.18	1.09	0.66	0.93
2	1.8	.....	1.47	1.75	3.4	2.15	2.3	2.4	1.15	1.09	.63	.81
3	1.13	.....	1.44	2.4	2.9	2.2	2.2	2.3	1.12	1.10	.59	.64
4	.99	1.16	1.44	8.6	2.7	2.25	2.1	2.2	1.09	1.02	.52	.95
5	.93	1.15	1.40	6.1	2.5	2.35	2.0	2.25	1.34	2.05	.55	1.20
6	.84	1.11	1.36	4.0	2.5	2.4	1.95	2.65	1.39	1.75	.56	.84
7	.78	1.04	1.39	3.2	3.3	2.5	1.95	2.3	1.18	1.55	.54	.60
8	.73	1.06	1.34	2.9	3.4	2.8	1.9	2.1	1.13	1.5	.48	.51
9	.70	1.16	1.42	2.7	2.7	3.3	2.25	2.2	1.08	1.30	.47	.54
10	.76	3.9	1.34	2.5	2.45	3.2	2.1	2.0	1.06	1.09	.46	.47
11	.81	2.5	1.31	2.35	2.4	3.1	1.95	1.95	1.04	1.18	1.22	.46
12	1.01	2.05	1.26	2.15	2.35	2.8	1.85	1.85	1.04	1.04	.59	.53
13	1.01	1.8	1.22	2.0	2 3	2.5	1.8	1.8	.97	.86	.49	.52
14	.92	1.7	1.24	1.7	2.35	2.9	1.75	1.95	.91	2.3	.43	.46
15	.87	1.6	1.24	1.8	2.35	3.4	1.95	2.0	1.10	2.05	.52	.70
16	.79	1.65	1.24	1.85	2.35	3.3	4.0	1.8	1.26	1.42	.48	.64
17	.74	1.85	1.26	1.9	2.3	3.1	3.1	1.65	1.10	1.19	.40	.61
18	.76	1.9	1.24	1.85	2.25	3.4	2.7	1.65	1.09	1.32	.34	.54
19	.83	1.7	1.14	1.8	2.15	3.6	2.4	1.6	.99	1.12	.37	.51
20	.88	1.55	1.20	1.75	2.25	3.0	2.4	1.6	.88	1.03	.37	.48
21	1.34	1.55	1.20	1.7	2.8	2.9	3.2	1.5	.91	.88	.31	.48
22	1.6	1.5	1.18	1.75	2.6	2.8	2.9	1.49	.98	.82	.96	.42
23	1.27	1.44	1.18	1.65	2.4	2.9	2.35	1.47	1.04	.70	1.29	.42
24	1.18	1.38	1.9	1.7	2.3	2.8	2.2	1.44	1.29	.64	.84	.47
25	2.3	1.31	2.1	3.4	2.15	2.6	2.15	1.38	1.12	.59	.85	.54
26	2.7	1.25	4.4	3.1	2.15	2.45	6.0	1.31	2.5	1.27	1.65	.81
27	2.2	1.34	3.5	2.45	2.3	2.3	5.0	1.31	1.5	1.14	2.05	.84
28	1.8	1.35	2.8	2.2	2.4	2.25	3.7	1.28	1.8	.92	1.40	.66
29	1.55	1.5	2.2	2.15	.....	2.35	3.1	1.25	1.8	.82	1.18	.54
30	1.42	1.6	2.1	2.05	.....	2.25	2.9	1.24	1.40	.70	1.23	.54
31	1.20	.....	2.0	2.05	.....	2.3	.....	1.24	.....	.73	1.20	.....

Daily discharge, in second-feet, of Rappahannock River near Fredericksburg, Va., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	172	462	750	1,220	7,380	2,080	1,700	2,240	455	388	165	288
2	1,100	455	718	1,040	3,700	1,560	1,770	1,920	432	388	154	225
3	418	448	687	1,920	2,740	1,620	1,620	1,770	410	395	141	158
4	323	440	687	23,600	2,400	1,700	1,480	1,620	388	342	121	300
5	288	432	645	12,000	2,080	1,840	1,350	1,700	588	1,420	130	470
6	240	402	607	5,100	2,080	1,920	1,280	2,320	636	1,040	132	240
7	212	355	636	3,290	3,490	2,080	1,280	1,770	455	805	127	144
8	191	369	588	2,740	3,700	2,570	1,200	1,480	418	750	110	118
9	179	440	666	2,400	2,400	3,490	1,700	1,620	382	550	108	127
10	204	4,850	588	2,080	2,000	3,290	1,480	1,350	369	388	106	108
11	225	2,080	560	1,840	1,920	3,100	1,280	1,280	355	455	486	106
12	336	1,420	518	1,560	1,840	2,570	1,160	1,160	355	355	141	124
13	336	1,100	486	1,350	1,770	2,080	1,100	1,100	311	250	113	121
14	282	975	502	975	1,840	2,740	1,040	1,280	276	1,770	99	106
15	255	860	502	1,100	1,840	3,700	1,280	1,350	395	1,420	121	179
16	216	918	502	1,160	1,840	3,490	5,100	1,100	518	666	110	158
17	195	1,160	518	1,220	1,770	3,100	3,100	918	395	462	92	148
18	204	1,220	502	1,160	1,700	3,700	2,400	918	388	569	80	127
19	235	975	425	1,100	1,560	4,140	1,920	860	323	410	86	118
20	260	805	470	1,040	1,700	2,920	1,920	860	260	349	86	110
21	588	805	470	975	2,570	2,740	3,290	750	276	260	74	110
22	860	750	455	1,040	2,240	2,570	2,740	740	317	230	305	97
23	526	687	455	918	1,920	2,740	1,840	718	355	179	542	97
24	455	626	1,220	975	1,770	2,570	1,620	687	542	158	240	108
25	1,770	560	1,480	3,700	1,560	2,240	1,560	626	410	141	245	127
26	2,400	510	6,190	3,100	1,560	2,000	11,600	560	2,080	526	918	225
27	1,620	588	3,920	2,000	1,770	1,770	8,010	560	750	425	1,420	240
28	1,100	598	2,570	1,620	1,920	1,700	4,370	534	1,100	282	645	165
29	805	750	1,620	1,560	.....	1,840	3,100	510	1,100	230	455	127
30	666	860	1,480	1,420	.....	1,700	2,740	502	645	179	494	127
31	470	.....	1,350	1,420	.....	1,770	.....	502	.....	191	470	.....

NOTE.—Discharge determined from a rating curve well defined above 500 second-feet and fairly well defined below.

Monthly discharge of Rappahannock River near Fredericksburg, Va., for the year ending Sept. 30, 1914.

[Drainage area, 1,590 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
October	2,400	172	553	0.348	0.40	A.
November	4,850	355	897	.564	.63	A.
December	6,190	425	1,060	.667	.77	A.
January	23,600	918	2,790	1.75	2.02	A.
February	7,380	1,560	2,320	1.46	1.52	A.
March	4,140	1,560	2,490	1.57	1.81	A.
April	11,600	1,040	2,540	1.60	1.78	A.
May	2,320	502	1,140	.717	.83	A.
June	2,080	260	523	.329	.37	A.
July	1,770	141	515	.326	.38	A.
August	1,420	74	275	.173	.20	B.
September	470	97	163	.103	.12	B.
The year	23,600	74	1,270	.799	10.83	

MISCELLANEOUS MEASUREMENTS.

Discharge measurements in the North Atlantic slope drainage basins at points other than the regular gaging stations were made in 1914, as shown by the following table:

Miscellaneous measurements in North Atlantic coast drainage basins in the year ending Sept. 30, 1914.

Date.	Stream.	Tributary to or diverting from—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
Aug. 27	Chicopee River	Connecticut River	Red Bridge, Mass	(c)	252
27	do	do	do	(d)	255
27	do	do	do	(e)	289
28	do	do	do	(f)	412
28	do	do	do	(g)	330
28	do	do	do	(h)	72
28	do	do	do	(i)	376
28	do	do	do	(j)	396
28	do	do	do	(k)	199
29	do	do	do	(l)	74
29	do	do	do	(m)	69
30	do	do	do	(n)	125
30	do	do	do	(o)	114
30	do	do	do	(p)	48
30	do	do	do	(q)	169
July 21	Westfield Little River	Westfield River	Westfield, Mass	a 14.5	5.5
22	Great Brook	do	Little River, Mass	1.00	25.6
Aug. 19	do	do	do	.97	20.9
July 24	Canal	Millers River	Erving, Mass	b 4.19	145
Sept. 20	White River	Connecticut River	Sharon, Vt	2.70	141
Sept. 1	West Canada Creek	Mohawk River	Kast Bridge, N. Y	29.44	1,300
20	Mougaup River	Delaware River	Rio, N. Y	.69	34.6

a Water surface to top of handrail of bridge, upstream side.
b Water surface to middle of bed piece of bridge, downstream side.
c Unit No. 4, gate open 0.74.
d Unit No. 3, gate open 0.52.
e Unit No. 2, gate open 0.64.
f Unit No. 4, gate open 1.00.
g Unit No. 4, gate open 0.895, exciter gage open 0.25.
h Unit No. 5, gate open 0.38, exciter gate open 0.16.
i Unit No. 3, gate open 1.00, exciter gage open 0.25.
j Unit No. 2, gate open 1.06, exciter gate open 0.25.
k Unit No. 4, gate open 0.61, exciter gate open 0.24.
l Unit No. 5, gate open 0.91.
m Unit No. 5, gate open 0.5+.
n Unit No. 4, gate open 0.37, exciter gate open 0.22.
o Unit No. 1, gate open 0.157.
p Lights and heater on Unit No. 7, measurement made in lower end of tail race.
q Measurement made about 100 feet above highway bridge. Water surface to reference point No. 1, 25.26 feet. Reference point No. 1 referred to crest of dam as 25.00.

INDEX.

STREAM-GAGING STATIONS

AND

PUBLICATIONS RELATING TO WATER RESOURCES

PART I. NORTH ATLANTIC SLOPE BASINS

STREAM-GAGING STATIONS AND PUBLICATIONS RELATING TO WATER RESOURCES.

PART I. NORTH ATLANTIC SLOPE BASINS.

INTRODUCTION.

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, 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 (in three volumes).

The North Atlantic slope section, to which this part pertains, includes the area drained by streams flowing into the Atlantic Ocean from St. John River in Maine to York River, Va., inclusive. The principal streams in this division are the St. Croix, Machias, Union, Penobscot, Kennebec, Androscoggin, Saco, Merrimac, Mystic, Blackstone, Connecticut, Hudson, Delaware, Susquehanna, Potomac, and Rappahannock. The streams drain wholly or in part the States of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Jersey, New Hampshire, New York, Pennsylvania, Rhode Island, Vermont, Virginia, and West Virginia.

This appendix contains, in addition to the annotated list of publications relating specifically to the section, a similar list of reports that are of general interest in many sections and cover a wide range of hydrologic subjects; also brief references to reports published by State and other organizations (p. XXII).

HOW GOVERNMENT REPORTS MAY BE OBTAINED OR CONSULTED.

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., Room 19, Federal Building.
Atlanta, Ga., Post Office Building.
Madison, Wis., c/o Railroad Commission of Wisconsin.
St. Paul, Minn., Old Capitol Building.
Austin, Tex., Old Post Office Building.
Helena, Mont., Montana National Bank Building.
Denver, Colo., 403 New Post Office Building.
Phoenix, Ariz., 417 Fleming Building.
Salt Lake City, Utah, 421 Federal Building.
Boise, Idaho, 615 Idaho Building.
Tacoma, Wash., 406 Federal Building.
Portland, Oreg., 416 Couch Building.
San Francisco, Cal., 328 Customhouse.
Los Angeles, Cal., 619 Federal Building.
Honolulu, Hawaii, Kapiolani 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 REPORTS.

Stream-flow records have been obtained at more than 3,400 points in the United States, and the data obtained have been published in the reports indicated in the following table:

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 [a]	do	1914.

[a] In preparation.

NOTE.—No data regarding stream flow are given in the 15th and 17th annual reports.

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 papers on surface-water supply published from 1899 to 1914. The data for any particular station will be found in the reports covering the years during which the station was maintained. For example, data from 1902 to 1914 for any station in the area covered by Part III are published in Water-Supply Papers 83, 98, 128, 169, 205, 243, 263, 283, 303, 323, 353, and 383, which contain records for the Ohio River basin for those years.

Numbers of water-supply papers containing results of stream measurements, 1899–1914.

Year.	I North Atlantic slope (St. John River to York River).	II South Atlantic and eastern Gulf of Mexico (James River to the Mississippi).	III Ohio River.	IV St. Lawrence River and Great Lakes.	V Hudson Bay and upper Mississippi River.	VI Missouri River.	VII Lower Mississippi River.	VIII Western Gulf of Mexico.	IX Colorado River.	X Great Basin.	XI Pacific slope in California.	XII North Pacific slope basins.		
												Pacific slope in Washington and upper Columbia River.	Snake River basin.	Lower Columbia River and Pacific slope 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	[h] 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	[i] 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] 169, 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

[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 slope 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.
[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 basins.
[s] Below junction with Gila.
[t] Rogue, Umpqua, and Siletz rivers only.

In these papers and in the following lists the stations are arranged in downstream order. The main stem of any river is determined by measuring or estimating its drainage area—that is, the headwater stream having the largest drainage area is considered the continuation of the main stream and local changes in name and lake surface are disregarded. All stations from the source to the mouth of the main stem of the river are presented first, and the tributaries in regular order from source to mouth follow, the streams in each tributary basin being listed before those of the next basin below.

The exceptions to this rule occur in the records for Mississippi River, which are given in four parts, as indicated on page III, and in the records for large lakes, where it is simpler to take up the streams in regular order around the rim of the lake than to cross back and forth over the lake surface.

GAGING STATIONS.

NOTE.—Dash after date indicates that station was being maintained September 30, 1914. Period after a date indicates discontinuance.

ST. JOHN RIVER BASIN.

St. John River near Dickey, Maine, 1910–11.
St. John River at Fort Kent, Maine, 1905–
St. John River at Van Buren, Maine, 1908–
Allagash River near Allagash, Maine, 1910–11.
St. Francis River at St. Francis, Maine, 1910–11.
Fish River at Wallagrass, Maine, 1903–1908; 1911.
Madawaska River at St. Rose du Degele, Quebec, 1910–11.
Aroostook River at Fort Fairfield, Maine, 1903–1910.

ST. CROIX RIVER BASIN.

St. Croix River near Woodland (Sprague Falls), Maine, 1902–1911.
St. Croix River near Baring, Maine, 1914–
West Branch of St. Croix River at Baileyville, Maine, 1910–1912.

MACHIAS RIVER BASIN.

Machias River at Whitneyville, Maine, 1903–

UNION RIVER BASIN.

Union River, West Branch (head of Union River), at Amherst, Maine, 1909–
Union River, West Branch, near Mariaville, Maine, 1909.
Union River at Ellsworth, Maine, 1909.
East Branch of Union River near Waltham, Maine, 1909.
Webb Brook at Waltham, Maine, 1909.
Green Lake (head of Reeds Brook) at Green Lake, Maine, 1909–1912.
Reeds Brook [Green Lake Stream] at Lakewood, Maine, 1909–1913.
Branch Lake (head of Branch Lake Stream) near Ellsworth, Maine, 1909–
Branch Lake Stream near Ellsworth, Maine, 1909–

PENOBSCOT RIVER BASIN.

Penobscot River, West Branch (head of Penobscot River) at Millinocket, Maine, 1901–
Penobscot River at West Enfield, Maine, 1901–
Penobscot River at Sunk Haze rips, near Costigan, Maine, 1899–1900.
East Branch of Penobscot River at Grand Lake dam, Maine, 1912.
East Branch of Penobscot River at Grindstone, Maine, 1902–
Mattawamkeag River at Mattawamkeag, Maine, 1902–
Piscataquis River near Foxcroft, Maine, 1902–
Passadumkeag Stream:
Cold Stream Pond (head of Cold Stream), Maine, 1900–1911 (record of opening and closing of pond).
Cold Stream at Enfield, Maine, 1904–1906.
Kenduskeag Stream near Bangor, Maine, 1908–
Orland River:
Phillips Lake outlet near East Holden, Maine, 1904–1908.

ST. GEORGE RIVER BASIN.

St. George River at Union, Maine, 1913–

KENNEBEC RIVER BASIN.

Moose River (head of Kennebec River) near Rockwood, Maine, 1902–1908; 1910–1912.
Moosehead Lake (on Kennebec River) at Greenville, Maine, 1903–1906 (stage only).
Moosehead Lake at east outlet, Maine (stage only), 1895–
Kennebec River at The Forks, Maine, 1901–
Kennebec River at Bingham, Maine, 1907–1910.
Kennebec River at North Anson, Maine, 1901–1907.
Kennebec River at Waterville, Maine, 1892–
Kennebec River at Gardiner, Maine, 1785–1910 (record of opening and closing of navigation).
Roach River at Roach River, Maine, 1901–1908.
Dead River near The Forks, Maine, 1901–1907; 1910–
Carrabassett River at North Anson, Maine, 1901–1907.
Sandy River near Farmington, Maine, 1910–
Sandy River near Madison, Maine, 1904–1908.
Sebasticook River at Pittsfield, Maine, 1908–
Messalonskee Stream at Waterville, Maine, 1903–1905.
Cobbosseecontee Lake (on Cobbosseecontee Stream), Maine, 1889–1911 (dates of opening and closing).
Cobbosseecontee Stream at Gardiner, Maine, 1890–

ANDROSCOGGIN RIVER BASIN.

Rangeley Lake (head of Androscoggin River), Maine, 1879–1911 (dates of opening and closing).
Androscoggin River at Errol dam, N. H., 1905–
Androscoggin River at Gorham, N. H., 1903 (fragmentary).
Androscoggin River at Shelburne, N. H., 1903–1907; 1910.
Androscoggin River at Rumford Falls, Maine, 1892–1903; 1905–
Androscoggin River at Dixfield, Maine, 1902–1908.
Magalloway River at Aziscohos dam, Maine, 1912–
Auburn Lake, Maine, 1890–1911 (date of opening).
Little Androscoggin River at Bisco Falls, near South Paris, Maine, 1913–

PRESUMPSCOT RIVER BASIN.

Presumpscot River at outlet of Sebago Lake, Maine, 1887–

SACO RIVER BASIN.

Saco River near Center Conway, N. H., 1903–1912.
Saco River at West Buxton, Maine, 1907–

MERRIMACK RIVER BASIN.

Pemigewasset River (head of Merrimack River) at Plymouth, N. H., 1886–
Merrimack River at Franklin Junction, N. H., 1903–
Merrimack River at Garvins Falls, N. H., 1904–
Merrimack River at Lowell, Mass., 1848–1861; 1866–
Merrimack River at Lawrence, Mass., 1880–
Middle Branch of Pemigewasset River at North Woodstock, N. H., 1911–12.
Lake Winnipesaukee at Lakeport, N. H., 1860–1911. (Stage only.)
Contoocook River at West Hopkinton, N. H., 1903–1907.
Suncook River at East Pembroke, N. H., 1904–5.
Souhegan River at Merrimack, N. H., 1909–
Nashua River:
South Branch of Nashua River at Clinton, Mass., 1896–
Concord River at Lowell, Mass., 1901–
Sudbury River at Framingham, Mass., 1875–
Lake Cochituate at Cochituate, Mass., 1863–

MYSTIC RIVER BASIN.

Mystic Lake (on Mystic River) near Boston, Mass., 1878–1897.

CHARLES RIVER BASIN.

Charles River at Waltham, Mass., 1903–1909.

TAUNTON RIVER BASIN.

Matfield River (head of Taunton River) at Elmwood, Mass., 1909–10.
Satucket River near Elmwood, Mass., 1909–10.

PROVIDENCE RIVER BASIN.

Providence River:
Seekonk River:
Tenmile River near Rumford, R. I., 1909.
Blackstone River at Woonsocket, R. I., 1904–5.
Blackstone River at Berkeley, R. I., 1901–2.
Branch River at Branch Village, R. I., 1909–10; 1912–13.
Woonasquatuckett River at Olneyville, R. I., 1910.

PAWTUXET RIVER BASIN.

Pawtuxet River at Harris, R. I., 1909.

PAWCATUCK RIVER, BASIN.

Pawcatuck River:
Wood River at Hope Valley, R. I., 1909–10.

THAMES RIVER BASIN.

Thames River:
Quinebaug River:
Shetucket River at Willimantic, Conn., 1904–5.

CONNECTICUT RIVER BASIN.

Connecticut River at Orford, N. H., 1900–
Connecticut River at Sunderland, Mass., 1904–
Connecticut River at Holyoke, Mass., 1880–1899.
Connecticut River at Hartford, Conn., 1896–1908.
Israel River above South Branch near Jefferson Highlands, N. H., 1903–1906.
Israel River below South Branch at Jefferson Highlands, N. H., 1903–1907.
Pasumpsic River near St. Johnsbury, Vt., 1909–
Passumpsic River at St. Johnsbury Center, Vt., 1903.
Ammonoosuc River at Bretton Woods, N. H., 1903–1907.
Zealand River near Twin Mountain, N. H., 1903–1907.
Little River at Twin Mountain, N. H., 1904–5.
White River at Sharon, Vt., 1903–4; 1909–1914.
Ashuelot River at Winchester, N. H., 1903–4.
Ashuelot River at Hinsdale, N. H., 1907–1911; 1914–
Millers River at Wendell, Mass., 1909–1913.
Millers River at Erving, Mass., 1914–
Moss Brook at Wendell, Mass., 1909–10.
Deerfield River at Hoosac Tunnel, Mass., 1909–1913.
Deerfield River at Charlemont, Mass., 1913–
Deerfield River at Shelburne Falls, Mass., 1907–1913.
Deerfield River at Deerfield, Mass., 1904–5.
Ware River (head of Chicopee River) at Ware, Mass., 1904–1911.
Ware River at Gibbs Crossing, Mass., 1912–
Burnshirt River near Templeton, Mass., 1909.
Swift River at West Ware, Mass., 1910–
Quaboag River at West Warren, Mass., 1903–1907.
Quaboag River at West Brimfield, Mass., 1909–
Westfield River at Knightville, Mass., 1909–
Westfield River at Russell, Mass., 1904–5.
Westfield River near Westfield, Mass., 1914–
Middle Branch of Westfield River at Goss Heights, Mass., 1910–
Westfield Little River near Westfield, Mass., 1905–
Borden Brook near Westfield, Mass., 1910–
Farmington River near New Boston, Mass., 1913–
Salmon River at Leesville, Conn., 1905–6.

HOUSATONIC RIVER BASIN.

Housatonic River near Great Barrington, Mass., 1913–
Housatonic River at Gaylordsville, Conn., 1900–
Tenmile River at Dover Plains, N. Y., 1901–1903.
Pomperaug River at Bennetts Bridge, Conn., 1913–

MIANUS RIVER BASIN.

Mianus River at Bedford, N. Y., 1903.
Mianus River near Stamford, Conn., 1903.

BYRAM RIVER BASIN.

Byram River, West Branch (head of Byram River) near Port Chester, N. Y., 1903.
Byram River at Pemberwick, Conn., 1903.
East Branch of Byram River near Greenwich, Conn., 1903.
Middle Branch of Byram River near Riverville, Conn., 1903.

HUDSON RIVER BASIN.

Hudson River at North Creek, N. Y., 1907–
Hudson River at Thurman, N. Y., 1907–
Hudson River at Corinth, N. Y., 1904–1912.
Hudson River at Spier Falls, N. Y., 1912–
Hudson River at Fort Edward, N. Y., 1899–1908.
Hudson River at Mechanicville, N. Y., 1890–
Cedar River near Indian Lake, N. Y., 1911–
Indian Lake Reservoir near Indian Lake, N. Y., 1900–
Indian River near Indian Lake, N. Y., 1912–1914.
Schroon Lake (on Schroon River) at Pottersville, N. Y., 1908–1911.
Schroon River at Riverbank, N. Y., 1907–
Schroon River at Warrensburg, N. Y., 1895–1902.
Sacandaga River at Wells, N. Y., 1907–1911.
Sacandaga River near Hope, N. Y., 1911–
Sacandaga River at Northville, N. Y., 1907–1910.
Sacandaga River near Hadley, N. Y., 1907–1910.
Sacandaga River (at cable) at Hadley, N. Y., 1911–
Sacandaga River at Union Bag & Paper Co.'s mill at Hadley, N. Y., 1909–1911.
West Branch of Sacandaga River, at Whitehouse, N. Y., 1910.
West Branch of Sacandaga River at Blackridge, near Wells, N. Y., 1911–
Battenkill River at Battenville, N. Y., 1908.
Fish Creek at Burgoyne, N. Y., 1905; 1908.
Hoosic River near Eagle Bridge, N. Y., 1910–
Hoosic River at Buskirk, N. Y., 1903–1908.
Mohawk River at Ridge Mills near Rome, N. Y., 1898–1900.
Mohawk River at Utica, N. Y., 1901–1903.
Mohawk River at Little Falls, N. Y., 1898–1909; 1912–
Mohawk River at Rocky Rift dam near Indian Castle, N. Y., 1901.
Mohawk River at Tribes Hill, N. Y., 1912.
Mohawk River at Schenectady, N. Y., 1899–1901.
Mohawk River at Rexford Flats, N. Y., 1898–1901.
Mohawk River at Barge Canal Lock 7, N. Y.,[1] 1913–
Mohawk River at Dunsbach Ferry, N. Y., 1898–1909.
Ninemile Creek at Stittville, N. Y., 1898–99.
Oriskany Creek at Coleman, N. Y., 1904–1906.
Oriskany Creek at Wood Road Bridge, near Oriskany, N. Y., 1901–1904.
Oriskany Creek at State dam near Oriskany, N. Y., 1898–1900.
Saquoit Creek at New York Mills, N. Y., 1898–1900
Nail Creek at Utica, N. Y., 1904.
Reels Creek near Deerfield, N. Y., 1901–1904.
Reels Creek at Utica, N. Y., 1901–2.
Johnson Brook at Deerfield, N. Y., 1903–1905.
Starch Factory Creek at New Hartford, N. Y., 1903–1906.
Graefenberg Creek at New Hartford, N. Y., 1903–1906.
Sylvan Glen Creek at New Hartford, N. Y., 1903–1906.
West Canada Creek at Wilmurt, N. Y., 1912–13.
West Canada Creek at Twin Rock Bridge, near Trenton Falls, N. Y., 1900–1909.
West Canada Creek at Poland, N. Y., 1913.
West Canada Creek at Middleville, N. Y., 1898–1901.
West Canada Creek at Kast Bridge, N. Y., 1905–1909; 1912–13.
East Canada Creek at Dolgeville, N. Y., 1898–1909; 1912.

[1] Formerly known as "Mohawk River at Vischer Ferry."

Hudson River tributaries—Continued.
Mohawk River tributaries—Continued.
Caroga Creek 3 miles above junction with Mohawk River, 1898–99.
Cayadutta Creek at Johnstown, N. Y., 1899–1900.
Schoharie Creek at Prattsville, N. Y., 1902–1913.
Schoharie Creek at Schoharie Falls, above Mill Point, N. Y., 1900–1901.
Schoharie Creek at Mill Point, N. Y., 1900–1903.
Schoharie Creek at Fort Hunter, N. Y., 1898–1901.
Schoharie Creek at Erie Canal aqueduct, below Fort Hunter, N. Y., 1900.
Alplaus Kill near Charlton, N. Y., 1913–
Quackenkill Creek at Quackenkill, N. Y., 1894.
Normanskill Creek at Frenchs Mill, N. Y., 1891.
Kinderhook Creek at Wilsons dam near Garfield, N. Y., 1892–1894.
Kinderhook Creek at East Nassau, N. Y., 1892–1894.
Kinderhook Creek at Rossman, N. Y., 1906–1909; 1911–1914.
Catskill Creek at South Cairo, N. Y., 1901–1907.
Esopus Creek at Olivebridge, N. Y., 1903–4.
Esopus Creek near Olivebridge, N. Y., 1906–1913.
Esopus Creek at Kingston, N. Y., 1901–1909.
Esopus Creek at Mount Marion, N. Y., 1907–1913.
Rondout Creek at Rosendale, N. Y., 1901–1903; 1906–1913.
Diversion to Delaware & Hudson Canal at Rosendale, N. Y., 1901–1903; 1906.
Wallkill River at Newpaltz, N. Y., 1901–1903.
Wappinger Creek at Wappinger Falls, N. Y., 1903–1905.
Fishkill Creek at Glenham, N. Y., 1901–1903.
Foundry Brook at Coldspring, N. Y., 1902–3.
Croton River at Croton dam, near Croton Lake, N. Y., 1870–1899.

PASSAIC RIVER BASIN.

Passaic River at Millington, N. J., 1903–1906.
Passaic River near Chatham, N. J., 1902–1911.
Passaic River at Two Bridges (Mountain View), N. J., 1901–1903.
Rockaway River at Boonton, N. J., 1903–4.
Pompton River at Pompton Plains, N. J., 1903–4.
Pompton River at Two Bridges (Mountain View), N. J., 1901–1903.
Ramapo River near Mahwah, N. J., 1903–1906; 1908.
Wanaque River at Wanaque, N. J., 1903–1905.

RARITAN RIVER BASIN.

Raritan River, South Branch (head of Raritan River), at Stanton, N. J., 1903–1906.
Raritan River at Finderne, N. J., 1903–1907.
Raritan River at Boundbrook, N. J., 1903–1909.
North Branch of Raritan River at Pluckemin, N. J., 1903–1906.
Millstone River at Millstone, N. J., 1903–4.

DELAWARE RIVER BASIN.

Delaware River, East Branch (head of Delaware River) at Fish Eddy, N. Y., 1912–
Delaware River, East Branch, at Hancock, N. Y., 1902–1912.
Delaware River at Port Jervis, N. Y., 1904–
Delaware River at Riegelsville, N. J., 1906–
Delaware River at Lambertville, N. J., 1897–1908.
Beaver Kill at Cooks Falls, N. Y., 1913–
West Branch of Delaware River at Hale Eddy, N. Y., 1912–

Delaware River tributaries—Continued.
West Branch of Delaware River at Hancock, N. Y., 1902–1912.
Mongaup River near Rio, N. Y., 1909–1913.
Neversink River at Godeffroy, N. Y., 1903; 1909–10; 1911–1914.
Neversink River at Port Jervis, N. Y., 1902–3.
Paulins Kill at Columbia, N. J., 1908–9.
Lehigh River at South Bethlehem, Pa., 1902–1905; 1909–1913.
Lehigh River at Easton, Pa., 1909.
Musconetcong River at Asbury, N. J., 1903.
Musconetcong River near Bloomsbury, N. J., 1903–1907.
Tohickon Creek at Point Pleasant, Pa., 1883–1889; 1901–1913.
Neshaminy Creek below Forks, Pa., 1884–1913.
Schuylkill River near Philadelphia, Pa., 1898–1912.
Perkiomen Creek near Frederick, Pa., 1884–1913.
Wissahickon Creek near Philadelphia, Pa., 1897–1902; 1905–6.

SUSQUEHANNA RIVER BASIN.

Susquehanna River at Colliersville, N. Y., 1907–8.
Susquehanna River at Conklin, N. Y., 1912–
Susquehanna River at Binghamton, N. Y., 1901–1912.
Susquehanna River at Wysox, Pa., 1908–9.
Susquehanna River at Wilkes-Barre, Pa., 1899–1903.
Susquehanna River at Danville, Pa., 1899–1913.
Susquehanna River at Harrisburg, Pa., 1891–1913.
Susquehanna River at McCall Ferry, Pa., 1902–1909.
Chenango River at South Oxford, N. Y., 1903.
Chenango River near Greene, N. Y., 1908.
Chenango River near Chenango Forks, N. Y., 1912–
Chenango River at Binghamton, N. Y., 1901–1912.
Eaton Brook, Madison County, N. Y., 1835.
Madison Brook, Madison County, N. Y., 1835.
Tioughnioga River at Chenango Forks, N. Y., 1903.
Cayuta Creek at Waverly, N. Y., 1898–1902. (Data in Water Supply Paper 109 only.
Chemung River at Chemung, N. Y., 1903. (Data for period prior to 1905 published in Water Supply Paper 109.)
West Branch of Susquehanna River at Williamsport Pa., 1895–1913.
West Branch of Susquehanna River at Allenwood, Pa., 1899–1902.
Juniata River at Newport, Pa., 1899–1913.
Broad Creek at Mill Green, Md., 1905–1909.
Octoraro Creek at Rowlandsville, Md., 1896–1899.
Deer Creek near Churchville, Md., 1905–1909.

GUNPOWDER RIVER BASIN.

Gunpowder Falls at Glencoe, Md., 1905–1909.
Little Gunpowder Falls near Belair, Md., 1905–1909.

PATAPSCO RIVER BASIN.

Patapsco River at Woodstock, Md., 1896–1909.

PATUXENT RIVER BASIN.

Patuxent River near Burtonsville, Md., 1911–12; 1913–
Patuxent River at Laurel, Md., 1896–1898.

POTOMAC RIVER BASIN.

Potomac River, North Branch (head of Potomac River), at Piedmont, W. Va., 1899–1906.
Potomac River, North Branch, at Cumberland, Md., 1894–1897.
Potomac River at Great Cacapon, W. Va., 1895.
Potomac River at Point of Rocks, Md., 1895–
Potomac River at Great Falls, Md., 1886–1891.
Potomac River at Chain Bridge, near Washington, D. C., 1892–1895.
Savage River at Bloomington, Md., 1905–6.
Georges Creek at Westernport, Md., 1905–6.
Wills Creek near Cumberland, Md., 1905–6.
South Branch of Potomac River near Springfield, W. Va., 1894–1896; 1899–1906.
Opequan Creek near Martinsburg, W. Va., 1905–6.
Tuscarora Creek at Martinsburg, W. Va., 1905.
Antietam Creek near Sharpsburg, Md., 1897–1905.
North River (head of South Fork of Shenandoah River, which is continuation of main stream) at Port Republic, Va., 1895–1899.
South Fork of Shenandoah River near Front Royal, Va., 1899–1906.
Shenandoah River at Millville, W. Va., 1895–1909.
Cooks Creek at Mount Crawford, Va., 1905–6.
Middle River:
Lewis Creek near Staunton, Va., 1905–6.
South River at Basic City, Va., 1905–6.
South River at Port Republic, Va., 1895–1899.
Elk Run at Elkton, Va., 1905–6.
Hawksbill Creek near Luray, Va., 1905–6.
North Fork of Shenandoah River near Riverton, Va., 1899–1906.
Passage Creek at Buckton, Va., 1905–6.
Monocacy River near Frederick, Md., 1896–
Goose Creek near Leesburg, Va., 1909–1912.
Rock Creek at Zoological Park, District of Columbia, 1897–1900.
Rock Creek at Lyons Mill, District of Columbia, 1892–1894.
Occoquan Creek near Occoquan, Va., 1913–

RAPPAHANNOCK RIVER BASIN.

Rappahannock River near Fredericksburg, Va., 1907–

REPORTS ON WATER RESOURCES OF NORTH ATLANTIC COAST.[1]

PUBLICATIONS OF UNITED STATES GEOLOGICAL SURVEY.

WATER-SUPPLY PAPERS.

Water-supply papers are distributed free by the Geological Survey as long as its stock lasts. An asterisk (*) indicates that this stock has been exhausted. Many of the papers marked in this way may, however, be purchased (at price noted) from the SUPERINTENDENT OF DOCUMENTS, WASHINGTON, D. C. Omission of the price indicates that the report is not obtainable from Government sources. Water-supply papers are of octavo size.

*24. Water resources of the State of New York, Part I, by G. W. Rafter, 1899, 99 pp., 13 pls. 15c.
Describes the principal rivers of New York and their more important tributaries, and gives data on temperature, precipitation, evaporation, and stream flow.

[1] For stream-measurement reports see tables on pages v and vi.

*25. Water resources of the State of New York, Part II, by G. W. Rafter, 1899, 100 pp., 12 pls. 15c.

Contains discussion of water storage projects on Genessee and Hudson Rivers, power development at Niagara Falls, descriptions and early history of State canals, and a chapter on the use and value of the water powers of the streams and canals; also brief discussion of the water yield of sand areas of Long Island.

*44. Profiles of rivers in the United States, by Henry Gannett. 1901. 100 pp., 11 pls. 15c.

Gives elevations and distances along rivers of the United States, also brief descriptions of many of the streams, including St. Croix, Penobscot, Kennebec, Androscoggin, Saco, Merrimack, Connecticut, Housatonic, Hudson, Mohawk, Delaware, Lehigh, Schuylkill, Susquehanna, Juniata, Potomac, and James Rivers.

57. Preliminary list of deep borings in the United States, Part I (Alabama-Montana), by N. H. Darton. 1902. 60 pp. (See No. 149.) 5c.

61. Preliminary list of deep borings in the United States, Part II (Nebraska-Wyoming), by N. H. Darton. 1902. 67 pp. 5c.

Nos. 57 and 61 contain information as to depth, diameter, yield, and head of water in borings more than 400 feet deep; under head "Remarks" give information concerning temperature, quality of water, purposes of boring, etc. The lists are arranged by States, and the States are arranged alphabetically. A second revised edition was published in 1905 as Water-Supply Paper 149 (q. v.).

*69. Water powers of the State of Maine, by H. A. Pressey. 1902. 124 pp., 14 pls. 20c.

Discusses briefly the geology and forests of Maine and in somewhat greater detail the drainage areas, lake storage, and water powers of the St. Croix, Penobscot, Kennebec, Androscoggin, Presumpscot, Saco, and St. John Rivers, and the minor coastal streams; mentions also developed, tidal powers.

72. Sewage pollution in the metropolitan area near New York City and its effects on inland water resources, by M. O. Leighton. 1902. 75 pp., 8 pls. 10c.

Defines "normal" and "polluted" waters and discusses the water of Raritan, Passaic, and Hudson Rivers and their tributaries and the damage resulting from pollution.

76. Observations on the flow of rivers in the vicinity of New York City, by H. A. Pressey. 1903. 108 pp., 13 pls. 15c.

Describes methods of measuring stream flow in open channels and under ice, and the quality of the river waters as determined by tests of turbidity, color, alkalinity, and permanent hardness. The streams considered are Catskill, Esopus, Rondout, and Fishkill creeks, and Wallkill, Tenmile, and Housatonic rivers.

79. Normal and polluted waters in northeastern United States, by M. O. Leighton. 1903. 192 pp. 10c.

Defines essential qualities of water for various uses, the impurities in rain, surface, and underground waters, the meaning and importance of sanitary analyses, and the principal sources of pollution; chiefly "a review of the more readily available records" of examination of water supplies derived from streams in the Merrimack, Connecticut, Housatonic, Delaware, and Ohio River basins; contains many analyses.

88. The Passaic flood of 1902, by G. B. Hollister and M. O. Leighton. 1903. 56 pp., 15 pls. 15c.

Describes the topography of the area drained by the Passaic and its principal tributaries; discusses flood-flow and losses caused by the floods, and makes comparison with previous floods, suggests construction of dam at Mountain View to control flood flow. (See also No. 92.)

92. The Passaic flood of 1903, by M. O. Leighton. 1904. 48 pp., 7 pls. 5c.

Discusses flood damages and preventive measures. (See No. 88.)

102. Contributions to the hydrology of eastern United States, 1903; M. L. Fuller, geologist in charge. 1904. 522 pp. 30c.

Contains brief reports on the wells and springs of the New England States and New York. The reports comprise tabulated well records giving information as to location, owner, depth, yield, head, etc., supplemented by notes as to elevation above sea, material penetrated, temperature, use, and quality; many miscellaneous analyses.

106. Water resources of the Philadelphia district, by Florence Bascom. 1904. 75 pp., 4 pls. 5c.

Describes the physiography, stratigraphic geology, rainfall, streams, ponds, springs, deep and artesian wells, and public water supplies of the area mapped on the Germantown, Norristown, Philadelphia, and Chester atlas sheets of the United States Geological Survey; compares quality of Delaware and Schuykill River waters.

108. Quality of water in the Susquehanna River drainage basin, by M. O. Leighton, with an introductory chapter on physiographic features, by G. B. Holliste. 1904. 76 pp., 4 pls. 15c.

109. Hydrography of the Susquehanna River drainage basin, by J. C. Hoyt and R. H. Anderson. 1905. 215 pp., 29 pls. 25c.

The scope of No. 108 is sufficiently indicated by its title. No. 109 describes the physical features of the area drained by the Susquehanna and its tributaries, contains the results of measurements of flow at the gaging stations, and discusses precipitation, floods, low water, and water powers,

110. Contributions to the hydrology of eastern United States, 1904; M. L. Fuller, geologist in charge. 1905. 211 pp., 5 pls. 10c.

Contains brief reports on water resources, surface and underground, of districts in the North Atlantic slope drainage basins, as shown by the following list:

Drilled wells of the Triassic area of the Connecticut Valley, by W. H. C. Pynchon.

Triassic rocks of the Connecticut Valley as a source of water supply, by M. L. Fuller. Scope indicated by title.

Water resources of the Taconic quadrangle, New York, Massachusetts, and Vermont, by F. B. Taylor. Discusses rainfall, drainage, water powers, lakes and ponds, underground waters, and mineral springs; also quality of spring water as indicated by chemical and sanitary analyses of Sand Spring, near Williamstown.

Water resources of the Watkins Glen quadrangle, New York, by Ralph S. Tarr. Discusses the use of the surface and underground waters for municipal supplies and their quality as indicated by examination of Sixmile and Fall creeks, and sanitary analyses of well water at Ithaca.

Water resources of the central and southwestern highlands of New Jersey, by Laurence La Forge. Treats of population, industries, climate, and soils, lakes, ponds, swamps and rivers, mineral springs (with analyses), water power, the Morris Canal; present and prospective sources and quality of municipal supplies.

Water resources of the Chambersburg and Mercersburg quadrangles, Pennsylvania, by George W. Stose. Describes streams and springs.

Water resources of the Curwensville, Patton, Ebensburg, and Barnesboro quadrangles, Pennsylvania, by F. G. Clapp. Treats briefly of surface and underground waters and their use for municipal supplies; gives analyses of waters at Cresson Springs.

Water resources of the Accident and Grantsville quadrangles, Maryland, by G. C. Martin.

Water resources of the Frostburg and Flintstone quadrangles, Maryland and West Virginia, by G. C. Martin.

114. Underground waters of eastern United States; M. L. Fuller, geologist in charge. 1905. 285 pp., 18 pls. 25c.

Contains brief reports on water supplies of the North Atlantic States as follows:

Maine, by W. S. Bayley.
New Hampshire, by M. L. Fuller.
Vermont, by G. H. Perkins.
Massachusetts and Rhode Island, by W. O. Crosby.
Connecticut, by H. E. Gregory.
New York, by F. B. Weeks.
New Jersey, by G. N. Knapp.
Pennsylvania, by M. L. Fuller.
Delaware, by N. H. Darton.
Maryland, by N. H. Darton and M. L. Fuller.
District of Columbia, by N. H. Darton and M. L. Fuller.
Virginia, by N. H. Darton and M. L. Fuller.

Each of these reports discusses the resources of the public and private water supplies and related subjects, and gives list of pertinent publications; mineral springs are listed and sales of mineral water are reported.

140. Field measurements of the rate of movement of underground waters, by C. S. Slichter. 1905. 122 pp., 15 pls. 15c.

Contains chapter on measurement of rate of underflow on Long Island, N. Y.

144. The normal distribution of chlorine in the natural waters of New York and New England, by D. D. Jackson. 1905. 31 pp., 5 pls. 10c.

Discusses common salt in coast and inland waters, salt as an index to pollution of streams and wells, the solutions and methods used in chlorine determinations, and the use of the normal chlorine map; gives charts and tables for chlorine in the New England States and New York.

145. Contributions to the hydrology of eastern United States, 1905; M. L. Fuller, geologist in charge. 1905. 220 pp., 6 pls. 10c.

Contains several brief reports relating chiefly to areas in the North Atlantic coast drainage basins, as follows:

Water resources of the Portsmouth-York region, New Hampshire and Maine, by George Otis Smith. Gives results of investigations made for the War Department to determine water supplies available for forts at mouth of harbor.

Water supply from glacial gravels near Augusta, Maine, by George Otis Smith. Describes the Silver Lake system of ponds near Augusta and the series of springs at the head of Spring Brook.

Water resources of the Pawpaw and Hancock quadrangles, West Virginia, Maryland, and Pennsylvania, by George W. Stose and George C. Martin. Describes rocks, springs, and streams in the area at the northernmost bend of the Potomac; discusses history of development, character of water (with analysis), flow, and origin of Berkeley Springs.

Water of a gravel-filled valley near Tully, N. Y., by George B. Hollister. Describes character of the sands and gravels, the volume of the springs issuing from them, deposits of tufa, the waters of the lakes, and the composition of the spring and lake waters; analyses.

147. Destructive floods in United States in 1904, by E. C. Murphy. 206 pp., 18 pls. 15c.

Describes floods on Susquehanna and Mohawk rivers and near Johnstown, Pa.

149. Preliminary list of deep borings in the United States, second edition with additions, by N. H. Darton. 1905. 175 pp. 10c.

Gives by States (and within the States by counties), location, depth, diameter, yield, height of water, and other available information, concerning wells 400 feet or more in depth; includes all wells listed in Water-Supply Papers 57 and 61; mentions also principal publications relating to deep borings.

155. Fluctuations of the water level in wells, with special reference to Long Island, New York by A. C. Veatch. 1906. 83 pp., 9 pls. 25c.

Includes general discussion of fluctuation due to rainfall and evaporation, barometric changes, temperature changes, changes in rivers, changes in lake level, tidal changes, effects of settlement, irrigation, dams, underground water developments, and to indeterminate causes.

*162. Destructive floods in the United States in 1905, with a discussion of flood discharge and frequency and an index to flood literature, by E. C. Murphy and others. 1906. 105 pp., 4 pls. 15c.

Contains accounts of floods in North Atlantic slope drainage basins as follows: Flood on Poquonnock River, Connecticut, by T. W. Norcross; flood on the Unadilla and Chenango rivers, New York, by R. E. Horton and C. C. Covert; also estimates of flood discharge and frequency on Kennebec, Androscoggin, Merrimac, Connecticut, Hudson, Passaic, Raritan, Delaware, Susquehanna, and Potomac Rivers; gives index to literature on floods on American streams.

*185. Investigations on the purification of Boston sewage, with a history of the sewage-disposal problem, by C.-E. A. Winslow and E. B. Phelps. 1906. 163 pp. 25c.

Discusses composition, disposal, purification, and treatment of sewages and recent tendencies in sewage-disposal practice in England, Germany, and the United States; describes character of crude sewage at Boston, removal of suspended matter, treatment in septic tanks, and purification in intermittent sand filtration and coarse material; gives bibliography.

*192. The Potomac River basin (Geographic history; Rainfall and stream flow; Pollution, typhoid fever, and character of water; Relation of soils and forest cover to quality and quantity of surface water; Effect of industrial wastes on fishes), by H. N. Parker, Bailey Willis, R. H. Bolster, W. W. Ashe, and M. C. Marsh. 1907. 364 pp., 10 pls. 60c.

Scope indicated by title.

*198. Water resources of the Kennebec River basin, by H. K. Barrows, with a section on the quality of Kennebec River water, by G. C. Whipple. 1907. 235 pp. 7 pls. 30c.

Describes physical characteristics and geology of the basin, the flow of the streams, evaporation, floods, developed and undeveloped water powers, water storage, log driving, and lumbering; under quality of water discusses effect of tides, pollution, and the epidemic of typhoid fever in 1902–3; contains gazetteer of rivers, lakes, and ponds.

*223. Underground waters of southern Maine, by F. G. Clapp, with records of deep wells, by W. S. Bayley. 1908. 268 pp., 24 pls. 55c.

Describes physiography, rivers, water-bearing rocks, amount, source, and temperature of the ground waters, recovery of waters by springs, collection galleries and tunnels, and wells; discusses well-drilling methods, municipal water supplies, and the chemical composition of the ground waters; gives details for each county.

232. Underground water resources of Connecticut, by H. E. Gregory, with a study of the occurrence of water in crystalline rocks, by E. E. Ellis. 1909. 200 pp. 5 pls. 20c.

Describes physiographic features, drainage, forests, climate, streams, lakes, population and industries, rocks; circulation, amount, temperature and contamination of ground water; discusses the ground waters of the crystalline rocks, the Triassic sandstones and traps, and the glacial drift; the quality of the ground waters (with analyses); well construction; temperature, volume, character, uses, and production of spring waters.

236. The quality of surface waters in the United States: Part I, Analyses of waters east of the one hundredth meridian, by R. B. Dole. 1909. 123 pp. 10c.

Describes collection of samples, method of examination, preparation of solutions, accuracy of estimates, and expression of analytical results; gives results of analyses of waters of Androscoggin, Hudson, Raritan, Delaware, Susquehanna, Lehigh, Potomac, and Shenandoah rivers.

*258. Underground water papers, 1910, by M. L. Fuller, F. G. Clapp, G. C. Matson, Samuel Sanford, and H. C. Wolff. 1911. 123 pp., 2 pls. 15c.

Contains four brief reports pertaining especially to districts in the North Atlantic coast drainage area:

Occurrence and composition of well waters in the slates of Maine, by F. G. Clapp. Analyses.

Occurrence and composition of well waters in the granites of New England, by F. G. Clapp. Discusses proportion of successful wells, and water supply and depth. Analyses.

Composition of mineral springs in Maine, by F. G. Clapp.

Saline artesian waters of the Atlantic Coastal Plain, by Samuel Sanford.

Underground waters near Manassas, Va., by F. G. Clapp.

279. Water resources of the Penobscot River basin, Maine, by H. K. Barrows and C. C. Babb. 1912. 285 pp., 19 pls. 65c.

Describes the topography, drainage, geology, forests, population, industries, transportation lines, and precipitation in the basin; gives results of investigations of stream flow at gaging stations; discusses relation of run-off to precipitation, evaporation, floods, low water, developed and undeveloped water powers, storage, log driving, and lumbering; contains gazetteer of rivers, lakes, and ponds.

374. Ground water in the Hartford, Stamford, Salisbury, Willimantic, and Saybrook areas, Connecticut, by H. E. Gregory and A. J. Ellis. 1916. 150 pp., 13 pls.

Describes occurrence of ground water, methods of developing, and requirements for municipal use. Gives by towns a description of the surface and ground water and of the public water supply, and records of wells and springs.

397. Ground water in the Waterbury area, Connecticut, by A. J. Ellis, under direction of H. E. Gregory. 1916. 73 pp., 4 pls. 15c.

Describes the geology of the area, the occurrence of ground water, its use for private and municipal supply, and methods of developing. Discusses under towns the population and industries, topography, water-bearing formations, surface and ground water, and public supplies, and gives records of wells and springs.

ANNUAL REPORTS.

Each of the papers contained in the annual reports was also issued in separate form.

Annual reports are distributed free by the Geological Survey as long as its stock lasts. An asterisk (*) indicates that this stock has been exhausted. Many of the papers so marked, however, may be purchased from the SUPERINTENDENT OF DOCUMENTS, WASHINGTON, D. C.

*Sixth Annual Report of the United States Geological Survey, 1884–85, J. W. Powell, Director. 1885. xxix, 570 pp., 65 pls. Cloth $2.00. Contains:

* Seacoast swamps of the eastern United States, by N. S. Shaler. pp. 353–398. Describes the coast swamps of New England; discusses economic problems connected with marine swamps; gives a detailed account of selected areas of salt marsh lands, and a list of the principal areas of salt marshes between the Hudson River and Portland, Maine.

*Tenth Annual Report of the United States Geological Survey, 1888–89, J. W. Powell, Director. 1890. 2 parts. Pt. I. Geology, xv, 774 pp., 98 pls. Cloth $2.35. Contains:

* General account of the fresh-water morasses of the United States, with a description of the Dismal Swamp district of Virginia and North Carolina, by N. S. Shaler, pp. 255–339, Pls. VI to XIX. Scope indicated by title.

Fourteenth Annual Report of the United States Geological Survey, 1892–93, J. W. Powell, Director. 1893. (Pt. II, 1894.) 2 parts. *Pt. II. Accompanying papers, xx, 597 pp., 73 pls. Cloth $2.10. Contains:

* Potable waters of the eastern United States, by W J McGee, pp. 1 to 47. Discusses cistern water, stream waters, and ground waters, including mineral springs and artesian wells.

PROFESSIONAL PAPERS.

Professional papers are distributed free by the Geological Survey as long as its stock lasts. An asterisk (*) indicates that this stock has been exhausted. Many of the papers marked with an asterisk may, however, by purchased from the SUPERINTENDENT OF DOCUMENTS, WASHINGTON, D. C. Professional papers are of quarto size.

*44. Underground water resources of Long Island, N. Y., by A. C. Veatch, C. S. Slichter, Isaiah Bowman W. O. Crosby, and R. E. Horton. 1906. 394 pp., 34 pls. $1.25.

Describes the geologic formations, the source of the ground waters, and requisite conditions for flowing wells; the springs, streams, ponds, and lakes; artesian and deep wells; fluctuation of ground water table; blowing wells; waterworks; discusses measurements of velocity of underflow, the results of sizing and filtration tests, and the utilization of stream waters; gives well records and notes (with chemical analyses) concerning representative wells.

BULLETINS.

An asterisk (*) indicates that the Geological Survey's stock of the paper is exhausted. Many of the papers so marked may be purchased from the SUPERINTENDENT OF DOCUMENTS, WASHINGTON, D. C.

*138. Artesian-well prospects in the Atlantic Coastal Plain region, by N. H. Darton, 1896. 232 pp., 19 pls.

Describes the general geologic structure of the Atlantic Coastal Plain region and summarizes the conditions affecting subterranean water in the Coastal Plain; discusses the general geologic relations in New York, southern New Jersey, Delaware, Maryland, District of Columbia, Virginia, North Carolina, South Carolina, and eastern Georgia; gives for each of the States a list of the deep wells and discusses well prospects. The notes on the wells that follow the tabulated lists contain many well sections and analyses of the waters.

264. Record of deep-well drilling for 1904, by M. L. Fuller, E. F. Lines, and A. C. Veatch. 1905. 106 pp. 10c.

Discusses the importance of accurate well records to the driller, to owners of oil, gas, and water wells, and to the geologist; describes the general methods of work; gives tabulated records of wells in Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Virginia, and detailed records of wells at Pleasantville and Atlantic Highlands, N. J., and Tully, N. Y. These wells were selected because they give definite stratigraphic information.

298. Record of deep-well drilling for 1905, by M. L. Fuller and Samuel Sanford. 1906. 299 pp. 25c.

Gives an account of progress in the collection of well records and samples; contains tabulated records of wells in Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and Virginia, and detailed records of wells in Newcastle County, Del.: Cumberland County, Maine; Anne Arundel, St. Mary, and Talbot counties, Md.; Hampshire County, Mass.; Monmouth County, N. J.; Saratoga County, N. Y.; and Lycoming and Somerset counties, Pa. The wells of which detailed sections are given were selected because they afford valuable stratigraphic information,

GEOLOGIC FOLIOS.

Under the plan adopted for the preparation of a geologic map of the United States the entire area is divided into small quadrangles, bounded by certain meridians and parallels, and these quadrangles, which number several thousand, are separately surveyed and mapped.[1] The unit of survey is also the unit of publiaction, and the maps and description of each quadrangle are issued in the form of a folio. When all the folios are completed they will constitute a Geologic Atlas of the United States.

A folio is designated by the name of the principal town or of a prominent natural feature within the quadrangle. Each folio includes maps showing the topography, geology, underground structure, and mineral deposits of the area mapped and several pages of descriptive text. The text explains the maps and describes the topographic and geologic features of the country and its mineral products. The topographic map shows roads, railroads, waterways ,and, by contour lines, the shapes of the hills and valleys and the height above sea level of all points in the quadrangle. The areal geology map shows the distribution of the various rocks at the surface. The structural-geology map shows the relations of the rocks to one another underground. The economic-geology map indicates the location of mineral deposits that are commercially valuable. The artesian-water maps shows the depth to underground-water horizons. Economic-geology and artesian-water maps are included in folios if the conditions in the areas mapped warrant their publication. The folios are of special interest to students of geography and geology and are valuable as guides in the development and utilization of mineral resources.

Folios 1 to 163, inclusive, are published in only one form (18 by 22 inches), called the library edition. Some of the folios that bear numbers higher than 163 are published also in an octavo edition (6 by 9 inches). Owing to a fire in the Geological Survey building May 18, 1913, the stock of geologic folios was more or less damaged by fire and water, but 80 or 90 per cent of the folios are usable. They will be sold at the uniform price of 5 cents each, with no reduction for wholesale orders. This rate applies to folios in stock from 1 to 184, inclusive (except reprints), also to the library edition of folio 186. The library edition of folios 185, 187, and higher numbers sells for 25 cents a copy, except that some folios which contain an unusually large amount of matter sell at higher prices. The octavo edition of folio 185 and higher numbers sells for 50 cents a copy, except folio 193, which sells for 75 cents a copy. A discount of 40 per cent is allowed on an order for folios or for folios together with topographic maps amounting to $5 or more at the retail rate.

All the folios contain descriptions of the drainage of the quadrangles. The folios in the following list contain also brief discussions of the underground waters in connection with the economic resources of the areas and more or less information concerning the utilization of the water resources.

An asterisk (*) indicates that the stock of the folio is exhausted.

*13. Fredericksburg, Virginia-Maryland, 1894. 5c.

23. Nomini, Maryland-Virginia, 1896. 5c.

[1] Index maps showing areas in the North Atlantic slope basins covered by topographic maps and by geologic folios will be mailed on receipt of request addressed to the Director, U. S. Geological Survey, Washington, D. C.

*70. Washington, District of Columbia-Maryland-Virginia, 1900.

*83. New York City (Paterson, Harlem, Staten Island, and Brooklyn quadrangles), New York-New Jersey, 1902.
Discusses the present and future water supply of New York City.

136. St. Marys, Maryland-Virginia, 1906. 5c.
Discusses artesian wells.

137. Dover, Delaware-Maryland-New Jersey, 1906. 5c.
Describes the shallow and deep wells used as sources of water supply; gives section of well at Middletown, Del.

149. Penobscot Bay, Maine, 1907. 5c.
Describes the wells and springs; gives analyses of spring water from North Bluehill.

152. Patuxtent, Maryland-District of Columbia, 1907. 5c.
Discusses the springs, shallow wells, and artesian wells.

*157. Passaic, New Jersey-New York, 1908.
Discusses the underground water of the quadrangle, including the cities of Newark, Hoboken, Jersey City, Paterson, Elizabeth, Passaic, Plainfield, Rahway, and Perth Amboy, and a portion of the city of New York; gives a list of the deep borings in the New Jersey portion of the quadrangle, and notes concerning wells on Staten Island, Long Island, Hoffman Island, and Governors Island.

158. Rockland, Maine, 1908. 5c.
Describes the water supply in Knox County, Maine, of which Rockland is the principal city; discusses the water obtained from wells drilled in limestone and granite, and the city water supply of Camden, Rockport, Rockland, and Thomaston.

160. Accident-Grantsville, Maryland-Pennsylvania-West Virginia, 1908. 5c.
Under "Mineral Resources" the folio describes Youghiogheny and Castleman rivers, Savage River, and Georges Creek, and the spring waters; notes possibility of obtaining artesian water.

*161. Franklin Furnace, New Jersey, 1908. 5c.
Describes the streams, water powers, and ground waters of a district in northwestern New Jersey, mainly in Sussex County but including also a small part of Morris County; gives tabulated list of water powers and of bored wells.

*162. Philadelphia (Norristown, Germantown, Chester, and Philadelphia quadrangles), Pennsylvania-New Jersey-Delaware, 1909.
Describes the underground waters of the Piedmont Plateau and the Coastal Plain, and gives a tabulated list of wells; discusses the water supply of Philadelphia and Camden, also suburban towns; gives analysis of filtered water of Pickering Creek.

167. Trenton, New Jersey-Pennsylvania,[1] 1909. 5c.
Describes streams tributary to Raritan and Delaware rivers (including estimates of capacity with and without storage) and the springs and wells; discusses also the public water supply of Trenton and suburban towns.

169. Watkins Glen-Catatonk, New York, 1909. 5c.
Describes the rivers, which include tributaries of the Susquehanna and the St. Lawrence, the lakes and swamps, and, under "Economic geology," springs and shallow and deep wells; discusses also water supply at Ithaca.

170. Mercersburg-Chambersburg, Pennsylvania,[2] 1909. 5c.
Describes the underground waters, including limestone springs, sandstone springs, and wells, and mentions briefly the sources of the water supplies of the principal towns.

182. Choptank, Maryland, 1912.[2] 5c.
The Choptank quadrangle includes the entire width of Chesapeake Bay and portions of many large estuaries.

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[1] Octova edition only.

[2] Issued in two editions—library (18 by 22 inches) and octovo (6 by 9 inches). Specify edition desired.

189. Barnesboro-Patton, Pennsylvania, 1913. 25c.
Discusses the water supply of various towns in the quadrangle.

191. Raritan, New Jersey,[1] 1914.
Discusses briefly the surface and ground waters of the quadrangle, the quality, and the utilization of streams for power; gives analysis of water from Raritan River and from Schooley Mountain Spring near Hackettstown.

192. Eastport, Maine, 1914. 25c.
Includes brief account of the water supply of the quadrangle and of the utilization of streams for power.

MISCELLANEOUS REPORTS.

Other Federal bureaus and State and other organizations have, from time to time, published reports relating to the water resources of various sections of the country. Notable among those pertaining to the North Atlantic States are the reports of the Maine State Water Storage Commission (Augusta), the New Hampshire Forestry Commission (Concord), the Metropolitan Water and Sewerage Board (Boston, Mass.), the New York State Water Supply Commission (Albany), the New York State Conservation Commission (Albany), the New York State engineer and surveyor (Albany), the various commissions on water supply of New York City, the Geological Survey of New Jersey (Trenton), State boards of health, and the Tenth Census (vol. 16).

The following reports deserve special mention:

Water power of Maine, by Walter Wells, Augusta, 1869.

Hydrology of the State of New York, by G. W. Rafter: New York State Museum Bull. 85, 1905.

Hydrography of Virginia, by N. C. Grover and R. H. Bolster: Virginia Geol. Survey Bull. 3, 1906.

Underground water resources of the Coastal Plain province of Virginia, by Samuel Sanford: Virginia Geol. Survey Bull. 5, 1913.

Surface water supply of Virginia, by G. C. Stevens: Virginia Geol. Survey Bull. 10, 1916.

Many of these reports can be obtained by applying to the several commissions, and most of them can be consulted in the public libraries of the larger cities.

GEOLOGICAL SURVEY HYDROLOGIC REPORTS OF GENERAL INTEREST.

The following list comprises reports not readily classifiable by drainage basins and covering a wide range of hydrologic investigations:

WATER-SUPPLY PAPERS.

*1. Pumping water for irrigation, by H. M. Wilson. 1896. 57 pp., 9 pls.
Describes pumps and motive powers, windmills, water wheels, and various kinds of engines; also storage reservoirs to retain pumped water until needed for irrigation.

[1] Issued in two editions—library (18 by 22 inches), 25c., and octavo (6 by 9 inches), 50c. Specify edition desired.

*3. Sewage irrigation, by G. W. Rafter. 1897. 100 pp., 4 pls. 10c. (See Water-Supply Paper 22.)

Discusses methods of sewage disposal by intermittent filtration and by irrigation; describes utilization of sewage in Germany, England, and France, and sewage purification in the United States.

*8. Windmills for irrigation, by E. C. Murphy. 1897. 49 pp., 8 pls. 10c.

Gives results of experimental tests of windmills during the summer of 1896 in the vicinity of Garden, Kansas; describes instruments and methods and draws conclusions.

*14. New tests of certain pumps and water lifts used in irrigation, by O. P. Hood. 1898. 91 pp., 1 pl. 10c.

Discusses efficiency of pumps and water lifts of various types.

*20. Experiments with windmills, by T. O. Perry. 1899. 97 pp., 12 pls. 15c.

Includes tables and descriptions of wind wheels, makes comparisons of wheels of several types, and discusses results.

*22. Sewage irrigation, Part II, by G. W. Rafter. 1899. 100 pp., 7 pls. 15c.

Gives résumé of Water-Supply Paper No. 3; discusses pollution of certain streams, experiments on purification of factory wastes in Massachusetts, value of commercial fertilizers, and describes American sewage disposal plants by States; contains bibliography of publications relating to sewage utilization and disposal.

32. Water resources of Puerto Rico, by H. M. Wilson. 1899. 48 pp., 17 pls. 15c.

Describes briefly topography, climate, rivers, irrigation methods, soils, forestation, water power, and transportation facilities.

*41. The windmill; its efficiency and economic use, Part I, by E. C. Murphy. 1901. 72 pp., 14 pls.

*42. The windmill; its efficiency and ceonomic use, Part II, by E. C. Murphy. 1901. 75 pp., 2 pls. 10c.

Nos. 41 and 42 give details of results of experimental tests with windmills of various types.

*43. Conveyance of water in irrigation canals, flumes, and pipes, by Samuel Fortier. 1901. 86 pp., 15 pls. 15c.

*44. Profiles of rivers in the United States, by Henry Gannett. 1901. 100 pp., 11 pls. 15c.

Gives elevations and distance along rivers of the United States, also brief descriptions of many of the streams. Arrangement geographic. Many river profiles are scattered through other reports on surface waters in various parts of the United States.

*56. Methods of stream measurement. 1901. 51 pp., 12 pls. 15c.

Describes the methods used by the Survey in 1901–2. (See also Nos. 64, 94, and 95.)

57. Preliminary list of deep borings in the United States, Part I (Alabama-Montana), by N. H. Darton. 1902. 60 pp. (See No. 149.) 5c.

61. Preliminary list of deep borings in the United States, Part II (Nebraska-Wyoming), by N. H. Darton. 1902. 67 pp. 5c.

Nos. 57 and 61 contain information as to depth, diameter, yield, and head of water in borings more than 400 feet deep; under head "Remarks" gives information concerning temperature quality of water, purposes of boring, etc. The lists are arranged by States and the States are arranged alphabetically. A second revised edition was published in 1905 as Water-Supply Paper 149 (q. v.). 5c.

64. Accuracy of stream measurements, by E. C. Murphy. 1902. 99 pp., 4 pls. (See No. 95.) 10c.

Describes methods of measuring velocity of water and of measuring and computing stream flow and compares results obtained with the different instruments and methods; describes also experiments and results at the Cornell University hydraulic laboratory. A second, enlarged edition published as Water-Supply Paper 95.

*67. The motions of underground waters, by C. S. Slichter. 1902. 106 pp., 8 pls. 15c.

Discusses origin, depth, and amount of underground waters; permeability of rocks and porosity of soils; causes, rates, and laws of motions of underground water; surface and deep zones of flow, and recovery of waters by open wells and artesian and deep wells; treats of the shape and position of the water table; gives simple methods of measuring yield of flowing well; describes artesian wells at Savannah, Ga.

72. Sewage pollution in the metropolitan area near New York City and its effect on inland water resources, by M. O. Leighton. 1902. 75 pp., 8 pls. 10c.

Defines "normal" and "polluted" waters and discusses the damage resulting from pollution.

77. The water resources of Molokai, Hawaiian Islands, by Waldemar Lindgren. 1903. 62 pp., 4 pls. 10c.

Describes briefly the topography, geology, coral reefs, climate, soils, vegetation, forests, fauna of the island, the springs, running streams and wells, and discusses the utilization of the surface and underground waters.

*80. The relation of rainfall to run-off, by G. W. Rafter. 1903. 104 pp. 10c.

Treats of measurements of rainfall and laws and measurements of stream flow; gives rainfall, run-off, and evaporation formulas; discusses effect of forests on rainfall and run-off.

87. Irrigation in India (second edition), by H. M. Wilson. 1903. 238 pp., 27 pls. 25c.

First edition was published in Part II of the Twelfth Annual Report.

*94. Hydrographic manual of the United States Geological Survey, prepared by E. C. Murphy, J. C. Hoyt, and G. B. Hollister. 1904. 76 pp., 3 pls. 10c.

Gives instruction for field and office work relating to measurements of stream flow by current meters. (See also No. 95.)

*95. Accuracy of stream measurements (second, enlarged edition), by E. C. Murphy. 1904. 169 pp., 6 pls.

Describes methods of measuring and computing stream flow and compares results derived from different instruments and methods. (See also No. 94.)

103. A review of the laws forbidding pollution of inland waters in the United States, by E. B. Goodell. 1904. 130 pp. (See No. 152.)

Explains the legal principles under which antipollution statutes become operative, quotes court decisions to show authority for various deductions, and classifies according to scope the statutes enacted in the different States.

110. Contributions to the hydrology of eastern United States, 1904; M. L. Fuller, geologist in charge. 1905. 211 pp., 5 pls. 10c.

Contains the following reports of general interest. The scope of each paper is indicated by its title.

Description of underflow meter used in measuring the velocity and direction of underground water, by Charles S. Slichter.

The California or "stovepipe" method of well construction, by Charles S. Slichter.

Approximate methods of measuring the yield of flowing wells, by Charles S. Slichter.

Corrections necessary in accurate determinations of flow from vertical well casings, from notes furnished by A. N. Talbot.

Experiments relating to problems of well contamination at Quitman, Ga., by S. W. McCallie.

Notes on the hydrology of Cuba, by M. L. Fuller.

113. The disposal of strawboard and oil-well wastes, by R. L. Sackett and Isaiah Bowman. 1905. 52 pp., 4 pls. 5c.

The first paper discusses the pollution of streams by sewage and by trade wastes, describes the manufacture of strawboard and gives results of various experiments in disposing of the waste The second paper describes briefly the topography, drainage, and geology of the region about Marion, Ind., and the contamination of rock wells and of streams by waste oil and brine.

114. Underground waters of eastern United States; M. L. Fuller, geologist in charge. 1905. 285 pp., 18 pls. 25c.

Contains report on "Occurrence of underground waters," by M. L. Fuller, discussing sources, amount, and temperature of waters, permeability and storage capacity of rocks, water-bearing formations, recovery of water by springs, wells and pumps, essential condition of artesian flows, and general conditions affecting underground waters in eastern United States.

115. River surveys and profiles made during 1903, arranged by W. C. Hall and J. C. Hoyt. 1905. 115 pp., 4 pl. 10c.
Contains results of surveys made to determine location of undeveloped power sites.

119. Index to the hydrographic progress reports of the United States Geological Survey, 1888 to 1903, by J. C. Hoyt and B. D. Wood. 1905. 253 pp. 15c.
Scope indicated by title.

120. Bibliographic review and index of papers relating to underground waters published by the United States Geological Survey, 1879–1904, by M. L. Fuller. 1905. 128 pp. 10c.
Scope indicated by title.

122. Relation of the law to underground waters, by D. W. Johnson. 1905. 55 pp. 5c.
Defines and classifies underground waters, gives common-law rules relating to their use, and cites State legislative acts affecting them.

140. Field measurements of the rate of movement of underground waters, by C. S. Slichter. 1905. 122 pp., 15 pls. 15c.
Discusses the capacity of sand to transmit water, describes measurements of underflow in Rio Hondo, San Gabriel, and Mohave River valley, Cal., and on Long Island, N. Y.; gives results of tests of wells and pumping plants, and describes stovepipe method of well construction.

143. Experiments on steel-concrete pipes on a working scale, by J. H. Quinton. 1905. 61 pp., 4 pls.
Scope indicated by title.

145. Contributions to the hydrology of Eastern United States, 1905, M. L. Fuller, geologist in charge. 1905. 220 pp., 6 pls. 10c.
Contains brief reports of general interest as follows:
Drainage of ponds into drilled wells, by Robert E. Horton. Discusses efficiency, cost, and capacity of drainage wells, and gives statistics of such wells in southern Michigan.
Construction of so-called fountain and geyser springs, by Myron L. Fuller.
A convenient gage for determining low artesian heads, by Myron L. Fuller.

146. Proceedings of second conference of engineers of the Reclamation Service, with accompanying papers, compiled by F. H. Newell, chief engineer. 1905. 267 pp. 15c.
Contains brief account of the organization of the hydrographic [water-resources] branch and the Reclamation Service, reports of conferences and committees, circulars of instruction, and many brief reports on subjects closely related to reclamation, and a bibliography of technical papers by members of the service. Of the papers read at the conference those listed below (scope indicated by title) are of more or less general interest:
Proposed State code of water laws, by Morris Bien.
Power engineering applied to irrigation problems, by O. H. Ensign.
Estimates on tunneling in irrigation projects, by A. L. Fellows.
Collection of stream-gaging data, by N. C. Grover.
Diamond-drill methods, by G. A. Hammond.
Mean-velocity and area curves, by F. W. Hanna.
Importance of general hydrographic data concerning basins of streams gaged, by R. E. Horton.
Effect of aquatic vegetation on stream flow, by R. E. Horton.
Sanitary regulations governing construction camps, by M. O. Leighton.
Necessity of draining irrigated land, by Thos. H. Means.
Alkali soils, by Thos. H. Means.
Cost of stream-gaging work, by E. C. Murphy.
Equipment of a cable gaging station, by E. C. Murphy.
Silting of reservoirs, by W. M. Reed.
Farm-unit classification, by D. W. Ross.
Cost of power for pumping irrigating water, by H. A. Storrs.
Records of flow at current-meter gaging stations during the frozen season, by F. H. Tillinghast.

147. Destructive floods in United States in 1904, by E. C. Murphy. 206 pp., 18 pls. 15c.
Contains a brief account of "A method of computing cross-section area of waterways," including formulas for maximum discharge and area of cross section.

150. Weir experiments, coefficients, and formulas, by R. E. Horton. 1906. 189 pp., 38 pls. (See Water-Supply Paper 200.) 15c.
Scope indicated by title.

151. Field assay of water, by M. O. Leighton. 1905. 77 pp., 4 pls. 10c.
Discusses methods, instruments, and reagents used in determining turbidity, color, iron chlorides, and hardness in connection with the studies of the quality of water in various parts of the United States

152. A review of the laws forbidding pollution of inland waters in the United States (second edition), by E. B. Goodell. 1905. 149 pp. 10c.
Scope indicated by title.

*155. Fluctuations of the water level in wells, with special reference to Long Island, N. Y., by A. C. Veatch. 1906. 83 pp., 9 pls. 25c.
Includes general discussion of fluctuation due to rainfall and evaporation, barometric changes, temperature changes, changes in rivers, changes in lake level, tidal changes, effects of settlement, irrigation, dams, underground water developments, and to indeterminate causes.

*160. Underground-water papers, 1906; M. L. Fuller, geologist in charge. 1906. 104 pp., 1 pl.
Gives account of work in 1905, lists of publications relating to underground waters, and contains the following brief reports of general interest:
Significance of the term "artesian," by Myron L. Fuller.
Representation of wells and springs on maps, by Myron L. Fuller.
Total amount of free water in the earth's crust, by Myron L. Fuller.
Use of fluorescein in the study of underground waters, by R. B. Dole.
Problems of water contamination, by Isaiah Bowman.
Instances of improvement of water in wells, by Myron L. Fuller.

*162. Destructive floods in the United States in 1905, with a discussion of flood discharge and frequency and an index to flood literature, by E. C. Murphy and others. 1906. 105 pp., 4 pls. 15c.

163. Bibliographic review and index of underground-water literature published in the United States in 1905, by M. L. Fuller, F. G. Clapp, and B. L. Johnson. 1906. 130 pp. 15c.
Scope indicated by title.

*179. Prevention of stream pollution by distillery refuse, based on investigations at Lynchburg, Ohio, by Herman Stabler. 1906. 34 pp., 1 pl. 10c.
Describes grain distillation, treatment of slop, sources, character, and effects of effluents on streams; discusses filtration, precipitation, fermentation, and evaporation methods of disposal of wastes without pollution.

*180. Turbine water-wheel tests and power tables, by R. E. Horton. 1906. 134 pp., 2 pls. 20c.
Scope indicated by title.

*185. Investigations on the purification of Boston sewage, with a history of the sewage-disposal problem, by C.-E. A. Winslow and E. B. Phelps. 1906. 163 pp. 25c.
Discusses composition, disposal, purification, and treatment of sewages and recent tendencies in sewage-disposal practice in England, Germany, and the United States; describes character of crude sewage at Boston, removal of suspended matter, treatment in septic tanks, and purification by intermittent sand filtration and coarse material; gives bibliography.

*186. Stream pollution by acid-iron wastes, a report based on investigations made at Shelby, Ohio, by Herman Stabler. 1906. 36 pp., 1 pl.
Gives history of pollution by acid-iron wastes at Shelby, Ohio, and resulting litigation; discusses effect of acid-iron liquors on sewage purification processes, recovery of copperas from acid-iron wastes, and other processes for disposal of pickling liquor.

*187. Determination of stream flow during the frozen season, by H. K. Barrows and R. E. Horton. 1907. 93 pp., 1 pl. 15c.
Scope indicated by title.

*189. The prevention of stream pollution by strawboard waste, by E. B. Phelps. 1906. 29 pp., 2 pls. 5c.
Describes manufacture of strawboard, present and proposed methods of disposal of waste liquors, laboratory investigations of precipitation and sedimentation, and field studies of amounts and character of water used, raw material and finished product, and mechanical filtration.

*194. Pollution of Illinois and Mississippi rivers by Chicago sewage (a digest of the testimony taken in the case of the State of Missouri *v.* The State of Illinois and the Sanitary District of Chicago), by M. O. Leighton. 1907. 369 pp., 2 pls. 40c.
Scope indicated by amplification of title.

*196. Water supply of Nome region, Seward Peninsula, Alaska, 1906, by J. C. Hoyt and F. F. Henshaw. 1907. 52 pp., 6 pls. 15c.
Gives results of measurements of flow of Alaskan streams, discusses available water supply for ditch and pipe lines and power development; presents notes for investors.

*200. Weir experiments, coefficients, and formulas (revision of paper No.150), by R. E. Horton. 1907. 195 pp., 38 pls. 35c.
Scope indicated by title.

*218. Water-supply investigations in Alaska, 1906–7 (Nome and Kougarok regions, Seward Peninsula; Fairbanks district, Yukon-Tanana region), by F. F. Henshaw and C. C. Covert. 1908. 156 pp., 12 pls. 25c.
Describes the drainage basins, gives results of observations at the gaging stations, and discusses the water supply of the ditches and pipe lines, and possibilities of development; gives also meteorological records.

*226. The pollution of streams by sulphite pulp waste, a study of possible remedies, by E. B. Phelps. 1908. 37 pp., 1 pl. 10c.
Describes manufacture of sulphite pulp, the waste liquors, and the experimental work leading to suggestions as to methods of preventing stream pollution.

228. Water-supply investigations of the Yukon-Tanana region, Alaska, 1907 and 1908 (Fairbanks, Circle, and Rampart districts), by C. C. Covert and C. E. Ellsworth. 1909. 108 pp., 7 pls. 20c.
Describes the drainage basins; gives results of observations at gaging stations; discusses the water supplies of the ditches and pipe lines and possibilities of hydraulic development.

*229. The disinfection of sewage and sewage filter effluents, with a chapter on the putrescibility and stability of sewage effluents, by E. B. Phelps. 1909. 91 pp., 1 pl. 15c.
Scope indicated by title.

*234. Papers on the conservation of water resources. 1909. 96 pp., 2 pls. 15c.
Contains the following papers, whose scope is indicated by their titles: Distribution of rainfall, by Henry Gannett; Floods, by M. O. Leighton; Developed water powers, compiled under the direction of W. M. Steuart, with discussion by M. O. Leighton; Undeveloped water powers, by M. O. Leighton; Irrigation, by F. H. Newell; Underground waters, by W. C. Mendenhall; Denudation, by R. B. Dole and Herman Stabler; Control of catchment areas, by H. N. Parker.

*235. The purification of some textile and other factory wastes, by Herman Stabler and G. H. Pratt. 1909. 76 pp. 10c.
Discusses waste waters from wool-scouring, bleaching, and dyeing cotton yarn, bleaching cotton piece goods, and manufacture of oleomargarine, fertilizer, and glue.

236. The quality of surface waters in the United States: Part I, Analyses of waters east of the one-hundredth meridian, by R. B. Dole. 1909 123 pp. 10c.
Describes collection of samples, method of examination, preparation of solutions, accuracy of estimates, and expression of analytical results.

238. The public utility of water powers and their governmental regulation, by René Tavernier and M. O. Leighton. 1910. 161 pp. 15c.
Discusses hydraulic power and irrigation, French, Italian, and Swiss legislation relative to the development of water powers, and laws proposed in the French parliament; reviews work of bureau of hydraulics and agricultural improvement of the French department of agriculture, and gives résumé of Federal and State water-power legislation in the United States.

255. Underground waters for farm use, by M. L. Fuller. 1910. 58 pp., 17 pls. 15c.
Discusses rocks as sources of water supply and the relative safety of supplies from different materials; springs, and their protection; open or dug and deep wells, their location, yield, relative cost, protection, and safety; advantages and disadvantages of cisterns and combination wells and cisterns.

257. Well-drilling methods, by Isaiah Bowman. 1911. 139 pp., 4 pls. 15c.
Discusses amount, distribution, and disposal of rainfall, water-bearing rocks, amount of underground water and artesian conditions, and oil and gas bearing formations; gives history of well drilling in Asia, Europe, and the United States; describes in detail the various methods and the machinery used; discusses loss of tools and geologic difficulties; contamination of well waters and methods of prevention; tests of capacity and measurement of depth; and costs of sinking wells.

*258. Underground water papers, 1910, by M. L. Fuller, F. G. Clapp, G. C. Matson, Samuel Sanford, and H. C. Wolff. 1911. 125 pp., 2 pls. 15c.
Contains the following papers (scope indicated by titles) of general interest:
Drainage by wells, by M. L. Fuller.
Freezing of wells and related phenomena, by M. L. Fuller.
Pollution of underground waters in limestone, by G. C. Matson.
Protection of shallow wells in sandy deposits, by M. L. Fuller.
Magnetic wells, by M. L. Fuller.

259. The underground waters of southwestern Ohio, by M. L. Fuller and F. G. Clapp, with a discussion of the chemical character of the waters, by R. B. Dole. 1912. 228 pp., 9 pls. 35c.
Describes the topography, climate, and geology of the region, the water-bearing formations, the source, mode of occurrence and head of the waters, and municipal supplies; gives details by counties; discusses in supplement, under chemical character, method of analysis and expression of results, mineral constituents, effect of the constituents on waters for domestic, industrial, or medicinal uses, methods of purification, chemical composition; many analyses and field assays. The matter in the supplement was also published in Water-Supply Paper 254 (The underground waters of north-central Indiana).

274. Some stream waters of the western United States, with chapters on sediment carried by the Rio Grande and the industrial application of water analyses, by Herman Stabler. 1911. 188 pp. 15c.
Describes collection of samples, plan of analytical work, and methods of analyses; discusses soap-consuming power of waters, water softening, boiler waters, and water for irrigation.

280. Gaging stations maintained by the United States Geological Survey, 1888–1910, and Survey publications relating to water resources, compiled by B. D. Wood. 1912. 102 pp. 10c.

314. Surface water supply of Seward Peninsula, Alaska, by F. F. Henshaw and G. L. Parker, with a sketch of the geography and geology by P. S. Smith, and a description of methods of placer mining by A. H. Brooks. 1913. 317 pp., 17 pls. 45c.
Contains results of work at gaging stations.

315. The purification of public water supplies, by G. A. Johnson. 1913. 84 pp., 8 pls. 10c.
Discusses ground, lake, and river waters as public supplies, development of waterworks systems in the United States, water consumption, and typhoid fever; describes methods of filtration and sterilization of water, and municipal water softening.

318. Water resources of Hawaii, 1909–1911, by W. F. Martin and C. H. Pierce. 1913. 552 pp., 15 pls. 50c.
Describes the general features of the islands and gives results of measurements of streams and of observations of rainfall and evaporation; contains gazetteer and a glossary of Hawaiian words in common use.

334. The Ohio Valley flood of March–April, 1913 (including comparisons with some earlier floods), by A. H. Horton and H. J. Jackson. 1913. 96 pp., 22 pls. 20c.
Although relating specifically to floods in the Ohio Valley, this report discusses also the causes of floods and the prevention of damage by floods.

336. Water resources of Hawaii, 1912, by C. H. Pierce and G. K. Larrison. 1914. 392 pp. 50c.
Contains results of stream measurements on the islands in 1912.

337. The effects of ice on stream flow, by William Glenn Hoyt. 1913. 77 pp., 7 pls. 15c.
Discusses methods of measuring the winter flow of streams.

342. Surface water supply of the Yukon-Tanana region, Alaska, by C. E. Ellsworth and R. W. Davenport. 1915. 343 pp., 13 pls. 45c.
Presents results of six years of observations of the water supply of the Yukon-Tanana region discusses climate and precipitation, and gives station records.

*345. Contributions to the hydrology of the United States, 1914. N. C. Grover, chief hydraulic engineer. 1915. 225 pp., 17 pls. 30c.
*(e) A method of determining the daily discharge of rivers of variable slope, by M. R. Hall, W. E. Hall, and C. H. Pierce, pp. 53–65. 5c. Scope indicated by title.
(f) The discharge of Yukon River at Eagle, Alaska, by E. A. Porter and R. W. Davenport, pp. 67–77, pls. IV–V. 5c. Describes briefly the location and size of the Yukon basin, the climatic conditions in the basin, and methods of collecting hydrometric data; compares run-off with precipitation, and gives table showing the discharge of some of the large rivers in the United States as compared with the discharge of the Yukon and the Nile.

364. Water analyses from the laboratory of the United States Geological Survey, tabulated by F. W. Clarke, chief chemist. 1914. 40 pp. 5c.
Contains analyses of waters from rivers, lakes, wells, and springs in various parts of the United States, including analyses of the geyser water of Yellowstone National Park, hot springs in Montana, brines from Death Valley, water from the Gulf of Mexico, and mine waters from Tennessee, Michigan, Missouri, and Oklahoma, Montana, Colorado and Utah, Nevada and Arizona, and California.

371. Equipment for current-meter gaging stations, by G. J. Lyon. 1915. 64 pp., 37 pls. 20c.
Describes methods of installing recording and other gages and of constructing gage wells, shelters, and structures for making discharge measurements and artificial controls.

373. Water resources of Hawaii, 1913, by G. K. Larrison. 1915. 190 pp. 20c.
Contains results of stream measurements on the islands in 1913.

375. Contributions to the hydrology of the United States, 1915. N. C. Grover, chief hydraulic engineer. 1916. 181 pp., 9 pls. 15c.
(c) Relation of stream gaging to the science of hydraulics, by C. H. Pierce and R. W. Davenport, pp. 77–84.
(e) A method for correcting river discharge for changing stage, by B. E. Jones, pp. 117–130.
(f) Conditions requiring the use of automatic gages in obtaining stream-flow records, by C. H. Pierce, pp. 131–139.

400. Contributions to the hydrology of the United States, 1916. N. C. Grover, chief hydraulic engineer.
(a) The people's interest in water-power resources, by G. O. Smith, pp. 1–8.

ANNUAL REPORTS.

*Fifth Annual Report of the United States Geological Survey, 1883–84, J. W. Powell, Director. 1885 xxxvi, 469 pp., 58 pls. $2.25. Contains:
*The requisite and qualifying conditions of artesian wells, by T. C. Chamberlain, pp. 125 to 173, Pl. XXI. Scope indicated by title.

*Twelfth Annual Report of the United States Geological Survey, 1890–91, J. W. Powell, Director. 1891. 2 parts. Pt. II, Irrigation, xviii, 576 pp., 93 pls. $2. Contains:
*Irrigation in India, by H. M. Wilson, pp. 363–561, Pls. CVII to CXLVI. (See Water-supply Paper 87.)

Thirteenth Annual Report of the United States Geological Survey, 1891–92, J. W. Powell, Director. 1892. (Pts. II and III, 1893.) 3 parts. Pt. III, Irrigation, pp. xi, 486, 77 plates. $1.85. Contains:

*American irrigation engineering, by H. M. Wilson, pp. 101–349, Pls. CXI to CXLVI. Discusses the economic aspects of irrigation, alkaline drainage, silt and sedimentation; gives brief history of legislation; describes canals; discusses water storage at reservoirs of the California and other projects, subsurface sources of supply, pumping and subirrigation.

Fourteenth Annual Report of the United States Geological Survey, 1892–93, J. W. Powell, Director, 1893. (Pt. II, 1894.) 2 parts. *Pt. II, Accompanying papers, pp. xx, 597, 73 pls. $2.10. Contains:

*Potable waters of the eastern United States, by W J McGee, pp. 1 to 47. Discusses cistern water, stream waters, and ground waters, including mineral springs and artesian wells.

*Natural mineral waters of the United States, by A. C. Peale, pp. 49–88, Pls. III and IV. Discusses the origin and flow of mineral springs, the source of mineralization, thermal springs, the chemical composition and analysis of spring waters, geographic distribution, and the utilization of mineral waters; gives a list of American mineral spring resorts; contains also some analyses.

Nineteenth Annual Report of the United States Geological Survey, 1897–98, Charles D. Walcott, Director. 1898. (Parts II, III, and V, 1899.) 6 parts in 7 vols. and separate case for maps with Pt. V. *Pt. II, papers chiefly of a theoretical nature, pp. v, 958, 172 plates. $2.65. Contains:

*Principles and conditions of the movements of ground water, by F. H. King, pp. 59–294, Pls. VI to XVI. Discusses the amount of water stored in sandstone, in soil, and in other rocks; the depth to which ground water penetrates; gravitational, thermal, and capillary movements of ground waters, and the configuration of the ground-water surface; gives the results of experimental investigations on the flow of air and water through a rigid, porous media and through sands, sandstones, and silts; discusses results obtained by other investigators, and summarizes results of observations; discusses also rate of flow of water through sand and rock, the growth of rivers, rate of filtration through soil, interference of wells, etc.

*Theoretical investigation of the motion of ground waters, by C. S. Slichter, pp. 295–384, Pl. XVII. Scope indicated by title.

Twentieth Annual Report of the United States Geological Survey, 1898–99, Charles D. Walcott, Director. 1899. (Parts II, III, IV, V, and VII, 1900.) 7 parts in 8 vols. and separate case of maps with Pt. V. *Pt. IV, Hydrography, vii, 660 pp., 75 plates. $1.40. Contains:

*Hydrography of Nicaragua, by A. P. Davis, pp. 563–637, Pls. LXIV to LXXV. Describes the topographic features of the boundary, the lake basin, and Rio San Juan; gives a brief résumé of the boundary dispute; discusses rainfall, temperature, and relative humidity, evaporation, resources, and productions, the ship, railway and canal projects; gives the history of the investigations by the Canal Commission, and results of measurements on the Rio Grande, on streams tributary to Lake Nicaragua, and on Rio San Juan and its tributaries.

Twenty-second Annual Report of the United States Geological Survey, 1900–1901, Charles D. Walcott, Director. 1901. (Parts III and IV, 1902.) 4 parts. Pt. IV, Hydrography, 690 pp., 65 pls. $2.20. Contains:

*Hydrography of the American Isthmus, by A. P. Davis, pp. 507–630, Pls. XXXVII to L. Describes the physiography, temperature, rainfall, and winds of Central America; discusses the hydrography of the Nicaragua Canal route and the Panama Canal route; gives estimated monthly discharges of many of the streams, and rainfall and evaporation tables at various points.

PROFESSIONAL PAPERS.

72. Denudation and erosion in the southern Appalachian region and the Monongahela basin, by L. C. Glenn. 1911. 137 pp., 21 pls. 35c.

Describes the topography, geology, drainage, forests, climate, and population, and transportation facilities of the region, the relation of agriculture, lumbering, mining, and power development to erosion and denudation, and the nature, effects, and remedies of erosion; gives details of conditions in Holston, Nolichucky, French Broad, Little Tennessee, and Hiwassee river basins, along Tennessee River proper, and in the basins of the Coosa-Alabama system, Chattahoochee, Savannah, Saluda, Broad, Catawba, Yadkin, New, and Monongahela rivers.

86. The transportation of débris by running water, by G. K. Gilbert, based on experiments made with the assistance of E. C. Murphy. 1914. 263 pp., 3 pls. 70c.

The results of an investigation which was carried on in a specially equipped laboratory at Berkeley, Cal., and was undertaken for the purpose of learning "the laws which control the movement of bed load and especially to determine how the quantity of load is related to the stream, slope and discharge and to the degree of comminution of the débris."

A highly technical report.

BULLETINS.

*32. Lists and analyses of the mineral springs of the United States (a preliminary study), by A. C. Peale. 1886. 235 pp.

Defines mineral waters, lists the springs by States, and gives tables of analyses so far as available.

264. Record of deep-well drilling for 1904, by M. L. Fuller, E. F. Lines, and A. C. Veatch. 1905. 106 pp. 10c.

*298. Record of deep-well drilling for 1905, by M. L. Fuller and Samuel Sanford. 1906. 299 pp. 25c.

Bulletins 264 and 298 discuss the importance of accurate well records to the driller, to owners of oil, gas, and water wells, and to the geologist; describes the general methods of work; gives tabulated records of wells by States, and detailed records selected as affording valuable stratigraphic information.

*319. Summary of the controlling factors of artesian flows, by Myron L. Fuller. 1908. 44 pp., 7 pls. 10c.

Describes underground reservoirs, the sources of underground waters, the confining agents, the primary and modifying factors of artesian circulation, the essential and modifying factors of artesian flow, and typical artesian systems.

*479. The geochemical interpretation of water analysees, by Chase Palmer. 1911. 31 pp. 5c.

Discusses the expression of chemical analyses, the chemical character of water and the properties of natural waters; gives a classification of waters based on property values and reacting values, and discusses the character of the waters of certain rivers as interpreted directly from the results of analyses; discusses also the relation of water properties to geologic formations, silica in river water, and the character of the water of the Mississippi and the Great Lakes and St. Lawrence River as indicated by chemical analyses.

INDEX BY AREAS AND SUBJECTS.

[A=Annual Reports; M=Monograph; B=Bulletin; P=Professional Paper; W=Water-Supply Paper; GF=Geologic folio. For titles see preceding pages.]

[1] Many of the reports contain brief subject bibliographies. See abstracts.

[2] Many analyses of river, spring, and well waters are scattered through publications, as noted in abstracts.

INDEX OF STREAMS.