DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY
GEORGE OTIS SMITH, DIRECTOR

WATER-SUPPLY PAPER 329

SURFACE WATER SUPPLY OF THE UNITED STATES

1912

PART IX. COLORADO RIVER BASIN

BY

ROBERT FOLLANSBEE, E. A. PORTER
AND H. D. PADGETT

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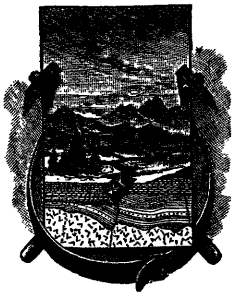

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SURFACE WATER SUPPLY OF COLORADO RIVER BASIN, 1912.

By ROBERT FOLLANSBEE, E. A. PORTER, and H. D. PADGETT.

AUTHORIZATION AND SCOPE OF WORK.

This volume is one of a series of 12 reports presenting results of measurements of flow made on streams in the United States during the calendar year 1912.

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 civil bills passed by Congress have carried the following item and appropriations:

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

Annual appropriations for the fiscal year ending June 30—

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 1913, inclusive	150,000

In the execution of the work many private and State organizations have cooperated, either by furnishing data or by assisting financially in collecting the data. Acknowledgments for cooperation of the first kind are made in connection with the description of each station affected and of the second kind on page 16.

Measurements of stream flow have been made at about 2,000 points in the United States and also at many points in small areas in Seward Peninsula and the Yukon-Tanana region, Alaska, and in the Hawaiian Islands. During 1912 gaging stations were maintained by the Survey and the cooperating organizations at about 1,500 points, and many discharge measurements were 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.

PUBLICATIONS.

A report for each calendar year has been prepared embodying the stream-flow data collected during that year. An index to the reports containing stream-flow measurements prior to 1904 has been published as Water-Supply Paper 119. Circulars are also available giving complete lists of the gaging stations maintained by the Survey to date, and a list of the reports relating to the water supply of the country.

Prior to 1902 gage heights and discharge measurements were published in water-supply papers or bulletins and estimates of monthly discharge in annual reports; since 1902 both classes of data have been published in water-supply papers, and they are now being published in 12 parts, as shown in the following table:

Papers on surface water supply of the United States, 1912.

Part.[a]	No.	Title.
I	321	North Atlantic coast basin.
II	322	South Atlantic coast and eastern Gulf of Mexico basins.
III	323	Ohio River basin.
IV	324	St. Lawrence River basin.
V	325	Upper Mississippi River and Hudson Bay basins.
VI	326	Missouri River basin.
VII	327	Lower Mississippi River basin.
VIII	328	Western Gulf of Mexico basin.
IX	329	Colorado River basin.
X	330	Great Basin.
XI	331	Pacific coast basin in California.
XII	332	North Pacific coast basin.

[a] For the purpose of uniformity in the presentation of reports, a general plan has been agreed upon by the United States Reclamation Service, the United States Forest Service, the United States Weather Bureau, and the United States Geological Survey, according to which the area of the United States has been divided into 12 parts, whose boundaries coincide with natural drainage lines indicated by the parts of the report.

A list of reports containing stream-flow data is presented in the following table:

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

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

Report.	Character of data.	Year.
10th A, pt. 2	Descriptive information only	
11th A, pt. 2	Monthly discharge	1884 to September, 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.
WS 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.
WS 15	Descriptions, measurements, and gage heights, eastern United States, eastern Mississippi River, and Missouri River above junction with Kansas.	1897.
WS 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.
WS 27	Measurements, ratings, and gage heights, eastern United States, eastern Mississippi River, and Missouri River.	1898.
WS 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.
WS 35 to 39	Descriptions, measurements, gage heights, and ratings	1899.
21st A, pt. 4	Monthly discharge	1899.
WS 47 to 52	Descriptions, measurements, gage heights, and ratings	1900.
22d A, pt. 4	Monthly discharge	1900.
WS 65, 66	Descriptions, measurements, gage heights, and ratings	1901.
WS 75	Monthly discharge	1901.
WS 82 to 85	Complete data	1902.
WS 97 to 100	do	1903.
WS 124 to 135	do	1904.
WS 165 to 178	do	1905.
WS 201 to 214	Complete data, except descriptions	1906.
WS 241 to 252	Complete data	1907–8.
WS 261 to 272	do	1909.
WS 281 to 292	do	1910.
WS 301 to 312	do	1911.
WS 321 to 332	do	1912.

NOTE.—No data regarding stream flow are given in the 15th and 17th annual reports.

The following table gives, by years and drainage basins, the numbers of the papers on surface-water supply published from 1899 to 1912. The data for any particular station will be found in the reports covering the years during which the station was maintained. For example, data for any station in the area covered by Part I are published in Water-Supply Papers 97, 124, 165, 201, 241, 261, 281, 301, and 321, which contain records for the New England streams from 1903 to 1912. The year covered by the report is indicated at the head of the column in which the paper is listed.

Numbers of water-supply papers containing results of stream measurements, 1899–1912.

	1899 [a]	1900 [b]	1901	1902	1903	1904	1905	1906	1907–8	1909	1910	1911	1912
North Atlantic coast (St. John River to York River)	35	47, [c] 48	65, 75	82	97	[d] 124, [e] 125, [f] 126	[d] 165, [e] 166, [f] 167	[d] 201, [e] 202, [f] 203	241	261	281	301	321
South Atlantic coast and eastern Gulf of Mexico (James River to the Mississippi)	[g] 35, 36	48	65, 75	[g] 82, 83	[g] 97, 98	[f] 126, 127	[f] 167, 168	[f] 203, 204	242	262	282	302	322
Ohio River basin	36	48, [h] 49	65, 75	83	98	128	169	205	243	263	283	303	323
St. Lawrence River and Great Lakes	36	49	65, 75	[i] 82, 83	97	129	170	206	244	264	284	304	324
Hudson Bay and upper Mississippi River	36	49	[j] 65, 66, 75	[j] 83, 85	[j] 98, 99, 100	[j] 128, 130	171	207	245	265	285	305	325
Missouri River	[k] 36, 37	49, [l] 50	66, 75	84	99	130, [m] 131	172	208	246	266	286	306	326
Lower Mississippi River	37	50	[j] 65, 66, 75	[j] 83, 84	[j] 98, 99	[j] 128, 131	[j] 169, 173	[j] 205, 209	247	267	287	307	327
Western Gulf of Mexico	37	50	66, 75	84	99	132	174	210	248	268	288	308	328
Colorado River	[n] 37, 38	50	66, 75	85	100	133	175, [o] 177	211	249	269	289	309	329
Great Basin	38, [p] 39	51	66, 75	85	100	133, [q] 134	176, [q] 177	212, [q] 213	250, [q] 251	270, [q] 271	290	310	330
Pacific coast in California	38, [r] 39	51	66, 75	85	100	134	177	213	251	271	291	311	331
North Pacific coast	38	51	66, 75	85	100	135	[s] 177, 178	214	252	272	292	312	332

[a] Rating tables and index to Water-Supply Papers 35–39 contained in Water-Supply Paper 39.
[b] 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.
[c] Wissahickon and Schuylkill rivers to James River.
[d] New England rivers only.
[e] Hudson River to Delaware River, inclusive.
[f] Susquehanna River to Yadkin River, inclusive.
[g] James River only.
[h] Scioto River.
[i] Lake Ontario and tributaries to St. Lawrence River proper.
[j] Tributaries of Mississippi from east.
[k] Gallatin River.
[l] Loup and Platte rivers near Columbus, Nebr., and all tributaries below junction with Platte.
[m] Platte and Kansas rivers.
[n] Green and Gunnison rivers and Grand River above junction with Gunnison.
[o] Below junction with Gila.
[p] Mohave River only.
[q] Great Basin in California, excepting Truckee and Carson drainage basins.
[r] Kings and Kern rivers and south Pacific coast drainage basins.
[s] Rogue, Umpqua, and Siletz rivers only.

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:

Albany, N. Y., Room 18, Federal Building.
Atlanta, Ga., Post Office Building.
Newport, Ky., Federal Building.
St. Paul, Minn., Old Capitol Building.
Madison, Wis., Capitol Building.
Helena, Mont., Montana National Bank Building.
Denver, Colo., 302 Chamber of Commerce Building.
Salt Lake City, Utah, Federal Building.
Boise, Idaho, 615 Idaho Building.
Portland, Oreg., 416 Couch Building.
Tacoma, Wash., Federal Building.
San Francisco, Cal., 505 Custom House.
Los Angeles, Cal., Federal Building.
Santa Fe, N. Mex., Capitol Building.
Honolulu, Hawaii, Kapiolani Building.

A list of the Geological Survey's publications will be sent on application to the Director of the United States Geological Survey, Washington, D. C.

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 which 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 which represent the actual quantity of water, as run-off in depth in inches and acre-feet. The units used in this series of reports are second-feet, second-feet per square mile, run-off in inches and acre-feet. They may be defined as follows:

"Second-foot" is an abbreviation for cubic foot per second and is the unit for the rate of discharge of water flowing in a stream 1 foot wide, 1 foot deep, at a rate 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 following table of equivalents.

"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 in 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 work.

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.

Second-feet per square mile.	Run-off 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 partial month multiply the values for one day by the number of days.

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

Second-feet.	Run-off in 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	367.0	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 partial month multiply values for one day by the number of days.

1 second-foot equals 40 California miner's inches (law of Mar. 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 covers 1 square mile 1.131 feet or 13.572 inches deep.
1 second-foot for one year equals 31,536,000 cubic feet.
1 second-foot equals about 1 acre-inch per hour.
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.
1⅓ horsepower equals about 1 kilowatt.

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

EXPLANATION OF DATA.

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

In addition to statements regarding the location and installation of current-meter stations, the descriptions give information in regard to any conditions which may affect the constancy of the relation of gage height to discharge, covering such points as ice, logging, shifting

channels, and backwater; also information regarding diversions which decrease the total flow at the measuring section. Statements are also made regarding the accuracy and reliability of the data.

The table of daily gage heights records 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. The gage height given in the table represents the elevation of the surface of the water above the zero of the gage. All gage heights affected by the presence of ice in the streams or by backwater from obstructions 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 and has no relation to zero flow or the bottom of the river. In general the zero is located somewhat below the lowest known flow, so that negative readings shall not occur.

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

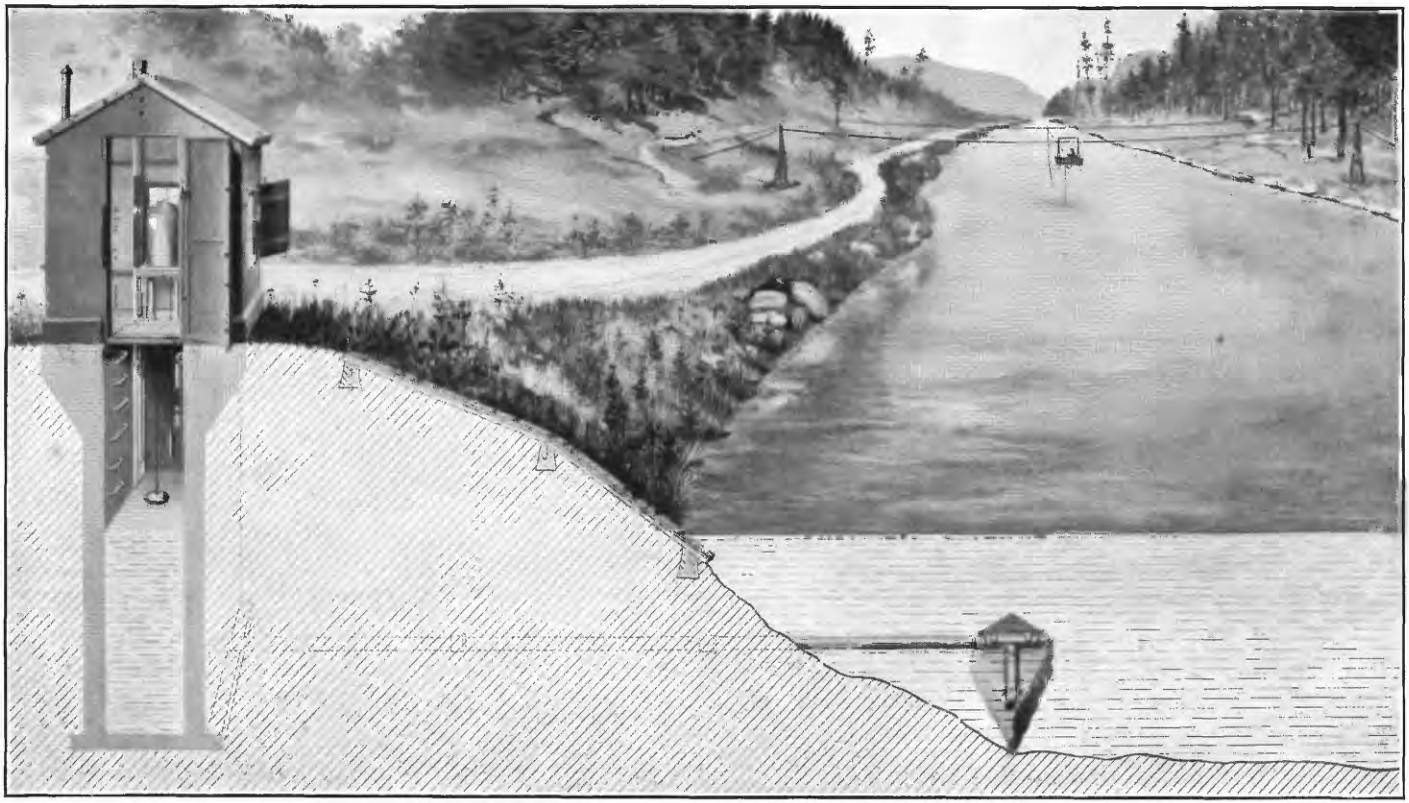
The rating table gives, either directly or by interpolation, the discharge in second-feet corresponding to every stage of the river recorded during the period for which it is applicable. It is not published in this report, but can be determined from the tables of daily gage heights and daily discharge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

The table of daily discharges gives the discharges in second-feet corresponding to the observed gage heights as determined from the rating tables.

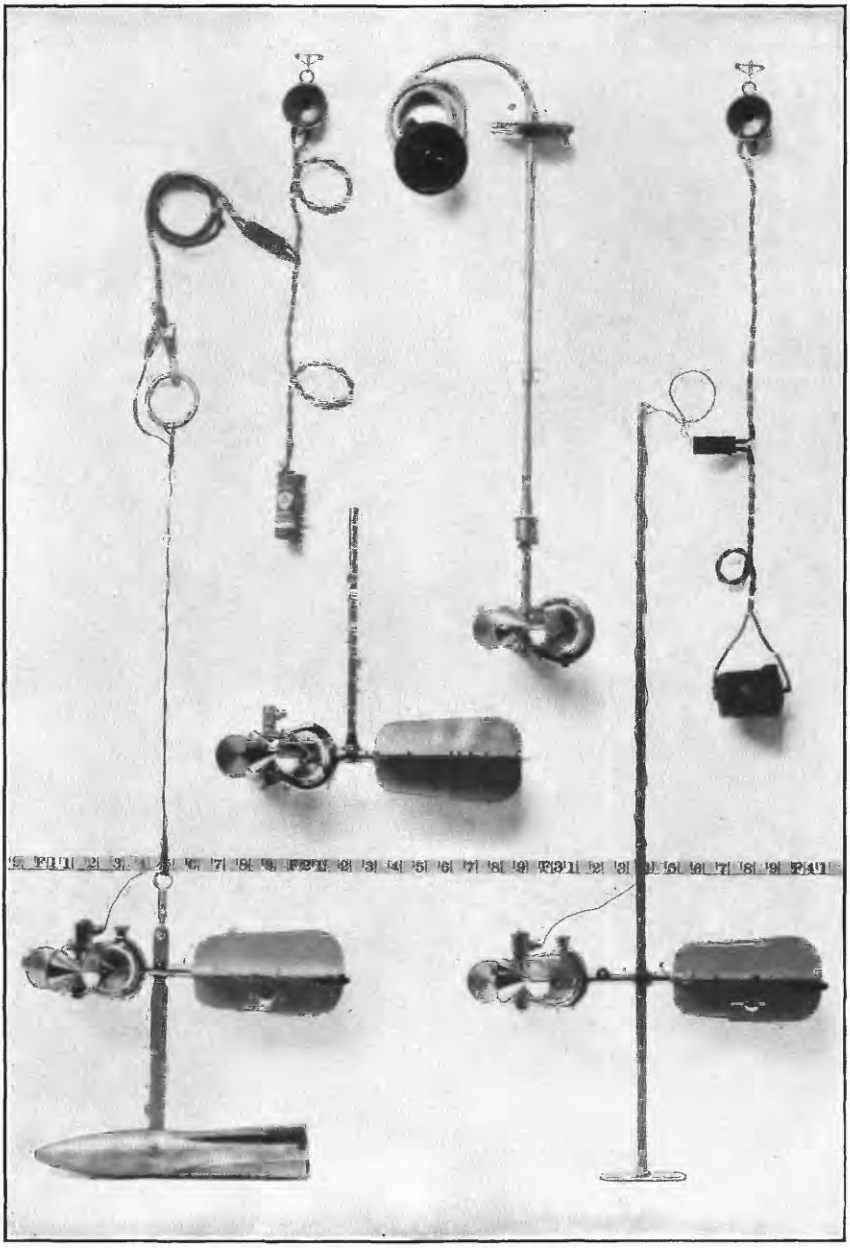
In the table of monthly discharge the column headed "Maximum" gives the mean flow, as determined from the rating table, for the day when the mean gage height was highest. As the gage height is the mean for the day, it does not indicate correctly the stage when the water surface was at crest height, and 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 12, are based.

The base data presented in this report, unless otherwise stated in description of station, have been collected by the methods commonly used at current-meter gaging stations and described in standard textbooks.

Plate I shows typical gaging stations. Plate II shows the current meter used in the work.



TYPICAL GAGING STATIONS.



PRICE CURRENT METERS.

ACCURACY AND RELIABILITY OF FIELD DATA AND COMPARATIVE RESULTS.

The accuracy of stream-flow data depends primarily on the natural conditions at the gaging station and on the methods and care with which the data are collected. Errors of the first group depend on the degree of permanency of channel and of permanency of the relation between discharge and stage.

Errors of the second class are due, first, to errors in observation of stage; second, to errors in measurements of flow; and, third, to errors due to misinterpretation of stage and flow data.

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 maximum or minimum nor to any individual day, but to the monthly mean. It is based on the accuracy of the rating, the probable reliability of the observer, 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 runoff 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, and they should, therefore, be considered as only approximate, particularly for periods of irrigation or of low water. For these errors it is as a rule not feasible to make adequate correction.

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 examining and adjusting to his own needs 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 determinations of daily discharge allow more detailed studies of the variation in flow by which the period of deficiency may be determined

It should be borne in mind that the observations in each succeeding year may be expected to throw new light on data already collected and published, and the engineer who makes use of the figures presented in these papers should verify all ratings and make such adjustments for earlier years as may seem necessary.

COOPERATION AND ASSISTANCE.

Work in New Mexico, in Utah, and in Arizona was carried on under cooperative agreement between the United States Geological Survey and the States.

In New Mexico, as a result of cooperation with Mr. James A. French, State engineer, a suboffice was opened at Santa Fe, and work actively resumed. The greater part of the field expense was paid by the State.

Special acknowledgments are also due to Mr. Caleb Tanner, State engineer of Utah.

In 1912 the State of Arizona passed an act providing that "The director of the Arizona Agricultural Experiment Station is hereby authorized and directed to formulate and enter into such agreements with the Director of the United States Geological Survey * * * as shall insure economy of expenditure and promptness of publication, and secure avoidance of duplication of work and other embarrassments incident to the operation of State and Federal agencies in the same field." On August 1, 1912, a joint cooperative agreement was signed by the Director of the United States Geological Survey and R. H. Forbes, director of the Arizona Agricultural Experiment Station. All work is carried on under the direct supervision of the United States Geological Survey, subject to the approval of the director of the Arizona Agricultural Experiment Station.

DIVISION OF WORK.

The field data in the Grand River drainage basin were collected under the direction of Robert Follansbee, district engineer, by H. B. Waha, J. L. Mathias, Raymond Richards, and R. H. Fletcher.

The work in New Mexico was under the general supervision of Robert Follansbee. Beginning with August, the work was in the direct charge of G. A. Gray, assistant engineer, who was assisted by F. O'Brien, J. E. Powers, C. J. Emerson, and E. L. Redding.

Field data in the Colorado drainage basin in Utah were collected under direction of E. C. La Rue, and E. A. Porter, district engineers, by J. C. Dort, G. H. Russell and Leonard Tanner.

Field data in Colorado drainage basin in Arizona were collected under the direction of H. D. McGlashan, by C. C. Jacobs and W. Richins.

Ratings, special estimates, and studies of the completed data were made by Robert Follansbee, E. A. Porter, G. A. Gray, H. D. McGlashan, Lynn Crandall, G. C. Stevens, and H. D. Padgett.

Computations were made by Robert Follansbee, Raymond Richards, R. H. Fletcher, G. A. Gray, H. J. Dean, R. C. Rice, Lynn Crandall, W. R. King, H. D. Padgett, B. E. Jones, M. I. Walters, and A. W. Harrington.

The data were prepared for publication by H. D. Padgett.

The report was edited by Mrs. B. D. Wood.

STATION RECORDS.

GREEN RIVER AND THE MAIN COLORADO.

GREEN RIVER NEAR KENDALL, WYO.

Location.—At Kendall ranger station, in sec. 23, T. 38 N., R. 110 W., on the southern border of the Yellowstone National Forest, about 6 miles north of Kendall post office. The nearest tributary, Gypsum Creek, enters a short distance below the station.

Records available.—August 3, 1910, to June 30, 1912.

Drainage area.—Not measured.

Gage.—Chain gage. On September 24, 1910, the datum was raised 2.52 feet, and all previous records corrected by that amount.

Channel.—Apparently permanent.

Discharge measurements.—Made from car and cable.

Winter flow.—Ice causes backwater and records are discontinued during the winter months.

Diversions.—Prior to July 1, 1912, there were adjudicated diversions from Green River of 354 second-feet. Practically all headgates are below the station.

Accuracy.—Conditions are favorable for accurate results and the estimates of daily discharge are considered reliable, though the station was not visited during 1912.

Cooperation.—Station maintained in cooperation with the United States Forest Service.

Daily gage height, in feet, and discharge, in second-feet, of Green River near Kendall, Wyo., for 1912.

[David E. Basham, observer.]

Day.	May.		June.		Day.	May.		June.	
	Gage height.	Discharge.	Gage height.	Discharge.		Gage height.	Discharge.	Gage height.	Discharge.
1					16			4.5	1,390
2	2.8	110			17			4.15	1,030
3	2.8	110			18			3.95	860
4					19			3.9	820
5					20			4.05	940
6					21			4.35	1,230
7					22			4.7	1,610
8			5.5	2,560	23			4.9	1,840
9			5.6	2,690	24				
10			5.3	2,320	25				
11			5.15	2,140	26				
12			5.0	1,960	27			5.4	2,440
13			5.05	2,020	28			5.4	2,440
14			5.0	1,960	29			5.25	2,260
15			4.7	1,610	30				
					31				

NOTE.—Daily discharge computed from the 1911 curve, which was slightly changed, owing to a corrected measurement, and which is well defined. No discharge measurements made during 1912.

GREEN RIVER NEAR BRIDGEPORT, UTAH.

Location.—At the ferry of the Jarvis or Park Live Stock Co. in sec. 3, T. 1 N., R. 25 E., Salt Lake base and meridian, 3 miles south of the town of Bridgeport, Utah.
Records available.—October 12, 1911, to December 31, 1912.
Drainage area.—Not measured.
Gage.—Staff, consisting of two vertical sections and one inclined section.
Channel.—Gravel and sand; may shift at high stages.
Discharge measurements.—Made from the ferryboat or car on ferry cable.
Winter flow.—Relation of gage height to discharge affected by ice during the winter months.
Diversions.—None.
Artificial regulation.—None.
Accuracy.—Records considered good for all stages.
The following measurement was made by J. C. Dort:
September 4: Gage height, 4.46; discharge, 1,810 second-feet.

Daily gage height, in feet, of Green River near Bridgeport, Utah, for 1912.

[Carl E. Johnson, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	3.0	3.0	3.0	5.0	4.25	7.9	11.4	6.65	4.9	3.85	3.9
2	3.0	3.0	3.0	5.0	4.25	8.4	10.9	6.65	4.8	3.85	3.9
3	3.0	3.0	3.0	5.0	4.5	8.9	11.6	6.75	4.7	3.8	3.9
4	3.0	3.0	3.0	5.0	4.5	9.2	11.4	6.75	4.5	3.8	3.9
5	3.0	3.0	3.0	5.0	4.75	9.9	11.2	6.55	.....	3.8	.....
6	3.0	3.0	3.0	5.0	4.75	10.5	10.8	6.45	.....	3.8	.....
7	3.0	3.0	3.0	5.0	4.95	10.8	10.7	6.45	.....	3.8	.....
8	3.0	3.0	3.0	4.5	5.2	11.1	9.9	6.35	4.2	3.9	.....
9	3.0	3.0	3.0	4.5	5.45	11.8	9.4	6.15	4.1	3.9	.....
10	3.0	3.0	3.0	4.5	5.7	12.4	8.9	5.95	.....	4.0	.....
11	3.0	3.0	3.0	4.5	5.95	12.7	8.5	5.95	.....	4.1	.....
12	3.0	3.0	3.0	4.5	5.95	12.8	8.3	5.85	.....	4.2	.....
13	3.0	3.0	3.0	4.5	6.2	13.4	8.3	5.75	.....	4.3	.....
14	3.0	3.0	3.0	4.5	6.2	13.4	8.1	5.55	.....	4.2	.....
15	3.0	3.0	3.0	4.5	6.2	13.1	7.9	5.45	.....	4.1	.....
16	3.0	3.0	3.0	4.5	5.95	12.8	7.9	5.45	.....	4.0	.....
17	3.0	3.0	3.0	4.5	5.7	11.8	7.7	5.45	.....	3.9	.....
18	3.0	3.0	3.0	4.5	5.7	10.8	7.7	5.55	.....	3.85	.....
19	3.0	3.0	3.0	4.5	5.7	10.2	7.6	5.55	.....	3.8	.....
20	3.0	3.0	3.0	4.5	6.45	9.8	7.5	5.35	.....	3.8	.....
21	3.0	3.0	3.0	4.5	6.95	9.5	7.3	5.65	.....	3.75	.....
22	3.0	3.0	3.5	4.25	7.4	9.3	7.3	5.55	3.95	3.75	.....
23	3.0	3.0	3.5	4.25	7.6	9.5	7.3	5.45	3.9	3.7	.....
24	3.0	3.0	5.0	4.25	7.9	9.0	7.1	5.45	3.85	3.7	.....
25	3.0	3.0	5.0	4.25	7.9	10.3	7.1	4.95	3.85	3.7	.....
26	3.0	3.0	5.0	4.0	7.5	10.5	6.95	4.9	3.9	3.7	.....
27	3.0	3.0	5.0	4.0	7.25	10.8	6.95	4.7	3.85	3.7	.....
28	3.0	3.0	5.0	4.0	6.95	11.4	6.95	4.6	3.8	3.7	.....
29	3.0	3.0	5.0	4.0	6.95	11.8	6.85	4.95	3.8	3.8	.....
30	3.0	.....	5.0	4.0	7.35	11.6	6.85	5.15	3.8	3.8	.....
31	3.0	.....	5.0	.....	7.7	.....	6.75	4.95	.....	3.9	.....

NOTE.—Relation of gage height to discharge affected by ice Jan. 1 to Apr. 7. Observer absent Nov. 5 to Dec. 31.

Daily discharge, in second-feet, of Green River near Bridgeport, Utah, for 1912.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	1,200	1,660	6,640	12,800	4,680	2,340	1,310	1,350
2	1,200	1,660	7,440	11,800	4,680	2,220	1,310	1,350
3	1,200	1,900	8,240	13,200	4,820	2,110	1,270	1,350
4	1,200	1,900	8,760	12,800	4,820	1,900	1,270	1,350
5	1,200	2,160	10,000	12,400	4,520	1,850	1,270	.....
6	1,200	2,160	11,100	11,600	4,380	1,800	1,270	.....
7	1,200	2,400	11,600	11,500	4,380	1,700	1,270	.....
8	1,900	2,710	12,200	10,000	4,240	1,620	1,350	.....
9	1,900	2,940	13,600	9,120	3,960	1,530	1,350	.....
10	1,900	3,360	14,800	8,240	3,680	1,510	1,440	.....
11	1,900	3,680	15,400	7,600	3,680	1,490	1,530	.....
12	1,900	3,680	15,600	7,280	3,560	1,480	1,620	.....
13	1,900	4,030	16,900	7,280	3,420	1,470	1,710	.....
14	1,900	4,030	16,900	6,960	3,160	1,460	1,620	.....
15	1,900	4,030	16,200	6,640	3,040	1,450	1,530	.....
16	1,900	3,680	15,600	6,640	3,040	1,440	1,440	.....
17	1,900	3,360	13,600	6,320	3,040	1,430	1,350	.....
18	1,900	3,360	11,600	6,320	3,160	1,420	1,310	.....
19	1,900	3,360	10,600	6,160	3,160	1,420	1,270	.....
20	1,900	4,380	9,840	6,000	2,900	1,410	1,270	.....
21	1,900	5,120	9,300	5,680	3,300	1,400	1,230	.....
22	1,660	5,840	8,940	5,680	3,160	1,400	1,230	.....
23	1,660	6,160	9,300	5,680	3,040	1,350	1,190	.....
24	1,660	6,640	8,400	5,680	3,040	1,310	1,190	.....
25	1,660	6,640	10,700	5,360	2,400	1,310	1,190	.....
26	1,440	6,000	11,100	5,120	2,340	1,350	1,190	.....
27	1,440	5,600	11,600	5,120	2,110	1,310	1,190	.....
28	1,440	5,120	12,800	5,120	2,000	1,270	1,190	.....
29	1,440	5,120	13,600	4,980	2,400	1,270	1,270	.....
30	1,440	5,760	13,200	4,980	2,640	1,270	1,270	.....
31	.....	6,320	.....	4,820	2,400	.....	1,350	.....

NOTE.—Discharge determined from a fairly well defined rating curve. Discharge Apr. 1 to 7 estimated because of ice. Discharge Sept. 5 to 7 and 10 to 21 interpolated. Mean discharge January to March and November to December estimated from climatologic data and records of Little Valley station.

Monthly discharge of Green River near Bridgeport, Utah, for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	[a] 550	33,800	D.
February	.....	.....	[a] 590	33,900	D.
March	.....	.....	[a] 774	47,600	D.
April	.....	.....	1,630	97,000	C.
May	6,640	1,660	4,020	247,000	A.
June	16,900	6,640	11,900	708,000	A.
July	13,200	4,820	7,700	473,000	A.
August	4,820	2,000	3,390	208,000	A.
September	2,340	1,270	1,540	91,600	B.
October	1,710	1,190	1,330	81,800	A.
November	.....	.....	1,100	65,500	D.
December	.....	.....	700	43,000	D.
The year	16,900	.....	2,930	2,130,000	

[a] Estimated.

GREEN RIVER AT LITTLE VALLEY, NEAR GREEN RIVER, UTAH.

Location.—At Little Valley Ferry, 4 miles downstream from Green River railroad station, in sec. 5, T. 22 S., R. 16 E., Salt Lake meridian.

Records available.—December 18, 1910, to December 31, 1912. Records are available at Green River (known also as Elgin or Blake), about 5 miles above this station, giving practically the same discharge for 1894–1899; 1905 to 1911.

Drainage area.—Not accurately known.

Gage.—Staff, in four sections—three inclined and one vertical.

Channel.—Shifts at measuring section; fairly permanent at control.

Discharge measurements.—Made from car on ferry cable.

Winter flow.—Ice affects relation of gage height to discharge at times during December, January, and February.

Diversions.—Below all important diversions.

Accuracy.—Rating curve well defined; records for 1912 considered good.

Discharge measurements of Green River at Little Valley, Utah, in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.ft.*			*Feet.*	*Sec.ft.*
Mar. 12	J. C. Dort	1.78	3,840	July 11	Porter and Dort	5.70	16,000
May 14	do	5.20	14,200	22	J. C. Dort	4.50	11,000
June 5	do	9.92	39,600	Nov. 16	G. H. Russell	1.86	3,860
20	do	8.85	30,700				

Daily gage height, in feet, of Green River at Little Valley, Utah, for 1912.

[S. E. Calkins, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.55	1.45	0.35	3.0	2.6	8.7	8.35	3.9	1.94	1.3	2.0	0.6
2	1.3	1.45	.4	3.4	2.7	8.77	8.4	3.98	2.2	1.3	1.8	.6
3	1.25	1.5	.45	3.6	3.0	9.1	8.25	3.7	2.2	1.4	2.1	.1
4	1.0	1.5	.5	3.3	3.37	9.5	8.1	3.65	2.2	1.4	2.1	.1
5	.55	1.55	.5	3.2	3.7	9.9	7.85	3.9	2.2	1.4	2.1	.1
6	.4	1.55	1.0	3.27	3.95	10.02	7.5	4.35	2.1	1.7	2.1	.1
7	.3	1.6	1.2	3.37	4.2	10.4	7.15	4.28	1.9	1.5	2.0	.1
8	.3	1.6	1.5	3.7	4.18	10.9	6.75	4.05	1.85	1.5	1.9	.1
9	.3	1.55	1.45	3.93	3.9	11.47	6.4	4.1	1.8	1.5	1.8	.1
10	.25	1.5	1.5	4.07	3.15	11.55	6.15	3.95	1.9	1.7	1.8	.2
11	.25	1.5	1.55	3.83	2.85	11.82	5.8	3.7	1.9	1.8	1.8	.2
12	.25	1.0	1.75	3.3	3.57	11.9	5.6	3.5	1.7	1.9	1.8	.4
13	.3	.8	2.0	3.2	4.15	11.73	5.42	3.0	1.6	1.9	1.8	.5
14	.35	.8	2.2	3.15	5.2	11.7	5.32	2.95	1.6	2.0	1.8	.5
15	.35	.7	2.45	3.1	5.25	11.62	5.25	2.85	1.6	1.97	1.8	.6
16	.4	.8	2.54	2.9	5.13	11.33	5.05	2.7	1.6	1.9	1.8	.6
17	.4	.3	2.3	2.9	5.2	10.9	4.95	2.75	1.6	1.87	1.85	.5
18	.4	.3	1.8	2.87	5.12	10.28	4.85	2.7	1.6	1.8	1.83	.5
19	.5	.35	1.6	2.8	5.0	9.95	4.85	2.74	1.7	1.8	1.8	.5
20	.55	.35	1.5	2.5	5.23	9.12	4.68	2.78	1.7	1.8	1.76	.5
21	.6	.4	1.6	2.45	6.22	8.25	4.6	2.75	2.0	1.7	1.65	.5
22	.6	.35	2.25	2.8	7.2	7.7	4.55	2.9	2.0	1.5	1.6	.3
23	.8	.35	2.8	2.83	7.82	7.3	4.5	2.82	1.8	1.5	1.6	.3
24	.85	.3	2.8	2.6	8.12	7.25	4.45	2.8	1.6	1.6	1.45	.3
25	.9	.3	2.4	2.65	8.2	7.2	4.7	2.6	1.5	1.6	1.45	.3
26	.95	.4	2.4	2.5	8.37	7.38	4.55	2.52	1.5	1.6	1.25	.3
27	1.5	.4	2.0	2.4	8.5	7.68	4.5	2.42	1.5	1.65	1.2	.3
28	1.5	.45	2.1	2.5	8.5	8.05	4.45	2.1	1.4	3.5	1.0	3.4
29	1.3	.4	2.0	2.55	8.53	8.38	4.7	2.0	1.4	1.64	.9	3.4
30	1.3	.....	2.0	2.7	8.7	8.4	4.4	1.9	1.3	2.85	.9	3.4
31	1.5	.....	2.87	.....	8.7	.....	4.05	2.05	.....	2.0	.....	3.4

NOTE.—Relation of gage height to discharge affected by ice Jan. 1 to 5, 27 to 31, Feb. 1 to 12, and Dec. 28 to 31.

Daily discharge, in second-feet, of Green River at Little Valley, Utah, for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,500	2,000	1,530	6,300	5,330	30,600	28,800	9,150	3,960	2,810	4,050	1,810
2	1,500	2,000	1,580	7,470	5,570	31,200	28,800	9,500	4,440	2,810	3,680	1,810
3	1,500	2,000	1,640	8,120	6,300	33,100	27,700	8,460	4,440	2,980	4,240	1,290
4	1,500	2,000	1,690	7,160	7,470	35,800	27,100	8,120	4,440	2,980	4,240	1,290
5	1,500	2,000	1,690	6,860	8,460	38,600	25,500	9,150	4,440	2,980	4,240	1,290
6	1,580	2,000	2,350	7,160	9,500	39,300	24,000	10,900	4,240	3,500	4,240	1,290
7	1,480	2,000	2,650	7,470	10,200	42,200	22,600	10,600	3,860	3,150	4,050	1,290
8	1,480	2,000	3,150	8,460	10,200	46,100	20,700	9,500	3,770	3,150	3,860	1,290
9	1,480	2,000	3,060	9,150	9,150	51,100	18,900	9,850	3,680	3,150	3,680	1,290
10	1,430	2,000	3,150	9,850	6,860	52,000	18,000	9,500	3,860	3,500	3,680	1,380
11	1,430	2,000	3,240	8,800	5,810	53,700	16,400	8,460	3,860	3,680	3,680	1,380
12	1,430	2,000	3,590	7,160	8,120	54,600	15,600	7,790	3,500	3,860	3,680	1,580
13	1,480	2,070	4,050	6,860	10,200	52,800	14,800	6,300	3,320	3,860	3,680	1,690
14	1,530	2,070	4,440	6,860	14,000	52,800	14,400	6,300	3,320	4,050	3,680	1,690
15	1,530	1,940	4,980	6,570	14,000	52,000	14,000	5,810	3,320	3,960	3,680	1,810
16	1,580	2,070	5,100	6,050	13,600	49,400	13,200	5,570	3,320	3,860	3,680	1,810
17	1,580	1,480	4,650	6,050	14,000	46,100	13,200	5,810	3,320	3,770	3,770	1,690
18	1,580	1,480	3,680	6,050	13,600	41,500	12,400	5,570	3,320	3,680	3,770	1,690
19	1,690	1,530	3,320	5,810	13,200	39,300	12,400	5,570	3,500	3,680	3,680	1,690
20	1,750	1,530	3,150	5,100	14,000	33,100	12,000	5,810	3,500	3,680	3,590	1,690
21	1,810	1,580	3,320	4,980	18,000	27,700	11,700	5,810	4,050	3,500	3,410	1,690
22	1,810	1,530	4,540	5,810	22,600	25,000	11,700	6,050	4,050	3,150	3,320	1,480
23	2,070	1,530	5,810	5,810	25,500	23,000	11,300	5,810	3,680	3,150	3,320	1,480
24	2,140	1,480	5,810	5,330	27,100	22,600	10,900	5,810	3,320	3,320	3,060	1,480
25	2,210	1,480	4,870	5,330	27,700	22,600	12,000	5,330	3,150	3,320	3,060	1,480
26	2,280	1,580	4,870	5,100	28,800	23,500	11,700	5,100	3,150	3,320	2,730	1,480
27	2,100	1,580	4,050	4,870	29,400	25,000	11,300	4,870	3,150	3,410	2,650	1,480
28	2,100	1,640	4,240	5,100	29,400	26,600	10,900	4,240	2,980	7,790	2,350	1,480
29	2,100	1,580	4,050	5,330	29,400	28,800	12,000	4,050	2,980	3,410	2,210	1,480
30	2,100	.....	4,050	5,570	30,600	28,800	10,900	3,860	2,810	5,810	2,210	1,480
31	2,100	.....	6,050	.....	30,600	.....	9,500	4,140	.....	4,050	.....	1,480

NOTE.—Daily discharge computed from a well-defined rating curve. Discharge estimated Jan. 1 to 5, 27 to 31, Feb. 1 to 12, and Dec. 28 to 31, because of ice.

Monthly discharge of Green River at Little Valley, Utah, for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet.)	Accuracy.
	Maximum.	Minimum.	Mean.		
January	2,280	.....	1,720	106,000	B.
February	.....	.....	1,800	104,000	B.
March	6,050	1,530	3,690	227,000	A.
April	9,850	4,870	6,550	390,000	A.
May	30,600	5,330	16,100	990,000	A.
June	54,600	22,600	37,600	2,240,000	A.
July	28,800	9,500	16,300	1,000,000	A.
August	10,900	3,860	6,860	422,000	A.
September	4,440	2,810	3,620	215,000	B.
October	7,790	2,810	3,660	225,000	B.
November	4,240	2,210	3,510	209,000	A.
December	1,810	1,290	1,520	93,500	B.
The year	54,600	.....	8,570	6,220,000	

COLORADO RIVER AT YUMA, ARIZ.

Location.—At Southern Pacific Co.'s railroad bridge at Yuma, in sec. 35, T. 16 S., R. 22 E., San Bernardino base and meridian, about 1½ miles below mouth of Gila River.

Records available.—April 1, 1878, to December 31, 1912.

Drainage area.—225,000 square miles.

Gage.—Vertical staff in two sections at the bridge; the zero of the gage is 102.79 feet above sea level.

Channel.—Shifting sand.

Discharge measurements.—Made from car and cable 600 feet below the gage.

Diversions.—Water is diverted for irrigation and power development above the station.

Accuracy.—Results considered good.

Cooperation.—Complete record published as furnished by the United States Reclamation Service through F. L. Sellew, project engineer.

Discharge measurements of Colorado River at Yuma, Ariz., in 1912.

[By B. R. Cloyd and George Schobinger.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Jan. 2	16.5	6,000	May 2	18.7	15,600	Sept. 3	16.1	11,400
4	16.0	5,100	4	19.5	21,500	5	16.55	12,700
6	15.7	4,400	7	19.8	23,300	7	16.6	12,600
9	15.6	4,500	9	21.45	36,100	10	16.35	11,000
11	15.25	3,600	11	21.5	35,800	12	16.1	10,200
13	15.0	3,400	14	21.0	32,600	14	16.1	9,700
16	15.2	3,500	16	21.75	39,300	17	16.0	8,300
18	15.4	3,600	18	22.1	41,100	19	15.9	8,300
20	16.05	4,600	21	22.65	47,200	21	16.0	8,000
23	16.8	6,100	23	22.5	46,000	24	16.0	7,700
25	17.2	7,200	25	23.15	53,400	26	16.1	7,500
27	17.6	8,000	28	24.3	62,200	28	16.15	7,700
30	17.4	7,600	30	25.0	68,800	Oct. 1	16.35	8,800
Feb. 1	17.45	7,700	June 1	25.6	80,200	3	16.35	9,400
3	17.4	7,500	4	27.0	90,800	5	16.55	10,200
6	17.1	7,200	6	28.0	112,500	8	16.65	10,400
8	17.1	7,400	8	28.4	120,700	10	16.7	11,600
10	17.1	7,300	11	28.3	117,100	12	16.55	10,700
13	17.1	7,000	13	28.0	120,600	15	16.4	10,800
15	17.2	7,200	15	28.0	116,500	17	16.35	10,800
17	17.1	6,700	18	28.45	129,800	19	16.3	9,900
20	17.4	7,200	20	28.9	140,800	22	16.35	10,400
22	17.4	8,000	25	25.55	89,800	24	16.4	10,300
24	17.4	7,600	27	23.6	70,700	26	16.4	10,300
27	17.3	7,400	29	22.7	58,100	29	16.4	10,500
29	17.5	7,800	July 2	22.9	55,700	31	18.0	21,800
Mar. 2	17.5	7,700	6	23.1	58,600	Nov. 2	17.4	17,800
5	17.6	7,000	9	23.5	65,600	5	17.55	18,900
7	17.5	7,000	11	22.8	57,800	7	16.8	15,000
9	17.5	7,100	13	21.1	51,300	9	16.5	12,600
12	17.8	7,900	16	20.2	41,300	12	16.1	11,800
14	18.45	15,100	18	19.8	39,200	14	16.0	11,100
16	19.55	23,400	20	19.55	36,500	16	16.0	10,800
19	18.4	17,000	23	19.75	37,700	19	16.1	10,100
21	18.1	14,400	25	19.45	37,600	21	16.2	10,000
23	18.2	15,300	27	19.0	33,000	23	16.2	9,800
26	18.0	14,100	30	19.5	36,700	26	16.1	9,400
28	19.9	24,800	Aug. 1	20.4	39,100	28	16.1	8,700
30	19.1	20,700	3	20.65	40,300	30	16.0	8,600
Apr. 1	18.5	17,500	6	19.7	36,500	Dec. 3	16.0	8,300
4	18.2	14,700	8	19.0	30,500	5	16.0	8,000
6	18.0	14,600	10	18.3	25,700	7	15.9	7,400
9	18.4	15,300	13	17.7	23,700	10	15.95	7,400
11	18.7	17,800	15	17.45	19,800	12	15.9	6,600
13	19.8	23,200	17	16.9	18,100	14	15.75	6,400
16	21.0	32,400	20	16.5	14,400	17	15.6	5,660
18	21.35	34,200	22	16.4	14,600	19	15.45	5,200
20	20.6	28,600	24	16.4	15,400	21	15.5	5,400
23	19.5	21,900	27	16.4	13,500	24	15.7	5,500
25	19.25	20,300	29	16.55	14,400	26	15.8	6,100
27	19.1	19,100	31	16.0	11,900	28	15.8	6,000
30	18.7	16,000				31	15.4	5,200

Daily gage height, in feet, of Colorado River at Yuma, Ariz., for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	16.60	17.45	17.5	18.45	18.65	25.6	22.7	20.45	15.95	16.4	16.95	15.85
2	16.45	17.4	17.5	18.3	18.8	26.0	22.9	20.75	16.0	16.4	17.4	15.95
3	16.15	17.35	17.45	18.2	19.4	26.6	23.3	20.6	16.2	16.35	17.15	16.0
4	16.0	17.05	17.6	18.15	19.45	27.1	23.25	20.1	16.85	16.35	17.0	16.0
5	15.9	17.0	17.6	18.1	19.35	27.6	23.2	19.9	16.5	16.5	17.5	16.0
6	15.7	17.05	17.5	18.05	19.4	28.05	23.15	19.7	16.4	16.3	17.0	15.9
7	15.65	17.1	17.5	18.0	19.9	28.35	23.25	19.25	16.6	16.45	16.8	15.95
8	15.7	17.1	17.55	18.25	20.9	28.4	23.25	18.95	16.65	16.65	16.7	16.0
9	15.55	17.1	17.5	18.45	21.5	28.5	23.45	18.8	16.4	17.1	16.5	15.95
10	15.4	17.1	17.55	18.6	21.65	28.45	23.05	18.3	16.2	16.65	16.2	16.0
11	15.25	17.1	17.6	18.8	21.45	28.3	22.7	18.0	16.2	16.65	16.05	15.9
12	15.05	17.1	18.55	19.2	21.25	28.2	21.95	17.8	16.1	16.6	16.1	15.95
13	15.0	17.1	18.2	19.75	20.9	28.0	21.05	17.7	16.1	16.9	16.1	16.1
14	15.1	17.15	18.5	20.2	21.05	28.0	20.9	17.6	16.1	16.7	16.05	15.8
15	15.5	17.2	18.8	20.6	21.45	27.95	20.45	17.45	16.1	16.4	16.0	15.8
16	15.25	17.5	19.3	21.0	21.8	27.95	20.15	17.2	16.0	16.3	16.05	15.75
17	15.3	17.15	18.35	21.35	22.0	28.15	20.0	17.0	16.0	16.35	16.2	15.6
18	15.5	17.3	18.35	21.4	22.1	28.5	19.8	16.85	15.9	16.15	16.0	15.5
19	15.8	17.4	18.35	21.1	22.45	28.7	19.6	16.65	15.9	16.3	16.1	15.5
20	16.15	17.4	18.2	20.55	22.65	28.9	19.6	16.5	15.95	16.3	16.2	15.5
21	16.35	17.4	18.05	20.05	22.7	29.0	19.55	16.3	16.05	16.35	16.25	15.5
22	16.5	17.4	17.95	19.85	22.5	29.05	19.7	16.5	16.1	16.4	16.3	15.5
23	16.85	17.4	18.4	19.5	22.5	28.35	19.7	16.65	16.1	16.4	16.15	15.55
24	16.95	17.4	18.1	19.35	22.85	26.8	19.55	16.4	16.0	16.35	16.1	15.7
25	17.25	17.2	18.05	19.2	23.2	25.45	19.4	16.35	16.1	16.4	16.1	15.7
26	17.5	17.3	18.0	19.2	23.75	24.35	19.2	16.3	16.1	16.4	16.15	15.8
27	17.6	17.35	18.8	19.05	24.1	23.5	19.05	16.45	16.1	16.4	16.2	15.8
28	17.45	17.4	19.9	18.9	24.35	22.85	19.05	16.5	16.25	16.3	16.05	15.7
29	17.4	17.5	19.6	18.7	24.65	22.75	19.45	16.5	16.35	16.3	16.0	15.65
30	17.4	.....	19.05	18.65	25.05	22.75	19.6	16.15	16.4	17.4	16.1	15.5
31	17.4	.....	18.7	.....	25.6	.....	20.0	16.0	.....	17.85	.....	15.4

Daily discharge, in second-feet, of Colorado River at Yuma, Ariz., for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	6,500	7,700	7,800	17,000	15,400	80,200	55,500	39,500	14,200	9,200	13,500	7,700
2	5,800	7,500	7,700	15,700	16,500	83,300	55,700	42,000	11,100	9,500	17,800	8,100
3	5,200	7,300	7,000	14,800	21,000	87,700	58,800	39,800	12,100	9,400	15,500	8,300
4	5,100	6,500	7,300	14,300	21,200	91,500	58,700	37,300	15,000	9,400	14,100	8,200
5	5,000	6,500	7,000	14,700	20,200	102,300	58,800	36,800	12,300	10,000	18,500	8,000
6	4,400	7,000	7,000	15,000	20,500	112,800	59,000	36,500	11,400	8,800	15,500	7,500
7	4,300	7,300	7,000	13,700	24,000	117,500	61,000	32,800	12,600	9,300	15,000	7,700
8	4,600	7,300	7,000	14,800	31,700	120,700	62,500	30,100	13,200	10,400	14,200	7,800
9	4,300	7,300	7,100	15,800	36,500	122,600	65,200	29,200	11,400	14,200	12,600	7,700
10	4,000	7,300	7,000	17,000	37,800	120,800	61,000	25,700	10,200	11,200	11,000	7,800
11	3,600	7,200	7,000	18,600	35,300	117,100	57,100	24,200	10,400	10,000	10,800	6,800
12	3,400	7,100	12,800	20,200	34,000	119,700	54,500	23,800	10,200	11,100	11,800	6,800
13	3,400	7,000	12,200	22,800	31,500	120,600	50,800	23,700	9,900	13,400	11,800	7,900
14	3,600	7,100	15,500	26,300	33,000	118,600	49,000	21,800	9,700	12,500	11,400	6,700
15	5,200	7,200	17,500	29,400	36,500	115,500	44,000	19,800	9,400	10,800	10,900	6,600
16	3,700	8,800	21,700	32,400	39,800	117,200	40,700	19,000	8,700	10,400	11,200	6,400
17	3,600	7,000	14,500	34,700	41,000	122,700	40,300	18,700	8,300	10,800	11,500	5,600
18	4,000	7,300	15,300	34,700	41,100	130,700	39,200	17,600	8,000	9,300	10,000	5,300
19	4,600	7,500	16,500	32,500	45,200	135,800	37,200	15,800	8,300	9,900	10,100	5,400
20	5,300	7,200	15,200	28,200	47,200	140,800	37,000	14,400	8,200	10,000	10,500	5,400
21	5,500	7,600	14,100	25,000	47,700	142,700	36,300	13,600	8,200	10,400	10,300	5,400
22	5,500	8,000	13,200	24,000	45,800	144,000	37,300	15,500	8,400	10,700	10,500	5,200
23	6,300	7,800	17,000	21,900	46,000	137,500	37,300	17,000	8,200	10,500	9,500	5,200
24	6,400	7,600	14,600	21,000	50,000	108,500	37,200	15,400	7,700	10,000	9,300	5,500
25	7,500	7,000	14,300	19,900	53,800	88,500	37,000	14,400	7,800	10,300	9,400	5,600
26	8,200	7,300	14,100	19,900	57,800	78,000	35,100	13,500	7,500	10,300	9,800	6,100
27	8,000	7,700	18,200	18,700	60,400	70,000	33,500	13,800	7,500	10,400	9,800	6,200
28	7,500	7,700	24,800	17,500	62,600	62,500	33,400	14,200	8,300	9,800	8,600	6,000
29	7,400	7,800	23,500	16,000	65,600	58,400	36,400	14,000	9,000	10,500	8,500	5,900
30	7,600	.....	20,200	15,500	69,100	57,100	37,700	12,300	9,200	18,000	9,100	5,400
31	7,500	.....	18,300	.....	76,500	.....	38,400	11,900	.....	20,700	.....	5,200

Monthly discharge of Colorado River at Yuma, Ariz., for 1912.

[Drainage area, 225,000 square miles.]

Month.	Discharge in second-feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.
January	8,200	3,400	5,390	0.024	0.03	331,000
February	8,800	6,500	7,370	.033	.04	424,000
March	24,800	7,000	13,300	.059	.07	818,000
April	34,700	13,700	21,100	.094	.10	1,260,000
May	76,500	15,400	40,800	.181	.21	2,510,000
June	144,000	57,100	108,000	.480	.54	6,430,000
July	65,200	33,400	46,600	.207	.24	2,870,000
August	42,000	11,900	22,700	.101	.12	1,400,000
September	15,000	7,500	9,780	.044	.05	582,000
October	20,700	9,200	11,000	.049	.06	676,000
November	18,500	8,500	11,800	.052	.06	702,000
December	8,300	5,200	6,560	.029	.03	403,000
The year	144,000	3,400	25,300	.112	1.55	18,400,000

NEW FORK RIVER BASIN.

PINE CREEK NEAR PINEDALE, WYO.

Location.—At an old Indian ford in sec. 22, T. 34 N., R. 109 W., one-third mile below the outlet of Fremont Lake and 4½ miles north of Pinedale post office.

Records available.—July 22, 1910, to June 30, 1912. From April 2, 1905, to October 31, 1906, a station described under the same name was maintained half a mile below the present station. The records at the two points are not comparable, as two ditches divert the water between the two.

Drainage area.—130 square miles.

Gage.—Chain gage; datum was raised 0.63 foot September 20, 1910; all readings have been referred to the present datum.

Channel.—Apparently permanent.

Discharge measurements.—Made from car and cable during high water and by wading during ordinary stages.

Storage.—The natural storage afforded by Fremont Lake and various other small lakes on its headwaters gives Pine Creek a fairly uniform flow.

Winter flow.—Ice causes backwater at the station during the winter months and the records are discontinued.

Diversions.—Prior to July 1, 1912, there were adjudicated diversions of 77 second-feet from Pine Creek. One ditch takes water above the station.

Accuracy.—No measurements were made during 1912, but previous measurements indicate permanency of channel and therefore the 1911 rating curve has been used. Estimates believed reliable.

Cooperation.—Station maintained in cooperation with the United States Forest Service.

Daily gage height, in feet, and discharge, in second-feet, of Pine Creek near Pinedale, Wyo., for 1912.

[Geo. E. Belknap, observer.]

Day.	March.		April.		May.		June.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	.....	.....	1.6	29	.....	42	2.3	188
2	.....	.....	1.6	29	1.7	42	.....	235
3	.....	.....	1.6	29	.....	42	2.5	280
4	.....	.....	1.6	29	1.7	42	2.65	355
5	.....	.....	1.6	29	.....	42	2.9	485
6	.....	.....	1.6	29	1.7	42	3.0	540
7	.....	.....	.....	29	.....	42	3.3	720
8	.....	.....	1.6	29	1.7	42	3.4	785
9	.....	.....	.....	29	.....	42	3.7	980
10	.....	.....	1.6	29	1.7	42	3.8	1,040
11	.....	.....	1.6	29	1.7	42	3.9	1,110
12	.....	.....	.....	29	.....	42	3.9	1,110
13	.....	.....	1.6	29	1.7	42	3.9	1,110
14	.....	.....	.....	29	.....	42	3.9	1,110
15	.....	.....	.....	29	1.7	42	3.9	1,110
16	.....	.....	1.6	29	1.8	58	3.7	980
17	.....	.....	.....	29	.....	67	3.5	850
18	.....	.....	1.6	29	1.9	76	3.4	785
19	.....	.....	.....	29	2.0	97	3.3	720
20	.....	.....	1.6	29	.....	102	3.3	720
21	.....	.....	.....	29	.....	107	3.2	660
22	.....	.....	1.6	29	.....	112	3.3	720
23	.....	.....	.....	35	.....	117	3.5	850
24	.....	.....	1.7	42	2.1	123	3.7	980
25	.....	.....	.....	42	.....	123	3.85	1,080
26	.....	.....	.....	42	.....	123	3.9	1,110
27	.....	.....	1.7	42	2.1	123	4.0	1,180
28	1.6	29	.....	42	.....	138	4.15	1,280
29	.....	.....	.....	42	2.2	152	4.1	1,250
30	.....	.....	.....	42	2.3	188	.....	1,200
31	.....	.....	.....	.....	2.3	188	.....	.....

NOTE.—Daily discharge computed from the curve for 1911, which is well defined.

Monthly discharge of Pine Creek near Pinedale, Wyo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April	42	29	32.2	1,920	B.
May	188	42	81.4	5,010	B.
June	1,280	188	851	50,600	B.

BIG SANDY CREEK BASIN.

BIG SANDY CREEK NEAR EDEN, WYO.

Location.—At Poston's ranch, above point of diversion for the Eden Canal, in T. 28 N., R. 106 W., near Eden, Wyo.

Records available.—April 28 to October 31, 1912.

Drainage area.—Not measured.

Channel.—Shifting.

Discharge measurements.—Made from wagon bridge.

Diversions.—Prior to July 1, 1912, there were adjudicated diversions of 37 second-feet from Big Sandy River.

Accuracy.—Owing to shifting channel and insufficient measurements, estimates of discharge have not been made.

Cooperation.—Field data furnished by the Eden Irrigation & Land Co.

Discharge measurements of Big Sandy Creek near Eden, Wyo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 24	W. E. Robertson	2.28	190
June 26	do	3.80	615

Daily gage height, in feet, of Big Sandy Creek near Eden, Wyo., for 1912.

[Wm. Dewey, observer.]

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Day.	May.	June.	July.	Aug.	Sept.	Oct.
1	.....	3.6	3.5	2.3	1.5	1.4	16	.....	3.0	2.7	1.7	1.5	1.4
2	.....	4.5	3.4	2.4	1.5	1.4	17	.....	2.8	2.5	1.7	1.5	1.4
3	.....	4.7	3.3	2.3	1.5	1.4	18	.....	2.7	2.4	1.9	1.4	1.4
4	.....	4.9	3.1	2.3	1.5	1.4	19	.....	2.8	2.9	1.8	1.4	1.4
5	.....	5.0	3.0	2.2	1.4	1.5	20	.....	3.0	2.6	1.7	1.4	1.4
6	.....	5.2	2.8	2.2	1.4	1.5	21	.....	3.6	2.5	1.6	1.4	1.4
7	.....	5.15	2.7	2.1	1.4	1.5	22	.....	.....	2.4	1.6	1.4	1.4
8	.....	5.2	2.6	2.0	1.4	1.4	23	.....	.....	2.3	1.5	1.4	1.4
9	.....	4.7	2.5	1.9	1.4	1.5	24	.....	4.5	2.2	1.5	1.4	1.4
10	.....	4.3	2.5	1.9	1.4	1.5	25	1.5	3.8	2.1	1.4	.....	1.4
11	.....	4.3	2.5	1.8	1.3	1.5	26	1.9	3.8	2.0	1.3	.....	1.5
12	.....	4.0	2.7	1.7	1.3	1.5	27	1.8	3.8	1.8	1.5	.....	1.5
13	.....	3.8	2.7	1.7	1.3	1.5	28	1.7	3.7	1.8	1.7	.....	1.5
14	.....	3.6	2.9	1.7	1.4	1.4	29	2.0	3.7	1.9	1.6	.....	1.5
15	.....	3.4	2.9	1.7	1.5	1.4	30	2.6	3.6	2.1	1.6	1.4	1.5
							31	2.9	.....	2.2	1.5	.....	1.5

DUTCH JOE CREEK NEAR BIG SANDY, WYO.

Location.—Half a mile west of Dutch Joe ranger station, in sec. 4, T. 30 N., R. 104 W., 2 miles above the junction of Dutch Joe Creek with Squaw Creek; no tributaries below the station.

Records available.—May 17, 1911, to June 28, 1912.

Drainage area.—17 square miles (measured from Forest Service atlas).

Gage.—Vertical staff.

Channel.—Apparently permanent.

Discharge measurements.—Made from bridge during high water and by wading at ordinary stages.

Diversions.—No water is diverted above the station. Prior to July 1, 1912, there was an adjudicated diversion of 2 second-feet below.

Winter flow.—Ice causes backwater at the station, and the records are discontinued during the winter months.

Accuracy.—Estimates of discharge are not available as the station has not been completely rated.

Cooperation.—Station maintained in cooperation with the United States Forest Service.

Daily gage height, in feet, of Dutch Joe Creek near Big Sandy, Wyo., for 1912.

[W. T. Schmehl, observer.]

Day.	Apr.	May.	June.	Day.	Apr.	May.	June.	Day.	Apr.	May.	June.
1				11			1.45	21			2.20
2			2.20	12	0.20		2.00	22	0.30		
3		1.40		13			2.20	23	.26		2.40
4	0.25		2.30	14				24		0.80	
5	.24			15				25		.75	2.20
6			2.30	16				26			
7				17	.30	0.40		27			
8			2.90	18	.25		1.00	28		.80	1.60
9		.30	2.20	19			1.00	29			
10	.80	.25		20				30			
								31		1.60	

SQUAW CREEK NEAR BIG SANDY, WYO.

Location.—At Dutch Joe ranger station, 1 mile above the mouth of Dutch Joe Creek and 1½ miles above the junction of Squaw Creek and Big Sandy Creek.

Records available.—May 17, 1911, to June 30, 1912.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Apparently permanent, although the data are not conclusive.

Discharge measurements.—Made from footbridge during high water and by wading at ordinary stages.

Diversions.—No water is diverted above the station.

Winter flow.—Ice causes backwater and the observations are discontinued during the winter months.

Accuracy.—As the rating curve for this station is based on three measurements only, the estimates can not be considered better than fair.

Cooperation.—Station maintained in cooperation with the United States Forest Service.

Daily gage height, in feet, and discharge, in second-feet, of Squaw Creek near Big Sandy, Wyo., for 1912.

[W. T. Schmehl, observer.]

Day.	April.		May.		June.		Day.	April.		May.		June.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.		Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1							16						
2					1.4	128	17			0.60	31		
3			0.15	10			18	0.15	10.0				
4	0.10	9.0					19						
5							20					1.1	88
6					1.7	173	21						
7							22						
8							23	.04	7.8				
9			.20	11			24			.80	51	1.1	88
10					1.6	158	25			.90	63		
11	.10	9.0			1.4	128	26				63		
12							27				63	.90	63
13							28			.90	63		
14							29						
15			.40	18			30						
							31						

NOTE.—Daily discharge computed from the curve for 1911, which is fairly well defined. No discharge measurements made during 1912.

LITTLE SANDY CREEK NEAR EDEN, WYO.

Location.—At the highway bridge about one-fourth mile above the mouth of the stream, in sec. 34, T. 25 N., R. 106 W., near Eden, Wyo.

Records available.—April 25, 1911, to September 11, 1912.

Channel.—Slightly shifting from year to year.

Diversions.—Prior to July 1, 1912, there were adjudicated diversions of 63 second-feet from the Little Sandy.

Accuracy.—Estimates can not be considered better than fair, as no discharge measurements were made during 1912.

Cooperation.—Station maintained in cooperation with Eden Irrigation & Land Co.

Daily gage height, in feet, and discharge, in second-feet, of Little Sandy Creek near Eden, Wyo., for 1912.

[W. E. Robertson, observer.]

Day.	April.		May.		June.		July.		August.		September.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	.....	.....	1.25	56	1.64	94	2.1	160	1.3	60	.....	15
2	.....	.....	1.16	47	.....	96	2.0	144	1.3	60	0.7	13
3	.....	.....	1.2	51	1.67	97	1.9	129	1.3	60	.7	13
4	.....	.....	.....	48	1.77	111	.....	122	1.25	56	.7	13
5	.....	.....	.....	45	1.87	125	1.8	115	.....	54	.....	13
6	.....	.....	1.1	42	1.92	118	1.7	101	1.2	51	.....	13
7	1.7	.....	1.05	38	1.95	136	1.7	101	1.2	51	.....	13
8	.....	.....	.....	39	1.97	140	1.6	89	1.2	51	.7	13
9	.....	.....	1.09	41	.....	158	1.5	78	1.1	42	.....	13
10	.....	.....	.....	49	2.19	175	1.4	69	.....	38	.7	13
11	.....	.....	1.27	57	2.36	205	.....	74	1.0	34	.7	13
12	.....	.....	1.28	58	2.45	222	1.5	78	.95	30	.....	.....
13	.....	.....	.....	51	.....	179	1.5	78	.....	25	.....	.....
14	.....	.....	1.12	44	1.95	136	1.4	69	.8	20	.....	.....
15	.....	.....	1.09	41	1.97	140	1.3	60	.8	20	.....	.....
16	1.3	60	1.07	40	2.0	144	1.3	60	.8	20	.....	.....
17	.....	.....	1.01	35	1.8	115	1.3	60	.....	27	.....	.....
18	.....	.....	.....	45	1.8	115	1.4	69	1.0	34	.....	.....
19	.....	.....	1.24	55	1.8	115	1.4	69	1.0	34	.....	.....
20	1.6	89	.....	61	1.7	101	.....	76	.....	30	.....	.....
21	.....	.....	1.38	67	1.6	89	.....	82	.9	27	.....	.....
22	.....	.....	1.45	74	1.6	89	1.6	89	.....	25	.....	.....
23	.....	.....	.....	66	1.6	89	1.5	78	.....	23	.....	.....
24	.....	.....	1.28	58	1.6	89	1.5	78	.....	22	.....	.....
25	.....	.....	.....	58	1.7	101	1.5	78	.8	20	.....	.....
26	.....	.....	1.28	58	1.7	101	1.5	78	.8	20	.....	.....
27	1.6	89	1.28	58	1.9	129	1.4	69	.....	20	.....	.....
28	1.3	60	1.38	67	2.0	144	.....	67	.8	20	.....	.....
29	.....	.....	1.3	60	2.1	160	.....	65	.....	19	.....	.....
30	.....	.....	1.22	53	2.1	160	.....	62	.....	18	.....	.....
31	.....	.....	1.41	70	.....	.....	1.3	60	.....	17	.....	.....

NOTE.—The relation of gage height to discharge on April 7 is probably affected by ice. Daily discharge computed from curve for 1911, which is well defined. No measurements during 1912. Discharge interpolated for days on which gage was not read.

Monthly discharge of Little Sandy Creek near Eden, Wyo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
May	70	35	52.7	3,240	C.
June	222	94	129	7,680	C.
July	160	60	84.1	5,170	C.
August	60	17	33.2	2,040	C.
September	15	13	13.2	288	C.
The period	.....	.....	.....	18,400	

YAMPA RIVER BASIN.

YAMPA RIVER AT YAMPA, COLO.

Location.—Near the bridge connecting the town of Yampa with the Denver, Northwestern & Pacific Railroad station.

Records available.—May 17, 1910, to November 30, 1912.

Drainage area.—52 square miles (State engineer's report).

Gage.—Vertical staff.

Channel.—Shifting during high water.

Discharge measurements.—Made from the highway bridge.

Winter flow.—Ice causes backwater and the records are discontinued during the winter months.

Diversions.—There are court decrees for diversions of 258 second-feet from the headwater streams above Yampa.

Cooperation.—Records are furnished complete for publication by the State engineer, who maintains the station.

Discharge measurements of Yampa River at Yampa, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 20[a]	C. L. Chatfield	.....	19
Apr. 8	.....do	1.15	25
May 16	.....do	1.03	22
July 4	.....do	1.30	126

[a] Ice present.

Daily gage height, in feet, of Yampa River at Yampa, Colo., for 1912.

[C. L. Arnold, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	1.1	1.5	1.55	1.5	0.65	0.7	0.7
2	.....	1.05	1.85	1.5	1.55	.65	.7	.7
3	.....	1.2	1.9	1.35	1.4	.6	.7	.7
4	.....	1.35	2.3	1.3	1.4	.6	.7	.7
5	.....	1.15	2.3	1.5	1.3	.6	.7	.7
6	.....	1.15	2.4	1.55	1.35	.6	.7	.7
7	1.15	1.15	2.65	1.65	1.3	.55	.7	.7
8	1.15	1.25	2.7	1.4	1.25	.5	.7	.7
9	1.05	1.2	2.65	1.3	1.2	.5	.7	.7
10	1.0	1.1	2.55	1.15	1.2	.6	.7	.7
11	1.05	1.05	2.3	1.05	1.0	.6	.65	.7
12	1.1	1.1	1.85	1.1	.9	.6	.65	.7
13	1.0	1.05	1.5	1.1	.8	.7	.6	.7
14	1.05	1.0	1.4	1.2	.8	.7	.6	.7
15	1.05	1.0	1.3	1.2	.9	.8	.6	.7
16	1.0	1.0	1.0	1.1	.8	.8	.65	.7
17	1.0	1.1	.90	1.2	.8	.8	.65	.65
18	1.05	1.3	.85	1.2	.7	.8	.65	.65
19	1.0	1.25	.80	1.05	.7	.8	.65	.65
20	1.05	1.5	.80	1.2	.7	.7	.7	.65
21	1.1	1.7	.90	1.2	.7	.7	.7	.65
22	1.1	1.5	1.0	1.2	.7	.7	.7	.65
23	1.05	1.5	1.0	1.15	.7	.7	.7	.65
24	1.05	1.85	1.05	.95	.7	.7	.7	.65
25	1.1	1.8	1.1	1.2	.7	.6	.7	.65
26	1.1	1.7	1.45	1.15	.65	.6	.7	.65
27	1.05	1.55	1.8	1.25	.6	.7	.7	.65
28	1.1	1.45	2.4	1.6	.6	.7	.7	.6
29	1.05	1.65	1.7	1.6	.7	.7	.7	.6
30	1.1	1.4	2.1	1.6	.7	.7	.7	.6
31	.....	1.9	.....	1.4	.7	.....	.7	.....

Daily discharge, in second-feet, of Yampa River at Yampa, Colo., for 1912.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	25	68	192	179	26	31	31
2	.....	20	156	179	192	26	31	31
3	.....	35	167	142	154	22	31	31
4	.....	52	259	130	154	22	31	31
5	.....	30	259	179	130	22	31	31
6	.....	30	320	192	142	22	31	31
7	30	30	395	218	130	18	31	31
8	30	40	410	154	120	14	31	31
9	20	35	395	130	109	14	31	31
10	16	25	365	100	109	22	31	31
11	20	20	325	82	73	22	26	31
12	25	25	205	91	58	22	26	31
13	16	20	150	91	43	31	22	31
14	20	16	128	109	43	31	22	31
15	20	16	108	109	58	43	22	31
16	16	16	73	91	43	43	26	31
17	16	25	58	109	43	43	26	26
18	20	46	50	109	31	43	26	26
19	16	40	43	82	31	43	26	26
20	20	68	43	109	31	31	31	26
21	25	93	58	109	31	31	31	26
22	25	68	73	109	31	31	31	26
23	20	68	73	100	31	31	31	26
24	20	115	82	66	31	31	31	26
25	25	107	91	109	31	22	31	26
26	25	93	166	100	26	22	31	26
27	20	74	260	120	22	31	31	26
28	25	62	464	205	22	31	31	22
29	20	86	232	205	31	31	31	22
30	25	57	352	205	31	31	31	22
31	.....	123	.....	154	31	.....	31	.....

Monthly discharge of Yampa River at Yampa, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April	30	16	21	1,021
May	123	16	50	3,094
June	464	43	194	11,560
July	218	66	132	8,093
August	192	22	71	4,346
September	43	14	28	1,690
October	31	22	29	1,793
November	31	22	28	1,682
The period	.....	.....	.....	33,279

YAMPA RIVER AT STEAMBOAT SPRINGS, COLO.

Location.—At the lower steel bridge at Steamboat Springs; a short distance below the mouth of Spring Creek.

Records available.—May 3, 1904, to October 31, 1906; March 1, 1910, to December 6, 1912.

Drainage area.—572 square miles (State engineer's report).

Gage.—Automatic recording gage.

Channel.—Practically permanent.

Discharge measurements.—Made from the steel bridge.

Winter flow.—The hot springs keep the river practically open during the winter months.

Diversions.—There are court decrees for diversions of 115 second-feet from Yampa River between Yampa and Steamboat Springs, and diversions of 231 second-feet from intervening tributaries.

Cooperation.—Since 1910 station has been maintained and records have been furnished complete for publication by the State engineer.

Discharge measurements of Yampa River at Steamboat Springs, Colo., in 1912.

Date.	Hydrographer.	Height.	Discharge.	Date.	Hydrographer.	Height.	Discharge.
		Feet.	*Sec.-feet.*			*Feet.*	*Sec.-feet.*
Feb. 17	C. L. Chatfield.....	1.20	98	May 12	C. L. Chatfield.....	2.98	1,160
23	.....do.....	1.11	92	June 19	.....do.....	3.25	1,355
Apr. 6	.....do.....	1.80	282	27	.....do.....	4.08	2,298
9	.....do.....	2.15	467	July 22	.....do.....	3.19	535
10	.....do.....	2.28	582	Aug. 21	.....do.....	1.38	187

Daily gage height, in feet, of Yampa River at Steamboat Springs, Colo., in 1912.

[K. Nakagawa, observer.]

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	1.4	1.3	1.4	2.8	5.1	4.1	2.6	1.5	1.55	1.45	1.35
2.....	1.2	1.2	1.4	3.1	5.25	3.8	2.5	1.45	1.5	1.3	1.3
3.....	1.15	1.2	1.5	3.2	5.65	3.5	2.3	1.4	1.5	1.1	1.4
4.....	1.4	1.2	1.6	2.9	5.9	3.35	2.1	1.35	1.5	1.55	1.35
5.....	1.6	1.2	1.7	2.85	5.9	3.3	2.05	1.3	1.55	1.4	1.45
6.....	1.7	1.2	1.8	2.8	5.7	3.35	1.9	1.3	1.6	1.35	1.5
7.....	1.55	1.2	1.9	3.05	5.6	3.4	1.9	1.3	1.6	1.6	.....
8.....	1.45	1.2	2.0	3.3	5.55	3.35	1.85	1.25	1.6	1.55	.....
9.....	1.25	1.2	2.1	3.3	5.7	3.3	1.8	1.25	1.55	1.6	.....
10.....	1.2	1.2	2.2	3.25	5.5	3.15	1.75	1.4	1.6	1.5	.....
11.....	1.15	1.25	2.2	2.95	5.35	3.05	1.7	1.4	1.65	1.6	.....
12.....	1.2	1.25	2.25	3.0	5.05	3.1	1.65	1.4	1.6	1.6	.....
13.....	1.25	1.25	2.15	2.75	4.9	3.05	1.6	1.3	1.6	1.4	.....
14.....	1.3	1.25	1.9	2.85	4.7	3.2	1.55	1.4	1.55	1.4	.....
15.....	1.1	1.25	1.9	3.15	4.45	2.9	1.6	1.5	1.55	1.4	.....
16.....	1.15	1.2	2.05	3.5	4.0	2.8	1.9	1.5	1.55	1.5	.....
17.....	1.2	1.3	2.25	3.4	3.6	2.6	1.75	1.6	1.6	1.4	.....
18.....	1.15	1.2	2.35	3.5	3.35	2.5	1.65	1.6	1.5	1.35	.....
19.....	1.2	1.2	2.55	3.6	3.3	2.6	1.6	1.6	1.35	1.4	.....
20.....	1.3	1.3	2.5	3.7	3.55	.....	1.6	1.55	1.6	1.4	.....
21.....	1.2	1.3	2.0	4.15	3.85	.....	1.5	1.5	1.6	1.5	.....
22.....	1.4	1.4	2.0	4.5	4.05	.....	1.45	1.45	1.5	1.3	.....
23.....	1.2	1.3	2.0	4.6	4.3	.....	1.4	1.5	1.55	1.3	.....
24.....	1.2	1.3	2.25	4.65	4.6	.....	1.4	1.6	1.6	1.25	.....
25.....	1.2	1.3	2.65	4.7	4.5	.....	1.35	1.55	1.55	1.2	.....
26.....	1.2	1.3	2.75	4.7	4.4	2.35	1.3	1.6	1.55	1.35	.....
27.....	1.2	1.3	2.7	4.75	4.35	2.8	1.3	1.6	1.65	1.2	.....
28.....	1.2	1.4	2.8	4.3	4.25	2.7	1.5	1.6	1.7	1.2	.....
29.....	1.3	1.5	2.8	4.4	4.2	2.5	1.5	1.6	1.6	1.2	.....
30.....	.....	1.5	2.9	4.85	4.25	2.55	1.75	1.6	1.6	1.2	.....
31.....	.....	.....	.....	5.2	.....	2.6	1.7	.....	1.6	.....	.....

Daily discharge, in second-feet, of Yampa River at Steamboat Springs, Colo., for 1912.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	195	160	195	970	3,380	2,250	810	230	250	212
2	130	130	195	1,240	3,560	1,930	740	212	230	160
3	115	130	230	1,330	4,065	1,630	610	195	230	100
4	195	130	270	1,060	4,390	1,480	500	178	230	250
5	270	130	315	1,015	4,390	1,430	475	160	250	195
6	315	130	360	970	4,130	1,480	405	160	270	160
7	250	130	405	1,195	4,000	1,580	405	160	270	270
8	212	130	450	1,430	3,935	1,480	382	145	270	250
9	145	130	500	1,430	4,130	1,430	360	145	250	270
10	130	130	550	1,380	3,870	1,285	338	195	270	230
11	115	145	550	1,105	3,680	1,195	315	195	292	270
12	130	145	580	1,150	3,320	1,240	292	195	270	270
13	145	145	525	940	3,140	1,195	270	160	270	195
14	160	145	405	1,015	2,910	1,330	250	195	250	195
15	100	145	405	1,285	2,635	1,060	270	230	250	212
16	115	130	475	1,630	2,140	970	405	230	250	230
17	130	160	580	1,530	1,730	810	338	270	270	195
18	115	130	640	1,630	1,480	740	292	270	230	178
19	130	130	775	1,730	1,430	810	270	270	250	195
20	160	160	740	1,830	1,680	740	270	250	270	195
21	130	160	450	2,305	1,980	700	230	230	270	230
22	195	195	450	2,690	2,195	700	212	212	230	160
23	130	160	450	2,800	2,470	670	195	230	250	160
24	130	160	580	2,855	2,800	670	195	270	270	160
25	130	160	850	2,910	2,690	640	178	250	250	130
26	130	160	940	2,910	2,580	640	160	270	250	178
27	130	160	890	2,965	2,525	970	160	270	292	130
28	130	195	970	2,470	2,415	890	230	270	315	130
29	160	230	970	2,580	2,360	740	230	270	270	130
30	.....	230	1,060	3,080	2,415	775	338	270	270	130
31	.....	195	.....	3,500	.....	810	315	.....	270	.....

Monthly discharge of Yampa River at Steamboat Springs, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
February	315	100	156	8,970
March	230	130	154	9,461
April	1,060	195	558	33,234
May	3,500	940	1,836	112,920
June	4,390	1,430	2,948	175,391
July	2,250	640	1,104	67,876
August	810	160	337	20,708
September	270	145	220	13,065
October	315	230	260	15,985
November	270	100	192	11,445
The period	.....	.....	.....	469,055

YAMPA RIVER AT CRAIG, COLO.

Location.—One mile south of Craig on steel bridge on road to Hamilton, Colo., a short distance below the mouth of Fortification Creek, the nearest tributary.

Records available.—May 25, 1901, to September 4, 1902; April 30, 1904, to October 31, 1906; April 1, 1910, to November 30, 1912.

Drainage area.—1,730 square miles.

Gage.—Vertical staff.

Channel.—Slightly shifting.

Discharge measurements.—Made from highway bridge.

Diversions.—There are court decrees for diversions of 238 second-feet from Yampa River between this station and Steamboat Springs, and 411 second-feet from intervening tributaries exclusive of a conditional decree for 587 second-feet from the North Fork of Elkhead Creek.

Cooperation.—Since 1910 station has been maintained and records have been furnished complete for publication by the State engineer.

Discharge measurements of Yampa River at Craig, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*			*Feet.*	*Sec.-feet.*
Feb. 15	C. L. Chatfield	.....	200	May 1	C. L. Chatfield	5.45	4,041
Apr. 15	Chatfield and Foote	3.38	1,300	11	do	6.20	5,571
23	C. L. Chatfield	3.45	1,369	28	do	7.60	8,830
28	Chatfield and Taylor	4.66	2,604	June 15	do	6.70	6,788
				Aug. 3	Chatfield and Ault.	4.00	1,470

Daily gage height, in feet, of Yampa River at Craig, Colo., for 1912.

[Fred A. Aiken, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	5.45	7.65	6.2	4.1	3.35	3.1	3.2
2	3.6	5.75	7.4	5.9	4.2	3.2	3.0	3.1
3	3.8	5.9	7.45	5.55	4.05	3.1	3.0	3.1
4	4.45	5.35	7.65	5.3	3.85	3.1	3.1	3.1
5	4.9	4.95	7.95	5.3	3.7	3.1	3.1	3.1
6	4.65	4.65	7.85	5.2	3.65	3.0	3.1	3.1
7	5.05	4.95	7.9	5.05	3.6	3.0	3.1	3.1
8	4.7	5.55	7.95	5.2	3.6	3.0	3.2	3.1
9	4.65	6.2	7.8	5.2	3.5	3.0	3.2	3.1
10	4.85	6.3	7.7	5.2	3.5	3.0	3.2	3.1
11	4.15	6.1	7.5	5.05	3.4	3.0	3.2	3.1
12	4.45	6.05	7.4	5.1	3.35	3.1	3.2	3.2
13	4.0	5.8	7.05	5.1	3.3	3.0	3.2	3.2
14	3.45	5.2	7.0	5.2	3.2	3.0	3.2	3.2
15	3.35	5.2	6.75	5.25	3.25	3.0	3.2	3.2
16	3.75	5.35	6.3	4.85	3.4	3.1	3.1	3.2
17	4.1	6.15	5.9	4.7	3.4	3.1	3.2	3.1
18	4.25	6.8	5.5	4.6	3.35	3.1	3.1	3.1
19	4.4	7.35	5.3	4.45	3.3	3.1	3.1	3.1
20	4.25	7.5	5.35	4.7	3.2	3.1	3.1	3.1
21	3.75	7.4	5.65	4.7	3.2	3.1	3.1	3.1
22	3.65	7.5	5.9	4.3	3.15	3.1	3.1	3.1
23	3.55	7.45	6.2	4.35	3.1	3.1	3.1	3.1
24	3.75	7.45	6.4	4.3	3.1	3.1	3.1	3.0
25	4.4	7.5	6.4	4.05	3.1	3.0	3.1	3.1
26	4.65	7.75	6.25	4.0	3.1	3.0	3.2	3.1
27	4.55	7.7	6.3	4.1	3.0	3.1	3.2	.....
28	4.7	7.45	6.35	4.3	3.0	3.1	3.2	.....
29	4.95	7.05	6.2	4.25	3.0	3.1	3.3	.....
30	5.15	7.1	6.25	4.15	3.4	3.1	3.2	.....
31	.....	7.45	.....	4.1	3.4	.....	3.2	.....

Daily discharge, in second-feet, of Yampa River at Craig, Colo., for 1912.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	1,490	3,815	9,420	5,450	1,745	932	700	790
2	1,490	4,360	8,720	4,700	1,875	790	615	700
3	1,700	4,700	8,860	3,955	1,685	700	615	700
4	2,430	3,650	9,420	3,490	1,455	700	700	700
5	2,990	3,055	10,285	3,490	1,290	700	700	700
6	2,670	2,670	9,925	3,320	1,238	615	700	700
7	3,190	3,055	10,140	3,080	1,185	615	700	700
8	2,730	3,985	10,285	3,320	1,185	615	790	700
9	2,670	5,450	9,850	3,320	1,080	615	790	700
10	2,925	5,710	9,560	3,320	1,080	615	790	700
11	2,085	4,190	9,280	3,080	980	615	790	700
12	2,430	5,065	8,720	3,160	932	700	790	790
13	1,920	4,470	7,740	3,160	885	615	790	790
14	1,345	3,410	7,600	3,320	790	615	790	790
15	1,255	3,410	6,915	3,405	838	615	790	790
16	1,645	3,650	5,710	2,775	980	700	700	790
17	2,030	5,320	4,700	2,560	980	700	790	700
18	2,195	7,050	3,860	2,420	932	700	700	700
19	2,370	7,580	3,490	2,210	885	700	700	700
20	2,195	9,000	3,580	2,560	790	700	700	700
21	1,645	8,720	4,150	2,560	790	700	700	700
22	1,540	9,000	4,700	2,000	745	700	700	700
23	1,440	8,860	5,450	2,070	700	700	700	700
24	1,645	8,860	5,970	2,000	700	700	700	615
25	2,370	9,000	5,970	1,685	700	615	700	700
26	2,670	9,705	5,580	1,625	700	615	790	700
27	2,550	9,560	5,710	1,745	615	700	790	700
28	2,730	8,860	5,840	2,000	615	700	790	700
29	3,055	7,740	5,450	1,935	615	700	790	700
30	3,335	7,880	5,580	1,808	980	700	790	700
31	.....	8,860	.....	1,745	980	.....	790	.....

Monthly discharge of Yampa River at Craig Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April	3,335	1,255	2,224	132,369
May	9,705	2,670	6,150	378,145
June	10,285	3,490	7,084	421,553
July	5,450	1,625	2,815	173,097
August	1,875	615	998	61,389
September	932	615	680	40,437
October	790	615	738	45,383
November	790	615	715	42,556
The period	.....	.....	.....	1,294,919

YAMPA RIVER NEAR MAYBELL, COLO.

Location.—At the Thornburg bridge 9 miles below Maybell. The nearest tributary is Deception Creek, which enters the river about 2 miles above.

Records available.—April 17, 1904, to October 31, 1905; June 12, 1910, to November 30, 1912.

Drainage area.—3,670 square miles (State engineer's report).

Gage.—Vertical staff.

Channel.—Practically permanent.

Discharge measurements.—Made from car and cable.

Winter flow.—Ice causes backwater at the gage and the records are discontinued during the winter months.

Diversions.—There are court decrees for diversions of 115 second-feet from Yampa River between this station and Craig. Below Maybell there are decrees for diversions of 37 second-feet from Yampa River.

Cooperation.—Station is maintained and records are furnished complete for publication by the State engineer.

Discharge measurements of Yampa River near Maybell, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 25	C. L. Chatfield	2.93	1,677
26	do	3.70	2,619
June 13	do	7.00	8,986
Aug. 12	do	1.83	798

Daily gage height, in feet, of Yampa River near Maybell, Colo., for 1912.

[Peter Farrell, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	3.5	6.65	8.75	5.65	2.25	1.7	1.8	2.0
2	3.75	7.15	8.45	5.6	2.5	2.35	1.9	2.2
3	4.25	6.4	8.6	5.5	2.25	2.45	2.2	2.6
4	4.5	5.9	6.65	4.8	1.75	2.2	1.7	2.7
5	4.0	5.65	7.0	4.65	1.7	1.6	1.45	2.8
6	3.5	5.2	7.9	4.65	2.0	1.35	1.15	2.2
7	4.0	5.3	8.0	4.6	2.25	1.7	1.1	2.6
8	3.75	5.65	8.05	4.45	2.75	1.95	1.2	2.2
9	3.5	6.15	8.2	4.4	2.0	1.85	1.55	1.95
10	3.0	6.4	7.85	4.25	1.5	1.65	1.7	2.2
11	3.25	6.65	7.5	4.2	1.8	1.25	1.8	1.7
12	3.5	5.9	7.35	4.0	1.75	1.35	2.05	1.6
13	4.25	5.65	7.05	3.6	1.65	1.7	2.2	1.35
14	3.5	5.4	7.15	3.9	1.7	1.75	2.4	1.2
15	3.5	5.1	7.0	4.0	1.3	1.9	2.7	1.4
16	4.0	5.9	6.8	3.6	1.55	2.05	2.6	1.6
17	3.75	6.4	6.85	3.5	1.7	2.05	2.5	1.7
18	3.5	6.65	6.7	3.1	2.05	2.2	2.6	1.8
19	3.25	7.15	6.45	3.1	2.45	2.7	2.7	1.6
20	3.0	6.9	6.45	2.85	2.8	2.6	2.75	1.9
21	3.25	7.15	6.3	2.5	2.95	2.1	2.7	1.85
22	.....	7.55	6.15	2.6	2.7	1.9	2.5	1.95
23	.....	7.8	6.4	2.25	2.9	1.7	2.35	2.3
24	.....	8.15	6.4	2.35	3.45	1.6	2.2	2.45
25	2.95	8.15	6.1	2.2	1.7	1.35	1.7	2.7
26	3.75	6.9	5.9	2.3	2.05	1.7	1.6	2.35
27	3.55	6.6	5.65	2.0	2.45	1.8	1.3	1.8
28	3.3	7.15	5.65	2.25	2.45	1.8	1.35	1.8
29	5.65	7.7	5.55	2.2	1.95	1.6	1.7	1.45
30	6.15	8.5	5.65	1.5	1.8	1.2	1.8	1.6
31	.....	8.5	.....	2.0	1.8	.....	1.95	.....

Daily discharge, in second-feet, of Yampa River near Maybell, Colo., for 1912.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	2,375	8,130	13,640	5,825	1,088	670	740	890
2	2,682	9,375	12,815	5,720	1,310	1,175	815	1,045
3	3,345	7,530	13,220	5,510	1,088	1,265	1,045	1,405
4	3,720	5,370	8,130	4,200	705	1,045	670	1,500
5	3,000	5,825	9,000	3,960	670	605	518	1,595
6	2,375	4,910	11,330	3,960	890	465	368	1,045
7	3,000	5,100	11,600	3,880	1,088	670	345	1,405
8	2,682	5,825	11,735	3,645	1,548	852	390	1,045
9	2,375	6,945	12,140	3,570	890	778	575	852
10	1,800	7,530	11,195	3,345	545	638	670	1,045
11	2,082	8,130	10,270	3,270	740	415	740	670
12	2,375	5,370	9,880	3,000	705	465	928	605
13	3,345	5,825	9,125	2,495	638	670	1,045	465
14	2,375	5,300	9,375	2,870	670	705	1,220	390
15	2,375	4,720	9,000	3,000	440	815	1,500	490
16	3,000	5,370	8,500	2,495	575	928	1,405	605
17	2,682	7,530	8,625	2,375	670	928	1,310	670
18	2,375	8,130	8,250	1,910	928	1,045	1,405	740
19	2,082	9,375	7,650	1,910	1,265	1,500	1,500	605
20	1,800	8,750	7,650	1,645	1,595	1,405	1,548	815
21	2,082	9,375	7,290	1,310	1,748	965	1,500	778
22	1,968	10,400	6,945	1,405	1,500	815	1,310	852
23	1,968	11,060	7,530	1,088	1,695	670	1,175	1,130
24	1,855	12,005	7,530	1,175	2,315	605	1,045	1,265
25	1,748	12,005	6,830	1,045	670	465	670	1,500
26	2,682	8,750	5,370	1,130	928	670	605	1,175
27	2,435	8,010	5,825	890	1,265	740	440	740
28	2,140	9,375	5,825	1,088	1,265	740	465	740
29	5,825	10,790	5,615	1,045	852	605	670	518
30	6,945	12,950	5,825	545	740	390	740	605
31	.....	12,950	.....	890	740	.....	852	.....

Monthly discharge of Yampa River near Maybell, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April	6,945	1,748	2,716	161,642
May	12,950	4,720	8,152	501,250
June	13,640	5,370	8,924	531,013
July	5,825	545	2,587	159,065
August	2,315	440	1,024	63,008
September	1,500	390	790	47,017
October	1,548	345	910	55,943
November	1,595	390	894	53,207
The period	.....	.....	.....	1,572,145

ELK RIVER AT HINMAN PARK, COLO.

Location.—At Hinman Park just above the mouth of South Fork and 8 miles above Clark.

Records available.—May 25 to October 31, 1912.

Drainage area.—61 square miles (State engineer's report).

Gage.—Bristol automatic gage.

Channel.—Rough but permanent.

Discharge measurements.—Made from cable and car.

Winter flow.—No data, as records were discontinued.

Cooperation.—Station is maintained by the State engineer in cooperation with the Elk River Irrigation & Construction Co. Records are published as furnished by the State engineer.

Discharge measurements of Elk River at Hinman Park, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 14	C. L. Chatfield	0.50	162	July 18	C. L. Chatfield	1.60	461
25	do	2.2	811	Sept. 10	do	.31	87
July 2	do	2.0	690	Nov. 10	W. P. Finley	.22	68

Daily gage height, in feet, and discharge, in second-feet, of Elk River at Hinman Park, Colo., for 1912.

Day.	May.		June.		July.		August.		September.		October.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1			2.4	955	2.1	755	1.1	260	0.4	105	0.25	82
2			2.5	1,025	1.95	658	1.1	260	.3	90	.2	75
3			2.6	1,100	1.8	565	1.0	230	.3	90	.2	75
4			2.7	1,175	1.7	510	.9	205	.3	90	.3	90
5			2.8	1,255	1.6	460	.85	192	.25	82	.35	98
6			2.9	1,335	1.55	438	.8	180	.3	90	.3	90
7			2.8	1,255	1.8	565	.75	170	.25	82	.25	82
8			2.75	1,215	1.95	658	.75	170	.2	75	.2	75
9			2.85	1,295	1.95	658	.7	160	.25	82	.2	75
10			2.6	1,100	1.95	658	.7	160	.3	90	.2	75
11			2.45	990	1.9	629	.7	160	.3	90	.2	75
12			2.4	955	1.95	658	.65	150	.3	90	.2	75
13			2.4	955	2.0	690	.55	130	.3	90	.2	75
14			2.1	755	2.2	820	.55	130	.25	82	.3	90
15			1.85	595	1.95	658	.55	130	.2	75	.2	75
16			1.5	415	2.05	722	.6	140	.2	75	.2	75
17			1.35	350	1.65	485	.55	130	.3	90	.2	75
18			1.3	330	1.7	510	.45	112	.3	90	.2	75
19			1.3	330	1.9	625	.4	105	.25	82	.2	75
20			1.55	438	1.8	565	.35	98	.2	75	.15	70
21			1.9	625	1.5	415	.35	98	.25	82	.15	70
22			2.0	690	1.45	392	.35	98	.25	82	.2	75
23			2.35	920	1.4	370	.35	98	.25	82	.2	75
24			2.35	920	1.3	330	.3	90	.2	75	.2	75
25	2.3	885	2.45	990	1.25	312	.35	98	.2	75	.2	75
26	2.05	722	2.45	990	1.15	278	.35	98	.3	90	.2	75
27	1.7	510	2.35	920	1.3	330	.4	105	.25	82	.2	75
28	1.65	485	2.35	920	1.35	312	.5	120	.25	82	.2	75
29	1.95	658	2.4	955	.95	228	.75	170	.25	82	.2	75
30	2.25	852	2.3	885	.9	205	.6	140	.2	75	.2	75
31	2.3	885			1.2	295	.45	112			.2	75

Monthly discharge of Elk River at Hinman Park, near Clark, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
May 25–31	885	485	714	9,912
June	1,335	330	888	52,886
July	820	205	508	31,241
August	260	90	145	8,924
September	105	75	84	5,002
October	98	70	77	4,754
The period				112,668

ELK RIVER NEAR CLARK, COLO.

Location.—At Kinney's ranch, 2 miles above Clark post office, Colo.
Records available.—May 1, 1910, to December 31, 1912.
Drainage area.—213 square miles (State engineer's report).
Gage.—Chain gage.
Channel.—Rough but permanent.
Diversions.—There are court decrees for diversions of 4 second-feet from Elk River above this station and 25 second-feet from the tributaries entering above.
Cooperation.—Records are furnished complete for publication by the State engineer, who maintains the station in cooperation with the Elk River Irrigation & Construction Co.

Discharge measurements of Elk River near Clark, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 22[a]	C. L. Chatfield	.....	48	July 25	C. L. Chatfield	3.4	467
May 13	.....do	3.92	725	30	.....do	3.3	447
July 2	.....do	4.75	1,114	Aug. 20	.....do	2.5	163
19	.....do	4.1	857	Sept. 10	.....do	2.52	139

[a] Relation of gage height to discharge affected by ice in stream.

Daily gage height, in feet, of Elk River near Clark, Colo., for 1912.

[Geo. M. Franz, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.1	3.4	6.95	4.5	3.2	2.7	2.3	2.4	2.2
2	2.1	3.6	6.35	4.65	3.2	2.6	2.5	2.3	2.2
3	2.2	3.75	6.9	4.65	3.2	2.6	2.6	2.3	2.2
4	2.2	3.65	6.6	4.5	3.0	2.6	2.5	2.3	2.2
5	2.25	3.35	6.7	4.65	3.2	2.6	2.6	2.3	2.2
6	2.25	3.55	7.3	4.45	3.2	2.6	2.3	2.3	2.2
7	2.3	3.8	6.85	4.35	3.1	2.5	2.4	2.3	2.3
8	2.4	4.85	6.95	4.6	3.1	2.7	2.4	2.3	2.2
9	2.65	5.65	7.3	4.25	3.0	2.6	2.4	2.4	2.2
10	2.65	5.95	7.25	4.4	3.1	2.5	2.3	2.4	2.2
11	2.6	5.15	6.4	4.4	3.0	2.5	2.2	2.4	2.2
12	2.6	4.15	5.0	4.4	3.2	2.5	2.4	2.2	2.3
13	2.55	4.8	4.9	4.3	3.1	2.5	2.3	2.3	2.2
14	2.6	5.6	5.15	4.35	3.1	2.6	2.2	2.3	2.2
15	2.6	3.95	4.9	4.25	3.1	2.5	2.1	2.2	2.3
16	2.65	4.4	4.9	4.1	3.0	2.6	2.1	2.2	2.2
17	2.7	4.1	5.2	3.7	3.0	2.5	2.2	2.2	2.2
18	2.8	3.95	5.4	3.65	3.1	2.6	2.2	2.2	2.2
19	2.8	6.3	5.55	3.8	3.0	2.4	2.2	2.2	2.3
20	2.7	6.3	5.4	4.0	3.0	2.5	2.2	2.2	2.2
21	2.7	6.65	5.55	3.9	3.0	2.4	2.2	2.2	2.2
22	2.7	6.9	4.9	3.75	3.0	2.5	2.3	2.3	2.2
23	2.9	7.05	5.1	3.75	2.9	2.4	2.4	2.2	2.1
24	2.9	6.6	5.1	3.7	2.9	2.3	2.2	2.2	2.2
25	2.9	6.8	5.2	3.6	2.9	2.4	2.2	2.3	2.1
26	2.9	7.0	5.2	3.55	2.8	2.3	2.1	2.2	2.1
27	2.95	6.75	5.0	3.35	2.9	2.3	2.2	2.2	2.1
28	3.1	6.05	5.1	3.45	2.8	2.2	2.1	2.2	2.2
29	3.2	6.25	4.75	3.35	2.7	2.1	2.2	2.2	2.2
30	3.6	6.95	4.85	3.25	2.8	2.2	2.1	2.2	2.2
31	.....	6.7	.....	3.3	2.6	.....	2.3	.....	2.3

Daily discharge, in second-feet, of Elk River near Clark, Colo., for 1912.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	65	470	3,835	1,080	390	205	105	125	85
2	65	555	2,920	1,180	390	175	150	105	85
3	85	632	3,750	1,180	390	175	175	105	85
4	85	580	3,280	1,080	310	175	150	105	85
5	95	450	3,430	1,180	390	175	175	105	85
6	95	532	4,470	1,050	390	175	105	105	85
7	105	660	3,670	990	350	150	125	105	105
8	125	1,320	3,835	1,145	350	205	125	105	85
9	190	2,040	4,470	930	310	175	125	125	85
10	190	2,395	4,375	1,020	350	150	105	125	85
11	175	1,552	2,990	1,020	310	150	85	125	85
12	175	870	1,430	1,020	390	150	125	85	105
13	162	1,285	1,355	960	350	150	105	105	85
14	175	1,985	1,552	990	350	175	85	105	85
15	175	750	1,355	930	350	150	65	85	105
16	190	1,020	1,355	840	310	175	65	85	85
17	205	840	1,595	605	310	150	85	85	85
18	235	750	1,780	580	350	175	85	85	85
19	235	2,850	1,932	660	310	125	85	85	105
20	205	2,850	1,780	780	310	150	85	85	85
21	205	3,355	1,932	720	310	125	85	85	85
22	205	3,750	1,355	632	310	150	105	105	85
23	270	4,010	1,510	632	270	125	125	85	65
24	270	3,280	1,510	605	270	105	85	85	85
25	270	3,590	1,595	555	270	125	85	105	65
26	270	3,920	1,595	532	235	105	65	85	65
27	290	3,510	1,430	450	270	105	85	85	65
28	350	2,525	1,510	490	235	85	65	85	85
29	390	2,785	1,250	450	205	65	85	85	85
30	555	3,835	1,320	410	235	85	65	85	85
31	.....	3,430	.....	430	175	.....	105	.....	105

Monthly discharge of Elk River near Clark, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April	555	65	204	12,113
May	4,010	450	2,012	123,722
June	4,470	1,250	2,339	139,175
July	1,180	410	812	49,837
August	390	175	314	19,329
September	205	65	146	8,698
October	175	65	102	6,278
November	125	85	98	5,811
December	105	65	86	5,288
The period	.....	.....	.....	370,251

ELK RIVER NEAR TRULL, COLO.

Location.—Two miles southwest of Trull post office on the road between Steamboat Springs and Hayden; below all tributaries; none above the station for several miles.

Records available.—May 2, 1904, to August 16, 1906; May 1, 1910, to December 4, 1912.

Drainage area.—415 square miles (State engineer's report).

Gage.—Chain gage.

Channel.—Fairly permanent.

Discharge measurements.—Made from highway bridge.

Diversions.—Between this station and that near Clark there are court decrees for diversions of 111 second-feet from Elk River and 62 second-feet from intervening tributaries. There are no decrees for diversions below the station.

Cooperation.—Since 1910 station maintained and records furnished complete for publication by the State engineer.

Discharge measurements of Elk River near Trull, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 24[a]	C. L. Chatfield	.....	70	June 23	C. L. Chatfield	8.75	2,672
Apr. 12	.....do	6.05	374	July 23	.....do	7.17	1,205
May 12	.....do	8.25	1,912	Aug 30	.....do	5.94	331
23	.....do	9.75	3,594				

[a] Relation of gage height to discharge affected by ice in stream.

Daily gage height, in feet, of Elk River near Trull, Colo., for 1912.

[Fred O. Smith, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	7.7	9.5	8.2	.....	6.0	5.3	5.4	5.4
2	.....	7.95	9.6	8.2	.....	5.8	5.3	.....	5.4
3	.....	7.85	9.9	8.2	.....	5.5	5.3	5.4	5.4
4	.....	7.8	10.0	8.15	6.0	5.3	5.3	5.4	5.4
5	.....	7.8	10.0	8.15	6.0	5.3	5.3	5.4	.....
6	.....	7.8	9.95	8.2	6.0	5.3	5.3	5.4	.....
7	6.0	7.8	9.9	7.9	6.0	5.3	5.35	5.4	.....
8	6.0	8.1	9.8	7.9	5.95	5.2	5.4	5.4	.....
9	6.0	8.6	9.85	8.0	6.0	5.2	5.3	5.4	.....
10	6.05	8.85	9.85	8.0	6.0	5.2	5.3	5.4	.....
11	6.15	8.55	.....	8.0	6.0	5.2	5.3	5.4	.....
12	5.8	8.1	.....	7.6	6.0	5.3	5.3	5.4	.....
13	5.8	7.9	.....	7.5	6.0	5.3	5.3	5.4	.....
14	5.8	7.65	.....	7.5	6.2	5.3	5.3	5.4	.....
15	5.8	7.55	.....	7.3	6.3	5.3	5.3	5.4	.....
16	5.9	7.95	.....	7.3	6.3	5.3	5.3	5.4	.....
17	5.9	9.0	7.15	7.2	6.2	5.2	5.3	5.4	.....
18	6.25	9.0	7.35	7.2	6.2	5.2	5.3	5.4	.....
19	6.4	9.85	7.4	7.2	6.2	5.2	5.3	5.4	.....
20	6.3	9.8	8.0	7.1	6.2	5.3	5.3	5.4	.....
21	6.0	9.7	8.35	7.0	6.2	5.3	5.3	5.4	.....
22	5.95	9.75	8.7	7.0	6.2	5.3	5.3	5.4	.....
23	5.95	9.8	.....	7.0	6.3	5.3	5.3	5.4	.....
24	6.55	9.7	9.0	7.0	6.3	5.3	5.3	5.4	.....
25	6.7	9.8	9.0	7.0	6.3	5.3	5.3	5.4	.....
26	6.65	9.75	9.0	7.0	6.3	5.3	5.3	5.4	.....
27	6.8	9.75	9.1	7.0	6.3	5.3	5.3	5.4	.....
28	6.95	9.15	9.2	.....	6.3	5.3	5.35	5.4	.....
29	7.0	9.7	9.2	.....	6.3	5.3	5.4	5.4	.....
30	7.15	10.0	8.9	.....	6.3	5.3	5.4	5.4	.....
31	.....	10.0	.....	.....	6.1	.....	5.4	.....	.....

Daily discharge, in second-feet, of Elk River near Trull, Colo., for 1912.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1,530	3,300	1,980	595	370	155	180	180
2	.....	1,745	3,410	1,980	520	300	155	180	180
3	.....	1,655	3,760	1,980	445	210	155	180	180
4	.....	1,610	3,880	1,930	370	155	155	180	180
5	.....	1,610	3,880	1,930	370	155	155	180	.....
6	.....	1,610	3,820	1,980	370	155	155	180	.....
7	370	1,610	3,760	1,700	370	155	168	180	.....
8	370	1,880	3,640	1,700	350	130	180	180	.....
9	370	2,380	3,700	1,790	370	130	155	180	.....
10	390	2,630	3,700	1,790	370	130	155	180	.....
11	430	2,330	3,460	1,790	370	130	155	180	.....
12	300	1,880	1,650	1,450	370	155	155	180	.....
13	300	1,700	1,560	1,370	370	155	155	180	.....
14	300	1,490	1,800	1,370	450	155	155	180	.....
15	300	1,410	1,560	1,210	500	155	155	180	.....
16	330	1,745	1,560	1,210	500	155	155	180	.....
17	330	2,780	1,090	1,130	450	130	155	180	.....
18	475	2,780	1,250	1,130	450	130	155	180	.....
19	550	3,700	1,290	1,130	450	130	155	180	.....
20	500	3,640	1,790	1,050	450	155	155	180	.....
21	370	3,520	2,130	970	450	155	155	180	.....
22	350	3,580	2,480	970	450	155	155	180	.....
23	350	3,640	2,600	970	500	155	155	180	.....
24	640	3,520	2,780	970	500	155	155	180	.....
25	740	3,640	2,780	970	500	155	155	180	.....
26	705	3,580	2,780	970	500	155	155	180	.....
27	810	3,580	2,880	970	500	155	155	180	.....
28	930	2,930	2,980	895	500	155	168	180	.....
29	970	3,520	2,980	820	500	155	180	180	.....
30	1,090	3,880	2,680	745	500	155	180	180	.....
31	.....	3,880	.....	670	410	.....	180	.....	.....

Monthly discharge of Elk River near Trull, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April	1,090	300	511	24,338
May	3,880	1,410	2,612	160,634
June	3,880	1,090	2,698	160,524
July	1,980	670	1,339	82,355
August	595	350	445	27,372
September	370	130	163	9,699
October	180	155	159	9,781
November	180	180	180	10,711
The period	.....	.....	.....	485,414

WILLOW CREEK AT RYAN'S RANCH, NEAR BAGGS, WYO.

Location.—In Colorado, about sec. 26, T. 11 N., R. 90 W., 2 miles northeast of Ryan's ranch house and 22 miles southwest of Baggs, Wyo. No important tributary between the station and the mouth of Willow Creek.

Records available.—May 4 to October 31, 1912.

Drainage area.—Approximately 5 square miles (State engineer's report).

Gage.—Bristol automatic gage.

Channel.—Small cobblestones, placed especially for the station.

Discharge measurements.—No data.

Cooperation.—Station maintained by the State engineer in cooperation with the Elk River Irrigation & Construction Co., and records are published as furnished by the State engineer.

Discharge measurements of Willow Creek at Ryan's ranch, near Baggs, Wyo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 4	C. L. Chatfield	0.52	4.0	June 21	W. P. Finley	0.21	24
10	do	.75	10.8	Aug. 2	C. L. Chatfield	−.10	6.2
29	do	1.40	77	23	W. P. Finley	−.10	4.6

Daily gage height, in feet, and discharge, in second-feet, of Willow Creek at Ryan's ranch, near Baggs, Wyo., for 1912.

[C. C. Ryan, observer.]

Day.	May.		June.		July.		August.		September.		October.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1			0.9	24	0.25	28	−0.1	6	−0.1	6	−0.2	3
2			.95	33	.25	28	−.1	6	−.1	6	−.2	3
3			1.05	50	.2	24	−.15	4	−.1	6	−.2	3
4	0.5	4	1.2	80	.15	20	−.15	4	−.15	4	−.2	3
5	.4	3	1.1	71	.2	24	−.1	6	−.1	6	−.15	4
6	.4	3	1.1	79	.15	20	−.1	6	−.1	6	−.2	3
7	.5	4	1.25	114	.1	17	−.1	6	−.1	6	−.2	3
8	.65	8	1.3	128	.1	17	−.1	6	−.1	6	−.2	3
9	.7	9	1.1	102	.1	17	−.1	6	−.15	4	−.2	3
10	.75	11	.95	87	.05	14	−.1	6	−.1	6	−.2	3
11			.9	86	.0	11	−.1	6	−.1	6	−.2	3
12			.85	84	.05	14	−.1	6	−.15	4	−.2	3
13			.9	98	.05	14	−.1	6	−.1	6	−.2	3
14			.7	74	.2	24	−.1	6	−.05	8	−.2	3
15			.55	60	−.05	8	.05	14	−.1	6	−.2	3
16			.4	42	−.1	6	.0	11	−.1	6	−.2	3
17	1.2	48	.3	32	−.05	8	−.05	8	−.1	6	−.2	3
18	1.25	55	.25	28	.0	11	−.05	8	−.05	8	−.2	3
19	1.2	48	.15	20	.15	20	−.1	6	−.05	8	−.2	3
20	1.2	48	.2	24	.1	17	−.1	6	−.05	8	−.2	3
21	1.25	55	.3	32	−.05	8	−.1	6	−.1	6	−.2	3
22	1.15	42	.4	42	−.1	6	−.1	6	−.1	6	−.2	3
23	1.15	42	.35	37	−.1	6	−.1	6	−.15	4	−.2	3
24	1.2	48	.35	37	−.1	6	−.1	6	−.1	6	.....	3
25	1.3	62	.35	37	−.1	6	−.1	6	−.1	6	.....	3
26	1.25	55	.35	37	−.1	6	−.15	4	−.1	6	.....	3
27	1.1	36	.35	37	−.1	6	−.1	6	−.15	4	.....	3
28	1.05	32	.35	37	−.1	6	−.1	6	−.15	4	.....	3
29	1.2	48	.3	32	−.15	4	.0	11	−.2	3	.....	3
30	1.25	55	.25	28	−.15	4	.2	24	−.2	3	.....	3
31	.95	23	.....	.....	−.1	6	.0	11	.....	.....	.....	3

Monthly discharge of Willow Creek near Baggs, Wyo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
May (22 days)	62	3	34	1,466
June	128	20	56	3,316
July	28	4	13	805
August	24	4	7	446
September	8	3	6	337
October	4	3	3	186
The period	.....	.....	.....	6,558

MAD CREEK NEAR STEAMBOAT SPRINGS, COLO.

Location.—At highway bridge on road to Hahns Peak, 6 miles from Steamboat Springs.

Records available.—July 1 to November 30, 1912.

Drainage area.—40 square miles (State engineer's report).

Gage.—Vertical staff.

Channel.—Rough but permanent.

Discharge measurements.—Made from bridge.

Winter flow.—No data, as records were discontinued.

Cooperation.—These records are published as furnished by the State engineer, who maintains the station in cooperation with Mr. F. A. Metcalf, of Steamboat Springs.

Discharge measurements of Mad Creek near Steamboat Springs, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
July 1	C. L. Chatfield	2.5	542	July 26	C. L. Chatfield	1.85	139
3	do	2.35	417	Aug. 29	do	1.08	22
20	do	2.2	329				

Daily gage height, in feet, and discharge, in second-feet, of Mad Creek near Steamboat Springs, Colo., for 1912.

[E. H. O'Neal, observer.]

Day.	July.		August.		September.		October.		November.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	2.6	630	1.9	172	1.3	34	1.1	17	1.4	48
2	2.4	450	1.9	172	1.3	34	1.1	17	1.4	48
3	2.35	412	1.8	140	1.2	24	1.2	24	1.4	48
4	2.3	375	1.8	140	1.1	17	1.2	24	1.4	48
5	2.2	310	1.8	140	1.0	13	1.2	24	1.3	34
6	2.15	282	1.6	88	1.0	13	1.3	34	1.3	34
7	2.1	255	1.6	88	1.0	13	1.3	34	1.3	34
8	2.3	375	1.5	66	.9	12	1.3	34	1.2	24
9	2.3	375	1.4	48	1.0	13	1.3	34	1.2	24
10	2.45	495	1.4	48	1.1	17	1.3	34	1.2	24
11	2.5	540	1.3	34	1.1	17	1.2	24	1.2	24
12	2.5	540	1.3	34	1.1	17	1.2	24	1.2	24
13	2.4	450	1.2	24	1.1	17	1.1	17	1.2	24
14	2.4	450	1.2	24	1.2	24	1.1	17	1.2	24
15	2.4	450	1.2	24	1.2	24	1.1	17	1.2	24
16	2.3	375	1.2	24	1.2	24	1.1	17	1.2	24
17	2.35	412	1.2	24	1.2	24	1.1	17	1.2	24
18	2.35	412	1.2	24	1.2	24	1.1	17	1.2	24
19	2.35	412	1.1	17	1.2	24	1.1	17	1.2	24
20	2.2	310	1.1	17	1.2	24	1.1	17	1.3	34
21	2.1	255	1.1	17	1.1	17	1.1	17	1.3	34
22	2.1	255	1.1	17	1.0	13	1.1	17	1.3	34
23	2.1	255	1.1	17	1.0	13	1.1	17	1.3	34
24	2.05	232	1.0	13	1.1	17	1.1	17	1.3	34
25	2.0	210	1.0	13	1.1	17	1.2	24	1.3	34
26	2.0	210	1.0	13	1.1	17	1.2	24	1.3	34
27	2.0	210	1.0	13	1.1	17	1.3	34	1.3	34
28	2.0	210	1.1	17	1.1	17	1.3	34	1.3	34
29	1.9	172	1.1	17	1.1	17	1.3	34	1.3	34
30	1.9	172	1.2	24	1.1	17	1.3	34	1.3	34
31	1.9	172	1.3	34	.....	.....	1.4	48	.....	.....

Monthly discharge of Mad Creek near Steamboat Springs, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
July	630	172	344	21,150
August	172	13	50	3,060
September	34	12	19	1,132
October	48	17	25	1,507
November	48	24	32	1,896
The period				28,745

ELK HEAD CREEK NEAR CRAIG, COLO.

Location.—One mile above the mouth at bridge on road between Steamboat Springs and Craig, the latter being 6 miles west. No tributary between the station and the mouth and none for several miles above.

Records available.—April 27 to September 7, 1906; April 17, 1910, to November 30, 1912.

Drainage area.—249 square miles (measured from Land Office map).

Gage.—Chain gage.

Channel.—Practically permanent.

Diversions.—There are court decrees for diversions of 45 second-feet from Elk Head Creek above the station and 48 second-feet from tributaries entering above. In addition, there are conditional decrees for reservoir diversions of 177,000 acre-feet from Elk Head Creek and a diversion of 587 second-feet from the North Fork.

Cooperation.—Since 1910 station maintained and records furnished complete for publication by the State engineer.

Discharge measurements of Elk Head Creek near Craig, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 15[a]	C. L. Chatfield		10	May 27	C. L. Chatfield	10.85	1,459
Apr. 28	do	6.76	354	June 16	do	5.95	300
May 11	do	8.71	767	Aug. 15	do	3.77	4.8

[a] Relation of gage height to discharge affected by ice in stream.

Daily gage height, in feet, of Elk Head Creek near Craig, Colo., for 1912.

[U. F. Harrison, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1		4.95	7.8	9.0	4.6	4.0	3.9	3.8	4.0
2		5.35	8.45	9.05	4.6	4.0	3.85	3.8	4.0
3		5.5	8.6	9.35	4.6	4.0	3.8	3.8	4.0
4		6.2	7.9	9.25	4.5	4.0	3.75	3.7	3.9
5		6.45	6.4	9.1	4.5	4.0	3.7	3.7	3.9
6		6.4	6.4	8.15	4.4	4.0	3.7	3.75	3.9
7		5.8	7.75	7.55	4.4	3.9	3.7	3.7	3.9
8		6.1	8.5	7.35	4.3	3.9	3.7	3.7	3.9
9		6.55	8.95	7.7	4.25	3.9	3.7	3.7	3.9
10		7.5	9.9	7.05	4.2	3.9	3.8	3.7	3.9
11		6.5	9.85	6.4	4.2	3.9	3.8	3.7	3.9
12		7.25	8.95	6.35	4.1	3.8	3.8	3.7	3.9
13		5.95	9.6	6.15	4.1	3.8	3.8	3.7	4.2
14		5.05	7.5	5.9	4.25	3.8	3.7	3.7	4.2
15		5.25	6.8	5.75	4.35	3.8	3.7	3.8	4.1

Daily gage height, in feet, of Elk Head Creek near Craig, Colo., for 1912—Continued.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
16	.....	5.45	8.65	6.0	4.25	3.8	3.7	3.8	4.0
17	.....	5.4	9.55	5.95	4.1	3.8	3.8	3.8	3.9
18	4.15	5.5	11.0	5.9	4.05	3.8	3.8	3.8	3.8
19	4.2	5.6	11.5	5.6	4.0	3.7	3.7	3.8	3.8
20	4.1	5.2	11.0	5.5	4.3	3.7	3.7	3.9	3.8
21	4.2	5.45	11.1	5.15	4.3	3.7	3.7	3.9	3.8
22	4.0	5.45	10.85	5.15	4.2	3.7	3.7	3.9	3.8
23	4.0	5.25	10.7	5.1	4.1	3.8	3.7	3.9	3.8
24	4.1	5.2	10.65	5.0	4.0	3.8	3.7	3.9	3.8
25	4.25	8.15	10.75	4.95	4.0	3.8	3.8	3.9	3.8
26	4.25	7.45	10.85	4.95	4.0	3.7	3.8	3.9	3.7
27	4.45	6.5	10.6	4.85	4.0	3.7	3.8	4.2	3.7
28	4.7	6.4	10.15	4.75	4.1	3.7	3.75	4.3	3.6
29	5.0	7.5	9.8	4.6	4.1	3.7	3.7	4.25	3.6
30	4.95	6.95	9.7	4.6	4.1	3.7	3.7	4.2	3.6
31	5.15	.....	10.0	.....	4.05	3.8	.....	4.1	.....

Daily discharge, in second-feet, of Elk Head Creek near Craig, Colo., for 1912.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	76	570	840	41	6	4	3	6
2	.....	128	708	852	41	6	4	3	6
3	.....	150	842	930	41	6	3	3	6
4	.....	258	590	904	34	6	2	2	4
5	.....	303	294	865	34	6	2	2	4
6	.....	294	294	642	27	6	2	2	4
7	.....	195	560	520	27	4	2	2	4
8	.....	241	819	480	20	4	2	2	4
9	.....	322	928	550	18	4	2	2	4
10	.....	510	1,097	420	15	4	3	2	4
11	.....	312	1,080	294	15	4	3	2	4
12	.....	460	928	285	10	3	3	2	4
13	.....	218	1,002	250	10	3	3	2	15
14	.....	88	510	210	18	3	2	2	15
15	.....	114	370	188	24	3	2	3	10
16	.....	142	854	225	18	3	2	3	6
17	.....	135	988	218	10	3	3	3	4
18	12	150	1,520	210	8	3	3	3	3
19	15	165	1,755	165	6	2	2	3	3
20	10	107	1,520	150	20	2	2	4	3
21	15	142	1,565	100	20	2	2	4	3
22	6	142	1,452	100	15	2	2	4	3
23	6	114	1,388	94	10	3	2	4	3
24	10	107	1,367	82	6	3	2	4	3
25	18	642	1,409	76	6	3	3	4	3
26	18	500	1,452	76	6	2	3	4	2
27	30	312	1,346	65	6	2	3	15	2
28	50	294	1,180	55	10	2	2	20	1
29	82	510	1,064	41	10	2	2	18	1
30	76	400	1,033	41	10	2	2	15	1
31	100	.....	1,130	.....	8	3	.....	10	.....

Monthly discharge of Elk Head Creek near Craig, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
March 18–31	100	6	32	889
April	642	76	251	14,937
May	1,755	294	1,020	62,708
June	930	41	331	19,696
July	41	6	18	1,079
August	6	2	3	212
September	4	2	2	147
October	20	2	5	294
November	15	1	4	268
The period	.....	.....	.....	100,227

FORTIFICATION CREEK AT CRAIG, COLO.

Location.—One-eighth mile east of Craig on the road to Hayden. No tributaries between the station and the mouth, and none for some distance above.

Records available.—June 12, 1905, to July 30, 1906; March 5, 1910, to September 30, 1912.

Drainage area.—256 square miles (measured from Land Office map).

Gage.—Chain gage.

Channel.—Very shifting.

Discharge measurements.—Made from bridge.

Diversions.—There are court decrees for diversions of 91 second-feet from Fortification Creek above the station and 20 second-feet from tributaries entering above. There is also a conditional decree for a diversion of 235,000 acre-feet from Fortification Creek.

Cooperation.—Station since 1910 maintained and records furnished complete for publication by the State engineer.

Discharge measurements of Fortification Creek at Craig, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 14	C. L. Chatfield	4.1	84
28	do	5.46	201
May 11	do	6.46	229
June 16	do	4.75	109

Daily gage height, in feet, and discharge, in second-feet, of Fortification Creek at Craig, Colo., for 1912.

[Mrs. E. L. Jameson, observer.]

Day.	April.		May.		June.		July.		August.		September.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	6.15	230	6.35	270	7.15	320	3.3	20	.....	1	3.1	5
2	6.15	230	7.0	350	7.3	345	3.2	22	.....	1	.....	5
3	6.15	230	7.25	385	7.6	385	3.15	17	.....	1	.....	2
4	6.15	230	5.65	190	7.75	410	3.1	15	.....	1	.....	2
5	5.65	183	4.95	130	7.55	380	3.1	15	.....	1	.....	2
6	6.15	230	4.55	105	7.1	315	3.1	15	.....	0	.....	2
7	.....	.....	5.15	135	6.7	265	3.05	10	.....	0	.....	2
8	.....	.....	6.9	300	8.2	480	2.95	8	.....	0	.....	2
9	.....	.....	8.1	465	7.3	345	2.85	7	.....	0	.....	2
10	.....	.....	7.9	400	6.5	245	2.75	5	.....	0	.....	2
11	.....	.....	7.05	290	6.0	195	2.75	5	.....	0	.....	2
12	.....	.....	6.85	280	5.75	175	.....	2	.....	0	.....	2
13	.....	.....	5.95	190	5.55	155	.....	2	.....	0	.....	2
14	4.0	75	5.3	140	5.3	140	.....	2	.....	0	.....	2
15	3.9	70	5.55	160	5.0	120	3.4	18	.....	0	.....	5
16	4.55	115	6.7	270	4.8	105	2.95	8	.....	0	.....	5
17	4.55	115	8.3	490	4.4	85	2.85	7	3.2	13	.....	4
18	4.55	115	8.6	535	4.25	75	.....	3	2.95	8	.....	3
19	5.15	155	8.8	565	4.1	70	.....	3	2.75	5	.....	2
20	4.55	115	8.5	520	4.0	65	.....	3	.....	5	.....	2
21	4.1	95	8.7	550	4.0	65	.....	4	.....	4	.....	3
22	4.15	100	8.45	510	3.75	50	.....	4	.....	2	.....	2
23	3.95	85	8.35	490	3.7	50	.....	4	.....	1	.....	2
24	4.1	95	8.5	520	3.95	50	.....	4	.....	1	.....	2
25	5.45	200	8.45	510	3.95	50	.....	4	.....	0	.....	2
26	5.9	245	8.55	530	3.8	45	.....	4	.....	0	.....	2
27	5.2	180	8.15	480	3.55	35	.....	4	.....	0	.....	2
28	5.3	185	6.75	275	3.5	35	.....	4	.....	0	.....	2
29	6.15	260	7.25	335	3.4	25	.....	4	.....	0	.....	2
30	5.9	245	8.05	470	3.25	22	.....	4	3.25	15	.....	2
31	.....	.....	8.2	480	.....	.....	.....	3	3.25	15	.....	.....

Monthly discharge of Fortification Creek at Craig, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April	260	70	164	7,504
May	565	105	365	22,453
June	480	22	170	10,120
July	22	2	7	456
August	15	0	2	147
September	12	2	3	165
The period				40,845

WILLIAMS RIVER AT HAMILTON, COLO.

Location.—Near Hamilton, at highway bridge, on the road from Meeker to Craig. Morapos Creek, the nearest tributary, enters some distance below the station.

Records available.—April 29, 1904, to October 31, 1906; April 15, 1910, to November 30, 1912.

Drainage area.—341 square miles (State engineer's report).

Gage.—Chain gage.

Channel.—Shifting.

Discharge measurements.—Made from highway bridge.

Diversions.—There are court decrees for diversions of 40 second-feet from Williams River above the station, and 7 second-feet below. There are also decrees for diversions of 87 second-feet from tributaries entering above.

Cooperation.—Since 1910 station maintained and records furnished complete for publication by the State engineer.

Discharge measurements of Williams River at Hamilton, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 10[a]	C. L. Chatfield		45	June 3	C. L. Chatfield	7.67	1,572
Apr. 15	do	3.0	110	Aug. 5	do	3.35	175
23	do	3.1	125				

[a] Relation of gage height to discharge affected by ice in stream.

Daily gage height, in feet, of Williams River at Hamilton, Colo., for 1912.

[Carrie A. Hamilton, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	3.25	3.8	7.3	5.4	3.8	2.95	2.9	2.8
2	3.35	3.9	7.5	5.2	3.75	2.9	2.9	2.8
3	3.4	3.9	7.95	5.1	3.7	2.8	2.9	2.8
4	3.45	3.9	8.15	4.9	3.55	2.8	2.9	2.9
5	3.35	3.7	7.9	4.8	3.4	2.8	2.9	2.9
6	3.2	3.6	7.75	4.6	3.3	2.75	2.9	2.9
7	3.25	3.9	7.8	4.55	3.3	2.7	2.9	2.9
8	3.25	4.4	8.2	4.6	3.25	2.7	2.9	3.0
9	3.4	4.55	8.05	4.4	3.2	2.75	2.9	3.0
10	3.25	4.4	7.35	4.3	3.2	2.8	2.9	2.95
11	3.25	4.35	6.95	4.15	3.1	2.8	2.8	2.9
12	3.35	4.2	6.35	4.2	3.1	2.8	2.8	2.85
13	3.25	4.1	6.6	4.2	3.05	2.8	2.8	2.8
14	3.15	3.9	6.3	4.2	3.0	2.8	2.8	2.8
15	3.15	4.05	6.1	4.1	3.0	2.8	2.8	2.8

Daily gage height, in feet, of Williams River at Hamilton, Colo., for 1912—Continued.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
16	3.05	4.4	5.6	4.0	3.1	2.8	2.8	2.8
17	3.1	5.05	5.2	3.9	3.1	2.8	2.8	2.8
18	3.2	6.0	4.95	3.8	3.05	2.8	2.8	2.8
19	3.25	6.75	4.85	3.8	3.0	2.8	2.8	2.8
20	3.15	7.1	4.95	3.95	3.0	2.8	2.8	2.8
21	3.05	7.9	5.2	3.85	3.0	2.8	2.8	2.8
22	3.1	7.75	5.25	3.7	2.95	2.8	2.8	2.8
23	3.2	7.85	5.5	3.7	2.9	2.8	2.8	.....
24	3.2	7.35	5.45	3.65	2.85	2.9	2.8	.....
25	3.15	8.15	5.5	3.55	2.8	2.9	2.8	.....
26	3.15	8.35	5.65	3.55	2.8	2.9	2.8	.....
27	3.05	8.2	5.7	3.9	2.8	2.9	2.8	.....
28	3.25	6.9	5.65	4.2	3.2	2.9	2.8	.....
29	3.4	7.5	5.45	3.9	3.15	2.9	2.8	.....
30	3.7	8.15	5.4	3.85	3.3	2.9	2.8	.....
31	.....	8.95	.....	3.75	3.2	.....	2.8	.....

Daily discharge, in second-feet, of Williams River at Hamilton, Colo., for 1912.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	152	272	1,436	745	272	100	91	74
2	172	295	1,510	676	260	91	91	74
3	183	295	1,676	643	249	74	91	74
4	194	295	1,752	577	215	74	91	91
5	172	249	1,658	546	183	74	91	91
6	143	226	1,602	484	162	66	91	91
7	152	295	1,621	470	162	58	91	91
8	152	426	1,771	484	152	58	91	108
9	183	470	1,714	426	143	66	91	108
10	152	426	1,454	399	143	74	91	100
11	152	412	1,306	358	125	74	74	91
12	172	372	1,086	372	125	74	74	82
13	152	345	1,177	372	116	74	74	74
14	134	295	1,068	372	108	74	74	74
15	134	332	996	345	108	74	74	74
16	116	426	816	320	125	74	74	74
17	125	626	676	295	125	74	74	74
18	143	960	594	272	116	74	74	74
19	152	1,232	562	272	108	74	74	74
20	134	1,362	594	308	108	74	74	74
21	116	1,658	676	284	108	74	74	74
22	125	1,602	693	249	100	74	74	74
23	143	1,640	780	249	91	74	74	74
24	143	1,454	762	238	82	91	74	74
25	134	1,752	780	215	74	91	74	74
26	134	1,828	834	215	74	91	74	74
27	116	1,771	852	295	74	91	74	74
28	152	1,288	834	372	143	91	74	74
29	183	1,510	762	295	134	91	74	74
30	249	1,752	745	284	162	91	74	74
31	.....	2,056	.....	260	143	.....	74	.....

Monthly discharge of Williams River at Hamilton, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April	249	116	152	9,053
May	2,056	226	901	55,384
June	1,771	562	1,093	65,034
July	745	215	377	23,191
August	272	74	138	8,509
September	100	58	78	4,629
October	91	74	79	4,887
November	108	74	80	4,774
The period	.....	.....	.....	175,461

MIDDLE FORK OF LITTLE SNAKE RIVER NEAR BATTLE CREEK, COLO.

Location.—At Gardner's ranch, in sec. 21, T. 11 N., R. 86 W., on the county road bridge 10 miles above Battle Creek.

Records available.—May 8 to October 26, 1912.

Drainage area.—152 square miles (State engineer's report).

Gage.—Bristol automatic gage.

Channel.—Practically permanent.

Discharge measurements.—No information.

Cooperation.—These records are published as furnished by the State engineer, who maintains the station in cooperation with the Elk River Irrigation & Construction Co.

Discharge measurements of Middle Fork of Little Snake River near Battle Creek, Colo. in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 8	C. L. Chatfield	1.94	218
30	do	5.35	1,540
June 16	W. P. Finley	2.30	317
July 31	do	1.28	90

Daily gage height, in feet, and discharge, in second-feet, of Middle Fork of Little Snake River near Battle Creek, Colo., for 1912.

[Ed. Turner, observer.]

Day.	May.		June.		July.		August.		September.		October.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1			4.5	1,117	1.9	209	1.15	62	0.6	16	0.65	19
2			4.6	1,162	1.85	198	1.1	56	.55	12	.65	19
3			4.85	1,285	1.75	174	.9	36	.5	10	.65	19
4			4.9	1,310	1.7	163	.8	28	.5	10	.65	19
5			4.65	1,186	1.7	163	.7	22	.5	10	.75	25
6			4.5	1,117	1.6	140	.7	22	.5	10	.75	25
7			4.45	1,094	1.55	130	.7	22	.5	10	.8	28
8	2.25	300	4.4	1,072	1.5	120	.75	25	.5	10	.75	25
9	2.45	356	4.3	1,027	1.4	100	.7	22	.5	10	.8	28
10	2.5	371	3.95	880	1.4	100	.7	22	.85	32	.8	28
11	2.4	342	3.7	777	1.35	92	.65	19	.7	22	.8	28
12	2.35	328	3.45	684	1.4	100	.6	16	.6	16	.85	32
13	2.15	274	3.4	666	1.4	100	.6	16	.6	16	.75	25
14	2.2	287	3.35	648	1.7	163	.6	16	.75	25	.7	22
15	2.45	356	3.1	563	1.4	100	.65	19	.7	22	.7	22
16	2.9	497	2.8	464	1.25	76	.8	28	.7	22	.7	22
17	3.6	740	2.55	386	1.15	62	.7	22	.85	32	.7	22
18	4.4	1,072	2.4	342	1.1	56	.7	22	.9	36	.7	22
19	4.6	1,162	2.3	313	1.3	83	.65	19	.8	28	.7	22
20	4.75	1,236	2.3	313	1.4	100	.6	16	.8	28	.8	28
21	5.1	1,410	2.35	328	1.15	62	.55	12	.7	22	.75	25
22	4.8	1,260	2.4	342	1.1	56	.55	12	.7	22	.7	22
23	4.8	1,260	2.35	328	1.15	62	.55	12	.7	22	.85	32
24	5.0	1,360	2.35	328	1.0	45	.5	10	.8	28	.85	32
25	5.2	1,460	2.4	342	1.0	45	.5	10	.7	22	.85	32
26	5.0	1,360	2.35	328	1.1	56	.45	9	.8	28	.95	40
27	4.4	1,072	2.2	287	1.15	62	.5	10	.8	28		
28	4.05	920	2.15	274	1.1	56	.55	12	.75	25		
29	4.6	1,162	2.1	261	.9	36	.6	16	.7	22		
30	5.0	1,360	2.05	248	1.0	45	.9	36	.65	19		
31	5.0	1,360			1.3	83	.8	28				

Monthly discharge of Middle Fork of Little Snake River near Battle Creek, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
May (8-31)	1,460	274	888	42,258
June	1,310	248	649	38,623
July	209	36	98	6,024
August	62	9	22	1,343
September	36	10	20	1,220
October (1-26)	40	19	26	1,315
The period				90,789

SOUTH FORK OF LITTLE SNAKE RIVER NEAR BATTLE CREEK, COLO.

Location.—At Gardner's ranch, in sec. 28, T. 12 N., R. 86 W., 10 miles above Battle Creek. No important tributary between the station and the mouth.

Records available.—May 8 to October 26, 1912.

Drainage area.—46 square miles (State engineer's report).

Gage.—Bristol automatic gage.

Channel.—Practically permanent.

Discharge measurements.—No data.

Diversions.—There are decrees for adjudicated diversions of 8 second-feet from the South Fork.

Cooperation.—Records are published as furnished by the State engineer, who maintains the station in cooperation with the Elk River Irrigation & Construction Co.

Discharge measurements of South Fork of Little Snake River at Battle Creek, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 8	C. L. Chatfield	1.41	91
31	do	2.22	232
June 19	W. P. Finley	1.47	91
July 31	do	1.03	14

Daily gage height, in feet, and discharge, in second-feet, of South Fork of Little Snake River near Battle Creek, Colo., for 1912.

[Ed. Turner, observer.]

Day.	May.		June.		July.		August.		September.		October.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1			2.1	210	1.3	62	1.1	30	0.8	3	0.9	8
2			2.05	200	1.3	62	1.05	24	.75	2	.9	8
3			2.1	210	1.3	62	1.0	17	.75	2	.9	8
4			2.1	210	1.3	62	.95	12	.75	2	.9	8
5			2.05	200	1.3	62	.9	8	.8	3	1.0	17
6			2.0	190	1.25	54	.9	8	.8	3	.95	12
7			2.05	200	1.15	38	.9	8	.8	3	.95	12
8	1.75	143	2.1	210	1.1	30	.9	8	.75	2	1.0	17
9	1.85	161	2.05	200	1.1	30	.9	8	.75	2	1.0	17
10	1.9	170	1.9	170	1.1	30	.85	6	.85	6	1.0	17
11	1.8	152	1.85	161	1.1	30	.8	3	.9	8	1.0	17
12	1.7	134	1.8	152	1.1	30	.8	3	.85	6	1.0	17
13	1.55	107	1.75	143	1.1	30	.8	3	.8	3	.9	8
14	1.55	107	1.75	143	1.2	46	.8	3	.9	8	.9	8
15	1.75	143	1.7	134	1.1	30	.85	6	.9	8	.95	12

Daily gage height, in feet, and discharge, in second-feet, of South Fork of Little Snake River near Battle Creek, Colo., for 1912—Continued.

Day.	May.		June.		July.		August.		September.		October.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
16	1.95	180	1.6	116	1.05	24	.9	8	.9	8	.95	12
17	2.1	210	1.55	107	1.05	24	.85	6	.9	8	.95	12
18	2.25	240	1.5	98	1.0	17	.85	6	.9	8	.95	12
19	2.3	250	1.5	98	1.1	30	.85	6	.9	8	.95	12
20	2.35	260	1.5	98	1.1	30	.8	3	.9	8	1.0	17
21	2.45	280	1.5	98	1.05	24	.8	3	.85	6	.95	12
22	2.3	250	1.45	89	1.0	17	.8	3	.9	8	1.1	30
23	2.3	250	1.4	80	1.05	24	.8	3	.85	6	1.0	17
24	2.3	250	1.4	80	1.0	17	.8	3	.9	8	1.05	24
25	2.3	250	1.4	80	1.0	17	.7	1	.9	8	1.05	24
26	2.3	250	1.4	80	1.0	17	.7	1	.9	8	1.1	30
27	2.15	220	1.4	80	1.05	24	.75	2	.95	12	.....	.....
28	2.05	200	1.4	80	1.0	17	.8	3	.9	8	.....	.....
29	2.05	200	1.35	71	.95	12	.85	6	.9	8	.....	.....
30	2.15	220	1.35	71	1.1	30	.95	12	.85	6	.....	.....
31	2.2	230	.....	.....	1.1	30	.95	12	.....	.....	.....	.....

Monthly discharge of South Fork of Little Snake River near Battle Creek, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
May (8–31)	280	107	202	9,634
June	210	71	135	8,051
July	62	12	33	2,007
August	30	1	7	446
September	12	2	6	355
October (1–26)	30	8	15	770
The period	.....	.....	.....	21,263

LITTLE SNAKE RIVER NEAR DIXON, WYO.

Location.—One mile west of Dixon, Wyo., in sec. 6, T. 12 N., R. 90 W. Nearest tributaries are Cottonwood Creek, which enters a short distance east of Dixon, and Beaver Creek, which enters a mile or less downstream.

Records available.—May 27, 1910, to November 30, 1912.

Drainage area.—1,294 square miles (State engineer's report).

Gage.—Chain gage.

Channel.—Slightly shifting during high water.

Cooperation.—Station is maintained and records are furnished complete for publication by the State engineer of Colorado.

Discharge measurements of Little Snake River near Dixon, Wyo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 13[a]	C. L. Chatfield	.....	105
May 5	.....do	2.95	951
9	.....do	4.95	2,486
31	.....do	7.18	6,535

[a] Relation between gage height and discharge affected by ice in stream.

Daily gage height, in feet, of Little Snake River near Dixon, Wyo., for 1912.

[Edith Madsen, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	1.35	3.0	6.45	3.25	1.6	1.05	1.1	1.25
2	1.55	3.45	6.45	3.0	1.5	.7	1.0	1.1
3	1.85	3.9	6.55	2.9	1.2	.7	.9	1.3
4	2.1	3.35	6.8	2.6	1.1	.7	.9	1.4
5	2.4	3.1	6.75	2.65	1.0	.7	.9	1.4
6	2.15	2.7	6.6	2.45	.95	.6	1.0	1.4
7	1.9	3.0	6.5	2.4	.9	.6	1.05	1.4
8	2.05	4.1	6.45	3.2	.75	.6	1.2	1.35
9	2.45	4.8	6.55	2.15	.8	.5	1.2	1.35
10	2.6	5.05	6.55	1.9	.85	.6	1.2	1.35
11	2.3	4.8	5.95	1.8	.7	.75	1.25	1.3
12	2.45	4.85	5.55	1.75	.65	.8	1.2	1.45
13	2.25	4.7	5.6	1.7	.55	.7	1.2	1.2
14	2.0	4.3	5.4	2.3	.5	.8	1.2	1.2
15	1.95	4.8	5.05	2.1	.7	.9	1.1	1.2
16	2.0	5.2	5.0	1.8	.8	1.0	1.1	1.05
17	2.0	5.85	4.1	1.7	.8	1.0	1.1	1.0
18	2.0	6.45	3.8	1.5	.75	1.0	1.1	1.05
19	2.5	7.0	3.55	1.4	.8	1.0	1.05	1.05
20	2.3	6.8	3.55	1.7	.65	1.0	1.15	1.15
21	2.1	7.05	3.45	1.6	.65	1.0	1.2	1.15
22	1.9	6.8	3.7	1.4	.65	1.0	1.1	1.15
23	1.9	6.5	3.8	1.3	.6	1.0	1.3	1.2
24	2.5	6.6	3.95	1.15	.6	1.05	1.3	1.2
25	2.35	6.55	4.15	1.1	.5	1.0	1.3	1.2
26	2.35	6.7	3.95	1.3	.5	1.0	1.3	1.2
27	2.45	6.4	3.75	1.3	.5	1.1	1.4	1.1
28	2.45	5.75	3.7	1.25	.6	1.05	2.0	1.1
29	2.85	5.9	3.4	1.1	.75	.9	1.7	1.15
30	3.05	6.35	3.4	1.1	1.2	.95	1.6	1.1
31	.....	6.8	.....	1.45	1.3	.....	1.5	.....

Daily discharge, in second-feet, of Little Snake River near Dixon, Wyo., for 1912.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	193	960	4,695	1,115	272	111	122	163
2	255	1,241	4,695	960	238	49	100	122
3	363	1,546	4,915	898	148	49	82	178
4	462	1,177	5,480	720	122	49	82	208
5	612	1,022	5,362	749	100	49	82	208
6	485	778	5,025	639	91	34	100	208
7	382	960	4,805	612	82	34	111	208
8	441	1,694	4,695	558	57	34	148	193
9	639	2,270	4,915	485	65	20	148	193
10	720	2,500	4,915	382	74	34	148	193
11	558	2,270	3,722	344	49	57	163	178
12	639	2,315	3,098	325	42	65	148	223
13	533	2,182	3,170	306	27	49	148	148
14	420	1,850	2,895	558	20	65	148	148
15	401	2,270	2,500	462	49	82	122	148
16	420	2,650	2,450	344	65	100	122	111
17	420	3,555	1,694	306	65	100	122	100
18	420	4,695	1,476	238	57	100	122	111
19	666	6,000	1,307	208	65	100	111	111
20	558	5,480	1,307	306	42	100	135	135
21	462	6,135	1,241	272	42	100	148	135
22	382	5,480	1,406	208	42	100	122	135
23	382	4,805	1,476	178	34	100	178	148
24	666	5,025	1,583	135	34	111	178	148
25	585	4,915	1,733	122	20	100	178	148
26	585	5,245	1,583	178	20	100	178	148
27	639	4,585	1,441	178	20	122	208	122
28	639	3,395	1,406	163	34	111	420	122
29	867	3,635	1,208	122	57	82	306	135
30	991	4,482	1,208	122	148	91	272	122
31	.....	5,480	.....	223	178	.....	238	.....

Monthly discharge of Little Snake River near Dixon, Wyo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April	991	193	526	31,310
May	6,135	778	3,245	199,534
June	5,480	1,208	2,914	173,370
July	1,115	122	401	24,627
August	272	20	76	4,679
September	122	20	77	4,561
October	420	82	158	9,699
November	223	100	152	9,223
The period				457,003

SLATER CREEK AT BAXTER'S RANCH, NEAR SLATER, COLO.

Location.—At Baxter's ranch, in sec. 22, T. 11 N., R. 89 W., 10 miles south of Slater.
Records available.—May 6 to October 31, 1912.
Drainage area.—80 square miles (State engineer's report).
Gage.—Bristol automatic gage.
Channel.—Rough but permanent.
Discharge measurements.—No data.
Diversions.—There are court decrees for diversions of 14 second-feet from Slater Creek, all below the station.
Cooperation.—These records are published as furnished by the State engineer, who maintains the station in cooperation with the Elk River Irrigation & Construction Co.

Discharge measurements of Slater Creek at Baxter's ranch, near Slater, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 6	C. L. Chatfield	1.8	63
June 20	W. P. Finley	2.68	275
Aug. 1	C. L. Chatfield	1.6	44

Daily gage height, in feet, and discharge, in second-feet, of Slater Creek at Baxter's ranch, near Slater, Colo., for 1912.

[F. D. Baxter, observer.]

Day.	May.		June.		July.		August.		September.		Ootober.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1			2.75	290	2.4	201	1.65	46	1.3	13		
2			2.9	332	2.35	188	1.5	30	1.2	7		
3			3.0	360	2.25	165	1.4	21	1.2	7		
4			3.2	416	2.15	143	1.35	17	1.2	7		
5			3.15	402	2.2	154	1.3	13	1.2	7		
6	1.9	88	3.1	388	2.1	132	1.3	13	1.2	7		
7	2.05	121	3.2	416	2.1	132	1.3	13	1.2	7		
8	2.35	188	3.3	444	2.05	121	1.3	13	1.15	6		
9	2.5	226	3.15	402	1.95	99	1.3	13	1.2	7		
10	2.6	251	2.95	346	1.9	88	1.3	13	1.25	10		
11	2.6	251	2.9	332	1.85	78	1.25	10	1.25	10		
12	2.65	264	2.85	328	1.9	88	1.25	10	1.2	7		
13	2.45	214	2.7	276	2.0	110	1.25	10	1.2	7		
14	2.4	201	2.7	276	2.3	176	1.2	7	1.4	21		
15	2.55	238	2.55	238	2.0	110	1.4	21	1.35	17	1.5	30

Daily gage height, in feet, and discharge, in second-feet, of Slater Creek at Baxter's ranch, near Slater, Colo., for 1912—Continued.

Day.	May.		June.		July.		August.		September.		October.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
16	3.0	360	2.35	188	1.85	78	1.5	30	1.3	13	1.4	21
17	3.45	492	2.3	176	1.7	53	1.4	21	1.55	35	1.45	26
18	3.7	572	2.35	188	1.65	46	1.4	21	1.35	17	1.4	26
19	3.85	626	2.45	214	1.75	61	1.35	17	1.3	13	1.4	26
20	4.05	706	2.65	264	1.9	88	1.25	10	1.3	13	1.4	26
21	4.0	685	2.75	290	1.7	53	1.2	7	1.3	13	1.4	26
22	3.8	608	2.8	304	1.65	46	1.2	7	1.3	13	1.5	30
23	3.75	590	2.75	290	1.7	53	1.2	7	1.35	17	1.5	30
24	3.9	644	2.7	276	1.55	35	1.2	7	1.4	21	1.5	30
25	3.95	664	2.75	290	1.5	30	1.2	7	1.35	17	.....	30
26	3.85	626	2.75	290	1.55	35	1.15	6	1.35	17	1.5	30
27	3.5	508	2.7	276	1.6	40	1.25	10	1.35	17	.....	26
28	3.45	492	2.65	264	1.55	35	1.3	13	1.35	17	.....	26
29	3.65	556	2.6	251	1.45	26	1.45	26	1.35	17	.....	26
30	3.65	556	2.45	214	1.55	35	1.6	40	1.3	13	.....	26
31	3.05	374	.....	.....	1.65	46	1.5	30	.....	.....	.....	26

Monthly discharge of Slater Creek at Baxter's ranch, near Slater, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
May 6–31	706	88	427	22,015
June	441	176	300	17,874
July	201	26	89	5,444
August	46	6	16	1,010
September	35	6	13	779
October 15–31	30	21	27	914
The period	.....	.....	.....	48,036

SLATER CREEK NEAR SLATER, COLO.

Location.—At a private bridge 3 miles south of Slater post office, about sec. 28, T. 12 N., R. 89 W. There is no tributary of importance below the station and none for several miles above.

Records available.—May 28, 1910, to May 25, 1912.

Drainage area.—143 square miles (State engineer's report).

Gage.—Vertical staff.

Channel.—Permanent.

Diversions.—There are court decrees for diversions of 14 second-feet from Slater Creek.

Cooperation.—These records are published as furnished by the State engineer, who maintains the station.

Discharge measurements of Slater Creek near Slater, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 13[a]	C. L. Chatfield	.....	18.8
May 6	.....do	1.7	72

[a] Relation of gage height to discharge affected by ice in stream.

Daily gage height, in feet, and discharge, in second-feet, of Slater Creek near Slater, Colo., for 1912.

[H. V. Rowell, observer.]

Day.	April.		May.		Day.	April.		May.	
	Gage height.	Discharge.	Gage height.	Discharge.		Gage height.	Discharge.	Gage height.	Discharge.
1	0.8	1	1.9	120	16	1.35	31	3.1	595
2	.85	2	1.95	131	17	1.35	31	3.85	1,022
3	.9	2	1.65	74	18	1.4	37	4.25	1,248
4	.95	4	1.85	110	19	1.4	37	5.0	1,700
5	1.0	5	1.9	120	20	1.45	44	4.45	1,365
6	1.1	8	1.7	82	21	1.45	44	4.45	1,365
7	1.1	8	2.15	185	22	1.5	50	4.1	1,165
8	1.15	12	2.7	390	23	1.5	50	4.15	1,192
9	1.2	15	2.8	440	24	1.55	58	4.2	1,220
10	1.2	15	2.7	390	25	1.8	100	4.5	1,395
11	1.25	20	2.6	345	26	1.7	82	.....	.....
12	1.25	20	2.7	390	27	1.7	82	.....	.....
13	1.3	25	2.5	305	28	1.6	65	.....	.....
14	1.3	25	2.05	156	29	1.8	100	.....	.....
15	1.35	31	2.45	286	30	1.6	65	.....	.....
					31	.....	.....	.....	.....

Monthly discharge of Slater Creek near Slater, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April	100	1	36	2,120
May (1–25)	1,700	74	632	31,322

FOURMILE CREEK AT RYAN'S RANCH, NEAR BAGGS, WYO.

Location.—In Colorado, at forest ranger station near Ryan's ranch, in sec. 9, T. 10 N., R. 90 W., 20 miles southeast of Baggs, Wyo.

Records available.—May 1 to October 31, 1912.

Drainage area.—Approximately 4 square miles (State engineer's report).

Gage.—Bristol automatic gage.

Channel.—Probably permanent.

Discharge measurements.—Made from footbridge.

Cooperation.—These records are published as furnished by the State engineer, who maintains the station in cooperation with the Elk River Irrigation & Construction Co.

Discharge measurements of Fourmile Creek at Ryan's ranch, near Baggs, Wyo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 3	C. L. Chatfield	0.63	7.4	June 21	W. P. Finley	0.80	14
10	do	.83	14.3	Aug 2	Chatfield and Ault	.55	2.7
29	do	1.42	77	23	W. P. Finley	.48	2.5

Daily gage height, in feet, and discharge, in second-feet, of Fourmile Creek at Ryan's ranch, near Baggs, Wyo., for 1912.

[C. C. Ryan, observer.]

Day.	May.		June.		July.		August.		September.		October.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	.....	5	1.2	50	0.7	8	0.6	5	0.45	2	0.35	2
2	.....	5	1.2	50	.7	8	.55	4	.4	2	.35	2
3	0.7	8	1.25	56	.7	8	.5	2	.4	2	.35	2
4	.55	4	1.15	44	.7	8	.55	4	.4	2	.4	2
5	.5	2	1.1	38	.7	8	.5	2	.4	2	.4	2
6	.45	2	1.1	38	.7	8	.5	2	.4	2	.4	2
7	.6	5	1.2	50	.65	7	.5	2	.4	2	.4	2
8	.8	13	1.25	56	.6	5	.5	2	.35	2	.35	2
9	.9	20	1.1	38	.6	5	.5	2	.35	2	.3	2
10	.9	20	1.0	28	.65	7	.5	2	.4	2	.3	2
11	.9	20	.95	24	.65	7	.45	2	.4	2	.3	2
12	.8	13	1.0	28	.7	8	.4	2	.35	2	.35	2
13	.7	8	1.0	28	.65	7	.4	2	.4	2	.35	2
14	.8	13	.95	24	.7	8	.4	2	.45	2	.35	2
15	1.0	28	.9	20	.7	8	.5	2	.45	2	.35	2
16	1.3	63	.75	11	.7	8	.6	5	.45	2	.35	2
17	1.45	84	.7	8	.7	8	.55	4	.45	2	.35	2
18	1.55	99	.7	8	.7	8	.45	2	.45	2	.35	2
19	1.45	84	.7	8	.7	8	.5	2	.45	2	.35	2
20	1.45	84	.75	11	.7	8	.4	2	.4	2	.4	2
21	1.5	91	.8	13	.65	7	.35	2	.4	2	.4	2
22	1.35	70	.8	13	.6	5	.4	2	.4	2	.4	2
23	1.35	70	.85	16	.6	5	.4	2	.2	1	.4	2
24	1.45	84	.8	13	.55	4	.4	2	.3	2	.....	2
25	1.5	91	.75	11	.55	4	.....	2	.35	2	.....	2
26	1.45	84	.75	11	.6	5	.35	2	.3	2	.....	2
27	1.3	63	.8	13	.6	5	.35	2	.4	2	.....	2
28	1.2	50	.75	11	.6	5	.4	2	.4	2	.....	2
29	1.35	70	.7	8	.55	4	.45	2	.35	2	.....	2
30	1.35	70	.7	8	.55	4	.6	5	.35	2	.....	2
31	1.3	63	.....	.....	.6	5	.5	2	.....	.....	.....	2

Monthly discharge of Fourmile Creek at Ryan's ranch, near Baggs, Wyo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
May	99	2	48	2,749
June	56	8	24	1,458
July	8	4	7	403
August	5	2	2	153
September	2	1	2	117
October	2	2	2	123
The period	.....	.....	.....	5,002

ASHLEY CREEK BASIN.

ASHLEY CREEK NEAR VERNAL, UTAH.

Location.—In sec. 13, T. 3 S., R. 20 E., Salt Lake base and meridian, about 1 mile below the Ashley Creek power plant and about 15 miles north of Vernal, Utah; 2½ miles above the point at which Dry Fork enters the creek.

Records available.—October 8, 1911, to December 31, 1912. Records are also available for a point below the mouth of Dry Fork from March 18, 1900, to December 31, 1904.

Drainage area.—107 square miles.

Gage.—Vertical staff on right bank.

Channel.—Shifts during high water.

Discharge measurements.—Made by wading.

Winter flow.—Very little ice forms at this station.

Diversions.—Above all diversions.

Artificial regulation.—Operation of power plant probably has no effect on flow at station.

Accuracy.—Poor, owing to infrequent gage readings and lack of discharge measurements.

Cooperation.—Maintained in cooperation with the United States Forest Service.

The following discharge measurement was made by J. C. Dort: September 6: Gage height, 1.81; discharge, 62.7 second-feet.

Daily gage height, in feet, of Ashley Creek near Vernal, Utah, for 1912.

[Grant Carpenter, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.23				1.25				1.8			
2			1.09	1.13		3.4						
3	1.21	1.12		1.58						1.7		
4												1.7
5											1.9	
6					1.1						1.9	
7	1.2	1.1	1.08	1.15					1.81			
8					1.2					1.8		1.63
9			1.08									
10	1.2	1.11										
11									1.8			
12					1.5			1.8				
13			1.1							1.75	1.8	
14	1.2			1.13								1.6
15		1.1								1.7		
16			1.1			2.7						
17	1.1	1.1		1.1							1.75	
18									1.7			
19					2.6							
20												
21	1.15	1.1	1.1									
22				1.11	2.5			1.8				1.55
23			1.1									
24	1.14	1.1		1.11						1.7	1.7	
25								1.8				
26					3.3							
27	1.13		1.1		3.9	2.6					1.7	
28		1.1		1.12								
29								1.9				1.55
30			1.1			2.5			1.7		1.7	
31	1.1											

NOTE.—Observer absent during July. Gage heights Oct. 8 to Dec. 31, 1911, are published in Water-Supply Paper No. 309.

Daily discharge, in second-feet, of Ashley Creek near Vernal, Utah, for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	41				42				62			
2			30	33		630						
3	39	32		88						51		
4												51
5											77	
6					31						77	
7	38	31	30	34					64			
8					38					62		45
9			30									
10	38	32										
11									62			
12					73			62				
13			31							56	62	
14	38			33								42
15		31								51		
16			31			300						
17	31	31		31							56	
18									51			
19					356							
20												
21	34	31	31									
22				32	280			62				38
23			31									
24	34	31		32						51	51	
25								62				
26					595							
27	33		31		880	260					51	
28		31		32								
29								77				38
30			31			225			51		51	
31	31											

NOTE.—Daily discharge determined from two fairly well defined curves, one applicable Jan. 1 to May 12, the other May 27 to Dec. 31. Discharge determined by indirect method for shifting channels May 19 to 26, Open water rating applied during the entire period.

Monthly discharge of Ashley Creek near Vernal, Utah, for 1912.

Month.	Discharge in second-feet (mean).	Run-off (total in acre-feet).	Accuracy.
January	35.5	2,180	C.
February	31.3	1,800	C.
March	30.4	1,870	C.
April	36.3	2,160	C.
August	63.0	3,870	D.
September	56.0	3,330	C.
October	54.0	3,320	C.
November	61.2	3,640	C.
December	42.4	2.610	C.

Note.—Monthly means estimated by interpolating daily discharge between days on which gage was read. Data insufficient to make accurate estimates May to July.

DUCHESNE RIVER BASIN.

DUCHESNE RIVER AT MYTON, UTAH.

Location.—In secs. 24–25, T. 3 S., R. 2 W., Uinta special base and meridian, at the highway bridge at Myton, Utah, 3 miles below the mouth of Lake Fork Creek and 15 miles above the mouth of Uinta River.

Records available.—October 26, 1899, to November 30, 1910; July 26, 1911, to December 31, 1912.

Drainage area.—2,750 square miles.
Gage.—Chain gage attached to upstream side of bridge.
Channel.—Cobblestones; fairly permanent.
Discharge measurements.—Made from highway bridge.
Winter flow.—The stream is frozen entirely across in the vicinity of the gage during the greater part of the winter.
Diversions.—A large part of the low-water flow of the Duchesne and its tributaries is diverted and used for irrigation above the station.
Artificial regulation.—None.
Accuracy.—Fair.

Discharge measurements of Duchesne River at Myton, Utah, for 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
June 11	J. C. Dort	5.9	4,970	June 17	J. C. Dort	4.5	2,960
15	do	5.3	3,990	Sept. 9	do	1.56	243
16	do	4.9	3,440				

Daily gage height, in feet, of Duchesne River at Myton, Utah, for 1912.

[J. E. Parsons, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.1	2.85	2.3	2.1	2.15	5.35	4.5	2.22	1.55	1.74	2.20	1.75
2	2.05	2.75	2.3	2.05	2.2	5.6	4.05	2.30	1.48	1.69	2.13	1.78
3	2.05	2.75	2.35	2.1	2.4	5.05	3.75	2.28	1.48	1.69	2.16	1.87
4	2.05	2.85	2.35	2.25	2.3	6.4	3.55	2.28	1.48	1.71	2.26	1.89
5	2.05	2.75	2.25	2.25	2.15	6.65	3.5	2.15	1.58	1.99	2.28	1.85
6	2.15	2.9	2.25	2.2	2.1	6.75	3.35	2.02	1.70	2.29	2.18	1.72
7	2.3	2.85	2.25	2.15	2.1	6.85	3.35	1.92	1.62	2.14	2.18	1.57
8	2.15	2.85	2.25	2.2	2.25	6.85	3.3	1.88	1.60	2.07	2.23	1.48
9	2.4	2.8	2.2	2.25	2.45	6.7	3.2	1.80	1.55	2.07	2.18	1.62
10	2.35	2.75	2.05	2.35	2.55	6.45	3.1	1.68	1.79	2.18	2.17	1.82
11	2.65	2.75	2.1	2.4	2.65	6.05	3.0	1.60	2.07	2.13	2.19	1.78
12	2.75	2.8	2.05	2.3	2.8	5.7	3.0	1.58	1.91	2.08	2.15	1.88
13	2.5	2.85	2.0	2.2	2.95	5.55	3.0	1.50	1.84	2.08	2.07	1.94
14	2.5	2.85	1.95	2.1	2.95	5.6	2.95	1.50	1.79	2.06	2.09	1.96
15	2.6	2.9	1.95	2.05	2.95	5.3	3.0	1.55	1.84	2.03	2.05	1.91
16	2.6	2.55	2.0	2.1	3.05	4.9	2.9	1.70	1.84	2.03	2.07	1.94
17	2.65	2.65	2.05	2.15	3.2	4.5	2.6	1.62	1.79	2.03	2.05	1.98
18	2.65	2.4	2.0	2.1	3.5	4.4	2.5	1.72	1.79	2.03	1.95	1.94
19	2.55	2.5	2.0	2.1	3.75	4.3	2.45	1.68	1.74	2.06	1.89	1.94
20	2.6	2.45	1.95	2.05	3.95	4.35	2.6	1.60	1.71	2.08	1.95	1.88
21	2.8	2.35	2.0	2.05	4.05	4.7	2.5	1.52	1.61	2.18	1.95	1.74
22	2.8	2.45	1.95	2.05	4.15	4.95	2.5	1.50	1.61	2.13	1.87	1.56
23	2.65	2.3	1.95	2.1	4.1	5.1	2.4	1.42	1.59	2.13	1.85	1.61
24	2.85	2.3	1.95	2.0	3.95	5.15	2.3	1.40	1.67	2.13	1.87	1.66
25	2.75	2.2	1.9	2.0	4.0	4.95	2.2	1.48	1.71	2.13	1.92	1.81
26	2.85	2.2	1.95	2.1	4.25	4.75	2.2	1.45	1.67	2.10	1.87	1.91
27	2.75	2.3	2.25	2.1	4.4	4.8	2.2	1.35	1.69	2.28	1.85	1.88
28	2.8	2.3	2.2	2.05	4.55	4.6	2.2	1.38	1.74	2.73	1.87	1.81
29	2.7	2.35	2.1	2.1	4.7	4.45	2.2	1.50	1.74	2.36	1.92	1.96
30	2.8	.....	2.05	2.15	5.0	4.45	2.3	1.58	1.74	2.30	1.97	2.01
31	2.8	.....	2.1	.....	5.4	.....	2.25	1.65	.....	2.40	.....	2.06

NOTE.—Relation of gage height to discharge probably affected by ice Jan. 1 to Mar. 13 and Dec. 29 to 31.

Daily discharge, in second-feet, of Duchesne River at Myton, Utah, for 1912.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	404	427	3,960	2,960	548	244	312	536	316
2	.....	383	450	4,330	2,380	598	222	292	497	328
3	.....	404	550	3,600	1,980	586	222	292	514	367
4	.....	474	498	5,560	1,720	586	222	300	573	376
5	.....	474	427	5,960	1,660	508	254	423	586	358
6	.....	450	404	6,140	1,470	438	296	592	525	304
7	.....	427	404	6,300	1,470	390	267	502	525	350
8	.....	450	474	6,320	1,410	371	260	464	555	222
9	.....	474	579	6,090	1,300	336	244	464	525	267
10	.....	524	641	5,720	1,200	289	332	525	519	345
11	.....	550	709	5,120	1,110	260	464	497	530	328
12	.....	498	816	4,590	1,110	254	385	470	508	371
13	.....	450	928	4,370	1,110	228	354	470	464	399
14	343	404	928	4,440	1,070	228	332	459	475	409
15	343	383	928	4,020	1,110	244	354	444	454	385
16	362	404	1,010	3,480	1,030	296	354	444	464	399
17	383	427	1,140	2,960	802	267	332	444	454	418
18	362	404	1,450	2,830	732	304	332	444	404	399
19	362	404	1,740	2,700	698	289	312	459	376	399
20	343	383	1,990	2,760	802	260	300	470	404	371
21	362	383	2,130	3,220	732	234	264	525	404	312
22	343	383	2,270	3,540	732	228	264	497	367	247
23	343	404	2,200	3,740	664	204	257	497	358	264
24	343	362	1,990	3,810	598	198	285	497	367	282
25	324	362	2,060	3,540	536	222	300	497	390	340
26	343	404	2,410	3,280	536	213	285	480	367	385
27	474	404	2,620	3,350	536	184	292	586	358	371
28	450	383	2,840	3,090	536	192	312	899	367	340
29	404	404	3,050	2,900	536	228	312	638	390	280
30	383	427	3,450	2,900	598	254	312	598	414	280
31	404	.....	4,020	.....	567	278	.....	664	.....	280

NOTE.—Discharge determined from two well-defined curves, one applicable Mar. 14 to May 25, the other June 8 to Dec. 28. Indirect method for shifting channels used May 26 to June 7. Discharge estimated because of ice as follows: Mar. 1 to 13, 330 second-feet; Dec. 29 to 31, 280 second-feet.

Monthly discharge of Duchesne River at Myton, Utah, for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	[a] 300	18,400	D.
February	.....	.....	[a] 280	16,100	D.
March	474	.....	354	21,800	C.
April	550	362	423	25,200	A.
May	4,020	404	1,470	90,400	B.
June	6,320	2,700	4,150	247,000	A.
July	2,960	536	1,090	67,000	A.
August	598	184	313	19,200	A.
September	464	222	299	17,800	A.
October	899	292	489	30,100	A.
November	586	358	456	27,100	B.
December	.....	.....	338	20,800	C.
The year	6,320	.....	828	601,000	

[a] Estimated.

LAKE FORK NEAR MYTON, UTAH.

Location.—In sec. 21, T. 3 S., R. 2 W., Uinta special base and meridian, 3 miles above Myton, Utah, about one-half mile above the junction of Lake Fork and Duchesne River, and about 100 yards below a county highway bridge.

Records available.—July 3, 1900, to December 31, 1903; June, 1907, to November 30, 1910; July 26, 1911, to December 31, 1912.

Drainage area.—Not known.

Gage.—Chain gage. Several different gages and data have been used during the life of the station. Inclined staff at same datum as chain gage used after September 8, 1912.

Channel.—Fairly permanent.

Discharge measurements.—Made from cable and car or by wading.

Winter flow.—Ice affects the relation of gage height to discharge for practically the entire winter period.

Diversions.—Several canals of the United States Indian Service and also some privately owned canals take water from this stream above the station for irrigation.

Accuracy.—Excellent.

Discharge measurements of Lake Fork near Myton, Utah, in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
June 16	J. C. Dort	4.48	937
17	do	4.04	733
Sept. 8	do	1.25	3.5

Daily gage height, in feet, of Lake Fork near Myton, Utah, for 1912.

[James McAfee, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.4	3.0	2.4	2.0	1.65	4.6	4.35	1.95	1.15	1.2	2.4	2.1
2	2.4	3.0	2.4	2.0	1.6	5.3	4.2	2.05	1.15	1.2	2.35	2.1
3	2.35	3.0	2.35	2.0	1.8	5.7	3.65	2.0	1.2	1.2	2.2	2.1
4	2.3	3.0	2.3	2.0	1.65	6.7	3.25	1.9	1.15	1.3	2.2	2.0
5	2.3	3.0	2.3	2.0	1.6	7.3	3.1	1.75	1.25	1.3	2.15	2.0
6	2.3	3.0	2.25	2.1	1.6	7.1	3.1	1.7	1.15	1.35	2.15	2.0
7	2.35	2.9	2.25	2.1	1.6	7.9	3.1	1.55	1.25	1.6	2.1	2.0
8	2.35	2.9	2.2	2.1	1.6	7.3	3.1	1.4	1.25	1.6	2.1	2.0
9	2.3	2.95	2.2	2.0	1.5	7.2	3.0	1.3	1.4	1.85	2.1	2.1
10	2.4	2.9	2.1	2.0	1.8	6.4	2.9	1.2	1.35	1.85	2.1	2.1
11	2.4	2.85	2.1	2.0	1.7	5.2	2.9	.....	1.35	1.95	2.1	2.1
12	2.4	2.85	2.1	2.0	1.65	5.2	2.85	.....	1.25	2.0	2.1	2.15
13	2.4	2.9	2.1	1.95	1.6	5.5	2.8	.....	1.25	2.0	2.1	2.15
14	2.65	2.9	2.0	1.9	1.6	5.2	3.05	.....	1.3	2.0	2.1	2.15
15	3.0	2.85	2.0	1.9	1.65	5.0	2.85	.....	1.2	2.1	2.0	2.15
16	3.0	2.85	2.0	1.9	1.7	5.4	2.65	.....	1.35	2.1	2.0	2.1
17	3.0	2.8	2.0	1.9	1.7	4.05	2.65	.....	1.2	2.1	2.0	2.1
18	3.0	2.8	2.0	1.9	1.7	4.8	2.65	.....	1.1	2.15	2.0	2.1
19	3.0	2.8	2.0	1.85	1.85	4.6	2.6	.....	1.2	2.1	2.0	2.1
20	3.0	2.7	2.0	.....	1.95	4.9	2.5	.....	1.3	2.2	2.0	2.1
21	3.0	2.7	2.0	1.85	2.0	4.8	2.55	.....	1.3	2.2	2.0	2.1
22	3.0	2.7	2.0	1.8	2.3	4.9	2.4	.....	1.3	2.25	2.0	2.1
23	3.0	2.5	2.0	1.8	2.35	5.1	2.3	.....	1.2	2.25	2.0	2.1
24	3.0	2.5	2.0	1.8	2.5	5.4	2.2	.....	1.3	2.15	.....	2.15
25	3.0	2.45	1.95	1.75	2.65	4.85	2.15	.....	1.3	2.1	2.0	2.15
26	3.0	2.45	1.95	1.75	2.7	4.8	2.05	.....	1.3	2.1	2.0	2.15
27	3.0	2.45	2.0	1.7	2.75	4.65	2.0	1.05	1.3	4.2	2.0	2.15
28	3.0	2.4	2.0	1.6	2.9	4.65	1.95	1.05	1.3	4.0	2.0	2.15
29	3.0	2.4	2.0	1.6	3.4	4.6	1.9	.95	1.2	3.6	2.1	.....
30	3.0	.....	1.95	1.6	4.0	4.5	1.8	.95	1.2	3.1	2.1	.....
31	3.0	.....	2.0	.....	4.4	.....	1.85	1.10	.....	2.65	.....	.....

NOTE.—Relation of gage height to discharge affected by ice Jan. 1 to Mar. 13 and Dec. 9 to 31. No observations Aug. 11 to 26, owing to chain gage having been stolen Aug. 11.

Daily discharge, in second-feet, of Lake Fork near Myton, Utah, for 1912.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	84	40	992	872	77	3.5	5	156	99
2	.....	84	35	1,360	800	92	3.5	5	146	99
3	.....	84	57	1,620	560	84	5	5	116	99
4	.....	84	40	2,260	407	70	3.5	10	116	84
5	.....	84	35	2,660	352	52	7.5	10	108	84
6	.....	99	35	2,520	352	46	3.5	14	108	84
7	.....	99	35	3,050	352	31	7.5	35	99	84
8	.....	99	35	2,660	352	17	7.5	35	99	84
9	.....	84	26	2,590	318	10	17	64	99	.....
10	.....	84	57	2,060	286	5	14	64	99	.....
11	.....	84	46	1,300	286	.....	14	77	99	.....
12	.....	84	40	1,300	271	.....	7.5	84	99	.....
13	.....	77	35	1,490	256	.....	7.5	84	99	.....
14	84	70	35	1,300	335	.....	10	84	99	.....
15	84	70	40	1,190	271	.....	5	99	84	.....
16	84	70	46	1,420	215	.....	14	99	84	.....
17	84	70	46	729	215	.....	5	99	84	.....
18	84	70	46	1,090	215	.....	2	108	84	.....
19	84	64	64	992	202	.....	5	99	84	.....
20	84	64	77	1,140	178	.....	10	116	84	.....
21	84	64	84	1,090	190	.....	10	116	84	.....
22	84	57	135	1,140	156	.....	10	126	84	.....
23	84	57	146	1,240	135	.....	5	126	84	.....
24	84	57	178	1,420	116	.....	10	108	84	.....
25	77	52	215	1,110	108	.....	10	99	84	.....
26	77	52	228	1,090	92	.....	10	99	84	.....
27	84	46	242	1,020	84	2	10	800	84	.....
28	84	35	286	1,020	77	2	10	706	84	.....
29	84	35	464	992	70	1.2	5	540	99	.....
30	77	35	706	944	57	1.2	5	352	99	.....
31	84	.....	896	.....	64	2	.....	215	.....	.....

NOTE.—Discharge determined from a well-defined rating curve. Discharge estimated because of ice Mar. 1 to 13, 75 second-feet, and Dec. 9 to 31, 80 second-feet. Discharge estimated Aug. 11 to 26, 3 second-feet; interpolated Apr. 20 and Nov. 24, because of missing gage readings.

Monthly discharge of Lake Fork near Myton, Utah, for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	[a] 65	4,000	D.
February	.....	.....	[a] 70	4,030	D.
March	.....	.....	79.5	4,890	C.
April	99	35	69.9	4,160	A.
May	896	26	144	8,850	A.
June	3,050	729	1,490	88,700	A.
July	872	57	266	16,400	A.
August	92	.....	17.4	1,070	C.
September	17	2	7.92	471	B.
October	800	5	145	8,920	A.
November	156	84	97.2	5,780	A.
December	.....	.....	82.5	5,070	C.
The year	3,050	.....	210	152,000	

[a] Estimated.

WHITE RIVER BASIN.

NORTH FORK OF WHITE RIVER NEAR BUFORD, COLO.

Location.—At Genier's ranch, 1½ miles above Buford, about sec. 3, T. 1 S., R. 91 W. No important tributary between the station and the mouth of South Fork.

Records available.—May 24, 1910, to December 7, 1912. From July 18, 1903, to October 31, 1906, a gaging station was maintained by the United States Geological Survey just below Ute Creek, 5 miles above the present station. The records at the two points are very nearly comparable, as no important tributaries enter between the two points.

Drainage area.—240 square miles (State engineer's report).

Gage.—Vertical staff.

Channel.—Practically permanent.

Discharge measurements.—Made from footbridge.

Diversions.—There is a court decree for a diversion of 1.6 second-feet from the North Fork above the station, but none below. There are also decrees for diversions of 33 second-feet from tributaries entering above the station.

Cooperation.—Records are published as furnished by the State engineer who maintains the station.

Discharge measurements of North Fork of White River near Buford, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 7	C. L. Chatfield	0.70	182
Apr. 18	do	.87	191
June 6	do	3.00	156
Aug. 10	do	1.35	377

Daily gage height, in feet, of North Fork of White River at Buford, Colo., for 1912.

[Mrs. H. Cenier, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.80	0.75	0.70	0.70	1.2	3.55	2.75	1.75	1.15	1.0	0.85	0.95
2	.85	.80	.70	.70	1.2	3.75	2.75	1.65	1.1	.95	.95	.95
3	.85	.75	.70	.75	1.15	3.95	2.55	1.65	1.1	.95	.95	.95
4	.95	.75	.70	.75	1.2	3.5	2.35	1.6	1.1	.95	.95	1.0
5	1.0	.75	.70	.80	1.15	3.1	2.4	1.5	1.1	.95	.95	.95
6	1.0	.65	.70	.80	1.1	3.3	2.35	1.45	1.05	.95	1.05	.95
7	.95	.70	.70	.80	1.2	3.1	2.35	1.45	1.05	1.05	.95	.85
8	.85	.70	.70	.75	1.55	3.0	2.25	1.35	1.05	.95	.95	.....
9	.....	.70	.70	.80	1.75	3.05	2.25	1.35	1.05	.95	.95	.....
10	.....	.70	.70	.80	1.65	3.05	2.3	1.35	1.05	1.0	.95	.....
11	.95	.70	.70	.85	1.7	2.8	2.25	1.3	1.05	1.0	.95	.....
12	1.05	.70	.70	.85	1.55	2.45	2.15	1.25	1.05	1.0	.95	.....
13	1.05	.70	.70	.85	1.5	2.35	2.1	1.25	1.1	1.0	.95	.....
14	1.0	.70	.70	.80	1.55	2.2	2.05	1.25	1.25	1.0	.95	.....
15	.95	.70	.70	.80	1.7	2.75	2.05	1.3	1.25	1.0	.95	.....
16	1.05	.70	.70	.90	2.1	2.55	2.05	1.45	1.15	.95	.90	.....
17	.95	.70	.70	.90	2.7	2.45	2.0	1.25	1.05	.95	.85	.....
18	1.0	.70	.70	.90	3.0	2.35	1.95	1.25	1.05	.95	.85	.....
19	.85	.70	.70	.90	3.15	2.35	1.95	1.25	1.05	.95	.85	.....
20	.85	.70	.70	.90	3.4	2.35	1.9	1.25	1.0	.95	.85	.....
21	.90	.70	.70	.85	3.45	2.45	1.9	1.2	1.0	.95	.85	.....
22	.85	.70	.70	.80	3.5	2.35	1.8	1.2	.95	.95	.85	.....
23	.80	.75	.70	.80	3.45	2.45	1.8	1.2	.95	.95	.90	.....
24	.80	.70	.75	.80	3.55	2.65	1.8	1.15	.95	.95	.95	.....
25	.80	.70	.75	.90	3.6	2.7	1.8	1.15	.95	.95	.90	.....
26	.85	.70	.75	.90	4.0	2.65	1.8	1.0	1.0	.95	.95	.....
27	.80	.70	.70	.90	3.7	2.75	1.75	1.15	1.05	.95	.95	.....
28	.70	.70	.70	.95	3.45	2.8	1.85	1.15	1.05	1.0	.95	.....
29	.75	.70	.70	1.0	3.8	2.75	1.85	1.25	1.05	.95	.95	.....
30	.75	.....	.75	1.1	4.05	2.8	1.75	1.35	1.0	.95	.95	.....
31	.80	.....	.70	.....	3.95	.....	1.75	1.25	.....	.85	.....	.....

Daily discharge, in second-feet, of North Fork of White River near Buford, Colo., for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	210	200	190	190	315	2,305	1,275	525	300	260	222
2	222	210	190	190	315	2,625	1,275	480	285	248	248
3	222	200	190	200	300	2,970	1,075	480	285	248	248
4	248	200	190	200	315	2,230	900	460	285	248	248
5	260	200	190	210	300	1,680	940	420	285	248	248
6	260	180	190	210	285	1,940	900	400	272	248	272
7	248	190	190	210	315	1,680	900	400	272	272	248
8	222	190	190	200	440	1,560	825	362	272	248	248
9	248	190	190	210	525	1,620	825	362	272	248	248
10	248	190	190	210	480	1,620	860	362	272	260	248
11	248	190	190	222	500	1,330	825	345	272	260	248
12	272	190	190	222	440	985	755	330	272	260	248
13	272	190	190	222	420	900	720	330	285	260	248
14	260	190	190	210	440	790	690	330	330	260	248
15	248	190	190	210	500	1,275	690	345	330	260	248
16	272	190	190	235	720	1,075	690	400	300	248	235
17	248	190	190	235	1,220	985	660	330	272	248	222
18	260	190	190	235	1,560	900	630	330	272	248	222
19	222	190	190	235	1,745	90	630	330	272	248	222
20	222	190	190	235	2,080	900	600	330	260	248	222
21	235	190	190	222	2,155	985	600	315	260	248	222
22	222	190	190	210	2,230	900	550	315	248	248	222
23	210	200	190	210	2,155	985	550	315	248	248	235
24	210	190	200	210	2,305	1,170	550	300	248	248	248
25	210	190	200	235	2,380	1,220	550	300	248	248	235
26	222	190	200	235	3,060	1,170	550	285	260	248	248
27	210	190	190	235	2,540	1,225	525	300	272	248	248
28	190	190	190	248	2,155	1,330	575	300	272	260	248
29	200	190	190	260	2,710	1,275	575	330	272	248	248
30	200	.....	200	285	3,150	1,330	525	362	260	248	248
31	210	.....	190	.....	2,970	.....	525	330	.....	222	.....

Monthly discharge of North Fork of White River near Buford, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January	272	190	233	14,343
February	210	180	192	11,048
March	200	190	191	11,762
April	285	190	221	13,172
May	3,150	285	1,323	81,373
June	2,970	790	1,397	83,128
July	1,275	525	733	45,105
August	525	285	358	22,023
September	330	248	275	16,369
October	272	222	251	15,435
November	272	222	241	14,366
The period	.....	.....	.....	328,124

WHITE RIVER AT MEEKER, COLO.

Location.—At Van Cleave's ranch, one-half mile southeast of Meeker, in sec. 23, T. 1 N., R. 94 W. Nearest tributary above is Curtis Creek; nearest below is Sulphur Creek.

Records available.—May 7, 1910, to December 15, 1912. From April 12, 1904, to October 31, 1906, a station was maintained at this point by the United States Geological Survey.

Drainage area.—634 square miles.

Gage.—Automatic recording gage.

Channel.—Practically permanent.

Discharge measurements.—Made from highway bridge.

Diversions.—There are court decrees for diversions of 186 second-feet from White River above the station and 59 second-feet from tributaries entering above. Below there are decrees for diversions of 198 second-feet from White River.

Cooperation.—Records are published as furnished by the State engineer, who maintains the station.

Discharge measurements of White River at Meeker, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 6	C. L. Chatfield	(a)	252	June 7	C. L. Chatfield	3.95	4,032
Apr. 17	do	1.00	415	12	do	3.80	3,724
June 4	do	3.75	3,768	Aug. 7	do	1.24	526

[a] Ice present.

Daily gage height, in feet, of White River at Meeker, Colo., for 1912.

[Walter Van Cleave, observer.]

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		0.9	1.15	1.15	3.55	3.0	1.35	1.05	0.85	0.75	0.90
2		.9	1.15	1.2	3.5	2.85	1.3	1.0	.85	.9	.85
3		.9	1.2	1.2	3.7	2.65	1.25	1.0	.85	.9	.95
4		.9	1.25	1.3	3.7	2.5	1.2	.95	.85	.8	.8
5		.95	1.2	1.15	3.8	2.35	1.2	.95	.9	.75	.8
6		1.05	1.15	1.1	3.9	2.2	1.2	.9	.85	.8	.85
7		1.1	1.1	1.3	3.9	2.2	1.2	.85	.95	.7	.8
8		1.1	1.1	1.45	4.1	2.25	1.2	.85	.9	.9	.8
9		1.0	1.15	1.6	4.3	2.2	1.2	.85	.9	1.05	.95
10		1.15	1.15	1.7	4.1	2.1	1.15	.9	.9	.95	1.0
11		1.1	1.05	1.7	4.0	2.0	1.15	.9	.9	1.1	1.05
12		1.05	1.05	1.6	3.7	2.0	1.1	.85	.9	.9	.95
13		1.0	1.0	1.5	3.55	2.05	1.05	.9	.9	.7	.95
14		1.0	.9	1.45	3.35	2.0	1.05	1.0	.9	.8	.85
15		1.0	.9	1.5	3.15	1.95	1.1	1.0	.95	.8	.8
16		1.0	.9	1.75	2.85	1.9	1.2	.9	.9	.75	
17		.95	1.0	2.3	2.55	1.75	1.15	.9	.9	.7	
18		1.15	.95	2.55	2.35	1.65	1.05	.9	.9	.8	
19		1.3	1.0	2.8	2.2	1.65	1.0	.9	.95	.9	
20	1.0	1.35	1.0	2.9	2.25	1.7	1.05	.9	1.0	.95	
21	1.0	1.15	.95	3.4	2.45	1.55	1.15	.9	1.1	.95	
22	1.0	1.1	.95	3.35	2.6	1.5	1.1	.9	.95	.85	
23	1.0	1.1	.9	3.4	2.8	1.5	1.05	.85	1.1	1.0	
24	1.0	1.0	.9	3.55	2.8	1.4	1.05	.9	1.0	.95	
25	.95	1.1	.95	3.7	2.85	1.4	1.0	.9	1.0	.9	
26	.9	1.15	1.0	3.8	2.8	1.5	1.0	.9	1.0	.9	
27	.9	1.2	1.0	3.7	3.0	1.6	1.05	.9	1.05	1.0	
28	.9	1.25	.95	3.25	3.1	1.6	1.15	.9	1.2	1.1	
29	.9	1.35	1.0	3.4	3.0	1.45	1.1	.85	1.0	.85	
30		1.3	1.1	3.7	3.0	1.4	1.25	.85	.95	.85	
31		1.2		4.05		1.35	1.2		.9		

Daily discharge, in second-feet, of White River at Meeker, Colo., for 1912.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	325	470	470	3,365	2,545	630	405	295	260
2	.....	325	470	505	3,285	2,435	585	375	295	325
3	.....	325	505	505	3,610	2,065	545	375	295	325
4	.....	325	545	585	3,610	1,870	505	350	295	275
5	.....	350	505	470	3,780	1,680	505	350	325	260
6	.....	405	470	435	3,950	1,500	505	325	295	275
7	.....	435	435	585	3,950	1,500	505	295	350	245
8	.....	435	435	628	4,290	1,560	505	295	325	325
9	.....	375	470	870	4,650	1,500	505	295	325	405
10	.....	470	470	970	4,290	1,390	470	325	325	350
11	.....	435	405	970	4,120	1,280	470	325	325	435
12	.....	405	405	870	3,610	1,280	435	295	325	325
13	.....	375	375	770	3,365	1,335	405	325	325	245
14	.....	375	325	628	3,050	1,280	405	375	325	275
15	.....	375	325	770	2,755	1,225	435	375	350	275
16	.....	375	325	1,020	2,435	1,170	505	325	325	260
17	.....	350	375	1,620	1,945	1,020	470	325	325	245
18	.....	470	350	1,945	1,680	920	405	325	325	275
19	.....	585	375	2,365	1,500	920	375	325	350	325
20	375	630	375	2,405	1,560	970	405	325	375	350
21	375	470	350	3,125	1,805	820	470	325	435	350
22	375	435	350	3,050	2,000	770	435	325	350	295
23	375	435	325	3,125	2,365	770	405	295	435	375
24	375	375	325	3,365	2,365	675	405	325	375	350
25	350	435	350	3,610	2,435	675	375	325	375	325
26	325	470	375	3,780	2,365	770	375	325	375	325
27	325	505	375	3,610	2,545	870	405	325	405	375
28	325	545	350	2,900	2,685	870	470	325	505	435
29	325	630	375	3,125	2,545	728	435	295	375	295
30	.....	585	435	3,610	2,545	675	545	295	350	295
31	.....	505	.....	4,205	.....	630	505	.....	325	.....

Monthly discharge of White River at Meeker, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
February 20-29	375	325	352	6,992
March	630	325	437	26,846
April	545	325	401	23,842
May	4,205	435	1,835	112,843
June	4,650	1,500	2,948	175,450
July	2,545	630	1,216	74,774
August	630	375	464	28,552
September	405	295	329	19,578
October	505	295	348	21,382
November	435	245	316	18,794
The period	.....	.....	.....	509,054

SOUTH FORK OF WHITE RIVER NEAR BUFORD, COLO.

Location.—At Shepherd's ranch, 7 miles above Buford, about sec. 7, T. 2 S., R. 90 W. Nearest tributary a small creek that enters from the east just below the station.

Records available.—July 25, 1903, to October 31, 1906, station maintained by the United States Geological Survey; June 1, 1910, to November 30, 1912.

Drainage area.—148 square miles (measured from Hayden's Atlas).

Gage.—Vertical staff.

Channel.—Fairly permanent.

Discharge measurements.—Made from highway bridge during high water and by wading at ordinary stages.

Winter flow.—Ice causes backwater and records are discontinued during the winter months.

Diversions.—There are no court decrees for diversions from the South Fork above the station, but below there is a decree for 5.4 second-feet. There is a decree for a diversion of 9.2 second-feet from tributaries entering above the station.

Cooperation.—Records are published as furnished by the State engineer, who maintains the station.

Discharge measurements of South Fork of White River near Buford, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 8[a]	C. L. Chatfield	.....	127
Apr. 19[a]	.....do	0.20	[b] 100
June 6	.....do	6.42	1,686
Aug. 9	.....do	.80	217

[a] Ice present. [b] Computed from measurement below forks.

Daily gage height, in feet, of South Fork of White River at Buford, Colo., for 1912.

[Hugh Jones, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	0.2	0.3	0.7	4.7	4.6	1.1	0.5	0.4	0.35
2	.2	.3	.7	5.0	4.2	1.1	.5	.4	.35
3	.3	.3	.4	5.3	4.0	1.0	.4	.4	.35
4	.3	.3	.4	5.9	3.8	1.0	.4	.4	.35
5	.2	.3	.4	6.5	3.7	.9	.4	.4	.35
6	.2	.3	.4	6.6	3.5	.9	.4	.4	.35
7	.2	.3	.6	6.6	3.3	.9	.4	.4	.35
8	.2	.3	.5	6.7	3.3	.8	.4	.4	.35
9	.2	.3	.5	7.0	3.2	.8	.4	.4	.35
10	.2	.2	.8	7.2	3.1	.8	.4	.4	.35
11	.3	.2	.7	7.2	3.0	.8	.4	.4	.35
12	.3	.2	.6	6.8	2.9	.8	.4	.4	.35
13	.2	.2	.7	6.5	2.8	.8	.4	.4	.35
14	.2	.2	.7	6.2	2.6	.7	.4	.4	.35
15	.2	.2	.8	6.0	2.5	.7	.4	.4	.4
16	.2	.2	.8	5.8	2.4	.7	.4	.4	.4
17	.2	.2	1.0	4.3	2.2	.7	.4	.4	.45
18	.2	.2	1.2	3.1	2.0	.7	.4	.4	.45
19	.3	.2	1.8	3.0	1.9	.7	.4	.4	.45
20	.3	.2	2.1	3.5	1.8	.7	.4	.4	.5
21	.2	.2	2.2	4.0	1.7	.7	.4	.4	.5
22	.2	.2	2.4	4.6	1.6	.6	.4	.35	.45
23	.2	.2	2.4	4.8	1.5	.6	.4	.35	.45
24	.2	.3	3.0	5.2	1.6	.6	.4	.35	.45
25	.2	.3	3.1	5.3	1.5	.6	.4	.35	.45
26	.2	.2	3.2	5.5	1.5	.6	.4	.35	.45
27	.2	.3	3.3	5.8	1.5	.6	.4	.35	.45
28	.2	.5	3.5	5.8	1.4	.6	.4	.35	.45
29	.2	.6	3.8	5.3	1.3	.6	.4	.35	.....
30	.3	.7	4.0	5.0	1.3	.5	.4	.35	.....
31	.3	.....	4.4	.....	1.2	.5	.....	.35	.....

Daily discharge, in second-feet, of South Fork of White River near Buford, Colo., for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	.....	90	110	194	1,379	1,343	283	152	131	120
2	.....	.....	90	110	194	1,490	1,200	283	152	131	120
3	.....	.....	110	110	131	1,605	1,130	260	131	131	120
4	.....	.....	110	110	131	1,848	1,060	260	131	131	120
5	.....	.....	90	110	131	2,190	1,026	228	131	131	120
6	.....	.....	90	110	131	2,154	959	228	131	131	120
7	.....	.....	90	110	173	2,154	894	228	131	131	120
8	.....	.....	90	110	152	2,200	894	216	131	131	120
9	.....	.....	90	110	152	2,340	862	216	131	131	120
10	.....	.....	90	90	216	2,436	831	216	131	131	120
11	.....	.....	110	90	194	2,436	800	216	131	131	120
12	.....	.....	110	90	173	2,246	769	216	131	131	120
13	.....	.....	90	90	194	2,109	738	216	131	131	120
14	.....	.....	90	90	194	1,976	678	194	131	131	120
15	.....	.....	90	90	216	1,890	649	194	131	131	131
16	.....	.....	90	90	216	1,806	620	194	131	131	131
17	.....	.....	90	90	260	1,235	564	194	131	131	142
18	.....	.....	90	90	306	831	510	194	131	131	142
19	.....	.....	110	90	456	800	483	194	131	131	142
20	.....	.....	110	90	537	959	456	194	131	131	152
21	.....	.....	90	90	564	1,130	430	194	131	131	152
22	.....	.....	90	90	620	1,343	404	173	131	120	142
23	.....	.....	90	90	620	1,416	379	173	131	120	142
24	.....	.....	90	110	800	1,566	404	173	131	120	142
25	.....	.....	90	110	831	1,605	379	173	131	120	142
26	.....	.....	90	90	862	1,684	379	173	131	120	142
27	.....	.....	90	110	894	1,806	379	173	131	120	142
28	.....	.....	90	152	959	1,806	354	173	131	120	142
29	.....	.....	90	173	1,060	1,605	330	173	131	120	142
30	.....	.....	110	194	1,130	1,490	330	152	131	120	142
31	.....	.....	110	.....	1,271	.....	306	152	.....	120	.....

Monthly discharge of South Fork of White River near Buford, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
March	110	90	95	5,851
April	194	90	106	6,326
May	1,271	131	450	27,693
June	2,436	800	1,718	102,220
July	1,343	306	662	40,741
August	283	152	203	12,508
September	152	131	132	7,879
October	131	120	127	7,837
November	152	120	132	7,835
The period	.....	.....	.....	218,889

PRICE RIVER BASIN.

PRICE RIVER NEAR HELPER, UTAH.

Location.—In sec 25 or 36, T. 13 S., R. 9 E., Salt Lake base and meridian, at settlement known locally as Spring Glenn, 2½ miles south of Helper, Utah; about 2 miles above the diversion dam of the Price River Irrigation Co., and 300 feet west of the main line of the Denver & Rio Grande Railroad, 4 miles below mouth of White Creek.

Records available.—February 21, 1904, to December 31, 1912.

Drainage area.—530 square miles.

Gage.—Vertical staff on left bank.

Channel.—Shifting during sudden floods.

Discharge measurements.—Made from cable and car.

Winter flow.—Relation of gage height to discharge is affected by ice during the winter.

Diversions.—Records indicate the amount of water available for the Price River Irrigation Co. and for the canals for the town of Price, which divert a few miles below the station. No important diversions above the station.

Regulation.—The Price River Irrigation Co. has a reservoir with a capacity of about 24,000 acre-feet (ultimately to be increased to 30,000 acre-feet) on Gooseberry Fork of Price River about 40 miles above the station. Stored water is turned out of this reservoir during the irrigation season and passes the gaging station on its way to the canal below.

Accuracy.—Good.

Discharge measurements of Price River near Helper, Utah, in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 4	J. C. Dort	[a] 2.98	34	July 10	J. W. Lewis	3.00	85.4
May 17	do	3.78	456	Aug. 1	do	3.28	144
June 6	do	4.38	885	Sept. 7	do	2.78	40.1
9	do	4.12	649	Nov. 15	G. H. Russell	2.81	42.7
29	Porter and Lewis	3.25	135				

[a] Relation of gage height to discharge affected by ice in stream.

Daily gage height, in feet, of Price River near Helper, Utah, for 1912.

[Ada Ostberg, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.7	2.7	2.7	2.8	3.3	4.50	3.28	3.20	2.80	2.75	2.8	2.6
2	2.7	2.7	2.7	3.2	3.2	4.50	3.27	3.15	2.78	2.75	2.7	2.7
3	2.8	2.7	2.7	3.6	3.2	4.50	3.25	3.08	2.77	2.7	2.7	2.7
4	2.8	2.7	2.7	3.3	3.1	4.50	3.00	3.08	2.78	2.7	2.7	2.8
5	2.8	2.7	2.7	3.35	3.1	4.40	3.19	3.05	2.80	4.5	2.7	2.9
6	2.8	2.8	2.7	3.0	3.1	4.38	3.10	3.03	2.78	2.8	2.65	3.3
7	2.8	2.8	2.7	3.1	3.2	4.20	3.10	2.98	2.78	2.8	2.6	3.3
8	2.7	2.8	2.7	3.3	3.3	4.25	3.10	2.98	2.78	2.8	2.6	3.3
9	2.7	2.7	2.7	3.3	3.3	4.15	3.05	2.98	3.35	2.9	2.7	2.7
10	2.7	2.7	2.8	3.6	3.4	4.00	3.05	2.95	3.20	2.9	2.8	2.7
11	2.7	2.7	2.8	3.4	3.5	3.85	3.10	2.95	3.00	2.8	2.8	2.65
12	2.6	2.7	2.8	3.2	3.5	3.80	3.15	2.95	2.90	2.88	2.75	2.6
13	2.6	2.7	2.7	3.1	3.6	3.75	3.25	2.95	2.85	2.8	2.75	2.7
14	2.6	2.7	2.7	3.1	3.5	3.78	3.20	2.93	2.87	2.75	2.7	2.7
15	2.7	2.7	2.7	3.0	3.5	3.65	3.30	2.93	2.85	2.7	2.75	3.0
16	2.7	2.7	2.7	3.0	3.7	3.60	3.30	2.90	2.85	2.7	2.8	3.25
17	2.7	2.7	2.8	3.0	3.8	3.48	3.25	2.90	2.80	2.7	2.8	2.7
18	2.8	2.7	2.8	3.1	3.9	3.40	3.21	2.90	2.80	2.7	2.75	2.7
19	2.8	2.7	2.9	3.0	4.1	3.38	3.25	2.90	2.80	2.8	2.72	3.4
20	3.0	2.7	3.0	3.0	4.1	3.35	3.20	2.95	2.80	2.75	2.7	2.7
21	3.0	2.7	3.0	2.9	4.3	3.35	3.20	2.88	2.80	2.75	2.7	2.7
22	2.9	2.7	3.9	2.9	4.3	3.30	3.10	2.85	2.80	2.75	2.68	2.7
23	2.9	2.7	3.9	2.9	4.2	3.35	3.12	2.82	2.75	2.72	2.65	2.7
24	2.9	2.7	3.0	3.0	4.2	3.25	3.20	2.80	2.75	2.7	2.65	2.7
25	2.9	2.7	3.0	3.1	4.2	3.35	3.15	2.80	2.75	2.7	2.65	2.7
26	2.8	2.7	3.1	3.1	4.3	3.30	3.25	2.78	2.75	2.8	2.65	2.7
27	2.8	2.7	2.9	3.2	4.2	3.28	3.25	2.78	2.75	3.0	2.65	3.2
28	2.8	2.7	2.9	3.2	4.2	3.28	3.10	2.80	2.78	3.1	2.65	3.5
29	2.8	2.7	3.0	3.3	4.3	3.27	3.20	2.83	2.75	2.9	2.6	2.7
30	2.8	.....	2.9	3.3	4.4	3.27	3.20	2.80	2.75	2.8	2.6	2.6
31	2.7	.....	2.9	.....	4.4	.....	3.20	2.80	.....	2.8	.....	2.6

NOTE.—Relation of gage height to discharge slightly affected by shore and anchor ice Jan. 1 to Mar. 31, Dec. 4 to 8, 15 to 16, 27 to 28.

Daily discharge, in second-feet, of Price River near Helper, Utah, for 1912.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	42	153	990	147	123	42	36	42	18
2	123	123	990	144	111	39	36	29	29
3	320	123	990	138	95	38	29	29	29
4	153	99	990	77	95	39	29	29	29
5	176	99	896	121	88	42	990	29	29
6	77	99	878	99	84	39	42	24	29
7	99	123	726	99	73	39	42	18	29
8	153	153	766	99	73	39	42	18	29
9	153	153	690	88	73	176	58	29	29
10	320	200	586	88	68	123	58	42	29
11	200	260	484	99	68	77	42	42	24
12	123	260	450	111	68	58	55	36	18
13	99	320	416	138	68	50	42	36	29
14	99	260	436	123	64	53	36	29	29
15	77	260	351	153	64	50	29	36	29
16	77	382	320	153	58	50	29	42	29
17	77	450	248	138	58	42	29	42	29
18	99	518	200	126	58	42	29	36	29
19	77	654	191	138	58	42	42	32	29
20	77	654	176	123	68	42	36	29	29
21	58	806	176	123	55	42	36	29	29
22	58	806	153	99	50	42	36	27	29
23	58	726	176	104	45	36	32	24	29
24	77	726	138	123	42	36	29	24	29
25	99	726	176	111	42	36	29	24	29
26	99	806	153	138	39	36	42	24	29
27	123	726	147	138	39	36	77	24	29
28	123	726	147	99	42	39	99	24	29
29	153	806	144	123	47	36	58	18	29
30	153	896	144	123	42	36	42	18	18
31	.....	896	.....	123	42	.....	42	.....	18

NOTE.—Discharge determined from a well-defined rating curve. Discharge Jan. 1 to Mar. 31, Dec. 4 to 8, 15 to 16, 27 to 28, estimated because of shore and anchor ice. Mean discharge January to March estimated.

Monthly discharge of Price River near Helper, Utah, for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	[a] 25	1,540	C.
February	.....	.....	[a] 30	1,730	C.
March	.....	.....	[a] 35	2,150	C.
April	320	42	121	7,200	B.
May	896	99	451	27,700	B.
June	990	138	444	26,400	A.
July	153	77	120	7,380	A.
August	123	39	64.5	3,970	A.
September	176	36	49.9	2,970	A.
October	990	29	72.7	4,470	A.
November	42	18	29.5	1,760	A.
December	29	18	27.4	1,680	B.
The year	990	.....	123	89,000	

[a] Estimated.

SAN RAFAEL RIVER BASIN.

SAN RAFAEL RIVER NEAR GREEN RIVER, UTAH.

Location.—In sec. 27, T. 22 S., R. 16 E., Salt Lake base and meridian, at the county bridge near the J. C. Morris ranch, on the main road from Green River, Utah, to Hankesville, Utah, about 16 miles southwest from Green River, Utah.

Records available.—May 5, 1909, to December 31, 1912.

Drainage area.—1,690 square miles.

Gage.—Vertical staff attached to downstream side of right crib abutment of bridge.

Channel.—Shifting; frequent discharge measurements are necessary.

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

Winter flow.—Affected by ice.

Diversions.—Water is diverted above the station for irrigation in Castle Valley. A small amount of water is diverted below the station.

Accuracy.—Fair, except for periods during which the observer was unable to read gage because of excessive deposits of silt.

Discharge measurements of San Rafael River near Green River, Utah, in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 13	J. C. Dort	2.10	141	July 12	J. C. Dort	2.70	144
May 13	do	2.04	126	Oct. 12	Leonard Tanner	2.40	84.3
June 4	do	6.34	2,210	Nov. 16	G. H. Russell	2.22	80.4
19	do	4.36	709				

Daily gage height, in feet, of San Rafael River near Green River, Utah, for 1912.

[E. F. Marshall and Mrs. W. E. Tomlison, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.3	1.3	.....	2.0	1.45	5.3	4.15	3.95	2.25	.....	5.6	1.7
2	1.3	1.3	.....	1.8	1.45	5.5	4.08	3.92	2.2	.....	5.15	1.8
3	1.3	1.3	.....	1.6	1.65	6.0	3.85	3.35	.....	.....	4.4	1.8
4	1.3	1.3	.....	1.6	1.85	6.7	3.58	2.8	.....	.....	3.0	1.85
5	1.3	1.3	.....	1.8	1.5	7.65	3.25	2.55	.....	.....	2.7	1.95
6	1.3	1.5	.....	1.8	1.38	7.4	3.15	2.15	2.2	.....	2.6	1.85
7	1.3	1.75	.....	1.7	1.2	6.85	3.05	1.85	.....	.....	2.0	1.8
8	1.3	2.1	.....	1.87	1.2	6.9	3.0	1.8	2.2	.....	1.95	2.0
9	1.3	2.35	.....	2.1	1.15	7.3	2.85	1.72	.....	.....	1.9	2.0
10	1.3	2.55	.....	2.15	1.5	6.8	2.8	1.75	2.9	.....	.....	1.95
11	1.3	.....	.....	2.25	1.55	6.25	2.72	1.7	2.35	.....	.....	1.8
12	1.3	.....	.....	2.05	2.15	5.78	2.8	1.7	2.2	2.4	.....	1.8
13	1.3	.....	2.1	1.9	1.8	5.65	3.02	1.6	.....	2.0	.....	1.82
14	1.3	.....	.....	1.85	1.8	6.0	2.8	1.6	2.2	2.0	.....	1.7
15	1.3	.....	.....	1.72	1.65	5.7	2.4	1.4	2.2	2.12	.....	1.7
16	1.3	.....	.....	1.6	1.52	5.35	1.8	1.3	.....	2.1	2.22	1.75
17	1.3	.....	.....	1.6	1.4	4.9	1.8	1.25	.....	2.25	2.38	1.8
18	1.3	.....	.....	1.6	2.5	4.55	1.8	.....	.....	2.35	2.32	1.85
19	1.3	.....	.....	1.6	2.58	4.5	1.6	.....	.....	2.4	2.3	1.9
20	1.3	.....	.....	1.78	2.85	4.45	1.6	.....	.....	2.2	2.3	2.1
21	1.3	.....	.....	1.68	3.2	4.4	1.4	.....	.....	2.15	2.12	2.2
22	1.3	.....	.....	1.55	3.5	4.6	1.8	.....	.....	2.1	2.0	2.3
23	1.3	.....	.....	1.4	3.15	4.6	1.8	.....	.....	2.1	2.0	2.2
24	1.3	.....	.....	1.3	3.12	4.6	1.8	.....	.....	2.0	2.0	2.1
25	1.3	.....	.....	1.45	3.05	4.8	1.6	.....	.....	1.92	1.9	2.08
26	1.3	.....	.....	1.45	3.9	4.5	3.8	.....	.....	1.82	1.85	2.2
27	1.3	.....	.....	1.48	3.9	4.6	2.95	.....	.....	3.2	1.8	2.25
28	1.3	.....	.....	1.45	4.1	4.6	3.0	.....	.....	6.9	1.8	2.3
29	1.3	.....	.....	1.35	4.6	4.3	3.9	.....	.....	6.12	1.75	2.3
30	1.3	.....	.....	1.45	5.45	4.1	3.4	.....	.....	6.95	1.7	2.3
31	1.3	.....	.....	.....	5.82	.....	4.2	2.35	.....	6.5	.....	.....

NOTE.—Observer reports frozen over Jan. 1 to Feb. 5, and breaking up Feb. 6 to 10. Observer absent Feb. 11 to Mar. 31. Gage heights July 16 to 25 estimated by observer as gage was buried by sand bar. No gage heights recorded Aug. 18 to 30, Sept. 3 to 5, 7, 13, 16 to 30, Oct. 1 to 11 and Nov. 10 to 15, as the lower part of the gage was covered by heavy deposits of silt. River frozen over Dec. 20 to 31.

Daily discharge, in second-feet, of San Rafael River near Green River, Utah, for 1912.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	50	.....	128	70	1,320	622	532	68	50	1,680	40
2	50	.....	102	70	1,480	591	519	62	50	1,310	45
3	50	.....	82	87	1,910	490	315	55	50	810	45
4	50	.....	82	108	2,560	388	170	55	50	255	48
5	50	.....	102	74	3,510	285	120	55	50	180	56
6	60	.....	102	66	3,260	255	58	62	50	155	48
7	90	.....	92	57	2,710	228	37	55	50	60	45
8	130	.....	112	57	2,760	215	34	62	50	56	60
9	200	.....	144	56	3,160	180	31	55	50	52	60
10	240	.....	155	74	2,660	170	32	190	50	100	56
11	.....	.....	178	78	2,140	154	30	82	50	60	45
12	.....	.....	136	155	1,710	170	30	62	84	60	45
13	.....	144	114	102	1,600	220	26	55	46	60	46
14	.....	.....	108	102	1,910	170	26	62	46	60	40
15	.....	.....	94	87	1,640	90	20	62	56	70	40
16	.....	.....	82	76	1,360	34	18	50	54	83	42
17	.....	.....	82	67	1,040	34	17	50	68	111	45
18	.....	.....	82	238	818	34	15	50	82	99	48
19	.....	.....	82	259	790	26	15	50	90	95	52
20	.....	.....	100	339	765	26	15	50	62	95	45
21	.....	.....	90	464	740	20	15	50	58	72	45
22	.....	.....	78	590	845	34	15	50	54	60	45
23	.....	.....	67	445	845	34	15	50	54	60	45
24	.....	.....	61	434	845	34	15	50	46	60	45
25	.....	.....	70	408	965	26	15	50	41	52	45
26	.....	.....	70	792	790	470	20	50	35	48	45
27	.....	.....	73	792	845	202	20	50	270	45	45
28	.....	.....	70	908	845	215	20	50	2,790	45	45
29	.....	.....	64	1,320	690	510	20	50	2,070	42	45
30	.....	.....	70	1,940	600	330	20	50	2,890	40	45
31	.....	.....	.....	2,270	.....	645	82	.....	2,470	.....	45

NOTE.—Daily discharge determined as follows: Feb. 1 to 10, estimated because of ice; Mar. 13 to May 31, from a well-defined rating curve; June 1 to Oct. 27, from a fairly well-defined curve; Oct. 28 to 31, by indirect method for shifting channels; Nov. 1 to Dec. 19, from a fairly well-defined curve; Dec. 20 to 31, estimated because of ice. Discharge for periods, August to November, when gage was covered with silt, based on observer's notes regarding depth of water in river and comparison with records on the streams in Castle Valley, which unite to form the San Rafael. Mean discharge January to March estimated.

Monthly discharge of San Rafael River near Green River, Utah, for 1912.

Month.	Discharge in second-feet.			Run-off (in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	*a* 50	3,070	D.
February	.....	.....	*a* 70	4,030	D.
March	.....	.....	*a* 100	6,150	D.
April	178	61	95.7	5,690	A.
May	2,270	56	406	25,000	A.
June	3,510	600	1,570	93,400	A.
July	645	20	223	13,700	A.
August	532	.....	74.7	4,590	C.
September	.....	.....	59.7	3,550	D.
October	2,890	.....	384	23,600	D.
November	1,680	.....	199	11,800	C.
December	.....	.....	46.6	2,870	C.
The year	3,510	.....	272	197,000	

a Estimated.

COTTONWOOD CREEK NEAR ORANGEVILLE, UTAH.

Location.—In sec. 9 or 10, T. 18 S., R. 7 E., Salt Lake base and meridian, at Johnson's ranch, about 5 miles northwest of Orangeville.

Records available.—May 1, 1909, to December 31, 1912.

Drainage area.—240 square miles.

Gage.—Inclined staff.

Channel.—Shifting.

Discharge measurements.—Made by wading at low stages and from a cable and car at high stages.

Floods.—Short, severe floods occur at this station during August and September.

Winter flow.—Relation of gage height to discharge affected by ice at times during the winter months.

Diversions.—Above all diversions except Johnson's ditch.

Accuracy.—Fair.

Discharge measurements of Cottonwood Creek near Orangeville, Utah, in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 26	Leonard Tanner	3.97	28.1	June 10	Leonard Tanner	7.80	861
May 16	do	4.67	113	Oct. 2	do	5.61	33.7
21	do	5.38	284				

Daily gage height, in feet, of Cottonwood Creek near Orangeville, Utah, for 1912.

[Robert Johnson, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	4.0	.....	3.9	4.2	.....	6.7	6.2	.....	5.6	.....	.....
2	4.5	4.2	3.7	4.0	4.2	.....	6.7	6.2	5.7	5.6	.....	6.0
3	4.5	4.2	.....	4.0	4.0	8.0	6.7	.....	5.7	.....	.....	.....
4	4.6	.....	3.8	4.1	3.9	8.3	.....	.....	.....	5.6	5.5	5.9
5	5.0	.....	.....	.....	.....	8.3	6.6	6.1	5.7	.....	.....	.....
6	5.0	3.9	3.9	3.9	4.0	8.3	6.6	6.0	5.7	.....	5.5	5.9
7	.....	.....	3.9	.....	4.0	8.3	.....	6.0	5.7	5.6	5.6	5.9
8	4.8	3.8	3.9	4.6	4.5	8.7	6.5	6.0	.....	5.6	5.6	.....
9	4.8	.....	3.9	4.8	4.2	.....	6.5	6.0	6.0	5.7	.....	5.9
10	4.8	4.1	.....	4.3	4.4	7.8	6.5	.....	5.8	5.7	.....	.....
11	.....	.....	4.0	4.1	4.6	7.9	6.4	.....	5.8	.....	5.6	6.0
12	4.5	3.8	3.8	4.0	.....	8.0	6.3	5.9	5.8	5.6	5.5	5.9
13	4.5	3.8	3.8	4.0	4.2	.....	6.3	5.9	5.7	.....	5.6	.....
14	.....	3.7	3.8	.....	4.5	8.0	.....	5.9	.....	5.6	.....	5.9
15	4.6	.....	.....	3.9	4.8	7.6	6.2	.....	.....	.....	5.6	.....
16	4.6	3.8	3.7	4.0	4.9	.....	6.1	5.9	5.7	5.6	5.5	6.0
17	.....	3.7	.....	.....	5.0	7.3	6.0	5.9	5.7	5.6	.....	.....
18	4.4	.....	4.0	4.0	.....	7.5	5.9	.....	.....	5.6	5.6	6.2
19	4.2	3.6	3.9	4.1	.....	7.6	5.9	5.8	5.6	5.6	5.7	6.3
20	4.2	3.6	3.9	.....	5.5	.....	5.9	5.8	5.6	.....	5.7	.....
21	.....	.....	3.9	.....	5.5	7.7	.....	5.8	5.6	5.6	.....	6.5
22	3.8	3.6	3.8	4.0	5.5	7.5	5.9	5.8	.....	.....	5.6	.....
23	3.8	.....	3.9	3.8	5.6	.....	5.9	5.8	5.6	5.6	5.6	6.3
24	3.9	3.6	.....	.....	5.8	7.6	.....	5.8	5.6	5.6	.....	6.3
25	3.8	.....	4.0	4.0	5.8	7.5	5.8	.....	5.6	.....	5.6	.....
26	3.8	3.7	4.0	4.0	.....	7.5	5.8	5.8	.....	5.6	5.6	.....
27	3.7	3.7	4.0	4.0	6.1	7.3	7.8	5.8	5.6	.....	5.5	6.0
28	.....	3.7	4.0	.....	6.4	7.1	.....	5.7	5.6	5.8	.....	6.0
29	4.2	3.7	4.0	4.2	6.7	6.9	7.0	5.7	.....	5.7	.....	.....
30	4.2	.....	4.2	4.5	6.8	.....	9.0	5.7	.....	5.7	5.7	.....
31	4.2	.....	.....	.....	6.8	.....	6.7	5.7	.....	5.6	.....	.....

NOTE.—Relation of gage height to discharge affected by ice Jan. 1 to Feb. 17 and Dec. 1 to 31.

Daily discharge, in second-feet, of Cottonwood Creek near Orangeville, Utah, for 1912.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	15	24	50	940	200	97	39	31	30
2	.....	15	31	50	1,200	200	97	39	31	28
3	.....	17	31	31	1,450	200	92	39	31	26
4	.....	19	40	24	1,630	186	88	39	31	24
5	.....	22	32	28	1,540	172	83	39	31	24
6	.....	24	24	31	1,450	172	70	39	31	24
7	.....	24	64	31	1,370	160	70	39	31	31
8	.....	24	104	88	1,630	148	70	54	31	31
9	.....	24	138	50	1,240	148	70	70	39	31
10	.....	28	62	74	860	148	66	48	39	31
11	.....	31	40	104	944	128	62	48	35	31
12	.....	19	31	77	1,030	112	58	48	31	24
13	.....	19	31	50	1,030	112	58	39	31	31
14	.....	19	28	88	1,030	104	58	39	31	31
15	.....	17	24	138	692	97	58	39	31	31
16	.....	15	31	158	584	83	58	39	31	24
17	.....	23	31	180	476	70	58	39	31	27
18	11	31	31	230	614	58	58	35	31	31
19	11	24	40	280	692	58	48	31	31	39
20	11	24	37	326	734	58	48	31	31	39
21	11	24	34	326	776	58	48	31	31	35
22	11	19	31	326	614	58	48	31	31	31
23	11	24	19	366	653	58	48	31	31	31
24	11	28	25	476	692	53	48	31	31	31
25	13	31	31	416	614	48	48	31	31	31
26	15	31	31	446	614	48	48	31	31	31
27	15	31	31	476	476	860	48	31	40	24
28	15	31	40	614	362	587	39	31	48	29
29	15	31	50	776	270	314	39	31	39	34
30	.....	50	88	776	235	1,880	39	31	39	39
31	.....	37	.....	692	.....	200	39	.....	31	.....

NOTE.—Discharge determined from two fairly well-defined curves, one applicable Feb. 18 to May 23, the other June 8 to Nov. 30, and by indirect method for shifting channels from May 24 to June 7. Discharge estimated, because of ice, Feb. 1 to 17, as 11 second-feet. Discharge interpolated for days on which gage was not read. Mean discharge January and December estimated.

Monthly discharge of Cottonwood Creek near Orangeville, Utah, for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	[a] 14	861	D.
February	.....	.....	11.6	667	D.
March	50	15	24.9	1,530	B.
April	138	19	41.8	2,490	A.
May	776	24	251	15,400	B.
June	1,630	235	881	52,400	B.
July	1,880	48	219	13,500	A.
August	97	39	60	3,690	A.
September	70	31	38.1	2,270	A.
October	48	31	33.0	2,030	A.
November	39	24	30.1	1,790	B.
December	.....	.....	[a] 20	1,230	C.
The year	1,880	.....	135	97,900	

[a] Estimated.

FERRON CREEK NEAR FERRON, UTAH.

Location.—In sec. 35, T. 19 S., R. 6 E., Salt Lake base and meridian, at the Peterson (formerly Christensen's) ranch, about 5 miles northwest of Ferron and 1½ miles above the flour mill.

Records available.—May 6, 1911, to December 31, 1912. Records are also available at the Westingskow ranch, several miles below, for the period April 28, 1909, to October 7, 1911.

Drainage area.—Not accurately known.
Gage.—Sloping gage at cable.
Channel.—Probably shifting at high stages.
Discharge measurements.—Made from cable and car or by wading at low stages.
Winter flow.—The relation of gage height to discharge is affected by the presence of ice during the winter months.
Diversions.—Above all diversions except the Christensen ditch.
Artificial regulation.—None at present.
Accuracy.—Records fair.

Discharge measurements of Ferron Creek near Ferron, Utah, in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 25	Leonard Tanner	1.74	10.1	May 20	Leonard Tanner	3.05	265
25	do	1.80	12.2	29	do	3.85	448
Apr. 10	do	2.06	34.4	30	do	4.25	608
May 8	do	2.10	40.5	Oct. 17	do	1.70	18.6

Daily gage height, in feet, of Ferron Creek near Ferron, Utah, for 1912.

[J. H. Christensen, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.7	2.2	.....	1.70	2.40	4.25	2.90	2.18	1.8	1.7	1.6	.....
2	.....	2.35	1.75	1.80	2.15	4.60	2.85	2.15	1.8	1.7	1.65	.....
3	2.8	3.4	.....	1.88	1.80	4.85	2.70	2.1	1.8	1.7	.....	.....
4	.....	.....	1.7	1.88	1.90	4.85	2.70	2.1	1.8	1.7	1.55	1.8
5	.....	2.1	.....	1.90	1.85	4.55	2.65	2.08	1.8	2.0	.....	.....
6	3.2	.....	1.8	1.92	1.98	4.45	2.65	2.05	1.7	.....	1.7	.....
7	3.2	2.0	.....	2.12	2.20	4.45	2.65	2.0	1.7	1.8	.....	2.35
8	2.6	2.0	.....	2.22	2.38	4.55	2.65	2.0	1.6	1.8	.....	.....
9	.....	2.0	1.8	2.28	2.32	4.30	2.55	2.0	1.9	1.95	.....	.....
10	3.1	1.9	1.7	2.10	2.52	4.20	2.50	2.0	1.7	1.75	.....	.....
11	.....	1.8	.....	1.85	2.65	4.00	2.45	2.0	1.8	1.65	.....	2.15
12	.....	1.9	1.8	1.80	2.62	4.05	2.48	2.0	1.7	1.72	.....	.....
13	2.95	.....	1.7	1.65	2.38	4.25	2.55	2.0	1.7	.....	1.6	.....
14	.....	3.4	.....	1.70	2.32	3.90	2.65	2.0	1.7	1.5	1.6	1.8
15	2.8	.....	1.8	1.75	2.52	3.60	2.50	1.95	1.7	1.5	.....	1.8
16	2.8	.....	1.8	1.82	2.85	3.35	2.45	1.95	1.7	.....	.....	.....
17	.....	1.9	.....	1.85	3.08	3.35	2.38	1.9	1.7	1.7	.....	.....
18	2.4	.....	1.8	1.88	3.25	3.35	2.35	1.9	1.7	1.7	.....	1.9
19	.....	1.9	.....	1.80	3.35	3.28	2.35	1.9	1.7	1.7	1.65	.....
20	2.4	2.45	1.75	1.80	3.50	3.28	2.35	1.9	1.7	1.7	.....	.....
21	2.4	.....	.....	1.68	3.30	3.30	2.35	1.9	1.7	1.7	.....	1.95
22	.....	3.7	1.4	1.75	3.15	3.32	2.32	1.9	1.7	1.5	.....	.....
23	2.5	.....	1.4	1.78	3.30	3.35	2.25	1.9	1.7	.....	1.8	.....
24	.....	.....	.....	1.90	3.52	3.20	2.20	1.9	1.68	1.65	1.8	.....
25	2.3	.....	1.6	1.82	3.50	3.15	2.22	1.9	1.68	1.7	.....	.....
26	2.0	1.7	1.75	1.80	3.40	3.15	2.32	1.85	1.68	1.8	.....	2.45
27	2.1	.....	.....	1.85	3.70	3.10	2.25	1.85	1.7	2.0	1.7	.....
28	2.1	1.75	1.8	1.85	3.90	3.00	2.20	1.8	1.7	1.5	.....	2.45
29	2.1	2.55	1.85	2.05	4.38	3.00	2.40	1.8	1.7	.....	.....	2.8
30	3.5	.....	1.75	2.30	4.25	3.00	2.32	1.8	1.7	.....	.....	.....
31	.....	.....	.....	.....	4.05	.....	2.28	1.8	.....	1.6	.....	.....

NOTE.—Relation of gage height to discharge affected by ice Jan. 1 to Feb. 29, and Dec. 7 to 31.

Daily discharge, in second-feet, of Ferron Creek near Ferron, Utah, for 1912.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	8	8	78	610	216	66	26	19	14	20
2	10	13	46	720	203	62	26	19	16	20
3	9	20	13	800	164	56	26	19	14	22
4	8	20	22	800	164	56	26	19	12	26
5	10	22	18	704	152	54	26	45	15	18
6	13	24	29	672	152	50	19	30	19	14
7	13	42	52	672	152	45	19	26	18	.....
8	13	54	75	704	152	45	14	26	17	.....
9	13	62	68	625	129	45	35	40	16	.....
10	8	40	102	595	118	45	19	22	15	.....
11	10	18	131	535	109	45	26	16	14	.....
12	13	13	129	550	114	45	19	20	14	.....
13	8	6	89	610	129	45	19	15	14	.....
14	10	8	81	505	152	45	19	10	14	.....
15	13	10	118	415	118	40	19	10	14	.....
16	13	15	203	340	109	40	19	14	14	.....
17	13	18	264	340	97	35	19	19	15	.....
18	13	20	312	340	92	35	19	19	16	.....
19	12	13	340	320	92	35	19	19	16	.....
20	10	13	385	320	92	35	19	19	18	.....
21	6	7	326	326	92	35	19	19	20	.....
22	1	10	284	332	87	35	19	10	22	.....
23	1	12	326	340	76	35	19	13	26	.....
24	3	22	391	298	69	35	18	16	26	.....
25	5	15	385	284	72	35	18	19	22	.....
26	10	13	355	284	87	30	18	26	20	.....
27	12	18	445	270	76	30	19	45	19	.....
28	13	18	505	242	69	26	19	10	20	.....
29	18	36	650	242	100	26	19	11	20	.....
30	10	64	610	242	87	26	19	13	20	.....
31	9	.....	550	.....	81	26	.....	14	.....	.....

NOTE.—Discharge determined from two fairly well defined curves, one applicable Mar. 1 to May 8, the other May 16 to Dec. 6, and by the indirect method for shifting channels from May 9 to 15. Discharge interpolated for days on which gage was not read. Discharge Dec. 7 to 31 estimated at 12 second-feet. Mean discharge January to February estimated.

Monthly discharge of Ferron Creek near Ferron, Utah, for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	[a] 8	492	D.
February	.....	.....	[a] 7	403	D.
March	18	1	9.9	609	C.
April	64	7	21.8	1,300	B.
May	650	13	238	14,600	A.
June	800	242	468	27,800	A.
July	216	69	116	7,130	A.
August	66	26	40.7	2,500	B.
September	35	14	20.7	1,230	B.
October	45	10	20.1	1,240	A.
November	26	12	17.3	1,030	B.
December	.....	.....	13.4	824	D.
The year	800	1	81.6	59,200	

[a] Estimated.

FERRON CREEK NEAR CASTLEDALE, UTAH.

Location.—About 8 miles below the town of Ferron, Utah, at a point known locally as Paradise, in sec. 35, T. 19 S., R. 8 E., Salt Lake base and meridian; 2 miles below the point of diversion of the Paradise canal.

Records available.—June 12, 1911, to December 31, 1912.

Drainage area.—Not measured.
Gage.—Inclined staff on left bank.
Channel.—Shifting during flood periods.
Discharge measurements.—Made from car and cable or by wading.
Winter flow.—Ice affects the relation of gage height to discharge during the winter months.
Diversions.—Below all diversions except the Fred Anderson ditch.
Artificial regulation.—Flow is affected at times as the result of manipulating the head gates of the various canals above the station.
Accuracy.—Fair only, owing to shifting character of stream bed and diurnal fluctuations at certain seasons of the year.

Discharge measurements of Ferron Creek near Castledale, Utah, in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 25	Leonard Tanner	4.30	0.0	May 31	Leonard Tanner	6.63	279
25	do	4.88	11.6	June 27	do	7.04	108
Apr. 11	do	5.02	18.9	Oct. 16	do	6.50	15.4
May 20	do	5.88	146				

Daily gage height, in feet, of Ferron Creek near Castledale, Utah, for 1912.

[Leroy Livingston and Henning Olsen, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1			5.0	4.8	5.0	6.95	6.9	6.55	6.3		6.5	
2			4.9	4.8		7.35	6.95	6.5			6.5	
3			4.95	4.85		8.0	7.0	6.55	6.35			
4			4.7	4.9		7.5		6.5	6.3			6.4
5			4.8	4.9	4.95	9.0			6.3	6.4		6.4
6	5.5	5.6	5.0	5.0	4.95	8.0	6.7		6.3			
7			4.6	4.85	4.75	8.5	6.7		6.3			
8			5.0	5.0	4.9	8.6	6.7				6.5	
9			4.9	4.9	4.95		6.5				6.5	
10		6.0	4.95	5.05	5.05	8.5			6.3			6.5
11			4.9	5.0	5.35	8.0	6.45				6.4	
12			4.8			9.6						
13	5.8		4.9	4.8	5.0	8.0	6.45		6.3			
14			4.9	4.8	5.4	9.05	6.45		6.35			6.6
15			4.8	4.8	4.9	7.35	6.4		6.35			
16			4.75	4.8	5.0				6.3	6.5	6.4	
17		5.65	4.7	5.0	6.35		6.4		6.3			
18			4.6		6.0		6.4		6.3			
19			4.65	4.8	6.0	7.3	6.35			6.5		
20	5.6		4.8	4.8	6.1	7.1	6.4		6.35	6.5	6.5	
21			5.0	4.8	6.4	7.05	6.35				6.4	7.1
22			5.0	4.6	6.5		6.4		6.35			7.2
23			5.05	4.4			6.3			6.5		
24		5.1		4.4	6.85	7.25		6.0	6.3	6.4		
25			4.9	5.1	6.9	6.9						
26			5.0		6.35	7.05			6.3		6.4	
27	5.8		5.0	4.6	6.4	7.0	6.7	6.6	6.3		6.5	7.2
28			4.8	4.65	6.6	7.1	6.6	6.1			6.5	7.2
29			4.85	4.6	6.9	6.9			6.3			
30			4.9	4.6	7.0	7.0	7.1	6.1	6.35			
31					6.75		6.6	6.05		6.4		

NOTE.—Relation of gage height to discharge affected by ice during January and February and Dec. 6 to 31, Creek dry Aug. 5 to 23.

Daily discharge, in second-feet, of Ferron Creek near Castledale, Utah, for 1912.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	19	9	19	338	78	22	6	8	16	12
2	14	9	18	392	88	16	7	8	16	10
3	16	12	18	491	98	22	8	9	16	10
4	6	14	17	383	80	16	6	9	16	10
5	9	14	16	635	60	.....	6	10	16	10
6	19	19	16	437	44	.....	6	10	16	.....
7	4	12	8	509	44	.....	6	11	16	.....
8	19	19	14	509	44	.....	6	11	16	.....
9	14	14	16	480	16	.....	6	12	16	.....
10	16	22	22	455	14	.....	6	12	13	.....
11	14	19	52	347	13	.....	6	13	10	.....
12	9	14	35	617	13	.....	6	13	10	.....
13	14	9	19	311	13	.....	6	14	10	.....
14	14	9	59	482	13	.....	8	15	10	.....
15	9	9	14	168	10	.....	8	15	10	.....
16	8	9	19	166	10	.....	6	16	10	.....
17	6	19	230	164	10	.....	6	16	10	.....
18	4	14	167	160	10	.....	6	16	12	.....
19	5	9	167	158	8	.....	7	16	14	.....
20	9	9	185	118	10	.....	8	16	16	.....
21	19	9	239	108	8	.....	8	16	10	.....
22	19	4	257	128	10	.....	8	16	10	.....
23	22	.5	290	130	6	.....	7	16	10	.....
23	18	.5	320	148	10	1	6	10	10	.....
25	14	25	329	78	16	10	6	10	10	.....
26	19	15	230	108	28	20	6	10	10	.....
27	19	4	239	98	44	28	6	10	16	.....
28	9	5	275	118	28	2	6	10	16	.....
29	12	4	329	78	70	2	6	10	16	.....
30	14	4	347	98	118	2	8	10	14	.....
31	12	.....	302	.....	28	2	.....	10	.....	.....

NOTE.—Discharge determined from two fairly well defined curves, one applicable Mar. 1 to June 1, the other June 15 to Dec. 5. Discharge determined by the indirect method for shifting channels June 2 to 14. Discharge interpolated for days on which gage was not read. Discharge, Dec. 6 to 31, estimated 8 second-feet because of ice. Mean discharge January to February estimated.

Monthly discharge of Ferron Creek near Castledale, Utah, for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	[a] 5	307	D.
February	.....	.....	[a] 5	288	D.
March	22	4	13.1	806	A.
April	25	0.5	11.2	666	B.
May	347	8	138	8,480	A.
June	635	78	280	16,700	B.
July	118	6	33.6	2,070	B.
August	28	0	4.6	283	B.
September	8	6	6.6	393	B.
October	16	8	12.2	750	C.
November	16	10	13.0	774	C.
December	.....	.....	8.4	516	D.
Total	635	0	44.1	32,000	

[a] Estimated.

HUNTINGTON CREEK NEAR HUNTINGTON, UTAH.

Location.—At Cunha ranch, about 7 miles northwest of Huntington, Utah, in sec. 6, T. 17 S., R. 8 E., Salt Lake base and meridian.

Records available.—May 3, 1909, to December 31, 1912.

Drainage area.—158 square miles.

Gage.—Vertical staff in two sections, and sloping gage, both at same datum, used during 1912.

Channel.—Shifting at extreme high stages.

Discharge measurements.—Made by wading at low stages and from a cable and car at high stages.

Floods.—Extremely high floods occasionally occur at this station in July and August.

Winter flow.—The stream is frozen entirely over during the greater part of the winter. Estimates of winter flow are approximate.

Diversions.—Above all diversions (except Cunha's ditch) and below all main tributaries except Fish Creek. Several small ditches divert from tributaries above the station.

Artificial regulation.—A small storage reservoir on Huntington Creek above the station controls the distribution of the flow to a slight extent.

Accuracy.—Fair except for high stages.

Discharge measurements of Huntington Creek near Huntington, Utah, in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 29	Leonard Tanner	2.79	34.5	May 17	Leonard Tanner	3.70	191
Apr. 6	do	2.86	41.1	June 12	do	4.43	455
May 7	do	2.96	49.8	Oct. 7	do	2.72	43.1

Daily gage height, in feet, of Huntington Creek near Huntington, Utah, for 1912.

[Joseph Cunha, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.0	.....	3.0	2.9	3.1	5.0	3.9	3.15	2.9	2.8	2.4	2.6
2	4.0	3.3	2.8	2.9	3.1	4.9	4.0	3.1	2.8	2.8	2.45	2.6
3	3.8	3.2	2.8	2.9	3.0	4.9	3.65	3.1	2.9	2.7	2.3	2.7
4	3.8	3.2	2.7	2.8	2.9	5.3	3.6	3.0	2.9	2.8	2.3	2.7
5	3.6	3.2	2.7	2.8	2.9	4.8	3.4	3.0	2.9	2.9	2.35	2.7
6	3.6	3.2	2.7	2.8	.....	5.0	3.35	3.0	2.9	.....	2.25	2.7
7	3.5	3.2	2.7	.....	3.0	5.2	3.35	3.0	2.9	2.7	2.2	2.7
8	3.5	3.2	2.7	2.9	3.1	5.15	3.3	3.0	2.85	2.75	2.2	2.7
9	3.5	3.3	2.7	3.0	3.1	4.9	3.3	3.05	2.9	2.8	2.1	2.7
10	3.5	3.3	2.7	3.1	3.3	4.8	3.3	3.2	2.8	2.8	2.0	2.7
11	3.6	3.2	2.6	3.0	3.4	4.5	3.05	3.2	2.8	2.8	2.0	2.7
12	3.6	3.2	2.6	2.9	3.3	4.5	3.2	3.15	2.8	2.8	2.0	2.7
13	3.6	3.2	2.6	2.8	3.4	4.5	3.1	3.1	2.8	2.75	2.0	2.7
14	3.6	3.2	2.55	.....	3.3	4.6	3.2	3.1	2.8	2.7	2.1	2.7
15	3.7	3.1	2.5	2.9	3.4	4.5	3.1	3.15	2.8	2.75	2.1	2.8
16	3.6	3.1	2.5	2.8	3.5	4.6	.....	3.1	2.8	2.75	2.1	2.8
17	3.7	3.1	2.4	2.9	3.9	4.4	3.1	3.4	2.8	2.7	2.1	2.8
18	3.7	3.1	2.4	2.9	3.9	4.15	3.22	3.25	2.8	2.75	2.1	2.8
19	3.7	3.2	2.4	2.9	4.1	4.1	3.3	3.2	2.7	2.7	2.1	2.9
20	3.7	3.2	2.3	2.9	.....	4.15	3.2	3.2	2.7	2.6	2.1	2.9
21	3.6	3.2	2.3	.....	.....	4.1	3.3	3.15	2.75	2.6	2.1	2.9
22	3.5	3.2	2.3	2.8	4.5	4.0	3.3	3.1	2.75	2.6	2.05	2.9
23	3.5	3.2	2.3	2.7	4.3	4.1	3.3	3.1	2.8	2.55	2.0	2.9
24	3.4	3.2	2.8	2.8	4.2	4.1	3.5	3.0	2.75	2.55	2.2	2.9
25	3.4	3.2	2.7	2.9	4.5	3.9	4.65	3.0	2.8	2.5	2.2	2.9
26	3.4	3.2	2.6	2.9	4.4	3.9	3.4	3.0	2.7	2.5	2.3	2.9
27	3.4	3.2	2.7	2.9	5.0	3.8	3.05	3.0	2.7	2.5	2.3	2.9
28	3.4	3.1	2.6	2.9	4.6	3.65	3.1	3.0	2.8	2.45	2.4	2.9
29	3.4	3.1	2.8	2.9	4.7	3.75	3.1	3.0	2.75	2.45	2.5	3.0
30	3.3	.....	2.6	2.9	4.95	3.8	3.1	3.0	2.8	2.4	2.5	3.0
31	3.3	.....	.....	.....	4.8	.....	3.1	3.0	.....	2.4	.....	3.0

NOTE.—Relation of gage height to discharge affected by ice Jan. 1–Mar. 1 and Nov. 24–Dec. 31.

Daily discharge, in second-feet, of Huntington Creek near Huntington, Utah, for 1912.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	35	44	70	766	247	94	58	47	18
2	35	44	70	704	280	86	47	47	20
3	35	44	56	704	178	86	58	38	15
4	27	35	44	966	165	71	58	47	15
5	27	35	44	646	122	71	58	58	16
6	27	35	50	766	113	71	58	47	14
7	27	44	56	896	113	71	58	38	13
8	27	44	70	863	104	71	52	42	13
9	27	56	70	704	104	78	58	47	12
10	27	70	104	646	104	103	47	47	11
11	22	56	122	486	63	103	47	47	11
12	22	44	104	486	86	94	47	47	11
13	22	35	122	486	70	86	47	42	11
14	20	40	104	536	86	86	47	38	12
15	18	44	122	486	70	94	47	42	12
16	18	35	143	536	70	86	47	42	12
17	15	44	247	440	70	143	47	38	12
18	15	44	247	334	90	112	47	42	12
19	15	44	315	315	104	103	38	38	12
20	12	44	354	334	86	103	38	29	12
21	12	40	396	315	104	94	42	29	12
22	12	35	486	280	104	86	42	29	12
23	12	27	396	315	104	86	47	26	11
24	35	35	354	315	143	71	42	26	.....
25	27	44	486	247	600	71	47	22	.....
26	22	44	440	247	143	71	38	22	.....
27	27	44	766	217	78	71	38	22	.....
28	22	44	536	178	86	71	47	20	.....
29	35	44	590	204	86	71	42	20	.....
30	22	44	735	217	86	71	47	18	.....
31	33	.....	646	.....	86	71	.....	18	.....

NOTE.—Daily discharge determined from two fairly well defined curves. Discharge interpolated for days of no gage height. Discharge estimated Mar. 1. Mean discharge Nov. 24–30 estimated 10 second-feet.

Monthly discharge of Huntington Creek near Huntington, Utah, for 1912.

[Drainage area, 160 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	.....	.....	[a] 18	0.112	0.13	1,110	C.
February	.....	.....	[a] 20	.125	.13	1,150	D.
March	35	12	24	.150	.17	1,480	C.
April	70	27	43	.269	.30	2,560	B.
May	766	44	269	1,68	1.94	16,500	A.
June	966	178	488	3.05	3.40	29,000	B.
July	600	63	127	.794	.92	7,800	B.
August	143	71	85	.531	.61	5,230	B.
September	58	38	48	.300	.33	2,860	B.
October	58	18	36	.225	.26	2,210	B.
November	20	.....	12	.075	.08	714	C.
December	.....	.....	[a] 10	.062	.07	615	D.
The year	966	.....	98	.612	8.34	71,200	

[a] Estimated.

HUNTINGTON CREEK NEAR CASTLEDALE, UTAH.

Location.—In sec. 33, T. 18 S., R. 9 E., Salt Lake base and meridian, about 5½ miles east of the town of Castledale and about 6 miles southeast of Huntington; about 4 miles above the entrance of Cottonwood Creek.

Records available.—May 12, 1911, to October 4, 1912.

Drainage area.—350 square miles.

Gage.—Vertical staff.

Channel.—Sand and gravel; likely to shift during high water.

Discharge measurements.—High-water measurements made from car and cable; low-water measurements by wading.

Winter flow.—During the winter months the relation of gage height to discharge is at times affected by ice.

Diversions.—The station is located below all diversions and shows the unappropriated flow of the stream.

Accuracy.—Fair.

Discharge measurements of Huntington Creek near Castledale, Utah, in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Mar. 27	Leonard Tanner	2.20	29.6
May 15	.....do	1.86	11.4
June 11	.....do	4.52	365
Oct. 4	.....do	1.95	18.4

Daily gage height, in feet, of Huntington Creek near Castledale, Utah, for 1912.

[Elmer Jeffs, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	1.75	2.75	1.68	2.1	1.8	6.0	1.95	3.4	1.85	.....
2	1.78	.....	1.7	2.1	1.8	5.8	1.95	3.2	1.85	.....
3	1.75	1.74	.....	2.0	1.85	6.2	1.9	2.3	1.82	.....
4	.....	1.7	1.75	2.2	1.7	6.1	.....	.....	1.8	1.95
5	1.74	1.72	1.7	2.1	1.8	6.0	1.92	.....	1.8	.....
6	1.75	1.72	1.72	2.0	1.75	5.9	1.9	2.1	.....	.....
7	.....	.....	.....	.....	1.8	5.5	1.9	2.0	1.85	.....
8	.....	1.75	1.74	2.1	1.85	5.8	1.92	3.2	1.87	.....
9	1.8	1.73	.....	2.0	2.2	5.4	1.9	2.1	1.95	.....
10	1.78	1.7	1.75	1.98	2.1	5.2	1.9	2.1	2.4	.....
11	1.75	1.7	1.7	2.0	2.0	4.75	1.85	.....	2.2	.....
12	1.7	1.72	1.72	2.2	1.85	.....	1.82	2.1	1.9	.....
13	1.7	1.7	1.72	2.2	2.2	4.55	1.8	2.0	1.95	.....
14	.....	.....	.....	.....	2.0	4.54	.....	1.85	1.9	.....
15	1.72	1.72	2.2	2.3	2.0	4.5	1.8	1.85	.....	.....
16	.....	1.72	.....	2.3	2.3	4.4	1.85	1.8	1.9	.....
17	1.7	1.7	.....	2.2	2.4	4.45	1.85	.....	.....	.....
18	1.7	1.65	.....	2.1	2.5	3.4	1.85	.....	1.8	.....
19	1.68	1.65	1.95	2.2	3.2	3.35	.....	1.8	1.8	.....
20	1.7	.....	.....	2.1	3.3	3.3	.....	1.8	.....	.....
21	.....	.....	1.95	2.3	3.9	3.3	.....	1.75	1.85	.....
22	.....	.....	.....	2.2	4.0	3.0	.....	1.85	.....	.....
23	1.7	1.65	1.98	2.3	4.0	2.85	.....	1.85	1.82	.....
24	1.75	.....	.....	2.2	4.1	2.8	.....	1.85	1.8	.....
25	1.72	1.65	.....	2.2	4.2	2.8	.....	.....	.....	.....
26	.....	.....	.....	2.2	4.1	.....	2.2	1.9	.....	.....
24	1.68	1.68	2.2	2.2	4.5	2.75	2.2	1.8	1.8	.....
28	.....	.....	.....	2.2	5.0	2.75	.....	1.9	1.82	.....
29	.....	.....	.....	1.8	5.2	2.8	3.2	1.85	1.9	.....
30	.....	.....	.....	1.85	6.35	2.73	3.0	1.85	1.9	.....
31	.....	.....	.....	.....	5.1	.....	.....	1.8	.....	.....

Daily discharge, in second-feet, of Huntington Creek near Castledale, Utah, for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	8	8	5	25	10	655	16	175	12	15
2	9	8	6	25	10	615	16	145	12	16
3	8	8	7	19	12	695	14	38	11	16
4	8	6	8	31	6	675	14	35	10	16
5	8	7	6	25	10	655	15	30	10	.....
6	8	7	7	19	8	635	14	25	11	.....
7	8	7	7	22	10	555	14	19	12	.....
8	9	8	8	25	12	615	15	145	13	.....
9	10	7	8	19	31	535	14	25	16	.....
10	9	6	8	18	25	495	14	25	47	.....
11	8	6	6	19	19	408	12	25	31	.....
12	6	7	7	31	12	389	11	25	14	.....
13	6	6	7	31	31	370	10	19	16	.....
14	6	6	19	34	19	368	10	12	14	.....
15	7	7	31	38	19	361	10	12	14	.....
16	6	7	24	38	38	343	12	10	14	.....
17	6	6	20	31	47	352	12	10	12	.....
18	6	4	18	25	57	175	12	10	10	.....
19	5	4	16	31	145	168	40	10	10	.....
20	6	4	16	25	160	160	40	10	11	.....
21	6	4	16	38	257	160	40	8	12	.....
22	6	4	17	31	274	117	40	12	11	.....
23	6	4	18	38	274	96	40	12	11	.....
24	8	4	21	31	291	90	40	12	10	.....
25	7	4	24	31	308	90	40	13	10	.....
26	6	4	27	31	291	87	31	14	10	.....
27	5	5	31	31	361	84	31	10	10	.....
28	6	5	30	31	455	84	31	14	11	.....
29	7	5	28	10	495	90	145	12	14	.....
30	8	.....	27	12	725	82	117	12	14	.....
31	8	.....	26	.....	475	.....	150	10	.....	.....

NOTE.—Daily discharge determined from a well-defined curve. Discharge estimated Feb. 1. Discharge interpolated for days of no gage height, except July 19–25, when mean discharge for period was estimated at 40 second-feet.

Monthly discharge of Huntington Creek near Castledale, Utah, for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	10	5	7.1	437	B.
February	8	4	5.8	334	B.
March	31	5	16.1	990	B.
April	38	10	27.2	1,620	A.
May	725	6	158	9,720	A.
June	695	82	340	20,200	A.
July	150	10	32.9	2,020	C.
August	175	8	30.1	1,850	B.
September	47	10	13.8	821	A.
October (1–4)	16	15	15.8	125	B.
The period	.....	.....	.....	38,100	

GRAND RIVER BASIN.

NORTH FORK OF GRAND RIVER NEAR GRAND LAKE, COLO.

Location.—Three miles southwest of Grand Lake, Colo., in sec. 13, T. 3 N., R. 76 W. Nearest tributary, Grand Lake outlet, enters some distance below; no tributaries for several miles above the station.

Records available.—July 29, 1904, to September 30, 1909; September 20, 1910, to November 30, 1912.

Drainage area.—107 square miles (measured from Forest atlas).

Gage.—Vertical staff.

Channel.—Practically permanent.

Discharge measurements.—Made from highway bridge at the gage.

Winter flow.—Ice forms along the edges, but springs keep the river open.

Diversions and storage.—There are court decrees for diversions of 716 second-feet from the headwaters above the station. Of this amount 525 second-feet are for diversion across the divide into the headwaters of the Cache la Poudre. There is also a reservoir decree for 19,000 acre-feet from the flood water.

Accuracy.—The meager gage heights for the greater part of the year make the estimates of discharge only fair or, possibly, good.

Cooperation.—During 1912 the station was maintained in cooperation with the United States Forest Service.

Discharge measurements of North Fork of Grand River near Grand Lake, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 16[a]	H. B. Waha	3.30	22.1
Mar. 31	J. L. Mathias	3.38	19.4
June 11	do	6.00	983
Aug. 13	Robert Follansbee	4.10	120

[a] Very little ice present in stream. Relation of gage height to discharge apparently not affected.

Daily gage height, in feet, of North Fork of Grand River near Grand Lake, Colo., for 1912.

[P. L. Barker, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1						5.2			3.8	3.72
2		3.35	3.3			5.2			3.78	3.88
3					3.8				3.75	
4						5.8			3.75	
5								4.3	3.7	
6	3.35					6.0	5.0	4.4	3.7	
7									3.72	
8					4.2				3.72	
9			3.3						3.75	
10		3.3							3.8	
11						6.0			3.82	
12	3.37								3.78	
13								4.2	3.78	
14								4.1	3.8	
15		3.3			3.9			4.08	3.85	
16		3.3	3.3					4.08	3.8	
17								4.05	3.82	
18					4.5		4.8	4.05	3.78	
19								4.0	3.75	
20	3.3			3.48				4.0	3.78	
21			3.3		5.2			3.95	3.78	
22								3.9	3.72	
23		3.3			5.2			3.9	3.72	
24								3.9	3.75	
25				3.5				3.85	3.75	
26								3.82	3.78	
27	3.3	3.28						3.82	3.78	
28					4.9			3.8	3.75	
29					5.0		4.8	3.8	3.72	
30								3.88	3.72	
31			3.38					3.88		

NOTE.—Gage heights Jan. 1 to Mar. 31 probably slightly affected by ice.

Daily discharge, in second-feet, of North Fork of Grand River near Grand Lake, Colo., for 1912.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	23	58	570	.....	278	65	57
2	24	61	570	.....	251	63	77
3	24	65	750	.....	224	60	.....
4	25	81	930	.....	197	60	.....
5	25	97	995	.....	170	55	.....
6	26	113	1,060	460	200	55	.....
7	26	129	1,060	452	192	57	.....
8	27	145	1,060	443	184	57	.....
9	27	135	1,060	435	176	60	.....
10	28	126	1,060	426	168	65	.....
11	28	117	1,060	418	160	68	.....
12	29	108	.....	410	152	63	.....
13	29	98	.....	401	145	68	.....
14	30	89	.....	393	120	65	.....
15	30	80	.....	385	116	72	.....
16	31	158	.....	376	116	65	.....
17	31	196	.....	368	110	68	.....
18	32	235	.....	360	110	63	.....
19	32	348	.....	360	100	60	.....
20	33	459	.....	360	100	63	.....
21	33	570	.....	360	90	63	.....
22	34	570	.....	360	80	57	.....
23	34	570	.....	360	80	57	.....
24	35	538	.....	360	80	60	.....
25	35	506	.....	360	72	60	.....
26	38	474	.....	360	68	63	.....
27	41	442	.....	360	68	63	.....
28	45	410	.....	360	65	60	.....
29	48	460	.....	360	65	57	.....
30	51	497	.....	332	77	57	.....
31	.....	534	.....	305	77	.....	.....

NOTE.—Daily discharge computed from a well-defined rating curve. Discharge interpolated for days for which gage heights are missing, except from June 12 to July 5. Estimates for January, February, and March based on two discharge measurements and a few scattered gage heights, some of which may be slightly affected by ice in stream.

Monthly discharge of North Fork of Grand River near Grand Lake, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	[a] 20	1,230	D.
February	.....	.....	[a] 20	1,150	D.
March	.....	.....	[a] 20	1,230	D.
April	55	23	31.8	1,890	C.
May	570	58	273	16,800	C.
June (1–11)	1,060	570	925	20,400	C.
July (6–31)	460	305	382	19,700	C.
August	278	65	132	8,120	B.
September	72	55	61.6	3,670	B.
The period	.....	.....	.....	.....	

[a] Estimated.

NOTE.—See footnote to daily discharge table.

GRAND RIVER AT SULPHUR SPRINGS, COLO.

Location.—At the bridge connecting the Denver, Northwestern & Pacific Railway station with the town of Sulphur Springs, in sec. 2, T. 1 N., R. 78 W. Nearest tributary, Beaver Creek, enters the river 2 miles below the station.

Records available.—July 22, 1904, to September 30, 1909, a station was maintained at this point by the United States Geological Survey; September 23, 1910, to November 30, 1912.

Drainage area.—946 square miles (measured from Hayden's atlas).

Gage.—Chain gage; datum the same as that of the gage used originally.

Channel.—Somewhat shifting.

Discharge measurements.—Made from bridge during high and ordinary stages and by wading during low water.

Winter flow.—The river is frozen over during the winter months and discharge measurements are made to determine the winter flow.

Diversions.—Between this station and that near Granby there are court decrees for diversions of 100 second-feet from Grand River and 662 second-feet from intervening tributaries. There is also a reservoir decree for 31,300 acre-feet from the flood waters of Grand River.

Accuracy.—Owing to the shifting of the channel, the estimates of discharge can not be considered better than fair or possibly good. Estimates have been made only for days on which the gage was read.

Cooperation.—Station maintained in cooperation with the United States Forest Service.

Discharge measurements of Grand River at Sulphur Springs, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 14[a]	H. B. Waha	2.77	100	Sept. 20	R. Richards	2.27	343
Apr. 2[a]	J. L. Mathias	3.25	126	July 13	C. L. Richards	5.40	3,130
June 13	....do	6.40	4,910				

[a] Relation between gage height and discharge affected by ice in stream.

Daily gage height, in feet, of Grand River at Sulphur Springs, Colo., for 1912.

[Jesse E. Wolfe, observer,]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	3.0	3.1	3.05	.....	6.1	5.1	.....	.....	.....	.....	.....
2	2.75	3.0	3.1	3.25	3.0	6.1	5.25	4.25	.....	.....	.....	.....
3	.....	3.1	3.1	.....	3.1	6.15	.....	4.0	.....	.....	.....	.....
4	2.7	3.1	3.2	.....	2.9	6.7	.....	.....	.....	.....	.....	.....
5	.....	3.1	3.2	.....	.....	7.0	4.9	.....	.....	.....	.....	2.9
6	.....	.....	3.2	.....	2.9	7.0	.....	.....	.....	.....	1.7	3.1
7	.....	.....	3.2	.....	2.6	7.45	4.9	.....	.....	.....	1.55	3.05
8	2.8	.....	3.3	.....	2.85	7.45	.....	.....	.....	.....	1.7	3.05
9	.....	.....	3.3	.....	2.7	7.45	.....	.....	.....	.....	1.75	.....
10	3.1	.....	.....	.....	2.9	6.8	.....	.....	.....	.....	.....	3.25
11	.....	.....	3.4	.....	2.65	.....	.....	.....	.....	.....	1.7	3.2
12	2.8	.....	3.45	.....	2.6	.....	.....	3.1	.....	.....	1.75	.....
13	2.8	.....	3.45	.....	2.55	6.4	.....	.....	.....	.....	1.75	.....
14	3.0	2.8	3.50	.....	2.4	.....	.....	.....	.....	.....	.....	3.2
15	3.1	.....	3.65	.....	.....	5.15	4.55	.....	.....	.....	.....	.....
16	3.1	.....	3.70	.....	.....	5.3	.....	.....	.....	.....	1.7	.....
17	3.1	.....	.....	.....	.....	.....	.....	2.9	.....	.....	.....	.....
18	3.1	.....	3.65	.....	3.6	.....	.....	.....	.....	.....	4.05	.....
19	3.1	.....	3.50	.....	.....	.....	4.55	2.8	.....	.....	3.0	.....
20	3.1	.....	3.6	.....	4.5	.....	.....	.....	2.27	.....	3.85	.....
21	3.0	.....	3.3	.....	.....	.....	.....	.....	.....	.....	3.05	.....
22	3.0	.....	3.4	.....	5.55	.....	4.5	.....	.....	.....	.....	.....
23	3.0	.....	3.3	.....	.....	.....	.....	2.65	.....	.....	3.15	.....
24	3.1	.....	.....	.....	.....	.....	.....	2.55	.....	.....	3.0	.....
25	3.1	.....	3.2	.....	5.9	.....	.....	.....	.....	.....	3.0	.....
26	3.1	.....	3.2	.....	.....	.....	.....	.....	.....	.....	3.75	.....
27	3.1	.....	3.1	.....	6.0	.....	.....	.....	.....	.....	.....	.....
28	.....	.....	3.1	.....	.....	.....	4.55	.....	.....	.....	2.95	.....
29	3.1	.....	3.2	.....	4.95	.....	.....	.....	.....	.....	.....	.....
30	3.1	.....	3.1	.....	5.0	.....	.....	.....	.....	.....	2.9	.....
31	3.0	.....	.....	.....	6.5	.....	4.5	.....	.....	.....	.....	.....

NOTE.—River frozen over Jan. 1 to Apr. 2 and partly frozen Nov. 18 to Dec. 31. Gage heights read to water surface in hole cut in the ice.

Daily discharge, in second-feet, of Grand River at Sulphur Springs, Colo., for 1912.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1		4,290	2,810				
2	780	4,290	3,010	1,820			
3	850	4,380		1,570			
4	710	5,330					
5		5,870	2,560				
6	710	5,870					150
7	520	6,700	2,560				
8	675	6,700					150
9	580	6,700					165
10	710	5,510					
11	550						150
12	520			850			165
13	495	4,800					165
14	420						
15		2,880	2,140				
16		3,080					150
17				710			
18	1,220						
19			2,140	640			
20	2,090				358		
21							
22	3,440		2,090				
23				550			
24				495			
25	3,970						
26							
27	4,130						
28			2,140				
29	2,620						
30	2,680						
31	4,970		2,090				

NOTE.—Daily discharge computed from a fairly well defined rating curve.

GRAND RIVER NEAR KREMMLING, COLO.

Location.—At the entrance to Gore Canyon, 3 miles southwest of Kremmling, in sec. 23, T. 1 N., R. 81 W. Nearest tributary, Blue River, enters a mile below Kremmling.

Records available.—July 24, 1904, to November 30, 1912.

Drainage area.—2,380 square miles.

Gage.—Automatic recording gage, except during the winter months when a staff gage is read.

Channel.—Somewhat shifting; the bed scours at high stages and silts during low.

Winter flow.—Although the river is frozen entirely across at the station, there is little, if any, backwater, as shown by discharge measurements made during the winter. Rapids below the station remain open and thus prevent backwater except for short periods when ice jams on the rapids.

Kremmling reservoir site.—The station is located at the site of the proposed Kremmling reservoir of the United States Reclamation Service. With a 200-foot dam at the mouth of Gore Canyon the capacity of the reservoir would be 2,200,000 acre-feet.

Diversions.—Between this station and that at Sulphur Springs there are court decrees for diversions of 34 second-feet from Grand River and 2,315 second-feet from intervening tributaries exclusive of diversions for placer mining in the Blue River drainage.

Accuracy.—Although the channel is somewhat shifting, sufficient discharge measurements have been made to form a basis for fairly reliable estimates of flow.

Cooperation.—During 1912 the station was maintained by State engineer, who furnished records complete for publication.

Discharge measurements of Grand River near Kremmling, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 5[a]	C. L. Chatfield	3.10	1,230
July 5	do	11.60	6,490
Aug. 22	do	4.05	1,480

[a] Relation of gage height to discharge probably affected by ice in stream.

Daily gage height, in feet, of Grand River near Kremmling, Colo., for 1912.

[H. C. Rogers, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	1.5	0.7	0.65	.....	4.1	16.7	15.0	9.6	3.4	1.4	1.15
2	1.35	.75	.65	.....	4.7	.....	14.2	9.2	3.2	1.35	1.05
3	1.25	.8	.75	.....	5.6	.....	13.1	8.4	3.1	1.95	.95
4	1.15	.75	.75	2.3	5.1	.....	12.2	7.6	2.95	2.15	1.1
5	1.05	.75	.65	3.15	4.5	.....	11.6	.....	2.85	2.2	1.25
6	.95	.85	.75	3.1	4.05	.....	11.2	.....	2.7	2.2	1.2
7	1.05	.75	.95	2.5	4.55	21.5	10.9	.....	2.6	2.2	1.15
8	.95	.85	.85	2.7	5.6	.....	11.2	.....	2.55	2.25	1.15
9	1.1	.85	.95	.....	6.5	17.8	11.4	.....	2.55	2.25	1.2
10	.85	.85	.85	.....	6.6	17.2	11.4	.....	2.8	2.2	1.95
11	.75	.95	.85	2.95	5.8	16.2	11.2	.....	2.85	2.25	1.85
12	.65	.9	.75	.....	5.4	15.5	11.1	.....	2.75	2.3	1.7
13	.7	.85	.85	2.5	5.1	14.8	11.2	7.2	2.65	2.25	1.55
14	.95	.8	.8	1.5	4.55	14.2	11.3	.....	2.7	2.2	1.95
15	.9	.75	.85	1.3	4.55	13.8	11.4	.....	2.9	2.2	2.1
16	.75	.8	.9	1.25	4.8	13.2	11.2	.....	2.9	2.2	1.8
17	.85	.85	.9	1.4	5.6	12.0	10.4	.....	3.0	2.3	1.5
18	.75	.85	.9	1.45	7.3	11.0	10.0	4.9	3.05	2.3	1.35
19	.75	.85	1.05	1.45	9.0	10.3	10.0	4.6	2.95	2.3	1.15
20	.8	.75	1.0	1.5	9.6	9.9	10.0	4.35	2.85	2.55	1.25
21	.75	.65	1.15	1.6	10.6	10.2	9.8	4.15	2.8	2.4	1.25
22	.85	.75	1.4	1.4	11.9	10.9	9.5	4.05	.....	2.45	1.35
23	.75	.75	1.05	1.3	12.6	12.2	10.3	3.95	.....	2.45	1.3
24	.9	.75	.95	1.35	12.8	13.6	9.9	3.7	.....	2.3	1.25
25	.85	.7	1.05	1.85	13.4	14.6	9.2	3.5	.....	2.25	1.15
26	.85	.65	1.15	2.15	13.9	15.0	9.0	3.4	.....	2.25	1.1
27	.75	.65	1.25	.....	14.2	15.0	9.0	3.3	.....	2.15	1.05
28	.85	.75	1.35	2.5	13.3	15.3	10.0	3.3	.....	2.2	1.0
29	.9	.7	1.25	2.85	12.2	15.4	9.6	3.4	.....	2.1	1.15
30	.85	.....	1.4	3.5	13.0	15.3	9.4	3.5	.....	1.95	1.05
31	.9	.....	1.5	.....	.....	.....	9.4	3.5	.....	1.65	.....

NOTE.—Backwater from ice Jan. 1 to 10, and possibly slight effect at other times during the winter. Gage heights Jan. 1 to Apr. 5 and Oct. 19 to Nov. 30 are the means of two daily readings from the staff gage.

Daily discharge, in second-feet, of Grand River near Kremmling, Colo., for 1912.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	780	1,435	13,545	11,320	4,775	1,205	900	702
2	825	1,670	.....	10,170	4,430	1,150	900	688
3	875	2,040	.....	8,700	3,800	1,125	900	672
4	925	1,830	.....	7,595	3,215	1,090	900	695
5	1,140	1,590	.....	6,800	.....	1,060	900	718
6	1,125	1,420	.....	6,400	.....	1,025	900	710
7	975	1,610	20,020	6,010	.....	1,000	900	702
8	1,025	2,040	.....	6,400	.....	988	912	702
9	1,040	2,525	16,100	6,630	.....	988	912	710
10	1,060	2,555	14,220	6,570	.....	1,060	900	848
11	1,090	2,115	12,800	6,340	.....	1,040	912	825
12	1,025	1,970	11,925	6,230	.....	1,010	925	795
13	975	1,830	11,050	6,400	2,955	1,010	912	765
14	755	1,610	10,100	6,455	.....	1,025	900	848
15	725	1,610	9,560	6,630	.....	1,075	900	880
16	718	1,690	8,765	6,400	.....	1,075	900	815
17	740	2,065	7,220	5,485	.....	1,100	925	755
18	748	3,020	6,120	5,050	1,750	1,110	925	732
19	748	4,180	5,385	5,140	1,630	1,090	925	702
20	755	4,685	5,000	5,050	1,530	1,060	988	718
21	775	5,690	5,240	4,865	1,450	1,050	950	718
22	740	7,160	6,010	4,640	1,420	1,030	962	732
23	725	7,985	7,465	5,385	1,380	1,010	962	725
24	732	8,375	9,360	5,000	1,295	1,000	925	718
25	825	9,025	10,710	4,340	1,235	980	912	702
26	890	9,765	11,180	4,260	1,205	960	912	695
27	830	10,100	11,180	4,220	1,175	940	890	688
28	975	8,960	11,655	5,095	1,175	920	900	680
29	1,060	7,595	11,790	4,685	1,205	900	880	702
30	1,235	8,635	11,655	4,510	1,235	900	848	688
31	.....	11,050	.....	4,555	1,235	.....	785	.....

NOTE.—Discharge estimated Jan. 1–Apr. 13.

Monthly discharge of Grand River near Kremmling, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January	.....	.....	[a] 434	26,678
February	.....	.....	[a] 425	24,466
March	.....	.....	[a] 465	28,602
April	1,235	718	894	53,228
May	11,050	1,420	4,446	273,382
June (24 days)	20,020	5,000	10,335	492,010
July	11,320	4,220	6,043	371,564
August (19 days)	4,775	1,175	2,005	75,560
September	1,205	900	1,003	61,440
October	988	785	908	55,859
November	880	672	734	43,696
The period	.....	.....	.....	1,506,484

[a] Estimated.

GRAND RIVER AT GLENWOOD SPRINGS, COLO.

Location.—At Glenwood Springs, at the point where the discharge from the hot springs enters the river. No Name Creek enters Grand River about 2 miles above the station and Roaring Fork enters one-half mile below.

Records available.—May 12, 1899, to December 31, 1912.

Drainage area.—4,520 square miles (measured from Nell's map of Colorado).

Gage.—Chain gage originally installed at the railroad bridge just above the Roaring Fork, but in 1900 a staff gage was installed at the present location. Since 1902 a number of automatic gages referred to the staff gage datum have been used, the present one being a Friez gage.

Channel.—Slightly shifting.

Discharge measurements.—Made from a car and cable stretched beneath the State Street Bridge, which crosses the river one-third mile below the gage.

Winter flow.—Ice never forms at the station, as the hot water from the springs keeps the water above the freezing point.

Artificial control.—The Shoshone power plant of the Central Colorado Power Co., 6 miles above Glenwood Springs, has sufficient pondage to withhold the flow of the river for a portion of the day during low-water periods.

Diversions.—Between this station and the one near Kremmling there are court decrees for a diversion of 13 second-feet from Grand River and 1,508 second-feet from the intervening tributaries.

Accuracy.—Conditions are favorable for accurate results and the estimates are considered reliable.

Cooperation.—Station maintained in cooperation with the United States Forest Service and Central Colorado Power Co.

Discharge measurements of Grand River at Glenwood Springs, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 2	C. L. Chatfield	3.34	658	May 24	J. L. Mathias	8.97	13,800
27	H. B. Waha	3.44	653	Sept. 25	R. H. Fletcher	4.28	1,650
Apr. 17	J. L. Mathias	4.07	1,400				

Daily gage height, in feet, of Grand River at Glenwood Springs, Colo., for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.4	3.4	3.5	3.7	4.8	9.8	9.8	7.0	4.5	4.3	4.0	3.6
2	3.4	3.35	3.5	3.6	5.1	9.6	9.4	7.0	4.4	4.3	3.6	3.45
3	3.4	3.4	3.6	3.7	5.3	9.6	9.0	6.6	4.4	4.3	2.75	3.4
4	3.35	3.15	3.6	3.9	5.5	10.3	8.6	6.4	4.3	4.2	2.85	3.5
5	3.4	3.6	3.6	4.1	5.2	11.2	8.2	6.2	4.3	4.2	2.9	3.6
6	3.4	3.4	3.7	4.2	5.0	11.6	8.0	6.0	4.2	4.2	2.9	3.4
7	3.4	3.35	3.5	4.3	4.9	11.6	7.8	5.8	4.2	4.2	2.95	3.15
8	3.55	3.4	3.45	4.2	5.2	11.8	8.0	5.7	4.2	4.2	2.9	3.15
9	3.45	3.4	3.45	4.2	5.7	12.0	8.0	5.6	4.2	4.2	.....	3.1
10	3.45	3.4	3.25	4.3	6.0	11.8	8.0	5.6	4.3	4.2	.....	3.1
11	3.55	3.45	3.6	4.4	5.9	11.2	8.0	5.4	4.3	4.2	4.0	3.3
12	3.5	3.6	3.5	4.2	5.6	10.6	7.8	5.2	4.3	4.2	4.1	3.25
13	3.5	3.6	3.5	4.3	5.4	10.2	7.8	5.1	4.3	4.3	4.2	3.35
14	3.5	3.35	3.4	4.1	5.2	9.8	7.8	5.0	4.3	4.2	4.0	3.45
15	3.6	3.5	3.3	4.0	5.1	9.5	8.0	5.0	4.4	4.2	4.0	3.4
16	3.45	3.45	3.3	4.0	5.2	9.2	7.8	5.0	4.4	4.3	3.8	3.45
17	3.5	3.45	3.3	4.0	5.4	8.7	7.6	5.0	4.4	4.1	3.5	3.35
18	3.5	3.45	3.4	4.0	6.0	8.3	7.3	5.0	4.4	4.1	3.9	3.4
19	3.5	3.5	3.45	4.1	6.7	8.0	7.2	4.7	4.4	4.1	3.8	3.5
20	3.6	3.35	3.4	4.2	7.2	7.8	7.2	4.8	4.4	4.1	3.5	3.25
21	3.35	3.3	3.8	4.1	7.6	7.8	7.2	4.8	4.3	4.1	3.6	3.3
22	3.6	3.45	3.5	4.0	8.2	8.2	7.0	4.8	4.3	4.1	3.7	3.5
23	3.45	3.6	3.5	4.0	8.4	8.6	7.2	4.6	4.4	4.1	3.7	3.3
24	3.5	3.7	3.5	4.0	8.6	9.1	7.4	4.6	4.2	4.0	3.6	3.15
25	3.45	3.35	3.6	4.0	9.2	9.6	7.0	4.6	4.3	4.1	3.6	3.25
26	3.4	3.5	3.6	4.3	9.5	9.8	6.8	4.5	4.3	4.1	3.4	3.5
27	3.6	3.5	3.6	4.4	9.6	9.9	6.8	4.4	4.3	4.1	3.4	3.3
28	3.25	3.5	3.5	4.4	9.2	9.9	7.0	4.4	4.3	4.1	3.4	3.35
29	3.7	3.45	3.6	4.5	8.8	10.1	7.2	4.4	4.3	4.1	3.5	3.3
30	3.4	.....	3.7	4.5	9.1	10.0	7.0	4.6	4.3	4.1	3.2	3.3
31	3.35	.....	3.8	.....	9.8	.....	7.0	4.6	.....	4.1	.....	3.5

Daily discharge, in second-feet, of Grand River at Glenwood Springs, Colo., for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	720	720	790	940	2,380	18,700	18,700	6,980	1,930	1,640	1,280	905
2	720	690	790	860	2,870	17,700	16,700	6,980	1,780	1,640	905	802
3	720	720	860	940	3,220	17,700	14,700	5,920	1,780	1,640	428	770
4	690	575	860	1,130	3,580	21,200	12,800	5,450	1,630	1,510	475	835
5	720	860	860	1,360	3,040	25,700	11,100	5,000	1,630	1,510	500	905
6	720	720	940	1,490	2,700	27,700	10,300	4,570	1,490	1,510	500	770
7	720	690	790	1,630	2,540	27,700	9,580	4,160	1,490	1,510	525	628
8	825	720	755	1,490	3,040	28,700	10,300	3,960	1,490	1,510	500	628
9	755	720	755	1,490	3,960	29,700	10,300	3,770	1,490	1,510	760	600
10	755	720	630	1,630	4,570	28,700	10,300	3,770	1,630	1,510	1,020	600
11	825	755	860	1,780	4,360	25,700	10,300	3,400	1,630	1,510	1,280	710
12	790	860	790	1,490	3,770	22,700	9,580	3,040	1,630	1,510	1,390	682
13	790	860	790	1,630	3,400	20,700	9,580	2,870	1,630	1,640	1,510	740
14	790	690	720	1,360	3,040	18,700	9,580	2,700	1,630	1,510	1,280	802
15	860	790	660	1,240	2,870	17,200	10,300	2,700	1,780	1,510	1,280	770
16	755	755	660	1,240	3,040	15,700	9,580	2,700	1,780	1,640	1,080	802
17	790	755	660	1,240	3,400	13,200	8,870	2,700	1,780	1,390	835	740
18	790	755	720	1,240	4,570	11,500	7,880	2,700	1,780	1,390	1,180	770
19	790	790	755	1,360	6,170	10,300	7,570	2,230	1,780	1,390	1,080	835
20	860	690	720	1,490	7,570	9,580	7,570	2,380	1,780	1,390	835	682
21	690	660	1,030	1,360	8,870	9,580	7,570	2,380	1,630	1,390	905	710
22	860	755	790	1,240	11,100	11,100	6,980	2,380	1,630	1,390	985	835
23	755	860	790	1,240	11,900	12,800	7,570	2,080	1,780	1,390	985	710
24	790	940	790	1,240	12,800	15,200	8,200	2,080	1,490	1,280	905	628
25	755	690	860	1,240	15,700	17,700	6,980	2,080	1,630	1,390	905	682
26	720	790	860	1,630	17,200	18,700	6,430	1,930	1,630	1,390	770	835
27	860	790	860	1,780	17,700	19,200	6,430	1,780	1,630	1,390	770	710
28	630	790	790	1,780	15,700	19,200	6,980	1,780	1,630	1,390	770	740
29	940	755	860	1,930	13,700	20,200	7,570	1,780	1,630	1,390	835	710
30	720	.....	940	1,930	15,200	19,700	6,980	2,080	1,630	1,390	655	710
31	690	.....	1,030	.....	18,700	.....	6,980	2,080	.....	1,390	.....	835

NOTE.—Daily discharge computed from a well-defined rating curve.

Monthly discharge of Grand River at Glenwood Springs, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (in total acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	940	630	768	47,200	B.
February	940	575	754	43,400	B.
March	1,030	630	805	49,500	B.
April	1,930	860	1,410	83,900	B.
May	18,700	2,380	7,510	462,000	B.
June	29,700	9,580	19,100	1,140,000	B.
July	18,700	6,430	9,490	584,000	B.
August	6,980	1,780	3,240	199,000	B.
September	1,930	1,490	1,660	98,800	A.
October	1,640	1,280	1,470	90,400	A.
November	1,510	428	904	53,800	A.
December	905	600	745	45,800	A.
The year	29,700	428	3,980	2,900,000	

GRAND RIVER NEAR PALISADES, COLO.

Location.—At the State bridge 2 miles above Palisades, about sec. 3, T. 11 S., R. 98 W. Nearest important tributary, Plateau Creek, enters about 6 miles above the station.

Records available.—April 9, 1902, to December 5, 1912.

Drainage area.—8,550 square miles.

Gage.—Chain gage; location and datum unchanged.

Channel.—Practically permanent.

Discharge measurements.—Made from bridge to which the gage is attached. Prior to 1906 measurements were made from the suspension bridge at Palisades, where conditions were less favorable for accurate determination of discharge.

Winter flow.—The river usually freezes over a portion of the year, but except for slush and ice and an occasional thin ice cover the effect on the gage heights is slight.

Diversions.—There are court decrees for diversions of 420 second-feet from Grand River and 2,500 second-feet from intervening tributaries between Palisades and the Glenwood Springs station. The proposed high line canal of the United States Reclamation Service will divert 700 second-feet 7 miles above the Palisades station. Below the station the Grand Valley Irrigation Co. has a diversion of 400 second-feet.

Accuracy.—Conditions are favorable for accurate results, and the estimates should be reliable.

Cooperation.—Field data furnished by the United States Reclamation Service.

Discharge measurements of Grand River near Palisades, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 27	Harper and Page	13.5	2,700	Aug. 29	J. C. Page	13.35	2,520
May 18	do	16.7	11,100	Sept. 7	Page and Mills	13.10	2,280
June 7	do	23.25	40,200	Oct. 16	E. H. Sweet	13.32	2,540
July 10	do	18.80	18,800				

Daily gage height, in feet, of Grand River near Palisades, Colo., for 1912.

[I. W. Penny, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	14.1	13.7	12.35	13.2	14.3	21.5	20.9	17.2	13.8	13.2	13.3	12.6
2	14.1	13.6	12.35	13.0	14.8	21.4	20.6	17.0	13.6	13.2	13.2	12.5
3	14.1	13.6	12.45	13.2	15.0	21.6	20.0	16.6	13.3	13.2	13.1	12.35
4	14.1	13.6	12.6	13.4	14.8	22.4	19.8	16.3	13.2	13.1	13.0	12.6
5	14.1	13.6	12.8	13.6	15.0	23.0	19.4	15.9	13.3	13.3	13.1	12.6
6	14.1	13.7	12.9	13.6	15.0	23.4	18.6	15.7	13.3	13.2	13.2	.....
7	14.1	13.6	13.2	13.6	14.6	23.4	18.4	15.4	13.2	13.3	13.2	.....
8	14.1	13.6	12.8	13.5	15.0	23.2	18.9	15.2	13.1	13.4	13.1	.....
9	14.1	13.7	12.6	13.6	15.6	23.6	19.1	14.9	13.0	13.4	13.0	.....
10	14.1	13.6	12.6	13.8	15.9	23.6	18.9	14.8	13.0	13.6	13.1	.....
11	14.1	13.6	12.8	13.8	16.0	22.9	18.8	15.2	13.1	13.4	13.2	.....
12	13.9	13.5	12.7	13.6	16.0	22.1	18.5	14.6	13.0	13.4	13.2	.....
13	13.9	13.7	12.6	13.6	15.6	21.7	18.4	14.4	13.1	13.4	13.1	.....
14	14.0	13.5	12.45	13.4	15.2	21.2	19.2	14.2	13.1	13.4	13.2	.....
15	13.9	13.4	12.45	13.4	15.0	20.6	19.6	14.5	13.2	13.4	13.2	.....
16	13.8	13.3	12.45	13.2	15.4	20.3	18.9	14.6	13.4	13.4	13.1	.....
17	13.8	13.2	12.6	13.2	16.0	19.8	18.5	14.7	13.2	13.2	12.9	.....
18	13.6	13.2	12.4	13.2	16.8	19.4	17.9	14.4	13.2	13.3	12.6	.....
19	13.4	13.0	12.3	13.2	18.1	18.8	17.3	14.2	13.3	13.3	12.9	.....
20	13.3	12.6	14.2	13.4	18.8	18.5	17.8	14.0	13.4	13.2	12.8	.....
21	13.2	12.35	13.7	13.4	19.9	18.6	17.6	14.0	13.4	13.1	12.6	.....
22	13.4	12.3	12.9	13.3	20.5	19.1	17.5	13.8	13.4	13.2	12.8	.....
23	13.6	12.45	12.6	13.4	20.6	19.6	17.4	13.8	13.3	13.2	12.8	.....
24	13.8	12.4	12.6	13.4	20.8	20.0	19.0	13.6	13.3	13.2	12.6	.....
25	13.8	12.35	12.6	13.2	21.3	20.7	17.2	13.5	13.3	13.1	12.6	.....
26	13.4	12.45	13.0	13.4	21.7	21.2	17.1	13.4	13.4	13.2	12.8	.....
27	13.6	12.4	12.8	13.5	21.8	21.2	16.9	13.6	13.3	13.5	12.8	.....
28	13.6	12.35	12.6	13.6	21.4	21.1	17.5	13.5	13.3	13.9	12.6	.....
29	13.7	12.3	12.45	13.8	20.8	21.0	17.6	13.6	13.3	13.5	12.6	.....
30	13.6	.....	12.5	14.0	21.4	21.2	17.2	13.7	13.3	13.4	12.6	.....
31	13.6	.....	12.8	.....	21.6	.....	17.0	16.2	.....	13.4	.....	.....

NOTE.—Ice present Jan. 1 to Feb. 20 and Dec. 6 to 31 approximate; gage heights Jan. 1 to 11 read to top of ice; during rest of period read to water surface.

Daily discharge, in second-feet, of Grand River near Palisades, Colo., for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	1,320	2,340	4,260	32,000	28,900	12,200	3,280	2,340	2,480	1,590
2	.....	.....	1,320	2,080	5,380	31,500	27,300	11,500	2,930	2,340	2,340	1,480
3	.....	.....	1,420	2,340	5,850	32,500	24,300	10,200	2,480	2,340	2,210	1,320
4	.....	.....	1,590	2,620	5,380	36,700	23,200	9,300	2,340	2,210	2,080	1,590
5	.....	.....	1,830	2,930	5,850	40,000	21,300	8,170	2,480	2,480	2,210	1,590
6	.....	.....	1,950	2,930	5,850	42,200	17,600	7,630	2,480	2,340	2,340	.....
7	.....	.....	2,340	2,930	4,920	42,200	16,700	6,840	2,340	2,480	2,340	.....
8	.....	.....	1,830	2,770	5,850	41,100	18,900	6,340	2,210	2,620	2,210	.....
9	.....	.....	1,590	2,930	7,360	43,400	19,900	5,610	2,080	2,620	2,080	.....
10	.....	.....	1,590	3,280	8,170	43,400	18,900	5,380	2,080	2,930	2,210	.....
11	.....	.....	1,830	3,280	8,450	39,400	18,500	6,340	2,210	2,620	2,340	.....
12	.....	.....	1,710	2,930	8,450	35,100	17,200	4,920	2,080	2,620	2,340	.....
13	.....	.....	1,590	2,930	7,360	33,000	16,700	4,480	2,210	2,620	2,210	.....
14	.....	.....	1,420	2,620	6,340	30,400	20,300	4,050	2,210	2,620	2,340	.....
15	.....	.....	1,420	2,620	5,850	27,300	22,300	4,700	2,340	2,620	2,340	.....
16	.....	.....	1,420	2,340	6,840	25,800	18,900	4,920	2,620	2,620	2,210	.....
17	.....	.....	1,590	2,340	8,450	23,200	17,200	5,150	2,340	2,340	1,950	.....
18	.....	.....	1,370	2,340	10,800	21,300	14,700	4,480	2,340	2,480	1,590	.....
19	.....	.....	1,270	2,340	15,500	18,500	12,500	4,050	2,480	2,480	1,950	.....
20	.....	.....	4,050	2,620	18,500	17,200	14,300	3,650	2,620	2,340	1,830	.....
21	.....	1,320	3,100	2,620	23,700	17,600	13,600	3,650	2,620	2,210	1,590	.....
22	.....	1,270	1,950	2,480	26,800	19,900	13,200	3,280	2,620	2,340	1,830	.....
23	.....	1,420	1,590	2,620	27,300	22,300	12,900	3,280	2,480	2,340	1,830	.....
24	.....	1,370	1,590	2,620	28,400	24,200	19,400	2,930	2,480	2,340	1,590	.....
25	.....	1,320	1,590	2,340	31,000	27,800	12,200	2,770	2,480	2,210	1,590	.....
26	.....	1,420	2,080	2,620	33,000	30,400	11,800	2,620	2,620	2,340	1,830	.....
27	.....	1,370	1,830	2,770	33,600	30,400	11,200	2,930	2,480	2,770	1,830	.....
28	.....	1,320	1,590	2,930	31,500	29,900	13,200	2,770	2,480	3,460	1,590	.....
29	.....	1,270	1,420	3,280	28,400	29,400	13,600	2,930	2,480	2,770	1,590	.....
30	.....	.....	1,480	3,650	31,500	30,400	12,200	3,100	2,480	2,620	1,590	.....
31	.....	.....	1,830	.....	32,500	.....	11,500	9,010	.....	2,620	.....	.....

NOTE.—Daily discharge computed from a well-defined rating curve.

Monthly discharge of Grand River near Palisades, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
March	4,050	1,320	1,760	108,000	B.
April	3,650	2,080	2,710	161,000	A.
May	33,600	4,260	15,600	959,000	A.
June	43,400	17,200	30,600	1,820,000	A.
July	28,900	11,200	17,200	1,060,000	A.
August	12,200	2,620	5,460	336,000	A.
September	3,280	2,080	2,450	146,000	A.
October	3,460	2,210	2,520	155,000	A.
November	2,480	1,590	2,020	120,000	A.
The period	.....	.....	.....	4,860,000	

GRAND RIVER NEAR FRUITA, COLO.

Location.—At highway bridge 1½ miles south of Fruita, in sec. 20, T. 1 N., R. 2 W., Ute principal meridian. Nearest important tributary, Little Salt Wash, enters a mile below the station; Gunnison River enters at Grand Junction, about 12 miles above.

Records available.—Flood records during 1908, 1909, and 1910; May 4, 1911 (station established), to December 5, 1912.

Drainage area.—16,800 square miles (Hayden's Atlas).

Gage.—Chain gage; datum was raised 0.05 foot May 3, 1911.

Channel.—Practically permanent.

Discharge measurements.—Made from the highway bridge.

Winter flow.—The river is frozen over during a portion of the year and readings are taken to water surface through a hole in the ice.

Diversions.—Between the Palisades station and Fruita nearly 500 second-feet are diverted during the irrigation season.

Maximum stage.—Since the establishment of the station the maximum stage has been 15.0 feet, which occurred June 9, 1909. The highest stage known was about 18.5 feet on July 4, 1884.

Accuracy.—Owing to insufficient high-water measurements, estimates of discharge have not yet been made. The base data are considered reliable.

Cooperation.—The gage heights are furnished through the courtesy of the United States Weather Bureau.

The following discharge measurement was made by R. H. Fletcher:
September 27, 1912: Gage height, 3.70 feet; discharge, 4,120 second-feet.

Daily gage height, in feet, of Grand River near Fruita, Colo., for 1912.

[P. W. Bryant and C. T. Swan, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	3.7	2.8	3.8	5.6	13.2	11.6	8.0	3.8	3.6	3.8	3.1
2	.....	3.7	2.8	3.5	6.7	12.7	11.1	8.0	4.0	3.6	3.8	3.1
3	.....	3.7	2.8	3.7	7.1	13.0	10.6	7.7	3.7	3.5	3.6	3.2
4	.....	3.7	2.8	4.2	7.1	13.5	10.1	7.2	3.6	3.5	3.6	3.0
5	.....	3.6	3.0	4.9	6.8	14.0	9.6	6.6	3.4	3.9	3.7	2.8
6	.....	3.7	3.2	5.0	6.4	14.2	9.2	6.5	3.4	3.8	3.6	.....
7	.....	3.6	3.3	4.9	6.4	14.2	9.0	6.2	3.4	3.8	3.6	.....
8	.....	3.6	3.2	4.9	7.0	13.9	9.2	5.8	3.5	3.9	3.6	.....
9	.....	3.7	3.1	5.2	7.8	14.0	9.3	5.6	3.2	3.9	3.6	.....
10	.....	3.7	3.0	5.5	8.2	14.2	9.2	5.2	3.0	4.0	3.6	.....
11	.....	3.8	2.9	5.7	8.3	13.6	9.2	5.2	3.2	4.0	3.8	.....
12	.....	3.7	2.9	5.1	8.6	13.1	9.2	5.0	3.4	4.1	3.8	.....
13	.....	3.7	2.9	4.9	8.4	12.4	9.0	4.8	3.3	4.05	3.7	.....
14	3.5	3.6	2.9	4.6	7.9	12.0	9.1	4.6	3.4	3.95	3.6	.....
15	3.5	3.6	2.8	4.2	7.6	11.6	9.3	4.6	3.2	3.85	3.6	.....
16	3.5	3.7	2.8	4.2	7.8	11.4	9.2	5.1	3.6	3.85	3.4	.....
17	3.5	3.7	2.7	4.1	8.7	10.8	9.0	5.6	3.8	3.85	3.4	.....
18	3.5	3.8	2.7	4.4	9.6	10.7	8.6	5.3	3.8	3.85	3.3	.....
19	3.6	3.7	2.8	4.0	10.6	10.1	8.5	4.9	3.9	3.8	3.3	.....
20	3.7	3.6	5.0	4.1	11.4	9.8	8.2	4.6	3.9	3.75	3.2	.....
21	3.7	3.5	4.2	4.3	12.2	9.6	8.3	4.4	3.9	3.75	3.2	.....
22	3.7	3.4	3.6	4.0	12.8	9.9	8.2	4.3	3.9	3.8	3.1	.....
23	3.7	3.3	3.5	3.7	13.9	10.4	8.0	4.2	3.9	3.75	3.0	.....
24	3.7	3.2	3.6	3.6	13.0	11.0	8.6	4.0	3.8	3.7	3.2	.....
25	3.8	3.1	3.2	3.9	13.2	11.4	8.0	3.6	3.7	3.7	3.2	.....
26	3.7	3.0	3.2	4.7	13.4	11.8	8.0	3.6	3.8	3.6	3.0	.....
27	3.6	2.9	3.5	4.6	13.6	11.9	8.1	3.6	3.8	3.7	3.0	.....
28	3.5	2.8	3.2	4.6	13.2	11.8	8.0	4.0	3.8	3.9	2.9	.....
29	3.5	2.7	3.4	4.6	12.8	11.7	8.1	3.8	3.8	4.05	2.9	.....
30	3.6	.....	3.6	5.3	12.9	11.6	7.9	3.4	3.8	4.1	2.8	.....
31	3.8	.....	3.6	.....	13.2	.....	7.9	4.0	.....	3.95	.....	.....

NOTE.—Ice caused backwater during January, February, and December.

NORTH INLET TO GRAND LAKE AT GRAND LAKE, COLO.

Location.—Just above Grand Lake, in sec. 5, T. 3 N., R. 75 W., in Grand County. No tributary between the station and Grand Lake.

Records available.—August 3, 1905, to September 30, 1909; September 20, 1910, to August 24, 1912.

Drainage area.—30 square miles (measured from Forest Atlas).

Gage.—Vertical staff.

Channel.—Somewhat shifting.

Discharge measurements.—Made from footbridge at the station during high water and by wading at ordinary stages.

Diversions and storage.—There are court decrees for the diversion of 13 second-feet above the station, and reservoir decrees for the storage of 1,450 acre-feet of flood water.

Winter flow.—Ice causes backwater during the winter months and discharge measurements are made to determine the flow.

Accuracy.—Conditions are favorable for accurate results and the estimates are considered reliable.

Cooperation.—During 1912 station was maintained in cooperation with the United States Forest Service.

Discharge measurements of north inlet to Grand Lake at Grand Lake, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 17[a]	H. B. Waha	1.90	4.6
Mar. 31[a]	J. L. Mathias	1.79	6.3
June 11	.....do	3.93	589

[a] Relation of gage height to discharge affected by ice in stream.

Daily gage height, in feet, of north inlet to Grand Lake at Grand Lake, Colo., for 1912.

[P. L. Barker, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1			1.8			3.3		
2		1.15			4.5		3.65	3.05
3							3.55	
4								
5								2.75
6	1.1					3.7	3.25	
7								
8					2.7			
9		1.15	1.7					
10					2.7			
11						3.95		3.1
12	1.2						3.7	3.05
13								
14								
15					2.2			
16			1.7					2.55
17	1.1	1.9		1.9				
18					2.45		3.35	
19								2.4
20	1.1				2.7	2.95		
21			1.75		2.98	3.15		
22								
23		1.6		1.9	3.03			
24	1.1							2.35
25				1.98		3.85		
26								
27			1.75					
28					2.95	3.85	3.15	
29							3.05	
30	1.1							
31			1.8					

NOTE.—Relation of gage height to discharge affected by ice Jan. 1 to Mar. 31, 1912. Gage height May 2 is doubtful, as it gives a discharge much too large as compared with discharge obtained from gage height of same day at the outlet.

Daily discharge, in second-feet, of north inlet to Grand Lake at Grand Lake, Colo., for 1912.

Day.	Apr.	May.	June.	July.	Aug.	Day.	Apr.	May.	June.	July.	Aug.
1			320			16					80
2				468	222	17	14				
3				422		18		62		340	
4						19					55
5					128	20		115	188		
6			490	300		21		198	260		
7						22					
8		115				23	14	216			
9						24					48
10		115				25	18		558		
11			602		240	26					
12				490	222	27					
13						28		188	558	260	
14						29				222	
15		30				30					
						31					

NOTE.—Daily discharge computed from a fairly well defined curve. Monthly estimates have not been made, as gage heights are too infrequent.

GRAND LAKE OUTLET AT GRAND LAKE, COLO.

Location.—At the footbridge at the outlet of Grand Lake, in sec. 6, T. 3 N., R. 75 W., half a mile south of Grand Lake post office. No tributary between Grand Lake and the North Fork of Grand River.

Records available.—July 3, 1904, to September 30, 1909; September 20, 1910, to November 30, 1912.

Drainage area.—62 square miles (measured from Hayden's atlas).

Gage.—Vertical staff; location and datum unchanged. Being so close to the outlet, the gage heights represent the level of the water surface in Grand Lake.

Channel.—Somewhat rough but permanent.

Discharge measurements.—Made by wading at various points below the gage.

Winter flow.—Shore ice forms at the station for about four months, but the stream does not freeze over because of the higher temperature of the water coming out of Grand Lake.

Diversions.—No water is diverted below the station on the North Inlet. There are court decrees for diversion above that point.

Artificial control.—As the area of Grand Lake is only 700 acres, or a little more than 1 square mile, its effect as a natural reservoir on the run-off is not great.

Accuracy.—Owing to the scarcity of gage heights the records at this station can not be considered better than fair or possibly good.

Cooperation.—Station maintained in cooperation with the United States Forest Service.

Dischage measurements of Grand Lake outlet at Grand Lake, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 17	H. B. Waha	1.31	9.7
Mar. 31	J. L. Mathias	1.36	11.1
June 11	....do	4.00	1,020
Aug. 13	Robert Follansbee	2.22	120

Daily gage height, in feet, of Grand Lake outlet at Grand Lake, Colo., for 1912.

[P. L. Barker, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1						3.3			1.92	1.65	1.55
2					1.55		3.8	3.05	1.90	1.60	1.54
3							3.7		1.90	1.61	1.52
4						4.2			1.84	1.60	1.51
5								3.0	1.85	1.64	1.50
6	1.26					4.2	3.2		1.80	1.68	1.50
7							3.0		1.78	1.70	1.50
8					1.75	4.2			1.72	1.70	1.50
9		1.34	1.38						1.74	1.70	1.50
10					1.93				1.78	1.70	1.50
11								2.8	1.80	1.70	1.50
12	1.31						3.6	2.32	1.80	1.70	1.49
13								2.21	1.80	1.68	1.50
14								2.22	1.80	1.69	1.50
15					1.8			2.20	1.80	1.69	1.49
16			1.36					2.22	1.78	1.69	1.49
17	1.38	1.32						2.22	1.78	1.68	1.50
18					1.9		3.3	2.21	1.75	1.60	1.45
19				1.43				2.14	1.73	1.59	1.46
20	1.36				2.25	2.7		2.10	1.70	1.60	1.45
21			1.36		2.45	2.9		2.12	1.70	1.60	1.45
22					2.65			2.08	1.70	1.60	1.45
23				1.45	2.8			2.00	1.70	1.60	1.45
24	1.36	1.34						2.00	1.71	1.60	1.45
25				1.4		4.2		1.95	1.70	1.60	1.40
26								1.92	1.70	1.60	1.40
27			1.36				3.2	1.90	1.70	1.60	1.40
28		1.34			2.85	4.3	3.0	1.90	1.70	1.59	3.1
29					2.85		3.0	1.90	1.70	1.59	3.1
30	1.36							1.92	1.70	1.60	3.1
31			1.36					1.94		1.58	3.1

NOTE.—Practically no backwater from ice, except Nov. 28 to 30, when gage heights are apparently affected.

Daily discharge, in second-feet, of Grand Lake outlet at Grand Lake, Colo., for 1912.

Day.	Jan.	Feb.	Mar.	Apr	May.	June.	July.	Aug.	Sept.	Oct.	Nov
1						500		385	63	30	21
2					21		750	390	60	25	20
3							700	385	60	26	19
4						1,080		375	51	25	18
5								370	52	29	17
6	9					1,080	450	355	45	33	17
7							370	340	43	35	17
8					40	1,080		330	37	35	17
9		11	12					315	39	35	17
10					64			300	43	35	17
11								290	45	35	17
12	10						650	146	45	35	16
13								118	45	33	17
14								120	45	34	17
15					45			115	45	34	16
16			11					120	43	34	16
17	12	10						120	43	33	17
18					60		500	118	40	25	14
19				14				103	38	24	15
20	11				128	260		95	35	25	14
21			11		185	330		99	35	25	14
22					245			91	35	25	14
23				14	290			75	35	25	14
24	11	11						75	36	25	14
25				12		1,080		68	35	25	12
26								63	35	25	12
27			11				450	60	35	25	12
28		11			310	1,150	370	60	35	24	12
29					310		370	60	35	24	12
30	11							63	35	25	12
31			11					66		23	

NOTE.—Daily discharge computed from a rating curve well defined below about 600 second-feet and above this point only fairly well defined. Discharge for days for which gage heights are missing interpolated—between days of gage heights, and used in determining monthly estimates Jan. 1 to Aug. 10, but these interpolated discharges are not published except Aug. 1 to 10, on account of the infrequency of gage readings.

Monthly discharge of Grand Lake outlet at Grand Lake, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	12	9	a 10	615	C.
February	11	10	a 11	633	C.
March	12	11	a 11	676	C.
April	14	12	a 13	774	C.
May	310	21	a 140	8,610	C.
June	1,150	260	a 830	49,400	C.
July	750	370	a 520	32,000	C.
August	390	60	183	11,300	B.
September	63	35	42.3	2,520	B.
October	35	23	28.7	1,760	B.
November	21	12	15.6	928	B.
The period				109,000	

a Estimated.

NOTE.—Maximum and minimum for January to July are for days of actual gage heights.

FRASER RIVER NEAR ARROW, COLO.

Location.—One-fourth mile from Idlewild ranger station, in the Arapahoe National Forest, in sec. 3, T. 2 S., R. 75 W., sixth principal meridian, 2 miles from Arrow.

Records available.—September 23, 1910, to November 27, 1912.

Gage.—Vertical staff whose location and datum have remained unchanged.

Channel.—Shifting after high water.

Discharge measurements.—Made from log bridge to which the gage is attached.

Winter flow.—The control remains open during the greater part of the winter and there is little if any backwater at the gage except for short periods.

Diversions.—There is a court decree for the diversion of 53 second-feet across the divide from the headwaters above the station. There are court decrees for diversions of 72 second-feet from Fraser River below.

Accuracy.—Owing to the high altitude of the drainage basin it is probable that at certain seasons there are diurnal fluctuations caused by the alternate melting and freezing. Therefore the mean daily gage height as determined by one or two readings may be considerably in error, and the estimates of discharge can not be considered better than fair.

Cooperation.—Station maintained in cooperation with the United States Forest Service.

Discharge measurements of Fraser River near Arrow, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 19a	H. B. Waha	0.70	6.3
Mar. 30a	J. L. Mathias	.66	5.4
June 10	....do	2.55	253
Sept. 19	R. Richards	1.12	22.6

a Ice along edges of stream. No apparent effect on relation between gage height and discharge.

Daily gage height, in feet, of Fraser River near Arrow, Colo., for 1912.

[D. W. McGraw, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	0.7			0.7	0.7			1.9	1.2	1.2	
2						2.0	2.8	1.8	1.3	1.1	
3		0.7				2.8	2.95	1.7	1.2	1.2	
4					.8	2.55		1.7	1.3	1.1	1.05
5	.7		0.7	.8		3.0	2.5	1.7	1.2		
6							2.4	1.6	1.3		
7							2.5	1.8		1.2	
8							2.9		1.2	1.1	
9		.7		.6	.9					1.1	
10					1.0	2.55	2.35	1.4	1.3	1.1	.95
11					.9		2.3	1.5	1.2		
12		.7	.7	.7			2.3	1.3	1.3		
13	.7						2.3	1.4	1.1	1.1	
14					1.0		2.2	1.4	1.2	1.0	
15			.7				2.0	1.4	1.1	1.1	1.05
16				.7			2.1	1.3	1.2	1.0	.95
17		.7					2.0	1.4	1.1	1.1	
18					1.5		2.0	1.3	1.2	1.0	
19		.7	.7	.7			2.2	1.4	1.1	1.1	
20					1.35		2.2	1.3	1.2	1.0	
21			.7							1.1	1.05
22							1.7		1.1		
23				.7			2.0		1.2		
24		.7			2.2		1.9	1.3	1.1		
25				.7	1.95		2.0	1.3		1.0	
26		.7	.65						1.1	1.0	
27					1.1		1.8	1.3	1.1	.9	1.15
28					2.1		1.8	1.3		1.0	
29					1.5		1.8	1.2			
30			.6		1.8			1.3		.9	
31					2.0						

NOTE.—Channel open during winter months. Observer states that water was over the gage on June 6, 7, 9, and July 1. No note as to other days during this period. Slight backwater during latter part of November.

Daily discharge, in second-feet, of Fraser River near Arrow, Colo., for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	8			8	8		300	119	30	30	
2						179	248	106	42	20	
3		8				290	270	93	30	30	
4					19	255	235	93	42	20	16
5	8		8	19		318	203	93	30	23	
6							189	80	42	26	
7							203	106	36	30	
8							263	90	30	20	
9		8		2	31		220	70	36	20	
10					44	255	182	54	42	20	8
11					31		175	67	30	20	
12		8	8	8			175	42	42	20	
13	8						175	54	20	20	
14					44		161	54	30	11	
15			8				133	54	20	20	16
16				8			147	42	30	11	8
17		8					133	54	20	20	
18					111		133	42	30	11	
19		8	8	8			161	54	20	20	
20					90		161	42	30	11	
21			8				127	42	25	20	16
22							93	42	20	17	
23				8			133	42	30	15	
24		8			206		119	42	20	13	
25				8	172		133	42	20	11	

Daily discharge in second-feet, of Fraser River near Arrow, Colo., for 1912—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
26		8	5				120	42	20	11	
27					57		106	42	20	4	11
28					192		106	42	22	11	
29					111		106	30	25	8	
30			2		151		110	42	28	4	
31					179		114	36		6	

NOTE.—Daily discharge computed from two fairly well defined rating curves as follows: Jan. 1 to June 5 the curve for 1911 was applicable; from July 2 to Nov. 21 a curve was used which was based on one measurement in 1912 and one in 1913. Discharge interpolated for days for which gage heights are missing in July and October. Gage observations infrequent during January, June, and November, and estimates of daily discharge are published only for days of such observations. Interpolated values for days for which gage heights are missing during this period were used in estimating monthly discharge.

Monthly discharge of Fraser River near Arrow, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January			a 8.0	492	D.
February			a 8.0	460	D.
March			a 7.0	430	D.
April			a 9.0	536	D.
May			a 80	4,920	D.
June					
July	300	93	166	10,200	C.
August	119	30	59.8	3,680	B.
September	42	20	28.7	1,710	B.
October	30	4	16.9	1,040	B.
November			a12.0	714	D.

a Estimated.

WILLIAMS FORK NEAR SCHOLL, COLO.

Location.—About 5 miles southeast of Scholl, Colo., in sec. 3, T. 2 S., R. 78 W., at the Horseshoe ranger station in the Arapahoe National Forest. Nearest important tributary, the South Fork, enters from the east 1 mile below the station.

Records available.—September 22, 1910, to June 30, 1912.

Drainage area.—141 square miles (measured from Forest Atlas).

Gage.—Vertical staff.

Channel.—Data too meager to determine.

Discharge measurements.—Made by wading a short distance below the gage.

Winter flow.—Ice causes some backwater during the winter months.

Diversions.—There are court decrees for the diversion of 858 second-feet from Williams Fork above the station. Of this amount 700 second-feet are to be diverted to the eastern slope. This latter diversion has not yet been made.

Accuracy.—As the station has not been completely rated no estimates of discharge are available.

Cooperation.—Station maintained in cooperation with the United States Forest Service.

Discharge measurements of Williams Fork near Scholl, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 15	H. B. Waha	1.10	38.4
Apr. 3	J. L. Mathias	1.15	39.8

Daily gage height, in feet, of Williams Fork near Scholl, Colo., for 1912.

[W. M. Thomas, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.
1	1.1	1.15	1.2	1.2	1.45	2.95	3.5
2	1.1	1.1	1.2	1.2	1.5	3.2	3.55
3	1.1	1.1	1.2	1.15	1.55	3.4	3.6
4	1.1	1.15	1.2	1.15	1.6	3.55	3.5
5	1.1	1.15	1.1	1.15	1.6	3.7	3.6
6	1.1	1.2	1.1	1.15	1.6	3.85	3.6
7	1.1	1.2	1.15	1.25	1.65	3.8	.....
8	1.1	1.2	1.15	1.25	1.75	3.95	.....
9	1.1	1.2	1.15	1.25	1.8	3.95	.....
10	1.1	1.2	1.15	1.3	1.9	3.85	.....
11	1.1	1.15	1.1	1.2	1.7	3.6	.....
12	1.1	1.15	1.1	1.2	1.65	3.65	.....
13	1.1	1.15	1.1	1.2	1.6	3.45	.....
14	1.1	1.1	1.1	1.2	1.55	3.5	.....
15	1.1	1.1	1.1	1.2	1.5	3.5	.....
16	1.1	1.1	1.1	1.2	1.5	3.45	.....
17	1.1	1.1	1.1	1.2	1.6	3.4	.....
18	1.1	1.1	1.1	1.2	2.1	3.3	.....
19	1.15	1.15	1.1	1.2	2.45	3.25	.....
20	1.15	1.15	1.1	1.2	2.7	3.2	.....
21	1.15	1.15	1.15	1.2	2.65	3.2	.....
22	1.15	1.15	1.2	1.15	2.55	3.25	.....
23	1.15	1.2	1.2	1.15	2.65	3.5	.....
24	1.15	1.2	1.2	1.15	2.8	3.55	.....
25	1.15	1.2	1.25	1.2	2.9	3.75	.....
26	1.15	1.2	1.25	1.2	2.9	3.7	.....
27	1.15	1.2	1.2	1.2	2.75	3.65	.....
28	1.15	1.2	1.2	1.2	2.75	3.5	.....
29	1.15	1.2	1.25	1.2	2.85	3.7	.....
30	1.15	.....	1.25	1.25	3.05	3.65	.....
31	1.15	.....	1.2	.....	3.25	.....	.....

NOTE.—Very slight backwater during the winter months.

WILLIAMS FORK NEAR SULPHUR SPRINGS, COLO.

Location.—On highway bridge at Field's ranch, 4 miles above the mouth of the river, about sec. 36, T. 1 N., R. 79 W. Nearest tributary is a small stream that enters from the west 2 miles below the station.

Records available.—July 25, 1904, to December 7, 1912.

Drainage area.—185 square miles (measured from Forest Atlas).

Gage.—Vertical staff; location and datum unchanged.

Channel.—Practically permanent.

Discharge measurements.—Made from bridge to which the gage is attached.

Winter flow.—The main channel is kept open by springs, but ice forms along the edges and slush ice frequently forms. The morning readings are usually affected by backwater from ice, but the afternoon readings are practically unaffected. The winter gage heights during 1912 were taken in the afternoon.

Diversions.—There are court decrees for the diversion of 502 second-feet from Williams Fork between the station near Scholl and Sulphur Springs. There are also two storage decrees for 80,700 and 1420 acre-feet, respectively, from Williams Fork.

Accuracy.—Conditions are favorable for accurate results and the estimates should be reliable.

Cooperation.—Since 1911 this station has been maintained in cooperation with the State engineer.

Discharge measurements of Williams Fork near Sulphur Springs, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 4	C. L. Chatfield	3.10	62
May 22	do	4.34	498
July 12	do	4.50	683
Aug. 24	do	3.48	139

Daily gage height, in feet, of Williams Fork near Sulphur Springs, Colo., for 1912.

[F. A. Field, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.05	3.00	3.02	3.02	3.36	4.55	4.95	4.39	3.37	3.31	3.02	2.95
2	3.05	2.98	3.03	3.02	3.42	4.55	4.9	4.28	3.36	3.28	3.02	2.82
3	3.08	2.98	3.02	3.08	3.52	4.7	4.8	4.12	3.34	3.29	3.24	3.01
4	3.08	2.95	3.0	3.08	3.44	4.9	4.7	4.08	3.34	3.30	3.16	2.96
5	3.08	2.95	2.95	3.1	3.39	5.0	4.7	4.01	3.31	3.30	3.18	3.0
6	3.08	2.9	3.0	3.25	3.38	5.05	4.48	4.0	3.3	3.29	3.0	2.98
7	3.1	3.0	3.02	3.26	3.46	5.0	4.5	3.91	3.28	3.29	3.17	2.99
8	3.1	2.95	3.0	3.21	3.55	5.15	4.65	3.91	3.26	3.25	3.12	.....
9	3.12	2.98	2.96	3.34	3.7	5.0	4.55	3.86	3.28	3.28	3.1	.....
10	3.05	2.98	2.94	3.14	3.69	5.0	4.6	3.82	3.36	3.28	3.15	.....
11	3.02	3.0	2.95	3.18	3.58	4.9	4.55	3.8	3.36	3.26	3.13	.....
12	3.02	3.0	2.98	3.14	3.46	4.9	4.5	3.76	3.34	3.28	3.16	.....
13	3.02	3.01	3.0	3.11	3.42	4.95	4.49	3.74	3.34	3.24	3.11	.....
14	3.03	3.02	3.01	3.08	3.36	4.85	4.5	3.71	3.36	3.22	3.01	.....
15	3.03	3.05	3.01	3.06	3.38	4.75	4.46	3.7	3.36	3.22	3.06	.....
16	3.02	3.02	3.01	3.16	3.37	4.7	4.5	3.7	3.38	3.22	3.08	.....
17	3.02	3.02	3.02	3.1	3.54	4.7	4.44	3.66	3.38	3.19	3.0	.....
18	3.0	3.02	3.0	3.11	3.86	4.6	4.46	3.67	3.36	3.26	3.01	.....
19	3.03	3.02	3.0	3.14	4.0	4.48	4.42	3.62	3.37	3.26	3.55	.....
20	3.0	3.03	2.98	3.08	4.09	4.46	4.36	3.58	3.36	3.25	2.96	.....
21	2.97	3.03	3.0	3.02	4.26	4.43	4.3	3.54	3.37	3.26	3.12	.....
22	3.05	3.02	3.0	3.04	4.41	4.48	4.26	3.52	3.35	3.14	2.98	.....
23	3.02	3.02	3.01	3.07	4.37	4.65	4.28	3.49	3.36	3.22	3.1	.....
24	3.0	3.02	2.98	3.12	4.38	4.8	4.34	3.48	3.36	3.22	3.1	.....
25	3.0	3.01	3.0	3.16	4.45	5.05	4.3	3.44	3.36	3.16	3.15	.....
26	3.02	3.0	2.98	3.12	4.48	5.0	4.24	3.41	3.34	3.23	3.05	.....
27	3.02	3.02	2.95	3.12	4.45	5.0	4.19	3.41	3.34	3.22	2.8	.....
28	3.01	3.02	2.95	3.14	4.3	5.0	4.22	3.45	3.34	3.27	2.84	.....
29	3.01	3.02	2.98	3.21	4.38	5.05	4.22	3.44	3.32	3.18	2.92	.....
30	3.0	.....	3.0	3.26	4.5	4.95	4.3	3.45	3.32	3.14	2.86	.....
31	3.0	.....	3.1	.....	4.7	.....	4.19	3.41	.....	3.18	.....	.....

NOTE.—Channel open during the winter period.

Daily discharge, in second-feet, of Williams Fork near Sulphur Springs, Colo., for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	58	54	55	55	97	665	1,120	587	114	102	62	58
2	58	52	56	55	108	665	1,070	501	112	97	62	51
3	61	52	55	61	130	805	970	397	108	98	91	61
4	61	51	54	61	114	1,000	870	373	108	100	79	58
5	61	51	51	62	104	1,110	870	331	102	100	82	60
6	61	49	54	81	118	1,160	667	325	100	98	60	59
7	62	54	55	82	116	1,110	685	280	97	98	80	60
8	62	51	54	75	128	1,270	822	280	94	92	73	.....
9	64	52	52	95	172	1,160	730	259	97	97	70	.....
10	58	52	51	67	169	1,110	775	243	112	97	78	.....
11	55	54	52	71	135	1,000	730	235	112	94	74	.....
12	55	54	52	67	107	1,000	685	221	108	97	79	.....
13	55	54	54	63	99	1,060	676	214	108	91	72	.....
14	56	55	54	61	89	955	685	204	112	88	61	.....
15	56	58	54	58	92	855	649	200	112	88	66	.....

Daily discharge, in second-feet, of Williams Fork near Sulphur Springs, Colo., for 1912—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
16	55	55	54	69	90	870	685	200	116	88	68	.....
17	55	55	55	62	125	870	631	188	116	84	60	.....
18	54	55	54	63	234	775	649	191	112	94	61	.....
19	56	55	54	67	295	667	613	176	114	94	158	.....
20	54	56	52	61	340	649	563	165	112	92	58	.....
21	52	56	54	55	439	622	515	155	114	94	73	.....
22	58	55	54	57	548	667	487	150	110	76	59	.....
23	55	55	54	60	518	822	501	142	112	88	70	.....
24	54	55	52	64	525	970	547	140	112	88	70	.....
25	54	54	54	69	580	1,240	515	130	112	79	78	.....
26	55	54	52	64	604	1,180	473	122	108	90	65	.....
27	55	55	52	64	580	1,180	439	122	108	88	50	.....
28	54	55	52	67	465	1,180	459	132	108	95	52	.....
29	54	55	52	75	525	1,240	459	130	104	82	56	.....
30	54	.....	54	82	620	1,120	515	132	104	76	53	.....
31	54	.....	62	.....	805	.....	439	122	.....	82	.....	.....

NOTE.—Daily discharge computed from two fairly well defined curves.

Monthly discharge of Williams Fork near Sulphur Springs, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	64	52	56.6	3,480	C.
February	58	49	53.9	3,100	C.
March	62	51	53.6	3,300	C.
April	95	55	66.4	3,950	C.
May	805	89	292	18,000	B.
June	1,270	622	966	57,500	C.
July	1,120	439	661	40,600	B.
August	587	122	227	14,000	B.
September	116	94	109	6,490	B.
October	102	76	91.2	5,610	B.
November	158	50	70.7	4,210	B.
December (1-7)	61	51	58.1	806	C.
The period	.....	.....	.....	161,000	

BLUE RIVER AT DILLON, COLO.

Location.—At the cemetery bridge on the outskirts of Dillon, in sec. 18, T. 5 S., R. 77 W., on the edge of the Leadville National Forest, a short distance above the mouth of Snake River. Tenmile Creek also enters below the station.

Records available.—October 15, 1910, to December 31, 1912.

Drainage area.—110 square miles (measured from Forest Atlas).

Gage.—Vertical staff; location and datum unchanged.

Channel.—Practically permanent.

Discharge measurements.—Made by wading near by.

Winter flow.—Ice causes backwater during the winter and discharge measurements are made to determine the flow.

Diversions.—There are court decrees for diversions of 2.3 second-feet from Blue River above the station and 68 second-feet below. There is an unadjudicated diversion from the headwaters of the Blue across Boreas Pass to Tarryall Creek. There are also decrees for diversions of 5 second-feet from tributaries entering above. In addition, there are decrees for placer mining, where practically all of the water used is returned to the river.

Accuracy.—Owing to the high altitude of this station alternate melting and freezing is likely to cause considerable diurnal fluctuations at certain seasons of the year, and the mean daily gage height based on one gage reading may be considerably in error. For this reason it is probable that the estimates can not be considered better than fair for certain months.

Cooperation.—Station maintained in cooperation with the United States Forest Service.

Discharge measurements of Blue River at Dillon, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 12[a]	J. L. Mathias	1.32	33.1
June 1	do	3.10	544
21	do	2.85	436
Sept. 28	Raymond Richards	1.80	76

[a] Ice present.

Daily gage height, in feet, of Blue River at Dillon, Colo., for 1912.

[J. W. Blundell, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1		1.50	1.30	1.40	1.62	3.10		2.80	1.90	1.70	1.70
2		1.50	1.30	1.30	1.68		3.20	2.80			1.70
3		1.50		1.25	2.81		3.00			1.70	
4			1.30	1.30	2.31		2.70				1.70
5		1.40	1.30	1.30		3.50	3.40	2.70			1.70
6	1.30	1.40	1.40	1.30	1.80	3.50	3.00	2.65			1.68
7		1.40	1.30			3.38		2.60		1.65	1.68
8		1.50	1.30	1.40	2.31	3.40	2.80			1.65	1.70
9		1.40	1.40	1.40	2.41	3.40	2.80	2.40	1.85		1.65
10		1.35			2.32	3.40	2.75		1.82		
11			1.40	1.35	1.96	3.30	2.75		1.80	1.80	
12			1.40	1.32		3.20	2.72	2.20	1.80		1.60
13		1.30	1.40	1.30	2.12	3.10	2.72	2.20	1.80		
14		1.60	1.30		2.26	3.20	2.70	2.20	1.80	1.75	1.55
15		1.40	1.40	1.27	2.38	3.00	2.80			1.70	
16		1.40	1.30	1.30	2.44		2.70	2.15	1.90		1.50
17	1.40	1.60		1.35	2.50		2.70	2.70	1.90	1.80	
18	1.50		1.30	1.30	2.61		2.60		1.85	1.80	1.50
19	1.40		1.30	1.30				2.20	1.82	1.80	
20	1.40		1.40	1.31	2.70		2.60	2.20			1.80
21			1.40		2.80	2.85		2.10		1.78	
22	1.40		1.50	1.33	2.95		2.90	2.05			2.00
23	1.50		1.50	1.35	3.00		2.80	2.00	1.80	1.75	2.10
24	1.50			1.38	3.10		2.80				
25	1.40		1.50	1.30	3.20		2.80		1.78	1.75	2.80
26	1.40	1.30	1.50	1.34		3.25	2.70	2.00		1.75	
27	1.50	1.40	1.60			3.90	2.70	1.98	1.75		
28		1.30	1.60	1.40		3.80		1.95	1.72		
29	1.40	1.30	1.50	1.50		3.40	2.80	1.92		1.72	
30	1.40		1.40	1.58	3.20		2.90	1.90	1.70	1.70	
31	1.50						2.80	1.90			

NOTE.—River entirely frozen over from Jan. 1 to Mar. 9; after that date the ice gradually went out. A measurement made Apr. 12 showed no backwater although some ice was still present. From Nov. 20 to 25 ice caused backwater.

Daily discharge, in second-feet, of Blue River at Dillon, Colo., for 1912.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	33	50	560	650	405	88	58	58
2	29	56	615	615	405	87	58	58
3	27	410	670	505	390	86	58	58
4	29	214	725	360	375	85	56	58
5	29	143	780	725	360	84	55	58
6	29	70	780	505	340	83	54	56
7	31	143	714	455	320	82	53	56
8	33	214	725	405	285	80	53	58
9	33	248	725	405	245	79	58	53
10	32	217	725	382	220	74	64	51
11	31	105	670	382	195	70	70	49
12	30	128	615	369	175	70	70	48
13	29	151	560	369	175	70	67	46
14	28	196	615	360	175	70	64	44
15	28	238	505	405	168	84	58	42
16	29	259	490	360	160	88	64	39
17	31	280	478	360	360	88	70	39
18	29	324	466	320	270	79	70	39
19	29	342	454	320	175	74	70	.....
20	29	360	442	320	175	73	70	.....
21	30	405	430	390	145	72	68	.....
22	30	480	472	455	130	71	66	.....
23	31	505	514	405	113	70	64	.....
24	32	560	556	405	113	69	64	.....
25	29	615	598	405	113	68	64	.....
26	31	615	642	360	113	66	64	.....
27	32	615	1,020	360	108	64	62	.....
28	33	615	960	380	100	60	61	.....
29	39	615	725	405	93	59	60	.....
30	46	615	690	455	88	58	58	.....
31	.....	590	.....	405	88	.....	58	.....

NOTE.—Daily discharge computed from a well-defined rating curve. Mean discharge Nov. 19 to 30 estimated 35 second-feet.

Monthly discharge of Blue River at Dillon, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April	46	27	31.0	1,840	B.
May	615	50	335	20,600	C.
June	1,020	430	631	37,500	C.
July	725	320	419	25,800	B.
August	405	88	212	13,000	B.
September	88	58	75.0	4,460	B.
October	70	53	62.2	3,820	B.
November	58	.....	44.3	2,640	B.
The period	.....	.....	.....	110,000	

TENMILE CREEK AT DILLON, COLO.

Location.—At the highway bridge in Dillon, Colo., in sec. 18, T. 5 S., R. 77 W., 300 yards above the mouth of the creek. Nearest tributary, Canon Creek, enters from the west about 4 miles above the station.

Records available.—October 15, 1910, to November 30, 1912.

Drainage area.—113 square miles (measured from Forest Atlas).

Gage.—Vertical staff; location and datum unchanged.

Channel.—Practically permanent.

Discharge measurements.—Made by wading near the bridge.

Winter flow —Ice causes backwater during the winter months, and discharge measurements are made to determine the flow during that period.

Diversions.—There are court decrees for diversions of 3.7 second-feet from Tenmile Creek above the station and 14.5 second-feet from tributaries entering above.

Accuracy.—Owing to the high altitude of this station alternate melting and freezing are likely to cause considerable diurnal fluctuations at certain seasons of the year, and the mean daily gage height based on one gage reading may be considerably in error. For this reason it is probable that the estimates can not be considered better than fair for certain months.

Cooperation.—Station maintained in cooperation with the United States Forest Service.

Discharge measurements of Tenmile Creek at Dillon, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 12[a]	J. L. Mathias	1.84	39.2
June 1	do	(b)	532
21	do	3.26	539
Sept. 28	Raymond Richards	1.95	64

[a] Ice along edges, but apparently of no effect on relation of gage height to discharge. [b] Gage out.

Daily gage height, in feet, of Tenmile Creek at Dillon, Colo., for 1912.

[I. W. Blundell, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1		4.50	1.90	1.90	2.20			2.70		1.80	1.78
2		5.10	1.85	1.90	2.30		4.10	2.60			1.75
3		5.50		1.85	2.82		4.00		1.95	1.80	
4			1.80	1.90	2.56		3.90				1.75
5		5.50	1.80	1.90			4.20	2.40			1.72
6		4.20	1.80	1.90	2.13		3.80	2.35			1.72
7		2.30	1.90			3.80		2.30		1.80	1.70
8		3.30	1.90	2.10	2.42	4.00	3.60			1.80	1.70
9		5.60	1.90	2.00	2.46	4.40	3.50	2.30	1.90		1.70
10	4.47	2.20			2.50	4.60	3.50		1.90		
11			1.90	1.95	2.22	4.00	3.30		1.85	1.90	
12		2.10	1.90	1.94		3.80	3.25	2.20	1.90		1.80
13			2.00	1.90	2.34	3.70	3.30	2.30	1.90		
14		2.10	1.90		2.46	3.70	3.30	2.30	1.90	1.80	1.80
15		1.90	1.90	1.74	2.52	3.60	3.05			1.80	
16		2.00	1.80	1.72	2.64		3.00	2.25	1.95		1.90
17	5.00	1.80		1.85	2.85		2.95	2.20	1.95	1.85	
18	4.70		1.90	1.88	2.90		2.90		2.00	1.85	2.50
19	4.90		1.90	1.87				2.25	1.98	1.80	
20	4.30		1.90	1.86	3.00		2.85	2.22			2.80
21			2.00		3.50			2.20		1.80	
22	3.30		2.00	1.90	3.70		2.90	2.15			3.00
23	3.40		2.10	1.90	3.90		2.85	2.10	1.90	1.82	3.20
24	3.40			1.82	4.10		2.85				
25	3.60		2.00	1.86	4.30		2.80		1.88	1.80	2.50
26	3.90	1.85	2.00	1.92		4.25	2.80	2.05		1.80	
27	5.40	1.80	2.30			4.20	2.85	2.00	1.85		
28		1.90	2.30	2.05		4.35		2.00	1.82		
29	3.00	1.85	2.20	2.08		3.85	2.80	2.00		1.80	
30	1.30		2.00	2.15			2.90	2.00	1.78	1.80	
31	4.60						2.80	2.00		1.80	

NOTE.—Creek entirely frozen over during January, February, and March. Gage heights Apr. 1 to 13 probably also affected by ice. Backwater from ice Nov. 12 to 25. The gage was out from May 31 to June 6, inclusive.

Daily discharge, in second-feet, of Tenmile Creek at Dillon, Colo., for 1912.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	115	532	900	289	66	42	40
2	.....	144	578	960	249	63	42	38
3	.....	340	624	910	220	61	42	38
4	.....	235	671	860	200	61	42	38
5	.....	166	717	1,010	177	60	42	35
6	.....	97	764	810	160	59	42	35
7	.....	140	810	760	144	57	42	33
8	.....	184	910	710	144	55	42	33
9	.....	198	1,110	660	144	53	46	33
10	.....	212	1,310	660	135	53	50	33
11	.....	121	910	560	125	48	53	33
12	39	140	810	535	115	53	50	.....
13	38	158	760	560	144	53	46	.....
14	37	198	760	560	144	53	42	.....
15	37	219	710	442	137	57	42	.....
16	35	265	682	420	130	61	45	.....
17	48	353	653	398	115	61	48	.....
18	51	375	624	375	122	69	48	.....
19	50	398	596	364	130	66	42	.....
20	49	420	567	353	121	63	42	.....
21	51	660	539	364	115	60	42	.....
22	53	760	640	375	103	56	43	.....
23	53	860	740	353	89	53	44	.....
24	44	960	840	353	85	52	43	.....
25	49	1,060	940	331	82	51	42	.....
26	56	984	1,040	331	79	50	42	.....
27	68	909	1,010	353	69	48	42	.....
28	79	834	1,080	342	69	44	42	.....
29	85	758	835	331	69	42	42	.....
30	102	683	867	375	69	40	42	.....
31	.....	607	.....	331	69	.....	42	.....

NOTE.—Daily discharge computed from a well-defined rating curve. Discharge interpolated for days on which gage heights are missing. Mean discharge Apr. 1 to 11 estimated 40 second-feet. Discharge measurement of Apr. 12 considered as the mean for the day. Discharge Apr. 13 interpolated.

Monthly discharge of Tenmile Creek at Dillon, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April	102	.....	48.8	2,900	C.
May	1,060	97	437	26,900	B.
June	1,310	532	788	46,900	B.
July	1,010	331	537	33,000	B.
August	289	69	130	7,990	B.
September	69	40	55.6	3,310	B.
October	53	42	43.7	2,690	B.
November	.....	.....	24.6	1,460	C.
The period	.....	.....	.....	125,000	

SNAKE RIVER AT DILLON, COLO.

Location.—At a highway bridge 200 yards above the mouth of the river in sec. 18, T. 5 S., R. 77 W. Nearest tributary is a small stream that enters from the north 1 mile above the station.

Records available.—October 15, 1910, to November 25, 1912.

Drainage area.—92 square miles (measured from Forest Atlas).

Gage.—Vertical staff; location and datum unchanged.

Channel.—Practically permanent.

Discharge measurements.—Made by wading above the bridge.

Winter flow.—Ice gorging causes backwater of varying amount. During 1912 the control remained open most of the winter.

Diversions.—There are court decrees for diversions of 4.5 second-feet from Snake River above the station and 11 second-feet from tributaries entering above.

Accuracy.—Owing to the high altitude of this station, alternate melting and freezing are likely to cause considerable diurnal fluctuations at certain seasons of the year, and the mean daily gage height based on one gage reading may be considerably in error. For this reason it is probable that the estimates can not be considered better than fair.

Cooperation.—Station maintained in cooperation with the United States Forest Service.

Discharge measurements of Snake River at Dillon, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 12[a]	J. L. Mathias	0.88	25.6
June 1	do	1.90	199
21	do	2.20	311
Sept. 28	Raymond Richard	.94	31.6

[a] Ice present.

Daily gage height, in feet, of Snake River at Dillon, Colo., for 1912.

[J. W. Blundell, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1		0.90	0.80	0.90	1.20	1.90		2.0		0.85	0.8
2		.90	.80	.80	1.23		2.8	1.95			.8
3		.90		.70	2.30		2.7		1.05	.85	
4			.80	.80	1.90		2.5				.78
5		.90	.80	.90			3.0	1.8			.75
6	1.00	1.00	.85	.90	1.32	2.90	2.7	1.8			.75
7		1.00	.90			2.5		1.8		.80	.65
8		.90	.90	1.00	1.38	2.6	2.5			.77	.63
9		.90	.80	.90	1.42	2.6	2.4	1.75	1.05		.55
10		.90			1.30	2.6	2.4		1.02		
11			.80	.85	1.22	2.4	2.3		1.0	.85	
12		.80	.80	.88		2.4	2.3	1.7	.95		.65
13			.80	.80	1.38	2.4	2.3	1.7	.95		
14		.80	.85		1.45	2.3	2.3	1.65	1.0	.85	1.15
15		.80	.80	.88	1.52	2.3	2.3			.8	
16		.80	.80	.82	1.55		2.3	1.6	1.05		1.65
17	1.00	.90		.91	1.60		2.3	1.6	1.05	.85	
18	.90		.80	.88	1.62		2.2		1.05	.85	1.45
19	.90		.80	.83				1.55	.95	.85	
20	.95		.80	.85	1.70		2.1	1.5			1.35
21			.90		1.70	2.2		1.45		.85	
22	.90		.90	.86	1.80		2.3	1.4			1.90
23	.90		1.00	.87	1.80		2.2	1.3	.95	.85	1.65
24	.95			.88	1.90		2.2				
25	.90		1.00	.90	2.00		2.1		.93	.85	1.75
26	.90	.80	1.00	.94		2.9	2.1	1.3		.85	
27	1.20	.80	.90			2.9	2.0	1.3	.93		
28	.90	.80	.90	.97		3.0		1.3	.9		
29	.90	.80	.90	1.05		2.7	2.0	1.3		.85	
30	.90		.80	1.16			2.1	1.25	.85	.85	
31	.90						2.0	1.25		.83	

NOTE.—Some backwater from ice for a few days during the winter months, but the control was open during greater part of time; pronounced backwater from ice Nov. 14 to 25.

Daily discharge, in second-feet, of Snake River at Dillon, Colo., for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	25	17	25	62	240	470	243	60	21	17
2	.....	25	17	17	67	294	480	230	51	21	17
3	.....	25	17	11	330	348	450	216	41	21	16
4	.....	25	17	17	216	402	390	202	41	20	16
5	.....	25	17	25	148	456	540	189	41	19	14
6	.....	25	21	25	81	510	450	189	41	18	14
7	.....	25	25	30	86	390	420	189	41	17	8
8	.....	25	25	35	92	420	390	182	41	15	8
9	.....	25	17	25	99	420	360	176	41	17	3
10	.....	25	17	23	78	420	360	171	37	19	4
11	.....	21	17	21	65	360	330	167	35	21	6
12	.....	17	17	23	78	360	330	163	30	21	8
13	.....	17	17	17	92	360	330	163	30	21	.....
14	.....	17	21	20	105	330	330	150	35	21	.....
15	.....	17	17	23	120	330	330	144	38	17	.....
16	.....	17	17	19	126	325	330	138	41	19	.....
17	.....	25	17	26	138	320	330	138	41	21	.....
18	25	24	17	23	143	315	300	132	41	21	.....
19	25	23	17	19	153	310	285	126	30	21	.....
20	30	22	17	21	163	305	271	115	30	21	.....
21	28	21	25	22	163	300	300	105	30	21	.....
22	25	20	25	22	189	342	330	95	30	21	.....
23	25	19	35	23	189	384	300	78	30	21	.....
24	30	18	35	23	216	426	300	78	29	21	.....
25	25	17	35	25	243	468	271	78	28	21	.....
26	25	17	35	29	243	510	271	78	28	21	.....
27	25	17	25	30	242	510	243	78	28	21	.....
28	25	17	25	32	242	540	243	78	25	21	.....
29	25	17	25	41	241	450	243	78	23	21	.....
30	25	.....	17	56	241	460	271	70	21	21	.....
31	25	.....	21	.....	240	.....	243	70	.....	19	.....

NOTE.—Daily discharge computed from a rating curve fairly well defined below discharge about 350 second-feet. Discharge interpolated for days for which gage heights are missing. Mean discharge estimated Jan. 1 to 17, 25 second-feet; Nov. 13 to 30, 10 second-feet.

Monthly discharge of Snake River near Dillon, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	25.4	1,560	D.
February	25	17	21.1	1,210	C.
March	35	17	21.5	1,320	C.
April	56	11	24.9	1,480	B.
May	330	62	158	9,720	C.
June	540	240	387	23,000	C.
July	540	243	338	20,800	C.
August	243	70	139	8,550	B.
September	60	21	35.3	2,100	B.
October	21	15	20.0	1,230	B.
November	.....	.....	10.4	619	C.
The period	.....	.....	.....	71,600	

EAGLE RIVER AT RED CLIFF, COLO.

Location.—In sec. 30, T. 6 S., R. 80 W., in the town of Red Cliff, in the Holy Cross National Forest, 100 yards above mouth of Turkey Creek, and 1 mile above the mouth of Homestake Creek.

Records available.—January 1, 1911, to November 30, 1912.

Drainage area.—74 square miles (measured from topographic sheet).

Gage.—Chain gage; location and datum unchanged.

Channel.—Shifting after high water.

Discharge measurements.—Made from highway bridge at station during high water and by wading at ordinary stages.

Winter flow.—Little if any ice forms at this station.

Diversions.—There are court decrees for diversions of 22 second-feet from Eagle River and tributaries above the station; 18.5 second-feet of this amount for diversion to the Arkansas basin.

Accuracy.—Owing to the high altitude of the drainage basin, alternate melting and freezing possibly cause diurnal fluctuations of stage at certain seasons; therefore, the mean daily stage as determined from two readings per day may be somewhat in error. For that reason the estimates can not be considered better than good.

Cooperation.—Station maintained in cooperation with the United States Forest Service.

Discharge measurements of Eagle River at Red Cliff, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 23	H. B. Waha	1.20	13.0	June 23	H. B. Waha	2.40	265
Apr. 13	J. L. Mathias	1.45	32.0	Sept. 21	R. H. Fletcher	.95	25.6
June 2	do	2.96	481				

Daily gage height, in feet, of Eagle River at Red Cliff, Colo., for 1912.

[S. D. Ackley, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	1.10	1.10	1.10	1.18	2.05	3.15	2.00	1.50	1.05	1.00	0.80
2	1.15	1.12	1.18	1.20	2.10	3.00	1.90	1.50	1.00	1.00	.80
3	1.10	1.15	1.12	1.22	2.15	3.20	1.80	1.50	.98	1.00	.80
4	1.10	.....	1.10	1.35	2.15	3.70	.....	.....	1.00	1.00	.80
5	1.10	1.15	1.12	1.38	1.90	3.80	2.00	1.35	.95	1.00	.80
6	1.10	.....	1.10	1.45	1.90	3.70	2.00	1.30	.95	.90	.80
7	.....	.....	1.10	1.45	1.90	3.60	2.00	1.30	.92	1.00	.80
8	1.12	1.12	1.10	1.40	2.02	3.60	1.85	1.25	.....	1.00	.80
9	1.15	1.12	1.10	1.48	2.10	.....	1.75	1.25	.90	1.00	.80
10	1.15	1.10	1.10	1.50	2.25	3.40	1.70	1.25	.90	1.00	.90
11	1.10	.....	1.10	1.45	2.05	3.00	1.60	.....	.90	1.00	.80
12	1.10	1.10	1.10	1.50	2.00	2.90	1.55	1.18	.90	1.00	.80
13	1.15	1.10	1.10	1.42	1.95	2.80	1.50	1.12	.90	.....	.80
14	1.10	1.12	1.10	1.38	1.85	2.65	.....	1.15	1.00	1.00	.80
15	1.10	1.28	1.10	1.38	1.80	2.65	1.50	1.15	.....	1.00	.75
16	1.10	1.25	1.10	1.35	2.05	.....	1.50	1.18	.95	.....	.80
17	1.15	1.12	.....	1.38	1.95	2.45	1.50	1.22	1.00	.....	.95
18	1.15	.....	1.10	1.32	2.30	2.30	1.50	.....	1.00	.....	.80
19	1.15	1.10	1.12	1.42	2.60	2.05	1.55	1.20	1.00	1.00	.80
20	1.10	1.10	1.2	1.45	2.85	2.00	1.50	1.18	.....	.....	.80
21	1.10	1.10	1.18	1.40	3.50	2.00	.....	1.12	.95	1.00	.80
22	1.15	1.10	1.10	1.40	3.65	.....	1.50	1.00	.90	.95	.70
23	1.15	1.10	1.12	1.40	3.65	2.40	1.65	1.05	.95	.90	.80
24	1.58	1.10	.....	1.45	3.55	2.30	1.60	1.00	1.00	1.00	.75
25	1.15	1.10	.....	1.55	3.75	2.50	1.60	.....	1.00	1.00	.75
26	1.12	1.10	.....	1.50	.....	2.25	1.60	1.00	1.00	.....	.75
27	1.15	1.10	.....	1.52	3.45	2.10	1.60	1.00	1.00	.90	.75
28	.....	1.05	.....	1.60	3.35	2.05	.....	1.00	.40	1.00	.65
29	1.10	1.10	.....	1.60	3.30	2.00	1.60	1.00	.35	.90	.65
30	1.15	.....	.....	1.82	3.45	.....	1.60	1.02	.40	.90	.65
31	1.15	.....	.....	.....	3.45	.....	1.58	1.00	.....	.85	.....

NOTE.—Channel open during winter months. Increased stage Jan. 24, Feb. 15 and 16, was due to melting snow. The rise May 25 was caused by the opening of the gates of the Pando ice pond, located above the station, and the low stages, Sept. 28 to 30, were caused by the filling of the Pando ice pond. Rise of Nov. 17 due to slush ice.

Daily discharge, in second-feet, of Eagle River at Red Cliff, Colo., for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	12	12	12	14	155	582	140	62	30	28	21
2	13	13	14	15	170	515	130	62	28	28	21
3	12	13	13	16	186	605	110	62	27	28	21
4	12	13	12	24	186	850	130	56	28	28	21
5	12	13	13	26	115	900	150	49	26	28	21
6	12	13	12	34	115	850	150	45	26	24	21
7	12	13	12	34	115	800	150	45	25	28	21
8	13	13	12	28	140	800	120	42	24	28	21
9	13	13	12	38	170	750	100	42	24	28	21
10	13	12	12	40	222	700	90	42	24	28	24
11	12	12	12	34	155	515	74	40	24	28	21
12	12	12	12	40	140	470	68	37	24	28	21
13	13	12	12	30	127	430	62	34	24	28	21
14	12	13	12	26	102	370	62	36	28	28	21
15	12	19	12	26	90	370	62	36	27	28	20
16	12	17	12	24	155	331	62	37	26	28	21
17	13	13	12	26	128	292	62	39	28	28	21
18	13	12	12	22	240	240	62	38	28	28	21
19	13	12	13	30	350	155	68	38	28	28	21
20	12	12	15	34	450	140	62	37	27	28	21
21	12	12	14	28	750	140	62	34	26	28	21
22	13	12	12	28	825	208	62	28	24	26	18
23	13	12	13	28	825	275	82	30	26	24	21
24	51	12	13	34	775	240	74	28	28	28	20
25	13	12	13	47	875	310	74	28	28	28	20
26	13	12	13	40	850	222	74	28	28	26	20
27	13	12	13	43	725	170	74	28	28	24	20
28	12	10	13	54	675	155	74	28	12	28	17
29	12	12	14	54	650	140	74	28	11	24	17
30	13	.....	14	95	725	140	74	29	12	24	17
31	13	.....	14	.....	725	.....	72	28	.....	22	.....

NOTE.—Daily discharge Jan. 1 to June 30 computed from a curve well defined up to about 500 second-feet. A fairly well defined curve based on one 1912 and several 1913 measurements is used July 1 to Nov. 30. Discharge interpolated for days for which gage heights are missing.

Monthly discharge of Eagle River at Red Cliff, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	51	12	13.7	842	C.
February	19	10	12.7	730	C.
March	15	12	12.7	781	B.
April	95	14	33.7	2,010	B.
May	875	90	384	23,600	B.
June	900	140	422	25,100	B.
July	150	62	87.4	5,370	B.
August	62	28	38.6	2,370	B.
September	30	11	25.0	1,490	B.
October	28	22	27.0	1,660	B.
November	24	17	20.4	1,210	B.
The period	.....	.....	.....	65,200	

EAGLE RIVER AT EAGLE, COLO.

Location.—At the highway bridge at Eagle, in Eagle County, Colo., three-fourths of a mile above the mouth of Brush Creek.

Records available.—March 12, 1905, to February 10, 1907, at site a short distance below the mouth of Brush Creek; January 17, 1911, to November 30, 1912, at present site.

Drainage area.—630 square miles (measured from Forest Atlas). Revised since publication of 1911 report.

Gage.—Vertical staff.

Channel.—Practically permanent.

Discharge measurements.—Made from highway bridge at ordinary and high stages and by wading during low water.

Winter flow.—Ice causes backwater during the winter. Discharge measurements are made to determine the winter flow.

Diversions.—Between Eagle and the station at Red Cliff there are court decrees for diversions of 50 second-feet from Eagle River and for diversions of 286 second-feet from intervening tributaries. Between Eagle and the mouth there are decrees for 28 second-feet from Eagle River.

Accuracy.—Except for the meager gage heights, which make the estimates for the later part of the year somewhat uncertain, the records are considered good.

Cooperation.—Station maintained in cooperation with the United States Forest Seryice.

Discharge measurements of Eagle River at Eagle, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 25[a]	H. B. Waha	0.23	89.6
Apr. 15	J. L. Mathias	.49	214
May 23	...do	3.36	2,660
Sept. 24	R. H. Fletcher	.60	287

[a] Relation of gage height to discharge slightly affected by ice. Measuring section clear of ice.

Daily gage height, in feet, of Eagle River at Eagle, Colo., for 1912.

[John B. Green, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	0.39	.....	0.25	1.05	4.1	3.8	.....	.....	.....	.....
2	0.80	.....	0.45	.3	1.15	3.8	3.4	.....	0.43	.....	.....
3	.....	.33	.44	.4	1.25	4.2	3.4	.....	.....	.....	0.43
4	.80	.....	.....	.48	1.5	4.9	3.0	.....	.....	.....	.....
5	.80	.42	.42	.5	1.3	5.0	2.6	.....	.44	0.4	.....
6	.....	.....	.....	.6	1.2	5.0	2.7	.....	.....	.....	.....
7	.80	.41	.43	.55	1.25	4.9	2.8	.....	.....	.....	.43
8	.....	.....	.46	.7	1.5	4.8	3.5	1.0	.....	.....	.....
9	.80	.41	.43	.65	1.8	5.0	3.3	.....	.....	.....	.41
10	.80	.....	.....	.75	1.7	4.4	3.3	.....	.34	.4	.4
11	.....	.40	.38	.6	1.5	4.4	3.4	.....	.....	.....	.....
12	.80	.40	.....	.6	1.5	4.0	3.3	.....	.37	.....	.....
13	.....	.....	.31	.55	1.4	4.0	3.1	.....	.....	.....	.....
14	.90	.40	.....	.5	1.35	3.7	3.2	.....	.37	.....	.....
15	.....	.....	.30	.5	1.2	3.8	3.2	.....	.....	.....	.....
16	.80	.40	.....	.5	1.3	3.4	3.2	.....	.....	.....	.....
17	.70	.43	.22	.5	1.5	3.1	3.2	.5	.....	.....	.4
18	.....	.....	.....	.5	1.8	3.1	3.0	.....	.....	.....	.....
19	.70	.60	.21	.6	2.3	2.9	2.8	.....	.....	.5	.....
20	.....	.....	.....	.55	2.5	3.2	2.6	.5	.3	.....	.4
21	.70	.50	.23	.55	2.9	3.0	2.5	.....	.....	.51	.....
22	.69	.....	.....	.55	3.1	3.6	2.8	.....	.....	.....	.4
23	.....	.43	.22	.55	3.4	3.8	3.6	.....	.....	.....	.....
24	.67	.....	.21	.57	3.4	4.2	2.8	.....	.6	.....	.....
25	.....	.42	.....	.8	3.8	4.5	2.8	.....	.....	.....	.....
26	.68	.....	.....	.75	4.0	4.4	2.8	.....	.....	.....	.....
27	.....	.41	.....	.65	3.9	4.3	2.8	.....	.....	.....	.....
28	.44	.....	.....	.80	3.2	4.3	2.8	.....	.34	.....	.....
29	.....	.42	.....	.85	3.5	4.0	2.8	.....	.....	.....	.....
30	.43	.....	.....	1.0	4.0	4.3	2.8	.....	.33	.....	.....
31	.....	.....	.30	.....	4.5	.....	2.8	.....	.....	.....	.....

NOTE.—Ice present Jan. 1 to Mar. 15 approximately. Gage heights Apr. 1 to July 31 are the mean of readings reported by independent observers to the Geological Survey and the Weather Bureau. Readings agreed closely.

Daily discharge, in second-feet, of Eagle River at Eagle, Colo., for 1912.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	125	562	3,400	3,100	.....	196	156	200
2	.....	140	638	3,100	2,700	.....	194	162	197
3	.....	180	715	3,500	2,700	.....	195	168	194
4	.....	216	920	4,200	2,300	.....	196	174	194
5	.....	225	755	4,300	1,900	.....	198	180	194
6	.....	275	675	4,300	2,000	.....	188	180	194
7	.....	250	715	4,200	2,100	.....	180	180	194
8	.....	330	920	4,100	2,800	525	172	180	189
9	.....	302	1,180	4,300	2,600	.....	164	180	184
10	.....	360	1,090	3,700	2,600	.....	156	180	180
11	.....	275	920	3,700	2,700	.....	162	185	180
12	.....	275	920	3,300	2,600	.....	168	190	180
13	.....	250	835	3,300	2,400	.....	168	195	180
14	.....	225	795	3,000	2,500	.....	168	200	180
15	.....	225	675	3,100	2,500	.....	162	205	180
16	116	225	755	2,700	2,500	.....	158	210	180
17	116	225	920	2,400	2,500	225	154	215	180
18	114	225	1,180	2,400	2,300	.....	150	220	180
19	113	275	1,620	2,200	2,100	.....	144	225	180
20	116	250	1,810	2,500	1,900	225	140	228	180
21	119	250	2,200	2,300	1,810	.....	175	230	180
22	118	250	2,400	2,900	2,100	.....	205	228	180
23	116	250	2,700	3,100	2,900	.....	240	225	.....
24	113	260	2,700	3,500	2,100	.....	275	222	.....
25	117	390	3,100	3,800	2,100	.....	245	219	.....
26	121	360	3,300	3,700	2,100	.....	215	216	.....
27	125	302	3,200	3,600	2,100	.....	185	213	.....
28	129	390	2,500	3,600	2,100	.....	156	210	.....
29	133	422	2,800	3,300	2,100	.....	154	207	.....
30	137	525	3,300	3,600	2,100	.....	152	204	.....
31	140	.....	3,800	.....	2,100	.....	.....	202	.....

NOTE.—Daily discharge computed from a fairly well-defined curve. Estimates of discharge Jan. 1 to Mar. 15 based on one measurement in February and comparison with almost uniform flow at Red Cliff, where Eagle River remains open. Mean discharge Mar. 1 to 15, estimated, 90 second-feet, Nov. 23 to 30, 180 second-feet. Discharge interpolated for days on which gage was not read. During August discharge is given only for days on which gage was read owing to scarcity of gage readings and to the variation of stage. The mean monthly discharge for August has been estimated from these interpolated discharges.

Monthly discharge of Eagle River at Eagle, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	[a] 100	6,150	D.
February	.....	.....	[a] 90	5,180	D.
March	140	.....	106	6,520	C.
April	525	125	275	16,400	B.
May	3,800	562	1,630	100,000	B.
June	4,300	2,200	3,370	201,000	B.
July	3,100	1,810	2,340	144,000	B.
August	.....	.....	512	31,500	C.
September	275	140	180	10,700	C.
October	230	156	200	12,300	C.
November	.....	.....	184	10,900	C.
The period	.....	.....	.....	545,000	

[a] Estimated.

HOMESTAKE CREEK AT RED CLIFF, COLO.

Location.—In sec. 30, T. 6 S., R. 80 W., one-fourth mile above the mouth of the creek and three-fourths of a mile from Red Cliff; below all tributaries.

Records available.—January 8, 1911, to November 12, 1912.

Drainage area.—64 square miles (measured from topographic sheet).

Gage.—Vertical staff.

Channel.—Apparently permanent.

Discharge measurements.—Made by wading near by.

Winter flow.—Ice causes backwater, and discharge measurements are made to determine the winter flow.

Diversions.—There are court decrees for diversions of 1.2 second-feet from Homestake Creek.

Accuracy.—Owing to the high altitude of the drainage basin, alternate melting and freezing may cause diurnal fluctuations in stage during certain seasons. Therefore the mean daily gage height as determined from one reading may be considerably in error. In view of the foregoing, and of the many interpolated discharges, the estimates can not be considered better than fair.

Cooperation.—Station maintained in cooperation with the United States Forest Service.

Discharge measurements of Homestake Creek at Red Cliff, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 23[a]	H. B. Waha	0.55	13.1
Apr. 13	J. L. Mathias	1.02	42.9
June 2	....do	2.90	467.
Sept. 21	R. H. Fletcher	.60	17.4

[a] Relation between gage height and discharge probably somewhat affected by ice in stream.

Daily gage height, in feet, of Homestake Creek at Red Cliff, Colo., for 1912.

[R. T. Sobey, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1		0.6	0.5		1.7	3.0	2.9				
2	0.5	.6	.45		2.1		2.8	2.0	0.8		
3	.5	.6		0.9	1.9		2.9		.75		
4			.5	.8	1.75	3.75			.7	0.6	
5	.5	.5	.5	.8		3.6			.7		
6			.5	.8	1.6	4.0	2.5				0.6
7		.5	.5		1.85	3.9			.65	.7	
8		.5	.5	1.3	1.95	3.9		1.2			
9	.5	.5	.5	1.3			2.65	1.1		.6	
10	.5	.5		1.2	2.0	3.8		1.1	.6	.65	
11	.5		.5	1.2	1.8		2.65				
12		.5	.5	1.1		3.2	2.8	1.15	.6		0.7
13	.5	.5		1.0	1.6	3.15	2.6				
14		.5			1.45	3.0			.6		
15			.5	1.2	1.5	3.0				.65	
16	.6	.5	.5	1.1	1.6			1.2		.65	
17	.6	.5		1.2	1.95	2.6	2.4	1.2	.7	.65	
18	.6	.55	.5	1.3	2.35		2.4			.65	
19	.6	.55	.5	1.2		2.4	2.3	1.15		.68	
20		.55	.55	1.1	2.85	2.5		1.0	.65		
21		.55	.7		2.95	2.9			.6	.65	
22	.55	.55	.55	.9	3.05	3.1	2.8	1.0		.65	
23	.6	.55		1.0				.95	.6		
24	.6	.5		.9			2.3			.65	
25				1.2	3.2	3.9	2.2				
26	.6			1.25			2.2	.8			
27		.5		1.3	3.0	3.5				.65	
28	.55	.5			2.9	3.6		.8	.65		
29	.5	.45		1.6			2.15	.8		.65	
30	.6			1.9	3.15			.95	.6	.6	
31	.6				3.5			.92			

NOTE.—Ice caused backwater from Jan. 1 to Mar. 22.

Daily discharge, in second-feet, of Homestake Creek at Red Cliff, Colo., for 1912.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	30	130	505	465	190	30	15
2	30	207	610	425	185	26	15
3	33	165	721	465	165	23	15
4	26	138	828	416	145	20	15
5	26	126	760	368	125	20	16
6	26	115	950	320	105	19	18
7	50	156	900	336	85	18	20
8	74	175	900	352	63	17	18
9	74	180	875	368	52	16	15
10	63	185	850	368	52	15	18
11	63	147	718	368	55	15	18
12	52	131	585	425	58	15	18
13	42	115	565	350	59	15	18
14	52	93	505	335	60	15	18
15	63	100	505	320	62	16	18
16	52	115	428	305	63	18	18
17	63	175	350	290	63	20	18
18	74	275	320	290	60	19	18
19	63	360	290	260	58	18	19
20	52	445	320	315	42	18	18
21	42	485	465	370	42	15	18
22	33	525	545	425	42	15	18
23	42	545	660	340	38	15	18
24	33	565	780	260	34	15	18
25	63	585	900	232	30	16	18
26	69	545	810	232	26	17	18
27	74	505	715	228	26	18	18
28	94	465	760	224	26	18	18
29	115	515	660	220	26	16	18
30	165	565	560	210	38	15	15
31	.....	715	.....	200	35	.....	15

NOTE.—Daily discharge computed from a well-defined rating curve. Discharge interpolated for days for which gage heights are missing. Estimate of mean discharge Jan. 1 to Mar. 31 (13 second-feet) based on one measurement in February and comparison with records of flow at Red Cliff.

Monthly discharge of Homestake Creek at Red Cliff, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	a13	799	D.
February	.....	.....	a13	748	D.
March	.....	.....	a13	799	D.
April	165	26	56.9	3,390	C.
May	715	93	308	18,900	C.
June	950	290	645	38,400	C.
July	465	200	325	20,000	B.
August	190	26	68.1	4,190	B.
September	30	15	17.8	1,060	B.
October	20	15	17.4	1,070	B.
The period	.....	.....	.....	89,400	

a Estimated.

GORE CREEK NEAR MINTURN, COLO.

Location.—In sec. 22, T. 5 S., R. 81 W., 200 feet above the mouth of the creek, 1 mile northwest of Minturn. Nearest tributary, Willow Creek, enters 2 miles above the station.

Records available.—July 15, 1911, to November 22, 1912.

Drainage area.—98 square miles (measured from Forest Atlas).

Gage.—Inclined staff.

Channel.—Apparently permanent. High-water readings are affected by backwater from Eagle River.

Discharge measurements.—Made from the railroad bridge near by during high water and by wading during ordinary stages.

Winter flow.—Ice causes backwater during winter months; discharge measurements are made to determine the winter flow.

Diversions.—There are court decrees for diversion of 5.7 second-feet from Gore Creek and 2.5 second-feet from a tributary entering above.

Accuracy.—As the station has not been completely rated, estimates of discharge are not available.

Cooperation.—Station maintained in cooperation with the United States Forest Service.

Discharge measurements of Gore Creek near Minturn, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 24	H. B. Waha	1.67	17.3	June 24	H. B. Waha	4.55	1,540
Apr. 14[a]	J. L. Mathias	1.76	24.0	Sept. 22	R. H. Fletcher	1.75	42.6
June 3	do	4.67	926				

[a] Measurement affected by backwater from Eagle River.

Daily gage height, in feet, of Gore Creek near Minturn, Colo., for 1912.

[G. W. Gustafson, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1		1.67		1.67	2.09		3.70				
2	1.75				2.15		3.70			1.92	
3		1.67		1.67		4.91			2.04		
4			1.67		2.17		3.53				1.83
5		1.67	1.75	1.75				2.64	2.00		
6	1.75	1.67			2.09			2.51			1.83
7		1.67	1.75		2.26						
8	1.79			1.83	2.32	6.10		2.46		1.92	1.83
9	1.75	1.67	1.67	1.87	2.32						
10	1.71	1.67				4.98		2.38			
11	1.75			1.88		5.02					1.85
12	1.75	1.67	1.67			4.72		2.34			
13	1.75	1.75			2.17	4.30	3.45		1.96		1.85
14					2.13	4.13		2.32			
15	1.75	1.75	1.67	1.79	2.13		3.45				
16	1.75			1.79			3.28	2.32	1.96		1.83
17	1.75	1.67		1.81	2.26	3.53	3.28	2.32			
18	1.75			1.81	2.49						1.88
19	1.75		1.67	1.83	2.89	3.36	3.28	2.30		1.89	
20		1.67			2.89		3.36	2.26			1.88
21		1.75				3.62				1.88	
22	1.75	1.67	1.67	1.80		3.70	3.28	2.22	2.10		1.88
23	1.71	1.67		1.80			3.28	2.19			
24	1.75	1.67				4.55	3.28				
25	1.71			1.80							
26	1.75	1.67			3.87	4.55		2.13			
27				1.79	3.66	4.26	3.02		1.92		
28		1.67			3.34	4.47					
29	1.67	1.75		1.95	3.77		2.94	2.13		1.89	
30	1.67			1.98	4.38				1.92	1.89	
31					4.30		2.85				

NOTE.—Ice present during January, February, and March.

BEAVER CREEK AT AVON, COLO.

Location.—On highway bridge in sec. 12, T. 5 S., R. 82 W., 300 feet above mouth of creek. Nearest tributary, a small stream that enters from the west 1½ miles above the station.

Records available.—February 25, 1911, to November 30, 1912.

Drainage area.—15 square miles (measured from Forest Atlas).

Gage.—Vertical staff.

Channel.—Shifting after high water.

Discharge measurements.—Made by wading except during flood stage, when they are made from bridge.

Winter flow.—Practically no backwater from ice at this station.

Diversions.—There are court decrees for diversions of 12 second-feet from Beaver Creek above the station.

Accuracy.—Owing to changes in channel and insufficient measurements estimates of discharge have not been made for 1912.

Cooperation.—Station maintained in cooperation with the United States Forest Service.

Discharge measurements of Beaver Creek at Avon, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 24[a]	H. B. Waha	0.33	2.8	June 24	H. B. Waha	1.50	105.0
Apr. 14	J. L. Mathias	.37	4.7	Sept. 23	R. H. Fletcher	.41	7.8
June 3	.....do	1.60	88.7				

[a] Relation of gage height to discharge somewhat affected by thin ice cover. Measuring section clear of ice.

Daily gage height, in feet, of Beaver Creek at Avon, Colo., for 1912.

[Ira T. Starbuck, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	0.4	0.3	0.3	.....	0.6	1.6	2.2	.....	.....	.....	.....
2	.4	.3	.3	.....	.65	.....	2.0	0.85	0.1	.....	.....
3	.4	.3	.3	.....	.6	.....	.....	.85	.....	.....	.....
4	.4	.....	.3	.....	.6	1.85	.....	.7	.05	.....	.....
5	.4	.3	.3	0.4	.6	1.8	.....	.....	.....	0.4	.....
6	.4	.3	.3	.4	.6	.....	1.3	.....	.2	.....	0.4
7	.4	.3	.3	.4	.65	.....	.....	.....	.25	.....	.2
8	.3	.3	.3	.4	.65	.....	.....	.....	.3	.....	.3
9	.3	.3	.3	.45	.65	.....	.....	.....	.3	.4	.3
10	.3	.3	.3	.4	.7	.....	.....	.67	.2	.4	.3
11	.3	.....	.3	.4	.7	.....	.....	.....	.....	.....	.....
12	.3	.3	.3	.4	.6	.....	.....	.....	.....	.....	.....
13	.3	.4	.3	.4	.6	.....	.....	.....	.....	.....	.25
14	.3	.4	.3	.4	.65	.....	1.3	.....	.3	.....	.25
15	.3	.3	.3	.4	.65	.....	.....	.....	.....	.38	.3
16	.3	.3	.3	.4	.7	.....	.....	.....	.35	.....	.28
17	.3	.3	.3	.4	.8	.....	1.0	.5	.....	.....	.3
18	.3	.....	.3	.4	.8	.....	.....	.5	.....	.....	.32
19	.3	.3	.3	.4	.....	.....	.....	.45	.3	.25	.1
20	.3	.3	.3	.4	1.2	.....	1.0	.3	.....	.....	.35
21	.3	.3	.3	.4	1.15	1.55	.9	.....	.4	.....	.32
22	.3	.3	.3	.4	1.5	1.6	.....	.....	.....	.....	.3
23	.4	.3	.3	.4	.....	.....	.....	.2	.3	.35	.28
24	.4	.....	.....	.45	1.7	1.7	.9	.2	.....	.....	.25
25	.4	.....	.....	.4	1.7	.....	.9	.2	.....	.....	.35
26	.4	.3	.....	.45	.....	2.12	.....	.2	.....	.....	.25
27	.3	.3	.....	.4	1.6	1.95	.....	.0	.....	.....	.28
28	.3	.3	.....	.45	1.7	2.2	.....	.1	.....	.38	.3
29	.3	.3	.....	.55	1.55	2.35	.8	.1	.....	.37	.2
30	.3	.....	.....	.7	1.6	2.25	.95	.....	.....	.....	.3
31	.3	.....	.....	.....	1.6	.....	1.0	.05	.....	.....	.....

BRUSH CREEK AT EAGLE, COLO.

Location.—At railroad bridge in sec. 6, T. 5 S., R. 84 W., three-fourths of a mile west of Eagle and 300 yards above the mouth of the creek. Nearest tributary a small stream that enters from the south half a mile above the station.

Records available.—January 18, 1911, to November 21, 1912.

Drainage area.—146 square miles (measured from Forest Atlas).

Gage.—Vertical staff.

Channel.—Shifting.

Discharge measurements.—Made from footbridge and by wading near by.

Winter flow.—Ice causes backwater during the winter months. Measurements are made to determine the discharge.

Diversions.—There are court decrees for diversions of 115 second-feet from Brush Creek and 27 second-feet from tributaries—all above the station.

Accuracy.—Owing to the meager gage heights during the summer months, estimates can be made only when gage heights are available; daily estimates for the remainder of the year are not considered better than fair.

Cooperation.—Station maintained in cooperation with the United States Forest Service.

Discharge measurements of Brush Creek at Eagle, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 25*a*	H. B. Waha	0.40	32.2
Apr. 15	J. L. Mathias	.38	30.5
May 23	....do	1.49	225
Sept. 24	R. H. Fletcher	.50	72.4

a No ice at gage. Ice above and below, which, however, does not appreciably affect relation of gage height to discharge.

Daily gage height, in feet, of Brush Creek at Eagle, Colo., for 1912.

[J. B. Green, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	0.20			0.3		1.8	2.0	0.5			
2		0.50	0.24		0.38				0.4		
3	.20			.23			1.9		.4		0.43
4		.60	.31								
5	.20	.60		.4		2.2			.4	0.34	
6			.40			2.2	2.1				
7	1.20	.40			.4						
8	1.20		.42	.3		2.6		.1			
9		.30	.41		.46						.4
10	1.30			.5	.63	2.4			.4	.3	
11		.30	.32	.6			1.0				
12	.60				.6				.4		
13			.30	.5			.9				
14	.40	.30		.4					.4		
15			.27	.38		1.5					
16	.30	.50				1.3	.9				.4
17	.30		.26	.38		1.2		.0			
18		.50	.24								
19	.30			.38		1.4				.33	
20		.80	.23	.37			.9	.0	.3		.4
21	.30			.38		1.6				.33	.4
22		1.00	.24	.38							
23	.30			.38	1.49				.2		
24				.37					.5		
25	.30	.21		.38							
26					1.0						
27	.31	.22		.38	1.2						
28				.38					.4		
29	.31	.22				1.9					
30				.38			.6		.4		
31	.40										

NOTE.—Ice caused backwater for short periods during the winter months. Discharge fairly constant.

Daily discharge, in second-feet, of Brush Creek at Eagle, Colo., for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	20	32	22	25	31	300	390	72	.....	.....	.....
2	20	32	22	24	31	325	.....	.....	60	.....	.....
3	20	32	24	22	31	350	270	.....	60	.....	64
4	20	32	26	27	31	375	.....	.....	.....	.....	.....
5	20	32	26	32	32	400	.....	.....	60	54	.....
6	22	32	26	30	32	400	420	.....	.....	.....	.....
7	24	32	26	27	32	450	.....	.....	.....	.....	.....
8	25	28	25	25	34	500	.....	34	.....	.....	.....
9	26	25	25	33	37	475	.....	.....	.....	.....	60
10	27	25	25	41	56	450	.....	.....	60	50	.....
11	28	25	25	52	54	450	170	.....	.....	.....	.....
12	29	25	25	46	52	400	.....	.....	60	.....	.....
13	30	25	25	41	70	350	148	.....	.....	.....	.....
14	32	25	25	32	85	300	.....	.....	60	.....	.....
15	28	25	24	31	100	250	.....	.....	.....	.....	.....
16	25	24	24	31	115	210	148	.....	.....	.....	60
17	25	24	23	31	130	185	.....	30	.....	.....	.....
18	25	23	22	31	145	212	.....	.....	.....	.....	.....
19	25	22	22	31	160	240	.....	.....	.....	53	.....
20	25	22	22	30	175	262	148	30	50	.....	60
21	25	21	22	31	190	285	.....	.....	.....	53	60
22	25	21	22	31	205	295	.....	.....	.....	.....	.....
23	25	20	22	31	226	305	.....	.....	42	.....	.....
24	25	20	22	30	185	315	.....	.....	72	.....	.....
25	25	20	23	31	150	320	.....	.....	.....	.....	.....
26	25	20	23	31	116	330	.....	.....	.....	.....	.....
27	26	21	23	31	158	340	.....	.....	.....	.....	.....
28	26	21	24	31	185	350	.....	.....	60	.....	.....
29	26	21	24	31	215	360	.....	.....	.....	.....	.....
30	29	.....	24	31	240	375	88	.....	60	.....	.....
31	32	.....	25	.....	270	.....	.....	.....	.....	.....	.....

NOTE.—Discharge determined as follows: Jan. 1 to May 31, from a fairly well defined curve; June 1 to 30, by the indirect method of shifting channels. Discharge interpolated for days on which gage was not read and for days when gage heights are distorted by ice. Mean monthly discharge July to November estimated from daily discharge obtained by indirect method and from a curve based on 1 measurement made Sept. 24, 1912. The interpolated values for this period, July to November, are not published, owing to infrequency of gage heights and measurements.

Monthly discharge of Brush Creek at Eagle, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	32	20	25.3	1,560	C.
February	32	20	25.1	1,440	C.
March	26	22	23.8	1,460	B.
April	52	22	31.7	1,890	B.
May	270	31	115.0	7,070	C.
June	500	185	339.0	20,200	C.
July	.....	.....	a 194.0	11,900	D.
August	.....	.....	a 41.0	2,520	D.
September	.....	.....	a 58.0	3,450	D.
October	.....	.....	a 54.0	3,320	D.
November	.....	.....	a 61.0	3,630	D.
The period	.....	.....	.....	58,400	

a Estimated.

NO NAME CREEK NEAR GLENWOOD SPRINGS, COLO.

Location.—In sec. 5, T. 5 S., R. 88 W., 4 miles from Glenwood Springs, and 1½ miles above the mouth of the creek. Nearest tributary, a small stream that enters some distance below the station.

Records available.—January 5, 1911, to October 26, 1912.

Drainage area.—Not measured.
Gage.—Vertical staff.
Channel.—Shifting.
Discharge measurements.—Made by wading near by or from footbridge.
Winter flow.—Gage heights at this station show slight effect of ice.
Diversions.—No water is diverted above the station, but the records do not represent the natural run-off of the drainage basin, as about half the run-off of Grizzly Creek is diverted into No Name Creek above the station. A short distance below the station are the head works of the Glenwood Light & Water Co. canal, which has a decree for 12 second-feet.
Accuracy.—Owing to the shifting channel and insufficient discharge measurements, no estimates of discharge have been made. The base data are considered reliable.
Cooperation.—Station maintained in cooperation with the United States Forest Service and the Glenwood Light & Water Co.

Discharge measurements of No Name Creek near Glenwood Springs, Colo., for 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 17	J. L. Mathias	2.54	24.2
May 24	do	3.15	86.7

Daily gage height, in feet, of No Name Creek near Glenwood Springs, Colo., for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	2.43	2.21	2.22	2.38	2.70	3.31	4.55	2.25	2.23	2.23
2	2.45	2.26	2.21	2.38	2.71	3.33	4.30	2.24	2.23	2.23
3	2.42	2.21	2.21	2.42	2.73	3.47	4.20	2.24	2.22	2.23
4	2.41	2.26	2.24	2.44	2.71	3.71	4.10	2.23	2.22	2.23
5	2.43	2.22	2.26	2.48	2.69	4.01	4.00	2.23	2.22	2.23
6	2.41	2.18	2.25	2.46	2.63	4.51	3.85	2.24	2.22	2.23
7	2.42	2.20	2.28	2.46	2.67	4.81	3.70	2.22	2.22	2.25
8	2.61	2.21	2.12	2.51	2.73	5.21	3.70	2.22	2.22	2.25
9	2.47	2.21	2.32	2.52	2.79	5.20	3.65	2.22	2.22	2.25
10	2.43	2.20	2.32	2.61	2.81	5.15	3.60	2.22	2.22	2.25
11	2.41	2.21	2.02	2.54	2.81	5.10	3.57	2.23	2.22	2.23
12	2.43	2.20	2.50	2.52	2.77	4.65	3.55	2.23	2.21	2.21
13	2.41	2.21	2.36	2.48	2.73	4.90	3.50	2.23	2.17	2.21
14	2.42	2.23	2.32	2.46	2.71	4.40	3.70	2.23	2.19	2.21
15	2.41	2.22	2.32	2.46	2.73	4.30	3.60	2.24	2.17	2.20
16	2.41	2.21	2.71	2.48	2.77	4.20	3.50	2.23	2.15	2.21
17	2.40	2.20	2.31	2.50	2.87	4.00	3.45	2.23	2.16	2.21
18	2.42	2.02	2.31	2.53	3.00	3.81	3.35	2.23	2.17	2.21
19	2.41	2.24	2.31	2.53	2.85	3.80	3.60	2.23	2.15	2.21
20	2.40	2.26	2.24	2.55	3.00	4.00	3.45	2.23	2.15	2.23
21	2.43	2.32	2.38	2.51	3.01	4.30	3.35	2.22	2.13	2.25
22	2.40	2.26	2.36	2.50	3.03	4.55	3.27	2.22	2.14	2.19
23	2.45	2.22	2.36	2.45	3.11	4.65	3.25	2.22	2.13	2.21
24	2.41	2.21	2.32	2.49	3.11	4.75	3.23	2.22	2.15	2.21
25	2.40	2.21	2.32	2.53	3.17	4.60	2.25	2.22	2.13	2.21
26	2.41	2.18	2.36	2.54	3.23	4.30	2.27	2.22	2.13	2.21
27	2.40	2.22	2.36	2.55	3.27	4.50	2.29	2.22	2.25	.....
28	2.38	2.21	2.38	2.55	3.17	4.65	2.31	2.22	2.23	.....
29	2.40	2.34	2.38	2.63	3.23	4.51	2.27	2.23	2.23	.....
30	2.37	.....	2.38	2.67	3.27	4.69	2.25	2.23	2.23	.....
31	2.40	.....	2.40	.....	3.30	.....	2.24	2.23	.....	.....

GLENWOOD LIGHT & WATER CO.'S FLUME NEAR GLENWOOD SPRINGS, COLO.

Location.—In sec. 32, T. 5 S., R. 88 W., 60 feet below the headgate of the flume and about 4 miles from Glenwood Springs.

Records available.—January 5, 1911, to October 26, 1912.

Gage.—Vertical staff.

Channel.—As this station is in a flume the channel should be practically permanent.

Discharge measurements.—Made from top of flume.

Accuracy.—As the flume has not been completely rated, no estimates have yet been made. The base data are considered reliable.

Cooperation.—Station maintained in cooperation with the Glenwood Light & Water Co.

Discharge measurements of Glenwood Light & Water Co.'s flume at Glenwood Springs, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 17	J. L. Mathias		14.4
May 24	do		16.3

Daily gage height, in feet, of Glenwood Light & Water Co.'s flume near Glenwood Springs, Colo., for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	1.2	1.2	1.1	1.15	1.2	1.2	1.2	1.2	1.2	1.2
2	1.2	1.2	1.1	1.15	1.2	1.2	1.2	1.2	1.2	1.2
3	1.2	1.2	1.1	1.18	1.2	1.2	1.2	1.2	1.2	1.2
4	1.15	1.2	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.2
5	1.2	1.2	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.2
6	1.2	1.2	1.1	1.2	1.2	1.2	1.1	1.15	1.2	1.2
7	1.2	1.0	1.1	1.2	1.2	1.2	1.1	1.15	1.2	1.2
8	1.2	1.2	.9	1.2	1.2	1.2	1.1	1.15	1.2	1.2
9	1.2	1.0	1.15	1.2	1.2	1.2	1.1	1.15	1.2	1.2
10	1.2	1.0	1.15	1.2	1.2	1.2	1.1	1.15	1.2	1.2
11	1.2	1.1	.5	1.2	1.2	1.2	1.1	1.2	1.2	1.2
12	1.2	1.1	1.25	1.2	1.2	1.15	1.1	1.2	1.2	1.2
13	1.2	1.1	1.2	1.2	1.2	1.2	1.1	1.2	1.2	1.2
14	1.2	1.2	1.15	1.2	1.2	1.2	1.2	1.2	1.2	1.2
15	1.2	1.1	1.15	1.2	1.2	1.2	1.2	1.2	1.2	1.2
16	1.2	1.1	1.15	1.2	1.2	1.1	1.2	1.2	1.2	1.2
17	1.2	1.1	1.1	1.2	1.2	1.05	1.2	1.2	1.2	1.2
18	1.2	.9	1.1	1.2	1.25	1.1	1.1	1.2	1.2	1.2
19	1.2	1.2	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.2
20	1.2	1.2	1.05	1.2	1.25	1.2	1.2	1.2	1.2	1.2
21	1.2	1.2	1.15	1.2	1.2	1.2	1.15	1.1	1.2	1.2
22	1.2	1.2	1.15	1.2	1.2	1.2	1.1	1.1	1.2	1.2
23	1.2	1.2	1.15	1.18	1.2	1.2	1.1	1.1	1.2	1.2
24	1.2	1.1	1.1	1.18	1.2	1.2	1.1	1.2	1.2	1.2
25	1.2	1.1	1.1	1.2	1.2	1.2	1.1	1.2	1.2	1.2
26	1.2	1.05	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.2
27	1.2	1.15	1.1	1.2	1.2	1.2	1.2	1.2	1.2	.....
28	1.16	1.1	1.15	1.2	1.2	1.2	1.2	1.2	1.2	.....
29	1.16	1.2	1.15	1.2	1.2	1.2	1.2	1.2	1.2	.....
30	1.16	.....	1.15	1.2	1.2	1.2	1.2	1.2	1.2	.....
31	1.2	.....	1.15	.....	.....	.....	1.2	1.2	.....	.....

NOTE.—Channel open during winter months.

ROARING FORK AT ASPEN, COLO.

Location.—In sec. 7, T. 10 S., R. 84 W., at Aspen, Colo., above Castle, Maroon, and Hunter creeks.

Records available.—January 1, 1911, to December 5, 1912.

Drainage area.—109 square miles (measured on topographic sheet).

Gage.—Vertical staff.

Channel.—Very rough and slightly shifting.

Discharge measurements.—Made by wading, except during high water, when bridge is used.

Winter flow.—Ice causes backwater during the winter; discharge measurements are made to determine the winter flow.

Diversions.—The Salvation ditch, which has a decree for 42 second-feet, diverts water above the station usually from the middle of May to the middle of September.

Accuracy.—Owing to the high altitude of the drainage basin, alternate melting and freezing probably cause diurnal fluctuations in stage at certain seasons. Therefore the mean daily stage, as determined from one reading, may be somewhat in error. For this reason the estimates can not be considered better than fair.

Cooperation.—Station maintained in cooperation with the United States Forest Service.

Discharge measurements of Roaring Fork at Aspen, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 28[a]	H. B. Waha	0.05	40.6	June 18	J. L. Mathias	2.60	560
Apr. 19	J. L. Mathias	.22	52.6	Oct. 1	R. Richards	.56	72
May 27	do	2.70	607				

[a] Middle of channel open. Relation between gage height and discharge apparently not affected by ice along sides.

Daily gage height, in feet, of Roaring Fork at Aspen, Colo., for 1912.

[N. S. Ashlock, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.3	−0.2	0.0	.....	0.5	2.8	4.0	.....	0.7	0.6	.....	0.3
2	.....	.....	.0	0.1	.8	.....	3.3	.....	.....	.....	.....	.3
3	.....	.1	.....	.15	.7	.....	.....	1.8	.....	.....	.....	.....
4	.....	.....	.0	.15	.....	4.7	.....	.....	.....	.5	.....	.....
5	.2	.....	.0	.15	.....	4.85	.....	.....	.....	.6	.....	.4
6	.....	.....	.....	.2	.5	4.85	2.4	1.4	.....	.6	0.2	.....
7	.2	.....	.0	.....	.6	4.7	.....	1.5	.....	.6	.....	.....
8	.....	.1	.0	.3	.9	4.7	3.5	.....	.....	.5	.4	.....
9	.....	.....	.0	.4	.....	4.6	.....	.....	.....	.....	.3	.....
10	.2	.....	.....	.4	1.0	4.4	.....	.....	.5	.....	.....	.....
11	.....	.....	.0	.....	.9	4.35	.....	.....	.....	.5	.....	.....
12	.....	.1	.....	.4	.85	3.65	.....	1.1	.....	.....	.....	.....
13	.1	.....	.....	.....	.8	3.65	2.75	.....	.4	.....	.4	.....
14	.2	.1	.0	.....	.75	3.4	.....	1.1	.....	.....	.....	.....
15	.....	.....	.0	.35	.....	3.45	3.0	.....	.....	.....	.....	.....
16	.....	.....	.0	.35	.7	3.0	.....	.....	.5	.....	.....	.....
17	.....	.0	.....	.3	.....	3.1	.....	.....	.....	.3	.....	.....
18	.....	.....	.0	.25	1.4	2.6	.....	.....	.....	.....	.....	.....
19	.....	.1	.....	.2	1.3	2.6	2.4	.....	.....	.4	.....	.....
20	.2	.....	.05	.2	1.7	2.8	2.3	1.0	.....	.....	.....	.....
21	.....	.....	.0	.....	2.2	.....	2.4	.....	.....	.5	.....	.....
22	.....	.....	.1	.2	2.2	.....	.....	.....	.....	.3	.....	.....
23	.4	.....	.....	.2	2.4	3.8	.....	.....	.5	.....	.....	.....
24	.....	.0	.....	.2	2.5	.....	.....	.7	.6	.....	.4	.....
25	.....	.....	.....	.2	.....	5.0	.....	.....	.....	.....	.....	.....
26	.....	.....	.....	.2	.....	5.3	2.4	.6	.....	.....	.....	.....
27	.1	.....	.....	.25	2.7	5.5	.....	.6	.5	.....	.....	.....
28	.....	.05	.....	.....	.....	4.9	.....	.6	.6	.....	.....	.....
29	.....	.1	.....	.35	3.1	4.75	2.1	.....	.....	.....	.....	.....
30	.....	.....	.....	.45	3.8	4.2	2.1	.....	.6	.....	.....	.....
31	.....	.....	.....	.....	3.5	.....	.....	.6	.....	.....	.....	.....

NOTE.—Ice caused backwater during January.

Daily discharge, in second-feet, of Roaring Fork at Aspen, Colo., for 1912.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	25	33	38	67	630	1,010	380	90	78	46	51
2	32	33	38	104	800	786	360	88	74	46	51
3	38	33	41	90	1,000	720	338	86	70	45	54
4	38	33	41	83	1,230	650	300	84	67	45	57
5	38	33	41	75	1,280	580	265	78	78	44	59
6	38	33	44	67	1,280	511	231	76	78	44	.....
7	38	33	48	78	1,230	680	257	74	78	52	.....
8	38	33	51	120	1,230	850	240	72	67	59	.....
9	38	33	59	130	1,200	800	220	70	67	51	.....
10	38	33	59	140	1,140	755	200	67	67	53	.....
11	38	33	59	120	1,120	710	180	65	67	55	.....
12	38	33	59	112	898	660	162	62	64	57	.....
13	38	33	57	104	898	615	162	59	61	59	.....
14	38	33	56	97	818	650	162	62	59	59	.....
15	36	33	55	94	834	690	158	65	56	59	.....
16	34	33	55	90	690	645	154	67	54	59	.....
17	33	33	51	160	722	600	150	67	51	59	.....
18	36	33	48	231	570	555	147	67	55	59	.....
19	38	34	44	207	570	511	143	67	59	59	.....
20	37	36	44	310	630	482	140	67	63	59	.....
21	36	33	44	453	730	511	126	67	67	59	.....
22	35	38	44	453	830	511	114	67	51	59	.....
23	34	38	44	511	946	511	102	67	51	59	.....
24	33	38	44	540	1,140	511	90	78	50	59	.....
25	34	38	44	560	1,330	511	84	74	50	58	.....
26	35	38	44	580	1,430	511	78	70	49	57	.....
27	36	38	48	600	1,490	485	78	67	49	56	.....
28	36	38	52	660	1,300	455	78	78	48	55	.....
29	38	38	55	722	1,250	424	78	78	48	54	.....
30	.....	38	63	946	1,070	424	78	78	47	53	.....
31	.....	38	.....	850	.....	400	78	.....	47	.....	.....

NOTE.—Daily discharge computed from a rating curve fairly well defined up to 700 second-feet. Above this the curve is extended on a tangent. Discharge interpolated for days for which gage heights are missing. Mean discharge for January estimated from measurement made during latter part of December, 1911, and the discharge obtained by applying open-channel rating curve to gage height read Feb. 1.

Monthly discharge of Roaring Fork at Aspen, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	[a] 25	1,540	D.
February	38	25	36	2,070	C.
March	38	33	34.7	2,130	C.
April	63	38	49.0	2,920	C.
May	946	67	302	18,600	B.
June	1,490	570	1,010	60,100	B.
July	1,010	400	604	37,100	C.
August	380	78	172	10,600	C.
September	90	59	71.9	4,280	C.
October	78	47	60.3	3,710	C.
November	59	44	54.6	3,250	C.
The period	.....	.....	.....	146,000	

[a] Estimated.

ROARING FORK AT GLENWOOD SPRINGS, COLO.

Location.—On bridge 500 feet above the mouth of the river in Glenwood Springs. Nearest important tributary enters about 3 miles above the station.

Records available.—April 6, 1906, to September 30, 1909; September 21, 1910, to December 31, 1912.

Drainage area.—1,450 square miles (Nell's map of Colorado, 1903).

Gage.—Chain gage; location and datum unchanged.

Channel.—Practically permanent, but rough. Extremely high water in Grand River may cause backwater at the gage. Measurements made at stages as high as 5.7 feet on Roaring Fork and 9.2 feet on Grand River have shown no backwater effect.

Discharge measurements.—Made from highway bridge.

Winter flow.—Surface ice rarely forms entirely across the river, but slush and anchor ice frequently occur. Discharge measurements sometimes show backwater from ice.

Diversions.—There are court decrees for diversions of 196 second-feet from Roaring Fork above the station, and 795 second-feet from the various tributaries.

Accuracy.—Conditions are favorable for accurate results; estimates should be reliable.

Cooperation.—Since 1910 the station has been maintained in cooperation with the United States Forest Service.

Discharge measurements of Roaring Fork at Glenwood Springs, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 24[a]	O. M. Wimmer	1.11	402	Apr. 25	J. L. Mathias	5.72	8,310
27	H. B. Waha	1.08	420	Sept. 25	R. H. Fletcher	1.95	902
Apr. 18[b]	J. L. Mathias	1.53	842				

[a] Some floating slush ice.
[b] Plotting of 1912-13 measurements indicate that this measurement is probably unreliable.

Daily gage height, in feet, of Roaring Fork at Glenwood Springs, Colo., for 1912.

[H. H. French, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1.0	1.05	1.15	2.7	5.4	4.8	3.6	.....	1.8	1.8	.....
2	1.0	1.0	1.05	1.4	2.8	6.3	4.7	3.5	.....	1.75	1.6	1.4
3	1.1	1.0	1.15	1.55	2.95	6.5	4.6	.....	.....	1.75	1.75	1.4
4	1.05	.....	1.05	2.05	2.55	6.9	4.5	3.4	.....	1.8	1.7	1.4
5	1.0	1.0	1.05	2.0	2.6	7.4	4.8	3.3	.....	1.8	.....	.....
6	1.2	1.0	1.1	2.05	2.65	7.5	4.6	3.2	.....	1.85	.....	1.1
7	.....	1.1	1.05	2.0	2.5	7.4	4.8	3.1	.....	1.9	1.75	1.1
8	1.2	1.2	1.25	1.75	2.7	7.5	4.7	3.1	.....	1.9	1.7	.....
9	1.35	1.1	1.05	2.0	2.9	7.4	4.6	3.1	1.95	1.85	1.75	1.4
10	.....	1.1	1.15	2.05	2.85	7.4	4.6	3.1	2.0	1.85	1.8	1.5
11	1.35	.....	1.15	2.15	2.65	6.9	.....	3.1	1.95	1.8	1.75	1.4
12	1.15	1.0	1.05	2.05	2.75	6.4	4.4	3.1	1.95	1.85	1.75	1.45
13	1.3	1.0	1.1	1.85	2.6	6.4	4.6	3.2	1.9	1.9	1.75	1.4
14	.....	1.0	1.0	2.0	2.4	6.6	.....	3.2	1.9	1.9	1.7	1.5
15	1.15	1.05	1.0	1.95	2.4	6.4	4.5	3.1	.....	1.8	1.6	.....
16	1.3	1.0	1.0	1.75	2.6	6.7	4.5	2.8	1.95	1.75	1.6	1.5
17	1.3	1.1	1.05	1.6	3.1	6.2	4.4	2.85	1.9	1.75	1.55	1.45
18	1.25	.....	1.1	1.5	3.6	6.1	4.6	2.85	1.95	1.75	1.6	1.45
19	1.2	1.15	1.2	1.45	4.1	6.2	4.5	2.95	1.95	1.75	1.55	1.4
20	1.25	1.05	1.15	1.55	4.6	6.4	.....	2.9	1.95	.....	1.55	1.4
21	.....	.9	1.3	1.75	4.8	6.4	4.4	2.7	1.9	1.8	1.6	1.3
22	1.0	.95	1.15	1.7	5.0	6.1	4.3	2.7	1.9	1.75	1.55	1.15
23	1.1	1.1	1.35	1.75	5.2	6.0	4.4	2.75	1.85	1.75	1.5	1.1
24	1.1	1.1	1.25	2.0	5.4	5.9	4.2	.....	1.9	1.7	.....	1.3
25	1.1	1.0	1.15	2.05	5.7	6.0	4.2	.....	1.9	.....	1.4	.....
26	1.2	.95	1.1	2.1	.....	5.8	4.2	.....	1.9	1.7	1.35	1.4
27	1.15	1.0	1.1	2.05	5.8	5.8	4.2	.....	1.9	.....	1.4	1.3
28	.....	1.1	1.1	2.15	5.0	6.0	.....	.....	1.8	1.8	1.4	1.4
29	1.1	.9	1.1	2.25	5.6	6.1	3.9	.....	1.85	1.7	1.4	.....
30	1.05	.....	1.25	2.4	5.7	6.0	4.0	.....	1.75	1.7	1.4	1.4
31	.....	.....	1.15	.....	6.4	.....	3.8	.....	.....	1.75	.....	.....

NOTE.—Practically open channel during the winter months. Rise in stage during January was caused by snow melting. During December the low stages were due to freezing and the high stages to thawing.

Daily discharge, in second-feet, of Roaring Fork at Glenwood Springs, Colo., for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	440	370	390	435	1,750	7,270	5,840	3,270	1,370	820	820	560
2	370	370	390	560	1,890	9,580	5,610	3,080	1,320	785	680	560
3	410	370	435	650	2,120	10,100	5,380	2,980	1,270	785	785	560
4	390	370	390	1,040	1,560	11,100	5,150	2,890	1,220	820	750	560
5	370	370	390	990	1,620	12,500	5,840	2,710	1,170	820	761	485
6	460	370	410	1,040	1,680	12,800	5,380	2,530	1,120	860	773	410
7	460	410	390	990	1,500	12,500	5,840	2,360	1,070	900	785	410
8	460	460	485	785	1,750	12,800	5,610	2,360	1,010	900	750	485
9	535	410	390	990	2,040	12,500	5,380	2,360	945	860	785	560
10	535	410	435	1,040	1,960	12,500	5,380	2,360	990	860	820	620
11	535	390	435	1,120	1,680	11,100	5,150	2,360	945	820	785	560
12	435	370	390	1,040	1,820	9,840	4,920	2,360	945	860	785	590
13	510	370	410	860	1,620	9,840	5,380	2,530	900	900	785	560
14	472	370	370	990	1,380	10,400	5,260	2,530	900	900	750	620
15	435	390	370	945	1,380	9,840	5,150	2,360	922	820	680	620
16	510	370	370	785	1,620	10,600	5,150	1,890	945	785	680	620
17	510	410	390	680	2,360	9,320	4,920	1,960	900	785	650	590
18	485	422	410	620	3,270	9,060	5,380	1,960	945	785	680	590
19	460	435	460	590	4,260	9,320	5,150	2,120	945	785	650	560
20	485	390	435	650	5,380	9,840	5,040	2,040	945	802	650	560
21	428	330	510	785	5,840	9,840	4,920	1,750	900	820	680	510
22	370	350	435	750	6,300	9,060	4,700	1,750	900	785	650	435
23	410	410	535	785	6,780	8,800	4,920	1,820	860	785	620	410
24	410	410	485	990	7,270	8,540	4,480	1,770	900	750	590	510
25	410	370	435	1,040	8,020	8,800	4,480	1,720	900	750	560	535
26	460	350	410	1,080	8,150	8,280	4,480	1,670	900	750	535	560
27	435	370	410	1,040	8,280	8,280	4,480	1,620	900	785	560	510
28	422	410	410	1,120	6,300	8,800	4,160	1,570	820	820	560	560
29	410	330	410	1,220	7,770	9,060	3,850	1,520	860	750	560	560
30	390	.....	485	1,380	8,020	8,800	4,050	1,470	785	750	560	560
31	380	.....	435	.....	9,840	.....	3,650	1,420	.....	785	.....	560

NOTE.—Daily discharge computed from a curve well defined between 400 and 9,000 second-feet. Discharge interpolated for days for which gage heights are missing.

Monthly discharge of Roaring Fork at Glenwood Springs, Colo., in 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	535	370	445	27,400	C.
February	460	330	385	22,100	B.
March	535	370	423	26,000	B.
April	1,380	435	900	53,600	B.
May	9,840	1,750	4,040	248,000	B.
June	12,800	7,270	10,000	595,000	B.
July	5,840	3,650	5,000	307,000	B.
August	3,270	1,420	2,160	133,000	B.
September	1,370	785	983	58,500	B.
October	900	750	812	49,900	B.
November	820	535	689	41,000	B.
December	620	410	542	33,300	B.
The year	12,800	330	2,200	1,590,000	

HUNTER CREEK AT ASPEN, COLO.

Location.—On the railroad bridge in Aspen, in sec. 7, T. 10 S., R. 84 W., about 500 feet above the mouth. No tributary enters within several miles of the mouth.

Records available.—February 17, 1911, to December 5, 1912.

Drainage area.—42 square miles (measured from topographic sheet).

Gage.—Vertical staff.

Channel.—Shifting after high water.

Discharge measurements.—Made by wading.

Winter flow.—Ice causes some backwater during the winter months, and discharge measurements are made to determine the flow.

Diversions.—During a portion of the time the Roaring Fork Light & Power Co. diverts water above the station. There is a court decree for a diversion of 15 second-feet above the station.

Accuracy.—Conditions are favorable for good results and the estimates are considered fair.

Cooperation.—Station maintained in cooperation with the United States Forest Service.

Discharge measurements at Hunter Creek near Aspen, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 28	H. B. Waha	0.30	1.1	June 18	J. L. Mathias	2.36	217
Apr. 19	J. L. Mathias	.78	8.8	Oct. 1	R. Richards	1.10	10.6
May 27	do	2.40	279				

Daily gage height, in feet, of Hunter Creek at Aspen, Colo., for 1912.

[N. S. Ashlock, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.3	0.4			0.95	2.4				1.2		0.9
2			0.3	0.35	1.05			2.1				
3	.3	.3		.4	1.1	3.0				1.1		
4			.3	.4								
5	.2			.4						1.3		.9
6				.45	.9		2.2	1.6		1.3	0.9	
7	.3		.3		1.0	3.2		1.7				
8		.3	.3	.8	1.2					1.2	1.0	
9			.3	.85							1.0	
10	.5			.85	1.5							
11			.3		1.1				0.9			
12		.3		.8				1.4	.9			
13	.5				1.0	2.7	2.2		.8		.9	
14	.5	.3	.3		1.0	2.6		1.4				
15			.3	.75		2.5	2.1					
16			.3	.75	1.0				1.4			
17		.3		.75		2.4				1.0		
18			.3	.75	1.4	2.3						
19		.3		.8		2.3				.9		
20	.3		.35	.75	1.8		2.0	1.2				
21			.3		2.2					1.1		
22			.35	.7	2.1							
23	.4			.6					.8			
24		.3		.6	2.2			1.1	1.1		.9	
25						3.2						
26				.65		3.0	2.1	1.0				
27	.3			.7		2.9		.9				
28		.3				3.1			1.2			
29		.3		.7	2.8	2.9	2.2					
30				.85	2.8		2.2		1.2			
31					2.7			.9				

NOTE.—Slight backwater from ice during January.

Daily discharge, in second-feet, of Hunter Creek at Aspen, Colo., for 1912.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2	1	1.5	16	280	330	165	4	19	7	4
2	1.5	1	1.5	22	390	300	158	4	16	6	4
3	1	1	2	25	500	270	135	4	12	6	4
4	1	1	2	21	500	240	110	4	20	5	4
5	1	1	2	18	500	210	90	4	28	5	4
6	1	1	2.5	14	510	180	67	4	28	4	.....
7	1	1	6	19	510	180	83	4	24	6	.....
8	1	1	10	33	475	180	72	4	19	7	.....
9	1	1	12	50	440	180	63	4	18	7	.....
10	1	1	12	68	410	180	57	4	16	6	.....
11	1	1	11	25	380	180	48	4	14	6	.....
12	1	1	10	22	350	180	39	4	13	5	.....
13	1	1	9	19	320	180	39	2	12	4	.....
14	1	1	8	19	290	170	39	15	11	4	.....
15	1	1	8.5	19	260	158	36	30	10	4	.....
16	1	1	8.5	19	245	154	32	39	8	4	.....
17	1	1	8.5	37	230	150	28	30	7	4	.....
18	1	1	8.5	55	205	145	25	25	5	4	.....
19	1	1	10	90	205	140	22	18	4	4	.....
20	1	1.5	8.5	125	260	137	19	10	8	4	.....
21	1	1	8	222	310	140	18	8	12	4	.....
22	1	1.5	7	195	360	145	16	5	12	4	.....
23	1	1.5	5	210	410	148	14	2	11	4	.....
24	1	1.5	5	222	460	150	12	12	11	4	.....
25	1	1.5	5	260	510	154	10	14	10	4	.....
26	1	1.5	6	300	430	158	7	16	10	4	.....
27	1	1.5	7	340	390	165	4	18	9	4	.....
28	1	1.5	7	380	510	172	4	19	9	4	.....
29	1	1.5	7	420	390	180	4	19	8	4	.....
30	.....	1.5	12	420	360	180	4	19	8	4	.....
31	.....	1.5	.....	385	.....	170	4	.....	7	.....	.....

NOTE.—Discharge Mar. 1 to June 3 computed from a rating curve well defined below 300 second-feet. Discharge June 7 to Dec. 5 computed from a fairly well defined rating curve. Discharge interpolated for days for which gage heights are missing. Mean discharge for January estimated 2 second-feet from a measurement in December, 1911, and record of the February flow.

Monthly discharge of Hunter Creek at Aspen, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	[a] 2.0	123	D.
February	2	1.0	1.0	60	D.
March	1.5	1.0	1.18	73	C.
April	12	1.5	6.67	397	B.
May	420	14	131	8,060	B.
June	510	205	380	22,600	B.
July	330	137	181	11,100	C.
August	165	4	45.9	2,820	C.
September	39	4	11.6	690	C.
October	28	4	12.9	793	C.
November	7	4	4.73	281	C.
The period	.....	.....	.....	47,000	

[a] Estimated.

CASTLE CREEK NEAR ASPEN, COLO.

Location.—In sec. 35, T. 10 S., R. 85 W., in the Sopris National Forest, on the highway bridge 4 miles above Aspen. No tributary between the station and the mouth of the creek except small gulches that carry spring run-off. Nearest tributary above, Conundrum Creek, enters about 6 miles upstream.

Records available.—February 16, 1911, to December 5, 1912.

Drainage area.—72 square miles (measured on topographic sheets).

Gage.—Vertical staff. On February 29, 1912, the gage was moved to the opposite side of the creek and to the lower side of the bridge. The datum was lowered 1.00 foot, but the difference in gage readings varies. All 1912 gage heights are referred to the latter datum.

Channel.—Apparently permanent.

Discharge measurements.—Made from the bridge during high water and by wading at ordinary stages.

Winter flow.—Ice causes some backwater at this station, and discharge measurements are made to determine the flow.

Diversions.—No water is diverted above the station. The Roaring Fork Light & Power Co. and the Newman mine divert water from Castle Creek below the station.

Accuracy.—Owing to a lack of high-water measurements no estimates of discharge have yet been made. The mean daily stage as determined from one reading may be somewhat in error, as a result of the high altitude of the station, and, therefore, the gage heights can not be considered better than fair.

Cooperation.—Station maintained in cooperation with the United States Forest Service.

Discharge measurements of Castle Creek near Aspen, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Feb. 29	H. B. Waha	0.65	27.4	June 19	J. L. Mathias	2.05	245
Apr. 20	J. L. Mathias	.68	30.7	Sept. 30	R. Richards	1.18	67
May 28	do	1.80	257				

Daily gage height, in feet, of Castle Creek near Aspen, Colo., for 1912.

[N. S. Ashlock, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1						1.6						
2		0.95	0.6					2.1				
3						2.6				1.2		
4					0.8	2.7						
5	1.05									1.1		0.8
6				0.65			2.1					
7		.95				3.0		1.7				
8			.6								0.8	
9	1.05		.6						1.4	1.3		
10												
11					.9							
12		.95		.6				1.7				
13				.6		2.9	2.5	1.6				
14			.6			2.7		1.8	1.4			
15	1.05		.6		.9	2.5						
16			.6						1.3			
17		.85		.65		2.2						
18	.95			.65	1.1	2.1						
19		.85						1.7	1.3	1.1		
20				.65			2.5					
21					1.5							
22										1.1		
23	.95											
24		.85						1.6	1.2			
25					1.8		2.7					
26	.95						2.5		1.2			
27				.6		3.0		1.5				
28					1.8							
29		.6				2.9						
30	.95			.7			2.3	1.5	1.2			
31												

NOTE.—Practically no backwater from ice during the winter months.

MAROON CREEK NEAR ASPEN, COLO.

Location.—In sec. 22, T. 10 S., R. 85 W., in the Sopris National Forest, just above the headgate of the Roaring Fork Light & Power Co., 5 miles above Aspen, Colo. Nearest tributary, Willow Creek, enters some distance below the station.

Records available.—January 1, 1911, to December 2, 1912.

Drainage area.—42 square miles (measured from topographic sheet).

Gage.—Vertical staff.

Channel.—Shifting.

Discharge measurements.—Made by wading, except during high water, when they are made from a footbridge.

Winter flow.—Discharge measurements indicate that ice does not cause backwater at this station.

Diversions.—There are one or two very small diversions for meadow irrigation above the station; the Roaring Fork Light & Power Co. diverts water just below.

Artificial control.—Snowslides upstream sometimes choke the channel, holding the water back temporarily.

Accuracy.—Owing to meager gage heights, diurnal fluctuation of stage, and shifting channel estimates can only be considered fair.

Cooperation.—Station maintained in cooperation with the United States Forest Service.

Discharge measurements of Maroon Creek near Aspen, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 29	H. B. Waha	0.60	37.3	June 19	J. L. Mathias	1.68	209
Apr. 20	J. L. Mathias	.48	26.8	Sept. 30	R. Richards	1.09	62.5
May 27	do	1.40	156				

Daily gage height, in feet, of Maroon Creek near Aspen, Colo., for 1912.

[N. S. Ashlock, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		0.5				1.45						0.7
2	1.4		0.5					1.8				.8
3						1.75						
4				0.5	0.65	1.9						
5								1.7		1.1		
6					.6		2.0				0.9	
7			.5									
8		.5		.5		1.7				1.1	.9	
9	.6		.4	.5								
10								1.6	1.5			
11					.8							
12												
13		.5				2.05	2.2	1.6				
14						2.0			1.4	1.0		
15		.5	.4		.7	2.0	2.2					
16	.5								1.3			
17						1.9						
18	.5		.4		.9							
19						1.68				1.0		
20		.5		.5			2.1					
21												
22					1.2					1.0		
23	.5											
24								1.4	1.2		.9	
25	.5			.5	1.4							
26				.5		2.2			1.1			
27					1.45	2.2	2.0	1.4				
28												
29	.5	.6					1.9					
30									1.1			
31												

NOTE.—Ice caused no backwater during the winter months, except Jan. 2, when the intense cold caused anchor ice to form temporarily.

Daily discharge, in second-feet, of Maroon Creek near Aspen, Colo., for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	38	30	34	30	37	165	330	245	134	68	41	15
2	38	30	30	30	39	205	325	235	136	68	40	24
3	38	30	30	30	41	245	315	225	138	68	39	.....
4	38	30	30	30	43	290	310	215	140	68	38	.....
5	38	30	30	30	40	270	300	205	142	68	37	.....
6	38	30	30	30	38	255	295	200	144	68	36	.....
7	38	30	30	30	42	240	305	195	146	68	36	.....
8	38	30	26	30	46	225	315	190	148	68	36	.....
9	38	30	23	30	50	245	325	185	150	65	36	.....
10	36	30	23	30	55	265	335	178	152	62	36	.....
11	35	30	23	30	60	285	345	178	146	60	36	.....
12	34	30	23	30	57	305	355	178	140	57	36	.....
13	33	30	23	30	54	330	365	178	133	54	36	.....
14	32	30	23	30	51	320	365	173	127	51	36	.....
15	31	30	23	30	48	320	365	168	116	51	36	.....
16	30	30	23	30	55	300	358	164	105	51	36	.....
17	30	30	23	30	60	285	351	160	102	51	36	.....
18	30	30	23	30	65	250	344	155	100	51	36	.....
19	30	30	23	30	80	209	337	150	97	51	36	.....
20	30	30	23	30	95	230	330	145	95	51	36	.....
21	30	30	24	30	105	250	325	140	93	51	36	.....
22	30	31	24	30	120	270	320	135	90	51	36	.....
23	30	32	25	30	132	295	315	131	88	50	36	.....
24	30	33	25	30	145	310	310	127	86	49	36	.....
25	30	34	26	30	156	335	305	127	77	48	33	.....
26	30	35	26	30	163	365	300	127	68	47	30	.....
27	30	36	27	31	170	365	295	127	68	46	27	.....
28	30	37	27	32	169	360	280	128	68	45	24	.....
29	30	38	28	33	168	350	265	129	68	44	21	.....
30	30	.....	28	35	167	340	260	130	68	43	18	.....
31	30	.....	29	.....	166	.....	250	132	.....	42	.....	.....

NOTE.—Discharge Jan. 1 to May 15 computed from a well-defined curve. Discharge May 16 to June 25 obtained by indirect method for shifting channels. Discharge June 26 to Dec. 2 computed from a fairly well-defined curve based on one measurement in 1912 and three in 1913. Discharge interpolated for days for which gage heights are missing.

Monthly discharge of Maroon Creek near Aspen, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	38	30	33.0	2,030	C.
February	38	30	31.2	1,790	C.
March	34	23	26.0	1,600	C.
April	35	30	30.4	1,810	C.
May	170	37	87.6	5,390	C.
June	365	165	283	16,800	C.
July	365	250	319	19,600	C.
August	245	127	166	10,200	C.
September	152	68	112	6,660	C.
October	68	42	55.3	3,400	C.
November	41	18	34.4	2,050	C.
The period	.....	.....	.....	71,300	

SNOW MASS CREEK AT SNOW MASS, COLO.

Location.—On a private bridge at Stewart's ranch, in sec. 27, T. 8 S., R. 86 W., half a mile from Snow Mass, Colo. No tributaries between the station and the mouth of the creek.

Records available.—February 21, 1911, to November 25, 1912.

Drainage area.—89 square miles (measured from topographic sheet and Forest Atlas).

Gage.—Vertical staff.

Channel.—Practically permanent.

Discharge measurements.—Made from the bridge during high water and by wading at other times.

Winter flow.—Ice causes backwater during the winter months, and discharge measurements are made to determine the flow.

Diversions.—There are court decrees for diversion of 29 second-feet from the main stream above the station and 7 second-feet below. There are also decrees for diversions of 73 second-feet from tributaries entering above.

Accuracy.—Owing to the meager gage heights, estimates have been made only for the days when the gage was read, except during the last half of the year, when the flow was gradually decreasing. These estimates are considered fair.

Cooperation.—Station maintained in cooperation with the United States Forest Service.

Discharge measurements of Snow Mass Creek at Snow Mass, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 22[a]	O. M. Wimmer	0.40	26.0	May 28	J. L. Mathias	1.36	287
Feb. 29	H. B. Waha	.50	75.1	Oct. 1	R. Richards	.49	62.5
Apr. 21	J. L. Mathias	.38	41.7				

[a] Relation between gage height and discharge affected by ice; measurement made just below gage, at open section, with ice above and below.

Daily gage height, in feet, of Snow Mass Creek at Snow Mass, Colo., for 1912.

[Geo. Hutchins, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1				0.35						0.49	
2		0.45			0.8				0.65		
3						1.8					
4	0.25		0.35								
5		.35						1.2			
6					.7						
7										.5	0.45
8	.25						1.4				
9											
10						1.4			.58		
11											
12		.25						.8			
13			.3		.8						
14										.5	.45
15	.25						1.4				
16									.58		
17						1.4					
18											.5
19		.25						.9			
20					1.3						
21											
22	.4		.35				1.3			.5	
23									.55		
24						1.8					
25											.5
26		.25						.7			
27											
28					1.36					.5	
29		.5					1.2				
30			.45		1.8						
31											

Daily discharge, in second-feet, of Snow Mass Creek at Snow Mass, Colo., for 1912.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1		52				240	102	72	71
2			130			240	100	72	70
3				475		240	98	72	69
4						240	97	72	69
5						240	95	73	68
6			110			225	93	73	67
7						210	91	73	66
8					305	194	90	73	66
9					305	178	88	73	66
10				305	305	162	87	73	66
11					305	146	87	73	66
12					305	130	87	73	66
13	45		130		305	133	87	73	66
14					305	137	87	73	66
15					305	140	87	73	68
16					300	144	87	73	70
17				305	295	147	86	73	72
18					290	151	85	73	73
19					285	155	84	73	73
20			270		280	149	84	73	73
21					275	142	83	73	73
22	52				270	136	83	73	73
23					266	129	82	73	73
24				475	262	123	81	73	73
25					258	116	80	73	73
26					254	110	79	73	
27					250	109	78	73	
28			291		245	108	76	73	
29					240	106	75	72	
30	66		475		240	105	74	72	
31					240	103		71	

NOTE.—Discharge computed from a fairly well defined curve. Discharge March to June given only for days on which gage heights were read. Discharge interpolated for days for which gage heights are missing July 7 to Nov. 25, as stage gradually decreased.

Monthly discharge of Snow Mass Creek at Snow Mass, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
July (8–31)	305	240	279	13,300	C.
August	240	103	158	9,710	C.
September	102	74	86.4	5,140	C.
October	73	71	72.7	4,470	C.
November (1–25)	73	66	69.4	3,440	C.
The period				36,100	

FRYING PAN CREEK AT NORRIE, COLO.

Location.—At the highway bridge in Norrie, in sec. 28, T. 8 S., R. 83 W., in the Sopris National Forest, 1 mile above the entrance of the North Fork.

Records available.—February 18, 1911, to November 30, 1912.

Drainage area.—112 square miles (measured from topographic sheet).

Gage.—Vertical staff.

Channel.—Slightly shifting after high water.

Discharge measurements.—Made from the bridge.

Winter flow.—Ice probably causes backwater during the winter months.

Diversions.—No water is diverted from this creek either above or below the station.

Accuracy.—Owing to the high altitude of the drainage basin, alternate melting and freezing causes diurnal fluctuations of stage at certain season; therefore the mean daily stage as determined from one reading may be considerably in error and the estimates can not be considered better than fair or, possibly, good.

Cooperation.—Station maintained in cooperation with the United States Forest Service.

Discharge measurements of Frying Pan Creek at Norrie, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 25[a]	O. M. Wimmer	2.16	27.0	May 29	J. L. Mathias	4.85	623
Mar. 1	H. B. Waha	2.41	26.7	June 20	do	4.48	472
Apr. 22	J. L. Mathias	2.63	62.3	Oct. 2	R. Richards	2.64	49.9

[a] Measurement made at section about 100 feet below gage. Channel open at measuring section, but ice above and below.

Daily gage height, in feet, of Frying Pan Creek at Norrie, Colo., for 1912.

[Benj. I. Beaty, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	2.65	.....	2.4	2.40	3.00	4.70	5.2	4.4	.....	2.65	.....
2	.....	2.55	.....	.....	.....	4.80	5.2	4.0	2.8	2.65	2.6
3	2.65	2.55	.....	2.50	3.00	5.65	4.9	.....	.....	2.6	2.65
4	2.65	.....	.....	2.55	2.90	6.00	4.8	.....	2.8	.....	.....
5	.....	.....	2.4	.....	2.90	6.20	4.5	3.7	2.8	2.65	2.6
6	2.65	.....	.....	2.70	.....	.....	4.5	.....	.....	.....	.....
7	.....	2.50	2.45	2.80	3.10	.....	5.1	3.6	2.7	.....	.....
8	2.70	.....	.....	.....	3.30	.....	4.9	.....	.....	2.6	2.6
9	.....	.....	2.4	2.80	3.20	5.80	.....	3.5	.....	.....	.....
10	2.65	2.45	2.4	2.80	3.20	.....	4.8	.....	2.5	.....	2.6
11	2.65	.....	.....	.....	.....	.....	.....	.....	.....	2.6	.....
12	.....	.....	2.4	.....	3.10	.....	4.7	3.3	2.5	.....	.....
13	2.65	2.45	.....	2.80	.....	5.15	.....	.....	.....	2.6	2.6
14	.....	.....	2.4	.....	.....	5.00	.....	3.2	2.5	.....	2.6
15	2.6	.....	.....	.....	3.10	5.05	4.8	.....	.....	.....	.....
16	.....	2.45	2.45	.....	.....	.....	4.7	.....	.....	.....	2.6
17	.....	.....	.....	.....	3.10	.....	4.5	3.0	2.7	2.6	2.6
18	2.60	.....	2.4	.....	3.70	4.40	.....	.....	.....	.....	.....
19	2.55	.....	.....	.....	3.95	4.55	4.4	3.0	2.7	2.6	.....
20	.....	2.45	.....	2.60	.....	4.50	4.3	3.0	.....	2.6	2.6
21	2.55	.....	2.4	.....	5.10	5.00	4.1	3.0	2.7	.....	.....
22	.....	.....	2.4	2.65	4.50	5.30	.....	.....	.....	2.6	.....
23	2.55	2.45	.....	.....	4.80	5.70	4.8	.....	.....	.....	2.6
24	.....	.....	.....	.....	.....	6.20	4.0	.....	2.6	.....	.....
25	2.55	.....	.....	.....	5.10	6.40	.....	.....	.....	.....	2.6
26	2.60	2.45	.....	2.70	5.30	6.40	.....	.....	.....	2.6	.....
27	2.55	.....	.....	2.70	5.00	5.80	4.4	.....	2.5	.....	.....
28	.....	2.4	.....	2.70	4.90	6.10	.....	2.9	2.7	.....	2.6
29	2.55	.....	.....	2.80	4.80	5.80	4.1	.....	.....	2.65	.....
30	.....	.....	.....	2.90	5.30	.....	.....	2.8	2.7	.....	2.6
31	.....	.....	.....	.....	5.30	.....	4.3	.....	.....	2.6	.....

NOTE.—Ice present during January, February, and March.

Daily discharge, in second-feet, of Frying Pan Creek at Norrie, Colo., for 1912.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	45	102	560	810	430	62	45	40
2	49	102	610	810	290	62	45	40
3	53	102	1,040	660	260	62	40	45
4	57	90	1,220	610	235	62	42	42
5	64	90	1,330	470	210	62	45	40
6	70	102	1,280	470	200	56	43	40
7	80	115	1,220	760	188	50	41	40
8	80	145	1,160	660	178	45	40	40
9	80	130	1,110	635	168	40	40	40
10	80	130	1,030	610	155	34	40	40
11	80	122	945	585	145	34	40	40
12	80	115	865	560	130	34	40	40
13	80	115	785	575	122	34	40	40
14	77	115	710	590	114	34	40	40
15	74	115	735	610	105	40	40	40
16	72	115	630	560	95	45	40	40
17	69	115	530	470	86	50	40	40
18	66	218	430	450	86	50	40	40
19	63	280	492	430	86	50	40	40
20	61	520	470	390	86	50	40	40
21	64	760	710	322	86	50	40	40
22	66	470	860	465	86	46	40	40
23	67	610	1,060	610	84	43	40	40
24	68	685	1,330	290	82	40	40	40
25	69	760	1,440	335	80	38	40	40
26	70	860	1,440	380	78	36	40	40
27	70	710	1,110	430	76	34	42	40
28	70	660	1,280	375	74	50	44	40
29	80	610	1,110	322	68	50	45	40
30	90	860	960	355	62	50	42	40
31	.....	860	.....	390	62	.....	40	.....

NOTE.—Daily discharge computed from two well-defined curves which merge at gage height 4.2 feet. The high water of May to July caused the change in the low-water part of curve. Mean discharge January to March estimated as 27 second-feet, from two discharge measurements and comparison with the constant flow at Thomasville, where stream remains open. Discharge interpolated for days for which gage heights are missing.

Monthly discharge of Frying Pan Creek at Norrie, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	[a] 27	1,660	D.
February	.....	.....	[a] 27	1,550	D.
March	.....	.....	[a] 27	1,660	D.
April	90	45	69.8	4,150	C.
May	860	90	348	21,400	B.
June	1,440	430	948	56,400	B.
July	810	290	516	31,700	B.
August	430	62	136	8,360	B.
September	62	34	46.4	2,760	B.
October	45	40	41.1	2,530	B.
November	45	40	40.2	2,390	B.
The period	.....	.....	.....	135,000	

[a] Estimated.

FRYING PAN CREEK AT THOMASVILLE, COLO.

Location.—At a private bridge in sec. 12, T. 8 S., R. 84 W., in the Sopris National Forest, three-fourths of a mile below Thomasville. Nearest tributary, Jakeman Creek, enters 100 yards above.

Records available.—January 2, 1911, to November 30, 1912.

Drainage area.—190 square miles (measured from Forest Atlas).

Gage.—Vertical staff.

Channel.—Practically permanent.

Discharge measurements.—Made from bridge during high water and by wading at ordinary stages.

Winter flow.—Ice causes backwater during the winter months and discharge measurements are made to determine the flow.

Diversions.—As there are no court decrees for diversion of water above the station, it is probable that the records represent the natural run-off from the drainage basin.

Accuracy.—Conditions favorable for fairly accurate determination of discharge; results should be reliable.

Cooperation.—Station maintained in cooperation with the United States Forest Service.

Discharge measurements of Frying Pan Creek at Thomasville, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 25[a]	O. M. Wimmer	0.49	47.9	May 29	J. L. Mathias	3.10	1,010
Mar. 1	H. B. Waha	.44	48.0	June 20	do	2.70	873
Apr. 22	J. L. Mathias	.80	81.8	Oct. 2	R. Richards	.80	94.6

[a] Ice at gage and measuring section. Slight effect on relation of gage height to discharge.

Daily gage height, in feet, of Frying Pan Creek near Thomasville, Colo., for 1912.

[Wm. P. Huffman, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	0.55	0.55	0.45	0.55	1.4	2.9	3.2	2.4	1.1	0.9	0.4
2	.55	.55	.55	.75	1.5	2.8	3.2	2.3	1.1	.8	.5
3	.55	.55	.45	.85	1.4	4.2	2.8	2.2	1.1	.8	.7
4	.55	.55	.45	.75	1.3	4.1	2.7	2.0	1.1	.8	.7
5	.55	.55	.55	.95	1.3	4.3	2.6	2.0	1.1	.8	.6
6	.55	.55	.55	.75	1.3	4.3	2.5	1.9	.9	.9	.4
7	.55	.55	.55	.75	1.5	4.0	2.7	1.7	.9	.9	.5
8	.55	.55	.55	.95	1.7	4.3	2.8	1.6	.9	.9	.5
9	.55	.55	.55	1.1	1.8	4.0	2.7	1.6	.9	.9	.....
10	.55	.55	.45	1.15	1.7	4.0	2.7	1.5	.9	.9	.5
11	.55	.55	.55	1.15	1.6	3.8	2.8	1.5	.9	.9	.....
12	.55	.55	.55	1.05	1.5	3.6	2.7	1.5	.9	.8	.5
13	.55	.55	.55	.95	1.5	3.4	2.6	.....	.9	.7	.4
14	.55	.55	.55	.85	1.5	3.2	2.8	1.5	.9	.7	.7
15	.55	.55	.55	.....	1.4	3.1	2.8	1.4	.9	.7	.65
16	.55	.55	.45	.....	1.4	3.0	2.7	.....	.9	.7	.8
17	.55	.55	.45	.....	1.8	2.9	2.6	1.5	.9	.7	.5
18	.55	.55	.55	.....	2.0	2.8	2.6	1.4	.9	.8	.9
19	.55	.55	.45	.....	2.2	2.7	2.6	1.3	.9	.8	.9
20	.55	.55	.45	.85	2.5	2.8	2.5	1.3	.9	.8	.....
21	.55	.55	.55	.85	2.75	2.9	2.5	1.3	.9	.9	.8
22	.55	.55	.45	.8	3.0	2.9	2.5	1.3	.8	.9	.8
23	.55	.55	.55	.9	3.0	3.4	2.9	1.2	.8	.9	.8
24	.55	.55	.....	.9	3.3	3.5	2.7	1.1	.9	.8	.6
25	.55	.55	.....	.9	3.5	4.2	2.4	1.1	.9	.8	.6
26	.55	.55	.....	.9	3.6	4.0	2.4	1.1	.9	.7	.6
27	.55	.55	.....	.9	3.0	3.6	2.5	1.1	.9	.7	.6
28	.55	.55	.....	.9	2.8	3.4	2.6	1.1	.9	.9	.....
29	.55	.55	.....	1.3	2.9	3.2	2.4	1.1	.9	.9	.5
30	.55	.....	.....	1.1	3.2	3.3	2.5	1.1	.9	.8	.....
31	.55	.....	.55	.....	3.4	.....	2.4	1.1	.....	.7	.....

Daily discharge, in second-feet, of Frying Pan Creek near Thomasville, Colo., for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	56	56	48	56	230	1,030	1,240	700	145	104	44
2	56	56	56	80	265	960	1,240	640	145	88	52
3	56	56	48	96	230	2,040	960	585	145	88	72
4	56	56	48	80	200	1,950	890	480	145	88	72
5	56	56	56	113	200	2,120	825	480	145	88	60
6	56	56	56	80	200	2,120	760	430	104	104	44
7	56	56	56	80	265	1,870	890	340	104	104	52
8	56	56	56	113	340	2,120	960	300	104	104	52
9	56	56	56	145	385	1,870	890	300	104	104	52
10	56	56	48	158	340	1,870	890	265	104	104	52
11	56	56	56	158	300	1,710	960	265	104	104	52
12	56	56	56	134	265	1,550	890	265	104	88	52
13	56	56	56	113	265	1,400	825	265	104	72	44
14	56	56	56	96	265	1,240	960	265	104	72	72
15	56	56	56	96	230	1,170	960	230	104	72	66
16	56	56	48	96	230	1,100	890	245	104	72	88
17	56	56	48	96	385	1,030	825	265	104	72	52
18	56	56	56	96	480	960	825	230	104	88	104
19	56	56	48	96	585	890	825	200	104	88	104
20	56	56	48	96	760	960	760	200	104	88	96
21	56	56	56	96	925	1,030	760	200	104	104	88
22	56	56	48	88	1,100	1,030	760	200	88	104	88
23	56	56	56	104	1,100	1,400	1,030	170	88	104	88
24	56	56	56	104	1,320	1,470	890	145	104	88	60
25	56	56	56	104	1,470	2,040	700	145	104	88	60
26	56	56	56	104	1,550	1,870	700	145	104	72	60
27	56	56	56	104	1,100	1,550	760	145	104	72	60
28	56	56	56	104	960	1,400	825	145	104	104	56
29	56	56	56	200	1,030	1,240	700	145	104	104	52
30	56	.....	56	145	1,240	1,320	760	145	104	88	50
31	56	.....	56	.....	1,400	.....	700	145	.....	72	.....

NOTE.—Daily discharge computed from a well-defined rating curve. Discharge interpolated Mar. 24 to 30 and Apr. 15 to 19.

Monthly discharge of Frying Pan Creek near Thomasville, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	56	56	56.0	3,440	C.
February	56	56	56.0	3,220	C.
March	56	48	53.7	3,300	C.
April	200	56	108	6,430	B.
May	1,550	200	633	38,900	B.
June	2,120	890	1,480	88,100	B.
July	1,240	700	866	53,200	B.
August	700	145	280	17,200	B.
September	145	88	110	6,550	B.
October	104	72	90.1	5,540	B.
November	104	44	64.8	3,860	B.
The period	.....	.....	.....	230,000	

NORTH FORK OF FRYING PAN CREEK NEAR NORRIE, COLO.

Location.—On a highway bridge in sec. 21, T. 8 S., R. 83 W., in the Sopris National Forest, about 1 mile from Norrie. No tributaries between the station and the mouth of the creek.

Records available.—February 18, 1911, to December 31, 1912.

Drainage area.—42 square miles (measured from topographic sheet).

Gage.—Vertical staff.

Channel.—Practically permanent.

Discharge measurements.—Made from the bridge during high water and by wading at ordinary stages.

Winter flow.—Ice causes little if any backwater during the winter months.

Diversions.—No water is diverted above the station, so the records represent the natural run-off.

Accuracy.—Owing to the scattering gage heights and the probable error in mean daily stage as determined from one reading, the estimates can not be considered better than fair.

Cooperation.—Station maintained in cooperation with the United States Forest Service.

Discharge measurements of North Fork of Frying Pan Creek near Norrie, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 25[a]	O. M. Wimmer	0.15	8.5	May 29	J. L. Mathias	2.38	385
Mar. 1	H. B. Waha	.15	6.0	June 20	do	1.80	236
Apr. 22	J. L. Mathias	.48	17.7	Oct. 2	R. Richards	.32	12.0

[a] Measurement made under complete ice cover.

Daily gage height, in feet, of North Fork of Frying Pan Creek near Norrie, Colo., for 1912.

[Benj. I. Beaty, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	0.2		0.15	0.2		2.0		1.3	0.45	0.35	
2	.2				1.1	2.1	2.0			.32	0.3
3		0.15		.3			2.0	1.1	.4		
4					1.1						
5						2.7				.35	.35
6				.4				1.0	.3		.35
7	.2						1.8	.9	.3		.35
8				.45	1.2		1.8			.35	
9			.15			2.6					
10		.15			1.2						
11				.5	1.1		1.7			.3	
12											
13	.2	.15	.15					.7	.3		
14	.15					2.1	1.95	.7			.6
15	.15		.15		1.2						
16							1.7				
17		.15									
18					1.4				.5	.4	
19							1.5			.4	
20				.5	1.7	1.8	1.45				
21								.5		.4	
22			.15	.48	2.2	2.2	1.5		.4		
23		.2		.5	2.0	2.5	1.6	.45		.4	.6
24	.15			.5					.3		
25				.5			1.4		.3		
26				.5	2.5	2.55	1.5	.45	.3	.4	.5
27	.15	.15				2.3		.4			
28					2.0						
29	.15				2.4			.6			
30											
31								.5			

NOTE.—Relation of gage height to discharge probably slightly affected by ice during Jan. and Feb.

Daily discharge, in second-feet, of North Fork of Frying Pan Creek near Norrie, Colo., for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	7	6	6	7	70	280	300	118	16	11	10
2	7	6	6	8	82	305	280	100	14	10	9
3	7	6	6	9	82	365	280	82	13	10	10
4	7	6	6	10	82	420	265	77	12	11	11
5	7	6	6	11	86	480	255	72	10	11	11
6	7	6	6	13	90	470	240	67	9	11	11
7	7	6	6	14	94	465	230	55	9	11	11
8	7	6	6	16	99	460	230	51	9	11	.....
9	7	6	6	17	99	450	220	47	9	11	.....
10	7	6	6	18	99	420	215	44	9	10	.....
11	7	6	6	19	82	390	205	41	9	9	.....
12	7	6	6	19	86	360	225	38	9	10	.....
13	7	6	6	19	90	335	245	34	9	10	.....
14	6	6	6	19	94	305	268	34	11	11	.....
15	6	6	6	19	99	290	235	31	13	11	.....
16	6	6	6	19	112	275	205	29	15	12	.....
17	6	6	6	19	125	265	190	27	17	12	.....
18	6	6	6	19	138	250	175	25	19	13	.....
19	6	6	6	19	170	240	159	23	17	13	.....
20	6	6	6	19	205	230	148	21	16	13	.....
21	6	7	6	18	270	280	154	19	15	13	.....
22	6	7	6	18	330	330	159	18	13	13	.....
23	6	7	6	19	280	420	180	16	11	13	.....
24	6	7	6	19	325	425	160	16	9	13	.....
25	6	7	6	19	370	430	138	16	9	13	.....
26	6	6	6	19	420	435	159	16	9	13	.....
27	6	6	6	30	350	360	152	13	9	12	.....
28	6	6	6	40	280	345	145	20	10	12	.....
29	6	6	6	50	390	330	139	26	10	11	.....
30	6	.....	6	60	350	315	132	22	11	11	.....
31	6	.....	6	.....	315	.....	125	19	.....	10	.....

NOTE.—Daily discharge computed from a well-defined rating curve. Discharge interpolated for days on which gage heights are missing.

Monthly discharge of North Fork of Frying Pan Creek near Norrie, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	7	6	6.4	394	C.
February	7	6	6.2	357	C.
March	6	6	6.0	369	C.
April	60	7	20.2	1,200	C.
May	420	70	186	11,400	C.
June	480	230	358	21,300	C.
July	300	125	200	12,300	C.
August	118	13	39.3	2,420	C.
September	19	9	11.7	696	C.
October	13	9	11.5	707	C.
November 1–7	11	9	10.4	144	C.
The period	.....	.....	.....	51,300	

CRYSTAL RIVER AT MARBLE, COLO.

Location.—Near the electric railway bridge of the Colorado-Yule Marble Co., in sec. 26, T. 11 S., R. 88 W., half a mile west of Marble. Nearest tributary, Carbonate Creek, enters at Marble.

Records available.—November 1, 1910, to December 7, 1912.

Drainage area.—77 square miles (measured from Forest Atlas).

Gage.—A vertical hook gage graduated to hundredths of a foot.
Channel.—Shifts slightly at long intervals.
Discharge measurements.—Made by wading.
Winter flow.—Gage heights at this station little, if any, affected by ice.
Diversions.—There are no court decrees for diversions above the station, but for 114 second-feet below Marble.
Accuracy.—Conditions are favorable for fairly accurate results and the estimates are considered reliable.
Cooperation.—The field data are furnished through the courtesy of the Colorado-Yule Marble Co.

Discharge measurements of Crystal River at Marble, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 1	H. V. Knouse	2.36	79.0
Nov. 25	do	2.00	44.0

Daily gage height, in feet, of Crystal River at Marble, Colo., for 1912.

[H. V. Knouse, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.99	1.86	1.86	.....	2.47	4.26	5.05	4.05	2.90	2.22	2.18	2.00
2	1.90	1.86	1.85	1.96	2.47	4.83	4.90	3.80	2.72	2.24	2.17	1.95
3	1.92	1.86	1.85	2.07	2.51	5.16	4.52	3.65	2.70	2.21	2.18	2.01
4	1.93	1.91	1.86	2.10	2.45	5.31	.....	3.60	2.62	2.21	2.18	2.02
5	1.98	1.94	1.87	2.10	2.37	5.52	3.95	3.50	2.58	2.28	2.16	1.98
6	1.97	1.88	1.72	2.14	2.34	5.55	4.28	3.40	2.52	2.24	2.15	1.88
7	1.96	1.88	1.92	2.08	2.45	5.48	4.40	3.25	2.58	2.31	2.16	1.93
8	1.92	1.87	1.72	2.12	2.58	5.62	4.90	3.20	2.55	2.24	2.15	.....
9	.....	1.88	2.10	2.23	2.61	5.42	4.95	3.22	2.55	2.23	2.16	.....
10	1.92	1.86	.....	2.26	2.59	5.25	5.15	3.20	2.48	2.26	2.12	.....
11	1.94	1.88	1.68	2.21	2.53	5.12	5.15	3.15	2.42	2.24	2.12	.....
12	1.93	1.88	1.92	2.20	2.51	5.05	5.00	3.10	2.38	2.23	2.16	.....
13	1.96	1.82	1.90	2.15	2.50	4.95	5.05	3.02	2.38	2.11	2.16	.....
14	1.94	1.82	1.95	2.10	2.44	4.32	5.50	3.00	2.40	2.26	2.15	.....
15	1.96	1.86	1.88	2.10	2.46	4.22	5.25	3.15	2.40	2.25	2.15	.....
16	1.93	1.87	1.88	2.14	2.63	4.05	4.90	3.15	2.42	2.23	2.13	.....
17	2.02	1.85	1.84	2.12	2.80	3.72	4.80	3.05	2.30	2.22	2.02	.....
18	1.98	.....	1.88	2.10	3.03	3.75	4.75	2.94	2.36	2.21	2.08	.....
19	1.94	1.86	1.87	2.12	3.58	3.65	4.65	2.92	2.38	2.19	2.11	.....
20	1.94	1.88	.....	2.10	3.72	3.88	4.70	2.90	2.34	2.21	2.07	.....
21	.....	1.85	.....	2.05	3.86	4.20	4.90	2.86	2.34	2.22	2.10	.....
22	1.94	1.86	.....	2.05	3.89	4.55	4.55	2.83	2.28	2.17	2.04	.....
23	1.94	1.86	.....	2.04	4.03	5.40	4.62	2.82	2.28	2.20	2.06	.....
24	1.92	1.87	1.90	2.16	4.22	6.04	4.35	2.75	2.28	2.19	2.05	.....
25	1.91	.....	1.90	2.22	4.46	5.85	4.20	2.70	2.26	2.15	2.06	.....
26	1.92	1.82	1.90	2.20	4.35	5.65	4.10	2.72	2.26	2.16	2.00	.....
27	1.90	1.83	1.88	2.20	4.30	5.45	4.15	2.80	2.24	2.23	1.98	.....
28	1.92	1.90	1.90	2.27	4.12	5.50	3.90	2.74	2.22	2.24	2.00	.....
29	1.90	1.78	.....	2.29	4.43	5.30	4.05	2.87	2.22	2.23	1.99	.....
30	1.88	.....	1.96	2.37	4.62	5.10	4.05	3.08	2.24	2.24	1.97	.....
31	1.90	.....	.....	.....	4.54	.....	3.95	3.00	.....	2.24	.....	.....

NOTE.—Slight ice effect Jan. 1 to 8, Mar. 7 to 9 and 20 to 23; gage readings were affected by snow slides below.

Daily discharge, in second-feet, of Crystal River at Marble, Colo., for 1910 and 1912.

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1910.			1910.			1910.		
1	44	28	11	44	31	21	34	31
2	44	31	12	39	34	22	39	31
3	39	34	13	39	31	23	44	31
4	50	39	14	39	31	24	34	31
5	44	34	15	39	31	25	44	31
6	34	31	16	39	31	26	39	34
7	34	39	17	39	31	27	39	31
8	39	34	18	39	31	28	31	31
9	44	34	19	39	31	29	34	28
10	34	34	20	28	31	30	31	31
						31	.....	31

NOTE.—Discharge determined from a well-defined curve based on measurements made during 1911 and 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1912.												
1	33	26	26	32	95	771	1,240	652	187	68	63	44
2	28	26	26	32	95	1,110	1,160	525	149	71	61	40
3	29	26	26	41	102	1,310	927	450	145	66	63	45
4	30	29	26	44	91	1,410	750	425	131	66	63	46
5	33	30	26	44	78	1,540	600	380	124	77	60	42
6	32	27	20	48	73	1,560	783	340	113	71	59	35
7	32	27	29	42	91	1,520	855	285	124	82	60	38
8	29	26	20	46	114	1,610	1,160	268	118	71	59	.....
9	29	27	20	59	120	1,480	1,180	275	118	70	60	.....
10	29	26	19	62	116	1,370	1,300	268	107	74	55	.....
11	30	27	18	56	105	1,290	1,300	254	98	71	55	.....
12	30	27	29	55	102	1,240	1,220	240	92	70	60	.....
13	32	24	28	50	100	1,180	1,240	218	92	54	60	.....
14	30	24	31	44	89	807	1,530	212	95	74	59	.....
15	32	26	27	44	93	747	1,370	254	95	72	59	.....
16	30	26	27	48	123	652	1,160	254	98	70	57	.....
17	36	26	25	46	156	485	1,100	226	80	68	46	.....
18	33	26	27	44	213	500	1,060	197	89	66	51	.....
19	30	26	26	46	416	450	1,000	193	92	64	54	.....
20	30	27	26	44	485	565	1,040	187	86	66	50	.....
21	30	26	26	39	555	735	1,160	178	86	68	53	.....
22	30	26	27	39	570	945	945	172	77	61	48	.....
23	30	26	27	38	642	1,460	987	169	77	65	49	.....
24	29	26	28	51	747	1,880	825	155	77	64	48	.....
25	29	25	28	57	891	1,760	735	145	74	59	49	.....
26	29	24	28	55	825	1,630	680	149	74	60	44	.....
27	28	24	27	55	795	1,500	708	165	71	70	42	.....
28	29	28	28	63	691	1,530	575	153	68	71	44	.....
29	28	22	30	66	873	1,400	652	180	68	70	43	.....
30	27	.....	32	78	987	1,280	652	234	71	71	42	.....
31	28	.....	32	.....	939	.....	600	212	.....	71	.....	.....

NOTE.—Daily discharge Jan. 1 to Aug. 6 computed from a well-defined rating curve; Aug. 7 to Dec. 7 a curve not so well defined, being slightly different below gage height 3.3 feet, was used. Discharge interpolated for days for which gage heights are missing.

Monthly discharge of Crystal River at Marble, Colo., for 1910 and 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1910.					
November	50	28	38.6	2,300	
December	39	28	32.0	1,970	
1912.					
January	36	27	30.1	1,850	B.
February	30	22	26.1	1,500	B.
March	32	18	26.3	1,620	B.
April	78	32	48.9	2,910	B.
May	987	73	367	22,600	B.
June	1,880	450	1,190	70,800	B.
July	1,530	575	984	60,500	B.
August	652	145	259	15,900	B.
September	187	68	99.2	5,900	B.
October	82	54	68.4	4,210	B.
November	63	42	53.9	3,210	B.
December 1-7	46	35	41.4	575	B.
The period				192,000	

MIDDLE ELK CREEK NEAR NEW CASTLE, COLO.

Location.—Opposite the mouth of West Elk Creek, in sec. 22, T. 5 S., R. 91 W., 2, miles above the entrance of East Elk Creek, a stream so small that it carries very little water except possibly during the spring.

Records available.—January 19, 1911, to December 31, 1912.

Drainage area.—122 square miles, including the area drained by West Elk Creek (measured from Forest Atlas).

Gage.—Vertical staff. The gage was originally placed 300 yards farther downstream, but was moved to its present position September 23, 1911; relation between the datums of the two gages not determined.

Channel.—Data too meager to determine.

Discharge measurements.—Made from a near-by bridge during high water and by wading below the mouth of West Elk Creek at ordinary stages.

Winter flow.—Gage heights at this station during the winter months little affected by ice.

Diversions.—There are court decrees for the diversion of 42 second-feet above the station and 35 second-feet from the main stream below.

Accuracy.—At the original site the channel was so shifting that no estimates of discharge are possible. The present site has not been completely rated and no estimates are available.

Cooperation.—Station maintained in cooperation with the United States Forest Service.

Discharge measurements of Middle Elk Creek near New Castle, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 26	H. B. Walia	1.10	20.1
Apr. 16	J. L. Mathias	1.20	17.3
May 26	....do	2.30	790

Daily gage height, in feet, of Middle Elk Creek near New Castle, Colo., for 1912.

[Ray L. Allen, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.08					3.45						0.95
2		1.1									1.15	
3								1.35	1.1			1.15
4					1.4				1.15			
5							2.1			1.1		
6			1.2	1.2							1.15	
7									1.1			
8					1.45	3.6		1.4				
9	1.02								1.15		1.1	
10		1.02					2.0			1.15		
11												.9
12						3.0						
13			1.18	1.2				1.2			1.15	
14					1.7		1.8	1.2			1.1	1.0
15		1.0						1.25				
16				1.0					1.3			
17											1.1	
18	1.0											
19		1.03			2.6						1.15	
20							1.55	1.4				
21						2.2			1.3			1.0
22					3.1					1.2		
23			1.2						1.2		1.05	
24								1.25				
25	1.2			1.2				1.05				
26									1.1			
27						2.3	1.3				.9	
28									1.15			1.1
29		1.0										
30				1.25			1.4			1.2	1.0	
31			1.22							1.2		

EAST ELK CREEK NEAR NEW CASTLE, COLO.

Location.—At the highway bridge on line between secs. 24 and 25, T. 5 S., R. 91 W., 2½ miles northwest of New Castle, Colo. No tributaries between the station and the mouth.

Records available.—January 19, 1911, to December 31, 1912.

Drainage area.—60 square miles (measured from Forest Atlas).

Gage.—Vertical staff.

Channel.—Permanent prior to high water of 1912, when it shifted.

Discharge measurements.—Made from the bridge during high water and by wading during ordinary stages.

Winter flow.—Little backwater from ice at this station during the winter except for short periods.

Diversions.—There are court decrees for diversion of 43 second-feet from East Elk Creek, chiefly above the station.

Accuracy.—Owing to the very meager gage heights, estimates have not been made other than for the days having gage heights. These estimates should be reliable prior to high water, but are somewhat uncertain for the later part of the year, owing to a shift in the channel.

Cooperation.—Station maintained in cooperation with the United States Forest Service.

Discharge measurements of East Elk Creek near New Castle, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 26	H. B. Waha	0.65	10.3
Apr. 16	J. L. Mathias	.71	13.2
May 26	....do	2.02	187
Sept. 26	R. H. Fletcher	.70	5.9

Daily gage height, in feet, of East Elk Creek near New Castle, Colo., for 1912.

[Ray L. Allen, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.	1.82	0.85				2.1						0.85
2.											0.85	
3.								1.1	0.8			.85
4.					0.9				.8			
5.							2.3			0.85		
6.			0.5	0.8							.85	
7.									.75			
8.					.92	2.7		.9				
9.	.2								.75		.9	
10.		.6					1.8			.85		
11.												.87
12.						2.5						
13.			.52	.9				.85			.9	
14.					.98			.8			.9	.85
15.		.5						.85				
16.				.7					1.0			
17.											.85	
18.	.25											
19.		.6			1.6						.85	
20.							1.45	.8				
21.						2.25			.8			1.75
22.					1.8					.9		
23.			.5						.9		.85	
24.								.9				
25.	.45			.75				.85				
26.		.65			2.02				.9			
27.		.7			2.4	2.4	1.2				.9	
28.									.85			1.65
29.												
30.				.78			1.25	.8		.9	.85	
31.			.6					.9		.9		

NOTE.—Backwater from ice Jan. 1 and Dec. 21 and 28. Channel open during rest of year.

Daily discharge, in second-feet, of East Elk Creek near New Castle, Colo., for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.		20				195						8
2.											8	
3.								25	6			8
4.					22				6			
5.							245			8		
6.			7	17							8	
7.									5			
8.					23	365		15				
9.	3								5		9	
10.		9					120			8		
11.												8
12.						305						
13.			7	22				12			9	
14.					27			10			9	8
15.		7						12				
16.				13					13			
17.											8	
18.	3.5											
19.		9			93						8	
20.							65	10				
21.						232			6			
22.					126					9		
23.			7						9		8	
24.								12				
25.	6			15				10				
26.		11			175				9			
27.		13			275	275	35				9	
28.									8			
29.												
30.				16			40	8		9	8	
31.			9					10		9		

NOTE.—Daily discharge determined as follows: Jan. 1 to July 5 from a well-defined curve; July 6 to Aug. 31 by indirect method for shifting channels; Sept. 1 to Dec. 14 from a fairly well defined curve based on one measurement Sept. 26, 1912, and four measurements in 1913.

TAYLOR RIVER AT ALMONT, COLO.

Location.—At highway bridge in Almont in sec. 22, T. 51 N., R. 1 E., New Mexico principal meridian, 100 yards above the junction of Taylor and East rivers.

Records available.—July 27, 1910, to December 31, 1912.

Drainage area.—413 square miles (measured from Forest Atlas).

Gage.—Vertical staff.

Channel.—Practically permanent.

Discharge measurements.—Made from highway bridge.

Winter flow.—Ice causes backwater.

Diversions.—There are no court decrees for diversions from Taylor River, but from Willow Creek, which enters above, there are decrees for 12 second-feet diversion.

Accuracy.—Conditions are favorable for accurate results; the estimates are considered good.

Cooperation.—Station maintained in cooperation with the United States Reclamation Service, by whom the field data are furnished.

Discharge measurements of Taylor River at Almont, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
June 13	E. H. Swett	3.62	1,840
Aug. 22	do	2.20	316

Daily gage height, in feet, of Taylor River at Almont, Colo., for 1912.

[Argus McClanahan, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.30	2.70	2.35	1.80	2.18	3.40	3.45	2.60	2.10	1.95	1.80	1.88
2	2.25	2.75	2.30	1.80	2.30	3.50	3.25	2.50	2.10	1.95	1.80	1.78
3	2.25	2.70	2.25	1.80	2.40	3.85	3.25	2.50	2.10	1.92	1.80	1.78
4	2.20	2.70	2.30	1.82	2.40	4.00	3.10	2.45	2.05	1.90	1.80	1.85
5	2.30	2.65	1.80	1.75	2.30	4.00	3.05	2.42	2.05	1.88	1.78	1.95
6	2.20	2.70	1.80	1.82	2.35	4.05	3.00	2.40	2.05	1.88	1.75	1.98
7	2.30	2.65	1.85	1.82	2.40	4.00	3.00	2.40	2.05	1.92	1.75	1.98
8	2.15	2.65	1.75	1.82	2.45	4.00	3.10	2.35	2.05	1.90	1.80	1.95
9	2.30	2.65	1.80	1.88	2.45	4.05	3.05	2.35	2.05	1.95	1.80	2.10
10	2.25	2.65	1.80	1.75	2.45	3.80	3.00	2.35	2.02	1.98	1.82	2.35
11	2.25	2.65	1.85	1.60	2.50	3.75	2.95	2.30	2.00	1.95	1.98	2.30
12	2.30	2.70	1.80	1.65	2.52	3.60	3.05	2.30	2.00	1.95	1.92	2.30
13	2.25	2.70	1.80	1.70	2.45	3.60	3.00	2.20	2.00	1.95	1.92	2.30
14	2.35	2.70	1.85	1.72	2.30	3.75	3.10	2.20	2.00	1.95	1.88	2.30
15	2.25	2.75	1.85	1.65	2.32	3.70	3.00	2.18	2.00	1.95	1.88	2.30
16	2.25	2.75	1.80	1.65	2.70	3.80	3.05	2.20	2.00	1.95	1.80	2.30
17	2.25	2.75	1.80	1.68	2.80	3.75	3.00	2.18	2.00	1.90	1.80	2.40
18	2.35	2.60	1.75	1.70	2.95	3.70	3.00	2.20	2.00	1.90	1.78	2.40
19	2.20	2.65	1.72	1.72	3.15	3.55	2.95	2.20	2.00	1.92	1.78	2.35
20	2.25	2.65	1.80	1.75	3.30	3.30	2.85	2.20	2.00	1.90	1.78	2.30
21	2.30	2.65	1.75	1.75	3.40	3.45	2.78	2.20	2.00	1.90	1.78	2.30
22	2.35	2.60	1.75	1.78	3.30	3.50	2.80	2.20	2.00	1.92	1.80	2.30
23	2.40	2.65	1.80	1.80	3.30	3.50	2.78	2.20	2.00	1.90	1.78	2.30
24	2.40	2.70	1.80	1.80	3.45	3.60	2.95	2.15	1.98	1.90	1.75	2.30
25	2.65	2.65	1.75	1.75	3.50	3.70	2.85	2.12	1.98	1.90	1.78	2.20
26	2.65	2.60	1.85	1.80	3.60	3.55	2.78	2.12	1.92	1.90	1.78	2.20
27	2.70	2.55	1.85	1.82	3.55	3.50	2.75	2.10	1.92	1.90	1.78	2.00
28	2.65	2.50	1.75	1.80	3.50	3.50	2.78	2.10	1.95	1.90	1.75	1.80
29	2.60	2.50	1.82	1.82	3.50	3.50	2.75	2.10	1.88	1.90	1.72	1.75
30	2.75	.....	1.85	2.00	3.85	3.50	2.68	2.08	1.95	1.80	1.72	1.75
31	2.70	.....	1.85	.....	3.70	.....	2.65	2.10	.....	1.80	.....	1.75

NOTE.—Ice present Jan. 1 to Mar. 4 and Dec. 4 to 28.

Daily discharge, in second-feet, of Taylor River at Almont, Colo., for 1912.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	160	320	1,440	1,500	590	280	215	160
2	.....	160	390	1,570	1,250	520	280	215	160
3	.....	160	450	2,060	1,250	520	280	203	160
4	.....	167	450	2,270	1,080	485	258	195	160
5	160	146	390	2,270	1,020	464	258	188	154
6	160	167	420	2,340	970	450	258	188	146
7	178	167	450	2,270	970	450	258	203	146
8	146	167	485	2,270	1,080	420	258	195	160
9	160	188	485	2,340	1,020	420	258	215	160
10	160	146	485	1,990	970	420	244	227	167
11	178	110	520	1,920	915	390	235	215	227
12	160	121	534	1,710	1,020	390	235	215	203
13	160	132	485	1,710	970	330	235	215	203
14	178	138	390	1,920	1,080	330	235	215	188
15	178	121	402	1,850	970	320	235	215	188
16	160	121	670	1,990	1,020	330	235	215	160
17	160	128	760	1,920	970	320	235	195	160
18	146	132	920	1,850	970	330	235	195	154
19	138	138	1,140	1,640	910	330	235	203	154
20	160	146	1,310	1,310	810	330	235	195	154
21	146	146	1,440	1,500	742	330	235	195	154
22	146	154	1,310	1,570	760	330	235	203	160
23	160	160	1,310	1,570	742	330	235	195	154
24	160	160	1,500	1,710	910	305	227	195	146
25	146	146	1,570	1,850	810	290	227	195	154
26	178	160	1,710	1,640	742	290	203	195	154
27	178	167	1,640	1,570	715	280	203	195	154
28	146	160	1,570	1,570	742	280	215	195	146
29	168	167	1,570	1,570	715	280	188	195	138
30	178	235	2,060	1,570	654	271	215	160	138
31	178	.....	1,850	.....	630	280	.....	160	.....

NOTE.—Daily discharge computed from a well-defined rating curve, which is same as that used for 1911 below 3.0 feet, the upper part having been changed as a result of a high-water measurement in 1912. Discharge Mar. 1 to 4 estimated 150 second-feet.

Monthly discharge of Taylor River at Almont, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
March	178	.....	160	9,840	B.
April	235	110	152	9,040	B.
May	2,060	320	935	57,500	B.
June	2,340	1,310	1,830	109,000	B.
July	1,500	630	932	57,300	B.
August	590	271	368	22,600	A.
September	280	188	239	14,200	A.
October	227	160	200	12,300	A.
November	227	138	162	9,640	B.
December	.....	.....	[a] 150	9,220	B.
The period	.....	.....	.....	311,000	

[a] Estimated.

GUNNISON RIVER NEAR GUNNISON, COLO.

Location.—At highway bridge 2 miles below Gunnison. Nearest tributary, Tomichi Creek, enters about 1 mile below.

Records available.—November 27, 1910, to December 31, 1912.

Drainage area.—963 square miles (measured from Hayden's Atlas).

Gage.—Chain gage; datum unchanged.

Channel.—Somewhat shifting.

Discharge measurements.—Made from bridge during high water and by wading at ordinary stages.

Winter flow.—Ice causes backwater during the winter months.

Diversions.—There are court decrees for diversions of 250 second-feet from Gunnison River between this station and the forks at Almont and diversions of 270 second-feet from intervening tributaries.

Cooperation.—Station is maintained in cooperation with the State engineer, by whom the completed data are furnished.

Discharge measurements of Gunnison River near Gunnison, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 2	B. S. Clayton	2.45	258	July 23	C. C. Hezmalhalch	2.18	2,200
Mar. 15	do	1.08	220	Oct. 8	C. E. Turner	.50	441
Apr. 22	do	.48	320	Nov. 24	do	.15	253
May 17	C. C. Hezmalhalch	2.19	2,250				

Daily gage height, in feet, of Gunnison River near Gunnison, Colo., for 1912.

[Mrs. C. W. Chinery, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.8	2.2	0.8	0.6	1.3	3.4	2.8	1.6	0.8	0.4	0.4	0.2
2	.9	2.4	.85	.6	1.4	3.6	2.4	1.5	.75	.4	.4	.2
3	.9	2.3	.....	.7	1.3	3.85	2.25	1.4	.7	.4	.45	.15
4	.8	2.0	.8	.8	1.2	4.0	2.2	1.3	.65	.4	.4	.15
5	.8	.....	.8	.8	1.2	4.15	2.0	1.2	.55	.4	.4	.1
6	1.1	.....	.7	.8	1.1	4.15	1.8	1.1	.5	.4	.35	.05
7	1.25	.....	1.0	.8	1.2	4.15	2.2	1.0	.5	.45	.35	.0
8	.9	.....	1.0	.85	1.5	3.95	2.0	1.0	.5	.5	.3	.05
9	1.1	.....	1.0	.95	1.6	3.95	2.2	.95	.5	.5	.3	.1
10	1.4	.....	.9	1.0	1.6	3.9	2.0	.9	.5	.5	.35	.1
11	1.5	1.6	.8	.8	1.6	3.65	2.0	.9	.5	.5	.4	.1
12	1.9	1.6	.8	.65	1.9	3.4	2.2	.85	.5	.5	.2	.1
13	1.9	1.6	.8	.6	1.9	3.4	2.1	.9	.5	.5	.15	.15
14	1.5	1.7	1.1	.55	2.0	3.3	1.9	1.0	.45	.5	.2	.15
15	1.4	1.5	1.3	.65	2.0	3.15	1.6	1.2	.6	.5	.2	.....
16	1.3	1.5	1.5	.6	2.15	2.9	1.6	1.1	.55	.45	.2	.....
17	1.5	1.5	.7	.65	2.2	2.9	1.6	1.05	.5	.45	.2	.....
18	1.55	1.6	.7	.7	2.8	2.75	1.7	1.0	.5	.4	.2	.....
19	1.5	1.8	.95	.65	2.9	2.7	1.7	.9	.5	.4	.2	.....
20	1.8	1.8	.7	.6	3.1	2.7	1.8	.85	.5	.4	.2	.....
21	1.9	1.9	.7	.45	3.6	2.6	1.7	.8	.55	.4	.2	.....
22	2.1	1.95	.7	.5	3.6	2.6	1.7	.75	.5	.4	.2	.....
23	2.2	1.8	.6	.5	3.5	2.8	1.9	.7	.5	.4	.2	.....
24	2.2	2.0	.7	.55	3.3	3.1	1.7	.7	.45	.35	.2	.....
25	2.4	.7	.7	.7	3.9	3.4	1.7	.65	.4	.3	.2	.....
26	2.4	.8	.7	.6	3.4	3.2	1.8	.7	.4	.3	.2	.....
27	2.2	.8	.7	.6	3.5	3.3	1.8	.8	.4	.3	.2	.....
28	1.9	.8	.6	.7	3.35	2.2	1.7	.7	.4	.35	.2	.....
29	1.9	.8	.6	.95	3.3	3.0	1.6	.7	.4	.4	.2	.....
30	2.2	.....	.6	1.05	3.7	3.1	1.6	.75	.4	.4	.2	.....
31	2.3	.....	.6	.....	3.6	.....	1.7	.8	.....	.4	.....	.....

Daily discharge, in second-feet, of Gunnison River near Gunnison, Colo., for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	275	260	205	340	1,005	4,390	3,270	1,380	660	320	320
2	275	260	210	340	1,120	4,780	2,580	1,250	615	320	320
3	275	260	240	415	1,005	5,280	2,340	1,120	575	320	370
4	275	250	205	500	890	5,580	2,260	1,005	540	320	320
5	275	250	205	500	890	5,880	1,950	890	450	320	320
6	260	250	200	500	785	5,880	1,655	785	420	320	280
7	260	260	210	500	890	5,880	2,260	680	420	370	280
8	260	240	210	542	1,250	5,480	1,950	680	420	420	240
9	260	240	210	632	1,380	5,480	2,260	632	420	420	240
10	260	230	205	680	1,380	5,380	1,950	585	420	420	280
11	260	230	205	500	1,380	4,880	1,950	585	420	420	320
12	250	230	205	378	1,800	4,390	2,260	542	420	420	180
13	250	230	205	340	1,800	4,390	2,100	585	420	420	160
14	250	230	215	308	1,950	4,200	1,800	680	370	420	180
15	250	225	220	378	1,950	3,915	1,380	890	520	420	180
16	250	225	225	340	2,180	3,450	1,380	785	470	370	180
17	250	225	250	378	2,260	3,450	1,380	732	420	370	180
18	240	230	275	415	3,270	3,180	1,510	680	420	320	180
19	240	240	275	378	3,450	3,090	1,510	585	420	320	180
20	240	240	300	340	3,820	3,090	1,655	525	420	320	180
21	240	240	300	250	4,780	2,920	1,510	540	470	320	180
22	240	240	320	275	4,780	2,920	1,510	455	420	320	180
23	250	240	340	275	4,580	3,270	1,800	415	420	320	180
24	250	245	415	308	4,200	3,820	1,510	430	370	280	180
25	250	200	415	415	5,380	4,390	1,510	400	320	240	180
26	250	200	415	340	4,390	4,010	1,655	455	320	240	180
27	250	205	415	340	4,580	4,200	1,655	575	320	240	180
28	250	205	340	415	4,295	4,010	1,510	485	320	280	180
29	260	205	340	632	4,200	3,630	1,380	505	320	320	180
30	260	.....	340	732	4,980	3,820	1,380	575	320	320	180
31	260	.....	340	.....	4,780	.....	1,510	640	.....	320	.....

Monthly discharge of Gunnison River near Gunnison, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January	275	240	255	15,669
February	260	200	234	13,458
March	415	200	273	16,770
April	732	250	423	25,163
May	5,380	785	2,755	169,391
June	5,880	2,920	4,301	255,941
July	3,270	1,380	1,817	111,730
August	1,380	400	680	41,794
September	660	320	431	25,666
October	420	240	340	20,926
November	370	160	223	13,270
The period	.....	.....	.....	709,808

EAST RIVER AT ALMONT, COLO.

Location.—At highway bridge at Almont, 200 feet above the junction of East and Taylor rivers.

Records available.—July 27, 1910, to December 31, 1912. A station was maintained at this point from April 15 to October 8, 1905, but the gage was referred to a different datum.

Drainage area.—295 square miles (measured from Forest Atlas).

Gage.—Vertical staff.

Channel.—Slightly shifting.

Discharge measurements.—Made from bridge.

Winter flow.—Ice causes backwater in varying amounts, but no measurements have been made to determine this.

Diversions.—There are court decrees for diversion of 78 second-feet from East River above the station and 52 second-feet from tributaries.

Accuracy.—Conditions are favorable and therefore the results should be reliable.

Cooperation.—Station maintained in cooperation with the United States Reclamation Service, by which the field data are furnished.

Discharge measurements of East River at Almont, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
June 13	E. H. Swett	3.32	1,860
Aug. 22	do	1.58	278

Daily gage height, in feet, of East River at Almont, Colo., for 1912.

[Argus McClanahan, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.20	1.50	1.10	0.90	1.65	3.00	2.80	2.10	1.40	1.25	1.00	0.88
2	1.15	1.50	1.10	.90	1.78	3.20	2.65	2.00	1.40	1.28	.90	1.10
3	1.10	1.45	.95	.95	1.75	3.95	2.65	2.00	1.35	1.28	.90	1.10
4	1.15	1.50	.95	1.00	1.80	4.35	2.50	1.90	1.35	1.30	1.00	1.20
5	1.10	1.45	.90	1.00	1.75	4.40	2.40	1.90	1.35	1.25	.90	1.28
6	1.05	1.40	.80	1.00	1.75	4.35	2.40	1.85	1.30	1.28	.80	1.30
7	1.10	1.45	.90	1.25	1.75	4.10	2.45	1.85	1.30	1.22	.90	1.28
8	1.15	1.50	.80	1.25	1.80	4.05	2.50	1.85	1.30	1.20	.95	1.30
9	1.15	1.45	.80	1.45	1.85	4.20	2.45	1.90	1.30	1.22	1.00	1.40
10	1.15	1.50	.80	1.65	1.95	3.60	2.52	1.85	1.30	1.20	1.05	1.65
11	1.20	1.55	.80	1.55	2.00	3.40	2.55	1.80	1.30	1.20	1.18	2.00
12	1.30	1.45	.85	1.50	2.08	3.05	2.52	1.75	1.30	1.20	1.12	2.10
13	1.30	1.50	.80	1.35	2.05	3.15	2.50	1.70	1.30	1.20	1.00	2.10
14	1.30	1.50	.85	1.30	1.90	2.90	2.60	1.65	1.30	1.20	.92	2.10
15	1.35	1.55	.90	1.30	1.85	2.90	2.52	1.68	1.30	1.20	.90	2.10
16	1.25	1.60	.80	1.35	2.17	2.75	2.65	1.68	1.30	1.20	.92	2.10
17	1.20	1.60	.82	1.40	2.35	2.62	2.50	1.68	1.30	1.20	.90	2.20
18	1.25	1.55	.82	1.30	2.45	2.68	2.50	1.72	1.30	1.20	.95	2.20
19	1.15	1.50	.85	1.30	2.65	2.55	2.40	1.70	1.30	1.15	.88	2.10
20	1.25	1.45	.85	1.35	2.80	2.50	2.35	1.62	1.30	1.18	.88	1.80
21	1.35	1.45	.92	1.30	3.00	2.65	2.25	1.60	1.30	1.15	.95	1.80
22	1.35	1.40	.85	1.25	2.75	2.80	2.30	1.60	1.30	1.20	.80	1.80
23	1.45	1.35	.90	1.35	2.85	2.85	2.35	1.55	1.30	1.20	.78	1.80
24	1.40	1.35	.90	1.40	3.10	3.20	2.30	1.50	1.28	1.20	.75	1.80
25	1.45	1.35	.95	1.38	3.25	3.40	2.25	1.50	1.28	1.15	.78	1.80
26	1.45	1.20	.95	1.30	3.30	3.25	2.25	1.50	1.25	1.12	.78	1.80
27	1.35	1.15	.95	1.32	3.25	3.00	2.20	1.50	1.25	1.15	.78	1.70
28	1.35	1.15	.90	1.35	3.00	2.92	2.15	1.48	1.25	1.10	.78	1.60
29	1.40	1.15	.85	1.42	3.15	2.90	2.20	1.48	1.25	1.10	.78	1.50
30	1.45	.....	.95	1.52	3.60	2.95	2.18	1.50	1.25	1.00	.78	1.50
31	1.50	.....	.95	.....	3.40	.....	2.10	1.45	.....	1.00	.....	1.50

NOTE.—Ice present Jan. 1 to Mar. 5 and Dec. 1 to 31.

Daily discharge, in second-feet, of East River at Almont, Colo., for 1912.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	70	315	1,520	1,300	630	205	155	90
2	.....	70	388	1,740	1,150	550	205	164	70
3	.....	80	370	2,620	1,150	550	188	164	70
4	.....	90	400	3,100	1,000	470	188	170	90
5	.....	90	370	3,160	900	470	188	155	70
6	55	90	370	3,100	900	435	170	164	55
7	70	155	370	2,800	950	435	170	146	70
8	55	155	400	2,740	1,000	435	170	140	80
9	55	225	435	2,920	950	470	170	146	90
10	55	315	510	2,200	1,020	435	170	140	102
11	55	268	550	1,960	1,050	400	170	140	135
12	62	245	614	1,580	1,020	370	170	140	120
13	55	188	590	1,680	1,000	340	170	140	90
14	62	170	470	1,410	1,100	315	170	140	74
15	70	170	435	1,410	1,020	330	170	140	70
16	55	188	686	1,250	1,150	330	170	140	74
17	58	205	850	1,120	1,000	330	170	140	70
18	58	170	950	1,180	1,000	352	170	140	80
19	62	170	1,150	1,050	900	340	170	128	67
20	62	188	1,300	1,000	850	300	170	135	67
21	74	170	1,520	1,150	755	290	170	128	80
22	62	155	1,250	1,300	800	290	170	140	55
23	70	188	1,360	1,360	850	268	170	140	52
24	70	205	1,630	1,740	800	245	164	140	48
25	80	198	1,800	1,960	755	245	164	128	52
26	80	170	1,850	1,800	755	245	155	120	52
27	80	177	1,800	1,520	710	245	155	128	52
28	70	187	1,520	1,430	670	237	155	115	52
29	62	213	1,680	1,410	710	237	155	115	52
30	80	254	2,200	1,460	694	245	155	90	52
31	80	.....	1,960	.....	630	225	.....	90	.....

NOTE.—Daily discharge computed from a fairly well defined rating curve. Mean discharge Mar. 1 to 5 estimated 55 second-feet.

Monthly discharge of East River at Almont, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
March	80	55	63.6	3,910	B.
April	315	70	174	10,400	B.
May	2,200	315	971	59,700	B.
June	3,160	1,000	1,820	108,000	B.
July	1,300	630	921	56,600	B.
August	630	225	357	22,000	B.
September	205	155	171	10,200	B.
October	170	90	137	8,420	B.
November	135	48	72.7	4,330	B.
The period	.....	.....	.....	284,000	

CEMENT CREEK NEAR CRESTED BUTTE, COLO.

Location.—At Ahren's ranch, in sec. 22, T. 14 S., R. 85 W., about 7 miles southeast of Crested Butte. No tributaries between the station and the mouth.

Records available.—November 23, 1910, to December 31, 1912.

Drainage area.—32 square miles (measured from Forest Atlas).

Gage.—Vertical staff.

Channel.—Somewhat shifting after high water.

Discharge measurements.—Made by wading except during extreme flood stage, when they are made from a footbridge.

Winter flow.—Ice causes little if any backwater at this station, owing to hot springs above.

Diversions.—There are court decrees for diversions of 8.5 second-feet from Cement Creek above the station.

Accuracy.—Estimates for periods prior to the high water are considered reliable; after that period, when a shift occurred, they were obtained by the indirect method and are only fair.

Cooperation.—Station maintained in cooperation with the United States Forest Service.

Discharge measurements of Cement Creek near Crested Butte, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Mar. 16	J. L. Mathias	0.39	19.3
Apr. 18	H. B. Waha	.40	17.4
June 11	....do	1.70	269
Oct. 1	R. H. Fletcher	.60	23.8

Daily gage height, in feet, of Cement Creek near Crested Butte, Colo., for 1912.

[Perry L. Snodgrass, observer.]

Day	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	0.4	0.3	0.3	0.55	1.4	1.4	0.9	.....	0.6	0.55	0.4
2	.....	.35	.3	.35	.55	1.6	1.4	.9	0.65	.....	.55	.....
3	.....	.35	.3	.3	.55	1.65	1.4	.9	.65	.55	.....	.4
4	.....	.4	.....	.3	.5	1.8	1.4	.9	.65	.....	.....	.....
5	.....	.4	.....	.35	.5	1.8	1.4	.9	.....	.6	.55	.....
6	.....	.4	.....	.3	.5	1.85	1.3	.8	.....	.55	.5	.4
7	.....	.....	.....	.4	.6	1.9	1.3	.8	.....	.....	.....	.4
8	.....	.....	.....	.35	.65	1.7	1.3	.....	.....	.6	.55	.4
9	.....	.....	.....	.45	.65	1.8	1.3	.8	.....	.....	.45	.....
10	0.4	.35	.....	.45	.6	1.7	.....	.75	.....	.6	.45	.....
11	.4	.4	.....	.4	.7	1.6	1.3	.75	.6	.6	.4	.....
12	.4	.4	.....	.45	.....	1.6	1.3	.75	.6	.6	.45	.4
13	.....	.3	.....	.4	.6	.....	.....	.7	.6	.....	.6	.....
14	.....	.35	.....	.4	.75	1.6	1.3	.7	.6	.6	.5	.4
15	.....	.....	.....	.4	.75	.....	1.2	.7	.6	.6	.....	.....
16	.4	.....	.4	.35	.78	1.4	1.2	.7	.6	.....	.5	.....
17	.4	.....	.....	.....	.8	1.5	1.2	.7	.6	.6	.4	.4
18	.....	.....	.....	.4	.8	1.6	1.3	.8	.....	.....	.4	.....
19	.....	.....	.3	.45	1.0	1.5	1.2	.75	.6	.6	.....	.4
20	.4	.....	.35	.45	1.0	1.6	1.1	.....	.6	.....	.45	.....
21	.....	.....	.4	.45	1.1	1.6	1.1	.....	.6	.6	.....	.4
22	.4	.....	.35	.45	1.4	1.6	1.0	.....	.6	.....	.4	.4
23	.....	.....	.3	.45	1.5	1.6	1.1	.....	.....	.55	.45	.35
24	.4	.....	.35	.45	1.4	1.6	1.1	.7	.....	.6	.....	.....
25	.....	.....	.3	.45	1.6	1.6	1.1	.7	.....	.....	.....	.....
26	.....	.....	.3	.45	1.7	1.7	1.0	.7	.....	.55	.4	.....
27	.4	.....	.3	.45	1.6	1.55	1.0	.....	.6	.....	.....	.....
28	.4	.....	.3	.48	1.65	1.5	.9	.7	.6	.55	.....	.....
29	.4	.3	.38	.5	1.8	1.6	.9	.....	.6	.55	.4	.35
30	.....	.....	.3	.6	1.4	1.4	.9	.7	.6	.....	.4	.35
31	.4	.....	.....	.....	1.6	.....	.9	.7	.....	.5	.....	.4

Daily discharge, in second-feet, of Cement Creek near Crested Butte, Colo., for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	18	18	12	12	30	184	165	58	29	23	20	11
2	18	15	12	15	30	240	165	58	27	22	20	11
3	18	15	12	12	30	255	165	58	27	20	20	11
4	18	18	12	12	25	300	165	58	27	21	20	11
5	18	18	12	15	25	300	165	58	27	23	20	11
6	18	18	13	12	25	315	140	42	26	20	16	11
7	18	17	13	18	35	330	140	42	26	21	18	11
8	18	16	13	15	41	270	140	42	25	23	20	11
9	18	15	14	22	41	300	140	42	24	23	14	11
10	18	15	14	22	35	270	140	36	23	23	14	11
11	18	18	15	18	47	240	140	36	23	23	11	11
12	18	18	15	22	41	238	140	36	23	23	14	11
13	18	12	16	18	35	238	140	31	23	23	23	11
14	18	15	16	18	54	238	140	31	23	23	16	11
15	18	15	17	18	54	210	118	31	23	23	16	11
16	18	14	18	15	59	180	118	31	23	23	16	11
17	18	14	16	16	62	208	118	31	23	23	11	11
18	18	14	14	18	62	238	140	42	23	23	11	11
19	18	14	12	22	96	202	118	36	23	23	12	11
20	18	14	15	22	96	228	96	35	23	23	14	11
21	18	13	18	22	116	228	96	34	23	23	12	11
22	18	13	15	22	184	228	76	33	23	22	11	11
23	18	13	12	22	212	228	96	32	23	20	14	9
24	18	13	15	22	184	228	96	31	23	23	13	9
25	18	13	12	22	240	228	96	31	23	22	12	9
26	18	12	12	22	270	256	76	31	23	20	11	9
27	18	12	12	22	240	206	76	31	23	20	11	9
28	18	12	12	24	255	200	58	31	23	20	11	9
29	18	12	17	25	300	227	58	31	23	20	11	9
30	18	.....	12	35	184	174	58	31	23	18	11	9
31	18	.....	12	.....	240	.....	58	31	.....	16	.....	11

NOTE.—Daily discharge determined as follows: Jan. 1 to June 11, from a fairly well defined curve; June 12 to 30, by indirect method for shifting channels; July 1 to Dec. 31, from a fairly well defined curve based on one measurement in 1912 and two in 1913. Discharge interpolated for days for which gage heights are missing.

Monthly discharge of Cement Creek near Crested Butte, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	18	18	18.0	1,110	C.
February	18	12	14.7	846	C.
March	18	12	13.9	855	C.
April	35	12	19.3	1,150	B.
May	300	25	108	6,640	B.
June	330	174	240	14,300	C.
July	165	58	117	7,190	C.
August	58	31	38.1	2,340	C.
September	29	23	24.0	1,430	C.
October	23	16	21.7	1,330	C.
November	23	11	14.8	881	C.
December	11	9	10.5	646	C.
The year	330	9	53.3	38,700	

QUARTZ CREEK NEAR PITKIN, COLO.

Location.—On highway bridge in sec. 8, T. 50 N., R. 4 E., New Mexico principal meridian, 1 mile southwest of Pitkin. Nearest tributary enters about 2 miles below the station.

Records available.—December 12, 1910, to December 31, 1912.

Drainage area.—53 square miles (measured from Forest Atlas).

Gage.—Vertical staff.

Channel.—Apparently permanent.

Discharge measurements.—Made by wading.

Winter flow.—Ice causes little if any backwater at this station.

Diversions.—No water is diverted above the station. Below the station there are court decrees for 30 second-feet.

Accuracy.—Owing to the high altitude of the drainage basin, alternate melting and freezing may cause diurnal fluctuations in stage at certain seasons; therefore the mean daily stage as determined from one reading may be considerably in error. For this reason the estimates can not be considered better than fair or, possibly, good.

Cooperation.—Station maintained in cooperation with the United States Forest Service.

Discharge measurements of Quartz Creek near Pitkin, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Mar. 15*a*	J. L. Mathias	0.56	21.8
Apr. 17	H. B. Waha	.60	24.8
June 10	do	1.80	263
Oct. 2	R. H. Fletcher	.80	30.1

a Slight ice along edges.

Daily gage height, in feet, of Quartz Creek near Pitkin, Colo., for 1912.

[John B. Camman, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	0.5	0.55	0.55	0.7	1.65	1.4	1.1	0.85	.....	.....	.....
2	1.2	.5	.55	.55	.75	1.9	1.4	.....	.85	0.8	0.8	.....
3	.65	.5	.55	.55	.75	1.9	1.35	.....	.85	.....	.....	.....
4	.65	.5	.55	.55	.8	1.9	1.35	1.0	.85	.....	.....	0.68
5	.65	.5	.55	.55	.....	1.9	1.35	1.0	.8	.....	.....	.65
6	.65	.5	.55	.55	.8	1.9	1.25	1.0	.8	.....	.9	.65
7	.65	.5	.55	.55	.7	1.85	1.2	.9	.8	.8	.....	.....
8	.65	.5	.55	.6	.75	1.85	1.25	.9	.....	.81	.8	.....
9	.65	.5	.55	.6	.75	1.85	1.2	.9	.....	.82	.....	.....
10	.65	.5	.55	.6	.75	1.8	1.25	.9	.....	.81	.....	.....
11	.65	.5	.55	.6	.8	1.8	1.25	.9	.....	.....	.....	.64
12	.65	.5	.55	.6	.8	1.8	1.25	.9	.....	.8	.....	.64
13	.65	.5	.55	.6	.85	1.7	.....	.9	.....	.....	.....	.....
14	.65	.5	.55	.6	.85	1.65	.....	.9	.....	.82	.....	.....
15	.65	.5	.55	.6	.85	1.75	.....	.9	.....	.....	.....	.....
16	.....	.5	.55	.6	.85	1.7	.....	.9	.....	.75	.....	.....
17	.6	.5	.55	.6	.85	1.6	.....	.9	.....	.....	.58	.....
18	.6	.5	.55	.6	1.2	1.6	.....	.9	1.0	.....	.....	.....
19	.6	.5	.55	.6	1.2	1.6	.....	.9	.....	.71	.51	.....
20	.6	.5	.55	.6	1.25	1.55	.....	.9	.92	.....	.51	.....
21	.....	.55	.55	.6	1.25	1.55	1.25	.9	.81	.....	.....	.....
22	.6	.55	.55	.6	1.5	1.55	1.25	.9	.....	.8	.....	.....
23	.55	.55	.55	.6	1.5	1.55	1.25	.9	.78	.78	.....	.....
24	.55	.6	.55	.6	1.7	.....	1 25	.....	.75	.....	.....	.....
25	.55	.6	.55	.6	1.75	.....	.....	.....	.72	.....	.7	.....
26	.55	.6	.55	.6	1.75	1.6	1.25	.....	.7	.....	.....	.....
27	.55	.6	.55	.6	1.8	1.55	1.25	.....	.7	.....	.69	.....
28	.55	.6	.55	.....	1.85	1.55	.....	.....	.....	.....	.....	.....
29	.5	.55	.55	.7	1.85	1.55	.....	.85	.....	.79	.....	.....
30	.5	.....	.55	.7	1.9	1.5	1.15	.85	.....	.75	.69	.....
31	.5	.....	.....	.....	1.8	.....	.....	.85	.....	.....	.....	.....

Daily discharge, in second-feet, of Quartz Creek near Pitkin, Colo., for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	25	20	22	22	27	189	112	61	37	32	32	27
2	25	20	22	22	30	296	112	57	37	33	33	26
3	25	20	22	22	30	296	102	54	37	33	35	26
4	25	20	22	22	33	296	102	50	37	33	37	26
5	25	20	22	22	33	296	102	50	33	33	39	25
6	25	20	22	22	33	296	82	50	33	33	41	25
7	25	20	22	22	27	274	74	41	33	33	37	25
8	25	20	22	23	30	274	82	41	33	34	33	25
9	25	20	22	23	30	274	74	41	34	35	32	25
10	25	20	22	23	30	252	82	41	36	34	29	25
11	25	20	22	23	33	252	82	41	38	34	28	25
12	25	20	22	23	33	252	82	41	40	33	27	25
13	25	20	22	23	37	208	82	41	42	34	26	.....
14	25	20	22	23	37	189	82	41	44	35	25	.....
15	25	20	22	23	37	230	82	41	46	32	24	.....
16	24	20	22	23	37	208	82	41	48	30	23	.....
17	23	20	22	23	37	170	82	41	50	30	22	.....
18	23	20	22	23	74	170	82	41	50	29	21	.....
19	23	20	22	23	74	170	82	41	46	28	20	.....
20	23	20	22	23	82	154	82	41	43	30	20	.....
21	23	22	22	23	82	154	82	41	34	32	20	.....
22	23	22	22	23	138	154	82	41	33	33	22	.....
23	22	22	22	23	138	154	82	41	32	32	24	.....
24	22	23	22	23	208	160	82	41	30	32	26	.....
25	22	23	22	23	230	165	82	40	28	32	27	.....
26	22	23	22	25	230	170	82	39	27	32	27	.....
27	22	23	22	23	252	154	82	38	27	32	27	.....
28	22	23	22	25	274	154	78	37	28	32	27	.....
29	20	22	22	27	274	154	73	37	29	32	27	.....
30	20	.....	22	27	296	138	68	37	30	30	27	.....
31	20	.....	22	.....	252	.....	64	37	.....	31	.....	.....

NOTE.—Daily discharge computed from a fairly well defined curve. Discharge interpolated for days of missing gage heights. Mean discharge Dec. 13 to 31 estimated as 22 second-feet.

Monthly discharge of Quartz Creek near Pitkin, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	25	20	23.5	1,440	C.
February	23	20	20.8	1,200	C.
March	22	22	22.0	1,350	C.
April	27	22	23.1	1,370	B.
May	296	27	102	6,270	C.
June	296	138	210	12,500	B.
July	112	64	83.9	5,160	C.
August	61	37	42.7	2,630	B.
September	50	27	36.5	2,170	B.
October	35	30	32.2	1,980	B.
November	41	20	27.9	1,660	B.
December	27	.....	23.3	1,430	C.
The year	296	20	54.0	39,200	

SAPINERO [1] CREEK AT SAPINERO, COLO.

Location.—At highway bridge in sec. 28, T. 49 N., R. 4 W., New Mexico principal meridian, half a mile northeast of Sapinero. No tributaries below the station.

Records available.—March 17, 1911, to November 20, 1912.

Drainage area.—84 square miles (measured from Forest Atlas).

[1] Known locally as Soap Creek.

Gage.—Vertical staff.

Channel.—Shifting after high water.

Discharge measurements.—Made from bridge during high water and by wading at ordinary stages.

Winter flow.—Ice causes backwater during the winter months.

Diversions.—Water sufficient to irrigate approximately 300 acres is diverted above the station.

Accuracy.—Owing to the shifting channel and the infrequency of gage heights and measurements the estimates can not be considered better than approximate or fair.

Cooperation.—Station maintained in cooperation with the United States Forest Service.

Discharge measurements of Sapinero Creek at Sapinero, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 18	J. L. Mathias	−0.17	[a] 20.6	June 12	H. B. Waha	2.05	434
Apr. 19	H. B. Waha	+.39	53.5	13	do	2.05	434
20	do	.35	46.6	Sept. 30	R. H. Fletcher	.37	11.4
20	do	.35	49.7				

[a] Measurement made under complete ice cover. Water flowing freely under ice.

Daily gage height, in feet, of Sapinero Creek at Sapinero, Colo., for 1912.

[Lester J. Stoner, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1			0.1	0.15				0.8		0.4	0.4
2			.1	.15				.8	0.3	.4	.4
3			.1	.2				.8	.3		
4			.05	.4				.7		.4	
5			.1	.45				.7	.3		
6	1.6								.4	.4	.4
7		0.0	.0	.38			1.5			.4	.45
8		.0	.0	.42			1.4	.6			
9		.0	.0	.72				.6			
10		.0					1.3		.3		.4
11		.0	— .2	.6			1.4		.3	.4	
12			— .2	.6			1.4	.5			.4
13			.0	.5			1.3	.5			
14							1.3		.3		
15	.0			.4			1.3	.6		.4	
16		.0	— .3	.4			1.3	.6			.4
17	.0	.0		.4			1.2				
18	.0	.0	— .17	.4						.4	
19	.0	.1	.15	.36					.55		
20	.0	.05	.1	.35			1.1		.45		.6
21			.15				1.0				
22	.0	.0	.15	.28			1.0			.4	
23	.0	.0	.2	.25				.4			
24	.0	.0		.35				.4	.35		
25	.0		.0	.4							
26			.2	.45			.9	.4	.35		
27		.0	.1	.6			.9		.35	.4	
28		.0	.15	.5			.9				
29		.0	.18	.7			.9				
30			.2				.8		.37		
31							.8				

NOTE.—Ice present Jan. 1 to Mar. 9, and Nov. 20.

Daily discharge, in second-feet, of Sapinero Creek at Sapinero, Colo., for 1912.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	32	.....	.....	.....	60	10	16	16
2	.....	32	.....	.....	.....	60	9	16	16
3	.....	35	.....	.....	.....	60	9	16	16
4	.....	55	.....	.....	.....	45	9	16	16
5	.....	62	.....	.....	.....	45	9	16	16
6	.....	58	.....	.....	.....	40	16	16	16
7	.....	53	.....	.....	185	35	14	16	20
8	.....	58	.....	.....	164	30	12	16	18
9	.....	104	.....	.....	154	30	11	16	17
10	.....	95	.....	.....	144	28	9	16	16
11	16	85	.....	.....	164	25	9	16	16
12	16	85	.....	.....	164	23	9	16	16
13	22	70	.....	.....	144	23	9	16	16
14	20	62	.....	.....	144	26	9	16	16
15	16	55	.....	.....	144	30	12	16	16
16	14	55	.....	.....	144	30	15	16	16
17	15	55	.....	.....	126	28	18	16	.....
18	17	55	.....	.....	120	26	22	16	.....
19	32	50	.....	.....	114	24	26	16	.....
20	28	49	.....	.....	108	22	20	16	.....
21	32	40	.....	.....	90	20	18	16	.....
22	32	41	.....	.....	90	18	16	16	.....
23	35	39	.....	.....	86	16	14	16	.....
24	28	49	.....	.....	84	16	12	16	.....
25	22	55	.....	.....	80	16	12	16	.....
26	35	62	.....	.....	75	16	12	16	.....
27	28	85	.....	.....	75	14	12	16	.....
28	32	70	.....	.....	75	13	13	16	.....
29	34	100	.....	.....	75	12	14	16	.....
30	35	.....	.....	.....	60	11	14	16	.....
31	34	.....	.....	.....	60	11	.....	16	.....

NOTE.—Daily discharge computed from two fairly well defined curves. No estimates of discharge for the period during which relation of gage height to discharge was affected by ice. Discharge interpolated for days for which gage heights are missing, except April 30 to July 6.

Monthly discharge of Sapinero Creek at Sapinero, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
March (11-31)	35	14	25.9	1,080	C.
April (1-29)	104	32	60.2	3,460	C.
July (7-31)	185	60	115	5,700	C.
August	60	11	27.5	1,690	C.
September	26	9	13.1	780	C.
October	16	16	16.0	984	C.
November (1-16)	20	16	16.4	520	C.
The period	.....	.....	.....	14,200	

UNCOMPAHGRE RIVER AT OURAY, COLO.

Location.—Near highway bridge in sec. 31, T. 44 N., R. 7 W. New Mexico principal meridian, half a mile south of Ouray, Colo. Nearest tributary, Canon Creek, enters 150 feet below; nearest tributary above is Bear Creek.

Records available.—January 25, 1911, to December 31, 1912. January 7 to March 17, 1908, records were kept at the power plant of the Ouray Electric Light & Power Co., 1 mile south of Ouray, and were furnished through the courtesy of Wheeler & Whinnerah.

Drainage area.—44 square miles (measured on topographic sheet).

Gage.—Vertical staff.

Channel.—Permanent except at time of high water, when channel scours and fills.

Discharge measurements.—Made from bridge during high water and by wading at ordinary stages.

Winter flow.—Little if any backwater from ice at this station, as channel remains open during the year.

Diversions.—Water is diverted 2 miles above the station by the Ouray Light & Power Co. This amounts approximately to 8 second-feet and is returned to the river below the station.

Accuracy.—Owing to the high altitude of the drainage basin, alternate melting and freezing may cause diurnal fluctuations in stage at certain seasons. Therefore the mean daily stage as determined from one reading may be considerably in error. For this reason the estimates can not be considered better than fair or, possibly, good.

Cooperation.—Station maintained in cooperation with the United States Forest Service.

Discharge measurements of Uncompahgre River at Ouray, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Mar. 20	J. L. Mathias	0.67	22.6
Apr. 21	H. B. Waha	.30	9.4
June 14	....do	2.10	[a]215
Sept. 29	R. H. Fletcher	.28	13.4

[a] Discharge obtained by subtracting the flow of Canon Creek from flow of the Uncompahgre below its junction with Canon Creek.

Daily gage height, in feet, of Uncompahgre River at Ouray, Colo., for 1912.

[T. J. Watkins, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.3	0.0	0.0	0.3	1.0	2.9	2.5	1.6	0.8	0.3	0.35	−0.1
2	.3	− .1	.....	.45	1.0	3.0	2.4	1.6	.8	.3	.35	+ .1
3	.3	− .1	.1	.4	.9	3.4	2.2	1.5	.7	.3	.35	.2
4	.3	+ .1	.1	.55	.9	3.4	2.0	1.4	.7	.3	.35	.1
5	.35	.1	.1	.45	.9	3.4	1.8	1.2	.5	.3	.25	− .15
6	.4	.....	.15	.4	.8	3.1	1.8	1.2	.6	.4	.35	− .35
7	.35	.....	.2	.6	.....	2.8	1.9	1.2	.6	.4	.35	− .2
8	.3	.15	.35	.7	.....	2.9	2.0	1.1	.6	.4	.35	.0
9	.25	.2	.05	.8	.....	3.1	2.1	1.0	.55	.4	.35	.0
10	.35	.2	.2	.9	.....	3.0	2.0	.8	.45	.3	.25	.0
11	.3	.2	.3	.7	.....	2.9	2.0	.9	.5	.5	.35	− .1
12	.25	.15	.5	.7	.....	2.5	2.1	.9	.....	.5	.35	− .1
13	.2	.1	.05	.6	.....	2.2	2.0	.8	.5	.7	.35	− .2
14	.2	.1	.0	.5	.....	2.1	2.0	.8	.5	.6	.35	− .2
15	.25	.2	.0	.38	.....	2.3	1.9	.6	.5	.5	.25	− .1
16	.25	.1	.1	.45	.....	2.4	2.0	.....	.6	.5	.35	− .1
17	.....	− .05	.1	.4	.....	2.3	1.9	.....	.6	.5	.35	− .1
18	.2	+ .15	.2	.4	.....	2.0	1.8	.9	.....	.4	.3	− .2
19	.2	.15	.25	.4	.....	1.9	1.8	.9	.....	.4	.3	− .2
20	.1	.15	.66	.4	.....	2.1	1.8	.7	.4	.3	.2	− .2
21	.1	.15	.4	.28	.....	2.3	1.8	.7	.4	.4	.2	− .2
22	.2	.1	.3	.25	2.4	2.6	1.8	.7	.3	.4	.2	− .2
23	.2	.05	.15	.2	2.6	2.7	1.7	.6	.3	.4	.15	− .2
24	.2	.1	.15	.45	3.0	2.6	1.7	.6	.3	.4	.15	− .2
25	.15	.1	.3	.55	3.0	2.7	1.6	.5	.2	.4	.0	− .2
26	.15	.1	.35	.6	2.9	.....	.....	.6	.3	.5	− .2	− .2
27	.15	.05	.2	.58	3.0	.....	.....	.6	.3	.6	− .2	− .2
28	.2	.0	.2	.65	3.0	2.7	1.9	.6	.3	.5	− .25	− .2
29	.15	− .1	.25	.75	3.2	2.9	2.0	.7	.3	.5	− .25	− .2
30	.1	.....	.25	.9	3.4	2.7	1.7	.7	.2	.3	− .35	− .2
31	.0	.....	.28	.....	3.0	.....	1.7	.8	.....	.4	.....	− .2

NOTE.—Observer absent May 7 to 21.

Daily discharge, in second-feet, of Uncompahgre River at Ouray, Colo., for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	9	2	2	9	53	400	300	133	40	13	14	4
2	9	0	3	14	53	425	277	133	40	13	14	8
3	9	0	4	12	43	525	236	119	32	13	14	10
4	9	4	4	18	43	525	199	105	32	13	14	8
5	10	4	4	14	43	525	164	80	20	13	12	3.5
6	12	4	5.2	12	32	450	164	80	25	16	14	1.8
7	10	5	6.5	20	47	375	181	80	25	16	14	3
8	9	5.2	10	25	62	400	199	69	25	16	14	6
9	7.8	6.5	3	32	77	450	217	59	22	16	14	6
10	10	6.5	6.5	43	92	425	199	40	18	13	12	6
11	9	6.5	9	25	107	400	199	49	20	20	14	4
12	7.8	5.2	16	25	122	300	217	49	20	20	14	4
13	6.5	4	3	20	137	236	199	40	20	32	14	3
14	6.5	4	2	16	152	217	199	40	20	25	14	3
15	7.8	6.5	2	11	167	256	181	25	20	20	12	4
16	7.8	4	4	14	182	277	199	32	25	20	14	4
17	7.2	1	4	12	197	256	181	40	25	20	14	4
18	6.5	5.2	6.5	12	212	199	164	49	20	16	13	3
19	6.5	5.2	7.8	12	227	181	164	49	20	16	13	3
20	4	5.2	23	12	243	217	164	32	16	13	10	3
21	4	5.2	12	8.5	259	256	164	32	16	16	10	3
22	6.5	4	9	7.8	277	325	164	32	13	16	10	3
23	6.5	3	5.2	6.5	325	350	148	25	13	16	9	3
24	6.5	4	5.2	14	425	325	148	25	13	16	9	3
25	5.2	4	9	18	425	350	133	20	10	16	6	3
26	5.2	4	10	20	400	350	149	25	13	20	3	3
27	5.2	3	6.5	19	425	350	165	25	13	25	3	3
28	6.5	2	6.5	22	425	350	181	25	13	20	2.5	3
29	5.2	0	7.8	28	475	400	199	32	13	20	2.5	3
30	4	.....	7.8	43	525	350	148	32	10	13	1.8	3
31	2	.....	8.5	.....	425	.....	148	40	.....	16	.....	3

NOTE.—Daily discharge determined as follows: Jan. 1 to May 31, from 1911 curve, which is fairly well defined; June 1 to Dec. 31, a poorly defined curve. Discharge interpolated for days for which gage heights are missing.

Monthly discharge of Uncompahgre River at Ouray, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (in total acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	12	2	7.14	439	B.
February	6.5	0	3.90	224	B.
March	23	2	6.87	422	B.
April	43	6.5	18.2	1,080	A.
May	525	32	215	13,200	C.
June	525	181	348	20,700	C.
July	300	133	186	11,400	C.
August	133	20	52.1	3,200	C.
September	40	10	19.8	1,180	C.
October	32	13	17.4	1,070	C.
November	14	1.8	10.8	643	C.
December	10	1.8	4.01	246	C.
The year	525	0	74.1	53,800	

UNCOMPAHGRE RIVER AT MONTROSE, COLO.

Location.—At highway bridge, one-fourth mile west of Montrose. Nearest important tributary, Happy Canyon Creek, enters about 2 miles below.

Records available.—April 22, 1903, to September 30, 1912.

Drainage area.—565 square miles.

Gage.—Vertical staff; location and datum unchanged.

Channel.—Extremely shifting.

Discharge measurements.—Made from the bridge.

Winter flow.—Although ice forms along the edges of the river during the winter months the river does not freeze over. Observations of gage heights are, however, discontinued during November, December, January, February, and March.

Diversions.—Uncompahgre River is so overappropriated that the United States Reclamation Service is constructing a tunnel and canal to divert 1,300 second-feet from Gunnison River into the Uncompahgre above Uncompahgre.

Accuracy.—Although the channel is extremely shifting, sufficient discharge measurements were made during 1912 to afford data for estimates by the indirect method, and these estimates may be considered reliable.

Cooperation.—Station maintained in cooperation with the United States Reclamation Service, by which the field data are furnished.

Discharge measurements of Uncompahgre River at Montrose, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 26	E. H. Swett	1.94	57	July 22	E. H. Sweet	4.15	676
May 23	do	5.03	1,180	Aug. 2	do	3.10	240
June 4	do	6.18	1,870	6	do	1.80	19.1
18	do	3.30	223	30	do	2.54	94.3
July 8	do	3.62	426				

Daily gage height, in feet, and discharge, in second-feet, of Uncompahgre River at Montrose, Colo., for 1912.

[Alfred Reeves, observer.]

Day.	Apr.		May.		June.		July.		Aug.		Sept.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	.....	.....	2.88	201	4.7	970	4.8	1,030	3.2	280	2.4	75
2	.....	.....	2.89	203	5.1	1,210	4.55	880	2.65	155	2.32	63
3	.....	.....	2.74	173	5.6	1,510	4.45	820	2.35	108	2.35	68
4	.....	.....	2.6	145	5.8	1,630	4.48	838	2.15	78	2.32	63
5	.....	.....	2.68	161	5.8	1,630	4.2	690	1.55	8	2.22	52
6	.....	.....	2.82	189	5.8	1,630	3.9	540	2.0	30	2.25	55
7	.....	.....	2.98	225	4.9	1,090	3.25	295	2.25	55	2.3	60
8	.....	.....	3.32	316	5.0	1,150	3.3	310	2.45	82	2.25	55
9	.....	.....	3.2	280	4.95	1,120	3.42	346	2.75	128	2.35	68
10	.....	.....	2.55	138	4.95	1,120	3.3	310	2.55	98	2.32	63
11	.....	.....	2.35	108	4.95	1,120	3.2	280	2.35	68	2.35	68
12	.....	.....	2.3	100	5.2	1,270	3.12	260	2.55	98	2.25	55
13	2.7	165	2.18	82	4.32	750	3.2	280	2.55	98	2.28	58
14	2.56	139	2.18	82	3.68	442	3.25	295	2.35	68	2.28	58
15	2.44	121	2.24	92	3.48	362	3.08	250	2.48	87	2.4	75
16	1.9	52	2.65	155	3.6	410	3.15	268	2.38	72	2.28	58
17	1.38	22	3.75	470	3.38	334	3.3	310	2.45	82	2.25	55
18	1.38	22	4.42	802	3.3	310	3.25	295	2.45	82	2.32	63
19	1.44	25	4.34	760	3.1	255	3.4	340	2.42	78	2.35	68
20	1.42	24	4.41	796	3.05	242	3.35	325	2.45	82	2.42	78
21	1.49	26	5.01	1,160	3.05	242	3.35	325	2.45	82	2.3	60
22	1.54	29	4.9	1,090	3.3	310	3.15	268	2.4	75	2.3	60
23	1.58	31	4.95	1,120	3.85	515	3.3	310	2.4	75	2.35	68
24	1.67	36	5.05	1,180	4.25	715	3.3	310	2.38	72	2.38	72
25	1.82	46	5.3	1,330	4.5	850	3.45	355	2.25	55	2.25	55
26	1.9	52	5.4	1,390	4.45	820	3.62	418	1.95	28	2.3	60
27	1.87	50	5.2	1,270	4.55	880	3.65	430	2.05	35	2.35	68
28	2.1	70	5.25	1,300	4.5	850	3.79	486	1.9	25	2.25	55
29	2.5	130	5.3	1,330	4.48	838	3.7	450	2.2	50	2.4	75
30	2.78	181	5.55	1,480	5.0	1,150	3.55	390	2.25	55	2.28	58
31	.....	.....	5.25	1,300	.....	.....	3.36	328	2.45	82	.....	.....

NOTE.—Daily discharge computed by indirect method for shifting channels.

Monthly discharge of Uncompahgre River at Montrose, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April 13–30	181	22	67.8	2,420	B.
May	1,480	82	627	38,600	B.
June	1,630	242	857	51,000	B.
July	1,030	250	420	25,800	B.
August	280	8	79.7	4,900	C.
September	78	52	63.0	3,750	C.
The period				126,000	

UNCOMPAHGRE RIVER NEAR DELTA, COLO.

Location.—At highway bridge on township line between Tps. 95 and 96, 2 miles south of Delta; no tributaries between the station and the mouth and no important tributaries for several miles upstream.

Records available.—April 29, 1903, to September 30, 1912.

Drainage area.—1, 130 square miles.

Gage.—Vertical staff. The gage was originally located at a highway bridge one-fourth mile above the Denver & Rio Grande Railroad bridge. On November 17, 1903, it was moved to the railroad bridge, where it was read until April 21, 1904. An inclined gage was installed near the bridge on April 21, 1904, which was used until November, 1906, when a staff gage was installed at the present site. April 16, 1910, a new gage was installed at a datum slightly different from the preceding. The relation between the gages at the various sites was not determined.

Channel.—Extremely shifting.

Discharge measurements.—Made from the bridge.

Winter flow.—The flow is probably not materially affected by ice, although ice forms along the edges and slush ice frequently occurs. Observations are discontinued during the winter months.

Diversions.—The normal flow is diverted during the irrigation season by ditches above the station, so that the records represent largely return seepage water.

Accuracy.—Estimates only fair or, for certain periods, possibly good, measurements being insufficient to permit use of indirect method for shifting channels to fullest extent.

Cooperation.—Station maintained in cooperation with the United States Reclamation Service, which furnishes the field data.

Discharge measurements of Uncompahgre River near Delta, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 19	E. H. Swett	1.57	93	June 6	E. H. Swett	3.73	1,630
May 11	do	2.32	278	July 24	do	2.28	600
28	do	3.85	1,620	Sept. 6	do	.66	44

Daily gage height, in feet, and discharge, in second-feet, of Uncompahgre River near Delta, Colo., for 1912.

[Mrs. W. J. Lance, observer.]

Day.	Apr.		May.		June.		July.		Aug.		Sept.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	.....	.....	2.55	380	3.5	1,390	3.05	1,080	1.65	300	0.6	35
2	.....	.....	2.75	460	3.4	1,320	2.75	870	1.5	245	.65	42
3	.....	.....	2.8	480	3.65	1,510	2.45	690	1.25	168	.6	35
4	.....	.....	2.4	320	3.85	1,670	2.2	550	1.05	118	.65	42
5	.....	.....	2.3	280	3.75	1,590	2.3	600	1.0	105	.7	50
6	.....	.....	2.15	235	3.7	1,550	1.6	280	.95	95	.75	58
7	.....	.....	2.15	235	3 2	1,180	1.75	340	.75	58	.6	35
8	.....	.....	2.65	420	3.0	1.040	1.75	340	.65	42	.7	50
9	.....	.....	3.0	565	2.95	1,000	1.55	262	.6	35	.7	50
10	.....	.....	2.8	480	2.95	1,000	1.4	210	.65	42	.75	58
11	.....	.....	2.7	440	2.8	900	1.15	142	1.0	105	.8	65
12	.....	.....	2.85	500	2.6	780	1.0	105	.95	95	.8	65
13	.....	.....	2.8	480	2.5	720	1.0	105	.7	50	.75	58
14	.....	.....	2.6	400	2.0	450	1.05	118	.7	50	.85	75
15	.....	.....	2.3	280	1.65	300	1.0	105	.85	75	1.25	168
16	1.8	140	2.4	320	1.5	245	1.0	105	1.1	130	1.1	130
17	1.8	140	3.0	565	1.75	340	.8	65	.95	95	1.2	155
18	1.75	128	3.55	940	1.8	360	.7	50	.9	85	1.35	195
19	1.55	80	4.1	1,240	1.45	228	1.5	245	.9	85	1.3	180
20	1.5	70	4.25	1,330	1.3	180	2.25	575	.8	65	1.3	180
21	1.4	55	4.35	1,600	1.55	262	2.15	525	.85	75	1.3	180
22	1.25	35	4.4	1,640	1.8	360	2.3	600	.7	50	1.4	210
23	1.2	30	4.0	1,380	1.9	400	2.45	690	.65	42	1.4	210
24	1.2	30	3.9	1,490	2.85	935	2.25	575	.6	35	1.5	245
25	1.3	40	4.0	1,570	2.7	840	2.25	575	.6	35	1.5	245
26	1.45	62	4.05	1,830	3.05	1,080	2.5	720	.6	35	1.5	245
27	1.25	35	3.95	1,750	3.0	1,040	3.0	1,040	.7	50	1.5	245
28	1.4	55	3.7	1,550	2.95	1,000	2.6	780	.7	50	1.5	245
29	1.95	178	3.75	1,590	3.1	1,110	1.95	425	.6	35	1.4	210
30	2.1	220	3.85	1,670	3.3	1,250	1.9	400	.6	35	1.3	180
31	.....	.....	3.4	1,320	.....	.....	1.85	380	.8	65	.....	.....

NOTE.—Daily discharge Apr. 16 to May 25 computed by indirect method for shifting channels. Daily discharge May 26 to Sept. 30 computed from a poorly defined rating curve.

Monthly discharge of Uncompahgre River near Delta, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April	220	30	86.5	2,580	C.
May	1,830	235	895	55,000	D.
June	1,670	180	868	51,600	C.
July	1,080	50	437	26,900	C.
August	300	35	82.3	5,060	C.
September	245	35	131	7,800	C.
The period	.....	.....	.....	149,000	

CANYON CREEK AT OURAY, COLO.

Location.—At Ouray, Colo., in sec. 31, T. 44 N., R. 7 W., New Mexico principal meridian, in the Uncompahgre National Forest, 200 feet above the mouth of the creek. Nearest tributary, a small stream, enters from the east some distance above.

Records available.—January 25, 1911, to December 31, 1912.

Drainage area.—26 square miles (measured on topographic sheets).

Gage.—Vertical staff.

Channel.—Shifting.

Discharge measurements.—Made from near-by footbridge during highwater and by wading at ordinary stages.

Winter flow.—Ice causes practically no backwater at this station.

Diversions.—No water is diverted above the station, so the records represent the natural run-off.

Accuracy.—Owing to the high altitude of the drainage basin, alternate melting and freezing causes diurnal fluctuations of stage at certain seasons. Therefore the mean daily stage as determined from one reading may be considerably in error. For this reason the estimates of discharge, in general, can not be considered better than fair.

Cooperation.—Station maintained in cooperation with the United States Forest Service.

Discharge measurements of Canyon Creek at Ouray, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Mar. 20	J. L. Mathias	0.10	7.4
Apr. 21	H. B. Waha	.20	10.0
June 14	do	1.30	173
Sept. 29	R. H. Fletcher	−.10	13.3

Daily gage height, in feet, of Canyon Creek at Ouray, Colo., for 1912.

[T. J. Watkins, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.15	0.1	0.1	0.18	0.7	1.9	2.0	1.0	0.4	−0.1	−0.15	−0.35
2	.15	.1	.....	.25	.7	2.1	1.8	1.0	.4	− .1	− .15	− .35
3	.15	.1	.1	.22	.6	2.4	1.6	.9	.4	− .1	− .15	− .25
4	.15	.1	.1	.3	.5	2.7	1.4	.8	.4	− .1	− .15	− .25
5	.15	.1	.0	.3	.5	2.5	1.2	.7	.3	− .1	− .15	− .3
6	.15	.1	− .1	.25	.4	2.2	1.0	.6	.3	− .1	− .2	− .3
7	.15	.1	− .1	.3	.....	2.0	1.2	.6	.2	.0	− .2	− .3
8	.15	.1	.1	.4	.....	2.0	1.3	.6	.1	.0	− .2	− .3
9	.15	.1	.05	.5	.....	2.1	1.4	.5	.05	− .1	− .2	− .3
10	.15	.1	.1	.6	.....	2.0	1.5	.5	.05	− .1	− .2	− .3
11	.1	.1	.15	.4	.....	1.8	1.4	.5	.....	− .1	− .2	− .25
12	.1	.1	.15	.4	.....	1.6	1.5	.5	.....	.0	− .2	− .3
13	.1	.1	.1	.35	.....	1.5	1.5	.5	.....	.2	− .25	− .3
14	.1	.1	.1	.35	.....	1.3	1.5	.5	.05	.2	− .25	− .4
15	.15	.1	.1	.3	.....	1.3	1.5	.4	.0	.2	− .3	− .4
16	.15	.1	.1	.3	.....	1.3	1.5	.....	.0	.1	− .3	− .4
17	.....	.15	.1	.3	.....	1.4	1.4	.....	.0	.0	− .3	− .4
18	.15	.1	.15	.25	.....	1.2	1.4	.5	.....	.0	− .3	− .4
19	.15	.1	.15	.25	.....	1.1	1.3	.5	.....	− .1	− .3	− .4
20	.1	.1	.08	.25	.....	1.4	1.4	.4	.0	− .1	− .3	− .4
21	.1	.1	.1	.2	.....	1.5	1.4	.4	− .1	− .1	− .35	− .4
22	.2	.1	.1	.2	1.5	1.8	1.3	.4	− .1	− .1	− .35	− .4
23	.15	.1	.1	.2	1.6	1.8	1.3	.4	− .1	− .1	− .35	− .4
24	.15	.1	.1	.25	1.9	1.8	1.3	.4	− .1	− .1	− .35	− .4
25	.15	.1	.15	.3	1.9	1.9	1.3	.3	− .1	− .1	− .4	− .4
26	.15	.1	.18	.3	1.8	.....	.....	.3	− .05	− .1	− .4	− .4
27	.15	.1	.15	.3	1.9	.....	.....	.3	− .05	− .1	− .4	− .4
28	.15	.1	.12	.35	1.9	2.0	1.3	.3	− .05	− .1	− .4	− .4
29	.1	.05	.15	.4	2.1	2.1	1.3	.4	− .05	− .1	− .4	− .4
30	.1	.....	.15	.45	2.3	2.0	1.2	.4	− .1	− .1	− .4	− .4
31	.1	.....	.18	.....	2.0	.....	1.1	.4	.....	− .1	.....	− .4

Daily discharge, in second-feet, of Canyon Creek at Ouray, Colo., for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	8	6	6	9	54	248	284	127	49	14	12	6
2	8	6	6	13	54	284	252	127	49	14	12	6
3	8	6	6	11	43	338	220	112	49	14	12	8
4	8	6	6	16	32	392	188	97	49	14	12	8
5	8	6	4	16	32	364	157	83	40	14	12	7
6	8	6	3	13	23	316	127	71	40	14	10	7
7	8	6	3	16	.....	284	157	71	31	18	10	7
8	8	6	6	23	.....	284	172	71	24	18	10	7
9	8	6	5	32	.....	300	188	59	21	14	10	7
10	8	6	6	43	.....	284	204	59	21	14	10	7
11	6	6	8	23	.....	252	188	59	21	14	10	8
12	6	6	8	23	.....	220	204	59	21	18	10	7
13	6	6	6	20	.....	204	204	59	21	31	8	7
14	6	6	6	20	.....	172	204	59	21	31	8	5
15	8	6	6	16	.....	172	204	49	18	31	7	5
16	8	6	6	16	.....	172	204	52	18	24	7	5
17	8	8	6	16	.....	188	188	56	18	18	7	5
18	8	6	8	13	.....	157	188	59	18	18	7	5
19	8	6	8	13	.....	142	172	59	18	14	7	5
20	6	6	6	13	.....	188	188	49	18	14	7	5
21	6	6	6	10	.....	204	188	49	14	14	6	5
22	10	6	6	10	178	252	172	49	14	14	6	5
23	8	6	6	10	195	252	172	49	14	14	6	5
24	8	6	6	13	248	252	172	49	14	14	6	5
25	8	6	8	16	248	268	172	40	14	14	5	5
26	8	6	9	16	230	273	172	40	16	14	5	5
27	8	6	8	16	248	278	172	40	16	14	5	5
28	8	6	7	20	248	284	172	40	16	14	5	5
29	6	5	8	23	284	300	172	49	16	14	5	5
30	6	.....	8	28	320	284	157	49	14	14	5	5
31	6	.....	9	.....	266	.....	142	49	.....	14	.....	5

NOTE.—Daily discharge for periods Jan. 1 to June 4 and June 5 to Dec. 31 computed from two poorly defined curves, each of which is based on two measurements and the slope of the 1911 curve.

Monthly discharge of Canyon Creek at Ouray, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	10	6	7.48	460	C.
February	8	5	6.03	347	C.
March	9	3	6.45	397	C.
April	43	9	17.6	1,050	C.
May (16 days)	320	23	169	5,360	C.
June	392	142	254	15,100	C.
July	284	142	186	11,400	C.
August	127	40	62.6	3,850	C.
September	49	14	23.8	1,420	C.
October	31	14	16.6	1,020	C.
November	12	5	8.07	480	C.
December	8	5	5.87	361	C.
The period	.....	.....	.....	41,200	

DOLORES RIVER BASIN.

DOLORES RIVER AT DOLORES, COLO.

Location.—One-fourth mile southwest of the railroad station at Dolores, in Montezuma County, Colo. Nearest tributary, Lost Canyon Creek, enters some distance above the station.

Records available.—August 27, 1910, to December 6, 1912.

Drainage area.—524 square miles (State engineer's report).

Gage.—Automatic recording gage.

Channel.—Probably permanent.

Discharge measurements.—Made from bridge.

Diversions.—No data.

Cooperation.—Station is maintained and records are furnished complete for publication by the State engineer.

Discharge measurements of Dolores River at Dolores, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 30[a]	B. S. Clayton	.....	77	July 20	C. C. Hezmalhalch	3.50	487
Mar. 11[a]	do	3.05	85	Sept. 22	C. E. Turner	2.62	75
Apr. 18	do	3.29	332	Oct. 22	do	2.72	113
May 13	C. C. Hezmalhalch	5.80	2,575	Nov. 20	do	2.50	70
June 14	do	4.60	1,476				

[a] Relation of gage height to discharge affected by ice in stream.

Daily gage height, in feet, of Dolores River at Dolores, Colo., for 1912.

[Mrs. J. R. Hughes, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	4.9	3.8	3.05	4.5	5.4	4.4	3.85	3.85	2.6	3.45	2.75
2	.....	4.9	3.8	3.05	5.0	5.3	4.05	3.6	3.1	2.6	2.35	2.5
3	.....	4.9	4.0	3.2	5.0	5.3	3.9	3.35	2.5	2.65	3.0	2.65
4	.....	4.7	4.0	3.4	4.6	5.45	3.9	3.4	2.9	2.7	2.5	2.6
5	.....	4.4	4.0	3.4	4.4	5.45	3.7	3.3	2.75	3.0	2.8	2.7
6	.....	4.4	4.0	3.4	4.3	5.35	3.7	3.25	2.75	2.8	2.8	2.6
7	4.7	4.45	4.0	3.4	4.7	5.2	3.65	3.15	2.7	2.7	2.75	.....
8	4.7	4.0	4.0	3.5	5.5	5.2	3.55	3.1	2.65	2.7	2.5	.....
9	4.5	4.0	4.0	4.0	5.5	5.25	3.6	3.05	2.7	2.7	2.85	.....
10	4.55	4.0	3.95	4.05	4.9	5.3	3.6	3.05	2.7	2.7	2.95	.....
11	4.55	4.0	3.95	3.9	5.0	5.2	3.55	3.0	2.7	2.75	2.95	.....
12	4.55	4.0	3.7	3.9	5.7	4.9	3.5	3.0	2.65	2.75	2.8	.....
13	4.5	4.0	3.7	3.5	6.0	4.5	3.5	3.0	2.65	2.8	2.7	.....
14	4.5	4.0	3.7	3.5	5.3	4.3	3.7	3.0	2.6	2.7	2.75	.....
15	4.55	4.0	3.65	3.4	5.5	4.7	4.7	3.35	2.7	2.75	2.35	.....
16	4.2	4.0	3.6	3.5	6.1	4.35	4.35	3.15	2.7	2.75	2.75	.....
17	4.6	4.0	3.0	3.5	6.2	4.5	3.9	3.25	2.8	2.7	2.6	.....
18	4.6	4.0	3.0	3.3	6.3	4.3	3.8	3.15	2.6	2.7	2.65	.....
19	5.0	4.0	3.0	3.2	6.35	4.05	3.5	3.15	2.6	2.75	2.6	.....
20	4.9	4.0	3.0	3.2	6.4	4.15	3.5	3.0	2.6	2.75	2.45	.....
21	4.9	4.0	3.0	3.2	6.5	4.2	3.4	3.05	2.6	2.7	2.5	.....
22	4.9	4.0	3.0	3.2	6.55	4.3	3.35	2.9	2.6	2.7	2.6	.....
23	4.8	4.0	3.0	3.15	6.3	4.4	3.4	2.85	2.6	2.75	2.7	.....
24	4.7	4.0	3.0	3.55	6.5	4.5	3.5	2.85	2.6	2.7	2.8	.....
25	4.7	4.0	3.2	3.8	6.3	4.45	4.15	2.8	2.6	2.7	2.6	.....
26	4.75	4.0	3.3	3.7	6.2	4.35	3.6	2.85	2.6	2.7	2.7	.....
27	4.75	4.8	3.3	3.7	6.0	4.45	3.6	2.6	2.6	2.7	2.45	.....
28	4.7	4.8	3.2	3.7	5.9	4.45	3.85	2.85	2.6	3.15	2.5	.....
29	4.7	4.9	3.2	4.2	6.0	4.85	3.85	2.9	2.65	3.0	2.5	.....
30	4.2	.....	3.2	4.2	6.1	4.6	3.8	3.25	2.65	2.9	2.5	.....
31	4.2	.....	3.2	.....	5.8	.....	3.85	3.15	.....	3.25	.....	.....

Daily discharge, in second-feet, of Dolores River at Dolores, Colo., for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	85	75	80	260	1,100	2,430	1,260	740	740	70	450
2	85	75	80	260	1,610	2,300	915	550	260	70	35
3	85	75	80	305	1,610	2,300	780	390	50	85	210
4	85	75	80	340	1,200	2,495	780	420	170	100	50
5	85	75	85	340	1,010	2,495	620	360	118	210	135
6	85	75	85	340	930	2,365	620	335	118	135	135
7	85	75	85	340	1,300	2,180	585	285	100	100	118
8	85	70	85	425	2,190	2,240	515	260	85	100	50
9	85	70	85	705	2,190	2,240	550	235	100	100	152
10	85	70	85	742	1,500	2,300	550	235	100	100	190
11	85	70	85	640	1,610	2,180	515	210	100	118	190
12	85	70	100	640	2,440	1,820	480	210	85	118	135
13	80	70	125	425	2,830	1,360	480	210	85	135	100
14	80	70	150	425	1,950	1,160	620	210	70	100	118
15	80	70	175	340	2,190	1,580	1,580	390	100	118	35
16	80	70	200	425	2,970	1,210	1,210	285	100	118	118
17	80	70	245	425	3,150	1,360	780	335	135	100	70
18	80	70	245	340	3,330	1,160	700	285	70	100	85
19	80	75	245	305	3,440	915	480	285	70	118	70
20	80	75	245	305	3,530	1,010	480	210	70	118	45
21	80	75	245	305	3,700	1,060	420	235	70	100	50
22	80	75	245	305	3,790	1,160	390	170	70	100	70
23	80	75	245	290	3,470	1,260	420	152	70	118	100
24	80	75	245	448	3,780	1,360	480	152	70	100	135
25	80	75	305	575	3,520	1,310	1,010	135	70	100	70
26	75	75	340	520	3,420	1,210	550	152	70	100	100
27	75	75	340	520	3,150	1,310	550	70	70	100	45
28	75	80	305	520	3,020	1,310	740	152	70	285	50
29	75	80	305	855	3,200	1,760	740	170	85	210	50
30	75	.....	305	855	3,370	1,470	700	335	85	170	50
31	75	.....	305	.....	2,960	.....	740	285	.....	335	.....

Monthly discharge of Dolores River at Dolores, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January	85	75	81	4,982
February	80	70	73	4,228
March	340	80	188	11,572
April	855	260	451	26,837
May	3,790	1,100	2,563	157,728
June	2,495	915	1,677	99,865
July	1,260	390	685	42,161
August	740	70	272	16,769
September	740	70	115	6,860
October	335	70	127	7,797
November	450	35	107	6,369
The period	.....	.....	.....	384,890

SAN MIGUEL RIVER AT PLACERVILLE, COLO.

Location.—About three-fourths of a mile below Placerville, Colo., about sec. 34, T. 44 N., R. 11 W., New Mexico principal meridian. Nearest tributary, Rio del Codo, enters at Placerville.

Records available.—September 13, 1910, to December 7, 1912.

Drainage area.—504 square miles (State engineer's report).

Gage.—Vertical staff.

Channel.—Permanent.

Discharge measurements.—Made from the bridge during high water and by wading at ordinary stages.

Diversions.—No data.

Cooperation.—Station is maintained and records are furnished complete for publication by the State engineer.

Discharge measurements of San Miguel River at Placerville, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-fe.*
Jan. 31	B. S. Clayton	0.60	82	Aug. 28	C. C. Hezmalhalch	1.08	191
Mar. 17	do	.38	58	Sept. 23	C. E. Turner	.85	124
Apr. 20	do	.83	121	Oct. 23	do	.65	94
May 15	C. C. Hezmalhalch	2.48	668	Nov. 22	do	.42	63
July 22	do	2.40	625				

Daily gage height, in feet, of San Miguel River at Placerville, Colo., for 1912.

[J. E. Stanquist, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug	Sept.	Oct.	Nov.	Dec.
1	3.95	0.65	0.55	0.55	1.95	3.6	3.05	1.95	1.2	0.70	0.60	0.45
2	3.9	1.0	.45	.60	2.25	3.9	2.75	1.8	1.05	.70	.60	.50
3	3.95	1.05	.50	.70	2.2	4.15	2.6	1.7	1.0	.70	.70	.45
4	3.7	.90	.50	.80	2.05	4.1	2.4	1.65	1.0	.70	.65	.45
5	3.45	.75	.50	.85	1.95	3.9	2.1	1.55	1.0	.85	.70	.45
6	3.15	.50	.45	.90	2.25	3.6	2.05	1 5	.90	.80	.65	.40
7	2.9	.55	.45	.90	2.6	3.5	2.4	1.35	.95	.80	.65	.40
8	2.75	.55	.50	1.05	2.8	3.55	2.4	1.35	.90	.80	.60	.....
9	2.8	.55	.50	1.25	2.65	3.6	2.4	1.3	.85	.70	.65	.....
10	2.5	.50	.50	1.15	2.55	3.55	2.4	1.3	.90	.80	.60	.....
11	1.9	.45	.45	1.15	2.9	3.35	2.4	1.25	.85	.70	.70	.....
12	1.8	.50	.45	1.05	3.0	3.05	2.35	1.25	.80	.65	.65	.....
13	1.9	.55	.40	.95	2.7	2.8	2.4	1.25	.80	.65	.65	.....
14	1.9	.55	.40	.90	2.55	2.55	2.5	1.35	.90	.70	.65	.....
15	1.85	.50	.50	.85	3.1	2.55	2.3	1.45	.90	.75	.65	.....
16	1.85	.50	.40	.85	3.4	2.75	2.15	1.45	.90	.70	.60	.....
17	1.55	.50	.40	.85	3.45	2.65	2.15	1.45	.90	.70	.60	.....
18	1.95	.50	.50	.75	3.65	2.5	2.05	1.55	.85	.70	.60	.....
19	1.45	.45	.55	.80	3.55	2.3	2.35	1.4	.80	.70	.60	.....
20	1.4	.45	.60	.85	3.55	2.45	2.45	1.3	.80	.75	.55	.....
21	1.35	.40	.50	.75	3.5	2.6	2.35	1.2	.80	.70	.60	.....
22	1.7	.45	.55	.75	3.55	2.8	2.3	1.15	.80	.65	.55	.....
23	1.9	.45	.50	.75	3.55	2.8	2.4	1.1	.80	.70	.55	.....
24	1.75	.45	.50	.90	3.65	2.9	2.1	1.05	.80	.70	.55	.....
25	1.3	.50	.60	1.15	3.9	2.95	2.55	1.05	.80	.65	.40	.....
26	1.05	.50	.65	.95	3.85	3.0	2.3	1.05	.80	.65	.40	.....
27	.70	.50	.55	1.15	3.75	2.9	2.15	1.05	.80	.70	.40	.....
28	.70	.50	.60	1.25	3.7	2.8	2.05	1.05	.70	.95	.45	.....
29	.65	.50	.60	1.35	3.9	3.0	2.1	1.0	.70	.75	.45	.....
30	.60	.....	.60	1.6	4.1	3.2	2.35	1.15	.70	.75	.45	.....
31	.70	.....	.60	.....	3.7	.....	2.25	1.45	.....	.7	.....	.....

Daily discharge, in second-feet, of San Miguel River at Placerville, Colo., for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	55	92	78	78	447	1,215	935	447	212	100	85
2	55	162	66	85	561	1,380	786	396	174	100	85
3	55	174	72	100	540	1,530	716	362	162	100	100
4	55	140	72	120	483	1,500	624	345	162	100	92
5	55	110	72	130	447	1,380	502	312	162	130	100
6	55	72	66	140	561	1,215	483	296	140	120	92
7	55	78	66	140	716	1,160	624	252	151	120	92
8	55	78	72	174	810	1,188	624	252	140	120	85
9	55	78	72	225	739	1,215	624	238	130	100	92
10	55	72	72	199	693	1,188	624	238	140	120	85
11	60	66	66	199	860	1,085	624	225	130	100	100
12	60	72	66	174	910	935	603	225	120	92	92
13	60	78	60	151	762	810	624	225	120	92	92
14	60	78	60	140	693	693	670	252	140	100	92
15	60	72	72	130	960	693	582	281	140	110	92
16	60	72	60	130	1,110	786	521	281	140	100	85
17	70	72	60	130	1,135	739	521	281	140	100	85
18	70	72	72	110	1,242	670	483	312	130	100	85
19	70	66	78	120	1,188	582	603	266	120	100	85
20	70	66	85	130	1,188	647	647	238	120	110	78
21	80	60	72	110	1,160	716	603	212	120	100	85
22	80	66	78	110	1,188	810	582	199	120	92	78
23	80	66	72	110	1,188	810	624	186	120	100	78
24	80	66	72	140	1,242	860	502	174	120	100	78
25	90	72	85	199	1,380	885	693	174	120	92	60
26	100	72	92	151	1,352	910	582	174	120	92	60
27	100	72	78	199	1,298	860	521	174	120	100	60
28	100	72	85	225	1,270	810	483	174	100	151	66
29	92	72	85	252	1,380	910	502	162	100	110	66
30	85	.....	85	328	1,500	1,010	603	199	100	110	66
31	100	.....	85	.....	1,270	.....	561	281	.....	100	.....

Monthly discharge of San Miguel River at Placerville, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January	100	55	70	4,318
February	174	66	82	4,736
March	92	60	73	4,514
April	328	78	154	9,182
May	1,500	447	977	60,046
June	1,530	582	973	57,902
July	935	483	602	37,044
August	447	162	253	15,537
September	212	100	134	7,960
October	151	92	105	6,468
November	100	60	83	4,941
The period	.....	.....	.....	212,648

FREMONT RIVER BASIN.

FREMONT RIVER NEAR THURBER, UTAH.

Location.—In sec. 6, T. 29 S., R. 4 E., Salt Lake Meridian, at the ranch of John Smith 2 miles below the town of Thurber.

Records available.—May 13, 1909, to December 31, 1912, when station was discontinued.

Drainage area.—720 square miles.

Gage.—Vertical staff.

Channel.—Shifts during high water.

Discharge measurements.—Made by wading at low stages and from a cable and car during high stages.

Winter records.—Ice affects relation of gage height to discharge at times during the winter months.

Diversions.—Nearly all of the low-water flow of the river above Thurber is diverted and used for irrigation, most of the water in the channel at such periods being derived from springs southwest of Thurber. Mill ditch and the Torrey Canal head about 500 feet below the station.

Artificial regulation.—The flow of the river is regulated by Johnson Reservoir (capacity, 4,800 acre-feet), which is located about 4 miles north of Fish Lake, the source of Fremont River.

Accuracy.—Records approximate at times, owing to shifting of the stream bed and possible backwater at gage from dam below.

Discharge measurements of Fremont River near Thurber, Utah, in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Aug. 19	J. C. Dort	5.05	69.2
Sept. 25	Leonard Tanner	5.34	88.4

Daily gage height, in feet, of Fremont River near Thurber, Utah, for 1912.

[John Smith, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.5	5.45	5.4	5.65	5.8	4.6	5.4	6.0	5.3	5.4	5.5	5.75
2	5.45	5.45	5.4	5.7	5.95	4.5	5.35	5.5	5.35	5.42	5.45	5.70
3	5.5	5.4	5.45	5.7	6.0	4.55	5.4	5.5	5.3	5.42	5.5	5.70
4	5.45	5.4	5.4	5.65	6.0	4.5	5.45	5.45	5.25	5.45	5.55	5.65
5	5.4	5.4	5.4	5.7	6.1	4.55	5.5	5.45	5.3	5.4	5.6	5.7
6	5.45	5.45	5.4	5.7	6.3	4.6	5.45	5.5	5.25	5.48	5.6	5.75
7	5.45	5.45	5.45	6.8	6.5	4.65	5.4	5.45	5.3	5.4	5.55	5.75
8	5.5	5.5	5.45	7.0	6.8	4.7	5.35	5.4	5.35	5.48	5.5	5.7
9	5.5	5.55	5.4	.....	6.9	4.65	5.4	5.45	5.4	5.48	5.55	5.7
10	5.55	5.55	5.4	7.3	6.95	4.6	5.35	5.4	5.35	5.5	5.55	5.75
11	5.5	5.5	5.45	.....	7.0	4.6	5.3	5.35	5.4	5.52	5.6	5.75
12	5.45	5.5	5.4	.....	7.0	4.55	5.35	5.3	5.4	5.5	5.6	5.7
13	5.45	5.55	5.45	6.8	7.0	4.5	5.3	5.35	5.45	5.45	5.55	5.65
14	5.5	5.55	5.45	6.5	6.95	4.5	5.3	5.3	5.4	5.45	5.55	5.7
15	5.5	5.55	5.45	6.0	7.0	4.5	5.35	5.3	5.45	5.5	5.6	5.65
16	5.45	5.5	5.45	5.7	7.0	4.55	5.35	5.35	5.4	5.45	5.65	5.65
17	5.4	5.5	5.5	6.55	7.0	4.5	5.4	5.4	5.45	5.4	5.6	5.7
18	5.4	5.45	5.5	6.4	7.0	4.5	5.35	5.3	5.5	5.4	5.55	5.75
19	5.45	5.5	5.55	6.0	6.8	4.6	5.3	5.2	5.45	5.35	5.6	5.7
20	5.5	5.45	5.55	5.85	6.0	4.7	5.3	5.05	5.4	5.35	5.6	5.7
21	5.5	5.45	5.5	5.8	5.5	4.8	5.35	5.05	5.4	5.4	5.55	5.75
22	5.45	5.45	5.5	5.6	5.55	4.9	5.4	5.15	5.45	5.45	5.6	5.75
23	5.4	5.45	5.55	5.55	5.6	5.15	5.4	5.10	5.4	5.4	5.6	5.7
24	5.4	5.45	5.55	5.5	5.55	5.2	5.45	5.15	5.35	5.45	5.65	5.7
25	5.45	5.45	5.6	5.45	5.5	5.3	5.4	5.15	5.4	5.45	5.6	5.7
26	5.4	5.45	5.65	5.5	5.4	5.35	5.4	5.2	5.35	5.45	5.65	5.75
27	5.4	5.4	5.65	5.45	5.35	5.4	5.45	5.15	5.35	5.5	5.7	5.7
28	5.4	5.4	5.6	5.5	5.2	5.35	5.5	5.1	5.4	5.55	5.7	5.75
29	5.4	5.4	5.6	5.6	5.0	5.3	5.8	5.15	5.35	5.5	5.75	5.75
30	5.45	.....	5.65	5.7	4.8	5.35	5.9	5.15	5.4	5.5	5.75	5.70
31	5.45	.....	5.65	.....	4.75	.....	5.95	5.2	.....	5.45	.....	5.75

NOTE.—Relation of gage height to discharge probably slightly affected by ice Jan. 1 to Feb. 29 and Nov. 22 to Dec. 31. Water over top of gage (7.0) during period Apr. 9 to 12. Gage height on Apr. 10 estimated by observer. During period May 12 to 20 the stream bed washed so badly that the water fell below the bottom of the gage, the recorded gage heights being estimated by the observer from observations of the water level one-fourth mile upstream. Diversion dam rebuilt below the gage May 20.

Daily discharge, in second-feet, of Fremont River near Thurber, Utah, for 1912.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	98	136	158	24	120	214	84	98	113
2	98	143	182	18	112	135	91	101	106
3	106	143	190	21	120	135	84	101	113
4	98	136	190	18	128	128	77	106	120
5	98	143	206	21	135	128	84	98	128
6	98	143	240	24	128	135	77	110	128
7	106	330	276	28	120	128	84	98	120
8	106	366	330	31	112	120	91	110	113
9	98	393	348	28	120	128	98	110	120
10	98	420	357	24	112	120	91	113	120
11	106	390	366	24	105	112	98	116	128
12	98	360	368	21	112	105	98	113	128
13	106	330	371	18	105	112	106	106	120
14	106	276	364	18	105	105	98	106	120
15	106	190	377	18	112	105	106	113	128
16	106	143	379	21	112	112	98	106	136
17	113	285	382	18	120	120	106	98	128
18	113	258	384	18	112	105	113	98	120
19	120	190	352	24	105	90	106	91	128
20	120	166	211	31	105	69	98	91	128
21	113	158	135	40	112	69	98	98	120
22	113	128	142	50	120	82	106	106	100
23	120	120	150	83	120	73	98	98	100
24	120	113	142	90	128	77	91	106	100
25	128	106	135	105	120	76	98	106	100
26	136	113	120	112	120	82	91	106	100
27	136	106	112	120	128	73	91	113	100
28	128	113	90	112	135	63	98	120	100
29	128	128	62	105	181	68	91	113	100
30	136	143	40	112	197	66	98	113	100
31	136	.....	36	.....	206	72	.....	106	.....

NOTE.—Discharge determined from two fairly well defined curves, one applicable Mar. 1 to May 11, and Sept. 1 to Nov. 20, the other May 21 to Aug. 21. Indirect method for shifting channels used May 12 to 20 and Aug. 22 to 31. Discharge estimated Apr. 9, 11, and 12 because water was over gage and Nov. 22 to 30 because of ice. Daily discharge May 12 to about June 25 approximate, owing to shifting stream bed and possible backwater effect from dam below.

Monthly discharge of Fremont River near Thurber, Utah, for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	[a] 80	4,920	C.
February	.....	.....	[a] 90	5,180	C.
March	136	98	113	6,950	B.
April	420	106	206	12,300	B.
May	384	36	232	14,300	C.
June	120	18	45.9	2,730	C.
July	206	105	125	7,690	B.
August	214	63	103	6,330	B.
September	113	77	94.9	5,650	B.
October	120	91	105	6,460	B.
November	136	100	116	6,900	B.
December	.....	.....	[a] 90	5,530	C.
The year	420	18	117	84,900	

[a] Estimated.

MUDDY CREEK NEAR EMERY, UTAH.

Location.—In the NE. ¼ NE. ¼ sec. 21, T. 21 S., R. 6 E., Salt Lake base and meridian, at Jacobsen's ranch, about 1 mile above the boundary line of the Manti National Forest and about 6 miles from Emery.

Records available.—May 1 to July 31, 1909; July 23, 1910, to December 31, 1912.

Drainage area.—87 square miles.

Gage.—Inclined staff.

Channel.—Shifting.

Discharge measurements.—Made from cable during high water and by wading during low and medium stages.

Winter flow.—Ice affects relation of gage height to discharge for long periods during the winter months. Estimates of winter flow are approximate only.

Diversions.—The station is located above the head gates of the Emery, Independence Co., and Lower canals. It is near a proposed reservoir site. Records indicate the natural flow of the stream at this point and the amount of water available for storage in the above-mentioned reservoir.

Accuracy.—Fair during the open-water season of 1912.

Discharge measurements of Muddy Creek near Emery, Utah, in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 21	Leonard Tanner	1.88	9.06	May 27	Leonard Tanner	3.48	288
22	do	1.94	11.5	27	do	3.20	225
Apr. 9	do	2.18	55	28	do	2.90	167
May 22	do	2.80	146	Sept. 28	do	1.75	24

Daily gage height, in feet, of Muddy Creek near Emery, Utah, for 1912.

[R. Jacobsen, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.4			2.0	2.8	3.5	2.6	2.3	2.0	1.75	1.75	1.75
2			2.2		2.25	3.45	2.6	2.3	2.0	1.75		
3		1.6		2.2	1.95	3.5	2.6	2.3	2.0	1.75	1.75	1.75
4					1.75	3.55	2.5	2.3	1.9	1.75		
5		1.7	2.2	2.3	1.9	3.45	2.5	2.3	1.9		1.75	1.75
6	1.4			2.4	2.2	3.3	2.5	2.3	1.9	1.95		
7				2.5	2.25	3.3	2.5	2.3	1.9	1.95	1.75	1.75
8			2.3	3.3	2.4	3.25	2.5	2.3	3.0			
9	1.4	1.8		2.1	2.35	3.2	2.5	2.3	3.2	1.8		1.75
10				2.2	2.45	3.2	2.5	2.3	2.0		1.75	
11			2.1	2.1	2.35	3.05	2.5	2.3	1.9	1.8		1.75
12	1.4	1.9		1.9	2.1	3.05	2.5	2.2	1.9			1.75
13				1.6	2.3	3.1	2.5	2.0	1.8	1.75	1.75	
14				1.7	2.5	3.1	2.4	2.0	1.8	1.75		1.75
15	1.5		2.0	1.8	2.2	3.1	2.4	2.0	1.8			
16		1.9		2.3	3.1	3.0	2.4	2.0	1.8	1.75	1.75	
17			1.9	2.5	3.0	2.9	2.4	2.1	1.8	1.75	1.75	
18				2.1	2.7	2.9	2.3	2.1	1.8			1.75
19	1.5	1.9		1.95	3.1	2.9	2.3	2.1	1.8		1.75	
20				1.8	3.3	2.8	2.3	2.1	1.8	1.75		1.75
21			1.9	2.0	3.05	2.8	4.0	2.1	1.8	1.75		
22			2.0	1.95	3.05	2.75	2.3	2.1	1.8		1.75	
23	1.5	1.9		2.2	2.95	2.7	2.3	2.1	1.8	1.75		
24				2.3	2.9	2.7	2.3	2.1	1.8		1.75	1.70
25			1.9	1.9	2.8	2.7	2.3	2.1	1.8	1.75		
26	1.5	2.0		2.0	3.1	2.7	2.3	2.1		1.75		
27				2.1	3.1	2.6	2.4	2.1			1.75	
28			2.0	2.15	3.15	2.6	4.1	2.0	1.75	1.75		
29	1.6	2.1		2.1	3.25	2.6	2.3	2.0	1.75	1.75		
30			1.9	2.8	3.35	2.6	2.3	2.0	1.75		1.75	
31					3.55		2.3	2.0		1.75		2.0

NOTE.—Relation of gage height probably affected by ice Jan. 1 to Mar. 15 and Nov. 1 to Dec. 31.

Daily discharge, in second-feet, of Muddy Creek near Emery, Utah, for 1912.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	.....	13	147	294	113	70	38	24
2	.....	18	63	282	113	70	38	24
3	.....	22	35	294	113	70	38	24
4	.....	30	24	306	98	70	32	24
5	.....	38	32	282	98	70	32	30
6	.....	56	56	247	98	70	32	35
7	.....	84	63	247	98	70	32	35
8	.....	247	84	236	98	70	185	30
9	.....	46	77	225	98	70	225	26
10	.....	56	91	225	98	70	38	26
11	.....	46	77	195	98	70	32	26
12	.....	32	46	195	98	56	32	25
13	.....	18	70	205	98	38	26	24
14	.....	22	98	205	84	38	26	24
15	.....	26	56	205	84	38	26	24
16	10	70	205	185	84	38	26	24
17	10	98	185	165	84	46	26	24
18	10	46	130	165	70	46	26	24
19	10	35	205	165	70	46	26	24
20	10	26	247	147	70	46	26	24
21	10	38	195	147	420	46	26	24
22	13	35	195	138	70	46	26	24
23	12	56	175	130	70	46	26	24
24	11	70	165	130	70	46	26	24
25	10	32	147	130	70	46	26	24
26	11	38	205	130	70	46	26	24
27	12	46	205	113	84	46	24	24
28	13	51	215	113	446	38	24	24
29	12	46	236	113	70	38	24	24
30	10	147	258	113	70	38	24	24
31	12	.....	306	.....	70	38	.....	24

NOTE.—Discharge determined from two well-defined curves, one applicable Mar. 16 to Apr. 1, the other Apr. 8 to Oct. 31. Indirect method for shifting channels used Apr. 2 to 7. Discharge Mar. 1 to 15 estimated, 7 second-feet. Discharge interpolated for days on which gage was not read.

Monthly discharge of Muddy Creek near Emery, Utah, for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	*a* 3	184	D.
February	.....	.....	*a* 5	288	D.
March	13	.....	9.1	560	C.
April	247	13	52.9	3,150	B.
May	306	24	138	8,480	A.
June	306	113	191	11,400	A.
July	446	70	109	6,700	A.
August	70	38	52.8	3,250	A.
September	225	24	40.5	2,410	A.
October	35	24	25.3	1,560	B.
November	.....	.....	*a* 10	595	D.
December	.....	.....	*a* 5	307	D.
The year	446	.....	53.5	38,900	

a Estimated.

NOTE.—Some of the recorded maximum monthly discharges probably represent the mean for a few hours only and not for an entire day.

MUDDY CREEK AT COUNTY BRIDGE NEAR EMERY, UTAH.

Location.—In the NE. ¼ sec. 35, T. 21 S., R. 6 E., Salt Lake base and meridian, at the county bridge about 2½ miles north of Emery.

Records available.—June 6, 1911, to December 31, 1912.

Drainage area.—Not measured.

Gage.—Chain gage attached to the highway bridge used from January 1 to October 18; inclined staff gage at same datum as chain gage bolted to rock cliff used after October 19.

Channel.—Fairly permanent except at low stages.

Discharge measurements.—Made from the bridge at high water or by wading at other stages.

Winter flow.—Ice affects the relation of gage height to discharge for periods during the winter months. Estimates of winter flow are approximate only.

Diversions.—Below all diversions except a few small ditches.

Accuracy.—Fair except during winter months and low-water periods.

Discharge measurements of Muddy Creek at county bridge near Emery, Utah, in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 23	Leonard Tanner	1.98	3.94	May 27	Leonard Tanner	3.33	91.2
Apr. 8	do	2.70	44.0	28	do	3.52	106
8	do	3.19	106	Sept. 28	do	3.30	.25
May 22	do	2.86	60.4				

Daily gage height, in feet, of Muddy Creek at county bridge near Emery, Utah, for 1912.

[R. Jacobson, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1				2.0	2.6	3.95	3.3			3.3	3.05	2.75
2			1.9		2.3	3.55	3.3					
3		3.5		2.1		3.68	3.35			3.3	2.75	
4						3.9		3.3				3.05
5		1.6	1.9	2.1		4.45	3.35				2.75	
6	2.8			2.2	2.6	4.2	3.3	3.3		3.3		
7				2.2	2.8	4.1	3.35				2.75	3.05
8			2.0	2.9	2.9	3.9	3.4			3.35		
9	3.0	1.7		2.6	2.9	3.8	3.4		3.45			2.75
10				2.4	3.2	4.0	3.4		3.5	3.35	2.75	
11				2.2	2.9	4.0	3.4					2.75
12	3.2	1.7	1.8		2.9	3.8	3.4			3.3		2.75
13					3.1	3.6	3.4				2.75	
14					2.9	3.8	3.4			3.3		2.75
15	3.2			2.3	3.1	3.8	3.4					
16		1.7	1.9	2.4		3.8	3.4			3.3		
17			1.7	2.7		3.8	3.4				2.75	
18				2.5		3.8	3.4					2.75
19	3.4	1.7		2.4		3.7	3.4			2.65	2.75	
20				2.2	3.5		3.4			2.65		2.75
21			1.9	2.1	3.6	3.75	3.4					
22				2.3	2.86	3.75				2.65	2.75	
23	3.4	1.7	1.98	2.6		3.7						
24			1.9	2.5	3.8	3.55	3.4				2.75	
25				2.4		3.55				2.65		
26	3.5	1.8		2.1	3.3	3.45						
27				2.1	3.3	3.45	3.4			3.05	2.75	2.75
28			1.9	2.6	3.5	3.3	3.35		3.3			
29	3.5	1.9		2.6	3.55	3.3	3.35			3.05	2.75	
30			1.9	3.0	3.9		3.35				2.75	
31					3.95		3.35			3.05		2.75

NOTE.—Readings Jan. 1 to Feb. 3 designate thickness of ice. Creek dry Apr. 12 to 14, May 3 to 5, Aug. 7 to Sept. 8, and Sept. 11 to 27. Relation of gage height to discharge probably affected by ice January to March and November to December.

Daily discharge, in second-feet, of Muddy Creek at county bridge near Emery, Utah, for 1912.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	4	40	142	19	3.0	0	0.3
2	6	20	110	16	2.0	0	.3
3	9	0	120	16	1.0	0	.3
4	9	0	138	14	.3	0	.3
5	9	0	182	11	.3	0	.3
6	14	40	162	6	.3	0	.3
7	14	54	154	6	0	0	.3
8	61	61	138	6	0	0	3.2
9	40	61	130	6	0	9	3.2
10	26	82	146	6	0	12	3.2
11	14	61	142	6	0	0	1.5
12	0	61	122	6	0	0	.3
13	0	75	102	6	0	0	.3
14	0	61	114	6	0	0	.3
15	20	75	110	6	0	0	.3
16	26	100	106	6	0	0	.3
17	47	100	103	6	0	0	.3
18	33	100	99	6	0	0	.3
19	26	100	87	6	0	0	.3
20	14	106	85	6	0	0	.3
21	9	114	83	6	0	0	.3
22	20	58	80	6	0	0	.3
23	40	90	73	6	0	0	.3
24	33	130	59	6	0	0	.3
25	26	110	55	6	0	0	.3
26	9	90	45	6	0	0	.3
27	9	90	41	6	0	0	20
28	40	106	28	3.2	0	.3	20
29	40	110	25	3.2	0	.3	20
30	68	138	22	3.2	0	.3	20
31	.....	142	.....	3.2	0	.....	20

NOTE.—Discharge determined from several rather poorly defined curves and indirect method for shifting channels. Discharge for days on which gage was not read estimated from records at upper station. Gage heights at this station give no indication of the floods that occurred at the upper station July 21 and 28, probably because the observer read the gages at different times of day.

Monthly discharge of Muddy Creek at county bridge near Emery, Utah, for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	[a] 2.0	123	D.
February	.....	.....	[a] 3.0	173	D.
March	.....	.....	[a] 3.5	215	D.
April	68	0	22.2	1,320	B.
May	142	0	76.6	4,710	B.
June	182	22	100	5,950	C.
July	19	3.2	7.12	438	C.
August	3.0	0	.22	14	D.
September	12	0	.73	43	D.
October	20	.3	3.80	234	D.
November	.....	.....	[a] 3.0	179	D.
December	.....	.....	[a] 2.0	123	D.
The year	182	0	18.6	13,500	

[a] Estimated on account of ice and unstable conditions at low water.

ESCALANTE RIVER BASIN.

ESCALANTE CREEK NEAR ESCALANTE, UTAH.

Location.—In sec. 9, T. 35 S., R. 3 E., Salt Lake meridian, just below the mouth of Winslow or Pine Creek and about 2 miles below the town of Escalante.

Records available.—August 5, 1909, to December 31, 1912.

Drainage area.—315 square miles.

Gage.—Vertical staff.

Channel.—Shifting.

Discharge measurements.—Made from cable and car or by wading.

Winter flow.—Ice affects the relation of gage height to discharge for periods during the winter months.

Diversions.—All the low-water flow is used for irrigation above the station; the records at this point indicate unappropriated and waste waters.

Floods.—This stream is subject to sudden floods of short duration, with resulting changes in the character of the stream bed and control.

Accuracy.—Poor, owing to shifting character of stream bed and lack of discharge measurements. Yearly total is probably correct within an accuracy of C, but daily discharge and monthly means during certain periods are apt to be in error by a greater amount than this.

Discharge measurements of Escalante Creek near Escalante, Utah, in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Oct. 3	G. H. Russell	1.68	6.2
4	....do	2.04	21.2
4	....do	2.15	28.1
5	....do	2.78	98.1

Daily gage height, in feet, of Escalante Creek near Escalante, Utah, for 1912.

[D. C. Shurtz, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1				2.85			1.85		1.9	2.2		1.80
2	3.1	2.6				3.6		4.8	2.2		2.0	
3				2.9	2.75		2.0			1.7		2.4
4	3.2		3.0			3.9		1.9		2.35	2.4	
5		2.65		3.0			1.8		2.1	2.4		1.9
6	3.2		3.5		2.8	3.7		1.6			2.3	
7		2.7		2.9			1.5		1.9	2.2		2.1
8	3.2				2.75			1.75			2.3	
9		2.8	3.1	2.8		2.6	1.6		2.2	2.4		2.4
10	3.1				2.85			1.5				
11			3.1	2.95		2.75	1.55		2.4	1.8		2.7
12	3.1	2.65						1.5				
13			3.1		3.0	2.65	2.2		2.55		2.5	2.8
14	2.4	2.7						1.6		1.4		
15			3.15	2.95	3.2		4.8		2.1		2.3	
16	2.4	2.8				2.4		4.2		1.3		2.7
17			2.6	2.85			2.0		2.3		2.9	
18		2.8			3.6	2.5		1.5			2.4	2.8
19	2.4		2.8	2.5			1.8		2.2	1.4		
20		2.85			3.6	2.55		1.6			2.6	
21	2.4		2.85	2.7			1.7		2.5	1.6		2.85
22		2.9			3.6			1.55			2.5	
23	2.4			2.75		1.8	1.8		1.8	1.4		2.5
24			2.7		3.4			1.65			2.7	
25		2.8		2.6		3.5	1.85		2.0	5.0		2.7
26	2.4				3.8			1.9			2.5	
27		2.9	2.85			2.5	5.0		2.2	7.2		2.8
28				2.8	3.85			4.6			2.6	
29	2.45	2.85				1.9	1.8		2.1	5.3		
30			2.9	2.6	4.0			2.2				
31	2.5						2.0			3.4		

NOTE.—Relation of gage height to discharge affected by ice Jan. 1 to 13 and Dec. 10 to 31.

Daily discharge, in second-feet, of Escalante Creek near Escalante, Utah, for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	17	35	33	22	118	14	20	16	31	30	20
2	.....	19	37	34	25	100	17	408	31	20	30	40
3	.....	20	40	36	27	120	20	16	29	8	44	59
4	.....	21	43	40	28	139	16	16	27	48	59	42
5	.....	22	45	43	29	130	12	10	25	59	55	25
6	.....	23	88	40	30	120	8	4	20	51	51	30
7	.....	24	50	36	28	89	2	7	16	43	51	36
8	.....	27	50	33	27	58	3	10	24	51	51	48
9	.....	30	50	30	30	27	4	6	31	59	54	59
10	.....	27	50	35	33	34	4	2	38	40	58	.....
11	.....	24	50	40	36	40	3	2	44	2)	61	.....
12	.....	22	50	40	40	39	17	2	50	15	65	.....
13	.....	23	50	40	43	38	31	3	56	10	68	.....
14	11	24	52	40	51	35	31	4	40	5	59	.....
15	11	27	54	40	59	31	408	4	25	4	51	.....
16	11	30	36	36	73	28	20	294	31	3	51	.....
17	11	30	19	33	87	33	20	2	37	4	112	.....
18	11	30	24	24	100	38	16	2	34	4	59	.....
19	11	32	30	15	100	42	12	3	31	5	68	.....
20	11	33	32	20	100	46	10	4	42	8	78	.....
21	11	34	33	24	100	34	8	4	52	11	73	.....
22	11	36	30	26	100	23	10	3	32	8	68	.....
23	11	34	27	27	89	12	12	4	12	5	78	.....
24	11	32	24	23	78	12	13	6	16	5	88	.....
25	11	30	27	19	102	170	14	11	20	476	78	.....
26	11	33	30	23	125	111	14	16	26	663	68	.....
27	11	36	33	26	128	52	446	16	31	850	73	.....
28	12	34	34	30	132	34	12	370	28	692	78	.....
29	13	33	35	24	143	16	12	31	25	535	58	.....
30	14	.....	36	19	154	15	16	31	28	360	39	.....
31	15	.....	34	.....	136	.....	20	23	.....	186	.....	.....

NOTE.—Discharge determined from a number of poorly defined curves and by indirect method for shifting channels. Discharge estimated as follows because of ice: Jan. 1 to 13, 10 second-feet; Dec. 10 to 31, 20 second-feet. Discharge estimated for days on which gage was not read.

Monthly discharge of Escalante Creek near Escalante, Utah, for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January	.....	.....	10.9	670
February	36	17	27.8	1,600
March	88	19	39.6	2,430
April	43	15	31	1,840
May	154	22	72.7	4,470
June	170	12	59.5	3,540
July	446	2	40.2	2,470
August	408	2	43	2,640
September	56	12	30.6	1,820
October	850	3	138	8,480
November	112	30	61.9	3,680
December	.....	.....	25.8	1,590
The year	850	2	48.6	35,200

NOTE.—For accuracy notes, see description.

SAN JUAN RIVER BASIN.

SAN JUAN RIVER AT PAGOSA SPRINGS, COLO.

Location.—At Pagosa Springs, in sec. 13, T. 35 N., R 2 W., New Mexico principal meridian. Nearest tributary is a stream that enters from the north a mile below.

Records available.—January 24, 1911, to June 30, 1912.

Drainage area.—287 square miles (measured from Forest Atlas).

Gage.—Vertical staff. The gage was originally located at a highway bridge above Pagosa Springs. On March 7, 1911, the gage was moved half a mile downstream. It was washed out by a flood October 5, 1911, and a new gage installed November 23 at the present site. The relation between datums of the different gages is not known.

Channel.—Apparently permanent.

Discharge measurements.—Made from near-by bridge during high water and by wading at ordinary stages.

Winter flow.—Ice causes backwater at this station for short periods.

Diversions.—Small irrigation ditches divert water above the station. Between sec. 17, T. 37 N., R. 1 E., and sec. 28, T. 36 N., R. 2 W., there are seven ditches averaging 2 feet wide on top, 1½ feet on bottom, and 1½ feet deep. There are court decrees for diversions of 20 second-feet above the station and 175 second-feet from tributaries entering above.

Accuracy.—Conditions are favorable for fairly accurate results; the estimates are considered reliable.

Cooperation.—Station is maintained in cooperation with the United States Forest Service.

Discharge measurements of San Juan River at Pagosa Springs, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 23	H. B. Waha	1.25	96	May 25	H. B. Waha	6.55	2,720
Mar. 26	do	1.90	150	June 5	do	7.10	2,900
Apr. 25	do	3.20	591	5	do	6.65	2,580

Daily gage height, in feet, and discharge, in second-feet, of San Juan River at Pagosa Springs, Colo., for 1912.

[R. W. Smith, observer.]

Day.	January.		February.		March.		April.		May.		June.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	1.45	.....	1.0	80	.....	90	.....	240	5.0	1,540	6.8	2,750
2	1.45	.....	1.0	80	1.2	90	2.3	240	5.2	1,660	7.0	2,900
3	1.5	.....	1.0	80	.....	93	2.6	340	4.8	1,420	7.2	3,050
4	1.5	.....	.....	79	.....	96	2.8	420	4.2	1,080	7.3	3,120
5	1.45	.....	.95	78	1.35	100	3.0	500	.....	998	7.0	2,900
6	1.45	.....	.95	78	1.35	100	3.25	612	3.9	915	7.0	2,900
7	1.35	.....	1.0	80	1.4	104	.....	646	4.5	1,240	7.3	3,120
8	1.3	.....	1.0	80	1.5	112	3.4	680	4.8	1,420	6.9	2,820
9	1.2	90	1.15	88	.....	114	3.4	680	4.9	1,480	.....	2,580
10	1.25	93	.....	87	.....	116	3.6	770	4.4	1,180	6.2	2,330
11	1.2	90	.....	86	1.55	117	3.2	590	4.4	1,180	6.2	2,330
12	1.2	90	1.1	85	.....	114	3.1	545	.....	1,270	5.6	1,920
13	1.2	90	1.1	85	1.5	112	2.8	420	4.7	1,360	5.2	1,660
14	.....	90	1.1	85	1.4	104	.....	360	4.4	1,180	5.1	1,600
15	1.2	90	1.2	90	.....	104	2.5	300	4.0	965	5.3	1,730
16	1.2	90	1.1	85	1.4	104	2.75	400	4.6	1,300	.....	1,700
17	1.3	96	1.1	85	.....	113	.....	380	5.3	1,730	5.2	1,660
18	1.2	90	.....	89	1.6	122	2.65	360	6.0	2,190	4.7	1,360
19	1.3	96	1.25	93	2.0	175	2.5	300	6.2	2,330	4.4	1,180
20	1.2	90	.....	84	2.9	460	2.5	300	6.2	2,330	4.3	1,130
21	.....	93	.9	75	.....	380	.....	262	6.4	2,470	4.9	1,480
22	1.3	96	.....	78	2.5	300	2.25	225	6.4	2,470	5.0	1,540
23	1.25	93	1.0	80	2.2	210	2.4	270	6.3	2,400	.....	1,670
24	1.2	90	1.0	80	.....	255	3.0	500	6.1	2,260	5.4	1,800
25	1.2	90	.....	82	2.5	300	3.15	568	6.6	2,610	5.2	1,660
26	1.2	90	1.1	85	.....	244	2.85	440	7.0	2,900	4.9	1,480
27	1.2	90	1.1	85	2.08	187	3.0	500	7.0	2,900	5.1	1,600
28	.....	90	1.2	90	2.18	206	.....	658	7.2	3,050	5.0	1,540
29	1.2	90	1.2	90	2.3	240	3.7	815	7.3	3,120	4.8	1,420
30	1.1	85	.....	.....	.....	240	4.5	1,240	7.2	3,050	.....	.....
31	1.0	80	.....	.....	.....	240	.....	.....	6.8	2,750	.....	.....

NOTE.—Ice caused backwater Jan. 1 to 8 and affected the relation of gage height to discharge. Daily discharge computed from a well-defined curve. Discharge interpolated for days on which gage was not read.

Monthly discharge of San Juan River at Pagosa Springs, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January (9–31)	96	80	90.5	4,130	B.
February	93	75	83.5	4,800	B.
March	460	90	172	10,600	B.
April	1,240	225	485	28,900	B.
May	3,120	915	1,900	117,000	B.
June (1–29)	3,120	1,130	2,030	117,000	B.
The period				282,000	

SAN JUAN RIVER AT ARBOLES, COLO.

Location.—At Arboles, Colo., a quarter of a mile above the mouth of Piedra River, near the center of T. 32 N., R. 5 W.

Records available.—1895 to 1899; August 21, 1910, to December 31, 1912.

Drainage area.—1,394 square miles.

Gage.—Chain gage.

Channel.—Probably permanent.

Discharge measurements.—Made from car and cable and by wading.

Winter flow.—Severe ice effect.

Diversions.—There are court decrees for the diversion of 23 second-feet between Arboles and the station at Pagosa Springs, and 61 second-feet from intervening tributaries.

Flood discharge.—Two severe floods have occurred on the San Juan since the station has been maintained. The maximum stage of the flood, September 6, 1909, although very high, was less than that of October 1, 1911, when the river rose 17 feet, with a maximum discharge of about 40,000 second-feet.

Cooperation.—Records from August 21, 1910, to October 1, 1912, were furnished by the State engineer of Colorado, by whom the station was maintained. After that date the station was maintained in cooperation with the State engineers of Colorado and New Mexico.

Discharge measurements of San Juan River at Arboles, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 26[a]	B. S. Clayton		213	Sept. 20	C. E. Turner	0.35	153
Mar. 1[a]	do		161	20	Gray and O'Brien	.35	143
Apr. 12	do	2.84	1,610	Oct. 7	F. O'Brien	.91	300
May 10	C. C. Hezmalhalch	3.60	2,210	17	do	.66	234
June 12	do	4.23	2,860	27	do	.44	199
July 18	do	2.10	955	Nov. 28[a]	do	.21	120
Aug. 26	do	.72	247	Dec. 16[a]	do	.53	119

[a] Measurements taken under ice cover.

Daily gage height, in feet, of San Juan River at Arboles, Colo., for 1912.

[L. E. Smack, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1.6	4.8	5.1	3.45	1.55	0.7	0.3	0.9	0.4
2	.....	1.8	4.95	5.3	3.25	1.45	.7	.3	.9	.4
3	.....	2.95	4.4	5.35	2.9	1.35	.6	.3	.8	.5
4	.....	3.15	3.65	5.3	2.35	1.35	.6	1.0	.8	.5
5	.....	2.85	3.1	5.25	2.3	1.25	.6	1.3	.8	.5
6	.....	3.25	3.3	5.3	2.1	1.15	.6	1.15	.7	.6
7	.....	3.35	3.65	5.15	2.2	1.1	.6	.9	.7	.6
8	.....	4.1	3.9	5.2	2.15	1.0	.6	.9	.7	.6
9	1.65	3.15	4.0	5.05	2.05	.85	.6	.85	.7	.7
10	3.65	3.65	3.55	4.75	2.0	.75	.6	.8	.6	.7
11	1.95	2.9	3.5	4.5	1.95	.65	.6	.7	.6	.7
12	1.3	2.8	3.55	4.2	1.95	.65	.6	.6	.6	.8
13	1.0	2.65	3.55	3.9	1.85	.7	.5	.6	.6	.8
14	.9	2.65	3.55	3.6	1.9	2.25	.5	.6	.5	.8
15	.85	2.7	4.1	4.0	1.95	1.6	.5	.6	.5	.8
16	.8	2.65	4.35	4.0	2.45	.95	.5	.6	.5	.5
17	.65	2.75	4.85	4.0	1.85	.8	.5	.6	.4	.75
18	.6	2.4	5.35	3.4	2.15	.8	.4	.6	.4	.8
19	5.15	2.4	5.8	3.35	2.1	.85	.4	.55	.4	.8
20	5.6	2.2	5.1	3.1	1.95	.85	.3	.5	.4	.85
21	3.3	2.05	5.35	3.15	1.8	.8	.3	.4	.4	.85
22	2.9	2.0	5.4	3.05	1.7	.8	.3	.4	.4	.85
23	2.4	2.1	5.35	3.55	1.95	.8	.3	.4	.4	.85
24	1.55	2.5	5.25	3.9	2.45	.8	.3	.4	.4	.85
25	1.9	3.3	5.55	3.7	2.65	.8	.3	.5	.3	.85
26	2.7	2.9	5.5	3.6	2.55	.7	.3	.5	.3	.9
27	2.35	2.95	5.4	3.5	2.15	.7	.3	.5	.3	.9
28	2.4	3.15	5.8	3.4	2.0	.7	.2	1.4	.3	1.1
29	2.65	3.3	5.55	3.55	1.85	.7	.2	1.1	.3	1.2
30	2.45	3.7	5.2	3.45	1.7	.7	.2	1.1	.3	1.2
31	2.7	.....	5.25	.....	1.6	.85	.....	1.0	.....	1.2

NOTE.—Gage heights affected by ice Jan. 1 to Mar. 8 and Nov. 25 to Dec. 31, stream being covered over.

Daily discharge, in second-feet, of San Juan River at Arboles, Colo., for 1912.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	160	635	3,405	3,710	2,095	605	235	155	300	134
2	160	760	3,555	3,920	1,915	548	235	155	300	133
3	160	1,652	3,005	3,972	1,610	495	210	155	265	132
4	200	1,825	2,282	3,920	1,160	495	210	340	265	131
5	225	1,568	1,780	3,868	1,120	448	210	470	265	130
6	250	1,915	1,960	3,920	970	402	210	402	235	129
7	275	2,005	2,282	3,762	1,045	380	210	300	235	128
8	300	2,710	2,520	3,815	1,008	340	210	300	235	127
9	325	1,825	2,615	3,658	935	282	210	282	235	126
10	350	2,282	2,188	3,355	900	250	210	265	210	125
11	400	1,610	2,140	3,105	865	222	210	235	210	124
12	470	1,525	2,188	2,805	865	222	210	210	210	124
13	340	1,400	2,188	2,520	795	235	190	210	210	123
14	300	1,400	2,188	2,235	830	1,082	190	210	190	122
15	282	1,440	2,710	2,615	865	635	190	210	190	121
16	265	1,400	2,955	2,615	1,240	320	190	210	190	120
17	210	1,482	3,455	2,615	795	265	190	210	170	120
18	210	1,200	3,972	2,050	1,008	265	170	210	170	120
19	3,762	1,200	4,460	2,005	970	282	170	200	170	120
20	4,240	1,045	3,710	1,780	865	282	155	190	170	118
21	1,960	935	3,972	1,825	760	265	155	170	170	116
22	1,610	900	4,025	1,738	695	265	155	170	170	115
23	1,200	970	3,972	2,188	865	265	155	170	170	112
24	605	1,280	3,867	2,520	1,240	265	155	170	170	110
25	830	1,960	4,185	2,330	1,400	265	155	190	150	110
26	1,440	1,610	4,130	2,235	1,320	235	155	190	150	110
27	1,160	1,652	4,025	2,140	1,008	235	155	190	150	105
28	1,200	1,825	4,460	2,050	900	235	145	520	135	105
29	1,400	1,960	4,185	2,188	795	235	145	380	135	105
30	1,240	2,330	3,815	2,095	695	235	145	380	135	105
31	1,440	.....	3,868	.....	635	282	.....	340	.....	105

NOTE.—Daily discharge Mar. 9 to Nov. 24 determined from a curve well defined between 130 and 3,600 second-feet. Discharge Mar. 1 to 8 and Nov. 25 to Dec. 31 estimated, because of ice, from discharge measurements and reports of U. S. Weather Bureau.

Monthly discharge of San Juan River at Arboles, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	[a] 232	14,281	D.
February	.....	.....	[a] 194	11,167	D.
March	4,240	160	870	53,493	C.
April	2,710	635	1,543	91,640	A.
May	4,460	1,780	3,228	198,473	A.
June	3,972	1,738	2,785	165,729	A.
July	2,095	635	1,038	63,807	A.
August	1,082	222	350	21,495	A.
September	235	145	184	10,979	A.
October	520	155	251	15,449	A.
November	300	135	199	11,841	B.
December	134	105	120	7,380	C.
The year	4,460	.....	920	666,000	

[a] Estimated.

SAN JUAN RIVER AT FARMINGTON, N. MEX.

Location.—In sec. 17, T. 29 N., R. 13 W., half a mile southwest of Farmington, at an old bridge site near Bentleys Ferry, 1,500 feet below the confluence of the San Juan and Animas rivers.

Records available.—September 19, 1912, to December 31, 1912.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Shifting.

Discharge measurements.—By wading at low stages and from cable at high and medium stages.

Winter flow.—Little affected by ice.

Diversions.—Considerable water is diverted for irrigation above this station.

Accuracy.—Because of the shifting character of the stream daily estimates of the discharge can be considered only fair.

Discharge measurements of San Juan River at Farmington, N. Mex., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Sept. 19	Gray and O'Brien	1.20	833	Oct. 23	F. O'Brien	1.40	956
Oct. 2	F. O'Brien	1.16	539	Dec. 10	do	.98	526
15	do	1.41	842				

Daily gage height, in feet, and discharge, in second-feet, of San Juan River at Farmington, N. Mex., for 1912.

[G. E. Bentley, observer.]

Day.	September.		October.		November.		December.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	.....	.....	1.10	502	1.78	1,420	1.26	796
2	.....	.....	1.16	540	1.71	1,330	1.18	710
3	.....	.....	1.16	545	1.70	1,320	1.22	752
4	.....	.....	1.16	548	1.80	1,450	1.12	650
5	.....	.....	1.16	555	1.68	1,290	1.12	650
6	.....	.....	1.60	1,020	1.75	1,380	1.12	650
7	.....	.....	1.68	1,120	1.70	1,320	.86	423
8	.....	.....	1.55	980	1.68	1,290	.78	361
9	.....	.....	1.50	925	1.65	1,260	.95	498
10	.....	.....	1.48	908	1.68	1,290	1.12	650
11	.....	.....	1.39	815	1.66	1,270	.92	472
12	.....	.....	1.35	735	1.70	1,320	1.12	650
13	.....	.....	1.39	817	1.70	1,320	.99	532
14	.....	.....	1.41	842	1.60	1,190	.95	498
15	.....	.....	1.44	880	1.45	1,010	.95	498
16	.....	.....	1.48	935	1.49	1,060	1.14	670
17	.....	.....	1.50	975	1.46	1,020	1.11	640
18	.....	.....	1.48	975	1.60	1,190	1.08	612
19	1.20	833	1.46	970	1.45	1,010	1.01	549
20	1.19	805	1.42	940	1.35	895	1.00	540
21	1.14	730	1.42	945	1.35	895	.78	361
22	1.14	710	1.45	1,010	1.32	862	.82	391
23	1.14	695	1.42	974	1.45	1,010	.78	361
24	1.11	645	1.42	974	1.32	862	.76	347
25	1.14	655	1.34	884	1.39	939	.74	333
26	1.11	605	1.34	884	1.22	752	.71	312
27	1.06	535	1.31	851	1.21	741	.61	246
28	1.15	605	1.60	1,190	1.10	630	.60	240
29	1.12	560	2.19	1,970	1.09	621	.64	266
30	1.08	505	1.92	1,610	1.10	630	.80	375
31	.....	.....	1.82	1,480	.....	.....	.84	407

NOTE.—Daily discharge determined as follows: Sept. 19 to Oct. 22 by the indirect method for shifting channels; Oct. 23 to Dec. 31 from a curve well defined between 300 and 1,200 second-feet.

Monthly discharge of San Juan River at Farmington, N. Mex., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
September (19–30)	833	505	657	15,600	B.
October	1,970	502	945	58,100	B.
November	1,450	621	1,090	64,900	B.
December	796	240	498	30,600	B.
The period	.....	.....	.....	169,000	

NAVAJO RIVER AT CHROMO, COLO.

Location.—At Chromo, Colo., in sec. 3, T. 32 N., R. 1 E., New Mexico principal meridian, near the southern boundary of the San Juan National Forest. Nearest tributary, Little Navajo Creek, enters 150 yards below.

Records available.—November 24, 1911, to July 20, 1912.

Drainage area.—171 square miles (measured from Hayden's Atlas).

Gage.—Vertical staff.

Channel.—Shifting.

Discharge measurements.—Made by wading.

Winter flow.—Ice causes backwater, and measurements are made to determine the discharge.

Diversions.—A few small ditches divert water above the station for irrigation.

Accuracy.—Though a shift occurred at high water, the estimates may be considered fair.

Cooperation.—Station maintained in cooperation with the United States Forest Service.

Discharge measurements of Navajo River at Chromo, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 22	H. B. Waha	a 2.42	50.1	May 23	H. B. Waha	2.55	849
Apr. 1	do	1.50	81.0	June 6	do	2.60	1,170
27	do	1.90	235				

a Relation between gage height and discharge affected by ice. Average thickness of ice at gage 2.1 feet. Measurement made 200 feet below gage. Middle of section open.

Daily discharge, in second-feet, of Navajo River at Chromo, Colo., for 1911.

[N. B. Price, observer.]

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1		105	11		105	21		
2		105	12		105	22		
3		90	13		105	23		
4		90	14		125	24	105	
5		125	15		125	25	105	
6		105	16			26	105	
7		90	17			27	105	
8		90	18			28	105	
9		90	19			29	105	
10		90	20			30	105	
						31		

NOTE.—Daily discharge computed from a fairly well defined curve. Daily discharge Nov. 29 to Dec. 1 interpolated, and mean discharge Dec. 16 to 31 estimated as 75 second-feet on basis of open water flow of Dec. 15 and a measurement of January, 1912, the gage heights for above periods being affected by ice in stream.

Daily gage height, in feet, and discharge, in second-feet, of Navajo River at Chromo, Colo., for 1912.

[Joseph Thane, observer.]

Day.	January.		February.		April.		May.		June.		July.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	3.75		2.5		1.5	75	2.3	550	2.55	900	2.4	820
2	3.2					150	2.3	550	2.65	1,060	2.3	690
3	2.53					200	2.15	420	2.7	1,180	2.3	690
4	2.6					250	2.0	310	2.6	1,020	2.2	580
5	2.65				2.0	310	2.05	345	2.55	1,000	2.2	580
6			2.8		2.1	380	2.1	380	2.8	1,540	2.15	530
7					2.2	460	2.1	380	3.05	1,860	2.1	480
8					2.25	505	2.2	460	3.0	1,780	2.0	400
9					2.25	505	2.2	460	2.9	1,620	2.0	400
10					2.4	660	2.1	380	2.7	1,300	1.9	330
11					1.85	218	2.15	420	2.7	1,300	1.9	330
12					1.75	168	2.2	460	2.6	1,140	1.9	330
13					1.65	125	2.1	380	2.6	1,140	1.8	270
14					2.15	420	2.1	380	2.55	1,060	1.8	270
15					1.7	145	2.05	345	2.65	1,220	2.1	480

Daily gage height, in feet, and discharge, in second-feet, of Navajo river at Chromo, Colo., for 1912—Continued.

Day.	January.		February.		April.		May.		June.		July.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
16					1.8	190	2.15	420	2.65	1,220	2.2	580
17			3.2		1.75	168	2.25	505	2.65	1,220	1.85	300
18					1.75	168	2.4	660	2.4	820	1.8	270
19					1.65	125	2.6	920	2.4	820	1.8	270
20	2.95				1.65	125	2.55	850	2.45	900	1.8	270
21	3.15				1.65	125	2.65	1,000	2.5	980		
22			1.4		1.75	168	2.7	1,080	2.55	1,060		
23			2.6		1.9	245	2.65	1,000	2.55	1,060		
24					2.1	380	2.6	920	2.5	980		
25					2.0	310	2.6	920	2.45	900		
26					2.05	345	2.65	1,000	2.45	900		
27					1.9	245	2.7	1,080	2.6	1,140		
28					2.05	345	2.6	920	2.45	900		
29					2.1	380	2.55	850	2.45	900		
30					2.2	460	2.45	720	2.45	900		
31							2.5	780				

NOTE.—Severe ice Jan. 1 to Mar. 1. Gage height of 3.0 feet on Mar. 1. Daily discharge computed from two curves, applicable April to May 31, and June 6 to July 20, respectively; the first is fairly well defined, the last is poorly defined. Discharge June 1 to 5 obtained by indirect method for shifting channels.

Monthly discharge of Navajo River at Chromo, Colo., for 1911–12.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1911.					
November 24–30	105	105	105	1,460	C.
December	125		88.5	5,440	C.
1912.					
April	660	75	278	16,500	B.
May	1,080	310	640	39,400	B.
June	1,860	820	1,130	67,200	B.
July 1–20	820	270	444	17,600	B.

NAVAJO RIVER AT EDITH, COLO.

Location.—Six miles northeast of Lumberton, N. Mex., at highway bridge on road from Lumberton to Edith, one-fourth mile east of Edith, short distance north of the New Mexico-Colorado State line, near southwestern corner of T. 33 N., R. 1 E., about 5 miles southwest and downstream from the confluence of Navajo and Little Navajo rivers. A small tributary from the north enters Navajo River about one-fourth mile below the station.

Records available.—September 21, 1912, to December 31, 1912.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Permanent at low stages but shifting during high.

Discharge measurements.—At low stages made by wading; at high stages made from bridge.

Winter flow.—Greatly affected by ice.

Diversions.—Considerable water is diverted above this station for irrigation.

Accuracy.—Estimates of daily discharge considered good.

Discharge measurements of Navajo River at Edith, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Sept. 21	Gray and O'Brien	1.43	36.6	Oct. 28	F. O'Brien	1.81	88.1
Oct. 8	F. O'Brien	1.61	58.9	Nov. 27[a]	do	1.40	34.0
18	do	1.53	47.9	Dec. 17[b]	do	2.15	43.3

[a] Floating slush ice. [b] Stream covered with ice.

Daily gage height, in feet, and discharge, in second-feet, of Navajo River at Edith, Colo., for 1912.

[W. C. Williams, observer.]

Day.	September.		October.		November.		December.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1			1.42	36	1.50	45	1.48	43
2			1.51	46	1.50	45	1.48	43
3			1.48	43	1.50	45	1.48	43
4			1.52	47	1.50	45	1.48	43
5			1.60	57	1.50	45	1.48	43
6			1.63	62	1.49	44	1.48	43
7			1.60	57	1.49	44	1.48	43
8			1.60	57	1.49	44	1.52	43
9			1.60	57	1.49	44	1.58	43
10			1.60	57	1.49	44	1.61	43
11			1.59	56	1.49	44	1.82	43
12			1.58	55	1.55	51	2.15	43
13			1.55	51	1.55	51	2.20	43
14			1.55	51	1.55	51	2.20	43
15			1.54	50	1.56	52	2.20	43
16			1.52	47	1.58	55	2.20	43
17			1.52	47	1.58	55	2.20	43
18			1.52	47	1.58	55	1.25	43
19			1.52	47	1.58	55	1.25	43
20			1.52	47	1.58	55	1.25	43
21	1.42	36	1.52	47	1.58	55	1.25	43
22	1.47	42	1.51	46	1.58	55	1.26	43
23	1.42	36	1.51	46	1.58	55	1.26	43
24	1.42	36	1.51	46	1.58	55	1.26	43
25	1.41	35	1.51	46	1.56	52	1.26	43
26	1.41	35	1.51	46	1.55	51	1.25	43
27	1.40	34	1.50	45	1.52	47	1.25	43
28	1.40	34	1.95	112	1.48	43	1.25	43
29	1.39	33	1.65	64	1.48	43		40
30	1.41	35	1.59	56	1.48	43	2.60	40
31			1.55	51			2.60	40

NOTE.—Gage heights affected by ice Dec. 8 to 31; average thickness of ice, 1.10 feet. Some slush ice in stream during latter part of November and early part of December. Daily discharge determined as follows: Sept. 21 to Dec. 7 from a curve well defined between 25 and 110 second-feet; Dec. 8 to 31 estimated because of ice, from discharge measurements and reports of United States Weather Bureau.

Monthly discharge of Navajo River at Edith, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
September 21–30	42	33	35.6	706	A.
October	112	36	52.3	3,220	A.
November	55	43	48.9	2,910	A.
December	43	40	42.7	2,630	B.

PIEDRA RIVER AT PIEDRA, COLO.

Location.—At Piedra post office, Colo., in sec. 8, T. 34 N., R. 4 W. New Mexico principal meridian, in the San Juan National Forest. Nearest tributary, Yellow Jacket Creek, enters one-fourth mile below.

Records available.—November 26, 1911, to July 22, 1912.

Drainage area.—376 square miles (measured from Hayden's Atlas).

Gage.—Vertical staff. On June 8, 1912, a gage reading to a different datum was placed on bridge 100 yards upstream from original gage; the exact relation between the two gages was not determined.

Channel.—Apparently permanent.

Discharge measurements.—Made by wading.

Winter flow.—Ice causes little if any backwater at this station.

Diversions.—A number of small ditches divert water above the station for irrigation.

Accuracy.—Sufficient measurements have been made to establish a well-defined curve, but owing to infrequency of gage readings monthly estimates have not been made.

Cooperation.—Station maintained in cooperation with the United States Forest Service.

Discharge measurements of Piedra River at Piedra, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 24	H. B. Waha	1.50	83.1	May 28	H. B. Waha	4.30	2,590
Mar. 28	do	1.71	145	June 2	do	[a]4.25	2,570
Apr. 26	do	2.60	647				

[a] New gage read 3.20.

Daily gage height, in feet, of Piedra River at Piedra, Colo., for 1912.

[Allen Snyder, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.
1							
2						4.25	
3		1.35		2.0			1.4
4			1.7				
5		1.4			2.95		
6				2.4			
7							1.1
8			1.8			4.2	
9				3.15			
10		1.45					
11			1.65	2.7			
12					3.8	3.2	
13		1.4		2.4			
14						1.8	
15							
16			1.6			1.9	
17		1.4					
18			1.45				
19					4.1		
20				2.3			
21							
22		1.25	1.8				.8
23						1.9	
24							
25	1.5						
26				2.6		1.8	
27	1.45	1.3			4.6		
28			1.75			1.75	
29		1.4					
30							
31	1.4						

NOTE.—Gage heights published for June 8 and 12 were read on old gage. Readings on new gage were 3.0 feet on 8th and 2.0 feet on 12th.

Daily discharge, in second-feet, of Piedra River at Piedra, Colo., for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.
1						
2						2,540
3		65		220		
4			130			
5		70			970	
6				465		
7						
8			155			2,480
9				1,180		
10		78				
11			118	725		
12					1,960	1,240
13		70		465		
14						
15						
16			105			
17		70				
18			78			
19					2,350	
20				385		
21						
22		55	155			
23						
24						
25	85					
26				635		
27	78	60			3,000	
28			142			
29		70				
30						
31	70					

NOTE.—Daily discharge computed from a well-defined curve which was not, however, applicable after June 12 when new gage was read.

PIEDRA RIVER AT ARBOLES, COLO.

Location.—At the railroad bridge at Arboles, Colo., in sec. 16, T. 32 N., R. 5 W., 1 mile above the junction with San Juan River. No tributaries between station and mouth.

Records available.—June 19, 1895, to September 30, 1899; August 21, 1910, to December 31, 1912.

Drainage area.—650 square miles.

Gage.—Chain gage.

Channel.—Practically permanent except during high water.

Discharge measurements.—Made from the bridge during high water and by wading at ordinary stages.

Diversions.—There are court decrees for diversions of 18 second-feet from Piedra River in Colorado and 52 second-feet from Colorado tributaries.

Cooperation.—Records from August 21, 1910, to September 30, 1912, furnished by the State engineer of Colorado; after that date the station was maintained in cooperation with the State engineers of Colorado and New Mexico.

Discharge measurements of Piedra River at Arboles, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 26[a]	B. S. Clayton		107	Sept. 20	Gray and O'Brien	1.90	93.0
Mar. 1	do	2.59	97	Oct. 7	F. O'Brien	2.35	172
Apr. 12	do	5.24	1,200	17	do	2.25	154
May 10	C. C. Hezmalhalch	6.01	1,930	27	do	2.15	140
June 12	do	5.16	1,400	Nov. 28[a]	do	1.56	69.5
July 18	do	3.04	377	Dec. 16[a]	do	2.52	97.5
Sept. 20	C. E. Turner	1.90	108				

[a] Ice in stream affected relation of gage height to discharge.

Daily gage height, in feet, of Piedra River at Arboles, Colo., for 1912.

[L. E. Smack, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.6	3.95	6.55	6.7	4.35	3.65	2.25	1.75	2.75	1.8
2	.....	4.05	6.6	6.75	4.15	3.6	2.25	1.75	2.7	1.8
3	.....	4.45	7.05	7.0	3.95	3.55	2.25	1.8	2.6	1.8
4	.....	4.7	5.9	6.85	3.7	3.35	2.25	2.05	2.6	1.8
5	.....	4.95	5.05	6.7	3.65	3.25	2.15	2.15	2.5	1.8
6	.....	5.45	5.85	6.75	3.4	3.15	2.15	2.2	2.45	1.8
7	.....	5.65	6.1	6.55	3.35	3.05	2.15	2.25	2.4	1.8
8	2.4	6.55	6.25	6.6	3.25	2.8	2.05	2.25	2.4	1.8
9	2.4	5.75	6.5	6.45	3.25	2.65	2.05	2.25	2.4	1.8
10	4.8	5.75	6.3	6.0	3.05	2.45	2.05	2.25	2.4	1.8
11	4.3	5.5	6.05	5.4	2.85	2.25	2.05	2.15	2.4	1.8
12	3.3	5.45	6.3	5.1	2.8	2.1	2.05	2.0	2.4	1.8
13	3.15	5.25	6.3	4.8	2.75	2.05	2.0	2.1	2.4	1.8
14	2.85	5.05	6.15	4.7	2.75	2.75	1.95	2.1	2.3	1.8
15	2.7	4.95	6.1	4.6	2.65	2.6	1.95	2.1	2.25	1.9
16	2.65	4.7	6.15	4.65	2.6	2.3	1.95	2.1	2.25	2.5
17	2.75	4.65	6.55	4.65	2.65	2.3	1.95	2.15	2.15	2.2
18	2.65	4.65	7.0	4.35	2.75	2.15	1.95	2.2	2.15	1.7
19	4.8	4.55	7.0	4.3	2.7	2.0	1.95	2.2	2.1	1.7
20	4.55	4.5	7.1	4.2	3.05	2.0	1.9	2.2	2.15	1.7
21	4.5	4.2	7.1	3.85	3.2	2.1	1.9	2.1	2.1	1.7
22	4.0	4.1	7.15	3.9	3.0	2.1	1.75	2.1	2.05	1.8
23	3.95	4.05	7.05	4.95	3.25	2.1	1.75	2.0	1.9	1.8
24	3.9	4.65	6.95	4.9	3.7	2.15	1.75	2.0	1.85	1.85
25	3.7	5.55	7.1	4.65	3.95	2.2	1.75	2.0	1.85	1.85
26	4.35	5.3	7.1	4.55	4.85	2.35	1.75	2.0	1.8	2.0
27	4.05	5.0	7.0	4.75	4.95	2.35	1.75	2.0	1.7	2.2
28	4.1	5.35	7.0	4.5	4.75	2.25	1.75	2.7	1.7	2.3
29	4.55	6.1	7.0	4.4	4.45	2.25	1.75	2.65	1.8	2.3
30	4.2	6.4	7.05	4.3	3.8	2.35	1.75	2.9	1.8	2.3
31	4.1	.....	6.95	.....	3.75	2.35	.....	2.85	.....	2.3

NOTE.—Gage heights affected by ice Nov. 28 to Dec. 31, 1912.

Daily discharge, in second-feet, of Piedra River at Arboles, Colo., for 1912.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	97	558	2,110	2,375	960	626	151	85	272	80
2	97	602	2,165	2,408	858	604	151	85	256	80
3	97	795	2,475	2,570	761	583	151	90	229	80
4	97	920	1,760	2,472	647	496	151	120	229	80
5	97	1,045	1,260	2,375	626	455	134	134	205	80
6	80	1,330	1,760	2,408	518	415	134	142	193	75
7	70	1,450	1,930	2,278	496	376	134	151	181	70
8	58	2,002	2,045	2,310	455	287	120	151	181	65
9	58	1,510	2,220	2,212	455	242	120	151	181	60
10	970	1,510	2,115	1,920	376	193	120	151	181	55
11	720	1,360	1,952	1,550	304	151	120	134	181	50
12	300	1,330	2,115	1,370	287	127	120	112	181	45
13	248	1,210	2,115	1,202	272	120	112	127	181	40
14	158	1,098	2,018	1,148	272	272	106	127	160	40
15	120	1,045	1,985	1,094	242	229	106	127	151	45
16	108	920	2,018	1,121	229	160	106	127	151	98
17	132	895	2,278	1,121	242	160	106	134	134	70
18	108	895	2,570	960	272	134	106	142	134	40
19	970	845	2,570	935	256	112	106	142	127	40
20	845	820	2,635	884	376	112	100	142	134	40
21	820	670	2,635	714	435	127	100	127	127	40
22	580	625	2,668	737	358	127	85	127	120	40
23	558	602	2,602	1,284	455	127	85	112	100	40
24	535	895	2,538	1,256	647	134	85	112	95	40
25	450	1,390	2,635	1,121	761	142	85	112	95	40
26	745	1,240	2,635	1,067	1,229	170	85	112	90	40
27	602	1,095	2,570	1,175	1,284	170	85	112	80	40
28	625	1,310	2,570	1,040	1,175	151	85	256	80	40
29	845	1,780	2,570	986	1,013	151	85	242	80	40
30	670	2,000	2,602	935	692	170	85	321	80	40
31	625	.....	2,538	.....	669	170	.....	304	.....	40

NOTE.—Daily discharge determined as follows: Mar. 2 to 7, estimated; Mar. 8 to Apr. 25, from a curve well defined between 60 and 2,000 second-feet; Apr. 26 to May 9, by indirect method for shifting channel; May 10 to Nov. 27, from a curve well defined between 80 and 2,500 second-feet; Nov. 28 to Dec. 31, estimated because of ice, from discharge measurements and reports of United States Weather Bureau.

Monthly discharge of Piedra River at Arboles, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
March	970	58	403	24,800	C.
April	2,002	558	1,125	67,000	B.
May	2,668	1,260	2,279	140,000	B.
June	2,570	714	1,501	89,000	B.
July	1,284	229	568	34,900	B.
August	626	112	242	14,900	B.
September	151	85	111	6,600	B.
October	321	85	146	8,980	B.
November	272	80	153	9,100	B.
December	98	40	54.0	3,320	C.
The period				399,000	

LOS PINOS RIVER NEAR IGNACIO, COLO.

Location.—At the highway bridge near Ignacio Indian Agency, about sec. 8, T. 33 N., R. 7 W. New Mexico principal meridian, 1 mile north of Ignacio. Nearest tributary is a small stream that enters from the west 2 miles below.

Records available.—April 22, 1899, to October 31, 1903; September 1, 1910, to November 30, 1912.

Drainage area.—450 square miles.

Gage.—Chain gage.

Channel.—Shifting.

Discharge measurements.—Made from the bridge during high water and by wading at ordinary stages.

Winter flow.—No data.

Diversions.—A number of ditches divert water above the station for irrigation.

Cooperation.—Station is maintained and records are furnished complete for publication by the State engineer.

Discharge measurements of Los Pinos River near Ignacio, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 27	B. S. Clayton	(a)	124	July 19	C. C. Hezmalhalch	2.58	417
Mar. 5	do	1.09	132	Aug. 25	do	1.16	83
Apr. 13	do	1.82	441	Sept. 20	C. E. Turner	.81	41
May 10	C. C. Hezmalhalch	2.82	1,176	Oct. 20	do	1.39	120
June 13	do	4.64	1,207	Nov. 18	do	1.55	136

[a] River covered with ice.

Daily discharge, in second-feet, of Los Pinos River at Ignacio, Colo., for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	150	125	132	230	932	1,148	820	576	96	41	289
2	150	125	132	250	1,065	1,236	668	540	96	58	289
3	150	125	132	360	1,160	1,434	576	390	82	46	276
4	150	125	132	482	932	1,500	558	276	69	52	276
5	150	125	132	538	805	1,590	522	250	58	148	250
6	150	125	192	538	768	1,280	488	237	52	104	237
7	150	125	210	662	848	1,170	576	189	46	104	224
8	140	125	173	730	1,160	1,258	540	158	46	138	224
9	140	125	173	730	1,212	1,280	505	138	46	104	224
10	140	120	482	805	1,065	1,258	540	96	46	75	224

Daily discharge, in second-feet, of Los Pinos River at Ignacio, Colo., for 1912—Contd.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
11	140	120	210	630	1,160	1,192	522	69	41	104	212
12	140	120	137	568	1,440	1,236	522	58	36	69	200
13	135	120	137	482	1,632	1,324	505	58	41	75	200
14	135	120	105	456	1,265	1,214	522	112	46	69	200
15	135	115	105	406	1,065	1,126	488	454	41	82	200
16	135	115	155	456	1,160	880	454	454	41	89	189
17	135	115	137	456	1,160	763	454	360	41	89	178
18	130	115	137	456	840	725	438	438	36	104	178
19	130	110	272	406	1,000	668	522	345	36	120	178
20	130	110	510	382	980	649	522	302	32	138	178
21	130	110	338	382	1,041	594	438	250	41	138	178
22	130	110	294	338	1,104	649	540	178	41	148	178
23	125	120	294	338	1,126	668	706	148	36	138	178
24	125	120	250	510	1,126	744	471	158	36	120	168
25	125	120	272	568	1,302	763	522	112	46	138	158
26	125	120	294	510	1,302	744	576	89	41	138	158
27	125	120	250	430	1,368	649	594	75	36	158	158
28	125	130	250	382	1,390	612	594	69	46	330	158
29	125	130	294	568	1,390	782	763	69	46	330	158
30	125	.....	294	730	1,434	940	649	69	46	302	138
31	125	.....	250	.....	1,368	.....	630	96	.....	302	.....

Monthly discharge of Los Pinos River near Ignacio, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January	150	125	136	8,331
February	130	110	120	6,922
March	510	105	222	13,636
April	805	230	493	29,314
May	1,632	768	1,148	70,613
June	1,590	594	1,002	59,656
July	820	438	556	34,166
August	576	58	220	13,514
September	96	32	48	2,882
October	330	41	131	8,035
November	289	138	202	12,012
The period	.....	.....	.....	259,081

ANIMAS RIVER AT DURANGO, COLO.

Location.—At the footbridge at the foot of Fourteenth Street in Durango. Nearest tributary, Lightner Creek, enters just above.

Records available.—From June 20, 1901, to December 31, 1905, at a point above Lightner Creek; January 1, 1910, to November 30, 1912.

Drainage area.—694 square miles (Hayden's Atlas).

Gage.—Automatic recording gage.

Channel.—Liable to shift during high water.

Discharge measurements.—Made from bridge and from cable.

Winter flow.—Little if any backwater from ice during the winter months.

Diversions.—Water is diverted above the station for irrigation.

Floods.—The severest flood in many years occurred in the first week of October, 1911, when the river reached a maximum stage of 13.6 feet.

Cooperation.—Records furnished through the courtesy of the San Juan Water & Power Co. and the State engineer of Colorado.

Discharge measurements of Animas River at Durango, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 28	B. S. Clayton	.....	274	June 15	C. C. Hezmalhalch	3.20	1,680
Mar. 1	C. C. Hezmalhalch	1.09	233	July 17	.....do	3.22	1,713
Apr. 17	B. S. Clayton	1.80	576	Sept. 21	C. E. Turner	1.38	312
May 12	C. C. Hezmalhalch	3.90	2,741	Nov. 19	.....do	1.36	292
31	H. B. Waha	5.30	5,340				

Daily discharge, in second-feet, of Animas River at Durango, Colo., for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	290	260	235	332	1,465	5,120	3,055	1,385	622	270	310
2	290	260	235	355	1,675	5,340	2,445	1,295	525	270	310
3	290	260	235	405	1,675	6,110	2,110	1,072	525	270	310
4	290	260	240	460	1,275	6,660	1,695	990	495	270	310
5	290	260	240	520	1,142	6,770	1,435	790	465	335	310
6	280	260	240	520	1,100	5,340	1,295	720	465	335	310
7	280	260	240	610	1,322	4,710	1,485	755	410	310	310
8	280	250	240	820	1,842	4,810	1,865	720	410	310	310
9	280	250	255	860	1,730	5,015	1,805	655	410	310	310
10	280	250	332	1,060	1,465	4,310	1,865	590	410	310	310
11	280	250	270	900	1,785	4,110	1,805	525	410	310	310
12	280	250	270	820	2,570	3,055	1,750	525	410	310	310
13	280	250	270	710	2,570	2,595	1,640	525	360	310	310
14	280	250	290	640	2,020	2,240	1,750	622	360	290	310
15	275	240	270	610	2,420	2,670	1,695	950	360	290	310
16	275	240	270	580	2,570	2,670	1,585	910	360	290	270
17	275	240	270	490	2,870	2,375	1,535	790	360	310	270
18	275	240	270	520	4,015	1,925	1,435	830	310	310	270
19	275	240	290	520	4,910	1,640	1,535	755	310	310	270
20	275	240	355	520	5,450	1,695	1,750	720	310	310	270
21	275	240	355	490	5,340	2,240	1,695	655	310	310	270
22	275	240	355	460	5,780	2,520	1,535	590	310	310	270
23	275	235	355	460	5,670	2,595	1,925	525	290	270	270
24	275	235	310	550	5,670	2,745	1,695	525	270	270	250
25	275	235	310	710	6,220	2,895	1,695	465	270	270	230
26	275	235	355	710	6,550	3,215	1,750	465	270	270	230
27	275	235	310	710	6,330	2,670	1,750	465	270	270	230
28	275	235	310	780	6,220	2,445	1,485	465	270	360	230
29	275	235	310	780	6,330	2,975	1,640	465	270	410	200
30	275	.....	332	1,020	6,990	3,385	1,865	495	270	360	200
31	275	.....	355	.....	5,560	.....	1,640	655	.....	310	.....

Monthly discharge of Animas River at Durango, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January	290	275	279	17,147
February	260	235	246	14,152
March	355	235	289	17,800
April	1,060	332	631	37,531
May	6,990	1,100	3,630	223,202
June	6,770	1,640	3,562	211,924
July	3,055	1,295	1,749	107,524
August	1,385	465	706	43,426
September	622	270	370	21,991
October	410	270	305	18,724
November	310	200	280	16,681
The period	.....	.....	.....	730,102

ANIMAS RIVER AT AZTEC, N. MEX.

Location.—In sec. 9, T. 30 N., R. 11 W., about half a mile west of Aztec, 200 feet upstream from suspension bridge on main wagon road to Farmington and La Plata, 20 miles above the mouth of the river and below all important tributaries.

Records available.—June 21, 1904, to December 14, 1904; June 8, 1907, to December 31, 1912.

Drainage area.—Approximately 1,300 square miles.

Gage.—Inclined staff. From June 21, 1904, to September 13, 1908, readings were taken from a gage about half a mile downstream from the present gage. Gage datum remained unchanged from September 14, 1908, to December 31, 1912. The gage was washed out June 1, 1912, and not replaced until September 16, 1912.

Channel.—Subject to shift during high water.

Discharge measurements.—Made by wading at low stages and from suspension bridge at high stages.

Winter flow.—Ice causes slight backwater at times during the winter months.

Diversions.—Considerable water is taken out above and below this point for irrigation.

Accuracy.—The discharge estimates for the first part of 1912 can be considered only fair, but those for the last part of 1912 can be rated as good.

Cooperation.—Maintained in cooperation with W. G. Black, Aztec, N. Mex.

Discharge measurements of Animas River at Aztec, N. Mex., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Ft.	*Sec. Ft.*			*Ft.*	*Sec. Ft.*
Sept. 16	Gray and O'Brien	3.90	325	Oct. 24	F. O'Brien	3.93	309
Oct. 2	F. O'Brien	3.79	248	Dec. 4	do	3.69	227
15	do	3.90	303				

NOTE.—The Aztec Light & Power Co. diverts water just above this station. The amount diverted at the time of the above measurements was as follows: Sept. 16, 45.6 second-feet; Oct. 2, 33.1 second-feet; Oct. 15, 46.9 second-feet; Oct. 24, 51.7 second-feet; Dec. 4, 53.5 second-feet.

Daily gage height, in feet, of Animas River at Aztec, N. Mex., for 1912.

[W. G. Black, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.3	2.3	2.3	2.7	4.0	.....	.....	.....	.....	3.7	4.0	3.8
2	2.2	2.4	2.4	2.7	4.35	.....	.....	.....	.....	3.8	4.0	3.8
3	2.3	2.4	2.4	2.8	4.5	.....	.....	.....	.....	3.8	4.0	3.8
4	2.3	2.4	2.4	3.0	4.2	.....	.....	.....	.....	3.8	4.0	3.8
5	2.3	2.5	2.4	3.0	4.0	.....	.....	.....	.....	3.9	3.9	3.8
6	2.2	2.45	2.5	3.1	3.9	.....	.....	.....	.....	4.0	3.9	3.8
7	2.25	2.5	2.5	3.3	4.0	.....	.....	.....	.....	4.0	3.9	3.8
8	2.3	2.4	2.6	3.5	4.5	.....	.....	.....	.....	4.0	3.9	.....
9	2.3	2.5	2.6	3.6	4.5	.....	.....	.....	.....	4.0	3.9	.....
10	2.3	2.5	2.7	3.9	4.1	.....	.....	.....	.....	4.0	3.9	.....
11	2.6	2.4	2.6	3.7	4.5	.....	.....	.....	.....	3.9	3.9	.....
12	2.3	2.4	2.7	3.55	5.1	.....	.....	.....	.....	3.9	3.9	.....
13	2.2	2.5	2.6	3.5	5.6	.....	.....	.....	.....	3.9	3.8	.....
14	2.4	2.5	2.5	3.2	5.0	.....	.....	.....	.....	3.9	3.8	.....
15	2.5	2.4	2.5	3.2	4.5	.....	.....	.....	.....	3.9	3.8	.....
16	2.4	2.3	2.5	3.2	5.1	.....	.....	.....	3.9	3.9	3.8	.....
17	2.4	2.4	2.5	3.3	5.6	.....	.....	.....	3.9	3.9	3.8	.....
18	2.45	2.3	2.5	3.1	6.0	.....	.....	.....	3.9	3.9	3.8	3.5
19	2.3	2.4	2.7	3.0	6.7	.....	.....	.....	3.9	3.9	3.8	3.5
20	2.4	2.4	3.5	3.1	6.7	.....	.....	.....	3.9	3.9	3.8	3.5
21	2.3	2.4	3.0	3.0	6.9	.....	.....	.....	3.8	3.9	3.8	3.6
22	2.4	2.4	3.0	3.0	7.1	.....	.....	.....	3.8	3.9	3.8	3.6
23	2.4	2.35	2.9	3.1	7.0	.....	.....	.....	3.8	3.9	3.8	3.4
24	2.4	2.4	2.7	3.1	7.0	.....	.....	.....	3.8	3.9	3.8	3.4
25	2.4	2.4	2.9	3.2	7.4	.....	.....	.....	3.8	3.9	3.8	3.5
26	2.4	2.3	2.7	3.4	7.5	.....	.....	.....	3.8	3.9	3.8	3.6
27	2.4	2.3	2.7	3.3	7.4	.....	.....	.....	3.8	3.9	3.8	3.7
28	2.4	2.3	2.9	3.3	7.3	.....	.....	.....	3.7	4.0	3.8	3.5
29	2.4	2.3	2.8	3.3	7.7	.....	.....	.....	3.8	4.0	3.8	3.3
30	2.35	.....	2.8	3.5	8.0	.....	.....	.....	3.7	4.0	3.8	3.3
31	2.3	.....	2.8	.....	7.0	.....	.....	.....	.....	4.0	.....	3.5

Daily discharge, in second-feet, of Animas River at Aztec, N. Mex., for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	380	380	380	470	1,010	.....	.....	.....	.....	220	360	260
2	360	400	400	470	1,240	.....	.....	.....	.....	260	360	260
3	380	400	400	500	1,350	.....	.....	.....	.....	260	360	260
4	380	400	400	560	1,130	.....	.....	.....	.....	260	360	260
5	380	420	400	560	1,010	.....	.....	.....	.....	310	310	260
6	360	410	420	600	960	.....	.....	.....	.....	360	310	260
7	370	420	420	680	1,010	.....	.....	.....	.....	360	310	260
8	380	400	440	760	1,350	.....	.....	.....	.....	360	310	250
9	380	420	440	810	1,350	.....	.....	.....	.....	360	310	240
10	380	420	470	960	1,070	.....	.....	.....	.....	360	310	230
11	440	400	440	860	1,350	.....	.....	.....	.....	310	310	220
12	380	400	470	785	1,930	.....	.....	.....	.....	310	310	210
13	360	420	440	760	2,490	.....	.....	.....	.....	310	260	200
14	400	420	420	640	1,820	.....	.....	.....	.....	310	260	190
15	420	400	420	640	1,350	.....	.....	.....	.....	310	260	180
16	400	380	420	640	1,930	.....	.....	.....	325	310	260	170
17	400	400	420	680	2,490	.....	.....	.....	324	310	260	160
18	410	380	420	600	3,000	.....	.....	.....	323	310	260	160
19	380	400	470	560	3,930	.....	.....	.....	322	310	260	160
20	400	400	760	600	3,930	.....	.....	.....	321	310	260	160
21	380	400	560	560	4,210	.....	.....	.....	270	310	260	190
22	400	400	560	560	4,500	.....	.....	.....	269	310	260	190
23	400	390	530	600	4,350	.....	.....	.....	268	310	260	135
24	400	400	470	600	4,350	.....	.....	.....	267	310	260	135
25	400	400	530	640	4,950	.....	.....	.....	266	310	260	160
26	400	380	470	720	5,100	.....	.....	.....	265	310	260	190
27	400	380	470	680	4,950	.....	.....	.....	264	310	260	220
28	400	380	530	680	4,800	.....	.....	.....	223	360	260	160
29	400	380	500	680	5,400	.....	.....	.....	262	360	260	115
30	390	.....	500	760	5,850	.....	.....	.....	221	360	260	115
31	380	.....	500	.....	4,350	.....	.....	.....	.....	360	.....	160

NOTE.—Daily discharge determined as follows: Jan. 1 to May 31, from a curve well defined between 350 and 6,000 second-feet; Sept. 16 to 30, by indirect method for shifting channels; Oct. 1 to Dec. 31, from a curve well defined between 135 and 700 second-feet.

Monthly discharge of Animas River at Aztec, N. Mex., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January	440	360	390	24,000
February	420	380	399	23,000
March	760	380	467	28,700
April	960	470	654	38,900
May	5,850	960	2,860	176,000
September (16–30)	325	221	279	8,300
October	360	220	317	19,500
November	360	260	287	17,100
December	260	115	197	12,100

ANIMAS RIVER AT FARMINGTON, N. MEX.

Location.—About three-fourths mile east of Farmington and one-fourth mile above the confluence of the Animas and San Juan rivers, in sec. 15, T. 29 N., R. 13 W.

Records available.—September 17, 1912, to December 31, 1912.

Drainage area.—Not measured.

Gage.—Automatic recording.

Channel.—Permanent.

Discharge measurements.—By wading at low stages and from cable during high stages.

Winter flow.—Ice causes backwater during the winter months.

Diversions.—Considerable water taken from the stream above this point.

Accuracy.—Owing to a lack of high-water discharge measurements, estimates of the discharge were not made for 1912.

Discharge measurements of Animas River at Farmington, N. Mex., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Sept. 17	Gray and O'Brien	1.53	347	Oct. 25	F. O'Brien	1.62	370
28	F. O'Brien	1.42	277	Dec. 5[a]	do	1.50	286
Oct. 12	do	1.63	384				

[a] Floating slush ice.

Daily gage height, in feet, of Animas River at Farmington, N. Mex., for 1912.

[G. H. Bergen, observer.]

Day.	Sept.	Oct.	Nov.	Dec.	Day.	Sept.	Oct.	Nov.	Dec.
1		1.41	1.74	1.54	16		1.61	1.60	1.34
2		1.41	1.69	1.50	17	1.53	1.62	1.59	1.32
3		1.43	1.69	1.49	18	1.54	1.64	1.58	1.31
4		1.42	1.68	1.47	19	1.52	1.66	1.57	1.30
5		1.42	1.68	1.45	20	1.50	1.65	1.54	1.29
6		1.63	1.69	1.40	21	1.50	1.64	1.52	1.33
7		1.74	1.66	1.30	22	1.48	1.63	1.52	1.19
8		1.72	1.65	1.26	23	1.48	1.62	1.54	1.16
9		1.70	1.62	1.38	24	1.48	1.61	1.53	1.18
10		1.71	1.59	1.41	25	1.46	1.60	1.52	1.22
11		1.70	1.60	1.41	26	1.44	1.60	1.50	1.25
12		1.61	1.60	1.37	27	1.43	1.62	1.53	1.27
13		1.61	1.59	1.32	28	1.44	1.75	1.55	1.30
14		1.61	1.57	1.31	29	1.42	1.85	1.51	1.28
15		1.60	1.59	1.34	30	1.42	1.88	1.51	1.25
					31		1.84		1.24

NOTE.—Gage heights were obtained from a chain gage Sept. 17 to 30 and from an automatic gage Oct. 1 to Dec. 31. Gage heights affected by ice Dec. 6 to 31.

HERMOSA CREEK NEAR HERMOSA, COLO.

Location.—In sec. 34, T. 37 N., R. 9 W. New Mexico principal meridian, in the San Juan National Forest, 1½ miles above Hermosa post office, 200 yards below the mouth of Buck Creek, 1½ miles above the mouth of Hermosa Creek. No tributaries between the station and mouth.

Records available.—November 28, 1911, to September 17, 1912.

Drainage area.—172 square miles (measured from topographic sheets).

Gage.—Vertical staff.

Channel.—Practically permanent.

Discharge measurements.—Made from a bridge 1 mile below station during high water and by wading at ordinary stages.

Winter flow.—So far as known, ice causes little if any backwater at this station.

Diversions.—The station is above all diversions.

Accuracy.—Owing to infrequency of gage readings, estimates of monthly discharge have not been made. Daily discharge for days when gage height was read may be considered good for stages below about 1,200 second-feet.

Cooperation.—Station maintained in cooperation with the United States Forest Service.

Discharge measurements of Hermosa Creek near Hermosa, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 26	H. B. Waha	1.55	44.3
Mar. 30	do	1.85	72.2
Apr. 23	do	2.15	123
May 31	do	4.35	1,070

Daily gage height, in feet, of Hermosa Creek near Hermosa, Colo., for 1912.

[Ralph R. Shaw, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1				1.9	3.55		2.95	2.55	2.3
2				1.9				2.5	2.0
3				2.15				2.45	2.0
4							2.8	2.4	
5				2.55		4.05			
6			1.55	2.3	3.65		2.6		
7				2.75	3.5				
8			1.55	2.95	3.85				
9				3.0	3.65				
10	1.6	1.55	1.55		3.6				
11			1.55		3.85				
12			1.55						
13							2.35		
14				2.55				2.35	
15								2.55	
16									
17									1.95
18								2.3	
19				2.35				2.25	
20				2.3	5.95		2.25		
21					6.15				
22			1.7						
23		1.55	1.7	2.15			2.55	2.4	
24			1.7	2.45		2.95	2.6	2.4	
25			1.7	2.55				2.2	
26		1.55	1.7	2.7			2.5		
27			1.75					(2.05)	
28			1.75	2.9			2.7	(2.05)	
29		1.55	1.8	3.05				2.05	
30			1.85	3.3				2.25	
31			1.85				2.6	2.4	

Daily discharge, in second-feet, of Hermosa Creek near Hermosa, Colo., for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1				80	550		316	208	152
2				80				196	96
3				123				185	96
4							270	174	
5				208		855			
6			44	152	602		220		
7				257	525				
8			44	316	722				
9				332	602				
10	48	44	44		575				
11			44		722				
12			44						
13							163		
14				208				163	
15								208	
16									
17									88
18								152	
19				163				142	
20				152	2,350		142		
21					2,510				
22			58						
23		44	58	123			208	174	
24			58	185		316	220	174	
25			58	208				132	
26		44	58	244			196		
27			63					105	
28			63	300			244	105	
29		44	68	349				105	
30			74	440				142	
31			74				220	174	

NOTE.—Daily discharge computed from a curve well defined below about 1,200 second-feet.

FLORIDA RIVER NEAR DURANGO, COLO.

Location.—At Cash ranch, in sec. 19, T. 35 N., R. 8 W., New Mexico principal meridian, 7 miles east of Durango. Nearest important tributary, Red Creek, enters several miles above. There are a number of small intermittent tributaries nearer.

Records available.—September 18, 1910, to November 30, 1912.

Drainage area.—136 square miles (State engineer's report).

Gage.—Vertical staff.

Channel.—Shifts during high water.

Discharge measurements.—Made from bridge during high water and by wading at ordinary stages.

Winter flow.—No data.

Diversions.—One diversion ditch heads above the station and others divert below to irrigate the lower valley.

Cooperation.—Station is maintained and records are furnished complete for publication by the State engineer.

Discharge measurements of Florida River near Durango, Colo., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 28[a]	B. S. Clayton	1.90	12	Sept. 21	C. E. Turner	2.47	21
Mar. 1	C. C. Heymalhaleh		13	Oct. 20	do	2.70	35
May 12	do	3.70	362	Nov. 19	do	*a* 2.52	25
July 17	do	3.13	82				

[a] Ice present.

Daily gage height, in feet, of Florida River near Durango, Colo., for 1912.

[Thos. Cash, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1		3.4		3.5	3.4	2.9	2.4	2.7
2		3.5		3.35	3.3	2.8	2.45	2.7
3		3.4	4.75	3.25	3.2	2.8	2.45	2.7
4		3.3	4.8	3.1	3.15	2.8	2.45	2.65
5		3.15	4.5	3.05	3.1	2.75	2.7	2.65
6		3.15	4.4	3.0	3.0	2.75	2.6	2.6
7		3.3	4.45	3.0	3.0	2.7	2.7	2.6
8		3.45	4.4	3.0	2.9	2.6	2.7	2.6
9		3.5	4.2	2.9	2.9	2.6	2.6	2.65
10		3.4	4.1	2.9	2.85	2.7	2.7	2.65
11		3.55	4.0	2.8	2.8	2.75	2.6	2.65
12		3.8	3.65	2.8	2.8	2.7	2.65	2.65
13		3.8	3.55	2.8	2.85	2.7	2.6	2.6
14		3.65	3.5	2.8	3.2	2.6	2.6	2.6
15		3.5	3.6	2.75	3.3	2.6	2.6	2.55
16		3.65	3.6	2.7	3.25	2.6	2.6	2.55
17		3.95	3.5	2.95	3.2	2.55	2.6	2.5
18		4.2	3.3	3.2	3.3	2.5	2.65	2.5
19		4.5	3.25	3.4	3.2	2.5	2.7	2.55
20		4.5	3.3	3.35	3.1	2.45	2.7	2.6
21	2.6	4.6	3.3	3.2	3.05	2.4	2.7	2.5
22	2.6	4.6	3.4	3.35	3.0	2.4	2.6	2.55
23	2.65		3.4	4.1	2.9	2.4	2.65	2.6
24	2.8		3.3	3.9	2.9	2.4	2.7	2.55
25	2.9		3.45	3.7	2.9	2.4	2.6	2.6
26	2.85		3.4	3.65	2.8	2.4	2.6	2.8
27	2.85		3.35	3.65	2.8	2.4	2.7	2.8
28	2.9		3.35	3.6	2.8	2.4	2.95	2.7
29	3.05		3.7	3.7	2.8	2.4	2.75	2.6
30	3.25		3.8	3.6	2.8	2.4	2.85	2.6
31				3.5	3.0		2.75	

Daily discharge, in second-feet, of Florida River near Durango, Colo., for 1912.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	280	.....	202	115	55	15	36
2	.....	307	.....	175	101	45	18	36
3	.....	280	539	158	87	45	18	36
4	.....	255	556	134	81	45	18	32
5	.....	221	458	127	75	40	36	32
6	.....	221	428	120	65	40	28	28
7	.....	255	443	120	65	36	36	28
8	.....	314	428	120	55	28	36	28
9	.....	307	370	107	55	28	28	32
10	.....	280	342	107	50	36	36	32
11	.....	320	314	94	45	40	28	32
12	.....	390	232	94	45	36	32	32
13	.....	390	212	94	50	36	28	28
14	.....	348	202	94	87	28	28	28
15	.....	307	222	88	101	28	28	24
16	.....	348	222	83	94	28	28	24
17	.....	436	202	114	87	24	28	21
18	.....	514	166	87	101	21	32	21
19	.....	613	158	115	87	21	36	24
20	.....	613	166	108	75	18	36	28
21	122	648	166	87	70	15	36	21
22	122	648	184	108	65	15	28	24
23	130	.....	184	247	55	15	32	28
24	154	.....	166	203	55	15	36	24
25	171	.....	193	165	55	15	28	28
26	162	.....	184	156	45	15	28	45
27	162	.....	175	156	45	15	36	45
28	171	.....	175	147	45	15	60	36
29	200	.....	242	165	45	15	40	28
30	244	.....	264	147	45	15	50	28
31	.....	.....	.....	131	65	.....	40	.....

Monthly discharge of Florida River near Durango, Colo., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April 21–30	244	122	164	3,249
May 1–22	648	221	377	16,453
June 3–30	556	158	271	15,060
July	247	83	131	8,639
August	115	45	68	4,187
September	55	15	28	1,642
October	60	15	32	1,958
November	45	21	30	1,763
The period	.....	.....	.....	52,351

LA PLATA RIVER NEAR LA PLATA, N. MEX.

Location.—At highway bridge in sec. 14, T. 31 N., R. 13 W., New Mexico principal meridian, 16 miles northwest of Aztec, at Williams Ranch house, and 1 mile south of La Plata post office. No important tributary between the station and the mouth of the river, 15 miles below.

Records available.—May 25, 1905, to December 31, 1912.

Drainage area.—Approximately 340 square miles.

Gage.—Chain gage; on September 15, 1912, the present chain gage was established 300 feet above the bridge which was washed out in October, 1911. This gage was referred to the old datum, but there was 1.2 feet fall in the stream between the two points. Gage heights have been corrected to original datum.

Channel.—Extremely shifting.

Discharge measurements.—By wading.

Winter flow.—Thin ice frequently forms across the stream during the winter and thick ice forms along the shore.

Diversions.—Nearly all the normal flow of the river is diverted above the station during the irrigation season; a few small ditches take water below.

Accuracy.—Data too meager for estimates of daily discharge.

Discharge measurements of La Plata River near La Plata, N. Mex., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Sept. 15	Gray and O'Brien	1.05	[a] 1.0	Oct. 24	F. O'Brien	1.05	0.4
Oct. 3	F. O'Brien	1.10	[a] .5	Dec. 11	do	1.10	[a] 2.0
14	do	1.08	2.2				

[a] Estimated. Zero flow at gage height 0.95.

Daily gage height, in feet, of La Plata River near La Plata, N. Mex., for 1912.

[Frank Williams, observer.]

Day.	Sept.	Oct.	Nov.	Dec.	Day.	Sept.	Oct.	Nov.	Dec.
1	.....	1.05	1.1	1.0	16	1.05	1.1	1.1	1.1
2	.....	1.05	1.1	1.05	17	1.05	1.1	1.1	1.1
3	.....	1.1	1.1	1.1	18	1.05	1.1	1.1	1.1
4	.....	1.95	1.1	1.1	19	1.05	1.1	1.1	1.1
5	.....	1.8	1.1	1.1	20	1.05	1.1	1.0	1.1
6	.....	1.5	1.1	1.1	21	1.05	1.05	1.0	1.1
7	.....	1.3	1.1	1.1	22	1.05	1.0	1.0	1.1
8	.....	1.2	1.1	1.1	23	1.05	1.05	.95	1.1
9	.....	1.15	1.1	1.1	24	1.05	1.05	.95	1.1
10	.....	1.1	1.1	1.1	25	1.05	1.05	.95	1.1
11	.....	1.1	1.15	1.1	26	1.05	1.05	.95	1.15
12	.....	1.1	1.1	1.1	27	1.05	1.05	.95	1.2
13	.....	1.1	1.1	1.1	28	1.05	1.05	.95	1.3
14	.....	1.1	1.1	1.1	29	1.05	1.05	.95	1.3
15	1.05	1.1	1.1	1.1	30	1.05	1.05	.95	1.3
					31	.....	1.1	.....	1.3

NOTE.—Gage heights affected by ice Dec. 26 to 31.

VIRGIN RIVER BASIN.

VIRGIN RIVER AT VIRGIN, UTAH.

Location.—Half a mile east of Virgin, Utah, 600 feet below the mouth of North Creek, in sec. 23, T. 41 S., R. 12 W., Salt Lake base and meridian.

Records available.—April 18, 1909, to December 31, 1912.

Drainage area.—1,010 square miles.

Gage.—Inclined staff.

Channel.—Gravel, sand, and bowlders; shifts during heavy floods.

Discharge measurements.—Made from cable and car and by wading.

Floods.—Virgin River is subject to occasional short but severe floods.

Winter flow.—Some ice occasionally forms at this station during the winter months.

Diversions.—Several small canals divert water above the station.

Accuracy.—Records for 1912 fair for discharges below 1,000 second-feet.

Discharge measurements of Virgin River at Virgin, Utah, in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Dec. 6	Leonard Tanner	2.52	120
7	do	2.63	147
7	do	2.69	155

Daily gage height, in feet, of Virgin River at Virgin, Utah, for 1912.

[Niles Earl, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.7	2.6	2.6	2.85	3.15	3.25	2.65	2.7	.....	.....	2.8	2.75
2	.....	2.6	2.7	.....	.....	.....	.....	.....	2.45	2.8	.....	2.75
3	2.6	2.7	.....	3.0	3.25	3.2	2.55	.....	2.45	.....	2.8	.....
4	2.6	2.7	.....	.....	3.2	3.2	.....	2.7	.....	.....	.....	2.75
5	.....	2.7	2.7	2.9	3.25	3.25	2.6	2.7	2.65	.....	2.75	2.75
6	2.6	2.7	3.1	3.5	3.2	3.2	.....	2.65	.....	2.8	.....	2.52
7	2.65	.....	2.75	3.15	3.25	3.15	2.55	2.65	2.6	2.75	2.75	2.66
8	2.7	2.7	.....	3.2	.....	.....	2.5	.....	2.65	.....	.....	.....
9	2.6	2.75	2.95	.....	3.35	3.15	.....	.....	.....	.....	.....	2.65
10	2.6	.....	3.1	3.2	3.55	.....	2.45	.....	.....	.....	2.75	2.65
11	.....	.....	2.65	.....	4.4	2.9	.....	2.6	2.75	2.75	.....	2.60
12	2.65	2.6	.....	3.05	4.4	2.9	2.45	.....	2.75	2.85	2.75	2.60
13	2.6	2.6	.....	2.9	.....	.....	.....	.....	.....	2.9	.....	.....
14	.....	2.6	.....	2.95	4.3	.....	2.55	2.7	2.8	.....	.....	2.60
15	2.65	2.6	2.65	3.1	.....	2.75	.....	.....	.....	2.85	2.7	.....
16	.....	.....	2.7	.....	3.5	2.7	2.6	.....	2.8	.....	.....	2.62
17	2.65	2.65	2.55	.....	.....	2.7	2.6	2.6	.....	2.75	2.7	2.62
18	2.65	2.7	2.7	3.0	3.5	.....	.....	2.65	2.85	.....	2.7	.....
19	2.65	2.7	.....	3.15	4.7	.....	.....	.....	.....	.....	2.7	2.65
20	2.65	2.7	2.85	2.95	.....	2.6	.....	.....	2.85	2.85	2.7	2.65
21	.....	.....	2.9	.....	3.8	2.6	2.7	2.65	.....	.....	.....	2.65
22	2.65	2.7	2.7	2.95	3.4	2.6	.....	2.55	2.9	2.85	2.7	.....
23	2.6	2.7	2.65	.....	.....	2.55	.....	2.65	.....	2.9	2.7	2.50
24	.....	2.6	2.65	3.1	.....	3.2	.....	.....	2.8	.....	2.7	2.55
25	2.6	.....	2.75	.....	3.45	.....	2.6	2.6	.....	2.85	.....	2.55
26	2.6	2.6	.....	3.1	3.35	.....	.....	.....	.....	3.4	.....	.....
27	2.7	2.7	.....	3.0	3.5	2.5	2.8	2.75	2.8	9.0	2.65	.....
28	.....	2.55	.....	3.0	.....	.....	2.75	.....	.....	5.5	2.65	2.52
29	2.65	.....	2.9	3.25	.....	.....	2.7	5.4	2.8	2.95	2.7	.....
30	2.6	.....	3.0	.....	3.3	2.65	.....	.....	2.85	.....	2.7	.....
31	2.6	.....	.....	.....	3.3	.....	7.4	2.55	.....	.....	.....	.....

Daily discharge, in second-feet, of Virgin River at Virgin, Utah, for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	128	118	118	148	209	233	123	128	108	140	182	171
2	123	118	128	162	221	226	118	128	104	140	182	171
3	118	128	128	176	233	220	113	128	104	140	182	171
4	118	128	128	166	220	220	116	128	114	140	176	171
5	118	128	128	156	233	233	118	128	123	140	171	171
6	118	128	198	318	220	220	115	123	120	140	171	124
7	123	128	134	209	233	209	113	123	118	134	171	152
8	128	128	150	220	248	209	108	122	123	134	171	151
9	118	134	166	220	263	209	106	121	127	134	171	150
10	118	128	198	220	339	182	104	120	130	134	171	150
11	120	123	123	204	1,020	156	104	118	134	134	171	140
12	123	118	123	187	1,020	156	104	121	134	148	171	140
13	118	118	123	156	980	148	108	124	137	156	168	140
14	120	118	123	166	930	141	113	128	140	151	163	140
15	123	118	123	198	624	134	115	124	140	148	160	142

Daily discharge, in second-feet, of Virgin River at Virgin, Utah, for 1912—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
16	123	120	128	190	318	128	118	121	140	141	160	144
17	123	123	113	183	318	128	118	118	144	134	160	144
18	123	128	128	176	318	124	121	123	148	138	160	147
19	123	128	138	209	1,320	121	124	123	148	143	160	150
20	123	128	148	166	900	118	126	123	148	148	160	150
21	123	128	156	166	490	118	128	123	151	148	160	150
22	123	128	128	166	280	118	126	113	156	148	160	135
23	118	128	123	182	286	113	123	123	148	156	160	120
24	118	118	123	198	292	220	120	120	140	152	160	130
25	118	118	134	198	299	176	118	118	140	148	156	130
26	118	118	136	198	263	142	129	126	140	280	153	128
27	128	128	144	176	318	108	140	134	140	8,100	150	126
28	125	113	150	176	294	114	134	140	140	2,700	150	124
29	123	116	156	233	270	118	128	2,200	140	244	160	123
30	118	.....	176	221	246	123	130	115	148	200	160	122
31	118	.....	162	.....	246	.....	5,100	113	.....	190	.....	121

NOTE.—Discharge determined from two curves fairly well defined below 1,000 second-feet, one applicable Jan. 1 to Oct. 27, the other Oct. 28 to Dec. 31. Discharge estimated for days on which gage was not read.

Monthly discharge of Virgin River at Virgin, Utah, for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	128	118	121	7,440	B.
February	134	113	124	7,130	B.
March	198	113	140	8,610	B.
April	318	148	191	11,400	B.
May	1,320	209	434	26,700	B.
June	233	108	162	9,640	B.
July	5,100	104	279	17,200	C.
August	2,200	113	190	11,700	B.
September	156	104	134	7,970	B.
October	[a] 8,100	134	493	30,300	C.
November	182	150	165	9,820	B.
December	171	121	143	8,790	B.
The year	8,100	104	216	157,000	

[a] Flood on Oct. 27 reached a gage height of 11.6 feet, corresponding to a probable discharge of 12,000 second-feet.

SANTA CLARA CREEK NEAR CENTRAL, UTAH.

Location.—In sec. 14, T. 39 S., R. 16 W., Salt Lake base and meridian, at R. H. Hunt's ranch, 6 miles below Pine Valley, and about 1 mile southeast of Central post office. Hunts Spring, which has a fairly constant discharge of about 3 second-feet, enters just below the station.

Records available.—April 21, 1909, to December 31, 1912.

Drainage area.—84 square miles.

Gage.—Vertical staff.

Channel.—Shifts during flood stages.

Discharge measurements.—Made by wading at low stages and from a footbridge at high stages.

Winter flow.—Ice does not form to any great extent.

Diversions.—The Eightmile Flat Canal, which has a maximum capacity of about 10 second-feet, is the only diversion above the station.

Artificial regulation.—None at present. After making allowance for the Eightmile Flat Canal, records will indicate the amount of water available for storage in the Pine Valley reservoir site.

Accuracy.—Records fair except for periods of shifting channels.

Discharge measurements of Santa Clara Creek near Central, Utah, in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Mar. 12	T. P. Martin	3.28	10.5
Dec. 10	Leonard Tanner	3.01	13.9

Daily gage height, in feet, of Santa Clara Creek near Central, Utah, for 1912.

[Royal H. Hunt, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.25	3.3	3.3	3.6	3.95	4.3	3.4	3.5	3.2	3.2	3.4	.....
2	.....	.....	3.3	3.45	4.1	4.3	3.4	3.4	3.2	3.25	3.4	3.1
3	3.25	3.3	3.3	3.45	3.9	4.25	3.4	3.35	3.2	3.25	3.35	.....
4	.....	3.3	3.3	3.6	3.8	4.2	3.4	3.35	3.2	4.7	3.3	3.1
5	3.3	3.25	3.3	3.65	3.8	4.2	3.4	3.35	3.2	3.6	3.3	.....
6	3.3	3.25	3.3	3.8	3.8	4.1	3.4	3.35	3.2	3.5	3.3	3.1
7	3.3	3.25	.....	3.85	3.95	4.0	3.4	3.35	3.2	3.45	3.3	3.1
8	.....	.....	3.3	3.9	4.1	4.0	3.35	3.35	3.2	3.45	3.3	.....
9	3.3	3.25	3.3	3.9	4.1	3.9	3.3	3.3	3.2	3.45	3.3	3.1
10	3.3	3.25	3.4	3.8	4.2	3.8	3.3	3.3	3.2	3.45	3.25	3.0
11	3.3	3.25	3.35	3.7	4.3	3.7	3.3	3.3	3.2	3.45	3.25	3.0
12	.....	3.25	3.3	3.65	4.3	3.65	3.3	3.3	.....	3.45	3.25	3.0
13	3.3	3.25	3.3	3.5	4.35	3.65	3.3	3.25	.....	3.45	3.25	3.0
14	3.3	3.25	3.3	3.55	4.4	3.65	3.3	3.25	3.2	3.45	3.2	3.0
15	3.3	.....	3.3	4.0	4.35	3.6	3.3	3.25	.....	3.45	3.15	3.0
16	.....	3.25	3.3	4.0	4.35	3.6	3.3	3.2	.....	3.45	3.15	.....
17	3.3	3.25	3.3	4.0	4.4	3.55	3.3	3.2	3.2	3.45	3.15	3.3
18	3.3	3.25	3.3	3.85	4.4	3.5	3.5	3.2	3.25	3.4	3.1	.....
19	.....	3.25	3.6	3.7	4.45	3.45	3.4	3.2	3.2	3.4	3.1	3.0
20	3.3	.....	3.3	3.7	4.6	3.45	3.35	3.15	3.2	3.4	3.1	3.0
21	.....	3.25	3.3	3.6	4.5	3.4	3.35	3.15	3.2	3.4	3.1	.....
22	3.3	.....	3.3	3.5	4.45	3.4	3.3	3.15	3.2	3.4	3.1	.....
23	3.3	3.25	3.3	3.55	4.3	3.4	3.3	3.15	3.2	3.4	3.1	3.0
24	.....	3.2	3.55	3.65	4.3	3.4	3.3	3.15	3.2	3.4	3.1	3.0
25	3.3	3.2	3.75	3.75	4.3	3.4	3.3	3.2	3.2	3.4	3.1	.....
26	3.3	3.3	3.6	3.75	4.25	3.4	3.3	3.2	3.2	3.4	3.1	.....
27	3.3	3.4	3.4	3.75	4.25	3.45	3.3	3.2	3.2	5.3	3.1	.....
28	3.3	3.3	3.4	3.75	4.3	3.45	3.35	3.2	3.2	3.8	3.1	3.0
29	.....	3.3	3.4	3.75	4.4	3.5	3.35	3.2	3.2	3.65	3.1	.....
30	3.3	.....	3.4	3.9	4.5	3.45	3.35	3.2	3.2	3.5	3.1	.....
31	3.3	.....	3.4	.....	4.35	.....	3.4	3.2	.....	3.45	.....	.....

NOTE.—The recorded gage height from Oct. 1, 1911, to Dec. 9, 1912, represent actual depths of water at the gage. Observer absent Feb. 1 to Mar. 13.

Daily discharge, in second-feet, of Santa Clara Creek near Central, Utah, for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	10	12	12	36	75	136	19	27	8	8	44	20
2	10	12	12	23	97	136	19	19	8	10	44	20
3	10	12	12	23	69	125	19	16	8	10	40	20
4	11	12	12	36	57	114	19	16	8	240	35	20
5	12	10	12	41	57	114	19	16	8	36	35	20
6	12	10	12	56	57	97	19	16	8	27	35	20
7	12	10	12	62	75	82	19	16	8	23	35	20
8	12	10	12	68	97	82	16	16	8	23	35	20
9	12	10	12	68	97	69	12	12	8	23	35	20
10	12	10	19	57	114	57	12	12	8	23	31	14
11	12	10	16	46	136	46	12	12	8	23	31	14
12	12	10	12	41	136	41	12	12	8	23	31	14
13	12	10	12	27	148	41	12	10	8	23	31	14
14	12	10	12	32	160	41	12	10	8	23	27	14
15	12	10	12	82	148	36	12	10	8	23	24	14

Daily discharge, in second-feet, of Santa Clara Creek near Central, Utah, for 1912—Con.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
16	12	10	12	82	148	36	12	8	8	23	24	14
17	12	10	12	82	160	32	12	8	8	23	24	35
18	12	10	12	63	160	27	27	8	10	19	20	14
19	12	10	36	46	172	23	19	8	8	19	20	14
20	12	10	12	46	210	23	16	7	8	19	20	14
21	12	10	12	36	184	19	16	7	8	19	20	14
22	12	10	12	27	172	19	12	7	8	19	20	14
23	12	10	12	32	136	19	12	7	8	19	20	14
24	12	8	32	41	136	19	12	7	8	19	20	14
25	12	8	51	51	136	19	12	8	8	19	20	14
26	12	12	36	51	125	19	12	8	8	19	20	14
27	12	19	19	51	125	23	12	8	8	532	20	14
28	12	12	19	51	136	23	16	8	8	93	20	14
29	12	12	19	51	160	27	16	8	8	74	20	14
30	12	.....	19	69	184	23	16	8	8	55	20	14
31	12	.....	19	.....	148	.....	19	8	.....	50	.....	14

NOTE.—Discharge determined from two well-defined curves, one applicable Jan. 1 to Oct. 26, the other Oct. 27 to Dec. 31. Discharge interpolated for days on which gage was not read.

Monthly discharge of Santa Clara Creek near Central, Utah, for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	12	10	11.8	726	B.
February	19	8	10.7	616	B.
March	51	12	16.9	1,040	B.
April	82	23	49.2	2,930	B.
May	210	57	130	7,990	B.
June	136	19	52.3	3,110	B.
July	27	12	15.3	941	B.
August	27	7	11.1	682	B.
September	10	8	8.1	482	B.
October	532	8	50.3	3,090	B.
November	44	20	27.4	1,630	B.
December	35	14	16.4	1,010	B.
The year	532	7	33.3	24,200	

SANTA CLARA CREEK NEAR ST. GEORGE, UTAH.

Location.—In sec. 27, T. 42 S., R. 16 W., Salt Lake base and meridian, about 2 miles west of St. George and 3 miles above mouth of creek.

Records available.—April 16, 1909, to December 31, 1912.

Drainage area.—540 square miles.

Gage.—Inclined staff.

Channel.—Shifting.

Discharge measurements.—Made from cable and car or by wading.

Winter flow.—Ice affects relation of gage height to discharge at times during the winter months.

Diversions.—The Bloomington and Seep canals divert water from Santa Clara Creek below the station; except for these canals the records indicate the amount of unappropriated water flowing from Santa Clara Creek into Virgin River.

Accuracy.—Poor, owing to shifting stream bed, lack of discharge measurements, and proper gage readings.

The following discharge measurement was made by Leonard Tanner:

December 12: Gage height, 4.76 feet; discharge, 34.6 second-feet.

Daily gage height, in feet, of Santa Clara Creek near St. George, Utah, for 1911–12.

[A. W. Burgess, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1911.												
1				3.85		3.9		4.7	4.5	2.0	0.8	
2	1.35				3.7		3.6	4.5		1.2		1.0
3	1.35			4.0		3.85			4.45		.6	
4					3.6		3.75	4.5				.5
5	1.55			4.05		3.9			4.45	2.7	.7	
6					3.85		3.75	4.45	4.5			.5
7	1.55			3.95		3.9				2.55	.8	
8				3.85	4.05	3.9	3.7	4.5	4.45		.8	.4
9	1.45				3.85					2.7	.6	
10	4.4			3.85		3.9	3.8			2.6		.5
11	2.6				3.85			4.5	4.45			
12	1.7			3.85	3.75	3.9	3.7	4.5		2.6	.8	.6
13					3.85					2.7	1.0	
14	1.4		3.5	3.6	3.95	3.9	3.8		4.5			
15			3.3		3.9	4.2	3.8	4.4				1.3
16	2.5		3.35	3.55				4.35	4.5	2.6	.7	
17	1.8			3.55	3.75	4.2	3.8				.5	
18			3.5					4.35	4.45	1.6		.7
19	1.25			3.5	3.7	4.2	4.2	4.35				
20			3.6						4.5	1.45	.6	.9
21	1.1		3.6	3.5	3.9	4.2	4.5	4.3		1.10		.6
22			3.6	3.4		3.9			4.45		.5	.9
23	1.1		3.6		3.95			4.45		1.0		.9
24			3.75	3.6		3.9	4.75		4.5	1.2	.7	
25	7.0		3.75		3.9			4.4	4.6			
26				3.6		3.9	4.8		4.5		.5	
27	3.0				3.8			4.5				
28	2.3		3.55	3.85	3.8	3.75	4.8		4.5	.8	.5	
29			3.6	3.85			4.6	4.5			.6	
30	2.35		3.6	3.85	3.8	3.75		4.5	13.0	.8		
31	2.5						4.6					
1912.												
1		.6	.6	1.4	1.2	2.2	.6					1.0
2	0.8	.6						1.4	.8	1.5	1.0	
3				1.0		2.0	.6					1.0
4	.6	.6	.5	1.0	1.3				.8	1.6	.9	
5		.6				2.0	.6	1.4				1.0
6	1.0		.7	1.3	1.6				.6		1.0	
7		.6	1.0			1.5		1.0		1.8		1.0
8	1.2			1.2	1.4		.6		.6		1.0	
9		.5	.6					.8		2.0		1.0
10		.5		1.6	1.5	1.4	.6		.5			
11	1.2		1.1		1.8					1.5	1.0	4.85
12	.7	.4		2.0			.5	.9	.6	1.4		4.76
13	.7	.6	.7		2.0	1.2		.7			1.0	4.75
14			.7	2.0			.5			1.3	1.2	
15	.6	.5	.6		1.8	1.0	.7	.5	.5		1.1	4.8
16			.7	2.5						1.4		4.8
17	.5	.5			1.8	.7	.5	.5	.5			
18	.7		1.2	3.0			2.0			1.4	1.2	
19	.3	.4			2.3	.6		.5	.6			4.75
20	.6		1.3	2.5						1.4	1.2	4.75
21	.3	.5	1.3			.8	1.0	.6			1.2	4.75
22				1.1	2.3	.6			.6			
23	.5	.4	1.0				1.0			1.2	1.2	4.8
24				1.2	2.4	.6		.7	.5	1.2		
25	.6		1.2				.5				1.1	4.8
26		.5		1.7	2.1	.6		.6	.5	1.4		
27	.6	.4	1.6				.5				1.1	4.8
28	.6	.6			2.0	.6		.7		3.0	1.1	
29	.5		1.4	1.2			4.0			1.8		
30			1.5		2.7			.8	.5		1.0	
31	.5						1.4			1.0		

NOTE.—Gage height of Sept. 30, 1911, estimated. From Oct. 1, 1911, to Dec. 9, 1912, the observer read actual depths of water. As gage is located at the controlling riffle, these depths will vary as gage heights.

Daily discharge, in second-feet, of Santa Clara Creek near St. George, Utah, for 1911–12.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1911.												
1	14	.....	.....	83	78	6	3	5	3	92	25	30
2	14	.....	.....	88	74	6	2	3	3	46	20	35
3	14	.....	.....	92	71	5	3	3	2.5	76	16	24
4	19	.....	.....	94	68	6	4	3	2.5	107	18	13
5	24	.....	.....	95	76	6	4	3	2.5	138	20	13
6	24	.....	.....	92	83	6	4	2.5	3	133	22	13
7	24	.....	.....	89	89	6	4	3	3	128	25	12
8	22	.....	.....	83	95	6	3	3	2.5	133	25	10
9	19	.....	.....	83	83	6	4	3	2.5	138	16	12
10	210	.....	.....	83	83	6	4.5	3	2.5	131	19	13
11	88	.....	.....	83	83	6	4	3	2.5	131	22	14
12	33	.....	.....	83	77	6	3	3	2.5	131	25	16
13	24	.....	.....	76	83	6	4	3	3	138	35	28
14	16	.....	62	68	89	6	4.5	2	3	136	30	40
15	50	.....	51	66	86	14	4.5	2	3	134	25	51
16	82	.....	54	65	82	14	4.5	1.5	3	131	20	40
17	39	.....	58	65	77	14	4.5	1.5	3	100	13	30
18	25	.....	62	64	76	14	6	1.5	2.5	68	14	20
19	11	.....	65	62	74	14	8	1.5	3	64	15	25
20	9	.....	68	62	71	14	9	1.5	3	60	16	30
21	7	.....	68	62	68	14	10	1	2.5	40	14	16
22	7	.....	68	57	61	6	11	2	2.5	38	13	30
23	7	.....	68	62	54	6	12	2.5	3	35	16	30
24	10	.....	77	68	46	6	9	2	3	46	20	30
25	280	.....	77	68	38	6	8	2	4	41	16	30
26	35	.....	73	68	29	6	7	2.5	3	35	13	30
27	35	.....	69	76	20	5	7	3	3	30	13	30
28	8	.....	65	83	14	4	7	3	3	25	13	30
29	8	.....	68	83	11	4	4	3	100	25	16	30
30	9	.....	68	83	8	4	4	3	490	25	20	30
31	13	.....	75	.....	7	.....	4	3	.....	25	.....	30
1912.												
1	25	16	16	57	46	85	4	34	9	20	35	35
2	25	16	15	46	47	78	4	34	9	40	35	35
3	20	16	14	35	49	71	4	34	9	42	32	35
4	16	16	13	35	50	70	4	34	9	45	30	35
5	20	16	16	43	58	70	4	34	6	150	32	35
6	35	16	20	51	65	58	4	25	4	80	35	35
7	40	16	35	48	67	46	4	16	4	58	35	35
8	46	14	25	46	68	42	4	12	4	65	35	35
9	46	13	16	57	64	38	4	9	3	72	35	35
10	46	13	28	68	62	34	4	10	2.5	58	35	37
11	46	12	40	80	74	30	3	11	3	40	35	39
12	20	10	30	92	80	26	2.5	12	4	34	35	35
13	20	16	20	92	85	22	2.5	6	3	31	35	35
14	18	14	20	92	80	18	2.5	4	3	29	46	36
15	16	13	16	108	72	14	6	2.5	2.5	31	40	37
16	14	13	20	124	71	10	4	2.5	2.5	34	42	37
17	13	13	33	142	70	6	2.5	2.5	2.5	34	44	36
18	20	12	46	160	84	5	72	2.5	3	34	46	35
19	8	10	48	142	99	4	55	2.5	4	34	46	35
20	16	12	51	124	98	6	35	3	4	34	46	35
21	8	13	51	81	98	9	16	4	4	30	46	35
22	10	12	43	40	97	4	16	4	4	27	46	36
23	13	10	35	43	100	4	16	5	3	24	46	37
24	14	11	40	46	102	4	9	6	2.5	24	43	37
25	16	12	46	60	92	4	2.5	5	2.5	29	40	37
26	16	13	57	74	82	4	2.5	4	2.5	34	40	37
27	16	10	68	64	78	4	2.5	5	2.5	150	40	37
28	16	16	62	54	75	4	5	6	2.5	155	40	37
29	13	16	57	46	96	4	223	8	2.5	80	38	37
30	13	.....	62	46	117	4	120	9	2.5	58	35	37
31	13	.....	60	.....	101	.....	34	9	.....	35	.....	37

NOTE.—Daily discharge determined from a number of poorly defined curves and by the indirect method for shifting channels. Discharge Mar. 1 to 13, 1911, estimated 50 second-feet. Discharge for days on which gage was not read estimated by comparison with records at the upper station. Discharge for days when depth of water was recorded instead of gage heights determined from a relation of depth to discharge as observed on Dec. 9, 1912. Discharges obviously approximate.

Monthly discharge of Santa Clara Creek near St. George, Utah, for 1911–12.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1911.					
January	280	7	38.1	2,340	C.
February	.....	.....	a60.0	3,330	D.
March	.....	.....	59.5	3,660	C.
April	95	57	76.2	4,530	C.
May	95	7	63.0	3,870	C.
June	14	4	7.6	452	D.
July	12	2	5.5	338	D.
August	5	1.0	2.55	157	C.
September	a490	2.5	22.3	1,330	D.
October	138	25	83.2	5,120	D.
November	35	13	19.2	1,140	C.
December	51	10	25.3	1,560	C.
The year	490	1.0	38.4	27,800	
1912.					
January	46	8	21.4	1,320	C.
February	16	10	13.4	771	C.
March	68	13	35.6	2,190	C.
April	160	35	73.2	4,360	D.
May	117	46	78.3	4,810	D.
June	85	4	25.9	1,540	D.
July	223	2.5	21.7	1,330	D.
August	34	2.5	11.5	707	D.
September	9	2.5	3.98	237	D.
October	155	20	52.0	3,200	D.
November	46	30	38.9	2,310	C.
December	39	35	36.0	2,210	B.
The year	223	2.5	34.4	25,000	

a Estimated.

BILL WILLIAMS RIVER BASIN.

BILL WILLIAMS RIVER NEAR SWANSEA, ARIZ.

Location.—In the canyon, 1 mile below Planet mine, 9 miles northwest of Swansea, and 28 miles north of Bouse.

Records available.—September 26, 1910, to December 31, 1912.

Drainage area.—Not measured.

Gage.—Staff in four sections. The two low-water sections are on right bank a short distance above cable. Upper sections are bolted to cliffs on left bank just above cable.

Channel.—Shifting sand.

Diversions.—A ranch diverts water for irrigating a few acres about 1 mile above the station. Desert claims of about 500 acres 20 miles above the station have been partly irrigated, principally from flood waters. Other small ranches above the station pump water from the river sands.

Discharge measurements.—Made from car and cable near gage or by wading. Data insufficient for estimates of daily and monthly discharge.

Discharge measurements of Bill Williams River near Swansea, Ariz., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 28	C. C. Jacob	3.18	17
Sept. 11	.....do	3.30	16

Daily gage height, in feet, of Bill Williams River near Swansea, Ariz., for 1912.

[L. G. Martinez, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.05	3.05	3.15	3.5	3.55	3.5	3.55	4.0	3.3	3.3	3.4	3.45
2	3.05	3.05	3.15	3.45	3.55	3.5	3.5	3.6	3.3	3.3	3.4	3.45
3	3.05	3.05	3.2	3.65	3.55	3.5	3.5	3.6	3.3	3.3	3.4	3.45
4	3.05	3.05	3.2	3.75	3.55	3.5	3.5	3.3	3.3	3.3	3.4	3.45
5	3.05	3.05	3.2	3.6	3.55	3.5	3.5	3.3	3.3	3.5	3.4	3.45
6	3.05	3.05	3.2	3.5	3.55	3.55	3.5	3.3	3.3	4.6	3.4	3.45
7	3.05	3.05	3.2	3.5	3.5	3.5	3.5	3.3	3.3	3.6	3.4	3.45
8	3.05	3.05	3.2	3.5	3.5	3.5	3.5	3.3	3.3	3.3	3.4	3.45
9	3.05	3.05	3.2	3.5	3.5	3.5	3.5	3.3	3.3	3.3	3.4	3.45
10	3.05	3.05	3.2	3.5	3.5	3.5	3.5	3.3	3.3	3.25	3.45	3.45
11	3.05	3.15	5.35	3.5	3.5	3.5	3.5	3.3	3.3	3.25	3.45	3.45
12	3.05	3.15	4.35	4.18	3.5	3.5	3.55	3.3	3.3	3.2	3.45	3.45
13	3.05	3.15	4.2	5.1	3.5	3.5	3.5	3.2	3.3	3.25	3.45	3.45
14	3.05	3.15	4.25	4.8	3.5	3.5	3.5	3.2	3.3	3.25	3.45	3.45
15	3.05	3.15	4.2	4.7	3.5	3.5	3.55	3.2	3.3	3.25	3.45	3.45
16	3.05	3.15	4.2	4.5	3.5	3.5	3.55	3.2	3.3	3.25	3.45	3.45
17	3.05	3.15	4.1	4.4	3.5	3.5	3.5	3.3	3.3	3.25	3.45	3.45
18	3.05	3.15	3.7	4.2	3.55	3.5	3.5	3.3	3.3	3.25	3.45	3.45
19	3.05	3.15	3.65	4.0	3.55	3.5	3.55	3.3	3.3	3.25	3.45	3.45
20	3.05	3.15	3.6	4.0	3.55	3.5	3.5	3.3	3.3	3.3	3.45	3.42
21	3.05	3.15	3.5	3.9	3.55	3.5	3.55	3.3	3.3	3.3	3.45	3.4
22	3.05	3.15	3.55	3.9	3.55	3.5	3.5	3.35	3.3	3.3	3.45	3.4
23	3.05	3.15	3.4	3.8	3.55	3.5	3.5	3.35	3.3	3.3	3.45	3.4
24	3.05	3.15	3.4	3.7	3.55	3.5	3.5	3.35	3.3	3.3	3.45	3.4
25	3.05	3,15	3.4	3.65	3.5	3.5	3.5	3.4	3.3	3.3	3.45	3.4
26	3.05	3.15	3.45	3.6	3.5	3.5	3.55	3.4	3.3	3.3	3.45	3.4
27	3.05	3.15	3.45	3.6	3.5	3.5	3.55	3.35	3.3	3.4	3.45	3.4
28	3.05	3.15	3.45	3.6	3.5	3.5	3.7	3.35	3.3	4.2	3.45	3.4
29	3.05	3.15	3.45	3.55	3.5	3.5	3.6	3.7	3.3	3.9	3.45	3.4
30	3.05	.....	3.45	3.55	3.5	3.55	3.6	3.6	3.3	3.6	3.45	3.4
31	3.05	.....	3.5	.....	3.5	.....	3.95	3.5	.....	3.4	.....	3.4

GILA RIVER BASIN.

GILA RIVER NEAR SILVER CITY, N. MEX.

Location.—45 miles northeast of Silver City, 2½ miles below Lyon's hunting lodge, 1 mile below the XSX ranch house, 500 feet below the confluence of East and West Forks of the Gila River, in northwestern corner of T. 13 S., R. 13 W.

Records available.—June 20, 1912, to December 31, 1912.

Drainage area.—Not measured.

Gage.—Automatic recording.

Channel.—Subject to a shift during high stages.

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

Winter flow.—Practically no backwater from ice during the winter months.

Diversions.—The flow at this point approximates the natural run-off, as there are practically no diversions above the station.

Accuracy.—Estimates of daily discharge in 1912 considered good.

Cooperation.—Maintained in cooperation with Boulware, Johnson & Converse, Silver City, N. Mex.

Discharge measurements of Gila River near Silver City, N. Mex., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
June 20	S. S. Carroll	1.95	54.8	Oct. 9	E. L. Redding	2.30	64.1
Aug. 16	Gray and Redding	2.45	96.5	Nov. 8	do	2.20	58.4
Sept. 8	E. L. Redding	2.55	81.7				

Daily gage height, in feet, of Gila River near Silver City, N. Mex., for 1912.

[George Seay, observer.]

Day.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1.8	1.9	3.0	2.2	2.15	2.1
2	.....	1.7	1.8	3.0	2.3	2.1	2.05
3	.....	1.7	1.8	3.1	2.25	2.1	2.1
4	.....	1.7	2.1	2.9	2.25	2.1	2.05
5	.....	1.7	2.3	2.7	2.35	2.1	2.0
6	.....	1.6	2.3	2.75	2.4	2.05	2.05
7	.....	1.5	2.1	2.5	2.2	2.05	2.05
8	.....	1.6	2.0	2.5	2.25	2.05	2.1
9	.....	1.6	2.0	2.35	2.15	2.05	2.1
10	.....	1.7	2.0	2.3	2.1	2.1	2.15
11	.....	1.8	2.1	2.4	2.15	2.15	2.05
12	.....	1.9	2.05	2.45	2.2	2.05	1.95
13	.....	2.0	2.25	2.4	2.2	2.1	1.9
14	.....	2.0	2.2	2.25	2.1	2.05	2.0
15	.....	2.0	2.45	2.15	2.2	2.1	2.0
16	.....	2.0	2.5	2.2	2.15	2.05	2.05
17	.....	2.1	2.55	2.2	2.15	2.05	1.95
18	.....	2.2	2.5	2.15	2.2	2.05	1.95
19	.....	2.3	2.55	2.25	2.15	2.05	1.95
20	1.95	2.4	2.75	2.2	2.1	2.05	2.05
21	2.0	2.5	2.7	2.1	2.1	2.0	1.95
22	1.9	2.6	2.7	2.05	2.05	2.0	2.0
23	1.9	2.4	2.5	2.05	2.05	2.0	1.9
24	2.0	2.5	2.15	2.05	2.15	2.0	1.9
25	2.2	2.5	2.35	2.05	2.2	1.95	1.95
26	2.1	2.5	2.3	2.0	2.2	2.0	1.9
27	2.0	2.3	2.3	2.05	2.2	2.0	1.95
28	2.0	2.2	2.2	2.1	2.3	1.95	1.95
29	2.1	2.3	2.3	2.1	2.15	1.95	2.0
30	1.95	2.3	3.05	2.1	2.2	2.05	1.95
31	.....	2.15	3.2	.....	2.15	.....	2.0

NOTE.—Gage heights July 7 to 21 estimated from information furnished by the gage reader.

Daily discharge, in second-feet, of Gila River near Silver City, N. Mex., for 1912.

Day.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	45	58	136	57	54	51
2	.....	39	52	136	63	51	48
3	.....	39	52	147	60	51	51
4	.....	39	72	124	60	51	48
5	.....	39	86	100	66	51	45
6	.....	34	86	106	70	48	48
7	.....	28	72	78	57	48	48
8	.....	35	64	77	60	48	51
9	.....	36	64	66	54	48	51
10	.....	42	64	63	51	51	54
11	.....	50	72	70	54	54	48
12	.....	57	68	74	57	48	42
13	.....	64	82	70	57	51	39
14	.....	64	78	60	51	48	45
15	.....	64	96	54	57	51	45
16	.....	64	100	57	54	48	48
17	.....	72	105	57	54	48	42
18	.....	78	100	54	57	48	42
19	.....	86	105	60	54	48	42
20	55	93	122	57	51	48	48
21	58	100	118	51	51	45	42
22	52	109	118	48	48	45	45
23	52	93	100	48	48	45	39
24	58	100	75	48	54	45	39
25	72	100	89	48	57	42	42
26	64	100	86	45	57	45	39
27	58	86	86	48	57	45	42
28	58	79	78	51	63	42	42
29	64	86	86	51	54	42	45
30	55	86	147	51	57	48	42
31	.....	75	160	.....	54	.....	45

NOTE.—Daily discharge determined as follows: June 20 to Sept. 7 by the indirect method for shifting channel, Sept. 8 to Dec. 31 from a well-defined curve.

Monthly discharge of Gila River near Silver City, N. Mex., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
June 20-30	72	52	58.7	1,280	B
July	109	28	67.2	4,130	B.
August	160	52	88.4	5,440	B.
September	147	45	71.2	4,240	B.
October	70	48	56.3	3,460	B.
November	54	42	47.9	2,850	B.
December	54	39	45.1	2,770	B.
The period				24,200	

GILA RIVER NEAR REDROCK, N. MEX.

Location.—About 40 miles west of Silver City, 4 miles northeast of Redrock post office, one-fourth mile above the mouth of the box canyon near Connor's ranch, near the eastern edge of T. 18 S., R. 18 W. Mancos Draw, the first large tributary upstream from the station, joins the Gila about 12 miles above.

Records available.—May 14, 1908, to December 31, 1912.

Drainage area.—Approximately 3,500 square miles.

Gage.—Automatic recording. Records from May 14, 1908, to July 16, 1909, are from a gage one-eighth mile downstream from the present gage. The datum of the gage has remained unchanged since the gage was installed at the present site on July 16, 1909.

Channel.—Shifting.

Discharge measurements.—Wading at low stages and from cable at flood stages.

Winter flow.—The relation between the gage height and discharge is not impaired by backwater from ice during the winter months.

Diversions.—Many diversions for irrigation are made above this station.

Accuracy.—Owing to the lack of discharge measurements, daily estimates of the discharge were not made for the first part of 1912. The estimates of daily discharge for the last part of 1912 can not be considered better than fair.

Discharge measurements of Gila River near Redrock, N. Mex., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 4	R. H. Fletcher	0.70	271	Oct. 17	E. L. Redding	1.00	95.3
June 16	S. S. Carroll	.20	88.3	Nov. 15	do	1.00	83.7
Aug. 9	Gray and Redding	1.25	122	Dec. 18	do	1.00	82.3
Sept. 20	E. L. Redding	1.00	75.8				

Daily gage height, in feet, of Gila River near Redrock, N. Mex., for 1912.

Day	Jan.	May.	June.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.00	.....	0.40	1.22	1.40	0.95	1.05	.....
2	1.00	.....	.....	1.22	1.40	.92	1.05	.....
3	1.00	0.70	.....	1.22	1.40	.90	1.05	.....
4	1.00	.70	.....	1.22	1.35	.90	1.05	.....
5	1.00	.70	.....	1.22	1.30	.80	1.00	.....
6	.70	.70	.....	1.22	1.30	.80	1.00	.....
7	.70	.70	.....	1.22	1.25	.80	1.00	.....
8	.70	.70	.....	1.25	1.20	.85	1.00	.....
9	.70	.70	.....	1.25	1.20	.90	1.00	.....
10	.70	.70	.....	1.22	1.15	.90	1.00	.....

Daily gage height, in feet, of Gila River near Redrock, N. Mex., for 1912—Continued.

Day.	Jan.	May.	June.	Aug.	Sept.	Oct.	Nov.	Dec.
11	0.70	0.70	.....	1.20	1.08	0.95	1.00	.....
12	.70	.70	.....	1.20	1.00	.95	1.00	.....
13	.70	.70	.....	1.20	1.00	.95	1.00	.....
14	.70	.70	.....	1.00	1.00	.95	1.00	.....
15	.70	.70	.....	.90	1.00	1.00	1.00	.....
16	.70	.70	0.20	.90	1.00	1.00	1.00	.....
17	.70	.70	.....	.90	1.00	1.00	1.00	.....
18	.80	.70	.....	.90	1.00	1.00	1.00	1.00
19	.80	.70	.....	.90	1.08	1.00	1.00	1.00
20	.90	.70	.....	.90	1.00	1.00	1.00	1.00
21	.90	.....	.....	.95	1.00	1.00	.....	1.00
22	.90	.....	.....	.95	.98	1.00	.....	1.00
23	.90	.....	.....	1.00	.98	1.05	.....	1.00
24	.....	.....	.....	1.00	.95	1.05	.....	.....
25	.....	.....	.....	1.00	.95	1.05	.....	.....
26	.....	.....	.....	1.00	.95	1.05	.....	.....
27	.....	.....	.....	1.10	.95	1.05	.....	.....
28	.....	.....	.....	1.20	.95	1.05	.....	.....
29	.....	.....	.....	1.30	.95	1.05	.....	.....
30	.....	.....	.....	1.35	.95	1.05	.....	.....
31	.....	.....	.....	1.40	.....	1.05	.....	.....

Daily discharge, in second-feet, of Gila River near Redrock, N. Mex., for 1912.

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1	115	144	74	97	83	16	69	77	95	84	82
2	115	144	73	97	83	17	69	77	95	84	82
3	115	144	71	96	83	18	69	77	95	84	82
4	115	135	71	96	83	19	69	91	95	84	82
5	115	126	62	86	83	20	69	76	95	84	82
6	115	126	62	86	83	21	75	76	95	84	82
7	115	118	62	86	83	22	75	75	95	84	82
8	122	109	69	86	83	23	80	75	98	84	82
9	122	109	78	85	83	24	80	74	98	84	82
10	115	100	78	85	83	25	80	74	98	84	82
11	112	91	88	85	82	26	80	74	98	84	82
12	112	77	88	85	82	27	93	74	98	84	82
13	112	77	88	84	82	28	110	74	98	84	82
14	81	77	88	84	82	29	127	74	98	84	82
15	69	77	95	84	82	30	136	74	97	84	82
						31	144	.....	97	.....	82

NOTE.—Daily discharge determined by the indirect method for shifting channels. Discharge estimated Nov. 21 to Dec. 17 and Dec. 24 to 31.

Monthly discharge of Gila River near Redrock, N. Mex., for 1912.

Month.	Discharge in second-feet.			Run-off, total in acre-feet.	Accuracy.
	Maximum.	Minimum.	Mean.		
August	144	69	99.2	6,100	B.
September	144	74	93.2	5,550	B.
October	98	62	86.8	5,340	B.
November	97	84	86.1	5,120	C.
December	83	82	82.3	5,060	C.
The period	.....	.....	.....	27,200	

GILA RIVER AT GUTHRIE, ARIZ.

Location.—About 500 feet above Arizona & New Mexico Railroad bridge at Guthrie, in sec. 3, T. 6 S., R. 30 E., and about 8 miles above junction with San Francisco River.

Records available.—November 6, 1910, to December 31, 1912.

Drainage area.—Not measured.

Gage.—Inclined staff bolted to conglomerate rock on right bank about 500 feet above bridge.

Channel.—Sand, and somewhat shifting.

Discharge measurements.—Made from car and cable 50 feet below gage, or by wading.

Diversions.—About 7,000 acres of land are irrigated from this stream above the station.

Accuracy.—Estimates have been prepared from rating curves covering short periods and by indirect method for shifting channels. Results are fair.

Discharge measurements of Gila River at Guthrie, Ariz., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 23	C. C. Jacob	5.42	94	Sept. 1	C. C. Jacob	6.24	470
Mar. 15	do	7.30	1,130	30	do	5.10	41
Apr. 18	do	5.86	243	Oct. 8	W. Richins	5.55	108
May 12	do	5.35	95	Nov. 26	C. C. Jacob	5.50	89
12	do	5.35	102	Dec. 6	W. Richins	5.60	133
Sept. 1	do	6.18	425				

Daily gage height, in feet, of Gila River at Guthrie, Ariz., for 1912.

[J. W. Beck, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.55	5.35	5.15	6.45	5.6	5.1	5.3	6.0	6.25	5.1	5.75	5.55
2	5.55	5.35	5.15	6.45	5.6	5.1	5.15	5.95	6.4	5.15	5.7	5.55
3	5.55	5.35	5.15	6.4	5.55	5.05	5.05	5.9	6.35	5.2	5.7	5.6
4	5.55	5.35	5.15	6.35	5.5	5.05	4.9	5.8	6.35	6.15	5.6	5.6
5	5.55	5.35	5.15	6.3	5.55	5.0	4.85	5.75	6.15	6.0	5.6	5.55
6	5.55	5.35	5.15	6.25	5.6	5.0	4.8	5.75	6.0	5.7	5.65	5.6
7	5.55	5.35	5.1	6.2	5.55	5.0	4.8	5.8	5.9	5.55	5.6	5.6
8	5.5	5.35	5.1	6.15	5.5	5.05	4.8	5.75	5.8	5.55	5.6	5.6
9	5.5	5.35	5.1	6.15	5.5	5.0	4.75	5.7	5.8	5.55	5.55	5.55
10	5.5	5.35	7.4	6.1	5.45	5.05	4.75	5.65	5.8	5.75	5.5	5.55
11	5.5	5.3	13.6	6.1	5.4	5.0	4.7	5.6	5.75	5.7	5.5	5.6
12	5.5	5.3	9.15	6.1	5.35	5.0	4.7	5.45	5.7	5.7	5.55	5.6
13	5.45	5.3	7.9	6.05	5.4	5.0	4.7	5.3	5.65	5.7	5.55	5.55
14	5.45	5.3	7.55	6.0	5.35	4.95	5.1	.....	5.6	5.65	5.6	5.5
15	5.45	5.3	7.25	6.0	5.3	4.9	4.7	.....	5.55	5.6	5.6	5.5
16	5.45	5.25	6.9	6.0	5.3	4.9	4.65	.....	5.45	5.55	5.6	5.5
17	5.45	5.25	6.75	6.0	5.25	4.85	5.1	.....	5.35	5.55	5.6	5.45
18	5.4	5.25	6.6	5.9	5.25	4.85	5.7	.....	5.25	5.5	5.6	5.45
19	5.4	5.25	6.5	5.85	5.3	4.8	5.8	.....	5.2	5.8	5.6	5.45
20	5.4	5.2	6.3	5.8	5.3	4.8	6.1	.....	5.15	5.45	5.55	5.4
21	5.4	5.2	6.55	5.8	5.25	4.8	6.4	.....	5.15	5.4	5.55	5.4
22	5.45	5.2	7.5	5.8	5.2	4.75	8.9	.....	5.1	5.4	5.55	5.45
23	5.4	5.2	7.15	5.75	5.2	4.75	10.2	.....	5.1	5.3	5.55	5.45
24	5.4	5.15	6.8	5.7	5.15	4.75	10.6	.....	5.1	5.3	5.5	5.45
25	5.4	5.25	6.9	5.65	5.15	4.75	9.1	.....	5.05	5.7	5.5	5.5
26	5.4	5.2	6.9	5.6	5.2	4.7	7.95	.....	5.0	6.2	5.5	5.5
27	5.4	5.2	6.85	5.6	5.2	4.8	6.55	5.7	4.95	6.1	5.5	5.5
28	5.4	5.15	6.7	5.7	5.2	5.2	5.85	5.6	4.9	6.0	5.55	5.5
29	5.4	5.15	6.7	5.7	5.15	5.3	6.85	5.55	.....	5.95	5.6	5.5
30	5.4	.....	6.6	5.65	5.15	5.3	6.95	5.65	5.1	5.8	5.6	5.5
31	5.4	.....	6.5	.....	5.15	.....	6.15	5.8	.....	5.8	.....	5.5

NOTE.—Mar. 11 maximum gage height 16.5 feet, occurred about 9 a. m. Remained at about this stage until 1 p. m. Gage not read Aug. 14 to 26.

Daily discharge, in second-feet, of Gila River at Guthrie, Ariz., for 1910–1912.

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1910.			1910.			1910.		
1		40	11	35	80	21	60	50
2		40	12	35	80	22	70	50
3		40	13	35	80	23	50	40
4		60	14	60	60	24	40	40
5		60	15	80	60	25	40	40
6	28	60	16	108	60	26	40	40
7	28	60	17	108	60	27	60	40
8	60	60	18	95	60	28	60	40
9	40	80	19	80	50	29	60	40
10	40	80	20	80	50	30	60	40
						31		40

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1911.												
1	40	130	140	340	32	6	150	405	197	710	275	125
2	40	225	545	330	32	6	92	338	165	640	235	120
3	40	225	600	340	32	6	60	255	165	640	235	113
4	40	225	700	298	20	6	32	218	165	580	235	126
5	40	200	665	278	20	6	32	197	90	640	235	128
6	40	165	665	258	20	6	20	165	80	1,020	235	128
7	40	165	1,160	238	20	6	10	150	80	1,710	235	131
8	40	165	1,050	220	10	6	10	120	80	540	200	135
9	40	165	905	200	10	6	10	105	80	410	182	138
10	40	165	1,050	220	10	6	26	105	1,860	275	165	140
11	40	165	1,050	183	8	120	183	80	760	235	160	138
12	60	165	575	167	8	183	437	80	385	200	165	138
13	183	165	575	150	8	120	630	80	195	165	152	140
14	120	135	575	138	8	150	540	80	165	138	152	138
15	200	90	413	138	6	92	690	80	275	138	152	138
16	200	65	390	120	6	92	630	80	149	138	155	138
17	200	65	280	150	6	70	690	38	108	110	160	135
18	200	65	280	138	6	70	515	10	90	110	148	130
19	138	145	320	108	6	70	722	10	80	110	142	130
20	108	145	280	70	6	70	758	10	860	110	148	126
21	138	145	222	70	6	50	630	8	570	86	142	126
22	138	145	205	50	6	60	540	8	165	110	138	126
23	138	145	240	32	6	32	437	120	135	110	138	126
24	138	145	280	32	6	40	2,290	150	135	110	135	128
25	168	125	465	20	6	32	3,260	218	135	110	135	128
26	775	125	710	20	6	26	820	380	135	86	135	128
27	610	125	700	20	6	20	1,070	255	195	110	130	128
28	740	125	690	26	6	20	890	197	195	110	126	126
29	350	.....	610	20	6	20	720	197	165	460	126	126
30	350	.....	540	32	6	10	595	338	195	235	120	125
31	350	.....	450	.....	6	.....	458	218	.....	235	.....	125
1912.												
1	125	75	35	550	170	41	85	325	445	41	165	108
2	125	75	35	550	170	41	52	300	525	52	150	108
3	125	75	35	525	155	33	33	280	500	62	150	120
4	125	75	35	500	140	33	17	240	445	315	120	120
5	125	75	35	470	155	28	12	225	395	255	120	108
6	125	75	35	445	170	28	9	225	325	150	135	120
7	125	75	30	420	155	28	9	240	280	108	120	120
8	110	75	30	395	140	33	9	225	240	108	120	120
9	110	75	30	395	140	28	6	205	240	108	108	108
10	110	75	1,120	370	128	33	6	190	240	165	90	108
11	110	65	.....	370	112	28	4	170	225	150	90	120
12	110	65	.....	370	100	28	4	128	205	150	108	120
13	98	65	1,620	350	112	28	4	85	190	150	108	108
14	98	65	1,320	325	100	20	41	85	170	135	120	90
15	98	65	1,000	325	85	17	4	85	155	120	120	90
16	98	55	840	325	85	17	3	85	128	108	120	90
17	98	55	740	325	72	12	41	85	100	108	120	80
18	86	55	640	280	72	12	205	85	72	90	120	80
19	86	55	580	260	85	9	240	85	62	180	120	80
20	86	45	470	240	85	9	370	85	52	80	108	70

Daily discharge, in second-feet, of Gila River at Guthrie, Ariz., for 1910–1912—Contd.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1912.												
21	86	45	610	240	72	9	525	85	52	70	108	70
22	98	45	1,280	240	62	6	2,540	85	41	70	108	80
23	86	45	1,020	225	62	6	.....	200	41	50	108	80
24	86	35	770	205	52	6	.....	200	41	50	90	80
25	86	55	840	190	52	6	.....	200	33	150	90	90
26	86	45	840	170	62	4	1,660	200	28	335	90	90
27	86	45	810	170	62	9	610	205	20	295	90	90
28	86	35	710	205	62	62	260	170	17	255	108	90
29	86	35	710	205	52	85	810	150	30	235	120	90
30	86	.....	640	190	52	85	875	190	41	180	120	90
31	86	.....	580	.....	52	.....	395	240	.....	180	.....	90

NOTE.—High water of July 24 and 25, 1911, caused a decided scour and estimates of discharge for these days are rather uncertain. As no high-water discharge measurements were made during 1912, estimates of discharge have not been made for Mar. 11 and 12 and July 23 to 25. Daily discharge estimated Aug. 14 to 26.

Monthly discharge of Gila River at Guthrie, Ariz., for 1910–1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
1910.				
November 6–30	108	28	55.8	2,880
December	80	40	54.2	3,330
1911.				
January	775	40	185	11,400
February	225	65	147	8,160
March	1,160	140	559	34,400
April	340	20	147	8,750
May	32	6	11.0	676
June	183	6	46.9	2,790
July	3,260	10	579	35,600
August	405	8	151	9,280
September	1,860	80	268	15,900
October	1,710	86	335	20,600
November	275	120	170	10,100
December	140	113	130	7,990
The year	3,260	6	229	166,000
1912.				
January	125	86	101	6,210
February	75	35	59.5	3,420
March	.....	35	601	34,600
April	550	170	328	19,500
May	170	52	99.1	6,090
June	85	4	26.1	1,550
July	.....	3	315	17,500
August	325	85	173	10,600
September	525	17	178	10,600
October	335	41	145	8,920
November	165	90	115	6,840
December	120	70	97.0	5,960
The year	.....	.....	.....	132,000

GILA RIVER AT KELVIN, ARIZ.

Location.—About one-half mile below mouth of Mineral Creek, 1 mile below Kelvin,[1] and 25 miles above Florence.

Records available.—January 26, 1911, to December 31, 1912.

Drainage area.—Not measured.

[1] Ray Junction on Arizona & Eastern Railroad.

Gage.—The original inclined staff was fastened to basalt ledge on right bank opposite observer's home. It was destroyed by the flood of March 8, 1911, and replaced by painting the section directly on the rock about 10 feet downstream. On November 23, 1911, an inclined staff for low water was fastened to the rock at the same location as first gage. On September 20, 1912, an auxiliary vertical staff for low water was installed on left bank opposite gage. Original datum has been maintained.

Channel.—Sand and somewhat shifting.

Discharge measurements.—Made from public car and cable about three-fourths mile above gage or by wading.

Diversions.—See Gila River at Guthrie.

Accuracy.—Rating curves are fairly well defined and results are fair.

Discharge measurements of Gila River at Kelvin, Ariz., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 10	C. C. Jacob	4.76	252	Sept. 20	C. C. Jacob	3.48	50
Mar. 28	do	5.60	1,330	Oct. 11	do	3.90	150
June 6	do	3.86	26	Nov. 18	do	3.55	84
Aug. 17	do	4.10	207	Dec. 10	do	3.81	150

Daily gage height, in feet, of Gila River near Kelvin, Ariz., for 1912.

[H. Measom, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.7	4.5	4.2	5.5	4.3	3.5	3.5	5.9	6.0	4.2	3.4	3.45
2	4.7	4.5	4.2	5.4	4.2	3.5	3.55	5.5	5.55	4.35	3.4	3.48
3	4.7	4.5	4.2	5.2	4.2	3.5	3.6	5.0	5.3	4.4	3.6	3.7
4	4.7	4.5	4.25	5.2	4.2	3.5	3.6	4.75	4.9	4.4	3.6	3.7
5	4.7	4.5	4.3	5.0	4.2	3.5	3.6	4.6	4.8	3.95	3.65	3.65
6	4.7	4.5	4.3	5.0	4.2	3.78	3.6	4.6	4.7	4.15	3.7	3.6
7	4.7	4.4	4.3	5.0	4.1	3.8	3.6	4.5	4.55	3.98	3.7	3.6
8	4.7	4.4	4.3	5.0	4.1	3.82	3.6	4.4	4.4	3.9	3.65	3.7
9	4.7	4.4	4.55	5.0	4.1	3.8	3.6	4.4	4.25	3.85	3.6	3.7
10	4.7	4.4	6.8	5.0	4.2	3.75	3.6	4.4	4.1	3.85	3.6	3.85
11	4.7	4.4	10.5	5.0	4.15	3.72	3.6	4.4	4.0	3.8	3.58	4.0
12	4.7	4.4	15.5	5.1	4.1	3.7	3.6	4.45	3.9	3.78	3.5	3.95
13	4.7	4.35	9.0	5.1	4.1	3.7	3.65	4.6	3.8	3.7	3.45	4.0
14	4.7	4.3	9.0	5.0	4.1	3.7	4.75	4.5	3.6	3.62	3.45	4.0
15	4.7	4.3	8.0	5.0	4.0	3.7	4.9	4.35	3.7	3.58	3.5	3.9
16	4.7	4.3	7.4	4.9	4.0	3.65	4.4	4.25	3.6	3.55	3.5	3.9
17	4.7	4.3	6.2	4.9	4.0	3.65	4.2	4.1	3.6	3.55	3.5	3.9
18	4.6	4.3	6.0	4.8	4.0	3.65	3.9	4.15	3.55	3.55	3.5	3.9
19	4.6	4.3	5.8	4.7	4.0	3.6	3.8	4.1	3.5	3.5	3.5	3.9
20	4.6	4.3	5.6	4.7	4.0	3.6	3.7	4.1	3.45	3.45	3.45	3.9
21	4.5	4.3	5.6	4.6	4.0	3.6	3.8	4.1	3.45	3.45	3.45	3.9
22	4.5	4.2	5.7	4.5	4.0	3.6	4.2	4.05	3.4	3.45	3.5	3.9
23	4.5	4.2	6.5	4.5	3.9	3.6	5.25	4.0	3.4	3.45	3.5	3.9
24	4.5	4.2	6.35	4.5	3.8	3.6	7.4	4.0	3.35	3.45	3.5	3.95
25	4.5	4.2	6.0	4.5	3.8	3.6	9.5	4.5	3.35	3.45	3.5	4.0
26	4.5	4.2	5.9	4.5	3.8	3.6	8.75	5.1	3.3	3.45	3.5	3.95
27	4.5	4.2	5.8	4.4	3.7	3.6	7.75	4.75	3.3	3.45	3.5	4.0
28	4.5	4.2	5.7	4.4	3.7	3.55	7.85	5.05	3.3	3.45	3.5	4.0
29	4.5	4.2	5.5	4.4	3.6	3.55	7.4	4.9	3.3	3.45	3.5	4.0
30	4.5	.....	5.5	4.3	3.5	3.55	8.2	5.75	3.3	3.4	3.5	3.95
31	4.5	.....	5.5	.....	3.5	.....	7.2	7.85	.....	3.4	.....	4.0

NOTE.—Mar. 12, maximum recorded gage height 16.0 feet at 9 a. m.

Daily discharge, in second-feet, of Gila River at Kelvin, Ariz., for 1911–12.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1911.												
1	.....	458	370	690	60	.....	.....	1,010	35	560	1,240	140
2	.....	425	425	650	60	.....	.....	570	12	640	1,050	140
3	.....	370	555	650	35	.....	.....	385	5	485	730	140
4	.....	925	790	650	35	.....	.....	290	155	485	640	140
5	.....	1,450	835	570	35	.....	.....	290	385	885	600	140
6	.....	748	4,700	570	35	.....	.....	290	180	3,220	560	115
7	.....	490	6,100	490	35	.....	.....	320	60	3,880	560	115
8	.....	592	6,100	420	35	.....	.....	420	12	2,970	522	115
9	.....	490	4,680	420	35	.....	.....	350	5	1,520	420	115
10	.....	425	4,680	420	35	.....	.....	320	3	830	420	115
11	.....	398	2,930	420	12	.....	.....	290	2	730	360	115
12	.....	370	1,700	350	12	.....	.....	260	48	522	360	115
13	.....	370	1,570	290	12	.....	.....	230	865	485	360	115
14	.....	345	1,510	260	12	.....	.....	230	1,570	485	305	128
15	.....	320	1,450	230	12	.....	.....	230	3,930	452	255	140
16	.....	398	1,450	230	12	.....	.....	180	1,240	420	255	170
17	.....	425	1,330	180	10	.....	.....	180	885	360	255	170
18	.....	425	1,330	180	8	.....	.....	130	830	360	210	210
19	.....	555	1,330	130	8	.....	.....	130	995	360	170	255
20	.....	630	1,220	130	6	.....	.....	110	1,170	360	140	232
21	.....	592	910	130	5	.....	.....	60	640	360	140	210
22	.....	522	650	130	5	.....	.....	650	780	360	140	210
23	.....	490	530	130	5	.....	.....	570	485	305	155	210
24	.....	425	610	130	5	.....	.....	290	332	305	210	210
25	.....	425	650	90	5	.....	.....	155	255	255	210	255
26	425	425	570	60	5	.....	11,900	60	210	255	210	305
27	458	370	570	60	5	.....	5,380	650	140	280	170	305
28	522	398	775	60	4	.....	4,050	910	255	522	170	305
29	425	.....	910	60	3	.....	2,130	385	600	1,370	170	255
30	555	.....	865	60	3	.....	1,510	180	730	3,350	170	255
31	555	.....	820	.....	3	.....	1,220	60	.....	3,100	.....	210
1912.												
1	210	140	75	1,210	180	3	3	1,760	1,900	275	50	58
2	210	140	75	1,090	130	3	4	1,280	1,340	345	50	62
3	210	140	75	880	130	3	5	790	1,070	370	85	110
4	210	140	85	880	130	3	5	592	705	370	85	110
5	210	140	95	690	130	3	5	490	630	182	98	98
6	210	140	95	690	130	11	5	490	555	255	110	85
7	210	115	95	690	90	12	5	425	458	193	110	85
8	210	115	95	690	90	17	5	370	370	165	98	110
9	210	115	155	690	90	12	5	370	298	150	85	110
10	210	115	2,730	690	130	10	5	370	235	150	85	150
11	210	115	14,300	690	110	9	5	370	200	135	81	200
12	210	115	32,900	780	90	8	5	398	165	130	65	182
13	210	105	9,200	780	90	8	6	490	135	110	58	200
14	210	95	9,200	690	90	8	480	425	85	90	58	200
15	210	95	6,100	690	60	8	600	345	110	81	65	165
16	210	95	4,440	600	60	6	240	298	85	75	65	165
17	210	95	2,170	600	60	6	130	235	85	75	65	165
18	170	95	1,870	520	60	6	35	255	75	75	65	165
19	170	95	1,590	440	60	5	12	235	65	65	65	165
20	170	95	1,330	440	60	5	8	235	58	58	58	165
21	140	95	1,330	370	60	5	12	235	58	58	58	165
22	140	75	1,460	300	60	5	130	218	50	58	65	165
23	140	75	2,660	300	35	5	930	200	50	58	65	165
24	140	75	2,410	300	12	5	4,440	200	45	58	65	182
25	140	75	1,870	300	12	5	10,800	425	45	58	65	200
26	140	75	1,730	300	12	5	8,400	880	40	58	65	182
27	140	75	1,590	240	8	5	5,390	592	40	58	65	200
28	140	75	1,460	240	8	4	5,670	835	40	58	65	200
29	140	75	1,210	240	5	4	4,440	705	40	58	65	200
30	140	.....	1,210	180	3	4	6,690	1,570	40	50	65	182
31	140	.....	1,210	.....	3	.....	3,960	5,670	.....	50	.....	200

NOTE.—Daily discharge 1911–12 computed from several rating curves which are fairly well defined. Discharges have not been computed for period June 1 to July 25, as this period is not covered by measurement, and it appears that the high water of June 14, 1911, scoured out the low-water channel. No high-water measurements were secured during 1912, therefore above stages of 8 feet discharge are rather uncertain.

Monthly discharge of Gila River at Kelvin, Ariz., for 1911–12.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
1911.				
January 26–31	555	425	490	5,830
February	1,450	320	509	28,300
March	6,100	370	1,710	105,000
April	690	60	295	17,600
May	60	3	17.8	1,090
July 26–31	11,900	1,220	4,360	51,900
August	1,010	60	329	20,200
September	3,930	2	560	33,300
October	3,880	255	983	60,400
November	1,240	140	372	22,100
December	305	115	182	11,200
The period				357,000
1912.				
January	210	140	181	11,100
February	140	75	103	5,920
March	32,900	75	3,380	208,000
April	1,210	180	573	34,100
May	180	3	70.6	4,340
June	17	3	6.4	381
July	10,800	3	1,690	104,000
August	5,670	200	702	43,200
September	1,900	40	302	18,000
October	370	50	128	7,870
November	110	50	71.5	4,250
December	200	58	155	9,530
The period	32,900	3	611	451,000

SAN FRANCISCO RIVER NEAR ALMA, N. MEX.

Location.—1½ miles south of Alma, about 90 miles northwest of Silver City, 5 miles northwest of Glenwood, at the mouth of the box canyon, 4½ miles above the mouth of Whitewater Creek, and about 1½ miles below the mouth of Mineral Creek, in sec. 4, T. 11 S., R. 20 W.

Records available.—August 11, 1912, to December 31, 1912.

Drainage area.—Not measured.

Gage.—Vertical staff. The present gage bears no relation to the datum and location of the gages previously used at the station 1 mile upstream.

Channel.—Fairly permanent at low stages but subject to shift during the flood stages.

Discharge measurements.—By wading at low water and from a cable during high stages.

Winter flow.—Practically no backwater from ice during the winter months.

Diversions.—Some water is diverted for irrigation above this station.

Accuracy.—Because of lack of high-water measurements, estimates of the daily discharge were not made. Estimates of daily discharge will be made at a later date, when high-water measurements become available.

Discharge measurements of San Francisco River near Alma, N. Mex., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Aug. 11	Gray and Redding	0.92	9.8
Sept. 14	E. L. Redding	.90	12.3
Oct. 15	....do	1.15	28.7
Nov. 13	....do	1.00	14.6

Daily gage height, in feet, of San Francisco River near Alma, N. Mex., for 1912.

[Mrs. G. G. Graham, observer.]

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1.25	1.8	1.0	1.05	16	1.00	1.00	1.15	1.0	1.0
2	.....	1.15	1.1	1.0	1.1	17	1.05	1.05	1.15	1.0	1.0
3	.....	1.05	1.15	1.0	1.25	18	1.05	1.00	1.1	1.0	1.0
4	.....	1.00	1.92	1.0	1.1	19	1.00	1.00	1.1	1.0	1.0
5	.....	1.00	1.5	1.0	1.1	20	1.05	1.00	1.05	1.0	1.0
6	.....	3.00	1.25	1.0	1.0	21	1.05	1.00	1.05	1.0	1.0
7	.....	2.50	1.9	1.0	1.0	22	1.50	1.00	1.0	1.0	1.0
8	.....	1.05	1.3	1.0	1.1	23	1.05	.90	1.0	1.0	1.0
9	.....	1.05	1.25	1.0	1.1	24	1.05	.90	1.1	1.0	1.0
10	.....	1.05	1.1	1.0	1.1	25	1.05	.85	1.0	1.0	1.0
11	0.95	1.00	1.15	1.0	1.0	26	1.50	.80	1.0	1.0	1.0
12	1.09	1.00	1.15	1.0	1.0	27	2.00	.70	1.0	1.0	1.05
13	2.00	1.00	1.25	1.0	1.0	28	1.50	.70	1.55	1.0	1.1
14	1.00	1.05	1.15	1.0	1.05	29	1.35	2.00	1.1	1.0	1.05
15	1.05	1.00	1.15	1.0	1.0	30	1.30	1.00	1.0	1.1	1.0
						31	2.65	.....	1.0	.....	1.0

SAN FRANCISCO RIVER AT DAM ABOVE CLIFTON, ARIZ.

Location.—At Arizona Copper Co.'s diversion dam, 1½ miles above Clifton and about 6½ miles above junction with Gila River.

Records available.—January 16, 1911, to June 29, 1912 (incomplete).

Drainage area.—Not measured.

Gage.—Original gage was a vertical staff in two sections bolted to upstream face of dam and right abutment. On November 13, 1911, the upper section was painted on inclined crest of dam and on vertical face of right abutment near vertical staff damaged by high water. Original datum has been maintained.

Channel.—Sand and gravel; somewhat shifting. Dam acts as a partial control, but record is affected by the accumulation of sand at intake of canal on right bank.

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

Diversions.—A small amount of water is used for irrigation one-fourth mile above dam. At the dam 12 to 14 second-feet are diverted for use in power development at Arizona Copper Co.'s smelter. This water is returned to the river above the station at Clifton.

Accuracy.—Estimates have been prepared from rating curves covering short periods and by indirect method for shifting channels. Results are fair.

Discharge measurements of San Francisco River near Clifton, Ariz., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 22	C. C. Jacob	7.11	73	May 11	C. C. Jacob	6.78	191
Mar. 14	do	7.50	662	Sept. 1	do	7.30	224
Apr. 17[a]	do	7.01	280				

[a] By wading ¾ mile below gage. Included 11.6 second-feet in Arizona Copper Co. canal, measured Apr. 17, 1912.

Daily discharge, in second-feet, of San Francisco River near Clifton, Ariz., for 1911.

[D. D. Potter and Bee Wilkerson, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	145	.....	.....	.....	56	145	145	195	105	105
2	.....	.....	145	.....	.....	.....	56	108	100	120	105	105
3	.....	.....	145	.....	.....	.....	56	100	90	100	105	105
4	.....	.....	430	.....	.....	.....	56	90	90	100	105	105
5	.....	.....	1,000	.....	.....	.....	56	90	80	2,340	105	105
6	.....	.....	3,280	.....	.....	.....	56	90	90	1,650	105	105
7	.....	265	6,200	.....	.....	.....	56	80	65	400	105	105
8	.....	245	4,160	.....	.....	.....	56	60	60	255	105	105
9	.....	225	4,120	.....	.....	.....	56	50	50	225	105	105
10	.....	205	2,630	.....	.....	.....	56	70	60	175	105	105
11	.....	185	1,120	.....	.....	.....	240	70	65	125	105	90
12	.....	165	1,120	.....	.....	.....	170	70	90	125	110	105
13	.....	145	660	.....	.....	.....	80	80	108	125	105	105
14	.....	145	660	.....	.....	.....	60	108	145	125	105	105
15	.....	123	570	.....	.....	.....	340	100	550	125	105	105
16	200	123	490	.....	.....	.....	170	100	1,060	125	105	105
17	145	145	490	.....	.....	.....	1,000	60	520	125	105	105
18	145	200	410	.....	.....	.....	410	65	100	125	105	105
19	145	200	410	.....	.....	.....	1,120	60	475	125	105	105
20	100	170	375	.....	.....	.....	520	65	170	125	105	105
21	123	145	345	.....	.....	.....	240	65	120	125	105	105
22	320	145	345	.....	.....	.....	240	60	120	125	105	105
23	255	145	310	.....	.....	.....	145	120	100	125	105	105
24	470	145	490	.....	.....	.....	100	80	100	125	105	105
25	390	145	890	.....	.....	.....	940	100	80	125	105	105
26	255	145	775	.....	.....	.....	360	120	80	125	105	105
27	200	145	775	.....	.....	.....	565	100	80	125	105	105
28	145	145	720	.....	.....	.....	360	100	100	125	105	105
29	.....	.....	660	.....	.....	.....	360	100	170	3,600	105	105
30	.....	.....	570	.....	.....	.....	195	100	500	2,200	105	105
31	.....	.....	530	.....	.....	.....	150	100	.....	890	.....	105

NOTE.—Daily discharge Feb. 8 to 12, and Feb. 25 to Mar. 2, interpolated. Mean discharge July 1 to 9 estimated as 56 second-feet. Daily discharge for remaining periods computed from rating curves covering short periods and by the indirect method for shifting channels.

Daily gage height, in feet, and discharge, in second-feet, of San Francisco River near Clifton, Ariz., for 1912.

[Juan Samara, observer.]

Day.	January.		February.		March.		April.		May.		June.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	.....	.....	7.1	70	7.1	70	7.1	345	7.0	280	.....	244
2	.....	.....	7.1	70	7.1	70	7.1	345	7.0	280	.....	256
3	.....	.....	7.1	70	7.1	70	7.1	345	7.0	280	.....	269
4	.....	.....	7.1	70	7.1	70	7.1	345	7.0	280	.....	282
5	.....	.....	7.1	70	7.1	70	7.1	345	7.0	280	.....	294
6	.....	.....	7.1	70	7.1	70	7.1	345	7.0	280	.....	307
7	.....	.....	7.1	70	7.1	70	7.1	345	7.0	280	.....	320
8	.....	.....	7.1	70	7.1	70	7.1	345	7.0	280	.....	332
9	.....	.....	7.1	70	8.1	780	7.1	345	7.0	280	7.1	345
10	.....	.....	7.1	70	12.1	7,400	7.1	345	7.0	280	7.0	280
11	.....	.....	7.1	70	10.0	5,000	7.1	345	6.8	180	7.0	280
12	.....	.....	7.1	70	8.5	1,930	7.1	345	6.8	180	7.0	280
13	.....	.....	7.1	70	7.8	1,000	7.1	345	6.8	180	7.0	280
14	.....	.....	7.1	70	7.5	670	7.1	345	6.8	180	7.0	280
15	.....	.....	7.1	70	7.3	490	7.1	345	6.8	180	7.0	280
16	.....	.....	7.1	70	7.2	410	7.1	345	6.8	180	7.0	280
17	.....	.....	7.0	40	7.1	345	7.1	345	6.8	180	7.0	280
18	.....	.....	7.0	40	7.1	345	7.1	345	6.8	180	6.8	180
19	.....	.....	7.0	40	7.1	345	7.1	345	6.8	180	6.8	180
20	.....	.....	7.0	40	7.1	345	7.1	345	6.8	180	6.8	180

Daily gage height, in feet, and discharge, in second-feet, of San Francisco River near Clifton, Ariz., for 1912—Continued.

Day.	January.		February.		March.		April.		May.		June.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
21	7.1	70	7.0	40	9.0	2,670	7.1	345	6.8	180	6.8	180
22	7.1	70	7.0	40	8.5	1,930	7.1	345	6.8	180	6.8	180
23	7.0	40	7.0	40	8.0	1,250	7.1	345	6.8	180	7.0	280
24	7.0	40	7.1	70	7.3	490	7.1	345	6.8	180	7.0	280
25	7.0	40	7.1	70	7.3	490	7.1	345	6.8	180	7.0	280
26	7.0	40	7.1	70	7.3	490	7.1	345	6.8	180	7.1	345
27	7.0	40	7.1	70	7.3	490	7.1	345	6.8	180	7.1	345
28	7.0	40	7.1	70	7.3	490	7.1	345	.....	193	7.1	345
29	7.0	40	7.1	70	7.3	490	7.0	280	.....	205	7.1	345
30	7.0	40	.....	.....	7.3	490	7.0	280	.....	218	.....	345
31	7.1	70	.....	.....	7.3	490	.....	.....	.....	231	.....	.....

NOTE.—Maximum recorded gage height on Mar. 10, 15.0 feet at 7.30 a. m. Mean gage height Mar. 10 computed from comparison with records at Clifton. May 28 to June 8 observer absent. Mean discharge Jan. 1 to 20 estimated as 88 second-feet. Discharge for Mar. 10 and 11 uncertain. Daily discharge May 28 to June 8 interpolated.

Monthly discharge of San Francisco River near Clifton, Ariz., for 1911–12.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
1911.				
January 16–28	470	100	223	5,750
February 7–28	265	123	168	7,330
March	6,200	145	1,130	69,500
July	1,120	56	269	16,500
August	145	50	87.3	5,370
September	1,060	50	185	11,000
October	3,600	100	468	28,800
November	110	105	105	6,250
December	105	90	105	6,460
The period	.....	.....	.....	157,000
1912.				
January	.....	.....	73.9	4,540
February	70	40	62.8	3,610
March	7,400	70	948	58,300
April	345	280	341	20,300
May	280	180	216	13,300
June	345	180	278	16,500
The period	.....	.....	.....	117,000

SAN FRANCISCO RIVER AT CLIFTON, ARIZ.

Location.—At highway bridge at Clifton, in sec. 19, T. 4 S., R. 30 E., 1½ miles below diversion dam of Arizona Copper Co., and 5 miles above junction with Gila River.

Records available.—October 24, 1910, to January 14, 1911; January 24 to March 31 and August 5 to December 26, 1912.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to retaining wall on left bank just above bridge. On October 1, 1912, a chain gage was installed on downstream side of highway bridge near right bank. Original datum has been maintained.

Channel.—Sand and gravel; somewhat shifting.

Discharge measurements.—Made from highway bridge or by wading

Diversions.—See station at Arizona Copper Co.'s dam near Clifton.

Accuracy.—Estimates have been prepared from rating tables covering short periods and by indirect method for shifting channels. Results are fair.

Discharge measurements of San Francisco River at Clifton, Ariz., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Sept. 1	C. C. Jacob	3.41	224	Oct. 8	W. Richins	3.78	208
30	do	3.31	103	Nov. 25	C. C. Jacob	3.51	57
Oct. 7	W. Richins	3.71	123	Dec. 5	W. Richins	3.45	41

Daily gage height, in feet, of San Francisco River at Clifton, Ariz., for 1912.

[Juan Samara and Peter Riley, observers.]

Day.	Jan.	Feb.	Mar.	June.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	4.2	4.0	.....	.....	3.2	3.2	3.6	3.4
2	.....	4.2	4.0	.....	.....	3.2	3.6	3.6	3.4
3	.....	4.2	4.0	.....	.....	3.2	3.7	3.6	3.3
4	.....	4.2	4.0	.....	.....	3.3	3.8	3.6	3.3
5	.....	4.3	4.0	.....	3.75	3.3	4.6	3.6	3.45
6	.....	4.3	4.0	.....	3.75	3.3	4.4	3.6	3.45
7	.....	4.3	3.8	.....	.....	3.3	4.3	3.6	3.5
8	.....	4.3	3.8	.....	3.85	3.3	4.4	3.6	3.5
9	.....	4.3	4.5	.....	4.05	3.35	4.1	3.6	3.6
10	.....	4.3	9.4	.....	3.75	3.4	4.1	3.6	3.55
11	.....	4.3	7.25	.....	3.75	3.4	4.1	3.6	3.65
12	.....	4.3	5.0	.....	3.85	3.4	4.1	3.6	3.6
13	.....	4.3	4.3	.....	3.85	3.4	4.1	3.6	3.7
14	.....	4.3	4.3	.....	3.85	3.4	4.1	3.6	3.7
15	.....	4.4	4.5	.....	3.85	3.4	4.1	3.7	3.7
16	.....	4.4	4.5	.....	3.75	3.4	4.1	3.7	3.75
17	.....	4.4	4.3	.....	3.75	3.4	4.1	3.7	3.7
18	.....	4.4	4.3	.....	3.75	3.4	4.1	3.7	3.7
19	.....	4.5	4.3	.....	3.75	3.4	4.1	3.7	3.6
20	.....	4.5	4.3	.....	3.75	3.4	4.1	3.7	3.8
21	.....	4.5	5.95	.....	3.85	3.4	4.0	3.7	3.8
22	.....	4.5	5.0	.....	3.95	3.3	4.0	3.7	3.8
23	.....	4.5	5.0	.....	4.75	3.3	3.9	3.7	3.75
24	4.3	4.0	5.0	4.3	4.45	3.3	3.9	3.7	3.7
25	4.3	4.0	5.0	4.48	4.15	3.3	3.85	3.5	3.7
26	4.3	4.0	5.0	4.45	3.85	3.3	3.8	3.5	3.7
27	4.3	4.0	5.0	4.2	3.85	3.3	5.0	3.5	.....
28	4.3	4.0	5.0	3.95	3.85	3.3	4.55	3.5	.....
29	4.3	4.0	5.0	3.9	3.75	3.3	3.8	3.5	.....
30	4.3	.....	5.0	.....	5.15	3.3	3.7	3.5	.....
31	4.2	.....	5.0	.....	.....	.....	3.55	.....	.....

NOTE.—Gage at bridge repaired and used Jan. 24 to Mar. 31. No observer Apr. 1 to Aug. 4. Gage heights Aug. 5 to 30 from auxiliary gage installed by observer. Gage heights Sept. 1 to 30 were obtained by measuring from reference point on bridge to water surface. Gage heights Oct. 1 to Nov. 24 are unreliable, owing to use by observer of an auxiliary gage.

Daily discharge, in second-feet, of San Francisco River at Clifton, Ariz., for 1910–1912.

Day.	1910			1911	1912		
	Oct.	Nov.	Dec.	Jan.	Sept.	Nov.	Dec.
1	.....	80	25	65	105	.....	35
2	.....	80	25	50	105	.....	35
3	.....	110	25	10	105	.....	10
4	.....	150	25	10	150	.....	10
5	.....	200	25	10	150	.....	41
6	.....	130	25	30	150	.....	41
7	.....	130	30	30	150	.....	55
8	.....	110	30	30	150	.....	55
9	.....	75	30	30	175	.....	100
10	.....	75	30	50	200	.....	78
11	.....	75	30	.....	175	.....	120
12	.....	115	30	.....	175	.....	100
13	.....	115	30	.....	175	.....	148
14	.....	115	30	.....	175	.....	148
15	.....	65	30	.....	175	.....	148
16	.....	140	80	.....	175	.....	170
17	.....	160	80	.....	175	.....	148
18	.....	160	65	.....	175	.....	148
19	.....	130	100	.....	175	.....	100
20	.....	130	100	.....	175	.....	200
21	.....	130	100	.....	155	.....	200
22	.....	130	65	.....	105	.....	200
23	68	45	65	.....	105	.....	170
24	73	45	65	.....	105	.....	148
25	80	45	100	.....	105	55	148
26	125	45	100	.....	105	55	148
27	175	45	65	.....	105	55	148
28	110	50	65	.....	105	55	148
29	125	50	65	.....	105	55	148
30	150	50	65	.....	100	55	148
31	80	.....	65	.....	.....	.....	148

Monthly discharge of San Francisco River at Clifton, Ariz., for 1910–1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
1910.				
October 23–31	175	68	109	1,950
November	200	45	99.3	5,910
December	100	25	53.7	3,300
1911.				
January 1–10	65	10	31.5	625
1912.				
September	200	100	143	8,510
November 25–30	55	55	55.0	655
December	200	10	118	7,260

WHITEWATER CREEK NEAR MOGOLLON, N. MEX.

Location.—3 miles south of Mogollon, 90 miles northwest of Silver City, at the Socorro Mines Co.'s power plant, 500 feet below the confluence of the South and North forks of Whitewater Creek in sec. 4, T. 11 S., R. 19 W.

Records available.—May 30, 1911, to December 31, 1912.

Drainage area.—34 square miles.

Gage.—Vertical staff gage on right bank installed May 30, 1911.

Channel.—Permanent at low stages, but subject to shift at high stages.

Discharge measurements.—By wading at low stages and from a footbridge during high stages.

Winter flow.—No backwater from ice during winter months.

Diversions.—The discharge at this point represents the natural run-off, as there are no diversions above the station.

Accuracy.—The estimates are rated as good.

Cooperation.—Maintained in cooperation with the Socorro Mines Co., Mogollon, N. Mex.

Discharge measurements of Whitewater Creek near Mogollon, N. Mex., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Aug. 12	Gray and Redding	1.38	4.3
Sept. 13	E. L. Redding	1.40	4.8
Oct. 15	....do	1.45	5.4
Nov. 12	....do	1.45	3.9

Daily gage height, in feet, of Whitewater Creek near Mogollon, N. Mex., for 1912.

[Wm. Mackley, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.30	1.25	1.25	1.35	1.45	.....	1.32	1.70	1.35	1.45	1.45
2	1.30	1.20	1.25	1.35	1.45	.....	1.32	1.60	1.35	1.45	1.45
3	1.30	1.20	1.25	1.35	1.45	.....	1.28	1.68	1.35	1.45	1.45
4	1.30	1.20	1.25	1.35	1.45	.....	1.28	1.65	1.45	1.45	1.45
5	1.30	1.20	1.25	1.35	1.45	.....	1.32	1.60	1.45	1.45	1.45
6	1.30	1.20	1.25	1.35	1.45	.....	1.32	1.55	1.45	1.45	1.45
7	1.30	1.20	1.25	1.35	1.45	.....	1.32	1.55	1.45	1.45	1.45
8	1.30	1.20	1.25	1.35	1.45	.....	1.32	1.45	1.45	1.45	1.45
9	1.30	1.20	1.25	1.35	1.45	.....	1.32	1.45	1.45	1.45	1.45
10	1.30	1.20	1.85	1.35	1.45	.....	1.32	1.45	1.45	1.45	1.55
11	1.30	1.20	2.15	1.35	.....	.....	1.32	1.45	1.45	1.45	1.55
12	1.30	1.20	1.75	1.35	.....	.....	1.32	1.45	1.45	1.45	1.55
13	1.30	1.20	1.35	1.35	.....	.....	1.32	1.45	1.45	1.45	1.55
14	1.30	1.20	1.35	1.35	.....	.....	1.38	1.45	1.45	1.45	1.55
15	1.30	1.20	1.35	1.35	.....	.....	1.55	1.45	1.45	1.45	1.55
16	1.30	1.20	1.35	1.35	.....	.....	1.40	1.45	1.45	1.45	1.55
17	1.30	1.25	1.35	1.35	.....	.....	1.45	1.40	1.45	1.45	1.55
18	1.30	1.25	1.35	1.35	.....	.....	1.35	1.40	1.45	1.45	1.55
19	1.30	1.25	2.10	1.35	.....	.....	1.52	1.40	1.45	1.45	1.45
20	1.30	1.25	2.05	1.35	.....	1.22	1.48	1.40	1.45	1.45	1.45
21	1.30	1.25	1.95	1.35	.....	1.28	1.50	1.40	1.45	1.45	1.45
22	1.30	1.25	1.95	1.35	.....	1.32	1.50	1.40	1.45	1.45	1.45
23	1.30	1.25	1.75	1.35	.....	1.32	1.48	1.38	1.45	1.45	1.45
24	1.30	1.25	1.45	1.35	.....	1.32	1.45	1.35	1.45	1.45	1.45
25	1.30	1.25	1.45	1.35	.....	1.32	1.45	1.35	1.45	1.45	1.45
26	1.30	1.25	1.45	1.35	.....	1.32	1.45	1.35	1.45	1.45	1.45
27	1.30	1.25	1.45	1.35	.....	1.32	1.42	1.35	1.45	1.45	1.45
28	1.30	1.25	1.45	1.45	.....	1.32	1.45	1.35	1.45	1.45	1.45
29	1.25	1.25	1.45	1.45	.....	1.32	1.50	1.35	1.45	1.45	1.45
30	1.25	.....	1.45	1.45	.....	1.32	1.60	1.35	1.45	1.45	1.45
31	1.25	.....	1.45	.....	.....	1.32	1.80	.....	1.45	.....	1.45

NOTE.—Gage was not read May 11 to July 19.

Daily discharge, in second-feet, of Whitewater Creek near Mogollon, N. Mex., for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.2	1.6	1.6	3.1	5.4	.....	3.1	15	2.9	4.9	3.9
2	2.2	1.0	1.6	3.1	5.4	.....	3.1	11	2.9	4.8	3.9
3	2.2	1.0	1.6	3.1	5.4	.....	2.4	14	2.9	4.7	3.9
4	2.2	1.0	1.6	3.1	5.4	.....	2.4	13	5.4	4.6	3.9
5	2.2	1.0	1.6	3.1	5.4	.....	3.1	11	5.4	4.5	3.9
6	2.2	1.0	1.6	3.1	5.4	.....	3.1	9.1	5.4	4.4	3.9
7	2.2	1.0	1.6	3.1	5.4	.....	3.1	9.1	5.4	4.3	3.9
8	2.2	1.0	1.6	3.1	5.4	.....	3.1	6.2	5.4	4.2	3.9
9	2.2	1.0	1.6	3.1	5.4	.....	3.1	6.2	5.4	4.1	3.9
10	2.2	1.0	20	3.1	5.4	.....	3.1	6.2	5.4	4.0	6.5
11	2.2	1.0	34	3.1	.....	.....	3.1	6.2	5.4	3.9	6.5
12	2.2	1.0	16	3.1	.....	.....	3.1	6.2	5.4	3.9	6.5
13	2.2	1.0	3.1	3.1	.....	.....	3.1	6.2	5.4	3.9	6.5
14	2.2	1.0	3.1	3.1	.....	.....	4.4	6.1	5.4	3.9	6.5
15	2.2	1.0	3.1	3.1	.....	.....	9.1	6.1	5.4	3.9	6.5
16	2.2	1.0	3.1	3.1	.....	.....	4.8	6.0	5.4	3.9	6.5
17	2.2	1.6	3.1	3.1	.....	.....	6.2	4.6	5.4	3.9	6.5
18	2.2	1.6	3.1	3.1	.....	.....	3.8	4.6	5.4	3.9	6.5
19	2.2	1.6	32	3.1	.....	.....	8.2	4.4	5.4	3.9	3.5
20	2.2	1.6	30	3.1	.....	1.7	7.0	4.4	5.4	3.9	3.5
21	2.2	1.6	25	3.1	.....	2.4	7.5	4.4	5.4	3.9	3.5
22	2.2	1.6	25	3.1	.....	3.1	7.5	4.4	5.4	3.9	3.5
23	2.2	1.6	16	3.1	.....	3.1	7.0	4.0	5.4	3.9	3.5
24	2.2	1.6	5.4	3.1	.....	3.1	6.2	3.1	5.4	3.9	3.5
25	2.2	1.6	5.4	3.1	.....	3.1	6.2	3.1	5.4	3.9	3.5
26	2.2	1.6	5.4	3.1	.....	3.1	6.2	3.1	5.4	3.9	3.5
27	2.2	1.6	5.4	3.1	.....	3.1	5.3	3.1	5.4	3.9	3.5
28	2.2	1.6	5.4	5.4	.....	3.1	6.2	3.1	5.3	3.9	3.5
29	1.6	1.6	5.4	5.4	.....	3.1	7.5	2.9	5.2	3.9	3.5
30	1.6	.....	5.4	5.4	.....	3.1	11	2.9	5.1	3.9	3.5
31	1.6	.....	5.4	.....	.....	3.1	17	.....	5.0	.....	3.5

NOTE.—Daily discharge determined from a well-defined curve Jan. 1 to May 10, July 20 to Sept. 13, Oct. 4 to 27, and Nov. 13 to Dec. 31. The indirect method for shifting channels was used Sept. 14 to Oct. 3 and Oct. 28 to Nov. 12.

Monthly discharge of Whitewater Creek near Mogollon, N. Mex., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January	2.2	1.6	2.14	132
February	1.6	1.0	1.29	74
March	34	1.6	8.84	544
April	5.4	3.1	3.33	198
May 1–10	5.4	5.4	5.4	107
July 20–31	3.1	1.7	2.92	69
August	17	2.4	5.48	337
September	15	2.9	6.32	376
October	5.4	2.9	5.13	315
November	4.9	3.9	4.08	243
December	6.5	3.5	4.49	276

SAN PEDRO RIVER NEAR FAIRBANK, ARIZ.

Location.—At Boquillas diversion dam, in southern part of San Juan de los Boquillas grant, about 2½ miles above Fairbank.

Records available.—November 15, 1911, to September 28, 1912.

Drainage area.—Not measured.

Gage.—Painted on vertical face of wing wall at left end of dam. Auxiliary gages were also placed in the canals and wasteways at each end of the dam.

Channel.—Shifting sand above and below dam.

Discharge measurements.—Made from suspension footbridge 600 feet below dam or by wading.

Diversions.—Some water is used for irrigation above Charleston. Nearly the entire low-water flow is diverted at the dam for irrigation on Boquillas ranch.

On account of the many changes in conditions at this station, due to placing and removing sand bags on crest of dam and adjustment of wasteways, it is impracticable to prepare estimates, and discharge measurements only are published.

Discharge measurements of San Pedro River and of canals and sluices near Fairbank, Ariz., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 19	C. C. Jacob	4.01	[a]14
Mar. 18	do	4.55	1.1
Apr. 20	do	4.95	3.2
Aug. 28	do	4.86	[a]766
	EAST SLUICEWAY.		
Mar. 18	C. C. Jacob	1.69	8.9
Apr. 20	do	1.34	2.6
	WEST SLUICEWAY.		
Mar. 18	C. C. Jacob	1.55	7.3
Apr. 20	do	1.22	1.2
	EAST CANAL.		
Mar. 18	C. C. Jacob	0.40	1.5
Apr. 20	do	1.44	2.9
Aug. 28[b]	do	.....	.0
	WEST CANAL.		
Mar. 18	C. C. Jacob	1.71	3.1
Apr. 20	do	2.10	7.8
Aug. 28	do	.....	(b)

[a] Total flow. [b] Dry. Undergoing repairs.

SAN PEDRO RIVER AT FAIRBANK, ARIZ.

Location.—Opposite ranch house of Boquillas Cattle Co., 1 mile below Boquillas diversion dam and 1½ miles above Fairbank.

Records available.—September 28 to December 31, 1912.

Drainage area.—Not measured.

Gage.—Vertical staff in three sections on right bank, opposite ranch house and just below footbridge.

Channel.—Sand and clay; shifting.

Discharge measurements.—Made from suspension footbridge 1 mile above gage, or by wading.

Diversions.—Some water is used for irrigation above Charleston. Water is also diverted at the dam, 1 mile above station, for irrigation on Boquillas ranch.

No estimates are practicable until additional measurements are made.

Discharge measurements of San Pedro River at Fairbank, Ariz., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Sept. 28	C. C. Jacob	3.82	15
Oct. 10	W. Richins	3.90	14
Nov. 28	C. C. Jacob	3.86	18
Dec. 10	W. Richins	3.76	11

Daily gage height, in feet, of San Pedro River at Fairbank, Ariz., for 1912.

[J. M. Stanley, observer.]

Day.	Sept.	Oct.	Nov.	Dec.	Day.	Sept.	Oct.	Nov.	Dec.
1		4.32	3.80	3.75	16		3.86	3.80	3.66
2		4.35	3.80	3.75	17		3.83	3.80	3.63
3		4.22	3.80	3.72	18		3.80	3.80	3.67
4		4.00	3.80	3.72	19		3.80	3.80	3.63
5		4.00	3.80	3.72	20		3.80	3.82	3.62
6		3.98	3.80	3.72	21		3.79	3.81	3.62
7		3.95	3.80	3.72	22		3.78	3.80	3.62
8		3.92	3.80	3.73	23		3.78	3.82	3.64
9		3.90	3.80	3.74	24		3.78	3.82	3.65
10		3.90	3.79	3.76	25		3.78	3.82	3.70
11		3.90	3.78	3.76	26		3.80	3.82	3.69
12		3.90	3.78	3.76	27		3.80	3.80	3.66
13		3.90	3.80	3.76	28	3.84	3.80	3.86	3.60
14		3.90	3.80	3.74	29	3.82	3.80	3.82	3.68
15		3.86	3.80	3.71	30	4.00	3.80	3.77	3.76
					31		3.80		3.75

SANTA CRUZ RIVER NEAR NOGALES, ARIZ.

Location.—Just below proposed dam site on Yerba Buena ranch, about 7 miles northeast of Nogales and one-half mile above the city pumping plant.

Records available.—March 22, 1907, to December 31, 1912 (incomplete).

Drainage area.—Not measured.

Gage.—Inclined staff fastened to large cottonwood tree on right bank about 500 feet below intake of small irrigation ditch. On January 18, 1912, a Richard Frères (Paris, France) self-recording water-stage register was installed on left bank about one-fourth mile below gage. An auxiliary gage is fastened to gage well. Original datum has not been maintained.

Channel.—Shifting sand.

Diversions.—About 140 acres of land are irrigated by water diverted from this stream above the station. An additional small irrigation ditch also diverts a short distance above the gage.

Cooperation.—Previous to July 1, 1912, the gage-height record was furnished by Santa Cruz County and Nogales Board of Trade.

Accuracy.—Measurements insufficient for estimates of daily and monthly discharge.

Discharge measurements of Santa Cruz River near Nogales, Ariz., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 18	C. C. Jacob	[a] 3.39	4.1	Aug. 8	J. A. Straith	1.54	7.9
Mar. 20	do	[a] 3.70 / [b] 1.80	24	27	C. C. Jacob	2.32	265
Apr. 21	do	1.57	.7	Oct. 11	W. Richins	1.54	8.5
July 20	J. A. Straith	2.10	32	Dec. 11	do	1.74	14

[a] Old staff gage. [b] Automatic gage.

NOTE.—Measurements made by wading at various sections near gage.

Daily gage height, in feet, of Santa Cruz River near Nogales, Ariz., for 1912.

Day.	Jan.	Feb.	Mar.	Apr.	May.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1.8	1.75	1.75	1.55	.....	1.65	2.1	1.55	1.55	1.65
2	.....	1.8	1.75	1.75	1.55	.....	1.65	1.95	1.55	1.55	1.6
3	.....	1.8	1.75	1.75	1.55	.....	1.6	1.65	1.55	1.55	1.65
4	.....	1.8	1.75	1.75	1.55	.....	1.55	.....	1.55	1.55	1.65
5	.....	1.8	1.75	1.7	1.5	.....	1.55	.....	1.55	1.55	1.6
6	.....	1.8	1.75	1.65	1.45	.....	1.55	.....	1.55	1.55	1.6
7	.....	1.75	1.75	1.65	1.4	.....	1.55	.....	1.55	1.55	1.65
8	.....	1.75	1.75	1.6	1.3	.....	1.55	.....	1.55	1.55	1.7
9	.....	1.75	1.75	1.55	1.25	.....	1.55	.....	1.55	1.55	1.7
10	.....	1.75	2.05	1.55	1.2	.....	1.5	.....	1.55	1.55	1.7
11	.....	1.7	.....	1.55	1.2	.....	1.5	.....	1.55	1.55	1.7
12	.....	1.7	.....	1.55	1.15	.....	2.0	.....	1.55	1.55	1.7
13	.....	1.7	.....	1.55	1.1	.....	1.8	.....	1.55	1.55	1.7
14	.....	1.7	.....	1.55	1.1	.....	1.75	.....	1.55	1.55	1.7
15	.....	1.7	.....	1.5	.....	.....	1.7	.....	1.55	1.6	1.65
16	.....	1.7	.....	1.5	.....	.....	1.7	.....	1.55	1.6	1.65
17	.....	1.7	1.95	1.5	.....	.....	1.7	.....	1.55	1.6	1.65
18	.....	1.7	1.9	1.45	.....	.....	1.7	.....	1.55	1.65	1.65
19	.....	1.75	1.85	1.5	.....	.....	1.8	.....	1.55	1.65	1.65
20	.....	1.7	1.8	1.55	.....	.....	1.75	.....	1.55	1.65	1.65
21	.....	1.7	.....	1.55	.....	1.9	1.75	.....	1.55	1.65	1.65
22	.....	1.7	.....	1.55	.....	2.5	1.75	.....	1.55	1.65	1.65
23	.....	1.75	.....	1.55	.....	2.7	1.75	.....	1.55	1.65	1.65
24	.....	1.75	.....	1.55	.....	2.8	1.75	.....	1.55	1.65	1.65
25	.....	1.8	.....	1.55	.....	2.65	1.7	.....	1.55	1.65	1.65
26	.....	1.75	.....	1.55	.....	2.45	1.7	.....	1.55	1.65	1.65
27	.....	1.75	1.8	1.55	.....	.....	.....	.....	1.55	1.65	1.65
28	1.8	1.75	1.8	1.55	.....	1.5	2.4	.....	1.55	1.65	1.65
29	1.8	1.75	1.8	1.55	.....	1.85	2.15	1.55	1.55	1.65	1.65
30	1.8	.....	1.8	1.55	.....	1.75	2.35	1.55	1.55	1.65	.....
31	1.8	.....	1.8	.....	.....	1.7	2.3	.....	1.55	.....	.....

NOTE.—No record Jan. 1 to 27, Mar. 11 to 16, Mar. 21 to 26, May 15 to July 20, and Sept. 4 to 28. Record indistinct July 27 and Aug. 27. On May 14 stream practically dry. Stream dry Dec. 30 and 31. Some uncertainity as to the April record, owing to float touching box and collection of silt in the box.

SANTA CRUZ RIVER AT TUCSON, ARIZ.

Location.—At Congress Street Bridge at Tucson, in sec. 13, T. 14 S., R. 13 E.

Records available.—October 15, 1905, to December 31, 1912 (incomplete).

Drainage area.—Not measured.

Gage.—Original gage was painted on bridge pier on left bank. During 1911 and up to September 30, 1912, gage heights were observed from a temporary staff or by measuring from a reference point on the bridge to the water surface. Beginning with October 1, 1912, record is from chain gage installed at the bridge. Original datum has been maintained.

Channel.—Sand, and somewhat shifting.

Discharge measurements.—Made from bridge or by wading.

Accuracy.—Estimates October 1 to December 31, 1912, prepared from a fairly well-defined rating curve. Results are fair.

Cooperation.—Previous to July 1, 1912, station was maintained by Arizona Experiment Station through G. E. P. Smith, irrigation engineer.

Discharge measurements of Santa Cruz River at Tucson, Ariz., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Oct. 13	W. Richins	−0.45	1.0
Nov. 24	C. C. Jacob	− .02	7.4
Dec. 12	W. Richins	+ .13	9.6
27	C. C. Jacob	+ .28	8.8

Daily gage height, in feet, and discharge, in second-feet, of Santa Cruz River at Tucson, Ariz., for 1912.

[Frank Poerner, observer.]

Day.	July.	Aug.	Sept.	Oct.		Nov.		Dec.	
	Gage height.	Gage height.	Gage height.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
	Feet.	*Feet.*	*Feet.*	*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*
1	.....	−0.29	−0.17	+0.08	7.6	−0.17	4.3	−0.04	5.6
2	.....	− .73	− .67	− .33	2.7	− .17	4.3	0	6.0
3	.....	− .93	.....	− .21	3.9	− .17	4.3	+ .14	8.8
4	.....	− .98	.....	− .32	2.8	− .17	4.3	+ .13	8.6
5	.....	− .98	.....	− .37	2.3	− .17	4.3	+ .13	8.6
6	.....	.....	.....	− .43	1.7	− .17	4.3	+ .13	8.6
7	.....	.....	.....	− .44	1.6	− .17	4.3	+ .13	8.6
8	.....	.....	.....	− .52	.8	− .17	4.3	+ .13	8.6
9	.....	.....	.....	− .51	.9	− .17	4.3	+ .13	8.6
10	.....	.....	.....	− .51	.9	− .17	4.3	+ .13	8.6
11	.....	.....	.....	− .50	1.0	− .12	4.8	+ .13	8.6
12	.....	− .29	.....	− .50	1.0	− .12	4.8	+ .13	8.6
13	.....	− .61	.....	− .46	1.4	− .12	4.8	+ .13	8.6
14	.....	− .56	.....	− .44	1.6	− .12	4.8	+ .13	8.6
15	.....	− .85	.....	− .44	1.6	− .12	4.8	+ .13	8.6
16	.....	− .85	.....	− .44	1.6	− .12	4.8	+ .13	8.6
17	0.07	− .64	.....	− .43	1.7	− .12	4.8	+ .28	12
18	− .31	− .77	.....	− .43	1.7	− .07	5.3	+ .28	12
19	+ .15	.....	.....	− .44	1.6	− .10	5.0	+ .28	12
20	− .47	− .89	.....	− .47	1.3	− .10	5.0	+ .28	12
21	− .56	.....	.....	− .47	1.3	− .10	5.0	+ .22	10
22	+ .33	.....	.....	− .42	1.8	− .10	5.0	+ .22	10
23	− .14	.....	.....	− .42	1.8	− .10	5.0	+ .22	10
24	+ .11	+ .61	.....	− .42	1.8	− .07	5.3	+ .25	11
25	+ .07	+ .81	.....	− .47	1.3	+ .06	7.2	+ .28	12
26	− .35	− .97	.....	− .44	1.6	+ .06	7.2	+ .28	12
27	− .19	− .20	.....	− .37	2.3	0	6.0	+ .28	12
28	− .44	− .11	.....	− .29	3.1	+ .03	6.6	+ .28	12
29	+ .61	− .46	.....	− .28	3.2	+ .03	6.6	+ .28	12
30	+ .72	− .42	.....	− .28	3.2	− .02	5.8	+ .28	12
31	+ .53	+ .06	.....	− .22	3.8	.....	.....	+ .30	12

Monthly discharge of Santa Cruz River at Tucson, Ariz., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
October	7.6	0.8	2.09	129
November	7.2	4.3	5.05	300
December	12	5.6	9.85	606

RILLITO CREEK NEAR TUCSON, ARIZ.

Location.—At highway bridge on Oracle road, in sec. 23, T. 13 S., R. 13 E., about 4 miles north of Tucson.

Records available.—Fragmentary records during 1912.

Drainage area.—Not measured.

Gage.—A Richard Frères (Paris, France) self-recording water-stage register installed on the right abutment of the bridge.

Discharge measurements.—Made from bridge or by wading.

Channel.—Wide and shallow; shifting sand.

Accuracy.—Results are approximate.

Cooperation.—Previous to July 1, 1912, station was maintained by Arizona Experiment Station through G. E. P. Smith, irrigation engineer.

Accuracy.—Data insufficient for estimates of daily and monthly discharge.

Observations of gage heights, in feet, of Rillito Creek near Tucson, Ariz., in 1912.

[F. O. Benedict, observer.]

Day.	Time.	Gage height.	Remarks.	Day.	Time.	Gage height.	Remarks.
Mar. 10	4.00 a. m.	4.5		Mar. 18	6.00 a. m.	3.9	
	6.00 a. m.	5.25			8.30 a. m.	3.8	
	7.00 a. m.	5.0			8.00 p. m.	.....	Dry.
	9.30 a. m.	4.55		19	7.30 a. m.	3.8	
	9.50 a. m.	4.85		20	6.00 a. m.	4.0	
	10.40 a. m.	4.75		28	2.00 a. m.	.....	Flood arrived.
	1.00 p. m.	4.6			8.00 a. m.	3.8	
	3.00 p. m.	4.5			5.00 p. m.	3.75	
	6.00 p. m.	4.25		29	8.00 a. m.	4.0	
11	5.00 a. m.	4.1			4.00 p. m.	3.9	
	7.00 a. m.	4.0		30	7.15 a. m.	3.75	
	8.30 a. m.	3.75			6.30 p. m.	3.8	
	10.15 a. m.	3.4		31	8.15 a. m.	4.1	
	2.00 p. m.	3.0			1.00 p. m.	4.05	
	4.30 p. m.	.....	Small flow.		7.00 p. m.	3.95	
12	7.30 a. m.	.....	Dry.	Apr. 1	8.00 a. m.	4.0	
14	7.00 a. m.	.....	Flood arrived.		3.00 p. m.	4.1	
	7.30 a. m.	4.0		2	7.30 a. m.	3.75	
	8.30 a. m.	4.0			4.00 p. m.	.....	All diverted.
	9.00 a. m.	4.0		July 27	6.00 a. m.	.....	Flood arrived.
	10.15 a. m.	4.0			6.30 a. m.	4.25	Maximum.
	11.00 a. m.	4.0			10.00 a. m.	3.5	
	11.50 a. m.	4.1			6.00 p. m.	.....	Dry.
	1.00. p. m.	3.5		28	5.00 a. m.	.....	Flood arrived.
	3.00 p. m.	3.			.....	4.75	Maximum.
	5.00 p. m.	.....	Dry.		1.00 p. m.	3.5	
15	6.30 a. m.	3.25		29	.....	.....	About 5 second-feet in morning.
	9.00 a. m.	3.0					
	1.00 p. m.	.....	Do.				
	6.30 p. m.	.....	Do.	Aug. 26	3.40 p. m.	3.6	
16	6.30 a. m.	3.5		28	7.30 a. m.	4.5	
	11.00 a. m.	3.4		29	Midnight.	5.9	Maximum.
	1.00 p. m.	3.0		30	.....	4.9	Mean for day.
	5.00 p. m.	.....	Do.	31	1.00 a. m.	5.9	
17	5.00 a. m.	3.5			6.00 a. m.	5.1	
	9.00 a. m.	3.4			8.00 a. m.	6.6	Maximum.
	12.00 noon.	3.0			10.00 a. m.	5.6	Automatic record stopped.
	4.00 p. m.	.....	Do.				

NOTE.—Two small floods in July not recorded. Records during August are from a Richard Frères automatic gage. This gage reads in centimeters but records have been reduced to feet and tenths.

SALT RIVER AT ROOSEVELT, ARIZ.

Location.—At Roosevelt dam, located in the Salt River Canyon just below the mouth of Tonto Creek, at Roosevelt, about 78 miles northeast of Phoenix.

Records available.—February 7, 1901, to December 9, 1907, and 1912.

Drainage area.—5,756 square miles. (Furnished by United States Reclamation Service.)

Accuracy.—Data for 1912 computed principally from the inflow and outflow of the reservoir.

Cooperation.—Complete estimates furnished by United States Reclamation Service through H. S. Reed, engineer.

Monthly discharge of Salt River at Roosevelt, Ariz., for 1912.

[Drainage area, 5,756 square miles.]

Month.	Discharge in second-feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.
January	240	203	228	0.0396	0.0500	14,012
February	233	233	233	.0405	.043[illegible]	13,398
March	14,826	233	1,898	.3298	.3803	116,704
April	2,828	1,643	2,258	.3940	.4396	134,310
May	2,403	611	1,139	.1979	.2282	70,029
June	611	266	415	.0721	.0805	23,036
July	796	179	368	.0639	.0737	22,610
August	1,042	411	548	.0952	.1098	33,700
September	1,242	199	448	.0848	.0946	26,642
October	790	200	423	.0734	.0847	26,000
November	329	240	288	.0500	.0558	17,136
December	315	243	293	.0509	.0587	18,006
The year	14,286	199	712	.1237	1.6995	515,583

BLACK RIVER NEAR FORT APACHE, ARIZ.

Location.—Just above bridge on highway from Rice to Fort Apache, about 2 miles above junction with White River, and 18 miles west of Fort Apache.

Records available.—November 24 to December 31, 1912.

Drainage area.—Not measured.

Gage.—Vertical staff in two sections fastened to willow tree on right bank about 400 feet above bridge.

Channel.—Bowlders and gravel. About 100 feet below gage a solid rock dike, which extends across the channel, acts as a permanent control.

Discharge measurements.—Made by wading below gage. High water measurements may be made from private cable about 1,000 feet below gage.

Accuracy.—Estimates are withheld until additional measurements are made.

The following discharge measurement was made by McGlashan and Jacob:

October 22, 1912: Gage height, 4.90 feet; discharge, 67 second-feet.

Daily gage height, in feet, of Black River near Fort Apache, Ariz., for 1912.

[E. R. Duke, observer.]

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1		5.0	11		5.5	21		5.3
2		5.0	12		5.4	22		
3		5.0	13		5.35	23		
4		5.1	14		5.3	24	4.85	
5		5.15	15		5.1	25	4.9	
6		5.2	16		5.2	26	4.9	
7		5.3	17		5.2	27	4.95	
8		5.4	18		5.25	28	4.95	
9		5.4	19		5.3	29	4.95	
10		5.5	20		5.3	30	5.0	
						31		

WHITE RIVER AT FORT APACHE, ARIZ.

Location.—At highway bridge on Fort Apache Military Reserve, just below junction of North and East Forks, at Fort Apache.

Records available.—October 22 to December 31, 1912.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to downstream end of left abutment of bridge.
Channel.—Sand and gravel; fairly permanent.
Discharge measurements.—Made from bridge or by wading.
Cooperation.—Gage-height record furnished by United States Army.
Accuracy.—Estimates withheld until additional measurements are made.

The following discharge measurement was made by McGlashan and Jacob:

October 23, 1912: Gage height, 4.78 feet; discharge, 68 second-feet.

The discharges of North Fork and East Fork of White River were measured and added to obtain the above result.

Daily gage height, in feet, of White River at Fort Apache, Ariz., for 1912.

[Maj. L. Hardeman, Fourth Cavalry.]

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1	.....	4.85	4.78	11	.....	4.8	4.72	21	.....	.....	4.62
2	.....	4.85	4.78	12	.....	4.8	4.70	22	.....	4.8	4.67
3	.....	4.85	4.8	13	.....	4.8	4.75	23	.....	4.8	4.70
4	.....	4.8	4.8	14	.....	4.8	4.70	24	4.8	4.8	4.72
5	.....	4.8	4.75	15	.....	4.8	4.70	25	4.8	4.75	4.80
6	.....	4.8	4.7	16	.....	4.8	4.75	26	4.8	4.75	4.70
7	.....	4.8	4.62	17	.....	.....	4.72	27	4.8	4.8	4.73
8	.....	4.8	4.75	18	.....	4.8	4.72	28	5.0	4.7	4.75
9	.....	4.8	4.78	19	.....	4.8	4.64	29	4.9	4.75	.....
10	.....	4.8	4.76	20	.....	.....	4.63	30	4.85	4.75	.....
								31	4.85	.....	.....

EAST FORK OF WHITE RIVER AT FORT APACHE, ARIZ.

Location.—On Fort Apache Military Reserve at Fort Apache, about 500 feet above junction with North Fork of White River.
Records available.—November 8 to December 31, 1912.
Drainage area.—Not measured.
Gage.—Vertical staff fastened to ash tree on left bank opposite officers' quarters.
Channel.—Bowlders and gravel.
Discharge measurements.—Made by wading near mouth.
Cooperation.—Gage-height observations furnished by United States Army.
Accuracy.—Estimates withheld until additional measurements are made.

The following measurement was made by McGlashan and Jacob:

October 23, 1912: Gage height, 5.25 feet; discharge, 15 second-feet.

Daily gage height, in feet, of East Fork White River at Fort Apache, Ariz., for 1912.

[Maj. L. Hardeman, Fourth Cavalry.]

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1	.....	5.22	11	5.3	5.12	21	.....	5.06
2	.....	5.22	12	5.3	5.10	22	5.25	5.16
3	.....	5.25	13	5.3	5.12	23	5.25	5.06
4	.....	5.25	14	5.3	5.08	24	5.25	5.10
5	.....	5.22	15	5.3	5.10	25	5.2	5.20
6	.....	5.20	16	5.3	5.18	26	5.2	5.10
7	.....	5.02	17	5.3	5.10	27	5.25	5.08
8	5.3	5.22	18	5.25	5.08	28	5.15	5.0
9	5.3	5.22	19	5.25	5.06	29	5.2	.....
10	5.3	5.22	20	.....	5.08	30	5.2	.....
						31	.....	.....

VERDE RIVER AT CAMP VERDE, ARIZ.

Location.—At highway bridge in sec. 30, T. 14 N., R. 5 E., above mouth of Beaver Creek, and about 1 mile north of Camp Verde.
Records available.—December 5 to 31, 1912.
Drainage area.—Not measured.
Gage.—Vertical staff.
Channel.—Sand and clay; somewhat shifting.
Discharge measurements.—Made from highway bridge or by wading.
Diversions.—Water is diverted for irrigation at various points above the station.
Accuracy.—Estimates withheld until additional measurements are made.

The following measurement was made by C. C. Jacob:
December 4, 1912: Gage height, 3.70; discharge, 176 second-feet.

Daily gage height, in feet, of Verde River at Camp Verde, Ariz., for 1912.

[Franklin Godard, observer.]

Day.	Dec.	Day.	Dec.	Day.	Dec.
1		11	3.6	21	3.6
2		12	3.6	22	3.6
3		13	3.6	23	3.6
4		14	3.6	24	3.6
5	3.7	15	3.6	25	3.6
6	3.7	16	3.6	26	
7	3.6	17	3.6	27	
8	3.6	18	3.6	28	
9	3.6	19	3.6	29	3.6
10	3.6	20	3.6	30	3.6
				31	3.6

VERDE RIVER AT McDOWELL, ARIZ.

Location.—At dam site on Salt River Indian Reservation, about three-fourths mile above junction with Salt River.
Records available.—August 14 to September 30, 1889; April 20, 1897, to November 11, 1899; January 1, 1901, to April 19, 1902; July 23 to 26, 1902; January 1, 1903, to December 31, 1910; and 1912.
Drainage area.—6,000 square miles (furnished by United States Reclamation Service).
Gage.—Painted directly on granite rocks on right bank.
Channel.—Sand and shifting.
Discharge measurements.—Made from car and cable or by wading.
Diversions.—See Verde River near Camp Verde. In addition, water is diverted 5 miles above station for use on Indian reservation.
Accuracy.—Since the completion of Roosevelt dam, March, 1910, flow has been determined indirectly from the computed flow of Salt River above and below mouth of Verde River.
Cooperation.—Complete estimates furnished by United States Reclamation Service through H. S. Reed, engineer.

Discharge measurements of Verde River at McDowell, Ariz., in 1911–12.

Date.	Hydrographer.	Gage height.	Discharge.
1911.		*Feet.*	*Sec.-ft.*
May 1	C. C. Jacob.	7.45	130
20	....do	7.35	106
Dec. 8	....do	8.20	197
1912.			
Feb. 16	....do	8.02	269

Monthly discharge of Verde River at McDowell, Ariz., for 1912.

[Drainage area, 6,000 square miles.]

Month.	Discharge in second-feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.
January	342	237	300	0.050	0.058	18,447
February	341	278	300	.050	.054	17,253
March	10,585	284	1,466	.243	.280	90,098
April	3,199	178	2,037	.340	.380	125,816
May	647	98	263	.044	.051	16,168
June	278	79	227	.038	.042	13,645
July	1,194	83	310	.052	.060	19,100
August	2,302	97	487	.081	.093	29,938
September	1,013	85	207	.034	.038	12,034
October	4,684	103	688	.115	.133	42,283
November	747	82	256	.043	.051	15,231
December	343	214	246	.041	.047	15,118
The year	10,585	79	566	.094	2.295	415,131

VERDE RIVER NEAR CAMP VERDE, ARIZ.

Location.—Just below power plant of Arizona Power Co. at Camp Childs, 3 miles above mouth of Fossil Creek and about 18 miles southeast of Camp Verde.

Records available.—February 26, 1911, to December 31, 1912.

Drainage area.—Not measured.

Gage.—Inclined staff in three sections on left bank about 300 feet below power plant of Arizona Power Co.

Channel.—Bowlders and bedrock, and appears fairly permanent.

Discharge measurements.—Made by car and cable 1 mile above gage, or by wading.

Artificial control.—About 60 second-feet diverted from Fossil Creek for power development and returned to the river above the gage. Water is also diverted for irrigation above the station.

Cooperation.—Gage-height record furnished by the United States Reclamation Service.

Accuracy.—Estimates can not be prepared until additional measurements are made.

The following measurement was made by W. Richins:

October 12, 1912: Gage height, 5.20 feet; discharge, 200 second-feet.

Daily gage height, in feet, of Verde River near Camp Verde, Ariz., for 1912.

[G. A. Brock and D. Z. Anderson, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.2	5.2	5.2	6.1	5.5	4.8	4.9	6.8	5.25	5.0	5.5	5.2
2	5.3	5.2	5.2	6.55	5.35	4.8	4.9	6.2	5.2	5.0	5.4	5.25
3	5.2	5.2	5.2	6.65	5.2	4.8	4.9	5.9	5.1	5.0	5.4	5.3
4	5.3	5.2	5.2	6.3	5.1	4.8	4.9	5.7	5.05	5.25	5.3	5.3
5	5.3	5.2	5.25	6.6	5.0	4.8	4.9	5.5	5.0	9.0	5.3	5.3
6	5.3	5.2	5.65	6.4	5.0	4.8	4.9	5.35	4.9	6.75	5.25	5.3
7	5.3	5.2	5.5	6.2	5.0	4.8	4.9	5.2	4.9	6.2	5.2	5.3
8	5.3	5.2	5.9	6.0	4.9	4.8	4.8	5.05	4.9	6.2	5.2	5.3
9	5.3	5.2	5.6	5.85	4.9	4.8	4.8	4.95	4.9	5.7	5.2	5.3
10	5.3	5.2	9.5	5.8	4.95	4.8	4.8	4.9	4.9	5.55	5.2	5.3
11	5.3	5.2	8.0	6.25	5.0	4.8	4.8	4.85	4.9	5.55	5.2	5.3
12	5.3	5.2	7.95	6.8	5.0	4.8	4.8	5.05	4.9	5.55	5.2	5.3
13	5.3	5.2	7.25	6.7	5.0	4.8	4.8	4.9	4.85	5.4	5.2	5.3
14	5.2	5.2	6.8	7.95	4.9	4.8	5.05	4.85	4.9	5.3	5.2	5.3
15	5.2	5.2	6.6	9.5	4.9	4.8	5.25	5.0	4.9	5.2	5.2	5.3
16	5.2	5.2	6.7	10.75	4.9	4.8	5.0	4.9	4.9	5.2	5.2	5.3
17	5.2	5.2	6.6	11.0	4.9	4.8	5.2	4.85	4.9	5.2	5.2	5.3
18	5.2	5.2	6.6	10.6	4.9	4.8	5.2	4.9	4.9	5.2	5.2	5.3
19	5.2	5.2	6.95	9.1	4.9	4.8	5.2	4.8	4.9	5.2	5.2	5.3
20	5.2	5.2	12.3	7.6	4.9	4.9	5.45	4.8	4.9	5.15	5.2	5.3
21	5.2	5.2	8.85	7.0	4.9	4.8	5.45	4.8	4.9	5.2	5.2	5.3
22	5.2	5.2	7.5	6.6	4.9	4.8	5.35	4.8	4.9	5.2	5.2	5.3
23	5.2	5.2	6.9	6.3	4.9	4.8	5.25	4.8	4.9	5.2	5.2	5.3
24	5.2	5.2	7.65	6.1	4.8	4.8	5.35	4.8	4.9	5.2	5.2	5.3
25	5.2	5.2	7.0	5.95	4.8	4.9	5.2	5.0	4.9	5.2	5.2	5.3
26	5.2	5.2	6.85	5.75	4.8	4.9	7.25	4.95	4.9	5.2	5.2	5.3
27	5.2	5.2	6.85	5.65	4.8	4.85	6.8	4.9	4.9	5.35	5.2	5.3
28	5.2	5.2	6.7	5.55	4.8	4.8	6.4	4.9	4.9	7.15	5.2	5.3
29	5.2	5.2	6.4	5.5	4.8	4.9	6.5	5.45	4.9	6.55	5.2	5.3
30	5.2	.....	6.2	5.5	4.8	4.9	6.6	5.85	4.9	5.9	5.2	5.3
31	5.2	.....	6.0	.....	4.8	.....	6.3	5.45	.....	5.65	.....	5.3

BEAVER CREEK AT CAMP VERDE, ARIZ.

Location.—In sec. 30, T. 14 N., R. 5 E., one-fourth mile above junction with Verde River, and about 1 mile north of Camp Verde.

Records available.—December 4 to 31, 1912.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to willow stump on right bank.

Channel.—Sand, clay, and solid rock.

Discharge measurements.—Made by wading near gage.

Diversions.—Water is diverted for irrigation at several points above the station.

Accuracy.—Estimates withheld until additional measurements are made.

The following measurement was made by C. C. Jacob:
December 5, 1912: Gage height, 4.00 feet; discharge, 11 second-feet.

Daily gage height, in feet, of Beaver Creek at Camp Verde, Ariz., for 1912.

[Franklin Godard, observer.]

Day.	Dec.	Day.	Dec.	Day.	Dec.
1	.....	11	4.0	21	4,0
2	.....	12	4.0	22	4.0
3	.....	13	4.0	23	4.0
4	.....	14	4.0	24	4.0
5	4.0	15	4.0	25	4.0
6	4.0	16	4.0	26	.....
7	4.0	17	4.0	27	.....
8	4.0	18	4.0	28	.....
9	4.0	19	4.0	29	4.0
10	4.0	20	4.0	30	4.0
				31	4.0

AGUA FRIA RIVER NEAR GLENDALE, ARIZ.

Location.—At old diversion dam of the Beardsley irrigation project at Camp Dyer, in sec. 28, T. 6 N., R. 1 E., 4 miles below mouth of Castle Creek, and 22 miles northwest of Glendale.

Records available.—November 10, 1910, to December 31, 1912.

Drainage area.—Not measured.

Gage.—The diversion dam failed during the flood of 1895, when a portion of the masonry near each end was washed out. At low and medium stages the entire stream flows through the larger opening, which is near the right bank. The gage for each channel is painted on upstream face of dam at right of opening. On September 18, 1912, a vertical staff for low water was installed on upstream face of dam at the left of right opening.

Channel.—Sand, and shifting.

Discharge measurements.—Made by wading or from car and cable.

Accuracy.—Full reliance can not be placed in the gage-height records observed by watchman at the dam. Data insufficient for estimates of daily and monthly discharge.

Cooperation.—Gage-height record furnished by Beardsley Irrigation Co., through A. L. Harris, engineer.

Discharge measurements of Agua Fria River near Glendale, Ariz., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 7	C. C. Jacob	21.82	3.2
Apr. 30	do	22.71	14
Sept. 18	do	23.40	2.7
Dec. 13	do	23.45	4.6

Daily gage height, in feet, of Agua Fria River near Glendale, Ariz., for 1912.

[R. Jones, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	22.1	21.8	21.8	23.0	22.75	22.6	22.8	23.9	23.9	23.45	23.4	23.4
2	22.1	21.8	21.8	23.0	22.75	22.6	22.8	23.9	23.9	23.5	23.45	23.45
3	22.1	21.8	21.8	23.0	22.75	22.6	22.8	23.9	23.9	23.5	23.5	23.5
4	22.1	21.8	21.8	23.0	22.75	22.6	22.8	23.9	23.9	25.0	23.5	23.5
5	22.05	21.8	21.8	23.0	22.7	22.6	22.8	23.9	23.9	30.0	23.5	23.5
6	22.05	21.8	21.8	23.0	22.7	22.6	22.75	23.45	23.9	24.25	23.5	23.5
7	22.05	21.8	21.8	23.0	22.7	22.6	22.7	23.0	23.9	23.5	23.4	23.5
8	22.05	21.8	21.8	23.0	22.7	22.6	22.7	23.0	23.9	23.5	23.4	24.25
9	22.0	21.8	21.8	23.0	22.7	22.6	22.7	23.0	23.9	23.45	23.4	23.5
10	22.0	21.8	30.0	23.0	22.7	22.6	22.7	23.0	23.9	23.4	23.4	23.5
11	22.0	21.8	25.0	23.0	22.7	22.6	22.7	23.0	23.9	23.4	23.4	23.5
12	22.0	21.8	25.0	24.0	22.7	22.6	22.7	26.95	23.9	23.4	23.2	23.5
13	21.95	21.8	24.0	25.0	22.7	22.6	22.8	25.0	23.5	23.4	23.2	23.5
14	21.95	21.8	25.0	25.0	22.65	22.6	22.7	25.0	23.5	23.4	23.2	23.5
15	21.95	21.8	23.0	25.0	22.6	22.6	22.7	24.0	23.5	23.4	23.2	23.5
16	21.95	21.8	23.0	25.0	22.6	22.6	22.7	23.0	23.5	23.4	23.2	23.5
17	21.9	21.8	23.0	25.0	22.6	22.6	22.7	23.0	23.4	23.4	23.2	23.5
18	21.9	21.8	23.0	23.0	22.6	22.6	27.5	22.95	23.4	23.4	23.2	23.5
19	21.9	21.8	23.0	23.0	22.6	22.6	24.0	22.9	23.4	23.4	23.2	23.5
20	21.9	21.8	23.0	23.0	22.6	22.6	24.0	22.9	23.4	23.4	23.2	23.5
21	21.85	21.8	23.0	23.0	22.6	22.6	24.0	22.9	23.4	23.4	23.2	23.5
22	21.85	21.8	23.0	23.0	22.6	22.6	23.0	22.9	23.4	23.4	23.2	23.5
23	21.85	21.8	23.0	23.0	22.6	22.6	23.0	22.9	23.4	23.4	23.2	23.5
24	21.85	21.8	22.95	23.0	22.6	22.6	22.85	24.45	23.4	23.4	23.2	23.5
25	21.8	21.8	22.9	23.0	22.6	22.6	23.85	23.4	23.4	23.4	23.2	23.5
26	21.8	21.8	22.9	22.95	22.6	22.6	35.0	23.45	23.4	23.4	23.2	23.5
27	21.8	21.8	22.9	22.9	22.6	22.6	27.5	24.45	23.4	25.0	23.2	23.5
28	21.8	21.8	23.0	22.9	22.6	23.8	35.0	25.0	23.4	25.0	23.2	23.5
29	21.8	21.8	23.0	22.9	22.6	22.9	25.0	25.0	23.4	23.5	23.2	23.5
30	21.8	.....	23.0	22.8	22.6	22.9	27.5	23.9	23.4	23.45	23.4	23.5
31	21.8	.....	24.0	.....	22.6	.....	25.0	23.9	.....	23.4	.....	23.5

HASSAYAMPA RIVER AT WALNUT GROVE, ARIZ.

Location.—At road crossing opposite Moore's ranch, in sec. 33, T. 11 N., R. 3 W., one-fourth mile below Walnut Grove and about 25 miles above Wickenburg.
Records available.—November 21 to December 31, 1912.
Drainage area.—Not measured.
Gage.—Vertical staff fastened to willow tree on right bank opposite ranch house.
Channel.—Sand and gravel; somewhat shifting.
Discharge measurements.—Made by wading near gage. A car and cable will be installed for use during high water.
Diversions.—Nearly the entire low-water flow is diverted for irrigation above the station.
Accuracy.—Estimates withheld until additional measurements are made.

The following discharge measurement was made by C. C. Jacob:
November 21, 1912: Gage height, 4.81 feet; discharge, 1 second-foot.

Daily gage height, in feet, of Hassayampa River at Walnut Grove, Ariz., for 1912.

[Reid A. French, observer.]

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1		4.8	11		4.8	21	4.8	4.8
2		4.8	12		4.78	22	4.82	4.8
3		5.0	13		4.78	23	4.82	4.8
4		4.9	14		4.8	24	4.8	4.8
5		4.78	15		4.8	25	4.8	4.8
6		4.82	16		4.8	26	4.8	4.8
7		4.8	17		4.8	27	4.8	4.8
8		4.82	18		4.8	28	4.8	4.8
9		4.82	19		4.8	29	4.8	4.8
10		4.8	20		4.8	30	4.8	4.8
						31		4.8

HASSAYAMPA RIVER AT WICKENBURG, ARIZ.

Location.—About one-fourth mile below Wickenburg, in sec. 12, T. 7 N., R. 5 W., and 100 feet below intake of O'Brien canal.
Records available.—November 23, 1910, to December 31, 1911, at Brill's ranch, about 4¼ miles below Wickenburg; January 1 to October 31, 1912, at present station. Station discontinued October 31, 1912.
Drainage area.—Not measured.
Gage.—Inclined staff on right bank, 100 feet below intake of O'Brien canal.
Channel.—Shifting sand.
Discharge measurements.—Made by wading or from car and cable.
Diversions.—O'Brien canal diverts water for irrigation 100 feet above gage. There are additional diversions for irrigation above Walnut Grove.
Accuracy.—Data insufficient for estimates of daily and monthly discharge.

Discharge measurements of Hassayampa River at Wickenburg, Ariz., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 1	C. C. Jacob	4.06	0.8	Sept. 10	C. C. Jacob	(a)	(a)
Apr. 3	do	4.40	1.3	Oct. 23	W. Richins	5.20	1.7
June 25	do	(a)	(a)				

a River dry; all water in O'Brien canal.

Daily gage height, in feet, of Hassayampa River at Wickenburg, Ariz., for 1912.

[W. H. McGinnis and B. P. Walter, observers.]

Day.	Jan.	Mar.	Apr.	July.	Aug.	Oct.	Day.	Jan.	Mar.	Apr.	July.	Aug.	Oct.
1	4.00	.....	.....	.....	.....	.....	16	4.20	.....	5.60	.....	.....	3.10
2	4.05	.....	.....	.....	.....	.....	17	4.15	.....	5.50	5.74	.....	3.10
3	4.00	.....	.....	.....	.....	.....	18	4.10	.....	5.75	.....	.....	3.10
4	4.00	.....	.....	.....	.....	3.50	19	4.10	.....	5.60	4.40	.....	3.10
5	4.00	.....	.....	.....	.....	6.95	20	4.10	.....	5.35	.....	.....	3.10
6	4.00	.....	.....	.....	.....	3.12	21	4.10	.....	5.20	.....	.....	3.20
7	4.00	.....	.....	.....	.....	3.12	22	4.10	4.90	5.00	.....	.....	3.20
8	4.00	.....	.....	.....	.....	3.12	23	4.10	4.60	5.00	.....	.....	3.20
9	4.15	.....	.....	.....	.....	3.12	24	4.10	.....	4.90	.....	.....	3.20
10	4.15	4.90	.....	.....	.....	3.12	25	4.05	.....	4.90	4.71	.....	3.30
11	4.10	4.72	4.70	.....	.....	3.10	26	4.10	.....	.....	5.44	.....	3.40
12	4.15	4.10	5.25	.....	5.81	3.10	27	4.10	4.15	.....	5.37	.....	3.85
13	4.15	.....	5.15	.....	4.61	3.10	28	4.10	4.05	.....	5.40	.....	3.30
14	4.10	4.10	5.55	5.33	5.40	3.10	29	4.00	4.00	.....	4.72	.....	3.20
15	4.15	4.10	5.35	.....	4.10	3.10	30	.....	.....	.....	5.39	.....	3.20
							31	.....	.....	.....	5.78	.....	.....

NOTE.—River dry on days for which gage heights are missing. Gage height July 28, Aug. 14, and Oct. 4 estimated.

Discharge measurements of O'Brien canal at Wickenburg, Ariz., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
June 25	.....	4.69	.8
Sept. 10	.....	3.68	1.0

Daily gage height, in feet, of O'Brien canal at Wickenburg, Ariz., for 1912.

[W. H. McGinnis and B. P. Walter, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	4.2	4.05	4.1	4.55	4.55	4.7	4.62	.....	.....	3.2
2	4.1	4.05	4.05	4.6	4.55	4.7	4.61	.....	.....	3.2
3	4.15	4.0	4.1	4.5	4.55	4.7	4.61	.....	.....	3.2
4	4.15	4.0	4.1	4.65	4.55	4.7	4.62	.....	.....	3.2
5	4.1	4.05	4.15	4.7	4.55	4.7	4.61	.....	.....	3.2
6	4.1	4.05	4.2	4.65	4.55	4.7	4.61	.....	.....	3.2
7	4.1	4.05	4.1	4.6	4.55	4.7	4.62	.....	.....	3.2
8	4.0	4.0	4.1	4.5	4.55	4.7	4.62	.....	.....	3.2
9	.....	4.15	4.25	4.45	4.55	4.7	4.61	.....	.....	3.2
10	.....	4.15	4.35	4.55	4.55	4.7	4.61	.....	3.68	3.2
11	.....	4.1	4.45	4.68	4.55	4.7	4.61	.....	3.68	3.2
12	.....	4.05	4.4	4.85	4.55	4.7	4.60	.....	3.68	3.2
13	.....	4.05	4.35	4.78	4.55	4.7	4.60	.....	3.67	3.2
14	.....	4.0	4.62	4.72	4.55	4.7	4.76	.....	3.67	3.2
15	.....	4.05	4.48	4.65	4.55	4.7	4.70	.....	3.68	.....
16	.....	4.05	4.3	4.82	4.55	4.7	4.71	.....	3.69	.....
17	.....	4.0	4.25	4.58	4.55	4.7	4.71	.....	3.69	.....
18	.....	4.05	4.2	4.65	4.55	4.7	4.90	.....	3.69	.....
19	.....	4.1	4.25	4.62	4.55	4.7	4.80	.....	3.69	.....
20	.....	4.1	4.25	4.62	4.7	4.7	4.84	.....	3.69	.....
21	.....	4.05	4.35	4.45	4.7	4.7	4.72	.....	3.69	.....
22	.....	4.1	4.5	4.60	4.7	4.7	4.74	.....	3.69	.....
23	.....	4.05	4.35	4.48	4.7	4.7	4.75	.....	3.69	.....
24	.....	4.05	4.4	4.80	4.7	.....	4.75	.....	3.66	.....
25	.....	4.05	4.35	4.62	4.7	4.69	4.75	.....	3.61	.....
26	.....	4.1	4.4	4.55	4.7	4.62	.....	.....	3.58	.....
27	.....	4.05	4.6	4.55	4.7	4.62	4.95	.....	3.52	.....
28	.....	4.05	4.35	4.55	4.7	4.62	.....	.....	3.52	.....
29	.....	5.05	4.65	4.55	4.7	4.62	.....	.....	3.52	.....
30	4.0	.....	4.85	4.55	4.7	.....	.....	.....	3.52	.....
31	4.0	.....	4.65	.....	4.7	.....	.....	.....	.....	.....

NOTE.—Ditch dry Jan. 9 to 29. Water in upper canal Mar. 14-15. Ditch dry Apr. 26 to May 19. Hydrographer states that gage height 4.55 is stage of zero flow. No reading June 24 and 29. Ditch broke July 26, July 28 to Sept. 9. Aug. 8 observer noted flow of 4 miner's inches in river.

WHITE WATER RIVER NEAR DOUGLAS, ARIZ.

Location.—At highway bridge, in sec. 20, T. 24 S., R. 27 E., just above El Paso & Southwestern Railroad bridge, three-fourths mile above former station at electric railway bridge and about 1 mile west of Douglas.

Records available.—July 1 to October 6, 1912. During 1911 some records were obtained at the electric railway bridge about three-fourths mile downstream. Estimates were not considered of sufficient accuracy for publication, however.

Drainage area.—Not measured.

Gage.—Vertical staff painted on bridge pier in center of channel.

Channel.—Gravel and silt; fairly permanent except at high stages.

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

Accuracy.—Results are fair for period covered by measurements.

Discharge measurements of White Water River near Douglas, Ariz., in 1912.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Aug. 29	C. C. Jacob	4.96	12	Aug. 31	Smith and Fox	6.12	148
30	Jacob and Smith	7.65	521	Sept. 1	do	5.38	43
30	do	8.43	638	1	do	5.68	71
30	do	8.95	976	2	do	5.09	16
31	Smith and Fox	7.29	482	30	R. M. Fox	7.95	533
31	do	6.24	168				

Daily gage height, in feet, and discharge, in second-feet, of White Water River near Douglas, Ariz., for 1912.

[L. E. King, observer.]

Day.	July.		August.		September.		October.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*	*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*
1	.....	.....	4.95	10	5.5	55	5.75	88
2	.....	.....	4.7	3	5.3	34	5.4	44
3	.....	.....	4.7	3	4.65	2	4.95	10
4	.....	.....	4.6	1	4.5	0	4.75	4
5	.....	.....	4.5	0	.....	.....	4.65	2
6	.....	.....	.....	.....	.....	.....	4.5	0
7	.....	.....	.....	.....	.....	.....	.....	.....
8	.....	.....	.....	.....	.....	.....	.....	.....
9	.....	.....	.....	.....	.....	.....	.....	.....
10	.....	.....	.....	.....	.....	.....	.....	.....
11	.....	.....	.....	.....	.....	.....	.....	.....
12	.....	.....	5.9	110	.....	.....	.....	.....
13	.....	.....	6.75	277	.....	.....	.....	.....
14	.....	.....	6.95	326	.....	.....	.....	.....
15	.....	.....	5.7	81	.....	.....	.....	.....
16	.....	.....	5.25	30	.....	.....	.....	.....
17	.....	.....	5.15	22	.....	.....	.....	.....
18	.....	.....	4.65	2	.....	.....	.....	.....
19	.....	.....	5.15	22	.....	.....	.....	.....
20	.....	.....	5.1	18	.....	.....	.....	.....
21	6.5	220	4.6	1	.....	.....	.....	.....
22	4.95	10	4.5	0	.....	.....	.....	.....
23	5.15	22	.....	0	.....	.....	.....	.....
24	6.3	179	5.35	39	.....	.....	.....	.....
25	6.15	151	4.65	2	.....	.....	.....	.....
26	5.15	22	6.1	142	.....	.....	.....	.....
27	5.1	18	6.1	142	.....	.....	.....	.....
28	4.95	10	6.05	134	.....	.....	.....	.....
29	4.95	10	4.9	8	.....	.....	.....	.....
30	5.0	12	8.5	810	7.4	446	.....	.....
31	5.35	39	6.8	289	.....	.....	.....	.....

NOTE.—Stream was dry July 1 to 20, Aug. 5 to 11, 22 to 23, Sept. 4 to 29, and Oct. 6. No records obtained after Oct. 6. Mean gage heights for Aug. 30, 31, and Sept. 30 were determined from graphs based on several additional readings. Maximum observed height Aug. 30 was 9.3 feet at 6.30 a. m.; same for Sept. 30 was 11.5 feet at 6.30 a. m.

Daily discharges computed from a rating curve which is well defined between 120 and 1,400 second-feet, and fairly well defined between 8 and 120 second-feet. Maximum discharge Aug. 30, 1,120 second-feet; Sept. 30, 2,060 second-feet.

Monthly discharge of White Water River near Douglas, Ariz., for 1912.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
July	220	0	22.4	1,380
August	810	0	79.7	4,900
September	446	0	17.9	1,070

MISCELLANEOUS MEASUREMENTS.

The following table gives the results of discharge measurements made in the Colorado River basin at points other than regular gaging stations in 1912:

Miscellaneous measurements in Colorado River drainage basin in 1912.

Streams.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
July 19	Price River	Green River	Near Colton, Utah, at highway bridge just below confluence of White River and Fish Creek.	[a] 1.50	149
Aug. 13	do	do	do	[a] 1.96	82
16	do	do	do	[a] 2.00	71
Sept. 3	do	do	do	[a] 2.41	34.6
4	do	do	do	[a] 2.38	36.8
July 22	do	do	Above Willow Creek, Castlegate, Utah.	[b] .1	121
Aug. 1	do	do	do	[b] .08	135
Sept. 7	do	do	do	[b] .62	43
July 23	do	do	Halfway, above Helper, Utah	[c] 1.17	115
10	do	do	do	[c] 1.36	97.5
Sept. 7	do	do	do	[c] 2.91	41.4
July 7	Fish Creek (West Fork of Price River).	Price River	Above Gooseberry Fork		17
Aug. 8	do	do	Above Scofield Valley		71.5
July 8	do	do	¼ mile above mouth of canyon		61.4
6	Gooseberry Creek	Fish Creek (West Fork of Price River).	Above reservoir		14.6
6	East side tributaries to Mammoth reservoir.				2.6
6	West side tributaries to Mammoth reservoir.				3.2
6	Cabinhollow Creek	Gooseberry Creek.	Outlet to Mammoth dam, Utah.		1.5
6	Gooseberry Creek	Fish Creek (West Fork of Price River).	Outlet of Mammoth dam, Utah.	2.9	29.1
15 (7.40 a. m.)	do	do	do	[d] 3.1	69.2
15 (11 a. m.)	do	do	do		93.0
15	do	do	do	[d] 3.1	67.1
Aug. 9	do	do	do	[d] 3.35	54.4
25	do	do	do	[d] 4.14	7.3
Sept. 27	Inflow Mammoth reservoir.	Gooseberry Creek.			5.5
July 7	Silver Creek	do	300 feet above mouth		4.7
9	White River	Price River	Colton, Utah	1.52	16.4
19	do	do	do	[e] .10	14.5

[a] Distance from water surface to reference point—a nail on cribbing of highway bridge just below confluence of White River and Fish Creek (West Fork of Price River).
[b] Distance from water surface to reference point—a nail in tree on left bank above footbridge.
[c] Distance from water surface to reference point—mark on rock about 30 feet below measuring section.
[d] Distance water surface to top of steel bar driven in stream bed just above bridge on right bank.
[e] Distance water surface to reference point.

Miscellaneous measurements in Colorado River drainage basin in 1912—Continued.

Streams—Continued.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
Sept. 14	San Juan River	Colorado River	Shiprock, N. Mex.		918
Oct. 26	Little Colorado River	do	Wading 100 feet above highway bridge at Greer, Ariz.		a 7.4
Aug. 16	East Fork of Gila River	Gila River	Just above confluence with West Fork of Gila River.		54.1
Sept. 9	do	do	do		42.2
Oct. 9	do	do	do		33.0
Nov. 8	do	do	do		31.0
Aug. 16	West Fork of Gila River	do	Just above confluence with East Fork of Gila River.		37.8
Sept. 9	do	do	do		38.5
Oct. 9	do	do	do		28.9
Nov. 8	do	do	do		28.4
June 19	Sapello Creek	do	Crossing of road from Silver City, N. Mex., to XSX ranch.		3.7
Mar. 19	Babocomari Creek	San Pedro River.	Fairbank, Ariz.		2.5
Oct. 24	North Fork of White River.	White River	Wading 40 feet above point where trail reaches river, about 8 miles below Cooley's ranch, 1 mile below sawmill, near Whiteriver, Ariz.		39
23	do	do	Wading just above mouth of East Fork of White River at Fort Apache, Ariz.		52
Feb. 16	Verde River	Gila River	Wading at former United States Reclamation Service gaging station at McDowell, Ariz.	8.02	269
Dec. 4	Clear Creek	Verde River	Wading just above road crossing, ¼ mile above mouth near Camp Verde, Ariz.		9.7
Nov. 21	Hassayampa River	Gila River	Wading near Wagoner, Ariz.		3.0

a Includes 0.3 second-foot estimated discharge of irrigation.

NOTE.—The measurements in the Price River basin were made by John W. Lewis, hydrographer for the Price River Irrigation Co.

Price River Irrigation Co.'s canal.

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
July 1		78.7	July 23	a 1.65	87.3
10	2.5	44.1	Aug. 6	a 2.90	33.2
13		68.8	6	a 2.60	54.1

a Distance water surface to reference point.

Ditches diverting from Price River Irrigation Co.'s canal in 1912.

Date.	Ditch.	Discharge.	Date.	Ditch.	Discharge.
July 3	Austin	4.5	Aug. 6	Rice & Burrows	1.18
3	Johnson	.86	6	Hills	4.4
3	Brown	6.33	6	Reives	.7
3	Johnson	3.15	6	Bishop Bryners	2.3
3	Austin	16.6	6	J. Y. Smith	.98
26	Morrison	1.6	6	Shays	1.3
26	Kirken	.5	14	Price Valley Fruit Farm	1.68
Aug. 6	Price Valley Fruit Farm	1.68	14	Rice & Burrows	1.6

Canals diverting from Price River in vicinity of Price and Helper.

Date.	Canal.	Discharge.	Date.	Canal.	Discharge.
July 1	Price	34.5	Aug. 6	Pioneer No. 1	10.3
13	do	41.3			

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