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

WATER-SUPPLY PAPER 309

SURFACE WATER SUPPLY OF THE UNITED STATES

1911

PART IX. COLORADO RIVER BASIN

PREPARED UNDER THE DIRECTION OF M. O. LEIGHTON

BY

ROBERT FOLLANSBEE, W. B. FREEMAN
AND G. CLYDE BALDWIN

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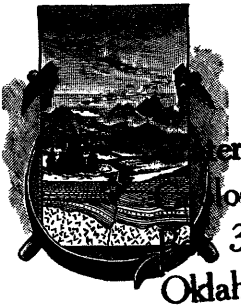

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SURFACE WATER SUPPLY OF THE COLORADO RIVER BASIN, 1911.

By ROBERT FOLLANSBEE, W. B. FREEMAN, and G. CLYDE BALDWIN.

AUTHORITY FOR INVESTIGATIONS.

This volume is Part IX of a series of 12 reports presenting results of measurements of flow made on certain streams in the United States during the calendar year 1911. The reports are listed below.

Papers on surface water supply of the United States, 1911.

Part.[a]	No.	Title.	Part.[a]	No.	Title.
I	301	North Atlantic coast.	VI	306	Missouri River basin.
II	302	South Atlantic coast and eastern Gulf of Mexico.	VII	307	Lower Mississippi River basin.
			VIII	308	Western Gulf of Mexico.
III	303	Ohio River basin.	IX	309	Colorado River basin.
IV	304	St. Lawrence River basin.	X	310	Great Basin.
V	305	Upper Mississippi River and Hudson Bay basins.	XI	311	Pacific coast in California.
			XII	312	North Pacific coast.

[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.

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 various private and State organizations have cooperated. Acknowledgments for such cooperation are made on page 15, and also in connection with the description of each station affected by the cooperative work.

PUBLICATIONS.

Measurements of stream flow have been made at more than 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 1911 gaging stations were maintained by the Survey and the cooperating organizations at about 1,500 points in the United States, 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 surface water-supply papers from time to time. A complete list of the gaging stations maintained by the Survey to and including 1910 and a list of the papers relating to the water supply of the country has been published by the Survey as Water-Supply Paper 280. An index to the reports containing stream-flow measurements prior to 1904 has been published as Water-Supply Paper 119.

For each calendar year there has been prepared a report embodying the stream-flow data collected during that year, which has been published either as a part of the annual report of the Director, as a bulletin, or as a water-supply paper, as shown by 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.

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

Report.	Character of data.	Year.
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.

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

The table which follows gives, by years and drainage basins, the numbers of the papers on surface-water supply published from 1899 to 1911. 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 Machias River at Whitneyville, Me., 1903 to 1911, are published in Water-Supply Papers 97, 124, 165, 201, 241, 261, 281, and 301, which contain records for the New England streams from 1903 to 1911.

Numbers of water-supply papers containing results of stream measurements, 1899–1911.

	1899 [a]	1900 [b]	1901	1902	1903	1904
North Atlantic coast (St. John River to York River)	35	47, [c] 48	65, 75	82	97	[d] 124, [e] 125, [f] 126
South Atlantic coast and eastern Gulf of Mexico (James River to the Mississippi)	[g] 35, 36	48	65, 75	[g] 72, 83	[g] 97, 98	[f] 126, 127
Ohio River basin	36	48, [h] 49	65, 75	83	98	128
St. Lawrence River and Great Lakes	36	49	65, 75	[i] 82, 83	97	129
Hudson Bay and upper Mississippi River	36	49	[j] 65, 66, 75	[j] 83, 85	[j] 98, 99, 100	[j] 128, 130
Missouri River	[k] 36, 37	49, [l] 50	66, 75	84	99	130, [m] 131
Lower Mississippi River	37	50	[j] 65, 66, 75	[j] 83, 84	[j] 98, 99	[j] 128, 131
Western Gulf of Mexico	37	50	66, 75	84	99	132
Colorado River	[n] 37, 38	50	66, 75	85	100	133
Great Basin	38, [o] 39	51	66, 75	85	100	133, [p] 134
Pacific coast in California	38, [q] 39	51	66, 75	85	100	134
North Pacific coast	38	51	66, 75	85	100	135

[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] Wissachickon 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] Mohave River only.
[p] Great Basin in California, excepting Truckee and Carson drainage basins.
[q] Kings and Kern rivers and south Pacific coast drainage basins.

Numbers of water-supply papers containing results of stream measurements, 1899–1911—Continued.

	1905	1906	1907–8	1909	1910	1911
North Atlantic coast (St. John River to York River)	[a]165, [a]166, [b]167	[c]201, [b]202, [c]203	241	261	281	301
South Atlantic coast and eastern Gulf of Mexico (James River to the Mississippi)	[c]167, 168	[c]203, 204	242	282	282	302
Ohio River Basin	169	205	243	263	283	303
St. Lawrence River and Great Lakes	170	206	244	264	284	304
Hudson Bay and upper Mississippi River	171	207	245	265	285	305
Missouri River	172	208	246	266	286	306
Lower Mississippi River	[d]169, 173	[d]205, 209	247	267	287	307
Western Gulf of Mexico	174	210	248	268	288	308
Colorado River	175, [e]177	211	249	269	289	309
Great Basin	176, [f]177	212, [f]213	250, [f]251	270, [f]271	290	310
Pacific coast in California	177	213	251	271	291	311
North Pacific coast	[g]177, 178	214	252	272	292	312

[a] New England rivers only.
[b] Hudson River to Delaware River, inclusive.
[c] Susquehanna River to Yadkin River, inclusive.
[d] Tributaries of Mississippi from east.
[e] Below junction with Gila.
[f] Great Basin in California, excepting Truckee and Carson drainage basin.
[g] Rogue, Umpqua, and Siletz rivers only.

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 depth 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.

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

NOTE.—For 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.

Discharge (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	357.0	368.9
7	13.88	388.8	402.6	416.5	430.4
8	15.87	444.3	460.2	476.0	491.9
9	17.85	499.8	517.7	535.5	553.4

NOTE.—For 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-feet.
100 United States gallons per minute for one day equals 0.442 acre-foot.
1,000,000 United States gallons per day equals 1.55 second-feet.
1,000,000 United States gallons equals 3.07 acre-feet.
1,000,000 cubic feet equals 22.95 acre-feet.
1 acre-foot equals 325,850 gallons.
1 inch deep on 1 square mile equals 2,323,200 cubic feet.
1 inch deep on 1 square mile equals 0.0737 second-foot per year.
1 foot equals 0.3048 meter.
1 mile equals 1.60935 kilometers.
1 mile equals 5,280 feet.
1 acre equals 0.4047 hectare.
1 acre equals 43,560 square feet.
1 acre equals 209 feet square, nearly.
1 square mile equals 2.59 square kilometers.
1 cubic foot equals 0.0283 cubic meter.
1 cubic foot of water weighs 62.5 pounds.
1 cubic meter per minute equals 0.5886 second-foot.
1 horsepower equals 550 foot-pounds per second.
1 horsepower equals 76.0 kilogram-meters per second.
1 horsepower equals 746 watts.
1 horsepower equals 1 second-foot falling 8.80 feet.
1½ horsepower equals about 1 kilowatt.

To calculate water power quickly: $\frac{\text{Sec.-ft.} \times \text{fall in feet}}{11}$ = 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, so far as available, 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

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MAP OF UNITED STATES, SHOWING MEAN ANNUAL PRECIPITATION

Blue lines and figures indicate average annual precipitation in depth in inches

Prepared by Henry Gannett
mainly from data of the
United States Geological Survey
and United States Weather Bureau

MAP OF UNITED STATES, SHOWING MEAN ANNUAL RUN-OFF

Blue lines and figures indicate average annual run-off in depth in inches

Prepared by Henry Gannett
mainly from data of the
United States Geological Survey

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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, as follows:

First plot the discharge measurements for the current and earlier years on cross-section paper, with gage heights in feet as ordinates and discharge in second-feet as abscissas. Then tabulate a number of gage heights taken from the daily gage-height table for the complete range of stage given and the corresponding discharges for the days selected from the daily discharge table and plot the values on cross-section paper. The last points plotted will define the rating curve used and will lie among the plotted discharge measurements. After drawing the rating curve, a table can be developed by scaling off the discharge in second-feet for each tenth foot of gage height. These values should be so adjusted that the first differences shall always be increasing or constant, except for known backwater periods.

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 at "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 10, are based.

The field methods used in the collection of the data presented in this series of reports are described in the introductory sections of Water-Supply Papers 261 to 272, inclusive, "Surface water supply of the United States, 1909." Plates I and II show the average precipitation and run-off in the United States as determined from the

measurements of stream flow made by the Geological Survey and records of rainfall collected by the Weather Bureau; Plate III shows typical gaging stations, indicating the method of suspending the current meter; Plate IV shows current meters [1] used in the work.

ACCURACY AND RELIABILITY OF FIELD DATA AND COMPARATIVE RESULTS.

The accuracy of steam-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.

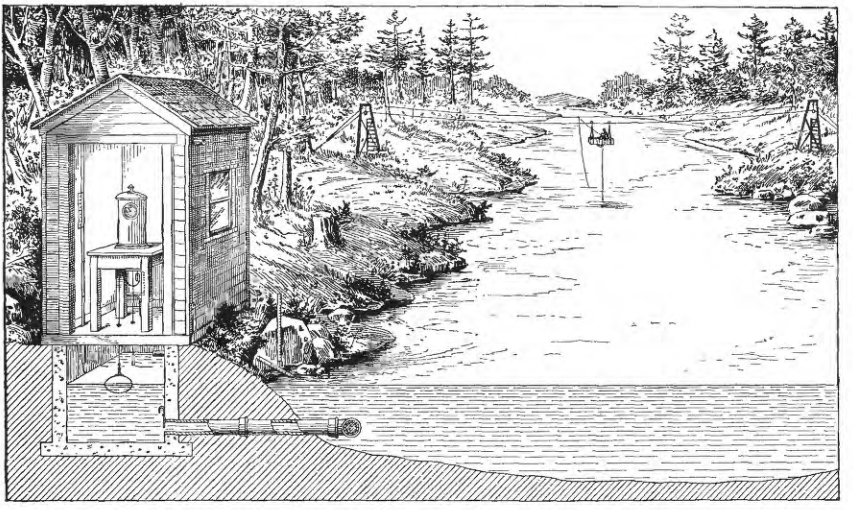
In order to give engineers and others information regarding the probable accuracy of the computed results, footnotes are added to the daily discharge tables, stating the probable accuracy of the rating tables used, and an accuracy column is inserted in the monthly discharge table. For the rating tables "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.

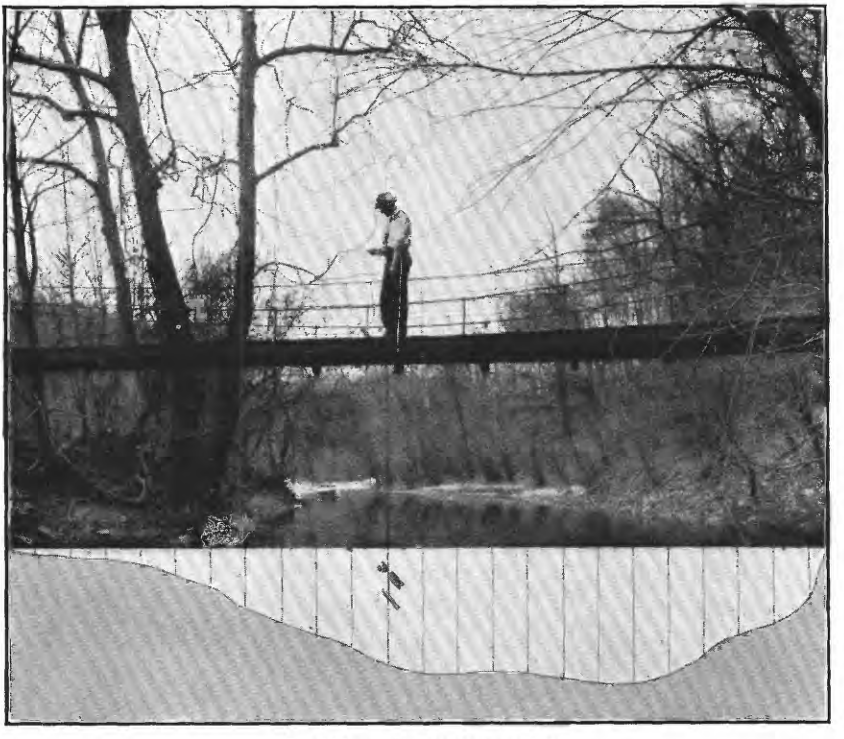
Even though the monthly means for any station may represent with a high degree of accuracy the quantity of water flowing past the gage, the figures showing discharge per square mile and depth of runoff in inches may be subject to gross errors which result from including in the measured drainage area 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

[1] See Hoyt, J. C., and others; Use and care of current meter as practiced by the United States Geological Survey: Trans. Am. Soc. Civil Eng., vol. 66, 1910, p. 70.

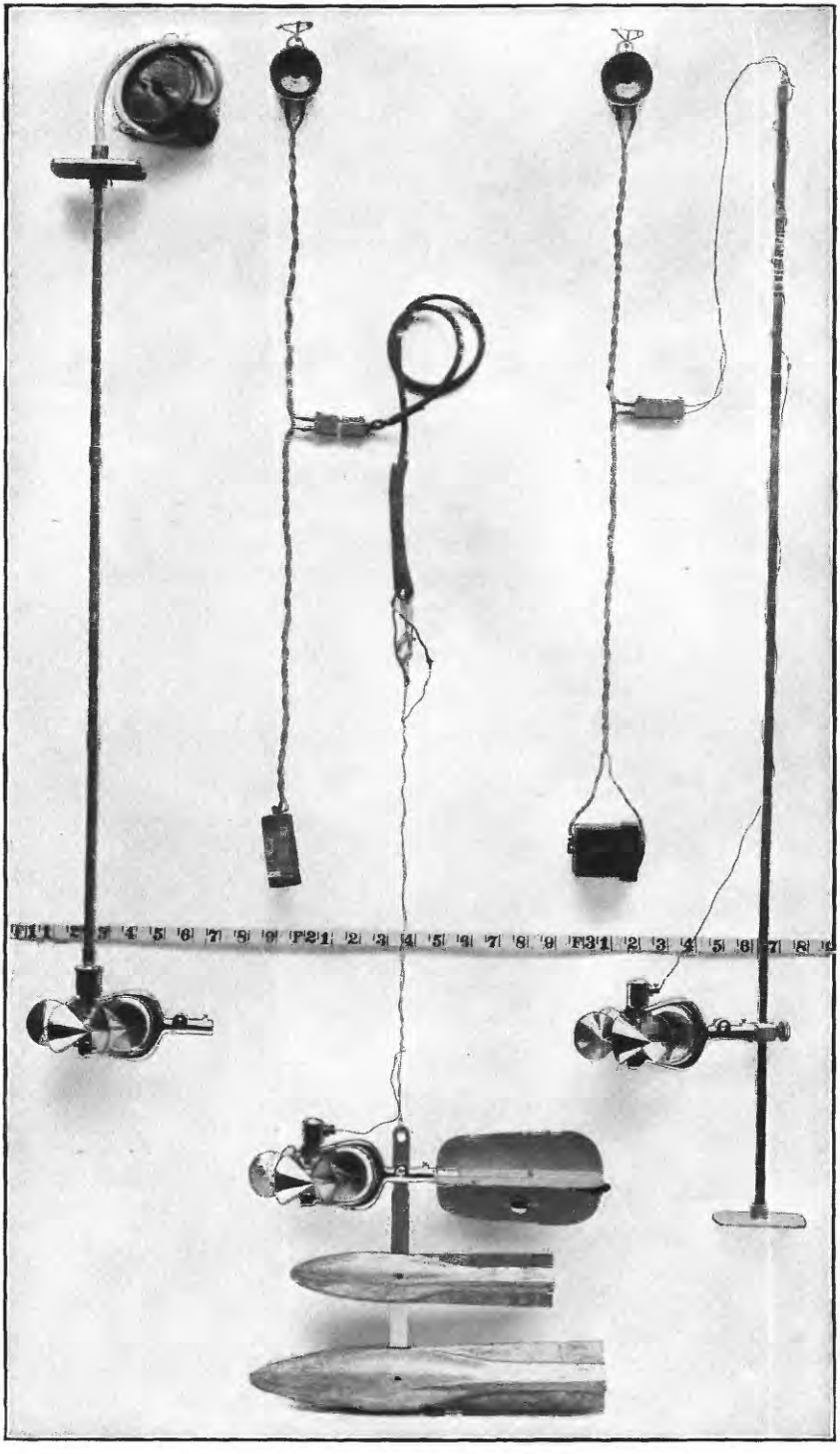


A. CABLE STATION WITH AUTOMATIC GAGE.



B. FOR BRIDGE MEASUREMENT.

TYPICAL GAGING STATIONS.



SMALL PRICE CURRENT METERS.

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.

The stream gaging work in Colorado, Wyoming, Utah, and New Mexico was conducted in cooperation with National bureaus and State organizations and was assisted by many private parties.

The United States Forest Service provided a hydrographer for measuring the streams on the national forests and also furnished records of gage heights.

The United States Reclamation Service furnished the field data for a number of stations in the Grand River basin.

The United States Weather Bureau furnished the gage heights for Grand River near Fruita.

The State engineer of Colorado, Mr. C. W. Comstock, cooperated in the maintenance of a number of stations on Grand River and furnished the complete records for many other stations, mostly those in the Yampa, White, and San Juan basins.

The territorial engineer of New Mexico, Mr. C. D. Miller, paid the field expenses incurred at the stations in San Juan basin, and was instrumental in obtaining cooperation with a number of private parties.

The State engineer of Utah, Mr. Caleb Tanner, cooperated in maintaining stations in that State.

Special acknowledgments are due Mr. Horace W. Sheley, consulting engineer, for assistance in stream-gaging work in Utah; the Denver Reservoir Irrigation Co. for records on Fraser River near Fraser, Colo., the San Juan Power & Light Co., for records of flow of San Juan River; the Colorado Yule Marble Co., for the field data for Crystal River at Marble, Colo.; the Central Colorado Power Co., for automatic gage on Grand River at Glenwood Springs and the gage records during the first half of the year; the Eden Irrigation Co., for field data for the Big Sandy River at Poston's ranch, near Big Sandy, Wyo.

The Socorro Mines Co. furnished records of flow of Whitewater Creek near Mogollon, N. Mex.

DIVISION OF WORK.

Field data for the Grand River drainage basin were collected under the direction of W. B. Freeman, district engineer, by J. B. Stewart, E. O. Christiansen, G. H. Russell, junior engineers, and H. B. Waha and O. M. Wimmer, Forest Service hydrographers.

Field data for the San Juan and Gila river basins in New Mexico were collected by G. H. Russell, under the direction of W. B. Freeman, district engineer, and C. D. Miller, Territorial engineer.

Field data for all stations in Arizona have been collected under the direction of W. B. Clapp and H. D. McGlashan, by C. C. Jacob.

Field data in the Colorado basin in Utah were collected under the direction of E. C. La Rue and G. C. Baldwin, by J. C. Dort, G. H. Canfield, and Leonard Tanner. Rating curves and many of the estimates were made under the direction of Robert Follansbee and E. A. Porter, by G. A. Gray, Raymond Richards, and C.W. Bennett.

The completed data were prepared for publication by H. D. Padgett. The report has been edited by Mrs. B. D. Wood.

GREEN RIVER AND THE MAIN COLORADO.

GREEN RIVER NEAR KENDALL, WYO.

Location.—At Kendall forest 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. Nearest tributary, Gypsum Creek, enters a short distance below the station.

Records available.—August 3, 1910, to November 6, 1911.

Drainage area.—Not measured.

Gage.—Chain gage. Datum was raised 2.52 feet September 24, 1910, 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 below the station.

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

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

Discharge measurements of Green River near Kendall, Wyo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 23	Wimmer and Belknap	3.45	470	June 27	G. E. Belknap	4.60	1,510
24	do	3.60	563	Aug. 1	do	3.60	664
25	do	3.75	698	Sept. 17	Belknap and Hill	3.00	236

Daily gage height, in feet, and discharge, in second-feet, of Green River near Kendall, Wyo., for 1910.

[Albert Hill, observer.]

Day.	August.		September.		October.		Day.	August.		September.		October.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.		Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1							16						
2	3.75	700			2.85	135	17						
3			3.1	260	2.8	110	18	3.3	380				
4					2.8	110	19					2.75	85
5							20	3.5	510			2.8	110
6			3.0	210	2.8	110	21	3.5	510				
7			2.9	160	2.8	110	22			3.05	235	2.7	60
8					2.8	110	23	3.4	440			2.8	110
9	3.5	510	2.85	135	2.8	110	24			3.0	210		
10	3.4	440			2.8	110	25					2.8	110
11	3.4	440			2.8	110	26					2.8	110
12	3.5	510			2.75	85	27						
13	3.5	510			2.8	110	28						
14	3.5	510			2.75	85	29			2.85	135		
15							30						
							31						

Daily gage height, in feet, of Green River near Kendall, Wyo., for 1911.

[Albert Hill, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1			4.0	4.6		3.1	3.0	
2			4.2	4.5		3.1		2.8
3						3.2	3.0	2.8
4						3.2	3.0	2.8
5			4.35			3.2	3.0	2.8
6			4.4			3.2	2.9	2.8
7		3.2	4.5	4.7	3.35	3.2	2.9	
8		3.35	4.7	4.8	3.3	3.1	2.9	
9		3.4			3.3	3.1	3.0	
10		3.3	4.5	4.3	3.3	3.0		
11		3.3	4.5	4.3	3.4			
12		3.3	4.8		3.4		3.0	
13		3.55	5.0		3.4		3.0	
14		3.5	5.2		3.4		3.0	
15		3.5	5.4		3.4	3.1		
16		3.5	5.6	4.4		3.1		
17		3.45	5.8	4.4		3.1		
18		3.4	5.9	4.4		3.0		
19		3.45	5.9	4.4		2.9		
20		3.3	5.8					
21		3.3				2.9		
22		3.3	5.7		3.35	2.9		
23		3.45	5.6		3.3	2.9		
24		3.6	5.4		3.25	2.9		
25		3.75	5.2		3.2			
26	2.85		4.8		3.1	2.9		
27	2.9		4.6	4.2	3.1			
28	2.9	3.5	4.6	3.9	3.1	2.9		
29	2.85	3.5	4.7	3.7	3.1	2.9		
30		3.5	4.6	3.7	3.1	2.95		
31		3.8		3.7				

Daily discharge, in second-feet, of Green River near Kendall, Wyo., for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1			900	1,460		260	210	
2			1,080	1,360		260		110
3						320	210	110
4						320	210	110
5			1,220			320	210	110
6			1,260			320	160	110
7		320	1,360	1,560	410	320	160	
8		410	1,560	1,660	380	260	160	
9		440			380	260	210	
10		380	1,360	1,170	380	210		
11		380	1,360	1,170	440			
12		380	1,660		440		210	
13		545	1,880		440		210	
14		510	2,110		440		210	
15		510	2,350		440	260		
16		510	2,600	1,260		260		
17		475	2,870	1,260		260		
18		440	3,010	1,260		210		
19		475	3,010	1,260		160		
20		380	2,870					
21		380				160		
22		380	2,730		410	160		
23		475	2,600		380	160		
24		580	2,350		350	160		
25		700	2,110		320			
26	135		1,660		260	160		
27	160		1,460	1,080	260			
28	160	510	1,460	820	260	160		
29	135	510	1,560	660	260	160		
30		510	1,460	660	260	185		
31		740		660				

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

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, 1911.

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.

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

Diversions.—None.

Accuracy.—Estimates may be considered excellent for the range of stage for which gage heights are available.

Cooperation.—Maintained in cooperation with the State of Utah.

The following discharge measurement was made by E. C. La Rue:
October 13, 1911: Gage height, 3.45 feet; discharge, 968 second-feet.

Daily gage height, in feet, and discharge, in second-feet, of Green River near Bridgeport, Utah, for 1911.

[Carl E. Johnson, observer.]

Day.	October.		November.		December.	Day.	October.		November.		December.
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.		Gage height.	Discharge.	Gage height.	Discharge.	Gage height.
1			3.25	845	3.0	16	3.4	950	3.2	810	3.0
2			3.25	845	3.0	17	3.4	950	3.2	810	3.0
3			3.2	810	3.0	18	3.4	950	3.25	845	3.0
4			3.2	810	3.0	19	3.4	950	3.25	845	3.0
5			3.2	810	3.0	20	3.35	915	3.3	880	3.0
6			3.2	810	3.0	21	3.3	880	3.4	950	3.0
7			3.2	810	3.0	22	3.3	880	3.4	950	3.0
8			3.2	810	3.0	23	3.3	880	3.4	950	3.0
9			3.2	810	3.0	24	3.3	880	3.3	950	3.0
10			3.2	810	3.0	25	3.3	880	3.3	880	3.0
11			3.2	810	3.0	26	3.3	880	3.25	845	3.0
12	3.5	1,020	3.2	810	3.0	27	3.3	880	3.2	810	3.0
13	3.45	985	3.2	810	3.0	28	3.3	880	3.0		3.0
14	3.4	950	3.2	810	3.0	29	3.3	880	3.0		3.0
15	3.4	950	3.2	810	3.0	30	3.3	880	3.0		3.0
						31	3.3	880			3.0

NOTE.—Relation of gage height to discharge probably affected by ice Nov. 28 to Dec. 31. Daily discharge determined from a rating curve well defined for all stages.

Monthly discharge of Green River near Bridgeport, Utah, for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October 12-31	1,020	880	[a] 915	36,300	A.
November	950		822	48,900	B.
December			[b] 580	35,700	C.

[a] Discharge Nov. 28-30 estimated at 640 second-feet. [b] Estimated.

GREEN RIVER NEAR ELGIN,[1] UTAH.

Location.—At the highway bridge 200 feet upstream from the Denver & Rio Grande Railroad bridge at Green River railroad station near Elgin, Utah, in sec. 15, T. 21 S., R. 16 E., Salt Lake base and meridian.

Records available.—October 21, 1894, to October 15, 1899; February, 1905, to December 31, 1911.

Drainage area.—38,200 square miles.

Gage.—Chain gage attached to bridge.

Channel.—Somewhat shifting; divided by the highway bridge into three sections, each 168 feet wide.

Discharge measurements.—Formerly made from the railroad bridge and from a near-by ferry; now they may be made from the highway bridge, where measuring conditions are very favorable.

Winter flow.—Ice usually exists at the station during December, January, and February, and affects the relation of gage height to discharge.

Diversions.—The gaging station is located below all important diversions.

Accuracy.—Fair only, owing to shifting character of stream bed.

Cooperation.—Maintained in cooperation with the State of Utah.

[1] Described in the earlier reports as near "Blake." The name of the post office was later changed to Elgin.

Discharge measurements of Green River near Elgin, Utah, in 1910 and 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Dec. 3	G. H. Canfield.....	5.52	2,280	July 20	J. C. Dort.....	6.93	6,280
				Sept. 16	.....do.....	4.79	1,753
1911.				Oct. 20	.....do.....	5.65	2,940
Mar. 31	G. H. Canfield.....	7.32	5,730				

NOTE.—Considerable angle of current was noted Sept. 16 and Oct. 20, and previous measurements have been reduced accordingly.

The following computations of discharge made in the office for periods from April 1 to December 20, 1911, have been used in connection with the current-meter measurements in constructing the rating curve.

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Apr. 1-7.....	7.15	5,260	Oct. 1-9.....	6.88	5,610
May 1-7.....	8.46	9,210	Nov. 1-6.....	5.40	2,580
June 1-7.....	9.56	13,770	7-11.....	5.30	2,280
Sept. 17-26.....	4.63	1,500	Dec. 10-20.....	4.80	1,640

NOTE.—The measurements recorded for Apr. 1-7, May 1-7, June 1-7, Sept. 17-26, Oct. 1-9, Nov. 1-6, 7-11, and Dec. 10-20 were computed from a study of records at Elgin and the Little Valley stations. The gage heights given are the means of the gage heights for the periods at Elgin station, and the discharges are the means of the computed discharges at the Little Valley station for the same periods, except that the means of the computed discharge for the periods Sept. 18-26 and Nov. 8-12 were used in obtaining mean discharges for the gage-height periods at Elgin.

Daily gage height, in feet, of Green River at Elgin, Utah, for 1911.

[L. H. Greene, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	5.0	6.85	4.6	7.2	8.05	9.0	9.5	6.2	4.9	6.45	5.4	5.0
2.....	5.0	7.25	4.8	7.05	8.5	9.35	9.05	6.2	4.9	6.55	5.4	5.0
3.....	5.0	8.25	5.35	6.95	8.7	9.5	8.9	6.15	4.8	6.8	5.4	4.95
4.....	5.0	8.3	5.5	6.9	8.7	9.5	8.7	6.1	4.85	6.95	5.4	4.85
5.....	5.0	8.0	5.75	7.05	8.65	9.6	8.55	5.0	4.9	6.85	5.4	4.8
6.....	5.0	7.55	5.9	7.35	8.35	9.95	8.45	5.9	5.0	7.05	5.4	4.75
7.....	5.0	6.95	6.0	7.55	8.3	10.0	8.35	5.8	5.0	7.2	5.3	4.6
8.....	5.15	6.75	6.2	7.85	8.4	10.0	8.25	5.75	4.9	7.15	5.3	4.7
9.....	5.25	6.6	7.1	7.95	8.65	10.25	8.1	5.65	4.85	7.0	5.3	4.7
10.....	5.35	6.3	7.1	7.9	8.95	10.3	8.0	5.55	4.7	6.85	5.3	4.8
11.....	6.2	6.0	8.5	7.75	9.7	10.45	7.95	5.5	4.7	6.7	5.3	4.8
12.....	6.55	5.85	9.3	7.55	9.7	10.6	7.9	5.5	4.6	6.55	5.2	4.8
13.....	6.7	5.75	9.5	7.4	10.05	10.6	7.75	5.4	4.6	6.3	5.2	4.8
14.....	6.8	5.7	9.2	7.2	9.95	10.6	7.7	5.4	4.6	6.2	5.1	4.8
15.....	6.35	5.65	8.75	7.2	9.65	10.55	7.65	5.4	4.7	6.05	5.1	4.8
16.....	5.9	5.6	8.15	7.2	9.45	10.5	7.45	5.3	4.8	6.0	5.05	4.8
17.....	5.8	5.55	7.75	7.05	9.35	10.5	7.4	5.3	4.7	6.0	5.0	4.8
18.....	5.85	5.5	7.6	7.0	9.3	10.5	7.3	5.2	4.7	5.9	5.0	4.8
19.....	6.05	5.4	7.5	6.8	9.3	10.95	7.15	5.2	4.7	5.8	5.0	4.8
20.....	6.2	5.3	7.5	6.8	9.65	11.3	6.95	5.15	4.6	5.8	5.0	4.8
21.....	6.2	5.2	7.5	6.6	9.6	11.4	6.85	5.1	4.6	5.7	5.15	4.8
22.....	6.1	5.15	7.5	6.6	9 6	11.3	6.8	5.1	4.6	5.5	5.25	4.8
23.....	6.0	5.1	7.5	6.6	9.5	11.3	6.7	5.25	4.6	5.45	5.6	4.8
24.....	5.85	5.0	7.85	6.6	9.15	11.15	6.75	5.3	4.6	5.4	5.65	4.7
25.....	5.7	5.0	7.95	6.8	8.7	11.1	6.7	5.2	4.6	5.4	5.6	4.7
26.....	5.5	4.85	8.0	6.9	8.7	10.85	6.7	5.2	4.6	5.3	5.35	4.6
27.....	5.5	4.8	7.9	7.35	8.7	10.75	6.6	5.1	5.45	5.3	5.15	4.6
28.....	5.5	4.8	7.8	7.55	8.8	10.6	6.6	5.1	6.15	5.3	5.0	4.6
29.....	6.15	.....	7.65	7.75	8.95	10.1	6.5	5.0	6.1	5.4	4.8	4.5
30.....	6.75	.....	7.5	7.85	9.05	9.85	6.45	5.0	6.65	5.4	4.95	4.5
31.....	6.6	.....	7.5	.....	9.1	.....	6.4	5.0	.....	5.4	.....	4.5

NOTE.—River reported frozen at the gage Jan. 1-16.

Daily discharge, in second-feet, of Green River at Elgin, Utah, for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	4,600	1,500	5,390	7,770	11,320	16,400	4,480	2,040	3,950	2,570	1,910
2	.....	5,510	1,630	5,045	9,380	12,820	14,240	4,460	2,030	4,180	2,570	1,910
3	.....	8,460	2,100	4,820	10,140	13,500	13,520	4,350	1,940	4,740	2,570	1,850
4	.....	8,640	2,260	4,710	10,140	13,500	12,610	4,230	1,970	5,160	2,570	1,780
5	.....	7,600	2,580	5,045	9,950	13,960	11,950	4,010	2,010	5,000	2,570	1,730
6	.....	6,280	2,790	5,760	8,820	15,630	10,515	3,790	2,100	5,630	2,570	1,700
7	.....	4,820	2,940	6,280	8,640	15,880	11,085	3,590	2,090	6,110	2,430	1,590
8	.....	4,380	3,290	7,130	9,000	15,880	10,660	3,480	1,980	6,120	2,420	1,640
9	.....	4,050	5,160	7,440	9,950	17,160	10,050	3,270	1,910	5,890	2,360	1,640
10	.....	3,470	5,160	7,280	11,120	17,420	9,670	3,070	1,760	5,450	2,320	1,720
11	.....	2,940	9,380	6,835	14,420	18,230	9,490	2,990	1,750	5,050	2,280	1,700
12	.....	2,720	12,600	6,280	14,420	19,050	9,310	2,950	1,680	4,770	2,160	1,690
13	.....	2,580	13,500	5,890	16,130	19,050	8,790	2,790	1,670	4,050	2,160	1,680
14	.....	2,510	12,160	5,390	15,630	19,050	8,620	2,780	1,640	3,840	2,060	1,670
15	.....	2,445	10,330	5,390	14,190	18,775	8,455	2,750	1,700	3,520	2,050	1,660
16	.....	2,380	8,110	5,390	13,270	18,500	7,810	2,600	1,750	3,440	2,000	1,650
17	2,650	2,320	6,835	5,045	12,820	18,500	7,650	2,590	1,690	3,430	1,970	1,640
18	2,720	2,260	6,410	4,930	12,600	18,500	7,340	2,440	1,690	3,290	1,950	1,640
19	3,025	2,150	6,150	4,490	12,600	20,990	6,880	2,430	1,680	3,130	1,950	1,630
20	3,290	2,050	6,150	4,490	14,190	23,050	6,315	2,360	1,586	2,940	1,940	1,630
21	3,290	1,950	6,150	4,050	13,960	27,600	6,050	2,310	1,570	2,700	2,080	1,630
22	3,110	1,905	6,150	4,050	13,960	26,950	5,920	2,300	1,560	2,690	2,160	1,630
23	2,940	1,860	6,150	4,050	13,500	26,950	5,670	2,460	1,550	2,630	2,590	1,630
24	2,720	1,780	7,130	4,050	11,950	25,975	5,795	2,520	1,540	2,570	2,640	1,560
25	2,510	1,780	7,440	4,490	10,140	25,650	5,670	2,390	1,530	2,570	2,590	1,560
26	2,260	1,665	7,600	4,710	10,140	24,040	5,670	2,380	1,520	2,440	2,250	1,500
27	2,260	1,630	7,280	5,760	10,140	23,405	5,420	2,260	2,240	2,440	2,060	1,500
28	2,260	1,630	6,980	6,280	10,520	22,470	5,420	2,250	3,370	2,440	1,900	1,500
29	3,200	.....	6,550	6,835	11,120	19,550	5,180	2,150	3,310	2,570	1,740	1,450
30	4,380	.....	6,150	7,130	11,530	18,190	5,065	2,140	4,390	2,570	1,860	1,450
31	4,050	.....	6,150	.....	11,740	.....	4,950	2,130	.....	2,570	.....	1,450

NOTE.—Daily discharge determined as follows: Jan. 1–10, estimated 1,200 second-feet; Jan. 11–16, estimated 2,600 second-feet; Jan. 17 to June 20, and Dec. 21 to Dec. 31, from a well-defined curve; June 21 to July 31 from a fairly well-defined curve; Aug. 1 to Dec. 20 by indirect method for shifting channels. The curves are partly defined by study of discharge data at Little Valley (7 miles below Elgin) during 1911.

Monthly discharge of Green River at Elgin, Utah, for 1911.

[Drainage area, 38,200 square miles.]

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	2,330	143,000	D.
February	8,640	1,630	3,440	191,000	B.
March	13,500	1,500	6,280	386,000	B.
April	7,440	4,050	5,480	326,000	B.
May	16,130	7,770	11,700	719,000	B.
June	27,600	11,320	19,400	1,150,000	A.
July	16,400	4,950	8,460	520,000	B.
August	4,480	2,130	2,930	180,000	B.
September	4,390	1,520	1,970	117,000	B.
October	6,120	2,440	3,800	234,000	B.
November	2,640	1,740	2,240	133,000	B.
December	1,910	1,450	1,640	101,000	B.
The year	27,600	.....	5,810	4,200,000	

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

Location.—At Little Valley Ferry, 4 miles downstream from Green River railroad station (7 miles by wagon road) in sec. 5, T. 22 S., R. 16 E., Salt Lake meridian.

Records available.—December 18, 1910, to December 31, 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 for periods during the months of December, January, and February.

Diversions.—Below all important diversions.

Accuracy.—Gage height data for 1911 are unreliable for first three months and fragmentary for the rest of the year. For this reason and as there is a complete and reliable record available at Elgin (only 6 miles by river above Little Valley) no estimates are published for 1911. Engineers and others interested are referred to the record at the Elgin station for 1911.

Cooperation.—Maintained in cooperation with the State of Utah.

Discharge measurements of Green River at Little Valley, near Green River, Utah, for 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 2	J. C. Dort	2.53	4,890
July 21	do	2.98	6,110
Sept. 17	do	.50	1,670
Oct. 20	do	[a]1.45	3,080

[a] Gage height for measurement made Oct. 20 unreliable, as the relation between a temporary gage and a permanent gage was determined by the gage reader.

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, 1911.

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 are considered good.

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

Discharge measurements of Colorado River at Yuma, Ariz., in 1911.

[By G. D. Thompkins and B. R. Cloyd.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Jan. 3	15.80	5,430	Jan. 19	17.20	12,820
5	15.80	4,960	21	17.80	15,460
7	15.70	4,750	24	17.00	11,580
11	15.00	4,320	26	17.00	11,080
14	16.10	6,510	28	16.70	9,840
17	16.00	7,130	31	17.00	10,550

Discharge measurements of Colorado River at Yuma, Ariz., in 1911—Continued.

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Feb. 2	16.70	9,360	Aug. 5	19.20	28,630
4	17.30	11,310	8	18.10	22,190
7	19.30	22,260	10	18.00	18,180
9	18.50	16,990	12	18.10	17,800
11	19.90	24,920	15	17.80	13,850
14	18.30	16,560	17	17.60	12,330
16	17.60	13,320	19	17.50	12,800
18	17.00	10,680	22	17.05	11,400
23	16.10	9,330	24	17.10	11,400
25	16.50	7,920	26	17.10	10,970
28	16.50	7,450	29	17.45	11,400
Mar. 2	16.60	7,590	31	18.55	17,200
4	16.40	7,000	Sept. 2	17.60	12,000
7	16.20	6,590	5	17.70	12,000
9	18.20	17,780	7	17.10	10,600
11	17.70	12,600	9	16.60	8,300
14	21.40	34,900	12	16.35	7,300
16	19.30	21,630	14	16.60	7,800
18	19.70	24,700	16	16.55	7,300
23	19.10	21,150	19	16.35	6,600
25	18.50	17,600	21	17.60	10,100
28	18.20	16,670	23	16.80	8,300
30	18.30	16,950	26	16.60	7,500
Apr. 1	18.60	17,430	28	18.00	14,200
4	18.80	18,180	30	16.80	8,700
8	18.80	19,900	Oct. 3	16.60	8,000
11	19.40	22,370	5	18.65	22,400
13	19.70	24,860	7	21.05	37,600
15	19.70	24,960	10	21.55	40,100
20	18.90	19,610	12	22.80	49,400
22	18.70	18,410	14	24.00	59,600
25	18.50	17,780	17	20.10	34,700
27	18.60	19,040	19	18.95	26,800
29	19.10	21,900	21	18.15	22,200
May 2	20.00	27,420	24	17.30	18,200
6	20.95	32,780	26	17.10	15,600
9	20.80	32,280	28	17.10	15,200
11	20.90	30,820	31	17.05	14,000
16	22.80	49,540	Nov. 2	17.10	13,200
18	23.50	55,100	4	18.10	18,300
20	23.90	64,200	7	17.65	15,100
23	23.30	54,750	9	17.20	13,300
25	23.00	54,790	11	17.10	12,700
27	23.20	58,750	14	17.00	11,600
June 1	22.20	50,310	16	16.90	11,100
3	22.50	51,330	18	16.90	10,000
6	22.60	53,810	21	17.00	10,700
10	23.20	56,540	23	17.00	9,400
13	23.80	63,180	25	16.90	9,300
15	24.00	66,540	28	17.00	9,600
22	25.45	70,650	30	17.00	9,500
24	25.85	78,300	Dec. 2	17.10	10,100
July 1	24.70	69,540	5	17.15	10,000
5	23.20	57,300	7	17.00	8,300
8	21.65	50,250	9	16.85	7,700
11	22.10	53,880	12	16.20	5,800
13	21.35	50,220	14	16.15	5,600
15	20.90	44,190	16	16.65	6,900
17	20.20	38,490	19	17.20	8,000
20	20.90	42,610	21	17.00	7,700
22	21.15	42,610	23	16.80	7,600
25	21.55	47,740	26	16.65	6,800
27	22.75	55,290	28	16.70	6,900
29	22.20	51,230	28	16.70	6,900
Aug. 1	21.45	46,070	30	16.70	6,900
3	20.40	36,030			

Daily gage height, in feet, of Colorado River at Yuma, Ariz., for 1911.

[G. D. Tompkins and B. R. Cloyd, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	16.15	16.85	16.65	18.55	19.9	22.2	24.6	21.5	17.9	16.75	17.0	17.05
2	15.7	16.75	16.5	18.8	20.0	22.35	24.4	20.95	17.55	16.6	17.1	17.1
3	15.8	17.15	16.4	18.85	20.0	22.5	24.25	20.3	17.6	17.65	17.45	17.05
4	15.8	17.45	16.4	18.8	20.15	22.6	23.8	19.7	17.6	18.9	18.2	17.1
5	15.75	18.1	16.4	18.65	20.4	22.65	22.9	19.2	17.7	18.95	18.1	17.1
6	15.7	17.9	16.3	19.0	20.9	22.6	22.0	18.8	17.3	20.6	17.75	17.1
7	15.7	19.6	16.2	18.6	21.2	22.8	21.6	18.35	17.05	21.05	17.6	17.0
8	15.7	19.25	16.2	19.0	21.05	22.9	21.7	18.1	16.8	21.0	17.4	16.95
9	15.4	18.45	18.3	18.9	20.9	23.0	22.0	17.85	16.6	21.1	17.2	17.05
10	15.0	18.6	18.5	19.25	21.0	23.25	22.2	18.0	16.5	21.65	17.2	16.55
11	15.0	20.0	17.65	19.35	20.85	23.5	22.05	18.15	16.4	22.35	17.1	16.3
12	15.1	19.35	18.0	19.55	21.2	23.55	21.6	18.1	16.45	22.9	17.05	16.15
13	16.0	18.7	20.0	19.75	21.5	23.8	21.3	18.15	16.45	23.5	17.0	16.15
14	15.95	18.25	21.35	19.85	21.85	23.9	21.1	18.0	16.6	24.1	17.0	16.15
15	17.45	17.8	19.95	19.7	22.25	24.05	20.95	17.8	16.55	23.75	16.9	16.45
16	16.7	17.55	19.25	19.45	22.9	24.3	20.35	17.65	16.55	21.45	16.9	16.6
17	15.95	17.4	19.45	19.25	23.3	24.4	20.2	17.55	16.45	20.0	16.95	16.8
18	15.9	17.0	19.85	19.13	23.6	24.75	20.4	17.5	16.5	19.3	16.95	17.1
19	17.3	16.7	20.5	18.9	23.9	24.75	20.35	17.5	16.35	18.9	17.05	17.2
20	18.0	16.6	20.3	18.9	23.9	25.05	20.8	17.5	16.6	18.45	17.05	17.0
21	17.75	16.55	20.05	18.8	23.75	25.25	20.9	17.25	17.5	18.1	17.0	17.0
22	17.55	16.45	19.6	18.65	23.4	25.45	21.15	17.05	17.0	17.7	17.05	17.0
23	17.3	16.3	19.0	18.4	23.15	25.6	21.25	17.0	16.75	17.4	17.05	16.8
24	16.9	16.5	18.6	18.3	23.0	25.85	21.0	17.1	16.6	17.35	17.1	16.8
25	16.8	16.5	18.4	18.5	23.0	25.65	21.15	17.1	16.6	17.25	16.9	16.6
26	17.0	16.35	18.2	18.6	23.2	25.45	22.4	17.05	16.6	17.1	17.0	16.65
27	16.85	16.5	18.1	18.65	23.2	25.25	22.85	17.05	17.25	17.0	17.0	16.8
28	16.7	16.55	18.0	18.9	23.3	24.95	22.55	17.25	17.8	17.15	17.0	16.7
29	16.9	.....	18.2	19.2	23.15	24.8	22.2	17.45	17.05	17.35	17.0	16.6
30	17.3	.....	18.3	19.55	22.6	24.7	22.75	18.0	16.75	17.15	17.05	16.7
31	16.95	.....	18.4	.....	22.4	.....	21.95	18.45	.....	17.05	.....	16.45

Daily discharge, in second-feet, of Colorado River at Yuma, Ariz., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	6,500	9,900	8,100	17,000	27,000	50,300	69,000	46,500	13,300	8,500	13,000	9,800
2	4,800	9,700	7,800	18,800	27,400	50,900	67,000	41,300	11,700	7,800	13,200	10,100
3	5,400	11,300	7,300	18,900	27,100	51,300	65,500	35,300	11,800	15,500	16,200	9,700
4	5,200	12,400	7,000	18,200	27,800	53,000	61,900	31,500	11,500	25,200	19,200	9,800
5	4,700	16,200	7,200	17,200	29,100	52,900	55,200	28,600	12,000	24,500	18,600	9,500
6	4,600	12,300	6,900	20,600	32,500	53,800	48,800	26,300	10,500	36,000	15,800	9,300
7	4,700	24,300	6,600	17,800	34,700	54,900	46,500	23,500	10,300	37,600	14,600	8,300
8	5,500	22,200	6,100	21,500	33,500	55,200	50,700	22,200	9,100	36,500	14,000	8,100
9	4,800	16,500	18,200	20,000	32,300	55,500	53,400	18,600	8,300	36,700	13,300	8,900
10	3,700	15,900	19,800	22,000	32,400	56,900	54,600	18,200	7,800	41,300	13,300	6,700
11	4,300	25,700	12,300	22,000	30,400	59,500	53,500	18,800	7,500	46,800	12,700	5,900
12	3,800	22,100	12,200	23,600	34,000	60,700	50,800	17,800	7,900	50,500	12,200	5,500
13	7,100	18,300	26,400	25,200	37,000	63,200	49,700	17,800	7,400	55,200	11,700	5,600
14	5,800	16,100	34,500	25,900	40,000	64,900	46,900	16,000	7,800	60,200	11,700	5,600
15	16,300	13,700	25,500	25,000	44,000	67,900	44,700	13,800	7,400	58,900	11,100	6,500
16	10,900	13,000	21,500	23,300	50,500	67,900	39,000	12,800	7,300	43,500	11,100	6,700
17	7,000	12,800	22,800	21,900	53,600	67,800	38,500	12,000	6,900	33,800	11,000	7,100
18	6,100	10,700	25,700	20,900	55,800	69,200	39,500	12,200	7,300	29,100	10,400	8,100
19	13,700	9,700	30,500	19,500	61,000	68,500	37,800	12,800	6,600	26,800	11,000	8,000
20	18,700	9,800	29,200	19,600	64,200	69,600	41,500	13,500	6,300	23,800	11,000	7,300
21	15,100	10,500	27,500	19,000	61,300	70,200	41,200	12,300	9,500	21,800	10,700	7,700
22	14,500	10,700	24,500	18,000	57,100	70,600	42,600	11,400	8,000	19,600	10,400	8,100
23	13,300	10,600	20,400	16,100	53,700	74,100	44,000	10,900	8,000	18,000	9,800	7,600
24	10,900	9,800	17,700	15,600	53,800	78,300	41,200	11,400	7,300	18,700	10,400	7,500
25	10,000	7,900	16,700	17,800	54,800	76,800	49,800	11,200	7,400	17,200	9,300	6,600
26	11,100	7,000	15,500	18,800	57,600	75,300	53,700	11,000	7,500	15,600	9,800	6,800
27	10,500	7,600	15,200	19,400	58,800	73,900	56,000	10,000	10,500	14,600	9,700	7,600
28	9,800	7,700	15,000	20,800	59,100	71,800	53,900	10,700	12,600	15,500	9,600	6,900
29	10,700	.....	16,500	22,700	57,800	70,500	51,200	11,400	9,200	17,300	9,600	6,500
30	13,200	.....	17,000	24,800	53,700	69,800	56,100	14,400	8,700	15,200	9,800	6,900
31	10,300	.....	16,700	.....	52,000	.....	50,400	16,500	.....	14,000	.....	5,800

Monthly discharge of Colorado River at Yuma, Ariz., for 1911.

[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	18,700	3,700	8,800	0.039	0.045	541,487
February	25,700	7,000	13,400	.059	.062	742,610
March	34,500	6,100	17,400	.077	.089	1,067,700
April	25,900	15,600	20,400	.091	.101	1,213,685
May	64,200	27,000	45,000	.200	.231	2,764,960
June	78,300	50,300	64,200	.285	.318	3,818,576
July	69,000	37,800	50,100	.223	.257	3,083,549
August	46,500	10,000	18,400	.082	.095	1,131,983
September	13,300	6,300	8,900	.040	.045	530,388
October	60,200	7,800	28,600	.125	.144	1,756,786
November	19,200	9,300	12,140	.054	.060	722,391
December	10,100	5,500	7,600	.034	.039	465,130
The year	78,300	3,700	24,600	.109	1.486	17,839,245

TRIBUTARY BASINS.

NEW FORK RIVER BASIN.

NEW FORK RIVER NEAR CORA, WYO.

Location.—At Alexander's ranch in sec. 29, T. 36 N., R. 110 W., 3½ miles below the outlet of New Fork Lake and 10 miles northwest of Cora post office.

Records available.—July 29, 1910, to September 30, 1911. From May 23 to August 31, 1905, a station described under the same name was maintained 12 miles below the present site. The records at the two points are not comparable, as several tributaries enter between and several diversions are made.

Drainage area.—Not measured.

Gage.—Vertical staff; datum was raised 7.12 feet September 23, 1910; all readings refer to the present datum.

Channel.—Data too meager to determine.

Discharge measurements.—Made by wading.

Diversions and storage.—The natural storage afforded by New Fork Lake and other lakes in the basin gives the New Fork a fairly uniform flow. New Fork Lake will probably be used for storage in connection with irrigation. Only one small ditch takes out above the station.

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

Accuracy.—Owing to insufficient data no estimates of discharge are available.

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

Discharge measurements of New Fork River near Cora, Wyo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 23	Wimmer and Belknap	1.68	39.5
Aug. 1	G. E. Belknap	1.90	69.7
Sept. 17	.....do	1.30	17.4

Daily gage height, in feet, of New Fork River near Cora, Wyo., for 1911.

[Eugene Alexander, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.7	1.4	1.3	1.3	1.4	1.8	2.7	1.9	1.4
2	1.6	1.4	1.3	1.3	1.4	1.9	2.6	1.9	1.4
3	1.7	1.3	1.3	1.3	1.4	1.9	2.5	1.85	1.4
4	1.9	1.4	1.2	1.3	1.4	1.9	2.5	1.8	1.4
5	2.0	1.4	1.2	1.3	1.4	2.0	2.55	1.8	1.4
6	1.9	1.4	1.2	1.3	1.4	2.1	2.6	1.8	1.4
7	1.7	1.4	1.3	1.3	1.4	2.2	2.6	1.75	1.4
8	1.5	1.4	1.3	1.3	1.4	2.35	2.7	1.7	1.4
9	1.4	1.4	1.3	1.3	1.5	2.45	2.6	1.7	1.4
10	1.4	1.4	1.3	1.3	1.5	2.5	2.5	1.7	1.4
11	1.4	1.4	1.3	1.3	1.5	2.5	2.45	1.7	1.4
12	1.4	1.4	1.3	1.3	1.5	2.65	2.4	1.7	1.4
13	1.3	1.4	1.3	1.3	1.5	2.85	2.35	1.7	1.4
14	1.3	1.4	1.3	1.3	1.6	3.05	2.3	1.7	1.4
15	1.2	1.4	1.3	1.3	1.6	3.1	2.3	1.7	1.4
16	1.2	1.3	1.3	1.3	1.6	3.35	2.3	1.7	1.4
17	1.3	1.3	1.3	1.3	1.6	3.4	2.3	1.7	1.4
18	1.3	1.3	1.3	1.3	1.7	3.4	2.3	1.7	1.4
19	1.2	1.3	1.3	1.3	1.7	3.35	2.3	1.6	1.4
20	1.2	1.3	1.3	1.3	1.7	3.25	2.25	1.6	1.4
21	1.2	1.3	1.3	1.3	1.7	3.25	2.2	1.6	1.3
22	1.2	1.3	1.3	1.3	1.7	3.3	2.2	1.6	1.3
23	1.2	1.3	1.3	1.4	1.7	3.25	2.15	1.6	1.3
24	1.3	1.3	1.3	1.4	1.7	3.15	2.1	1.5	1.3
25	1.2	1.3	1.2	1.4	1.7	2.95	2.1	1.5	1.3
26	1.3	1.3	1.3	1.4	1.7	2.85	2.05	1.5	1.3
27	1.4	1.3	1.3	1.4	1.8	2.75	2.0	1.5	1.3
28	1.4	1.3	1.3	1.4	1.8	2.7	2.0	1.5	1.3
29	1.3	.....	1.3	1.4	1.8	2.7	1.95	1.5	1.4
30	1.3	.....	1.3	1.4	1.8	2.7	1.9	1.5	1.4
31	1.4	.....	1.3	.....	1.8	.....	1.9	1.4	.....

NOTE.—From Jan. 1 to Apr. 10 gage heights were affected by ice; average thickness of ice in January, 12. feet; in February, 1.2 feet; in March, 0.9 foot; from Apr. 1 to 10, 0.6 foot.

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 December 16, 1911. From April 2, 1905, to October 31, 1906, a station described under the same name was maintained one-half mile below the present station. The records at the two points are not comparable, as two ditches divert water between the two.

Drainage area.—130 square miles (measured from Land Office map).

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 gives Pine Creek a fairly uniform flow.

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.—On account of the scattering gage heights the records can not be considered better than fair.

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

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

Discharge measurements of Pine Creek near Pinedale, Wyo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 23	G. E. Belknap	1.60	28.6	June 26	G. E. Belknap	4.40	1,470
May 22	Wimmer and Belknap	2.00	99.3	July 29	Belknap and Hall	2.70	372
22	G. E. Belknap	2.00	95.0				

Daily gage height, in feet, of Pine Creek near Pinedale, Wyo., for 1911.

[Geo. E. Belknap, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.6	1.6	.....	.....	.....	.....	.....	.....	.....
2	1.6	.....	.....	.....	.....	2.0	.....	.....	.....
3	1.6	.....	.....	.....	.....	.....	.....	.....	1.8
4	1.6	1.65	.....	.....	.....	.....	.....	.....	.....
5	1.6	1.7	.....	3.8	2.4	1.9	.....	1.7	.....
6	1.6	1.7	.....	.....	.....	.....	.....	.....	1.7
7	1.6	1.7	2.7	.....	.....	.....	1.8	.....	1.7
8	1.6	1.7	2.7	.....	2.4	.....	.....	.....	.....
9	1.6	.....	.....	.....	.....	1.8	.....	.....	.....
10	1.6	.....	2.9	.....	.....	.....	.....	.....	1.75
11	1.7	.....	3.0	.....	.....	.....	.....	1.7	.....
12	1.6	.....	3.15	.....	.....	.....	.....	.....	1.6
13	1.6	.....	3.4	.....	.....	.....	1.9	.....	.....
14	.....	1.8	3.6	.....	.....	.....	.....	.....	1.6
15	1.6	.....	3.8	3.7	.....	.....	.....	.....	.....
16	1.6	.....	4.0	.....	2.1	1.7	.....	1.8	1.6
17	1.6	.....	4.3	.....	2.1	.....	1.8	1.8	.....
18	1.6	.....	4.4	.....	.....	.....	.....	.....	.....
19	1.6	.....	4.5	.....	.....	.....	.....	.....	.....
20	1.6	.....	.....	.....	.....	.....	.....	.....	.....
21	1.7	1.9	.....	.....	.....	.....	.....	1.8	.....
22	1.6	2.0	.....	.....	.....	.....	.....	.....	.....
23	1.6	2.0	.....	.....	.....	1.7	.....	1.8	.....
24	1.6	.....	4.6	3.6	2.1	.....	1.8	.....	.....
25	1.6	.....	.....	.....	.....	.....	.....	.....	.....
26	1.6	.....	4.4	.....	.....	.....	.....	.....	.....
27	1.6	.....	4.2	.....	.....	.....	.....	.....	.....
28	1.6	2.3	4.1	.....	.....	.....	.....	.....	.....
29	1.6	.....	.....	.....	.....	.....	.....	.....	.....
30	1.6	.....	4.0	.....	2.0	1.7	1.8	1.8	.....
31	.....	.....	.....	3.6	.....	.....	.....	.....	.....

NOTE.—Nov. 16 to Dec. 31 gage readings affected by ice.

Daily discharge, in second-feet, of Pine Creek near Pinedale, Wyo., for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	29	29	266	1,150	778	97	45	.....
2	29	32	285	1,130	641	97	48	.....
3	29	34	304	1,100	504	90	50	.....
4	29	36	323	1,070	367	83	52	.....
5	29	42	342	1,040	230	76	54	42
6	29	42	361	1,030	230	72	56	.....
7	29	42	380	1,030	230	68	58	.....
8	29	42	380	1,020	230	63	61	.....
9	29	45	432	1,020	217	58	64	.....
10	29	48	485	1,010	204	56	67	.....
11	42	51	540	1,000	191	54	70	42
12	29	54	630	998	178	52	73	.....
13	29	56	785	992	164	50	76	.....
14	29	58	915	986	150	48	72	.....
15	29	61	1,040	980	136	45	68	.....

Daily discharge, in second-feet, of Pine Creek near Pinedale, Wyo., for 1911—Contd.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
16	29	64	1,180	973	123	42	63	.....
17	29	67	1,400	966	123	42	58	.....
18	29	70	1,480	959	123	42	58	.....
19	29	72	1,550	952	123	42	58	.....
20	29	74	1,560	945	123	42	58	.....
21	42	76	1,580	938	123	42	58	.....
22	29	97	1,600	931	123	42	58	.....
23	29	97	1,610	923	123	42	58	.....
24	29	115	1,620	915	123	42	58	.....
25	29	133	1,550	915	119	42	58	.....
26	29	151	1,480	915	115	42	58	.....
27	29	170	1,320	915	111	42	58	.....
28	29	188	1,250	915	107	42	58	.....
29	29	208	1,120	915	102	42	58	.....
30	29	228	1,180	915	97	42	58	.....
31	.....	247	.....	915	97	.....	58	.....

NOTE.—Daily discharge determined from a fairly well-defined rating curve. Discharge interpolated for days for which gage heights are missing.

Monthly discharge of Pine Creek near Pinedale, Wyo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April	42	29	29.9	1,780	C.
May	247	29	88.0	5,410	C.
June	1,620	266	965	57,400	C.
July	1,150	915	983	60,400	C.
August	778	97	203	12,500	C.
September	97	42	54.6	3,250	C.
October	76	45	59.6	3,660	C.
November	.....	.....	[a] 40.0	2,380	D.
The period	.....	.....	.....	147,000	

[a] Estimated.

BIG SANDY CREEK BASIN.

BIG SANDY CREEK NEAR BIG SANDY, WYO.

Location.—At Leckie's ranch, in sec. 18, T. 30 N., R. 104 W., about 4 miles east of Big Sandy post office, Wyo.; below all mountain tributaries.

Records available.—July 26, 1910, to August 31, 1911.

Drainage area.—Not measured.

Gage.—Chain gage installed September 27, 1910. All data for 1910 derived from readings on a staff gage referred to a different datum.

Channel.—Apparently permanent.

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

Diversions and storage.—The Eden Irrigation Co., which has a project in T. 26 N., R. 105 W., is building a reservoir at the present gaging station site. Prior to July 1, 1912, there were adjudicated diversions from Big Sandy River of 37 second-feet. It is not known what portion of this is above the station.

Accuracy.—Owing to the meager data the records can not be considered better than fair.

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

Discharge measurements of Big Sandy Creek near Big Sandy, Wyo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 18	Schmehl and Wimmer	6.21	154
19	do	6.08	143
Aug. 4	W. T. Schmehl	5.20	61

Daily gage height, in feet, and discharge, in second-feet, of Big Sandy Creek near Big Sandy, Wyo., for 1911.

[Mrs. Annie Leckie, observer.]

Day.	May.		June.		July.		August.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	.....	82	6.7	208	7.0	241	5.3	68
2	5.45	82	6.8	219	6.6	197	5.25	64
3	5.5	86	6.9	230	6.5	186	5.2	60
4	.....	110	7.2	264	6.55	192	5.2	60
5	6.0	133	7.3	276	6.9	230	.....	68
6	5.8	113	7.4	288	6.55	192	5.4	77
7	6.0	133	7.6	312	.....	194	5.35	72
8	5.9	123	7.5	300	6.6	197	5.2	60
9	.....	133	7.6	312	.....	191	5.2	60
10	6.1	143	7.9	348	.....	185	5.2	60
11	.....	154	7.9	348	.....	178	5.2	60
12	.....	164	8.3	396	.....	171	5.2	60
13	6.4	175	8.1	372	6.3	164	5.2	60
14	.....	180	7.9	348	.....	158	5.2	60
15	6.5	186	.....	372	6.2	153	5.2	60
16	6.5	186	8.3	396	6.2	153	5.2	60
17	6.35	170	8.2	384	6.0	133	5.3	68
18	6.25	158	.....	336	6.0	133	5.3	68
19	6.3	164	7.4	288	6.0	133	5.3	68
20	6.0	133	7.4	288	6.0	133	5.2	60
21	6.2	153	7.6	312	5.9	123	5.2	60
22	6.2	153	7.4	288	5.8	113	5.1	52
23	6.35	170	7.3	276	5.8	113	5.1	52
24	6.4	175	7.0	241	5.75	108	5.1	52
25	6.7	208	7.0	241	5.7	104	5.1	52
26	6.7	208	.....	230	5.6	95	.....	52
27	6.5	186	6.8	219	5.6	95	.....	52
28	6.4	175	6.8	219	5.45	82	5.1	52
29	6.5	186	6.8	219	5.4	77	5.1	52
30	6.7	208	6.8	219	5.35	72	5.1	52
31	6.7	208	.....	.....	5.3	68	5.1	52

NOTE.—Daily discharge determined from a poorly defined rating curve. Discharge interpolated for days for which gage heights are missing.

Monthly discharge of Big Sandy Creek near Big Sandy, Wyo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
May	208	82	168	10,300	C.
June	396	208	292	17,400	C.
July	241	68	147	9,040	C.
August	77	52	59.8	3,680	C.

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 7, 1911.

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.—Results are fairly accurate.

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

Discharge measurements of Big Sandy Creek near Eden, Wyo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 28	W. E. Robertson	1.03	450
June 21	do	4.33	588
July 7	do	2.33	252

Daily gage height, in feet, of Big Sandy Creek near Eden, Wyo., for 1911.

[W. E. Robertson, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	.....	1.0	2.9	3.9	1.3	0.8	1.1
2	.....	.9	3.0	2.5	1.3	.8	1.4
3	.....	1.0	3.1	2.4	1.3	.8	1.5
4	.....	1.1	3.4	2.5	1.2	.9	1.5
5	.....	1.0	3.7	2.3	1.1	.9	1.5
6	.....	1.6	3.8	2.4	1.2	.9	1.4
7	.....	1.5	3.9	2.33	1.2	.9	1.4
8	.....	1.5	4.0	2.4	1.2	1.0	.....
9	.....	1.6	4.0	2.4	1.1	1.0	.....
10	.....	1.7	3.3	2.1	1.1	.9	.....
11	.....	1.7	3.2	2.0	1.0	.9	.....
12	.....	2.0	4.0	1.8	1.0	1.0	.....
13	.....	2.1	4.3	1.8	1.0	.9	.....
14	.....	2.0	5.0	1.8	1.0	.9	.....
15	.....	2.1	5.1	1.8	1.0	.9	.....
16	.....	2.3	5.4	1.7	1.0	.9	.....
17	.....	2.3	4.6	1.6	1.0	.9	.....
18	.....	2.2	.....	1.8	1.0	.9	.....
19	.....	1.8	.....	1.7	1.0	.9	.....
20	.....	1.7	.....	1.6	1.0	.9	.....
21	.....	1.7	4.33	1.6	.9	.8	.....
22	.....	1.9	.....	1.5	.9	.8	.....
23	.....	2.0	4.2	1.4	1.0	.9	.....
24	.....	2.5	4.2	1.4	.9	.....	.....
25	.....	2.6	4.1	1.4	.9	.9	.....
26	.....	2.4	4.0	1.5	.9	.9	.....
27	.....	2.1	4.0	1.5	.9	1.0	.....
28	1.03	2.2	3.8	1.4	.9	1.0	.....
29	1.0	2.1	3.7	1.4	.9	1.1	.....
30	1.0	2.0	3.9	1.3	.8	1.1	.....
31	.....	2.6	.....	1.3	.8	.....	.....

Daily discharge, in second-feet, of Big Sandy Creek near Eden, Wyo., for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	.....	41	342	510	86	13	56
2	.....	27	358	278	86	13	102
3	.....	41	374	262	86	13	118
4	.....	56	424	278	71	27	118
5	.....	41	475	246	56	27	118
6	.....	134	492	262	71	27	102
7	.....	118	510	251	71	27	102
8	.....	118	528	262	71	41	.....
9	.....	134	528	262	56	41	.....
10	.....	150	407	214	56	27	.....
11	.....	150	390	198	41	27	.....
12	.....	198	528	166	41	41	.....
13	.....	214	582	166	41	27	.....
14	.....	198	725	166	41	27	.....
15	.....	214	748	166	41	27	.....
16	.....	246	818	150	41	27	.....
17	.....	246	640	134	41	27	.....
18	.....	230	629	166	41	27	.....
19	.....	166	615	150	41	27	.....
20	.....	150	601	134	41	27	.....
21	.....	150	587	134	27	13	.....
22	.....	182	576	118	27	13	.....
23	.....	198	564	102	41	27	.....
24	.....	278	564	102	27	27	.....
25	.....	294	546	102	27	27	.....
26	.....	262	528	118	27	27	.....
27	.....	214	528	118	27	41	.....
28	45	230	492	102	27	41	.....
29	41	214	475	102	27	56	.....
30	41	198	510	86	13	56	.....
31	.....	294	.....	86	13	.....	.....

NOTE.—Daily discharge determined from a fairly well defined rating curve; discharge interpolated for days for which gage heights are missing.

Monthly discharge of Big Sandy Creek near Eden, Wyo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April (28-30)	45	41	42.3	252	C.
May	294	27	174	10,700	C.
June	818	342	536	31,900	C.
July	510	86	180	11,100	C.
August	86	13	45.3	2,790	C.
September	56	13	28.9	1,720	C.
October (1-7)	118	56	102	1,420	C.
The period	.....	.....	.....	59,900	

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 to November 6, 1911.

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

Gage.—Vertical staff.

Channel.—Data too meager to determine.

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.—As the station has not yet been completely rated estimates of discharge can not be presented.

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

Discharge measurements of Dutch Joe Creek near Big Sandy, Wyo., for 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 17	O. M. Wimmer	0.90	35.7
18	....do	.80	22.7
Aug. 1	W. T. Schmehl	.59	11.5

Daily gage height, in feet, of Dutch Joe Creek near Big Sandy, Wyo., for 1911.

[W. G. Schmehl, observer.]

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	1.35	1.35	0.59	0.28	.....	0.40
2	.....	1.35	1.10	.59	.25	.....	.35
3	.....	1.32	1.00	.55	.30	.....	.32
4	.....	1.60	1.00	.55	.30	0.60	.30
5	.....	1.56	1.20	.55	.40	.62	.25
6	.....	1.90	1.00	.50	.50	.59	.34
7	.....	2.05	1.00	.50	.49	.60	.....
8	.....	2.00	1.10	.50	.40	.55	.....
9	.....	1.60	.90	.50	.40	.55	.....
10	.....	1.50	.90	.48	.40	.60	.....
11	.....	1.80	.85	.50	.....	.....	.....
12	.....	2.35	.88	.48	.....	.....	.....
13	.....	2.60	.80	.50	.40	.30	.....
14	.....	2.25	.80	.45	.50	.30	.....
15	.....	2.30	.84	.44	.40	.30	.....
16	.....	2.80	.90	.42	.40	.40	.....
17	0.90	2.30	.80	.40	.38	.40	.....
18	.80	1.80	.80	.40	.35	.37	.....
19	.78	1.60	.85	.40	.36	.42	.....
20	.71	1.75	.80	.39	.35	.43	.....
21	.64	2.50	.80	.37	.35	.58	.....
22	.84	1.60	.80	.32	.40	.40	.....
23	.95	1.60	.75	.30	.41	.....	.....
24	.98	1.60	.75	.30	.40	.46	.....
25	1.10	1.45	.73	.30	.45	.....	.....
26	1.14	1.45	.75	.30	.50	.45	.....
27	1.00	1.35	.70	.29	.52	.40	.....
28	.95	1.35	.70	.30	.60	.....	.....
29	.88	1.30	.70	.30	.59	.51	.....
30	.96	1.40	.65	.30	.....	.....	.....
31	1.20	.....	.60	.30	.....	.25	.....

NOTE.—Gage heights Oct. 31 to Nov. 6 affected by ice.

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 River.

Records available.—May 17 to November 8, 1911.

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 records are discontinued during the winter months.

Accuracy.—Owing to meager data the results can not be considered better than fair.

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

Discharge measurements of Squaw Creek near Big Sandy, Wyo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 17	Schmehl and Wimmer	0.70	41.8
19	do	.60	30.1
Aug. 9	W. T. Schmehl	.24	12.5

Daily gage height, in feet, of Squaw Creek near Big Sandy, Wyo., for 1911.

[W. T. Schmehl, observer.]

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1					0.05		0.15
2				0.30			
3					.06		
4		0.90		.30			
5		.95					
6		.90				0.25	
7			0.60				
8			.60		.15	.30	.10
9			.80	.24		.28	
10		.88		.25	.10		
11							
12		1.00					
13			.75				
14		.85					
15					.10		
16		1.20				.10	
17	0.70	1.00	.45	.15	.06	.11	
18	.65	.98					
19	.58	.95		.13			
20		1.00	.45				
21	.74			.10	.05		
22	.80			.10			
23	.75	.94	.40			.10	
24	.73				.10		
25		.80			.17		
26		.80				.10	
27	.73	.78	.35				
28	.75	.78					
29		.75					
30	.78						
31	.80						

NOTE.—Ice present from Oct. 16 to Nov. 8.

Daily discharge, in second-feet, of Squaw Creek near Big Sandy, Wyo., for 1911.

Day.	May.	June.	July.	Aug.	Sept.	Oct.
1	.....	54	42	14	8	11
2	.....	57	40	14	8	12
3	.....	60	38	14	8.2	12
4	.....	63	36	14	8.5	12
5	.....	69	34	14	8.8	12
6	.....	63	32	13	9.2	12
7	.....	63	31	13	9.6	13
8	.....	62	31	12	10	14
9	.....	62	51	12	10	13
10	.....	61	50	12	9	.....
11	.....	68	48	12	9	.....
12	.....	75	47	12	9	.....
13	.....	66	46	11	9	.....
14	.....	57	40	11	9	.....
15	.....	79	34	10	9.	.....
16	.....	101	28	10	8.6	.....
17	40	75	21	10	8.2	.....
18	36	73	21	10	8.2	.....
19	30	69	21	10	8.1	.....
20	37	75	21	10	8.	.....
21	44	72	20	9	8	.....
22	51	70	19	9	8	.....
23	46	68	18	9	9	.....
24	43	60	18	9	9	.....
25	43	51	17	9	10	.....
26	43	51	16	9	10	.....
27	43	49	16	8	10	.....
28	46	49	16	8	10	.....
29	48	46	15	8	11	.....
30	49	44	15	8	11	.....
31	51	.....	14	8	.....	.....

NOTE.—Daily discharge determined from a poorly defined rating curve. Discharge interpolated for days for which gage heights are missing.

Monthly discharge of Squaw Creek near Big Sandy, Wyo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
May 17-31	.....	.....	43.3	1,290	C.
June	101	44	63.7	3,790	C.
July	51	14	28.9	1,780	C.
August	14	8	10.7	658	C.
September	10	8	9.05	539	C.
October 1-9	14	.....	12.3	219	C.
The period	.....	.....	.....	8,280	

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 to October 31, 1911.

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.—Fair.

Cooperation.—Station maintained in cooperation with Eden Irrigation & Land Co., by which the field data were furnished.

Discharge measurements of Little Sandy Creek near Eden, Wyo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 26	W. E. Robertson	0.80	16.9	June 18	W. E. Robertson	2.30	194
May 10	do	1.15	44.2	July 3	do	1.63	92.4
29	do	1.18	40.7	29	do	.98	33.0
June 7	do	1.49	69.7	Aug. 5	do	.67	11.8
10	do	1.86	116				

Daily gage height, in feet, of Little Sandy Creek near Eden, Wyo., for 1911.

[W. E. Robertson, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1		0.9	1.0	1.7	0.8	0.2	0.4
2		.9	1.1	1.6	.7	.2	
3		.9	1.1	1.63	.7	.2	.5
4		.9	1.2		.7	.2	.5
5		.9	1.3		.67	.2	.5
6		.9	1.35		.7	.2	.6
7		.9	1.49	1.5	.7	.2	
8		1.0	1.7	1.5	.7	.2	.7
9		1.1		1.6	.5	.2	.65
10		1.15	1.86	1.5	.6	.2	
11		1.2	2.0	1.4	.5	.2	.7
12		1.12	1.8	1.4	.6	.3	.7
13		1.0		1.3	.4	.4	.7
14						.3	.65
15		1.1		1.2	.5	.3	
16		1.1	2.2		.4	.3	.6
17		1.2	2.2	1.2		.3	
18		1.2	2.3	1.2		.2	.7
19		1.07	2.3	1.1		.2	.7
20		1.05	2.1	1.1		.2	
21		1.0		1.2	.3	.2	.5
22			2.3	1.2	.3	.2	.5
23		.9	2.4	1.2	.3	.2	
24		.85	2.4	1.1	.3	.2	.6
25	0.8	1.0	2.1	1.1	.3	.2	.7
26	.8		2.1	1.1	.3	.3	
27	.8	1.3	1.9		.3	.3	
28	.8	1.25	1.8	1.0	.3	.3	
29	.85	1.18	1.7	.98	.2	.2	
30				.9	.2	.3	
31		1.1		.8	.2		

Daily discharge, in second-feet, of Little Sandy Creek near Eden, Wyo., for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1		23	34	101	20	0	4
2		23	38	89	13	0	5
3		23	38	93	13	0	6
4		23	46	89	13	0	6
5		23	54	85	12	0	6
6		23	58	81	13	0	9
7		23	71	78	13	0	11
8		30	95	78	13	0	13
9		42	106	89	6	0	11
10		46	116	78	9	0	12
11		51	136	69	6	0	13
12		44	108	69	7	2	13
13		34	125	60	4	4	13
14		38	142	56	5	2	11
15		42	159	51	6	2	10

Daily discharge, in second-feet, of Little Sandy Creek near Eden, Wyo., for 1911—Contd.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
16	.....	42	177	51	4	2	9
17	.....	51	177	51	4	2	11
18	.....	51	194	51	3	0	13
19	.....	40	194	42	3	0	13
20	.....	38	160	42	2	0	10
21	.....	34	177	51	2	0	6
22	.....	30	194	51	2	0	6
23	.....	27	213	51	2	0	8
24	.....	23	213	42	2	0	9
25	16	34	160	42	2	0	13
26	16	47	160	42	2	2	12
27	16	60	127	38	2	2	11
28	16	56	115	34	2	2	10
29	19	44	101	32	0	0	9
30	21	41	101	27	0	2	9
31	.....	38	.....	20	0	.....	8

NOTE.—Daily discharge determined from a fairly well-defined rating curve. Discharge interpolated for days for which gage heights are missing.

Monthly discharge of Little Sandy Creek near Eden, Wyo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April 25–30	21	16	17.3	206	B.
May	60	23	36.9	2,270	B.
June	213	34	126	7,500	B.
July	101	20	59.1	3,630	B.
August	20	0	5.97	367	C.
September	4	0	.73	43	C.
October	13	4	9.68	595	C.
The period	.....	.....	.....	14,600	

BEAVER CREEK BASIN.

BEAVER CREEK NEAR LADORE, COLO.

Location.—At Myers ranch, about 16 miles from Ladore, Colo.

Records available.—April 24, 1910, to November 30, 1911.

Drainage area.—27 square miles (State engineer's report).

Gage.—Vertical staff.

Channel.—Apparently shifting.

Discharge measurements.—Made by wading. High-water measurements are made by the slope method.

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

Diversions.—Water is diverted for irrigation above the station.

Cooperation.—Station maintained by the State engineer, who furnishes the records complete for publication.

The following discharge measurement was made by C. L. Chatfield:

June 2, 1911: Gage height, 0.30 foot; discharge, 0.25 second-foot.

Daily gage height, in feet, of Beaver Creek near Ladore, Colo., for 1911.

[F. F. Myers, observer.]

Day.	Apr.	May.	June.	July.	Sept.	Oct.	Nov.
1	0.7	0.7	0.3	0.1	.....	0.5	0.6
2	1.9	.7	.3	.1	.....	.5	.6
3	2.6	.7	.3	.1	.....	.5	.6
4	2.55	.7	.3	.1	.....	.6	.6
5	2.65	.7	.3	.05	.....	.7	.6
6	1.95	.7	.3	.1	0.1	.75	.6
7	1.2	.7	.3	.1	.2	.7	.6
8	1.2	.6	.3	.2	.2	.7	.6
9	1.2	.5	.2	.15	.2	.6	.6
10	1.25	.5	.15	.1	.2	.6	.6
11	1.05	.4	.25	.1	.2	.6	.7
12	1.05	.4	.3	.1	.2	.6	.7
13	.85	.4	.3	.05	.2	.6	.7
14	.75	.4	.3	.05	.35	.6	.7
15	.65	.4	.3	.05	.4	.6	.7
16	.8	.4	.3	.....	.4	.6	.7
17	1.0	.4	.3	.....	.4	.6	.7
18	1.0	.4	.3	.....	.4	.6	.7
19	1.0	.4	.3	.....	.4	.6	.7
20	.8	.4	.3	.....	.5	.6	.7
21	.8	.4	.3	.....	.5	.6	.7
22	1.0	.4	.3	.....	.5	.6	.7
23	1.0	.4	.3	.....	.5	.6	.7
24	1.0	.4	.3	.....	.5	.6	.7
25	1.0	.4	.3	.....	.5	.6	.7
26	.9	.4	.2	.....	.5	.6	.7
27	.8	.4	.2	.....	.5	.6	.7
28	.7	.4	.1	.....	.5	.6	.7
29	.7	.4	.1	.....	.5	.6	.7
30	.7	.3	.1	.....	.5	.6	.7
31	.....	.3	.....	.....	.....	.6	.....

NOTE.—Gage heights affected by ice Dec. 5 to 31.

Daily discharge, in second-feet, of Beaver Creek near Ladore, Colo., for 1911.

Day.	Apr.	May.	June.	July.	Sept.	Oct.	Nov.
1	2.3	2.3	0.3	0.2	.....	0.7	1.2
2	43	2.3	.3	.2	.....	.7	1.2
3	110	2.3	.3	.2	.....	.7	1.2
4	104	2.3	.3	.2	.....	1.2	1.2
5	117	2.3	.3	.1	.....	2.3	1.2
6	46	2.3	.3	.2	0.2	3.0	1.2
7	13	2.3	.3	.2	.2	2.3	1.2
8	13	1.2	.2	.2	.2	2.3	1.2
9	13	.7	.2	.2	.2	1.2	1.2
10	14.5	.7	.2	.2	.2	1.2	1.2
11	9	.5	.2	.2	.2	1.2	2.3
12	9	.5	.2	.2	.2	1.2	2.3
13	4.6	.5	.3	.1	.2	1.2	2.3
14	3	.5	.3	.1	.4	1.2	2.3
15	1.8	.5	.3	.1	.5	1.2	2.3
16	3.7	.5	.3	.....	.5	1.2	2.3
17	7.5	.5	.3	.....	.5	1.2	2.3
18	7.5	.5	.3	.....	.5	1.2	2.3
19	7.5	.5	.3	.....	.5	1.2	2.3
20	3.7	.5	.3	.....	.7	1.2	2.3
21	3.7	.5	.3	.....	.7	1.2	2.3
22	7.5	.5	.3	.....	.7	1.2	2.3
23	7.5	.5	.3	.....	.7	1.2	2.3
24	7.5	.5	.3	.....	.7	1.2	2.3
25	7.5	.5	.3	.....	.7	1.2	2.3
26	5.4	.5	.2	.....	.7	1.2	2.3
27	3.7	.5	.2	.....	.7	1.2	2.3
28	2.3	.5	.2	.....	.7	1.2	2.3
29	2.3	.5	.2	.....	.7	1.2	2.3
30	2.3	.3	.2	.....	.7	1.2	2.3
31	.....	.3	.....	.....	.....	1.2	.....

NOTE.—Channel dry July 16 to Sept. 5.

Monthly discharge of Beaver Creek near Ladore, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April	117	2.3	19.4	1,156
May	2.3	.3	.9	57.1
June	.3	.2	.3	15.8
July	.2	0	.1	5.2
August	0	0	0	0
September	.7	.2	.4	24
October	3.0	.7	1.3	80.9
November	2.3	1.2	1.9	115
The period				1,454

VERMILION CREEK BASIN.

VERMILION CREEK NEAR LADORE, COLO.

Location.—About 5 miles from Ladore, Colo.

Records available.—July 1, 1910, to November 30, 1911.

Drainage area.—1,017 square miles (State engineer's report).

Gage.—Vertical staff.

Channel.—Practically permanent.

Discharge measurements.—Made by wading at ordinary stages and by the float method during high stages.

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

Diversions.—No data.

Cooperation.—Station maintained by the State engineer, who furnishes the records complete for publication.

Discharge measurements of Vermilion Creek near Ladore, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
June 2	Chatfield and Turner		4.0
Oct. 3	C. L. Chatfield	0.00	201
4	do	−.60	45

Daily gage height, in feet, of Vermilion Creek near Ladore, Colo., for 1911.

[E. Bassett, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1		2.35									
2		.6									3.4
3			4.45								.0
4			5.0								.0
5			5.75	2.1							.0
6			4.65	.6							.0
7			3.25								
8			2.0				0.0				
9			1.25				.6				
10			.5								

Daily gage height, in feet, of Vermilion Creek near Ladore, Colo., in 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
11											
12						2.5					
13					0.85	1.2		2.25			
14								—.2			
15			2.55								
16			3.5								
17			4.6								
18			4.9								
19			3.1								
20			2.2								
21			3.25								
22			4.2								
23			3.1			2.2					
24			2.2			.15					
25			1.65						1.5		
26			.7						.9		
27											
28											
29									2.2	1.2	
30									.9	.0	
31	2.75										

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 16, 1911.

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

Gage.—Vertical staff, whose datum was changed May 17, 1911.

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 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 23	C. L. Chatfield	2.30	20.4	July 16	C. L. Chatfield	0.70	8.9
25	do	2.20	16	Aug. 5	do	.45	1.2
May 17	do	1.20	52	Sept. 14	do	.78	8.5
June 13	do	1.60	104	Oct. 29	do	1.05	22

Daily gage height, in feet, and discharge, in second-feet, of Yampa River at Yampa, Colo., for 1911.

[C. L. Arnold, observer.]

Day.	July.		August.		September.		October.		November.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	1.1	35	0.7	7	0.95	22	0.8	12	1.0	26
2	1.2	46	.7	7	.95	22	.8	12	1.0	26
3	1.1	35	.7	7	.9	18	.8	12	.95	22
4	1.3	59	.7	7	.9	18	.9	18	.95	22
5	1.2	46	.7	7	.9	18	1.0	26	1.05	30
6	1.1	35	.7	7	.9	18	1.0	26	1.05	30
7	1.0	26	.7	7	.85	15	.9	18	1.05	30
8	1.05	30	.7	7	.85	15	.9	18	1.0	26
9	1.1	35	.75	10	.85	15	.9	18	1.05	30
10	1.0	26	.75	10	.85	15	.8	12	1.15	30
11	1.0	26	.9	18	.85	15	.8	12	1.15	30
12	1.1	35	1.05	30	.8	12	.8	12	1.3	30
13	1.05	30	1.1	35	.8	12	.8	12	1.4	30
14	.95	22	.95	22	.8	12	.8	12	1.4	30
15	.85	15	1.0	26	.8	12	.8	12	1.4	30
16	.9	18	1.0	26	.8	12	.75	10	1.4	30
17	1.05	30	1.0	26	.85	15	.8	12	.....	.....
18	1.1	35	.95	22	.9	18	.8	12	.....	.....
19	1.15	40	.95	22	.9	18	.7	7	.....	.....
20	1.0	26	1.0	26	.9	18	.75	10	.....	.....
21	1.1	35	1.1	35	.9	18	.95	22	.....	.....
22	1.05	30	1.1	35	.8	12	1.15	40	.....	.....
23	.90	18	1.2	46	.8	12	1.3	59	.....	.....
24	.8	12	1.1	35	.8	12	1.25	52	.....	.....
25	.8	12	1.05	30	.8	12	1.1	35	.....	.....
26	.85	15	1.0	26	.85	15	1.1	35	.....	.....
27	.75	10	1.0	26	.85	15	1.05	30	.....	.....
28	.7	7	1.0	26	.9	18	1.05	30	.....	.....
29	.6	4	1.0	26	.9	18	1.0	26	.....	.....
30	.6	4	1.0	26	.9	18	1.0	26	.....	.....
31	.8	12	.95	22	.....	.....	1.0	26	.....	.....

Monthly discharge of Yampa River at Yampa, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
July	59	4	26	1,605
August	46	7	21	1,313
September	22	12	16	932
October	59	7	21	1,317
Nov. 1–16	30	22	28	897
The period	.....	.....	.....	6,064

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 November 30, 1911.

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

Discharge measurements of Yampa River at Steamboat Springs, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 15	C. L. Chatfield	4.00	2,110	July 26	C. L. Chatfield	1.35	172
22	do	3.10	1,130	Aug. 29	do	1.00	77
June 10	do	3.62	1,850	Sept. 13	do	1.00	66
20	do	3.35	1,480	Oct. 31	do	1.13	89
July 18	do	1.55	243				

Daily gage height, in feet, of Yampa River at Steamboat Springs, Colo., for 1911.

[R. H. Tifdale, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	1.0	1.1	1.15	1.9	2.4	4.4	2.0	1.25	1.05	1.6	1.15
2	1.0	1.1	1.2	1.95	2.4	4.4	1.9	1.3	1.15	1.35	1.15
3	1.0	1.1	1.2	2.0	2.4	4.25	1.9	1.2	1.1	1.5	1.2
4	1.0	1.1	1.2	2.05	2.4	4.25	1.9	1.2	1.25	1.4	1.15
5	1.0	1.1	1.2	2.1		4.3	2.0	1.1	1.3	2.2	1.4
6	1.0	1.1	1.2	2.1		4.3	1.8	1.05	1.2	2.2	1.25
7	1.0	1.1	1.2	2.1		4.2	2.15	1.0	1.0	1.9	1.25
8	1.0	1.1	1.2	2.05		4.5	2.1	1.0	1.05	1.6	1.35
9	1.0	1.1	1.25	2.05		4.4	2.0	1.0	1.0	1.55	1.35
10	1.0	1.15	1.3	2.0	2.7	3.75	2.0	1.0	1.0	1.5	1.3
11	1.1	1.15	1.35	2.0		3.8	2.05	1.0	1.0	1.4	1.15
12	1.1	1.15	1.4	2.0		3.8	2.1	1.0	1.05	1.35	1.25
13	1.1	1.15	1.45	2.0		3.75	2.9	1.0	1.05	1.3	1.3
14	1.1	1.15	1.5	2.0		3.5	1.75	1.0	1.05	1.3	1.3
15	1.1	1.15	1.55	2.0	3.9	3.45	1.7	1.0	1.0	1.3	1.35
16	1.1	1.15	1.55	1.95		3.85	1.75	1.1	1.0	1.3	1.3
17	1.1	1.15	1.5	1.95		3.65	1.6	1.15	1.1	1.3	1.25
18	1.1	1.15	1.5	1.9		3.35	1.55	1.25	1.0	1.3	1.25
19	1.1	1.15	1.5	1.9		3.35	1.6	1.2	1.0	1.2	1.3
20	1.1	1.15	1.5	1.9	3.4	3.15	1.45	1.2	1.0	1.15	1.3
21	1.1	1.15	1.5	2.0	3.15	3.25	1.55		1.0	1.05	1.3
22	1.1	1.15	1.5	2.0	3.15	3.15	1.6		1.0	1.1	1.3
23	1.1	1.15	1.5	2.1	3.3	3.1	1.45		1.2	1.3	1.6
24	1.1	1.15	1.55	2.2	3.65	3.1	1.35		1.15	1.3	1.45
25	1.1	1.15	1.6	2.3	3.75	2.8	1.3		1.1	1.3	1.4
26	1.1	1.15	1.65	2.4	4.0	2.75	1.35		1.1	1.3	1.4
27	1.1	1.15	1.7	2.4	3.8	2.2	1.3	1.25	1.2	1.3	1.5
28	1.1	1.15	1.75	2.4		2.35	1.3	1.45	1.1	1.25	1.6
29	1.15		1.8	2.4		2.0	1.3	1.35	1.15	1.25	1.65
30	1.15		1.8	2.4		2.0	1.35	1.2	1.25	1.15	
31	1.15		1.85				1.25	1.05		1.1	

Daily discharge, in second-feet, of Yampa River at Steamboat Springs, Colo., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	73	95	105	380	680	2,635	430	130	80	250	102
2	73	93	115	405	680	2,635	380	145	102	162	102
3	73	93	115	430	680	2,478	380	115	90	215	115
4	73	93	115	458	680	2,478	380	115	130	180	102
5	73	93	115	485	720	2,530	430	90	145	545	180
6	73	93	115	485	760	2,530	330	80	115	545	130
7	73	93	115	485	800	2,425	515	70	70	380	130
8	73	93	115	458	840	2,640	485	70	80	250	162
9	73	93	130	458	880	2,635	430	70	70	232	162
10	73	105	145	430	905	1,870	430	70	70	215	145
11	93	105	162	430	1,125	1,920	458	70	70	180	102
12	93	105	180	430	1,345	1,920	485	70	80	162	130
13	93	105	198	430	1,565	1,870	380	70	80	145	145
14	93	105	215	430	1,785	1,630	310	70	80	145	145
15	93	105	232	430	2,020	1,580	290	70	70	145	162
16	93	105	232	405	1,935	1,970	310	90	70	145	145
17	93	105	232	405	1,835	1,772	250	102	90	145	130
18	93	105	215	380	1,735	1,488	232	130	70	145	130
19	93	105	215	380	1,635	1,488	250	115	70	115	145
20	93	105	215	380	1,535	1,300	198	115	70	102	145
21	93	105	215	430	1,300	1,392	232	120	70	80	145
22	93	105	215	430	1,300	1,300	250	120	70	90	145
23	93	105	215	485	1,440	1,255	198	120	102	145	145
24	93	105	232	545	1,770	1,255	162	125	102	145	145
25	93	105	250	610	1,870	990	145	125	90	145	145
26	93	105	270	680	2,120	948	162	130	90	145	145
27	93	105	290	680	1,920	545	145	130	115	145	145
28	93	105	310	680	2,060	645	145	198	90	130	145
29	105	.....	330	680	2,200	430	145	162	102	130	145
30	105	.....	330	680	2,340	430	162	115	130	102	145
31	105	.....	355	.....	2,480	.....	130	80	.....	90	.....

NOTE.—Discharge interpolated for days for which gage heights are missing.

Monthly discharge of Yampa River at Steamboat Springs, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January	105	73	91	5,578
February	105	93	101	5,617
March	355	105	203	12,482
April	680	380	482	28,780
May	2,480	680	1,450	89,141
June	2,640	430	1,700	101,129
July	515	130	298	18,305
August	198	70	106	6,510
September	145	70	89	5,282
October	545	80	190	11,693
November	180	102	139	8,249
The period	.....	.....	.....	292,766

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.

Records available.—April 30, 1904, to October 31, 1906; April 1, 1910, to November 30, 1911.

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

Discharge measurements of Yampa River at Craig, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 11[a]	C. L. Chatfield.....	3.60	263	June 28	C. L. Chatfield.....	4.62	2,440
May 23	.....do.....	5.10	3,460	July 11	.....do.....	3.40	973
28	.....do.....	5.80	4,470	Aug. 8	.....do.....	2.45	206
June 6	.....do.....	6.35	5,850	Sept. 23	.....do.....	2.20	131
23	.....do.....	5.56	3,970	Oct. 26	.....do.....	2.60	330

[a] Ice present.

Daily gage height, in feet, of Yampa River at Craig, Colo., for 1911.

[Fred A. Aiken, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	3.55	5.0	6.2	4.15	2.75	2.35	3.0	2.5
2	3.85	4.65	6.4	4.25	2.7	2.35	3.2	2.5
3	4.1	4.55	6.25	4.05	2.65	2.35	3.1	2.5
4	4.5	4.85	6.3	4.1	2.55	2.45	3.05	2.5
5	4.4	4.85	6.25	4.0	2.55	2.45	3.25	2.45
6	4.25	5.55	6.4	4.15	2.45	2.45	4.15	2.6
7	4.05	6.25	6.4	4.1	2.45	2.35	3.7	2.5
8	3.8	6.3	6.35	3.95	2.45	2.35	3.35	2.45
9	3.65	6.65	6.8	3.9	2.45	2.35	3.1	2.5
10	3.9	7.05	6.3	3.55	2.45	2.25	3.05	2.5
11	3.95	6.6	5.9	3.4	2.45	2.25	3.0	2.5
12	3.7	5.85	5.85	3.3	2.45	2.25	2.9	.....
13	3.55	5.8	6.0	3.2	2.45	2.25	2.9	.....
14	3.4	6.0	6.0	3.15	2.45	2.25	2.7	.....
15	3.35	6.3	5.85	3.1	2.45	2.25	2.7	.....
16	3.3	6.35	5.95	3.05	2.45	2.25	2.7	.....
17	3.35	6.45	6.65	3.05	2.45	2.25	2.7	.....
18	3.3	6.4	6.2	3.15	2.45	2.25	2.7	.....
19	3.35	6.35	6.0	3.05	2.35	2.25	2.7	.....
20	3.4	5.85	6.1	3.05	2.35	2.25	2.7	.....
21	3.45	5.65	5.9	3.0	2.35	2.2	2.6	2.5
22	3.6	5.1	5.9	2.95	2.7	2.2	2.6	2.55
23	4.1	5.2	5.55	3.0	2.55	2.2	2.6	.....
24	4.6	5.6	5.3	3.1	2.55	2.3	2.7	.....
25	4.75	5.75	5.15	2.95	2.55	2.4	2.7	.....
26	4.85	5.85	4.8	2.95	2.55	2.35	2.7	.....
27	5.2	5.9	4.7	2.9	2.55	2.3	2.6	.....
28	5.5	6.0	4.45	2.85	2.45	2.4	2.6	.....
29	5.75	6.05	4.4	2.85	2.35	2.4	2.6	.....
30	5.4	6.15	4.25	2.85	2.35	2.45	2.6	.....
31	.....	6.15	.....	2.75	2.35	.....	2.5	.....

Daily discharge, in second-feet, of Yampa River at Craig, Colo., for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	1,132	3,000	4,455	1,808	425	172	615	260
2	1,455	2,490	5,025	1,935	390	172	790	260
3	1,745	2,350	4,598	1,685	358	172	700	260
4	2,280	2,775	4,740	1,745	292	230	638	260
5	2,140	2,775	4,598	1,625	292	230	838	230
6	1,935	3,955	5,025	1,808	230	230	1,808	325
7	1,685	4,598	5,025	1,745	230	172	1,290	260
8	1,400	4,740	4,882	1,578	230	172	932	230
9	1,238	6,825	7,350	1,510	230	172	700	260
10	1,510	8,315	4,740	1,132	230	120	658	260
11	1,578	6,650	4,700	980	230	120	615	260
12	1,290	4,585	4,585	885	230	120	535	260
13	1,132	4,470	4,940	790	230	120	535	260
14	980	4,940	4,940	745	230	120	390	260
15	932	4,740	4,585	700	230	120	390	260
16	885	4,882	4,820	658	230	120	390	260
17	932	5,178	6,825	658	230	120	390	260
18	885	5,025	4,455	745	230	120	390	260
19	932	4,882	4,940	658	172	120	390	260
20	980	4,585	4,190	658	172	120	390	260
21	1,030	4,150	4,700	615	172	95	325	260
22	1,185	3,160	4,700	575	390	95	325	292
23	1,745	3,320	3,955	615	292	95	325	260
24	2,420	4,050	3,490	700	292	145	390	260
25	2,630	4,360	3,240	575	292	200	390	260
26	2,775	4,585	2,700	575	292	172	358	260
27	3,320	4,700	2,560	535	292	145	325	260
28	3,860	4,940	2,210	496	230	200	325	260
29	4,360	5,065	2,140	496	172	200	325	260
30	3,670	4,222	1,935	496	172	230	325	260
31	.....	4,222	.....	425	172	.....	260	.....

NOTE.—Discharge Nov. 12 to 20 and 23 to 30 interpolated.

Monthly discharge of Yampa River at Craig, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April	4,360	885	1,801	107,189
May	8,315	2,350	4,469	274,778
June	7,350	1,935	4,368	259,930
July	1,935	425	973	59,804
August	425	172	254	15,588
September	230	95	154	9,162
October	1,808	260	551	33,872
November	325	230	261	15,544
The period	.....	.....	.....	775,867

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, 1911.

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

Gage.—Chain.

Channel.—Practically permanent.

Discharge measurements.—Made from the bridge.

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 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Aug. 14	C. L. Chatfield	0.72	196
Oct. 8	.....do	2.50	1,290

Daily gage height, in feet, of Yampa River near Maybell, Colo., for 1911.

[Peter Farrell, observer.]

Day.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	3.95	1.1	0.9	0.95	1.2
2	.....	3.8	1.0	1.0	1.1	1.05
3	.....	3.75	1.0	1.1	1.45	.9
4	.....	3.65	.9	.9	1.85	.95
5	5.4	3.55	.8	.85	2.3	1.3
6	5.75	3.4	.65	.9	2.9	1.45
7	5.45	3.35	.65	.85	3.15	1.5
8	5.5	3.05	.55	.75	3.35	1.2
9	5.55	3.0	.55	.8	3.25	1.15
10	5.8	2.95	.5	.85	3.15	1.05
11	5.65	2.9	.5	.65	3.4	1.0
12	5.5	2.85	.65	.6	3.15	.9
13	5.1	2.8	.6	.85	3.05	1.05
14	5.05	2.8	.7	.8	2.85	1.15
15	5.5	2.8	.75	.65	3.4	1.2
16	6.0	2.75	.75	.7	3.5	1.1
17	5.0	2.7	.7	.75	3.15	1.1
18	4.9	2.6	.8	.8	2.95	1.2
19	4.85	2.5	1.0	.85	2.8	1.45
20	4.8	2.25	1.05	.9	2.75	1.6
21	4.6	2.1	.9	1.15	2.45	1.8
22	4.65	1.8	.85	1.25	2.3	1.7
23	4.55	1.7	.9	1.55	2.25	1.35
24	4.85	1.65	.75	1.4	2.1	1.3
25	4.85	1.65	.75	1.15	1.9	1.2
26	4.75	1.5	.9	.9	1.75	1.45
27	4.7	1.55	.95	.85	1.65	1.6
28	4.4	1.4	.85	.85	1.35	1.5
29	3.45	1.35	.8	.8	1.25	1.35
30	3.95	1.2	.7	.85	1.2	1.3
31	.....	1.1	.75	.....	1.15	.....

NOTE.—Gage heights affected by ice Nov. 18 to 30.

Daily discharge, in second-feet, of Yampa River near Maybell, Colo., for 1911.

Day.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	2,935	345	255	278	395
2	.....	2,740	300	300	345	322
3	.....	2,675	300	345	530	255
4	.....	2,548	255	255	780	445
5	4,960	2,422	215	235	1,120	445
6	5,480	2,340	165	255	1,680	530
7	5,032	2,282	165	235	1,955	560
8	5,105	1,845	138	198	2,282	395
9	5,180	1,790	138	215	2,168	370
10	5,555	1,735	125	235	1,955	322
11	5,330	1,680	125	165	2,340	300
12	5,105	1,628	165	150	1,955	255
13	4,525	1,575	150	235	1,845	322
14	4,452	1,575	180	215	1,628	370
15	5,105	1,575	198	165	2,340	395
16	5,855	1,525	198	180	2,360	345
17	4,380	1,475	180	198	1,955	345
18	4,235	1,380	215	215	1,735	395
19	4,162	1,290	300	235	1,575	395
20	4,090	1,080	322	255	1,475	395
21	3,805	965	255	370	1,248	395
22	3,875	745	235	420	1,120	395
23	3,738	680	255	590	1,080	395
24	4,162	650	198	500	965	395
25	4,162	650	198	370	815	395
26	4,018	560	255	255	712	395
27	3,945	590	278	235	650	395
28	3,535	500	235	235	472	395
29	2,400	472	215	215	420	395
30	2,935	395	180	235	395	395
31	.....	345	198	.....	370	.....

NOTE.—Discharge estimated Nov. 18 to 30 because of presence of ice.

Monthly discharge of Yampa River near Maybell, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
June 5–30	5,855	2,400	4,428	228,353
July	2,935	345	1,440	89,556
August	345	125	216	13,252
September	590	150	266	15,800
October	2,360	278	1,308	80,426
November	560	255	384	22,822
The period	.....	.....	.....	449,209

SODA CREEK AT STEAMBOAT SPRINGS, COLO.

Location.—At the Main Street Bridge at Steamboat Springs, below all tributaries, the nearest being a small creek that enters from the east about 2 miles above.

Records available.—June 8, 1910, to August 31, 1911.

Drainage area.—47 square miles (State engineer's report).

Gage.—Chain gage.

Channel.—Practically permanent.

Discharge measurements.—Made from highway bridge.

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

Discharge measurements of Soda Creek at Steamboat Springs, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 21	C. L. Chatfield		[a] 2.5	July 24	C.L. Chatfield	1.30	17
May 16	do	2.80	297	Aug. 29	do	.80	.83
20	do	2.35	153	Sept. 13	do	.85	1.12
22	do	2.22	124	Oct. 31	do	1.20	8.4
June 17	do	2.52	225				

[a] Estimated.

Daily gage height, in feet, and discharge, in second-feet, of Soda Creek at Steamboat Springs, Colo., for 1911.

Day.	May.		June.		July.		August.	
	Gage height.	Discharge.	Gage height	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1			2.7	270	2.1	100	1.1	8
2			2.45	185	1.9	69	1.05	6.5
3			2.75	290	1.9	69	1.0	5
4			2.9	350	1.85	63	1.0	5
5			2.9	350	1.9	69	.9	2.5
6			2.8	310	1.9	69	.9	2.5
7			3.05	410	1.8	57	.85	1.8
8			2.95	370	1.8	57	.8	1
9			2.85	330	1.7	47	.8	1
10			2.7	270	1.7	47	.8	1
11			2.75	290	1.7	47	.8	1
12			2.75	290	1.7	47	.8	1
13			2.7	270	1.7	47	.8	1
14			2.9	350	1.6	38	.8	1
15	2.9	350	3.1	430	1.5	30	.8	1
16	2.8	310	3.4	560	1.5	30	.8	1
17	2.8	310	3.0	395	1.5	30	.8	1
18	2.5	200	3.0	395	1.45	26	.8	1
19		180	3.15	450	1.4	23	.8	1
20	2.35	158	3.05	410	1.4	23	.8	1
21	2.2	120	2.9	350	1.4	23	.8	1
22	2.2	120	3.1	430	1.4	23	.9	2.5
23	2.55	218	2.8	310	1.3	17	.95	3.8
24	2.55	218	2.45	185	1.3	17	.9	2.5
25	2.65	252	2.25	132	1.2	17	.9	2.5
26	2.7	252	2.45	185	1.2	12	.9	2.5
27	2.7	270	2.35	158	1.2	12	.9	2.5
28	2.65	252	2.3	145	1.1	8	.9	2.5
29	2.6	235	2.1	100	1.1	8	.9	2.5
30	2.75	290	2.05	92	1.1	8	.9	2.5
31	2.7	290			1.1	8	.9	2.5

NOTE.—Discharge May 19 interpolated.

Monthly discharge of Soda Creek at Steamboat Springs, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
May 15–31	350	120	237	7,984
June	560	92	302	17,954
July	100	8	37	2,253
August	8	1	2.3	142
The period				28,333

ELK RIVER NEAR CLARK, COLO.

Location.—At Kinney's ranch, 2 miles above Clark post office, Colo.
Records available.—May 1, 1910, to September 30, 1911.
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 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 and Construction Co.

Discharge measurements of Elk River near Clark, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 20[a]	C. L. Chatfield		62	July 22	C. L. Chatfield	3.50	399
June 11	do	5.05	1,440	23	do	3.30	345
19	do	5.05	1,450	Sept. 18	do	2.15	58

[a] Ice conditions.

Daily gage height, in feet, and discharge, in second-feet, of Elk River near Clark, Colo., for 1911.

[H. S. Deane, observer.]

Day.	June.		July.		August.		September.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	5.4	1,780	4.0	640	3.0	250	2.35	122
2	5.2	1,580	4.1	700	2.95	238	2.35	122
3	5.35	1,730	4.05	670	2.9	225	2.35	122
4	5.45	1,830	4.0	640	2.8	205	2.35	122
5	5.4	1,780	4.0	640	2.8	205	2.35	122
6	5.3	1,680	3.9	585	2.7	185	2.35	122
7	5.2	1,580	3.8	535	2.7	185	2.3	115
8	5.9	2,335	3.7	490	2.7	185	2.3	115
9	5.4	1,780	3.5	405	2.7	185	2.3	115
10	5.3	1,680	3.5	405	2.65	175	2.3	115
11	5.35	1,730	3.5	405	2.65	175	2.3	115
12	5.4	1,780	3.45	388	2.65	175	2.3	115
13	5.4	1,780	3.4	370	2.6	165	2.3	115
14	5.4	1,780	3.4	370	2.6	165	2.4	130
15	5.5	1,880	3.4	370	2.6	165	2.45	138
16	6.0	2,460	3.4	370	2.6	165	2.4	130
17	5.3	1,680	3.3	335	2.6	165	2.3	115
18	5.2	1,580	3.3	335	2.55	155	2.25	108
19	5.1	1,480	3.3	335	2.55	155	2.25	108
20	5.1	1,480	3.3	335	2.55	155	2.2	100
21	5.1	1,480	3.2	305	2.6	165	2.25	108
22	5.1	1,480	3.45	388	2.7	185	2.2	100
23	5.0	1,380	3.4	370	2.7	185	2.2	100
24	5.0	1,380	3.3	335	2.5	145	2.2	100
25	4.85	1,245	3.2	305	2.4	130	2.2	100
26	4.55	1,000	3.2	305	2.4	130	2.15	92
27	4.1	700	3.2	305	2.4	130	2.15	92
28	4.1	700	3.15	290	2.4	130	2.15	92
29	4.05	670	3.15	290	2.35	122	2.15	92
30	4.0	640	3.1	275	2.35	122	2.6	165
31			3.05	262	2.35	122		

Monthly discharge of Elk River near Clark, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
June	2,460	640	1,535	91,359
July	700	262	411	25,296
August	250	122	169	10,401
September	165	92	114	6,758
The period				133,814

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 November 30, 1911.

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

Discharge measurements of Elk River near Trull, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 17[a]	C. L. Chatfield		93	July 24	Chatfield and Turner.	6.0	375
May 16	do	8.98	2,720	Aug. 31	do	5.07	91
June 7	Chatfield and Turner.	9.1	2,880	Sept. 15	do	5.12	102

[a] Ice conditions.

Daily gage height, in feet, of Elk River near Trull, Colo., for 1911.

[Fred O. Smith, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1		6.0	7.35	8.9	7.4	5.65	5.0	6.6	5.3
2		6.15	7.25	8.9	7.4	5.65	5.0	6.5	5.2
3		6.35	7.25	8.75	7.25	5.55	5.0	6.25	5.1
4		6.55	7.75	8.8	7.3	5.5	5.15	5.8	5.2
5		6.4	8.45	9.05	7.2	5.5	5.1	6.7	5.1
6		6.3	8.9	9.15	7.25	5.4	5.1	7.4	5.1
7		6.15	8.7	9.05	7.05	5.35	5.1	7.1	5.1
8		6.3	9.2	9.65	6.95	5.35	5.1	6.9	5.1
9		6.2	9.5	9.3	6.75	5.4	5.1	6.25	5.1
10		6.25	9.3	8.45	6.5	5.4	5.0	5.95	.....
11		6.25	8.4	8.4	6.45	5.4	5.0	5.8	.....
12		6.1	8.15	8.75	6.3	5.4	5.0	5.8	.....
13		5.9	8.5	8.8	6.3	5.3	5.05	5.7	.....
14		5.8	8.45	8.75	6.3	5.3	5.1	5.5	.....
15		5.7	9.05	8.75	6.2	5.3	5.1	5.5	5.35

Daily gage height, in feet, of Elk River near Trull, Colo., for 1911—Continued.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
16	.....	5.7	8.95	8.9	6.15	5.3	5.05	5.5	5.35
17	.....	5.9	8.85	9.25	6.2	5.3	5.0	5.4	5.3
18	.....	6.05	8.95	8.75	6.2	5.25	5.0	5.4	5.3
19	.....	6.15	8.45	9.1	6.15	5.3	5.0	5.4	5.3
20	5.5	6.4	8.0	8.95	6.05	.....	4.95	5.35	.....
21	5.5	6.6	7.65	8.7	6.0	.....	5.0	5.3	.....
22	5.5	6.8	7.6	8.8	6.05	5.3	5.2	5.4	.....
23	5.45	7.0	7.75	8.35	6.05	5.3	5.3	5.4	.....
24	5.6	7.15	8.25	8.2	6.0	5.3	5.3	5.3	.....
25	5.5	7.35	8.3	7.85	5.9	5.3	5.3	5.3	.....
26	5.4	7.6	8.4	7.8	5.8	5.3	5.35	5.3	.....
27	5.3	7.95	8.1	7.6	5.9	5.3	5.3	5.3	.....
28	5.3	8.2	8.0	7.65	5.8	5.2	5.25	5.25	.....
29	5.35	8.15	8.35	7.65	5.8	5.1	5.25	5.2	.....
30	5.45	7.95	8.3	7.35	5.7	5.1	5.3	5.2	.....
31	5.7	.....	8.65	.....	5.7	5.0	.....	5.2	.....

Daily discharge, in second-feet, of Elk River near Trull, Colo., for 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	388	1,220	2,670	1,258	251	80	700	148
2	.....	458	1,145	2,670	1,258	251	80	642	122
3	.....	559	1,145	2,511	1,145	219	80	507	100
4	.....	671	1,540	2,564	1,182	204	111	304	122
5	.....	586	2,199	2,834	1,108	204	100	762	100
6	.....	532	2,670	2,947	1,145	174	100	1,258	100
7	.....	458	2,458	2,834	1,000	161	100	1,036	100
8	.....	532	3,004	3,526	929	161	100	894	100
9	.....	482	3,352	3,120	795	174	100	507	100
10	.....	507	3,120	2,199	642	174	80	366	122
11	.....	507	2,148	2,148	614	174	80	304	122
12	.....	434	1,902	2,511	532	174	80	304	122
13	.....	344	2,250	2,564	532	145	90	268	122
14	.....	304	2,199	2,511	532	148	100	204	122
15	.....	268	2,834	2,511	482	148	100	204	161
16	.....	268	2,724	2,670	458	148	90	204	161
17	.....	344	2,617	3,062	482	148	80	174	148
18	.....	411	2,724	2,511	482	135	80	174	148
19	.....	458	2,199	2,890	458	148	80	174	148
20	204	586	1,760	2,724	411	148	71	161	148
21	204	700	1,457	2,458	388	148	80	148	148
22	204	828	1,416	2,564	411	148	122	174	148
23	189	964	1,540	2,098	411	148	148	174	148
24	234	1,072	1,999	1,950	388	148	148	148	148
25	204	1,220	2,048	1,626	344	148	148	148	148
26	174	1,416	2,148	1,582	304	148	161	148	148
27	148	1,715	1,854	1,416	344	148	148	148	148
28	148	1,950	1,760	1,457	304	122	135	135	148
29	161	1,902	2,098	1,457	304	100	135	122	148
30	189	1,715	2,048	1,220	268	100	148	122	148
31	268	.....	2,406	.....	268	80	.....	122	.....

NOTE.—Daily discharge for days for which gage heights are missing obtained by interpolation and from climatologic records.

Monthly discharge of Elk River near Trull, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
March 20-31	268	148	194	4,616
April	1,950	268	753	44,785
May	3,352	1,145	2,128	130,877
June	3,526	1,220	2,394	142,423
July	1,258	268	619	38,041
August	251	80	159	9,779
September	161	71	105	6,258
October	1,258	122	347	21,295
November	161	100	133	7,926
The period				406,000

TROUT CREEK AT PINNACLE, COLO.

Location.—One-fourth mile above Pinnacle, in Routt County, Colo.
Records available.—April 9, 1910, to December 31, 1911.
Drainage area.—27 square miles (State engineer's report).
Gage.—Vertical staff.
Channel.—Permanent.
Discharge measurements.—Made by wading.
Winter flow.—Ice causes backwater and the records are discontinued during the winter months.
Diversions.—No data.
Cooperation.—Station maintained by the State engineer, who furnishes the records complete for publication.

Discharge measurements of Trout Creek at Pinnacle, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 23[a]	C. L. Chatfield	1.80	11	Aug. 26	C. L. Chatfield	1.87	13
May 26	C. E. Turner	2.50	65.8	Oct. 28	do	1.78	9.7
July 15	C. L. Chatfield	1.95	19.7				

[a] Ice conditions.

Daily gage height, in feet, of Trout Creek at Pinnacle, Colo., for 1911.

[Mrs. D. M. Chapman, observer.]

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1			1.75	1.9	2.75	2.2	1.9	1.8	1.9	1.8	1.8
2			1.75	1.9	2.9	2.1	1.9	1.8	1.85	1.8	1.8
3			1.8	1.95	2.7	2.1	1.9	1.8	1.9	1.8	1.8
4			1.8	2.00	2.7	2.1	1.9	1.85	1.95	1.8	1.8
5		1.7	1.8	2.1	2.8	2.1	1.85	1.85	2.05	1.7	1.8
6		1.7	1.8	2.2	2.8	2.1	1.8	1.8	1.95	1.7	1.8
7		1.75	1.8	2.25	2.9	2.1	1.8	1.8	1.95	1.7	1.8
8		1.75	1.75	2.3	3.0	2.1	1.8	1.8	1.95	1.7	1.7
9		1.75	1.8	2.4	2.85	2.05	1.8	1.8	1.9	1.95	1.8
10		1.75	1.8	2.1	2.65	2.0	1.8	1.8	1.9	1.95	1.8
11		1.8	1.8	2.1	2.65	2.0	1.9	1.8	1.9	1.95	1.8
12		1.7	1.8	2.15	2.7	2.0	1.85	1.8	1.85	1.8	1.8
13		1.75	1.7	2.25	2.65	1.95	1.85	1.8	1.85	1.8	1.8
14		1.7	1.7	2.4	2.6	1.9	1.85	1.8	1.8	1.8	1.8
15		1.75	1.8	2.4	2.4	1.95	1.85	1.8	1.8	1.8	1.8

Daily gage height, in feet, of Trout Creek at Pinnacle, Colo., for 1911—Continued.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
16	.....	1.75	1.8	2.4	2.4	1.95	1.8	1.8	1.8	1.95	1.8
17	.....	1.75	1.8	2.4	2.35	1.95	1.8	1.8	1.75	1.9	1.8
18	.....	1.75	1.8	2.45	2.4	1.95	1.8	1.8	1.7	1.8	1.8
19	.....	1.75	1.85	2.25	2.4	1.9	1.8	1.8	1.7	1.8	1.8
20	.....	1.75	1.9	2.2	2.4	1.9	1.8	1.8	1.7	1.8	1.8
21	.....	1.7	1.9	2.2	2.35	1.9	1.8	1.8	1.9	1.8	1.8
22	.....	1.7	1.9	2.2	2.4	1.9	1.85	1.75	2.4	1.8	1.8
23	1.80	1.7	1.9	2.3	2.3	1.9	1.9	1.8	2.15	1.8	1.8
24	.....	1.8	1.9	2.35	2.3	1.9	1.9	1.8	1.8	1.8	1.8
25	.....	1.7	1.9	2.5	2.25	1.9	1.9	1.8	1.8	1.8	1.8
26	.....	1.7	1.9	2.5	2.25	1.9	1.85	1.8	1.85	1.8	1.8
27	.....	1.8	2.0	2.4	2.25	1.9	1.85	1.8	1.8	1.8	1.8
28	.....	1.7	2.0	2.4	2.25	1.9	1.85	1.8	1.8	1.8	1.8
29	.....	1.75	2.0	2.5	2.2	1.9	1.85	1.8	1.8	1.8	1.8
30	.....	1.75	2.0	2.6	2.2	1.9	1.8	1.8	1.8	1.8	1.8
31	.....	1.75	.....	2.7	.....	1.9	1.8	.....	1.8	.....	1.8

NOTE.—Ice affected the gage height on Feb. 23, and it is quite probable that there was a slight effect until Mar. 4.

Daily discharge, in second-feet, of Trout Creek at Pinnacle, Colo., for 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	9	9	17	159	49	17	11	17	11	11
2	9	9	17	202	36	17	11	14	11	11
3	9	11	21	145	36	17	11	17	11	11
4	9	11	25	145	36	17	14	21	11	11
5	7	11	36	173	36	14	14	30	7	11
6	7	11	49	173	36	11	11	21	7	11
7	9	11	56	202	36	11	11	21	7	11
8	9	9	64	232	36	11	11	21	7	7
9	9	11	80	188	30	11	11	17	21	11
10	9	11	36	132	25	11	11	17	21	11
11	11	11	36	132	25	17	11	17	21	11
12	7	11	42	145	25	14	11	14	11	11
13	9	7	56	132	21	14	11	14	11	11
14	7	7	80	120	17	14	11	11	11	11
15	9	11	80	80	21	14	11	11	11	11
16	9	11	80	80	21	11	11	11	21	11
17	9	11	80	72	21	11	11	9	17	11
18	9	11	89	80	21	11	11	7	11	11
19	9	14	56	80	17	11	11	7	11	11
20	9	17	49	80	17	11	11	7	11	11
21	7	17	49	72	17	11	11	17	11	11
22	7	17	49	80	17	14	9	80	11	11
23	7	17	64	64	17	17	11	42	11	11
24	11	17	72	64	17	17	11	11	11	11
25	7	17	98	56	17	17	11	11	11	11
26	7	17	98	56	17	14	11	14	11	11
27	11	25	80	56	17	14	11	11	11	11
28	7	25	80	56	17	14	11	11	11	11
29	9	25	98	49	17	14	11	11	11	11
30	9	25	120	49	17	11	11	11	11	11
31	9	.....	145	.....	17	11	.....	11	.....	11

NOTE.—Daily discharge estimated Mar. 1 to 4 because of ice.

Monthly discharge of Trout Creek at Pinnacle, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
March	11	7	8.5	526
April	25	7	14	827
May	145	17	65	3,971
June	232	49	112	6,653
July	49	17	24	1,486
August	17	11	14	831
September	14	9	11	662
October	80	7	17	1,059
November	21	7	12	714
December	11	7	11	668
The period				17,397

FISH CREEK AT DUNKLEY, COLO.

Location.—At wagon bridge one-fourth mile below Dunkley, in Routt County, Colo., near the center of T. 4 N., R. 87 W., and the northern boundary of the White River National Forest.

Records available.—April 8, 1910, to November 30, 1911.

Drainage area.—29 square miles (State engineer's report).

Gage.—Vertical staff.

Channel.—Practically permanent.

Cooperation.—Records are furnished complete for publication by the State engineer, who maintains the station in cooperation with the Williams River Highline Irrigation Co.

Discharge measurements of Fish Creek at Dunkley, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 10	C. L. Chatfield		8
May 27	C. E. Turner	2.70	19.6
July 13	C. L. Chatfield	2.00	15
Aug. 26	do	1.95	1.38

Daily gage height, in feet, of Fish Creek at Dunkley, Colo., for 1911.

[R. S. Bird, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1		2.95	3.0	2.5	2.45	2.2	2.0	2.8	2.1
2		2.9	3.0	2.55	2.55	2.15	2.0	2.7	2.2
3		2.9	3.2	2.5	2.5	2.1	2.0	2.5	2.15
4		2.9	3.4	2.4	2.6	2.2	2.0	2.35	2.1
5	2.7	3.0	3.4	2.45	2.4	2.1	2.0	3.0	2.1
6	3.2	2.8	4.3	2.35	2.35	2.2	2.0	2.9	2.1
7	3.3	2.9	4.7	2.4	2.4	2.1	2.0	2.8	2.2
8	3.3	2.85	5.3	2.4	2.25	2.1	2.0	2.6	2.15
9	3.3	2.7	5.85	2.4	2.05	2.1	2.0	2.4	2.1
10	5.15	2.65	6.05	2.4	2.0	2.0	2.0	2.4	2.05
11	4.8	2.5	6.0	2.35	2.1	2.0	2.0	2.3	2.1
12	3.0	2.5	5.45	2.4	2.1	2.0	2.0	2.3	2.0
13	3.0	2.3	4.75	2.3	2.2	2.0	2.0	2.2	2.0
14	2.5	2.3	4.1	2.4	2.4	2.0	2.0	2.2	2.0
15	2.4	2.1	4.25	2.5	2.45	2.0	2.0	2.2	2.05
16	2.55	2.1	4.2	3.0	2.6	2.0	2.0	2.2	2.0
17	2.65	2.1	4.2	3.0	2.5	2.0	2.0	2.15	2.0
18	3.05	2.05	4.05	3.0	2.35	2.0	2.0	2.1	2.0
19	2.7	1.9	3.95	3.0	2.2	1.95	2.0	2.0	2.0
20	2.8	2.05	3.85	3.05	2.2	2.0	2.0	2.0	1.9

Daily gage height, in feet, of Fish Creek at Dunkley, Colo., for 1911—Continued.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
21	2.85	2.1	3.9	2.95	2.1	2.0	2.0	2.0	1.95
22	2.8	2.15	3.7	2.9	2.1	2.0	2.05	2.2	2.0
23	2.75	2.1	3.55	2.9	2.0	2.0	2.2	2.1	1.9
24	2.65	2.2	3.3	2.7	2.05	2.0	2.1	2.15	1.95
25	2.5	2.7	3.05	2.45	2.0	2.0	2.05	2.2	1.9
26	2.7	2.85	2.8	2.45	2.1	2.0	2.0	2.1	1.9
27	2.7	3.7	2.75	2.4	2.1	2.0	2.0	2.1	1.9
28	2.8	4.1	2.65	2.25	2.1	2.0	2.1	2.1	1.9
29	2.8	4.0	2.6	2.3	2.1	2.0	2.1	2.1	1.95
30	2.95	3.0	2.5	2.3	2.1	1.95	2.1	2.1	1.9
31	2.95	.....	2.55	.....	2.15	2.0	.....	2.1	.....

Daily discharge, in second-feet, of Fish Creek at Dunkley, Colo., for 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	15	25	26	17	7	3	1	11	2
2	15	24	26	18	9	2	1	10	3
3	15	24	30	17	8	2	1	7	2
4	20	24	35	16	10	3	1	4	2
5	20	26	35	16	7	2	1	15	2
6	30	22	60	15	5	3	1	13	2
7	32	24	74	16	6	2	1	11	3
8	32	23	98	16	4	2	1	8	2
9	60	20	124	16	2	2	1	5	2
10	92	20	134	16	1	1	1	5	2
11	78	17	131	13	2	1	1	4	2
12	26	17	104	14	2	1	1	4	1
13	26	14	76	13	3	1	1	3	1
14	17	14	53	14	4	1	1	3	1
15	16	11	58	15	6	1	1	3	2
16	18	11	56	22	8	1	1	3	1
17	20	11	56	22	7	1	1	2	1
18	27	10	52	22	4	1	1	2	1
19	20	8	48	22	3	1	1	1	1
20	22	10	46	23	3	1	1	1	.5
21	23	11	47	19	2	1	1	1	1
22	22	12	42	18	2	1	1	3	1
23	21	11	38	18	1	1	3	2	.5
24	20	12	32	14	2	1	2	2	1
25	17	20	27	11	1	1	1	3	.5
26	20	23	22	9	2	1	1	2	.5
27	20	42	21	8	2	1	1	2	.5
28	22	53	20	6	2	1	2	2	.5
29	22	50	19	7	2	1	2	2	1
30	25	26	17	7	2	1	2	2	.5
31	25	.....	18	.....	2	1	.....	2	.....

NOTE.—Daily discharge Mar. 1 to 4 estimated by interpolation.

Monthly discharge of Fish Creek at Dunkley, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
March	92	15	27	1,662
April	53	8	20	1,220
May	134	17	52	3,223
June	23	6	15	912
July	10	1	3.9	240
August	3	1	1.4	85
September	3	1	1.2	71
October	15	1	4.5	274
November	3	.5	1.4	80
The period				7,767

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, 1911.

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

Gage.—Chain gage.

Channel.—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.—Station maintained and records furnished complete for publication by the State engineer.

Discharge measurements of Elk Head Creek near Craig, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 11	C. L. Chatfield	.....	14	June 22	C. L. Chatfield	5.20	114
May 23	do	7.14	464	July 13	do	4.23	12.5
June 6	Chatfield and Turner	5.73	175	Sept. 22	do	3.50	0.

Daily gage height, in feet, of Elk Head Creek near Craig, Colo., for 1911.

[W. F. Harrison, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	7.2	7.75	6.3	4.25	4.0	3.4	4.25	4.0
2	6.45	7.5	6.15	4.35	3.95	3.4	4.25	4.0
3	7.0	7.55	6.05	4.35	3.9	3.5	4.5	4.0
4	6.85	7.95	5.95	4.35	3.85	3.5	4.55	4.0
5	6.45	9.3	5.8	4.3	3.8	3.4	4.7	4.0
6	6.1	9.7	5.7	4.4	3.8	3.4	5.1	4.0
7	6.35	9.95	5.7	4.4	3.8	3.4	4.7	4.0
8	6.5	10.2	5.6	4.35	3.7	3.4	4.35	4.0
9	6.6	10.35	5.5	4.35	3.7	3.5	4.2	4.0
10	6.05	9.1	5.5	4.3	3.7	3.5	4.0	4.0
11	5.75	7.95	5.35	4.3	3.7	3.5	4.0	4.1
12	5.5	8.05	5.2	4.2	3.7	3.4	4.0	4.1
13	5.45	8.15	5.2	4.2	3.7	3.4	4.0	4.1
14	5.15	8.6	5.1	4.25	3.7	3.4	4.0	4.2
15	5.15	8.55	4.95	4.0	3.7	3.4	4.0	4.2
16	5.2	9.0	.....	4.0	3.7	3.4	4.0	4.2
17	5.2	8.8	5.9	4.05	3.7	3.4	3.95	4.0
18	5.5	8.7	5.45	4.2	3.7	3.4	3.85	4.1
19	5.6	8.3	5.6	4.15	3.7	3.4	4.0	4.0
20	6.49	7.2	5.45	4.15	3.7	3.4	4.0	4.1
21	6.6	6.85	5.2	4.4	3.7	3.4	4.0	4.0
22	6.9	6.8	5.45	4.3	3.7	3.4	4.1	4.0
23	7.25	7.1	5.0	4.2	3.7	3.4	4.15	4.0
24	7.3	7.25	4.9	4.2	3.7	3.4	4.0	4.0
25	7.9	7.35	4.75	4.2	3.65	3.5	4.0	4.0
26	8.45	7.3	4.6	4.2	3.55	3.5	4.1	.....
27	9.0	6.85	4.45	4.1	3.55	3.5	4.1	.....
28	8.75	6.65	4.35	4.1	3.5	3.5	4.1	.....
29	7.9	6.55	4.3	4.05	3.5	3.7	4.0	.....
30	8.4	6.4	4.2	4.0	3.5	3.7	4.0	.....
31	.....	6.35	.....	4.0	3.5	.....	.....	.....

Daily discharge, in second-feet, of Elk Head Creek near Craig, Colo., for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	462	578	284	18	6	0	18	6
2	312	525	256	24	4	0	18	6
3	422	536	238	24	3	0	34	6
4	392	621	220	24	2	0	38	6
5	312	942	195	21	1	0	50	6
6	247	1,045	179	27	1	0	94	6
7	294	1,110	179	27	1	0	50	6
8	322	1,178	163	24	0.5	0	24	6
9	342	1,218	148	24	.5	0	15	6
10	238	892	148	21	.5	0	6	6
11	187	621	127	21	.5	0	6	10
12	148	643	107	15	.5	0	6	10
13	141	666	107	15	.5	0	6	10
14	100	770	94	18	.5	0	6	15
15	100	758	75	6	.5	0	6	15
16	107	867	144	6	.5	0	6	15
17	107	818	212	8	.5	0	4	6
18	148	794	141	15	.5	0	2	10
19	163	700	163	12	.5	0	6	6
20	312	462	141	12	.5	0	6	10
21	342	392	107	27	.5	0	6	6
22	402	382	141	21	.5	0	10	6
23	472	442	81	15	.5	0	12	6
24	483	472	69	15	.5	0	6	6
25	610	494	54	15	.2	0	6	6
26	734	483	41	15	0	0	10	6
27	867	392	30	10	0	0	10	6
28	806	352	24	10	0	0	10	6
29	610	332	21	8	0	0.5	6	6
30	723	303	15	6	0	.5	6	6
31	.....	294	.....	6	0	.....	6	.....

NOTE.—Discharge for days for which gage heights are missing determined by interpolation.

Monthly discharge of Elk Head Creek near Craig, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April	867	100	364	21,660
May	1,218	294	648	39,832
June	284	15	130	7,743
July	27	6	16	1,012
August	6	0	.9	54
September	.5	0	.03	2
October	94	2	16	970
November	15	6	7.6	450
The period	.....	.....	.....	71,723

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 November 30, 1911.

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

Gage.—Chain gage.

Channel.—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 is maintained and records furnished complete for publication by the State engineer.

Discharge measurements of Fortification Creek at Craig, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 12[a]	C. L. Chatfield	.....	8.5	June 23	C. L. Chatfield	3.75	42
Mar. 10[a]	E. S. Foote	9.90	375	July 13	do	.....	[b]5
May 24	C. L. Chatfield	4.47	100	Aug. 8	do	.....	.0
June 6	Chatfield and Turner	3.70	37	Sept. 22	do	.....	.0

[a] Ice conditions. [b] Estimated.

Daily gage height, in feet, of Fortification Creek at Craig, Colo., for 1911.

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

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Oct.	Nov.
1	.....	4.4	4.85	3.95	2.7	.....	4.9	.....
2	.....	4.7	4.55	4.0	2.6	.....	3.9	.....
3	.....	4.7	4.45	3.9	2.6	.....	4.7	.....
4	.....	4.8	4.6	3.6	2.6	.....	3.7	.....
5	.....	4.55	5.45	3.75	2.65	.....	5.85	.....
6	.....	4.0	6.35	3.65	2.6	.....	5.55	.....
7	.....	3.85	6.35	3.55	2.6	.....	4.15	.....
8	11.1	3.65	6.5	3.6	2.6	.....	3.45	.....
9	10.25	3.8	6.9	3.6	.....	.....	3.2	.....
10	10.5	4.0	6.85	3.5	.....	.....	3.1	.....
11	8.5	4.15	5.8	3.45	.....	.....	3.1	.....
12	5.5	3.8	5.2	3.3	.....	.....	3.0	.....
13	5.05	3.6	5.05	3.25	.....	.....	2.95	.....
14	5.05	3.45	5.1	4.6	.....	.....	2.8	.....
15	5.0	3.35	5.2	3.8	.....	.....	2.8	.....
16	5.8	3.35	5.2	3.5	.....	.....	2.8	.....
17	5.95	3.45	5.1	4.05	3.15	.....	2.8	.....
18	4.85	3.65	5.1	3.95	.....	.....	.....	.....
19	5.45	3.95	4.8	4.25	.....	.....	.....	.....
20	5.45	4.2	4.35	3.85	.....	.....	.....	.....
21	6.2	4.45	4.05	3.85	.....	4.75	.....	3.4
22	5.7	4.7	4.2	3.9	.....	4.55	.....	3.35
23	5.45	4.9	4.1	3.75	.....	3.15	.....	3.35
24	4.85	5.0	4.4	3.6	.....	.....	.....	3.35
25	4.4	5.05	4.4	3.45	.....	.....	.....	3.35
26	3.65	4.95	4.25	3.3	.....	.....	.....	3.3
27	3.5	5.4	4.25	3.3	.....	.....	.....	3.5
28	3.75	5.65	4.0	3.05	.....	.....	.....	.....
29	3.8	5.95	3.9	3.05	.....	.....	.....	.....
30	4.4	4.85	3.8	2.7	.....	.....	.....	.....
31	4.75	.....	3.8	.....	.....	.....	.....	.....

NOTE.—Ice affected the gage heights Mar. 8 to 11.

Daily discharge, in second-feet, of Fortification Creek at Craig, Colo., for 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	95	125	55	10	0	0	82	12
2	.....	115	105	60	5	0	0	34	12
3	.....	115	100	50	5	0	0	70	12
4	.....	120	110	35	5	0	0	27	12
5	.....	105	165	40	5	0	0	152	12
6	.....	75	250	40	5	0	0	128	12
7	.....	70	250	30	3	0	0	44	12
8	500	60	270	40	2	0	0	20	12
9	410	65	320	40	.5	0	0	13	12
10	450	75	310	35	.5	0	0	11	12
11	220	85	195	30	.5	0	0	11	15
12	170	65	150	25	.5	0	0	9	15
13	135	55	135	25	.5	0	0	8	15
14	135	50	140	80	.5	0	0	6	15
15	135	45	150	40	.5	0	0	6	15
16	195	45	150	35	.5	0	0	6	15
17	210	50	140	55	13	0	0	6	15
18	125	60	140	50	1	0	0	6	15
19	165	75	120	60	1	0	0	6	15
20	165	85	90	50	1	0	0	6	15
21	235	100	80	50	.5	75	0	6	18
22	190	115	85	50	.5	60	0	6	16
23	165	125	80	45	.5	10	0	6	16
24	125	135	95	35	.5	0	0	6	16
25	95	135	95	30	.5	0	0	6	16
26	60	130	80	25	0	0	0	6	15
27	50	160	80	25	0	0	0	6	15
28	60	185	65	20	0	0	0	6	15
29	65	210	60	20	0	0	0	6	15
30	95	125	50	10	0	0	0	6	15
31	115	.....	50	.....	0	0	.....	6	.....

NOTE.—Daily discharge estimated Mar. 8 to 11 on account of ice. Discharge July 9 to 16, 18 to 25, Oct. 18 to Nov. 20, and Nov. 28 to 30, estimated by interpolation and from climatologic reports. No flow in the creek from July 26 to Aug. 20 and Aug. 24 to Sept. 30.

Monthly discharge of Fortification Creek at Craig, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
March 8–31	500	50	178	8,469
April	210	45	98	5,812
May	320	50	137	8,400
June	80	10	39.5	2,350
July	13	0	1.7	102
August	75	0	4.7	288
September	0	0	0	0
October	152	6	23	1,422
November	18	12	14	847
The period	.....	.....	.....	27,685

WILLIAMS RIVER NEAR PYRAMID, COLO.

Location.—At Dunstan's ranch, 3 miles below Pyramid post office. Willow Creek, the nearest important tributary, enters from the east about 8 miles below the station.

Records available.—April 14, 1910, to November 30, 1911.

Drainage area.—98 square miles (measured from Hayden's atlas).

Gage.—Vertical staff.

Channel.—Permanent.

Discharge measurements.—Made from footbridge.

Diversions.—The Williams Highline ditch diverts water several miles above the station. The natural flow is somewhat regulated by Basin reservoir on the headwaters.

Cooperation.—Records are furnished complete for publication by the State engineer, who maintains the station in cooperation with the Williams River Highline Irrigation Co.

Discharge measurements of Williams River near Pyramid, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 10	C. L. Chatfield	1.60	29	Aug. 24	Chatfield and Ault	1.50	47
May 26	C. E. Turner	2.45	318	Oct. 27	C. L. Chatfield	1.35	34
July 14	C. L. Chatfield	1.80	84				

Daily gage height, in feet, of Williams River near Pyramid, Colo., for 1911.

[Edna B. Evans, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	1.5	1.8	2.6	2.05	1.5	1.4	1.45	1.35
2	.....	1.55	1.75	2.55	2.0	1.5	1.4	1.5	1.35
3	.....	.....	1.8	2.5	1.95	1.5	1.4	1.55	1.35
4	.....	.....	2.0	2.55	1.95	1.5	1.4	1.55	1.35
5	1.25	.....	2.3	2.6	1.9	1.5	1.4	2.05	1.35
6	1.25	1.45	2.3	2.55	1.9	1.5	1.4	1.65	1.35
7	1.3	1.35	2.3	.....	1.9	1.5	1.4	1.55	1.4
8	1.35	.....	2.7	3.1	1.9	1.5	1.4	1.5	1.4
9	1.35	1.45	2.95	2.7	1.9	1.5	1.4	1.5	1.4
10	1.35	1.5	2.45	2.55	1.9	1.5	1.4	1.4	1.4
11	1.35	1.55	2.2	2.55	1.85	1.5	1.4	1.4	1.4
12	1.35	1.5	2.3	2.6	1.85	1.5	1.4	1.4	.....
13	1.4	1.45	2.35	2.55	1.8	1.5	1.4	1.4	.....
14	1.4	.....	2.7	2.55	1.8	1.4	1.35	1.35	.....
15	1.35	1.4	2.6	2.5	1.8	1.4	1.35	1.4	.....
16	1.35	1.45	2.5	2.4	1.8	1.4	1.4	1.35	.....
17	1.35	.....	2.6	2.4	1.8	1.4	1.4	1.3	.....
18	1.35	.....	2.55	2.55	1.8	1.4	1.4	1.3	.....
19	1.3	.....	2.45	2.4	1.75	1.4	1.4	1.35	.....
20	1.35	.....	2.3	2.35	1.75	1.45	1.4	1.35	.....
21	1.35	1.5	2.15	2.45	1.7	1.6	1.4	1.35	.....
22	1.35	1.65	.....	2.4	1.8	1.6	1.4	1.4	.....
23	1.35	1.75	2.4	2.4	1.7	1.5	1.4	1.4	.....
24	1.3	1.7	.....	2.35	1.7	1.5	1.4	1.4	.....
25	1.3	.....	.....	2.25	1.65	1.45	1.4	1.4	.....
26	1.4	1.85	.....	2.2	1.7	1.4	1.3	1.4	.....
27	1.35	2.0	2.35	2.0	1.7	1.4	1.3	1.35	.....
28	1.4	2.05	.....	1.9	1.7	1.4	1.35	1.35	.....
29	1.35	.....	2.4	2.0	1.7	1.4	1.45	1.35	.....
30	1.35	1.9	2.45	1.95	1.65	1.4	1.45	1.4	.....
31	1.4	.....	2.55	.....	1.55	1.4	.....	1.35	.....

Daily discharge, in second-feet, of Williams River near Pyramid, Colo., for 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	23	51	128	462	214	51	36	44	31
2	23	62	114	436	195	51	36	51	31
3	23	62	128	410	178	51	36	62	31
4	23	62	195	436	178	51	36	62	31
5	23	62	315	462	160	51	36	214	31
6	23	44	315	436	160	51	36	86	31
7	26	31	315	436	160	51	36	62	36
8	31	31	518	790	160	51	36	51	36
9	31	44	678	518	160	51	36	51	36
10	31	51	386	436	160	51	36	36	36
11	31	62	272	436	144	51	36	36	36
12	31	51	315	462	144	51	36	36	36
13	36	44	338	436	128	51	36	36	36
14	36	44	518	436	128	36	31	31	36
15	31	36	462	410	128	36	31	36	36
16	31	44	410	361	128	36	36	31	36
17	31	44	462	361	128	36	36	26	36
18	31	44	436	436	128	36	36	26	36
19	26	44	386	361	114	36	36	31	36
20	31	44	315	338	114	44	36	31	36
21	31	51	252	386	99	73	36	31	36
22	31	86	252	361	128	73	36	36	36
23	31	114	361	361	99	51	36	36	36
24	26	99	361	338	99	51	36	36	36
25	26	99	361	294	86	44	36	36	36
26	36	144	361	272	99	36	26	36	36
27	31	195	338	195	99	36	26	31	36
28	36	214	338	160	99	36	31	31	36
29	31	214	361	195	99	36	44	31	36
30	31	160	386	178	86	36	44	36	36
31	36	.....	436	.....	62	36	.....	31	.....

NOTE.—Discharge for days for which gage heights are missing determined by interpolation and from climatologic reports.

Monthly discharge of Williams River near Pyramid, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
March	36	28	30	1,821
April	214	36	78	4,627
May	678	114	349	21,439
June	790	160	387	23,007
July	214	62	130	8,061
August	73	36	46	2,838
September	44	26	35	2,105
October	214	26	45	2,797
November	.....	.....	[a] 35	2,082
The period	.....	.....	.....	68,777

[a] The discharge from Nov. 12 to 30 was estimated at 36 second-feet.

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 11, 1911.

Drainage area.—341 square miles (measured from Land Office map).

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

Discharge measurements of Williams River at Hamilton, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 8[a]	C. L. Chatfield	3.00	61	Aug. 23	C. L. Chatfield	2.62	46
May 25	C. E. Turner	5.37	844	Oct. 10	do	2.80	78
June 30	C. L. Chatfield	3.53	220	25	do	2.70	63
July 10	do	3.15	138				

[a] Ice conditions.

Daily gage height, in feet, of Williams River at Hamilton, Colo., for 1911.

[Carrie A. Hamilton, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	3.0	3.1	5.55	3.5	2.7	2.55	3.2	2.6
2	.....	3.0	2.9	5.35	3.65	2.7	2.55	3.1	2.6
3	.....	3.1	4.0	5.2	3.55	2.7	2.6	3.1	2.6
4	.....	3.4	4.25	5.2	3.5	2.7	2.6	3.0	2.65
5	.....	3.3	5.05	5.3	3.45	2.7	2.7	3.75	2.75
6	.....	3.15	5.65	5.25	3.45	2.65	2.7	3.8	2.75
7	.....	3.15	5.7	5.3	3.4	2.65	2.7	3.25	2.75
8	.....	3.1	6.35	6.2	3.35	2.6	2.65	2.9	2.75
9	.....	3.05	6.6	6.05	3.25	2.6	2.6	2.9	2.75
10	.....	3.1	6.45	5.75	3.15	2.6	2.6	2.85	2.75
11	.....	3.05	5.85	5.4	3.1	2.6	2.6	2.75	2.75
12	3.2	3.0	5.0	4.85	3.0	2.6	2.6	2.7	.....
13	3.2	3.0	5.55	4.9	3.0	2.6	2.6	2.7	.....
14	3.05	3.05	5.9	4.9	2.95	2.6	2.7	2.7	.....
15	3.1	2.85	5.8	5.1	3.0	2.55	2.7	2.7	.....
16	2.9	3.0	6.05	4.85	3.0	2.55	2.6	2.65	.....
17	3.0	3.05	6.2	4.85	2.95	2.55	2.6	2.6	.....
18	2.85	2.95	5.85	4.8	2.9	2.55	2.6	2.6	.....
19	2.8	3.1	5.65	4.9	2.9	2.55	2.6	2.6	.....
20	2.9	3.1	5.0	4.9	2.85	2.5	2.6	2.45	.....
21	2.95	3.3	4.7	5.5	2.8	2.6	2.6	2.4	.....
22	2.9	3.5	4.65	5.05	2.85	2.7	2.6	2.5	.....
23	2.95	3.7	5.05	4.45	3.0	2.65	2.6	2.75	.....
24	2.95	3.8	5.7	4.25	2.9	2.6	2.6	2.7	.....
25	2.9	3.55	5.25	4.15	2.85	2.6	2.6	2.7	.....
26	2.8	4.0	5.65	4.05	2.8	2.55	2.6	2.7	.....
27	3.0	4.05	5.05	3.85	2.7	2.55	2.7	2.7	.....
28	2.95	4.55	4.95	3.8	2.9	2.55	2.7	2.65	.....
29	2.95	3.65	5.05	3.65	2.75	2.55	2.7	2.6	.....
30	2.95	3.75	5.25	3.55	2.7	2.55	2.7	2.6	.....
31	3.0	.....	5.35	.....	2.7	2.55	.....	2.6	.....

Daily discharge, in second-feet, of Williams River at Hamilton, Colo., for 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	108	125	804	204	58	36	143	43
2	.....	108	295	730	238	58	36	125	43
3	.....	125	320	678	215	58	43	125	43
4	.....	183	385	678	204	58	43	108	43
5	.....	162	626	713	194	58	58	260	43
6	.....	134	840	696	194	50	58	272	43
7	.....	134	859	713	183	50	58	152	43
8	.....	125	1,118	1,052	172	43	50	91	43
9	.....	116	1,234	992	152	43	43	91	43
10	.....	125	1,164	878	134	43	43	82	43
11	.....	116	914	748	125	43	43	66	43
12	143	108	610	562	108	43	43	58	.....
13	143	108	804	577	108	43	43	58	.....
14	116	116	933	577	100	43	58	58	.....
15	125	82	896	643	108	36	58	58	.....
16	91	108	992	562	108	36	43	50	.....
17	108	116	1,052	562	100	36	43	43	.....
18	82	100	914	546	91	36	43	43	.....
19	82	125	840	577	91	36	43	43	.....
20	91	125	610	577	82	30	43	24	.....
21	100	162	515	785	74	43	43	19	.....
22	91	204	500	626	82	58	43	30	.....
23	100	249	626	440	108	50	43	66	.....
24	100	272	859	386	91	43	43	58	.....
25	91	215	696	358	82	43	43	58	.....
26	74	320	840	332	74	36	43	58	.....
27	108	332	626	284	58	36	58	58	.....
28	100	470	594	272	91	36	58	50	.....
29	100	238	626	238	66	36	58	43	.....
30	100	260	696	215	58	36	58	43	.....
31	108	.....	730	.....	58	36	.....	43	.....

Monthly discharge of Williams River at Hamilton, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
March 12-31	143	74	103	4,072
April	470	82	172	10,207
May	1,234	125	737	45,302
June	1,052	215	593	35,308
July	238	58	121	7,444
August	58	30	44	2,686
September	58	36	47	2,813
October	272	19	80	4,911
November 1-11	43	43	43	938
The period	.....	.....	.....	113,681

LITTLE SNAKE RIVER NEAR DIXON, WYO.

Location.—One mile west of Dixon, Wyo. Nearest tributaries: 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, 1911.

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

Gage.—Chain gage.

Channel.—Practically permanent.

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 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 13[a]	C. L. Chatfield		141	June 27	C. L. Chatfield	2.40	643
May 25	do	4.68	2,060	29	do	2.20	471
June 25	do	2.75	785	Sept. 25	do	.62	34

[a] Ice conditions.

Daily gage height, in feet, of Little Snake River near Dixon, Wyo., for 1911.

[Edith Madsen, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1		2.35	3.8	5.45	1.85	0.55	0.35	2.4	1.0
2		2.5	3.6	4.9	1.75	.5	.45	1.65	.95
3		2.7	3.5	4.7	1.75	.45	.4	1.85	1.0
4		2.65	3.7	4.7	1.65	.4	.4	1.6	1.0
5		2.55	4.35	4.75	1.65	.35	.3	1.9	1.3
6		2.2	5.2	4.7	1.6	.2	.35	2.7	1.15
7		2.1	5.15	4.6	1.5	.35	.35	2.1	1.05
8		1.9	5.4	4.7	1.35	.5	.45	1.65	1.05
9		2.05	5.8	4.8	1.4	.4	.45	1.45	1.1
10		2.3	5.75	4.3	1.4	.25	.45	1.4	1.1
11		2.25	5.2	4.05	1.1	.3	.45	1.4	1.05
12		2.2	4.6	4.1	.95	.3	.4	1.3	1.05
13		1.85	4.8	4.1	.95	.35	.35	1.3	1.05
14		1.85	5.05	4.0	1.2	.45	.4	1.15	1.1
15	1.25	1.75	5.4	4.0	.75	.4	.4	1.1	1.0
16	1.3	1.85	5.3	4.1	.7	.35	.5	1.2	1.1
17	1.4	1.9	5.2	4.2	.75	.35	.55	1.15	1.2
18	1.3	1.85	5.45	4.1	.85	.3	.5	1.2	1.3
19	1.3	2.15	5.05	4.0	.9	.3	.55	1.2	1.3
20	1.5	2.6	4.6	3.9	.75	.3	.55	1.1	1.2
21	1.8	2.8	4.4	3.8	.8	.35	.6	.9	1.15
22	1.85	3.2	4.25	3.6	.75	.35	.6	.9	1.3
23	2.0	3.4	4.65	3.3	.7	.25	.65	1.1	1.1
24	2.15	3.6	4.8	3.1	.7	.3	.65	1.1	1.3
25	1.95	3.7	4.7	2.8	.75	.3	.6	1.15	1.3
26	1.6	3.8	5.0	2.6	.65	.35	.55	1.15	
27	1.55	4.3	4.8	2.4	.55	35	.6	1.1	
28	1.75	4.65	4.5	2.3	.4	.35	.75	1.0	
29	1.55	4.75	4.6	2.1	.65	.25	.8	1.0	
30	1.6	4.25	4.55	1.95	.75	.35	.95	.95	
31	1.95		4.75		.5	.35		1.0	

Daily discharge, in second-feet, of Little Snake River near Dixon, Wyo., for 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	140	585	1,425	2,688	360	22	12	610	85
2	140	660	1,295	2,230	320	20	18	280	75
3	140	760	1,230	2,070	320	18	15	360	85
4	140	735	1,360	2,070	280	15	15	260	85
5	140	685	1,805	2,110	280	12	10	380	160
6	145	510	2,475	2,070	260	5	12	760	118
7	145	465	2,432	1,990	225	12	12	465	95
8	145	380	2,645	2,070	175	20	18	280	95
9	145	442	3,000	2,150	190	15	18	208	105
10	145	560	2,955	1,770	190	8	18	190	105
11	145	535	2,475	1,595	105	10	18	190	95
12	145	510	1,990	1,630	75	10	15	160	95
13	145	360	2,150	1,630	75	12	12	160	95
14	145	360	2,350	1,560	130	18	15	118	105
15	145	320	2,645	1,560	42	15	15	105	85

Daily discharge, in second-feet, of Little Snake River near Dixon, Wyo., for 1911—Contd.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
16	160	360	2,560	1,630	35	12	20	130	105
17	190	380	2,475	1,700	42	12	22	118	130
18	160	360	2,688	1,630	58	10	20	130	160
19	160	488	2,350	1,560	65	10	22	130	160
20	225	710	1,990	1,490	42	10	22	105	130
21	340	810	1,840	1,425	50	12	25	65	118
22	360	1,045	1,735	1,295	42	8	25	65	160
23	420	1,165	2,030	1,105	35	8	30	105	105
24	488	1,295	2,150	985	35	10	30	105	160
25	400	1,360	2,070	810	42	10	25	118	160
26	260	1,425	2,310	710	30	12	22	118	130
27	242	1,770	2,150	610	22	12	25	105	130
28	320	2,030	1,915	560	15	12	42	85	130
29	242	2,110	1,990	465	30	8	50	85	130
30	260	1,735	1,952	400	42	12	75	75	130
31	400	.....	2,110	.....	20	12	.....	85	.....

NOTE.—Discharge Mar. 1 to 14 and Nov. 26 to 30 estimated from climatologic reports.

Monthly discharge of Little Snake River near Dixon, Wyo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
March	488	140	219	13,442
April	2,110	320	830	49,408
May	3,000	1,230	2,147	131,994
June	2,688	400	1,519	90,383
July	360	15	117	7,204
August	22	5	12	758
September	75	10	23	1,346
October	760	65	198	12,198
November	160	75	117	6,984
The period	.....	.....	.....	313.717

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. No important tributary below the station and none for several miles above.

Records available.—May 28, 1910, to October 31, 1911.

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

Gage.—Vertical staff.

Channel.—Practically permanent.

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

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

Discharge measurements of Slater Creek near Slater, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 13[a]	C. L. Chatfield	.....	22
May 26	.....do	2.90	486
June 26	.....do	1.90	118
Sept. 25	.....do	1.10	86

[a] Ice present.

Daily gage height, in feet, of Slater Creek near Slater Colo., for 1911.

[H. V. Rowell, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	.....	1.55	2.3	2.95	1.7	1.15	1.05	1.9
2	.....	1.6	2.2	3.0	1.7	1.15	1.05	1.95
3	.....	1.65	2.2	2.85	1.65	1.1	1.1	1.8
4	.....	1.8	2.5	2.9	1.65	1.1	1.2	1.8
5	.....	1.65	2.9	3.05	1.6	1.1	1.15	2.1
6	.....	1.55	3.4	3.05	1.5	1.1	1.15	2.1
7	.....	1.5	3.6	3.2	1.5	1.1	1.15	1.8
8	.....	1.35	3.65	3.3	1.5	1.1	1.1	1.55
9	.....	1.5	3.85	3.0	1.45	1.05	1.1	1.5
10	.....	1.55	3.4	2.6	1.4	1.05	1.1	1.45
11	.....	1.55	2.85	2.5	1.4	1.05	1.1	1.45
12	.....	1.6	2.9	2.55	1.3	1.05	1.1	1.4
13	.....	1.55	3.45	2.6	1.3	1.05	1.1	1.4
14	.....	1.45	3.2	2.6	1.2	1.05	1.2	1.4
15	.....	1.3	3.45	2.55	1.2	1.0	1.15	1.45
16	.....	1.3	3.35	3.05	1.2	1.0	1.1	1.4
17	1.2	1.3	3.35	2.85	1.25	1.0	1.1	1.4
18	1.2	1.4	3.15	2.55	1.25	1.0	1.1	1.4
19	1.3	1.6	2.65	2.65	1.2	1.0	1.1	1.45
20	1.3	1.7	2.5	2.45	1.2	1.0	1.1	1.45
21	1.4	1.8	2.5	2.55	1.2	1.0	1.1	1.45
22	1.5	1.85	2.65	2.3	1.2	1.0	1.1	1.45
23	1.5	2.0	2.9	2.2	1.25	1.1	1.2	1.5
24	1.5	2.1	2.65	2.1	1.25	1.1	1.15	1.45
25	1.45	2.15	2.9	2.0	1.25	1.0	1.15	1.45
26	1.4	2.2	2.9	1.9	1.2	1.0	1.2	1.45
27	1.4	2.4	2.8	1.8	1.2	1.0	1.25	1.45
28	1.35	2.65	2.7	1.8	1.2	1.0	1.3	1.4
29	1.35	2.8	2.75	1.75	1.2	1.0	1.3	1.35
30	1.4	2.5	2.9	1.7	1.15	1.0	1.35	1.3
31	1.5	.....	3.0	.....	1.15	1.05	.....	1.3

Daily discharge, in second-feet, of Slater Creek near Slater, Colo., for 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	20	58	230	515	82	12	6	120
2	20	65	200	540	82	12	6	131
3	20	74	200	465	74	8	8	100
4	20	100	305	490	74	8	15	100
5	20	74	490	568	65	8	12	170
6	20	58	770	568	50	8	12	170
7	20	50	880	655	50	8	12	100
8	20	31	910	710	50	8	8	58
9	20	50	1,022	540	44	6	8	50
10	20	58	770	345	37	6	8	44
11	15	58	465	305	37	6	8	44
12	15	65	490	325	25	6	8	37
13	15	58	798	345	25	6	8	37
14	15	44	655	345	15	6	15	37
15	15	25	798	325	15	5	12	44
16	15	25	740	568	15	5	8	37
17	15	25	740	465	20	5	8	37
18	15	37	625	325	20	5	8	37
19	25	65	368	368	15	5	8	44
20	25	82	305	286	15	5	8	44
21	37	100	305	325	15	5	8	44
22	50	110	368	230	15	5	8	44
23	50	142	490	200	20	8	15	50
24	50	170	368	170	20	8	12	44
25	44	185	490	142	20	5	12	44
26	37	200	490	120	15	5	15	44
27	37	267	440	100	15	5	20	44
28	31	368	390	100	15	5	25	37
29	31	440	415	91	15	5	25	31
30	37	350	490	82	12	5	31	25
31	50	.....	540	.....	12	6	.....	25

NOTE.—Discharge Mar. 1 to 16 estimated from climatologic reports.

Monthly discharge of Slater Creek near Slater, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
March	50	15	27	1,634
April	440	25	113	6,722
May	1,022	200	534	32,820
June	710	82	354	21,050
July	82	12	32	1,952
August	12	5	6.5	397
September	31	6	12	708
October	170	25	60	3,715
The period				68,998

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 mouth of Dry Fork.

Records available.—March 18, 1900, to December 31, 1904, at a point below the mouth of Dry Fork; October 8, 1911, to December 31, 1911, at present site.

Drainage area.—107 square miles.

Gage.—Vertical staff on the right bank.

Channel.—Shifting.

Discharge measurements.—Made by wading.

Winter flow.—Ice affects the relation of gage height to discharge during the greater part of the winter months.

Diversions.—Above all diversions.

Artificial control.—The operation of the power plant probably has no effect on the flow at the station.

Accuracy.—Poor, because of lack of discharge measurements. As only one discharge measurement was made during 1911 and one in 1912 (taken at the same gage height as the 1911 measurement) a rating curve can not be constructed.

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

The following discharge measurement was made by E. C. La Rue:
October 8, 1911: Gage height, 1.68 feet; discharge, 108 second-feet.

Daily gage height, in feet, and discharge, in second-feet, of Ashley Creek near Vernal, Utah, for 1911.

[Grant Carpenter, observer.]

Day.	October.		November.		December.		Day.	October.		November.		December.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.		Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1							16						
2					1.3	47	17						
3							18	1.6	91				
4							19			1.38	57		
5			1.45	66	1.3	47	20					1.27	44
6							21						
7							22	1.55	82				
8	1.68	1.08					23						
9							24					1.25	42
10					1.3	47	25						
11	1.65	1.02					26	1.55	82	1.33	51		
12							27					1.24	42
13			1.35	53	1.3	47	28						
14					1.28	45	29						
15	1.6	91					30						
							31	1.5	73				

Monthly discharge of Ashley Creek near Vernal, Utah, for 1911.

Month.	Discharge in second-feet (Mean.)	Run-off (total in acre-feet).	Accuracy.
October	92.2	5,670	D.
November	57.9	3,450	D.
December	44.7	2,750	C.

NOTE.—Monthly means estimated by interpolating daily discharge between days when gage was read.

DUCHESNE RIVER BASIN.

DUCHESNE RIVER AT MYTON, UTAH.

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

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

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.—Ice may affect relation of gage height to discharge at times during the winter months.

Diversions.—A large portion of the low-water flow of the Duchesne and its tributaries is diverted and used for irrigation above the station.

Artificial control.—None.

Accuracy.—Fair.

Cooperation.—Maintained in cocperation with the State of Utah.

The following discharge measurement was made by J. C. Dort:
July 25, 1911: Gage height, 2.38 feet; discharge, 538 second-feet.

Daily gage height, in feet, and discharge, in second-feet, of Duchesne River at Myton, Utah, for 1911.

[J. E. Parsons, observer.]

Day.	July.		August.		September.		October.		November.		December.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1			2.0	382	1.45	206	2.50	605	1.9	345	1.6	247
2			1.85	328	1.4	193	2.35	532	1.95	364	1.75	294
3			1.9	345	1.4	193	2.30	510	1.9	345	1.7	277
4			1.75	294	1.45	206	2.20	465	1.9	345	1.8	310
5			1.7	277	1.4	193	2.25	488	2.0	382	1.9	345
6			1.6	247	1.4	193	2.25	488	1.95	364	1.95	364
7			1.55	233	1.4	193	2.20	465	1.9	345	2.05	402
8			1.55	233	1.4	193	2.15	444	1.95	364	1.95	364
9			1.5	219	1.45	206	2.15	444	2.05	402	2.0	382
10			1.5	219	1.4	193	2.1	422	2.0	382	1.7	277
11			1.5	219	1.4	193	2.15	444	2.05	402	1.85	328
12			1.65	262	1.4	193	2.15	444	1.75	294	1.95	364
13			1.7	277	1.55	233	2.1	422	1.75	294	1.9	345
14			1.75	294	1.6	247	2.1	422	1.9	345	1.7	277
15			1.6	247	1.55	233	2.1	422	2.05	402	1.9	345
16			1.55	233	1.5	219	2.1	422	2.15	444	1.8	310
17			1.6	247	1.5	219	2.05	402	2.0	382	2.05	402
18			1.55	233	1.4	193	2.05	402	1.95	364	2.05	402
19			1.6	247	1.5	219	2.0	382	2.1	422	2.0	382
20			1.5	219	1.5	219	1.95	364	2.1	422	2.0	382

Daily gage height, in feet, and discharge in second-feet, of Duchesne River at Myton, Utah, for 1911—Continued.

Day.	July.		August.		September.		October.		November.		December.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
21	.....	.....	1.5	219	1.5	219	1.95	364	2.1	422	1.95	364
22	.....	.....	1.5	219	1.5	219	1.9	345	2.1	422	1.9	345
23	.....	.....	1.55	233	1.5	219	2.0	382	1.8	310	1.9	345
24	.....	.....	1.6	247	1.6	247	2.0	382	1.8	310	1.85	328
25	2.4	555	1.5	219	1.65	262	2.0	382	1.95	364	1.8	310
26	2.5	605	1.5	219	1.7	277	2.0	382	2.05	402	1.8	310
27	2.4	555	1.5	219	1.8	310	2.0	382	1.8	310	1.85	328
28	2.2	465	1.5	219	2.8	770	2.0	382	1.75	294	1.95	364
29	2.1	422	1.4	193	2.25	488	2.0	382	1.75	294	2.0	382
30	2.05	402	1.4	193	2.3	510	2.0	382	1.65	262	2.0	382
31	2.05	402	1.4	193	.....	.....	1.9	345	.....	.....	.....	382

NOTE.—There may have been some ice effect the last part of December. Daily discharge determined from a well-defined rating curve. Discharge estimated Dec. 31.

Monthly discharge of Duchesne River at Myton, Utah, for 1911.

[Drainage area, 2,750 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.	
August	382	193	246	0.090	0.10	15,100	B.
September	770	193	255	.093	.10	15,200	B.
October	605	345	423	.154	.18	26,000	A.
November	444	262	360	.131	.15	21,400	A.
December	402	247	343	.125	.14	21,100	B.
The period	.....	.....	.....	.....	.....	98,800	

LAKE FORK CREEK NEAR MYTON, UTAH.

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

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

Drainage area.—Not measured.

Gage.—Chain gage. Several different gages and datums have been used previous to 1910. See Water-Supply Paper 289. The datum used in 1911 is 0.03 feet lower than that in 1910.

Channel.—Fairly permanent.

Discharge measurements.—Made from car and cable 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 some privately owned canals take water from this stream above the station for irrigation.

Accuracy.—Excellent.

Cooperation.—Maintained in cooperation with the State of Utah.

Discharge measurements of Lake Fork Creek near Myton, Utah, in 1911.

Date.	Hydrographer.	Discharge.	Gage height.
		Sec.-ft.	*Feet.*
July 26	J. C. Dort	216	2.66
27	....do	157	2.38
Sept. 28	E. C. La Rue	69.6	1.90

Daily gage height, in feet, and discharge, in second-feet, of Lake Fork Creek near Myton, Utah, for 1911.

[James McAffee, observer.]

Day.	July.		August.		September.		October.		November.		December.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	.....	.....	1.85	64	1.0	1.5	2.1	99	1.8	57	1.9	70
2	.....	.....	1.6	35	.9	1.0	2.0	84	1.8	57	1.9	70
3	.....	.....	1.55	31	1.05	1.8	1.9	70	1.8	57	1.9	70
4	.....	.....	1.6	35	.9	1.0	.....	93	1.8	57	1.9	70
5	.....	.....	1.3	10	.9	1.0	2.2	116	1.8	57	1.9	70
6	.....	.....	1.25	7.5	.9	1.0	2.1	99	1.8	57	1.9	70
7	.....	.....	1.2	5.0	.9	1.0	1.9	70	1.8	57	1.95	.....
8	.....	.....	1.1	2.0	1.05	1.8	.....	70	1.8	57	1.95	.....
9	.....	.....	1.15	3.5	.....	1.4	1.9	70	1.8	57	2.0	.....
10	.....	.....	1.0	1.5	.9	1.0	1.9	70	1.8	57	2.0	.....
11	.....	.....	.9	1.0	.9	1.0	2.0	84	1.8	57	2.0	.....
12	.....	.....	.9	1.0	.9	1.0	1.95	77	1.8	57	2.0	.....
13	.....	.....	.9	1.0	.....	1.4	1.9	70	1.8	57	2.0	.....
14	.....	.....	1.15	3.5	1.05	1.8	1.9	70	1.8	57	2.0	.....
15	.....	.....	1.1	2.0	.9	1.0	.....	70	1.8	57	2.1	.....
16	.....	.....	1.1	2.0	.9	1.0	1.9	70	1.8	57	2.1	.....
17	.....	.....	.....	1.8	.95	1.2	1.9	70	1.8	57	2.1	.....
18	.....	.....	1.0	1.5	1.1	2.0	1.9	70	.....	70	2.1	.....
19	.....	.....	1.15	3.5	1.0	1.5	1.9	70	2.0	84	2.1	.....
20	.....	.....	.9	1.0	1.0	1.5	1.9	70	2.0	84	2.1	.....
21	.....	.....	.9	1.0	1.0	1.5	1.8	57	1.9	70	2.1	.....
22	.....	.....	.....	1.5	1.0	1.5	1.8	57	1.9	70	2.15	.....
23	.....	.....	1.1	2.0	1.15	3.5	1.8	57	1.9	70	2.15	.....
24	.....	.....	1.75	52	1.0	1.5	1.8	57	1.8	57	2.35	.....
25	.....	.....	1.4	17	1.0	1.5	1.8	57	1.9	70	2.4	.....
26	2.7	228	1.1	2.0	1.1	2.0	1.8	57	.....	70	.....	.....
27	2.4	156	1.0	1.5	.....	36	1.8	57	1.9	70	2.4	.....
28	2.15	108	1.1	2.0	1.9	70	1.8	57	1.9	70	2.4	.....
29	2.0	84	1.15	3.5	1.6	35	1.8	57	1.9	70	2.4	.....
30	2.1	99	1.0	1.5	1.6	35	1.8	57	1.9	70	2.4	.....
31	1.9	70	1.0	1.5	.....	.....	1.8	57	.....	.....	.....	.....

NOTE.—Relation of gage heights to discharge probably affected by ice Dec. 7 to 31. Daily discharge determined from a well-defined rating curve. Discharge interpolated for days for which gage heights are missing.

Monthly discharge of Lake Fork Creek near Myton, Utah, for 1911.

[Drainage area, 475 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.	
August	64	1.0	9.6	0.020	0.02	590	B.
September	70	1.0	7.1	.015	.02	422	C.
October	116	57	70.6	.149	.17	4,340	A.
November	84	57	63.1	.133	.15	3,750	A.
December	.....	.....	70	.147	.17	4,300	C.
The period	.....	.....	.....	.....	.....	13,400	

NOTE.—The mean monthly discharge for December was estimated because of ice, from the flow when the river was open during the first part of the month.

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 enters between the station and the mouth of the South Fork.

Records available.—May 24, 1910, to December 31, 1911. 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.

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 decrees for diversions of 33 second-feet from tributaries entering above.

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

Discharge measurements of North Fork of White River near Buford, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Sec. ft.	*Sec. ft.*			*Sec. ft.*	*Sec. ft.*
Feb. 6	C. L. Chatfield	0.72	190	Aug. 20	C. L. Chatfield	0.91	241
May 23	C. E. Turner	2.00	609	Oct. 21	do	.78	192
July 5	C. L. Chatfield	1.40	397				

Daily gage height, in feet, of North Fork of White River near Buford, Colo., for 1911.

[Mrs. H. Genier, observer.]

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	0.7	0.85	1.4	2.4	.....	1.0	0.85	1.15	0.8	0.8
2	.....	.7	.9	1.4	.....	1.55	.95	.85	1.05	.8	.8
3	.....	.7	.95	1.45	2.35	1.5	.9	.9	1.05	.75	1.25
4	.....	.7	1.0	1.85	2.4	1.5	.9	.9	.9	.75	.8
5	0.75	.7	.95	2.3	.....	1.4	.9	.85	1.55	.8	.8
6	.75	.7	.9	2.6	.....	1.4	.9	.8	1.15	.8	.8
7	.75	.7	.8	2.55	2.45	1.4	.9	.8	1.05	.8	.8
8	.8	.7	.85	2.9	3.0	1.3	.9	.8	1.05	.8	.9
9	.85	.75	.85	3.0	2.8	1.3	.9	.8	1.0	.8	.85
10	.8	.75	.9	2.65	2.5	1.3	.9	.8	.95	.85	.85
11	.8	.8	.....	2.1	2.45	1.2	.9	.8	.9	.85	.85
12	.75	.7	.85	2.1	2.35	1.2	.95	.8	.85	.85	.75
13	.75	.75	.75	2.3	2.4	1.2	.9	.9	.8	.85	.7
14	.7	.8	.....	2.5	2.35	1.2	.9	.85	.8	.9	.7
15	.7	.7	.8	2.6	2.3	1.15	.9	.8	.8	.9	.7
16	.7	.7	.....	2.5	2.45	1.1	.9	.8	.8	.9	.7
17	.75	.75	.75	.....	2.3	1.1	.9	.8	.8	.85	.7
18	.8	.70	.85	2.35	2.3	1.1	.9	.8	.8	.9	.65
19	.8	.75	.9	2.3	2.3	1.1	.9	.8	.8	.85	.75
20	.....	.75	1.1	2.0	2.15	1.1	.....	.8	.75	.9	.9
21	.....	.8	1.2	.....	2.4	1.1	.....	.....	.8	.85	.9
22	.....	.7	1.3	1.85	2.2	1.5	.....	.75	.8	.8	.85
23	.8	.8	1.45	2.0	2.15	1.15	.....	.75	.8	.8	.9
24	.8	.8	1.5	2.05	2.0	1.1	.....	.75	.8	.8	.9
25	.75	.8	.....	2.25	1.85	1.1	.....	.75	.8	.8	.85
26	.75	.7	1.6	.....	1.75	1.1	.....	.8	.8	.8	.85
27	.7	.75	1.8	2.15	1.7	1.1	.9	.8	.8	.8	.85
28	.7	.7	2.0	1.9	1.6	1.1	.85	.8	.75	.75	.85
29	.....	.7	1.95	1.95	1.5	1.1	.85	.85	.75	.75	.85
30	.....	.75	1.6	2.05	1.5	1.0	.85	1.15	.7	.8	.8
31	.....	.75	.....	2.2	.....	1.0	.85	.....	.8	.....	.8

Daily discharge, in second-feet, of North Fork of White River near Buford, Colo., for 1911.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	190	187	220	408	836	488	262	220	315	208	208
2	190	187	233	408	836	468	248	220	280	208	208
3	190	187	248	428	813	448	233	233	280	198	352
4	190	187	262	592	836	448	233	233	233	198	208
5	198	187	248	790	836	408	233	220	468	208	208
6	198	187	233	931	836	408	233	208	315	208	208
7	198	187	208	907	860	408	233	208	280	208	208
8	208	187	220	1,080	1,130	370	233	208	280	208	233
9	220	198	220	1,130	1,030	370	233	208	262	208	220
10	208	198	233	956	883	370	233	208	248	220	220
11	208	208	233	700	860	333	233	208	233	220	200
12	198	187	220	700	813	333	248	208	220	220	198
13	198	198	198	790	836	333	233	208	208	220	187
14	187	208	198	883	813	333	233	220	208	233	187
15	187	187	208	931	790	315	233	208	208	233	187
16	187	187	208	883	860	297	233	208	208	233	187
17	198	198	198	883	790	297	233	208	208	220	187
18	208	187	220	813	790	297	233	208	208	233	178
19	208	198	248	790	790	297	233	208	208	220	198
20	208	198	297	656	722	297	233	208	198	233	233
21	208	208	333	656	836	297	262	208	208	220	233
22	208	187	370	592	745	448	233	198	208	208	220
23	208	208	428	656	722	315	233	198	208	208	233
24	208	208	448	678	656	297	233	198	208	208	233
25	198	208	448	768	592	297	233	198	208	208	220
26	198	187	488	768	550	297	233	208	208	208	220
27	187	198	571	722	529	297	233	208	208	208	220
28	187	187	656	613	488	297	220	208	198	198	220
29	.....	187	634	634	448	297	220	220	198	198	220
30	.....	198	488	678	448	262	220	315	187	208	208
31	.....	198	.....	745	.....	262	220	.....	208	.....	208

NOTE.—Discharge for days for which gage heights are missing determined by interpolation and from climatologic reports.

Monthly discharge of North Fork of White River near Buford, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
February	220	187	199	11,066
March	208	187	194	11,944
April	656	198	314	18,678
May	1,130	408	747	45,955
June	1,130	448	766	45,568
July	488	262	345	21,191
August	262	220	234	14,398
September	315	198	214	12,754
October	468	187	236	14,509
November	233	198	214	12,712
December	352	178	215	13,230
The period	.....	.....	.....	222,005

WHITE RIVER AT MEEKER, COLO.

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

Records available.—April 12, 1904, to October 31, 1906; May 7, 1910, to November 30, 1911.

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

Discharge measurements of White River at Meeker, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 7	C. L. Chatfield	0.95	340	Aug. 18	C. L. Chatfield	0.98	368
May 22	C. E. Turner	1.9	1,170	19	do	.93	334
July 1	C. L. Chatfield	1.57	864	22	Chatfield and Ault	1.0	372
3	do	1.57	837	Oct. 12	C. L. Chatfield	1.1	437
8	do	1.42	679	19	do	1.03	386
Aug. 17	do	.93	339				

Daily gage height, in feet, of White River at Meeker, Colo., for 1911.

[Walter Van Cleave, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	0.8	1.05	0.85	1.15	1.6	2.45	1.5	0.9	0.9	1.15	1.1
2	.8	.9	.85	1.15	1.55	2.55	1.5	.85	.9	1.0	1.05
3		1.0	1.0	1.15	1.5	2.6	1.55	.8	.95	1.05	1.1
4		.95	1.1	1.2	1.6	2.6	1.55	.85	1.05	1.0	1.1
5	.85	.95	1.15	1.25	2.0	2.65	1.5	.8	1.0	1.35	1.05
6	.9	.95	1.15	1.2	2.3	2.8	1.4	.8	.95	1.6	1.0
7	.8	.95	1.15	1.15	2.3	2.85	1.4	.85	.9	1.35	1.1
8		.9	1.1	1.1	2.45	3.15	1.4	.8	.9	1.15	1.25
9		1.0	1.2	1.15	2.8	3.3	1.35	.85	.9	1.1	1.2
10		1.15	1.25	1.2	2.75	3.0	1.3	.8	.85	1.05	1.2
11		1.1	1.2	1.2	2.25	2.75	1.3	.85	.85	1.0	1.15
12		1.0	.9	1.15	2.15	2.75	1.25	.8	.8	1.05	1.1
13		.9	.8	1.0	2.3	2.75	1.2	.85	.85	1.1	1.1
14		.95	.9	1.05	2.35	2.65	1.2	.85	.9	1.1	
15		.9	.85	.95	2.45	2.6	1.15	.9	.9	1.1	
16		.8	.9	1.1	2.1	2.6	1.1	.9	.9	1.1	
17		.95	1.0	1.0	2.25	2.45	1.05	.9	.8	1.05	1.1
18		.95	.9	1.0	2.25	2.4	1.05	.9	.8	1.05	1.05
19	.95	.95	.85	1.15	2.3	2.45	1.0	.9	.8	1.0	
20	1.0	.85	.9	1.3	2.1	2.4	1.0	.9	.8	1.05	
21	1.0	.8	.9	1.4	1.9	2.55	1.0	.95	.75	1.0	1.05
22	.9	.8	1.0	1.4	1.85	2.4	1.05	1.0	.8	1.15	1.1
23	1.0	.8	1.0	1.4	1.95	2.55	1.15	1.0	.8	1.2	1.05
24	1.0	.95	1.0	1.5	2.15	2.1	1.0	1.0	.8	1.15	
25	1.0	.85	1.0	1.5	2.15	2.0	1.0	1.0	.8	1.1	
26	1.0	.8	.85	1.6	2.25	1.8	1.0	1.0	.8	1.1	
27	1.0	.8	.8	1.65	2.1	1.75	1.0	.95	.9	1.1	
28	1.0	.8	.9	1.85	2.1	1.65	1.0	.9	.9	1.1	
29	1.0		.9	1.9	2.15	1.55	1.0	.9	.9	1.05	
30	1.2		.95	1.7	2.2	1.45	.95	.9	1.0	1.05	
31	1.2		1.1		2.4		.9	.9		1.1	

Daily discharge, in second-feet, of White River at Meeker, Colo., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	275	405	295	470	870	1,805	770	325	325	470	435
2	275	325	295	470	820	1,945	770	295	325	375	405
3	275	375	375	470	770	2,000	820	275	350	405	435
4	275	350	435	505	870	2,000	820	295	405	375	435
5	295	350	470	545	1,280	2,065	770	275	375	630	405
6	325	350	470	505	1,620	2,365	675	275	350	870	375
7	275	350	470	470	1,620	2,435	675	295	325	630	435
8	295	325	435	435	1,805	2,775	675	275	325	470	545
9	295	375	505	470	2,365	3,030	630	295	325	435	505
10	295	470	545	505	2,198	2,545	585	275	295	405	505

Daily discharge, in second-feet, of White River at Meeker, Colo., for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
11	295	435	505	505	1,560	2,198	585	295	295	375	470
12	295	375	325	470	1,445	2,198	545	275	275	405	435
13	295	325	275	375	1,620	2,198	505	295	295	435	435
14	325	350	325	405	1,680	2,065	505	295	325	435	435
15	325	325	295	350	1,805	2,000	470	325	325	435	435
16	325	275	325	435	1,390	2,000	435	325	325	435	435
17	325	350	375	375	1,560	1,805	405	325	275	405	435
18	325	350	325	375	1,560	1,740	405	325	275	405	405
19	350	350	295	470	1,620	1,805	375	325	275	375	405
20	375	295	325	585	1,390	1,740	375	325	275	405	405
21	375	275	325	675	1,170	1,945	375	350	260	375	405
22	350	295	375	675	1,120	1,740	405	375	275	405	435
23	375	295	375	675	1,225	1,560	470	375	275	505	405
24	375	350	375	770	1,445	1,390	375	375	275	470	405
25	375	295	375	770	1,445	1,280	375	375	275	435	405
26	375	275	295	870	1,560	1,070	375	375	275	435	405
27	375	375	275	920	1,390	1,020	375	350	325	435	405
28	375	375	325	1,120	1,390	920	375	325	325	435	405
29	375	.....	325	1,170	1,445	820	375	325	325	405	405
30	505	.....	350	970	1,500	628	350	325	375	405	405
31	505	.....	435	.....	1,740	.....	325	325	.....	435	.....

NOTE.—Discharge for days for which gage heights are missing determined by interpolation and from climatologic reports.

Monthly discharge of White River at Meeker, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January	.....	.....	338	20,777
February	470	275	337	18,736
March	545	275	371	22,800
April	1,170	350	594	35,316
May	2,365	770	1,461	89,807
June	3,030	628	1,836	109,263
July	820	325	515	31,676
August	375	275	318	19,567
September	405	260	311	18,496
October	870	375	449	27,600
November	.....	.....	428	25,497
The period	.....	.....	.....	419,535

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 which enters from the east just below the station.

Records available.—July 25, 1903, to October 31, 1906; June 1, 1910, to October 31, 1911.

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.

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.

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

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

Discharge measurements of South Fork of White River near Buford, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 6	C. L. Chatfield	0.40	128	Aug. 21	Chatfield and Ault	0.50	143
May 23	C. E. Turner	2.25	580	Oct. 22	do	.40	119
July 6	C. L. Chatfield	1.60	405				

Daily gage height, in feet, of South Fork of White River near Buford, Colo., for 1911.

[Hugh Jones, observer.]

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	.....	0.2	0.2	0.6	4.6	.....	0.7	0.3	0.4
2	.....	.2	.3	.....	4.9	2.0	.7	.3	.4
3	.....	.2	.4	.....	5.0	2.0	.6	.3	.6
4	.....	.2	.2	.8	5.2	1.9	.6	.3	.9
5	.....	.2	.4	1.0	5.7	1.8	.5	.3	1.1
6	.....	.2	.....	1.3	5.8	1.7	.5	.3	1.1
7	0.4	.2	.....	1.7	6.3	1.6	.5	.3	1.0
8	.3	.2	.5	2.3	6.5	1.5	.5	.3	.5
9	.3	.2	.....	.....	6.7	1.5	.5	.3	.4
10	.3	.2	.....	1.8	.....	1.4	.4	.3	.4
11	.3	.2	.....	1.7	5.4	1.4	.4	.3	.4
12	.2	.2	.....	1.8	5.8	1.3	.4	.3	.4
13	.2	.2	.....	.....	5.0	1.3	.4	.3	.4
14	.2	.2	.2	.....	4.8	1.3	.4	.3	.4
15	.2	.2	.2	1.7	.....	1.2	.4	.3	.4
16	.3	.1	.....	1.8	.....	1.2	.3	.3	.4
17	.3	.1	.....	2.2	.....	1.0	.3	.3	.4
18	.3	.2	.5	2.4	.....	1.0	.2	.3	.4
19	.3	.2	.....	3.0	4.9	1.0	.2	.3	.4
20	.3	.2	.....	.....	4.1	1.0	.2	.3	.4
21	.4	.2	.....	2.4	4.6	1.0	.5	.3	.4
22	.4	.2	.6	2.0	4.5	1.0	.4	.3	.4
23	.4	.2	.....	2.3	3.8	1.0	.3	.3	.4
24	.4	.2	.....	2.4	3.7	1.0	.2	.3	.4
25	.4	.2	.....	3.2	3.6	1.0	.4	.3	.4
26	.4	.2	.7	3.5	.....	1.0	.4	.3	.4
27	.4	.2	.8	.....	3.5	1.0	.4	.3	.4
28	.2	.2	.9	3.8	3.3	1.0	.4	.3	.4
29	.....	.2	1.0	.....	3.0	.9	.4	.3	.....
30	.....	.2	.9	4.0	2.0	.8	.4	.3	.....
31	.....	.2	.....	4.5	.....	.8	.4	.....	.....

Daily discharge, in second-feet, of South Fork of White River near Buford, Colo., for 1911.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	125	90	90	165	1,361	511	186	107	125
2	125	90	107	165	1,469	511	186	107	125
3	125	90	125	165	1,505	511	165	107	165
4	125	90	90	208	1,579	484	165	107	231
5	125	90	125	255	1,764	457	144	107	279
6	125	90	125	327	1,801	430	144	107	279
7	125	90	125	430	1,991	404	144	107	255
8	107	90	144	595	2,077	378	144	107	144
9	107	90	144	595	2,153	378	144	107	125
10	107	90	144	457	1,991	352	125	107	125
11	107	90	144	430	1,653	352	125	107	125
12	90	90	144	457	1,801	327	125	107	125
13	90	90	144	457	1,505	327	125	107	125
14	90	90	90	457	1,433	327	125	107	125
15	90	90	90	430	1,433	303	125	107	125
16	107	75	90	457	1,433	303	107	107	125
17	107	75	90	567	1,433	255	107	107	125
18	107	90	144	624	1,433	255	90	107	125
19	107	90	144	807	1,469	255	90	107	125
20	107	90	144	807	1,183	255	90	107	125

Daily discharge, in second-feet, of South Fork of White River near Buford, Colo., for 1911— Continued.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
21	125	90	144	624	1,361	255	144	107	125
22	125	90	165	511	1,325	255	125	107	125
23	125	90	165	595	1,077	255	107	107	125
24	125	90	165	624	1,041	255	90	107	125
25	125	90	165	872	1,006	255	125	107	125
26	125	90	186	972	1,006	255	125	107	125
27	125	90	208	972	972	255	125	107	125
28	90	90	231	1,077	905	255	125	107	125
29	.....	90	255	1,077	807	231	125	107	125
30	.....	90	231	1,148	511	208	125	107	125
31	.....	90	.....	1,325	.....	208	125	.....	125

NOTE.—Discharge for days for which gage heights are missing determined by interpolation and from climatologic reports.

Monthly discharge of South Fork of White River near Buford, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
February	125	90	113	6,274
March	90	75	89	5,474
April	255	90	145	8,644
May	1,325	165	602	36,996
June	2,153	511	1,416	84,254
July	511	208	325	19,958
August	186	90	129	7,928
September	107	107	107	6,367
October	279	125	144	8,882
The period	.....	.....	.....	184,777

PRICE RIVER BASIN.

PRICE RIVER NEAR HELPER, UTAH.

Location.—At settlement known locally as Spring Glenn, in sec. 25 or 36, T. 13 S., R. 9 E., Salt Lake base and meridian, 2½ miles south of Helper, Utah, about 2½ 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, 1911.

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 not seriously affected by ice.

Diversions.—Records indicate the amount of water available for the Price River Irrigation Co. and for the canals for the town of Price, which take out a few miles below the station.

Accuracy.—Good.

Cooperation.—Maintained in cooperation with the State of Utah.

Discharge measurements of Price River near Helper, Utah, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 21	G. H. Canfield	3.66	436	July 23	J. C. Dort	2.90	81.4
21	.....do	3.82	526	Sept. 15	.....do	2.70	40.0
28	.....do	3.16	155				

Daily gage height, in feet, of Price River near Helper, Utah, for 1911.

[Ada Ostberg, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.6	3.1	2.7	3.4	3.5	3.6	2.9	2.8	2.6	3.2	2.9	2.8
2	2.6	2.9	2.7	3.4	3.5	3.6	2.9	2.7	2.6	3.2	2.9	2.8
3	2.6	2.8	2.7	3.5	3.6	3.6	2.9	2.7	2.6	3.1	2.9	2.8
4	2.6	2.9	2.7	3.4	3.6	3.6	2.9	2.7	2.6	2.9	2.8	2.8
5	2.6	2.9	2.8	3.4	3.8	3.5	2.8	2.7	2.7	2.9	2.8	2.8
6	2.6	2.9	2.8	3.3	3.9	3.5	2.8	2.7	2.7	2.9	2.8	2.8
7	2.6	2.8	2.9	3.3	3.9	3.4	2.8	2.7	2.7	2.9	2.8	2.8
8	2.6	2.8	2.9	3.2	4.0	3.4	2.8	2.7	2.6	2.9	2.8	2.8
9	2.6	2.7	3.0	3.2	4.1	3.4	2.8	2.7	2.6	2.9	2.9	2.8
10	2.7	2.7	3.0	3.2	4.1	3.4	2.8	2.7	2.6	2.9	2.9	2.8
11	2.6	2.8	3.5	3.2	4.0	3.3	2.8	2.7	2.6	2.9	2.9	2.9
12	2.6	2.8	3.4	3.2	4.0	3.3	2.8	2.7	2.7	2.9	2.9	2.9
13	2.6	2.8	3.2	3.2	4.0	3.3	2.8	2.7	2.7	2.9	2.9	3.0
14	2.6	2.8	3.0	3.2	4.0	3.3	2.9	2.7	3.35	2.9	2.9	3.0
15	2.6	2.8	3.0	3.2	4.0	3.2	2.9	2.7	3.35	2.9	2.9	2.9
16	2.6	2.7	3.4	3.2	3.9	3.45	2.9	2.7	2.7	2.9	2.9	2.9
17	2.6	2.7	3.7	3.2	3.9	3.3	2.9	2.7	2.7	2.9	2.9	2.9
18	2.7	2.7	3.3	3.2	4.0	3.65	3.35	2.7	2.7	2.9	2.9	2.9
19	2.7	2.7	3.4	3.2	4.0	3.4	3.25	2.7	2.6	2.9	2.9	2.9
20	2.8	2.8	3.7	3.2	3.9	3.3	2.9	2.7	2.6	2.9	2.9	2.8
21	2.8	2.8	3.8	3.2	3.9	3.3	3.0	2.7	2.6	2.9	2.9	2.8
22	2.8	2.8	3.6	3.2	3.8	3.2	3.0	2.7	2.6	2.9	2.9	2.8
23	2.8	2.7	3.4	3.2	3.8	3.2	2.9	2.65	2.6	2.9	2.9	2.8
24	2.8	2.7	3.4	3.3	3.7	3.2	2.9	2.65	2.6	2.9	2.9	2.8
25	2.8	2.7	3.4	3.4	3.7	3.2	2.9	2.6	2.6	2.9	2.9	2.8
26	2.8	2.7	3.3	3.5	3.7	3.1	2.9	2.6	3.8	2.9	2.8	2.8
27	2.7	2.7	3.2	3.5	3.6	3.1	2.8	2.6	4.6	2.9	2.8	2.7
28	2.7	2.7	3.2	3.6	3.6	3.0	2.8	2.6	3.2	2.9	2.8	2.7
29	2.8	.....	3.2	3.6	3.6	3.0	2.8	2.6	3.7	2.9	2.7	2.7
30	2.9	.....	3.4	3.6	3.6	2.9	2.8	2.6	3.2	2.9	2.7	2.7
31	3.3	.....	3.5	.....	3.6	.....	2.8	2.6	.....	2.9	.....	.....

NOTE.—Relation of gage height to discharge probably affected by ice Jan. 1 to Jan. 9.

Daily discharge, in second-feet, of Price River near Helper, Utah, for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	20	137	40	259	318	384	82	59	25	170	82	59
2	20	82	40	259	318	384	82	40	25	170	82	59
3	20	59	40	318	384	384	82	40	25	137	82	59
4	20	82	40	259	384	384	82	40	25	82	59	59
5	20	82	59	259	534	318	59	40	40	82	59	59
6	20	82	59	210	619	318	59	40	40	82	59	59
7	20	59	82	210	619	259	59	40	40	82	59	59
8	20	59	82	170	710	259	59	40	25	82	59	59
9	20	40	107	170	810	259	59	40	25	82	82	59
10	40	40	107	170	810	259	59	40	25	82	82	59
11	25	59	318	170	710	210	59	40	25	82	82	82
12	25	59	259	170	710	210	59	40	40	82	82	82
13	25	59	170	170	710	210	59	40	40	82	82	107
14	25	59	107	170	710	210	82	40	234	82	82	107
15	25	59	107	170	710	170	82	40	234	82	82	82
16	25	40	259	170	619	288	82	40	40	82	82	82
17	25	40	456	170	619	210	82	40	40	82	82	82
18	40	40	210	170	710	420	234	40	40	82	82	82
19	40	40	259	170	710	259	190	40	25	82	82	82
20	59	59	456	170	619	210	82	40	25	82	82	59
21	59	59	534	170	619	210	107	40	25	82	82	59
22	59	59	384	170	534	170	107	40	25	82	82	59
23	59	40	259	170	534	170	82	32	25	82	82	59
24	59	40	259	210	456	170	82	32	25	82	82	59
25	59	40	259	259	456	170	82	25	25	82	82	59
26	59	40	210	318	456	137	82	25	534	82	59	59
27	40	40	170	318	384	137	59	25	1,350	82	59	40
28	40	40	170	384	384	107	59	25	170	82	59	40
29	59	.....	170	384	384	107	59	25	456	82	40	40
30	82	.....	259	384	384	82	59	25	170	82	40	40
31	210	.....	318	.....	384	.....	59	25	.....	82	.....	40

NOTE.—Daily discharge Jan. 1 to Jan. 9 estimated, because of ice, from climatologic records and run-off in adjacent drainage areas.

Monthly discharge of Price River near Helper, Utah, for 1911.

[Drainage area, 530 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	210	20	42.5	0.080	0.09	2,610	C.
February	137	40	56.9	.107	.11	3,160	B.
March	534	40	202	.381	.44	12,400	A.
April	384	170	225	.425	.47	13,400	A.
May	810	318	558	1.05	1.21	34,300	A.
June	420	82	236	.445	.50	14,000	A.
July	234	59	81.6	.154	.18	5,020	A.
August	59	25	36.7	.069	.08	2,260	A.
September	1,350	25	128	.242	.27	7,620	A.
October	170	82	89.5	.169	.19	5,500	A.
November	82	40	73.1	.138	.15	4,350	B.
December	107	40	64.2	.121	.14	3,950	B.
The year	1,350	20	150	.283	3.83	109,000	

PRICE RIVER AT WOODSIDE, UTAH.

Location.—At the Denver & Rio Grande Railroad bridge crossing Price River at Woodside, in secs. 9 and 16, T. 18 S, R. 14 E., Salt Lake base and meridian, about 8 miles below a proposed diversion dam for an irrigation project, and about 15 miles above the junction with Green River.

Records available.—October 1, 1909, to December 31, 1911.

Drainage area.—1,500 square miles.

Gage.—Distance from a fixed point on the bridge to water surface is measured daily.

Channel.—Composed largely of quicksand.

Diversions.—A few small tributaries enter Price River between the dam site and the station.

Discharge measurements.—Made from upper side of railroad bridge.

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

Accuracy.—Because of the shifting character of the stream bed and as only two measurements were made during 1911, estimates of daily and monthly discharge can not be made.

Cooperation.—Data for this station supplied by Mr. Horace W. Sheley, consulting engineer, Salt Lake City, Utah. The location of station and methods of collecting data and making estimates have been approved by the United States Geological Survey.

Discharge measurements of Price River at Woodside, Utah, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Mar. 28	Canfield and Sheley	13.87	300
July 23	J. C. Dort	14.26	115

Daily gage height, in feet, of Price River at Woodside, Utah, for 1911.

[D. P. Adams, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1	.....	8.5	10.4	9.45	9.4	10.05	10.45	10.95
2	.....	9.1	10.5	9.45	9.65	10.0	10.45	11.05
3	.....	9.4	10.4	9.35	9.55	9.95	10.55	11.15
4	.....	9.3	10.2	9.55	9.4	10.05	10.55	11.35
5	.....	9.65	9.95	9.6	9.3	10.05	10.55	11.45
6	.....	9.85	9.75	9.7	9.2	10.2	10.6	11.45
7	.....	9.95	10.0	9.75	9.15	10.2	10.65	11.55
8	.....	10.1	9.9	9.9	9.05	10.15	10.7	11.55
9	.....	10.25	9.75	9.95	9.0	10.25	10.75	11.65
10	.....	10.3	9.7	9.85	9.0	10.35	10.85	11.65
11	.....	10.3	8.8	9.9	8.85	10.35	10.9	11.55
12	.....	10.3	9.1	9.95	8.95	10.4	10.95	11.45
13	.....	10.3	9.55	9.95	9.1	10.45	11.05	11.45
14	.....	10.3	9.9	10.05	9.15	10.5	11.05	10.95
15	.....	10.3	10.05	10.1	9.2	8.65	11.05	10.9
16	.....	10.35	9.6	10.05	9.25	9.4	11.05	.....
17	.....	10.4	9.2	10.05	9.35	9.95	11.05	.....
18	.....	10.4	8.85	10.0	9.35	9.6	9.95	.....
19	.....	10.4	9.35	10.05	9.4	9.55	10.7	.....
20	.....	10.45	9.35	10.0	9.45	9.6	10.6	.....
21	.....	10.5	9.35	9.95	9.45	9.6	10.2	.....
22	.....	10.3	9.3	9.9	9.55	9.35	9.75	.....
23	.....	10.2	8.8	9.95	9.65	9.8	10.55	.....
24	.....	10.3	8.8	9.9	9.7	10.0	10.45	.....
25	.....	10.35	8.75	9.85	9.8	10.05	10.75	.....
26	.....	10.4	9.55	9.7	9.85	10.05	9.3	.....
27	.....	10.15	9.85	9.65	9.8	10.15	10.1	.....
28	.....	10.35	9.75	9.55	9.8	10.2	10.3	.....
29	9.75	.....	9.4	9.5	9.9	10.3	10.55	.....
30	5.9	.....	9.15	9.5	9.95	10.35	10.8	.....
31	7.65	.....	9.25	.....	10.05	.....	10.9	.....

SAN RAFAEL RIVER BASIN.

SAN RAFAEL RIVER NEAR GREEN RIVER, UTAH.

Location.—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, in sec. 27, T. 22 S., R. 16 E., Salt Lake base and meridian.

Records available.—May 5, 1909, to December 31, 1911.

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. No water is diverted below the station.

Accuracy.—Poor, owing to shifting character of stream bed and lack of discharge measurements.

Cooperation.—Maintained in cooperation with the State of Utah.

Discharge measurements of San Rafael River near Green River, Utah, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Mar. 30	G. H. Canfield	1.09	101
July 22	J. C. Dort	1.96	121

Daily gage height, in feet, of San Rafael River near Green River, Utah, for 1911.

[E. F. Marshall, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	1.8	3.55	1.6	2.4	1.6	3.6	2.1	1.25	0.9	5.0	1.35
2	1.8	2.25	1.6	1.9	1.45	3.8	2.2	1.2	.8	2.85	1.45
3	1.8	2.65	1.55	1.85	1.45	3.7	1.95	1.1	.8	3.65	1.35
4	1.8	2.4	1.65	2.15	1.75	3.4	2.2	1.05	.8	5.25	1.4
5	1.8	2.6	1.75	1.9	2.35	3.6	2.1	.95	.75	6.15	1.35
6	1.8	2.25	1.65	1.9	3.25	4.0	2.05	.95	.7	4.6	1.25
7	1.8	2.05	1.65	1.75	3.7	4.05	1.9	.9	.7	3.4	1.3
8	1.8	2.1	1.75	2.05	3.65	3.7	1.75	.9	.65	2.8	1.2
9	1.8	1.85	1.85	1.9	3.95	3.7	1.6	.9	.6	2.45	1.3
10	2.45	1.75	2.05	1.8	3.8	3.8	1.5	.9	.6	1.8	1.25
11	5.0	1.65	2.2	1.75	3.95	3.7	1.4	.9	.6	1.5	1.25
12	3.7	1.7	2.05	1.65	3.35	3.5	1.35	.9	.6	1.6	1.25
13	2.9	1.75	1.75	1.55	2.9	3.55	1.35	2.2	.6	1.5	1.25
14	2.4	1.65	1.65	1.7	2.55	3.25	1.25	2.1	1.7	1.7	1.25
15	2.2	1.75	1.65	1.55	2.8	3.9	1.2	1.7	1.4	1.6	1.25
16	1.6	1.8	1.75	1.45	3.05	3.8	1.25	1.45	1.9	1.55	1.25
17	1.5	1.65	1.75	1.65	2.9	3.7	1.25	1.25	1.75	1.45	1.25
18	1.25	1.55	1.9	1.55	3.05	4.15	1.05	1.15	1.55	1.7	1.25
19	1.35	1.55	1.8	1.65	2.95	4.1	1.15	1.05	1.8	1.65	1.35
20	1.45	1.75	1.75	1.55	3.05	3.55	1.65	1.05	1.4	1.55	1.55
21	1.55	1.65	2.1	1.45	2.9	3.4	1.85	.95	1.05	1.65	1.5
22	1.55	1.65	1.75	1.35	2.8	3.3	1.7	.9	1.0	1.45	1.55
23	1.45	1.55	1.65	1.45	3.1	3.4	1.6	3.55	.9	1.25	1.5
24	1.55	1.6	1.7	1.45	3.4	3.15	1.7	2.4	1.1	1.45	1.45
25	1.5	1.65	2.1	1.7	3.8	3.25	1.4	1.9	.95	1.65	1.35
26	1.4	1.65	1.75	1.8	3.8	3.05	1.3	1.55	1.05	1.65	.....
27	1.45	1.65	1.65	2.1	3.65	2.8	2.5	1.3	.95	1.4	.....
28	1.6	1.75	1.55	1.95	3.35	2.7	2.35	1.2	2.15	1.65	.....
29	1.9	.....	1.45	1.95	3.2	2.6	1.9	1.1	3.75	1.4	.....
30	2.8	.....	1.2	1.8	3.05	2.4	1.4	1.05	5.6	1.35	.....
31	2.6	.....	2.35	.....	3.35	.....	1.45	1.15	.....	1.25	.....

NOTE.—River frozen over Nov. 26 to Dec. 31, during which period relation of gage heights to discharge was probably affected by ice.

Daily discharge, in second-feet, of San Rafael River near Green River, Utah, for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	102	649	142	272	142	670	144	59	50	1,560	64
2	102	240	142	178	128	760	166	57	50	339	70
3	102	336	137	172	128	714	121	55	50	663	64
4	102	272	148	221	159	586	166	54	50	1,760	67
5	102	322	159	178	261	670	144	52	50	2,580	64
6	102	240	148	178	528	862	136	52	50	1,320	59
7	102	202	148	159	714	877	114	50	50	544	61
8	102	212	159	202	692	688	97	50	50	322	57
9	102	172	172	178	835	688	82	50	50	226	61
10	284	159	202	165	760	740	74	50	50	102	59
11	1,550	148	230	159	835	688	67	50	50	74	59
12	714	153	202	148	566	590	64	50	50	82	59
13	412	159	159	137	412	614	64	166	50	74	59
14	272	148	148	153	309	483	59	144	92	92	59
15	230	159	148	137	380	792	57	92	67	82	59
16	142	165	159	128	460	740	59	70	114	78	59
17	132	148	159	148	412	688	59	59	97	70	59
18	112	137	178	137	460	939	54	56	78	92	59
19	119	137	165	148	428	908	56	54	102	87	64
20	128	159	159	137	460	614	87	54	67	78	78
21	137	148	212	128	412	544	108	52	54	87	74
22	137	148	159	119	380	502	92	50	52	70	78
23	128	137	148	128	476	544	82	614	50	59	74
24	137	142	153	128	586	445	92	214	55	70	70
25	132	148	212	153	760	483	67	114	51	87	64
26	123	148	159	165	760	308	61	78	54	87	.....
27	128	148	148	212	692	322	238	61	51	67	.....
28	142	159	137	185	566	292	202	57	155	87	.....
29	178	.....	128	185	510	264	114	55	714	67	.....
30	380	.....	108	165	460	214	67	54	2,070	64	.....
31	322	.....	261	.....	566	.....	70	56	.....	59	.....

NOTE.—Daily discharge determined from curves drawn through 1910 and 1911 discharge measurements and parallel to a well-defined curve for 1912. Daily discharge, Nov. 26–30, estimated at 65 second-feet.

Monthly discharge of San Rafael River near Green River, Utah, for 1911.

[Drainage area, 1,690 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	1,550	102	224	0.133	0.15	13,800	B.
February	649	137	196	.116	.12	10,900	A.
March	261	108	164	.097	.11	10,100	A.
April	272	119	163	.096	.11	9,700	A.
May	835	128	492	.291	.34	30,300	B.
June	939	214	608	.359	.40	36,200	B.
July	238	54	98.8	.059	.07	6,080	B.
August	614	50	88.0	.052	.06	5,410	B.
September	2,070	50	152	.090	.10	9,040	B.
October	2,580	59	356	.211	.24	21,900	B.
November	.....	.....	64.1	.038	.04	3,810	C.
December	.....	.....	[a] 60.0	.036	.04	3,690	C.
The year	2,580	.....	222	.131	1.78	161,000	

[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, 1911.

Drainage area.—158 square miles.

Gage.—Vertical staff in two sections.

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.

Point of zero flow.—On September 4 it was determined that there would be no flow past the station if the stage were to fall below about 1.5 feet. Control will change.

Winter flow.—Ice affects relation of gage height to discharge at times during winter months.

Diversions.—Above all diversions (except Cunha's ditch) and below all main tributaries.

Artificial control.—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.

Cooperation.—Maintained in cooperation with the State of Utah.

Discharge measurements of Huntington Creek near Huntington, Utah, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 22[a]	G. H. Canfield	2.75	43.6	Aug. 23[a]	Leonard Tanner	2.80	48.9
May 10	Leonard Tanner	4.25	436	Sept. 4[a]	J. C. Dort	2.74	39.5
June 16	do	3.90	284	4[a]	Leonard Tanner	2.74	40.7
July 11[a]	do	3.30	128	Oct. 21[a]	do	2.55	26.5

[a] Made by wading.

Daily gage height, in feet, of Huntington Creek near Huntington, Utah, for 1911.

[Joseph Cunha, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.0	.....	2.8	.....	3.8	4.1	3.5	3.0	2.7	2.6	2.8	.....
2	.....	2.75	2.8	.....	3.9	4.0	3.5	3.0	2.7	2.6	2.7	.....
3	.....	.....	2.8	.....	3.9	4.1	3.5	3.0	2.7	2.6	2.8	.....
4	.....	.....	2.85	2.9	3.95	4.15	3.5	3.0	2.7	2.6	2.7	.....
5	.....	.....	.....	2.8	4.0	4.15	3.4	3.0	2.7	2.6	2.8	.....
6	3.0	.....	2.9	2.8	4.0	4.05	3.4	3.0	2.7	2.6	2.7	.....
7	.....	.....	.....	2.8	3.95	4.05	3.4	3.0	2.8	2.6	2.8	.....
8	.....	.....	.....	2.8	3.9	4.15	3.4	3.0	2.8	2.6	2.7	.....
9	.....	2.75	2.9	2.85	3.9	4.15	3.3	3.0	2.8	2.6	2.8	.....
10	.....	2.75	2.9	2.85	3.9	4.15	3.3	3.0	2.8	2.6	2.7	3.2
11	3.0	2.75	2.8	2.85	3.85	4.1	3.3	3.0	2.8	2.6	2.8	.....
12	.....	.....	.....	2.85	3.9	4.0	3.4	3.0	2.8	2.6	2.8	3.3
13	.....	.....	.....	2.85	3.95	4.0	3.4	3.0	2.7	2.6	2.8	.....
14	3.0	.....	.....	2.85	3.85	4.0	3.3	3.0	2.7	2.6	2.8	3.3
15	.....	.....	.....	2.8	3.85	4.0	3.3	3.0	2.7	.....	2.8	.....
16	2.8	.....	.....	2.9	3.95	3.9	3.2	3.0	2.7	.....	2.9	3.4
17	.....	.....	2.9	2.95	3.95	3.9	3.2	3.0	2.7	.....	3.0	3.6
18	.....	2.85	2.9	2.95	3.95	3.7	3.3	3.0	2.7	.....	3.0	3.7
19	2.8	2.85	2.9	2.95	3.85	3.7	3.2	3.0	2.7	.....	.....	3.8
20	.....	2.85	2.7	2.95	3.85	3.7	3.3	2.9	2.7	.....	.....	4.0
21	.....	.....	2.8	2.95	3.95	3.6	3.3	2.9	2.6	2.8	.....	4.0
22	.....	.....	2.75	2.95	3.95	3.7	3.3	2.9	2.6	2.8	.....	4.2
23	.....	.....	2.7	3.2	3.95	3.6	3.2	2.8	2.6	2.7	.....	4.4
24	.....	.....	2.75	3.2	4.05	3.55	3.2	2.8	2.6	2.8	.....	4.5
25	2.65	.....	2.7	3.3	4.0	3.5	3.1	2.8	2.6	2.7	.....	4.6
26	.....	.....	2.8	3.3	4.05	3.5	3.1	2.8	2.6	2.85	.....	4.7
27	.....	.....	2.75	3.4	3.95	3.4	3.1	2.8	2.6	2.7	.....	4.8
28	2.65	2.8	2.75	3.5	4.0	3.4	3.1	2.8	2.6	2.8	.....	5.0
29	.....	.....	2.8	3.6	4.0	3.4	3.2	2.8	2.6	2.7	.....	5.0
30	.....	.....	2.75	3.7	4.0	3.4	3.1	2.8	2.6	2.8	.....	5.0
31	.....	.....	2.8	.....	4.0	.....	3.1	2.7	.....	2.7	.....	5.0

NOTE.—Relation of gage height to discharge probably affected by ice Jan. 1 to Feb. 28 and Nov. 1 to Dec. 31. Gage heights Oct. 1–31 questionable.

Daily discharge, in second-feet, of Huntington Creek near Huntington, Utah, for 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	47	50	251	364	167	71	38
2	47	52	285	323	167	71	38
3	47	55	285	364	167	71	38
4	52	58	304	386	167	71	38
5	55	47	323	386	143	71	38
6	58	47	323	344	143	71	38
7	58	47	304	344	143	71	47
8	58	47	285	386	143	71	47
9	58	52	285	386	122	71	47
10	58	52	285	386	122	71	47
11	47	52	268	364	122	71	47
12	49	52	285	323	143	71	47
13	51	52	304	323	143	71	38
14	52	52	268	323	122	71	38
15	54	47	268	323	122	71	38
16	56	58	304	285	103	71	38
17	58	64	304	285	103	71	38
18	58	64	304	221	122	71	38
19	58	64	268	221	103	71	38
20	38	64	268	221	122	58	38
21	47	64	304	193	122	58	29
22	42	64	304	221	122	58	29
23	38	103	304	193	103	47	29
24	42	103	344	180	103	47	29
25	38	122	323	167	86	47	29
26	47	122	344	167	86	47	29
27	42	143	304	143	86	47	29
28	42	167	323	143	86	47	29
29	47	193	323	143	103	47	29
30	42	221	323	143	86	47	29
31	47	.....	323	.....	86	38	.....

NOTE.—Daily discharge determined from a fairly well defined rating curve for all stages. Discharge estimated for days for which gage heights are missing.

Monthly discharge of Huntington Creek near Huntington, Utah, for 1911.

[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	.....	.....	30	0.188	0.22	1,840	D.
February	.....	.....	40	.250	.26	2,220	D.
March	58	38	49.4	.308	.36	3,040	C.
April	221	47	79.3	.496	.55	4,720	B.
May	344	251	296	1.85	2.13	18,200	B.
June	386	143	275	1.72	1.92	16,400	B.
July	167	86	121	.756	.88	7,440	A.
August	71	38	62.5	.390	.45	3,840	A.
September	47	29	36.8	.230	.26	2,190	B.
October	.....	.....	25	.156	.18	1,540	C.
November	.....	.....	25	.156	.17	1,490	D.
December	.....	.....	20	.125	.14	1,230	D.
The year	386	.....	88.9	.556	7.52	64,200	

NOTE.—The mean monthly discharges for January, February, November, and December were estimated because of ice. October was estimated because of probable incorrect gage readings by observer.

HUNTINGTON CREEK NEAR CASTLEDALE, UTAH.

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

Records available.—May 12, 1911, to December 31, 1911.

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.

Point of zero flow.—On September 5 it was determined that there would be no flow past the station if the stage were to fall below about 1.5 feet. Control will probably change.

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.

Accuracy.—Good.

Cooperation.—Maintained in cooperation with the State of Utah.

Discharge measurements of Huntington Creek near Castledale, Utah, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 12	Leonard Tanner	3.12	132	Aug. 19	Leonard Tanner	1.75	8.7
June 26	do	2.45	63.3	Sept. 5	J. C. Dort	1.70	4.76
July 26	do	2.18	30.5	5	Leonard Tanner	1.70	5.01
Aug. 4	do	1.80	11.6				

Daily gage height, in feet, of Huntington Creek near Castledale, Utah, for 1911.

[Elmer Jeffs, observer.]

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	2.15	1.85	1.75	.....	1.8	1.85
2	.....	.....	2.2	1.75	1.75	1.8	1.8	1.8
3	.....	.....	3.0	.....	.....	1.8	1.85	1.9
4	.....	.....	2.9	1.8	1.75	1.9	1.9	.....
5	.....	.....	2.65	1.7	1.7	1.9	.....	1.85
6	.....	.....	2.4	.....	1.7	1.9	1.85	1.85
7	.....	.....	2.5	1.8	1.65	1.8	1.85	1.85
8	.....	.....	1.9	1.75	1.65	1.9	1.8	1.85
9	.....	.....	1.9	1.7	1.7	1.85	1.85	.....
10	.....	.....	1.9	1.7	1.75	1.8	1.8	2.8
11	.....	.....	1.85	1.8	1.8	1.8	1.8	2.75
12	3.1	.....	1.85	.....	1.8	1.8	.....	2.75
13	.....	.....	1.8	.....	1.7	1.9	.....	2.75
14	.....	.....	1.8	2.8	1.7	1.9	.....	2.85
15	.....	.....	1.75	1.8	1.7	.....	1.8	2.8
16	.....	.....	.....	1.7	.....	.....	1.9	.....
17	.....	.....	1.75	1.8	.....	.....	1.85	2.8
18	.....	.....	1.75	1.7	1.7	.....	1.85	2.8
19	.....	.....	1.8	1.7	1.75	1.9	1.8	2.8
20	.....	.....	1.8	1.75	1.75	1.9	1.8	2.8
21	.....	.....	1.8	3.8	1.7	1.8	1.9	2.85
22	.....	.....	1.9	1.85	1.75	1.8	1.8	2.85
23	.....	.....	.....	1.75	1.75	1.9	1.8	.....
24	.....	.....	.....	1.8	1.7	1.9	1.8	.....
25	.....	.....	.....	1.8	1.7	1.8	1.8	2.8
26	.....	2.45	2.5	1.8	1.7	1.8	.....	2.8
27	3.0	2.4	2.6	.....	1.75	1.8	1.85	1.75
28	.....	2.25	2.95	1.7	1.75	1.9	1.85	1.75
29	.....	2.2	2.0	1.75	4.2	1.8	1.85	1.75
30	.....	2.2	.....	1.75	2.6	1.9	1.85	2.7
31	.....	.....	1.9	1.8	.....	1.85	.....	.....

NOTE.—Relation of gage height to discharge probably affected by ice Dec. 9–31.

Daily discharge, in second-feet, of Huntington Creek near Castledale, Utah, for 1911.

Day.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	32	13	7.5	41	10
2	.....	36	7.5	7.5	10	10
3	.....	117	9	7.5	10	13
4	.....	105	10	7.5	16	16
5	.....	77	5	5	16	14
6	.....	53	7.5	5	16	13
7	.....	62	10	3.5	10	13
8	.....	16	7.5	3.5	16	10
9	.....	16	5	5	13	13
10	.....	16	5	7.5	10	10
11	.....	13	10	10	10	10
12	.....	13	38	10	10	10
13	.....	10	65	5	16	10
14	.....	10	93	5	16	10
15	.....	7.5	10	5	16	10
16	.....	7.5	5	5	16	16
17	.....	7.5	10	5	16	13
18	.....	7.5	5	5	16	13
19	.....	10	5	7.5	16	10
20	.....	10	7.5	7.5	16	10
21	.....	10	234	5	10	16
22	.....	16	13	7.5	10	10
23	.....	28	7.5	7.5	16	10
24	.....	39	10	5	16	10
25	.....	50	10	5	10	10
26	58	62	10	5	10	12
27	53	72	7.5	7.5	10	13
28	40	111	5	7.5	16	13
29	36	22	7.5	301	10	13
30	36	19	7.5	72	16	13
31	.....	16	10	.....	13	.....

NOTE.—Daily discharge determined from a rating curve fairly well defined below 3.5 feet on gage. Discharge interpolated for days for which gage heights are missing.

Monthly discharge of Huntington Creek near Castledale, Utah, for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
July	117	7.5	34.5	2,120	B.
August	234	5	21.0	1,290	B.
September	301	3.5	18.2	1,080	B.
October	41	10	14.3	879	B.
November	16	10	11.8	702	B.
December[a]	.....	.....	10.0	615	D.
The period	.....	.....	.....	6,790	

[a] Estimated.

COTTONWOOD CREEK NEAR ORANGEVILLE, UTAH.

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

Records available.—May 1, 1909, to December 31, 1911.

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.

Point of zero flow.—On August 22, 1911, it was determined that there would be no flow past the gage if the stage were to fall below about 3 feet. Control will change.

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.—Poor, because of shifting channel.

Cooperation.—Maintained in cooperation with the State of Utah.

Discharge measurements of Cottonwood Creek near Orangeville, Utah, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 23[a]	G. H. Canfield	3.81	39.2	Aug. 22[b]	Leonard Tanner	4.05	34.2
May 8	Leonard Tanner	5.7	539.2	Sept. 11[b]	J. C. Dort	4.03	31.7
June 24	....do	5.2	238.9	Oct. 13[b]	Leonard Tanner	3.94	26.7
July 19[b]	....do	4.4	83.8				

[a] Wading under cable. [b] Wading below cable.

NOTE.—The above measurements refer to the gage installed Mar. 22, 1910.

Daily gage height, in feet, of Cottonwood Creek near Orangeville, Utah, for 1911.

[Robert Johnson, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	4.1	3.7	.....	4.4	6.2	.....	4.2	.....	.....	3.8	4.0
2	4.2	3.8	3.7	.....	4.7	6.2	.....	4.2	.....	4.0	3.8	4.1
3	4.2	3.8	.....	4.5	5.0	6.3	.....	4.2	.....	4.0	3.8	.....
4	.....	3.8	3.8	4.1	5.0	.....	.....	4.2	.....	4.0	3.8	4.0
5	4.2	.....	.....	4.0	5.2	6.4	4.7	.....	4.0	4.0	.....	.....
6	4.2	3.8	3.9	.....	5.8	6.4	4.7	.....	4.0	4.0	3.8	4.1
7	4.2	3.7	3.9	4.0	.....	.....	4.7	4.1	4.0	4.0	.....	.....
8	.....	3.6	4.0	4.2	5.7	6.5	4.7	4.1	4.0	.....	3.8	4.0
9	3.8	3.7	4.0	.....	5.9	6.0	.....	.....	4.0	4.0	3.8	4.1
10	.....	.....	3.9	3.6	.....	6.0	4.6	4.1	.....	4.0	3.8	.....
11	4.3	3.7	3.9	3.6	5.5	.....	4.5	4.1	.....	.....	3.8	4.0
12	4.0	.....	.....	3.6	5.7	6.1	4.5	4.4	4.4	4.0	.....	4.0
13	4.6	3.7	4.6	3.6	5.7	6.1	4.5	.....	4.0	4.0	4.0	.....
14	3.9	3.8	4.9	4.0	.....	6.1	.....	4.2	4.0	3.95	.....	4.0
15	.....	3.9	4.9	4.1	5.4	.....	4.7	4.6	4.0	.....	3.95	4.0
16	3.8	.....	4.8	.....	5.4	6.0	.....	4.4	4.0	3.95	.....	.....
17	4.0	3.8	4.8	4.0	5.4	5.9	4.6	.....	.....	3.95	3.9	.....
18	.....	3.7	4.6	4.0	5.5	.....	4.6	4.1	4.0	3.95	4.0	3.7
19	4.5	.....	.....	3.9	5.4	5.7	4.4	4.1	4.0	3.8	.....	3.7
20	.....	3.8	4.1	3.9	5.4	.....	4.4	.....	4.0	.....	.....	.....
21	5.0	3.8	3.9	4.0	.....	5.5	.....	4.1	4.0	3.8	3.9	3.7
22	.....	3.7	4.5	3.9	5.8	5.4	4.4	4.0	4.0	.....	.....	.....
23	4.2	.....	3.8	.....	6.0	5.4	.....	.....	4.0	4.0	3.95	3.7
24	4.6	3.7	.....	4.5	6.0	5.3	.....	4.0	.....	3.9	4.0	.....
25	4.6	3.8	3.6	4.7	.....	.....	4.6	4.0	4.0	3.9	.....	.....
26	3.8	.....	.....	4.5	5.9	5.2	4.4	4.0	4.0	.....	.....	3.6
27	.....	4.0	3.7	4.5	5.8	5.1	4.3	.....	4.0	3.9	4.0	4.0
28	3.6	3.7	3.9	4.4	.....	5.0	.....	.....	4.0	3.9	4.1	4.0
29	.....	.....	4.2	4.4	.....	5.0	4.3	4.0	5.3	.....	4.0	4.0
30	4.9	.....	4.8	.....	.....	5.0	.....	4.0	4.2	.....	.....	4.0
31	5.1	.....	4.8	.....	6.2	.....	.....	4.0	.....	.....	.....	.....

NOTE.—Relation of gage height to discharge affected by ice Jan. 1 to about Jan. 31, for several days in February, and about Nov. 13 to Dec. 31.

Daily discharge, in second-feet, of Cottonwood Creek near Orangeville, Utah, for 1911.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	64	34	192	114	592	160	43	31	37	21
2	40	34	163	192	592	146	43	31	31	21
3	40	37	136	294	628	132	43	31	31	21
4	40	40	64	294	646	118	43	31	31	21
5	40	43	54	363	664	102	41	31	31	21
6	40	46	54	574	664	102	39	31	31	21
7	34	46	54	556	682	102	37	31	31	21
8	29	54	77	538	700	102	37	31	31	21
9	34	54	52	610	520	94	37	31	31	21
10	34	46	29	538	520	85	37	40	31	21
11	34	46	29	472	538	70	37	50	31	21
12	34	104	29	538	556	70	60	60	31	26
13	34	163	29	538	556	70	52	31	31	31
14	40	260	54	486	556	86	43	31	28	30
15	46	260	64	433	538	102	85	31	28	28
16	43	226	59	433	520	94	60	31	28	27
17	40	226	54	433	485	85	48	31	28	26
18	34	163	54	468	450	85	37	31	28	31
19	37	114	46	433	415	60	37	31	21	30
20	40	64	46	433	380	60	37	31	21	28
21	40	46	54	504	345	60	37	31	21	26
22	34	136	46	574	310	60	31	31	26	27
23	34	40	91	646	310	68	31	31	31	28
24	34	34	136	646	275	76	31	31	26	31
25	40	29	192	628	258	85	31	31	26	31
26	47	32	136	610	240	60	31	31	26	31
27	54	34	136	574	205	50	31	31	26	31
28	34	46	114	580	175	50	31	31	26	37
29	.....	77	114	584	175	50	31	275	26	31
30	.....	226	114	588	175	48	31	43	24	31
31	.....	226	.....	592	.....	46	31	.....	22	.....

NOTE.—Daily discharge determined from two poorly defined rating curves applicable Jan. 1 to May 30 and May 31 to Dec. 31, respectively. Discharge interpolated for days when the gage was not read.

Monthly discharge of Cottonwood Creek near Orangeville, Utah, for 1911.

[Drainage area, 240 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	.....	.....	30	0.125	0.14	1,840	D.
February	64	34	39.1	.162	.17	2,170	D.
March	260	29	96.3	.401	.46	5,920	B.
April	192	29	82.4	.343	.38	4,900	B.
May	646	114	492	2.05	2.36	30,200	B.
June	700	175	456	1.90	2.12	27,100	C.
July	160	46	83.2	.347	.40	5,120	C.
August	85	31	40.1	.166	.19	2,470	A.
September	275	31	41.4	.173	.19	2,460	A.
October	37	21	28.1	.117	.14	1,730	A.
November	37	21	26.4	.108	.12	1,570	D.
December	.....	.....	25	.104	.12	1,540	D.
The year	700	.....	117	.488	6.79	87,000	

NOTE.—The mean monthly discharges for January and December were estimated because of ice in the stream. Accuracy for February and November given low because of possible ice effect.

FERRON CREEK (UPPER STATION) NEAR FERRON, UTAH.

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

Records available.—May 6 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff and sloping gage. New sloping gage installed September 13, 1911, 150 feet below the staff, was used for records after that date.

Channel.—Probably shifts at high stages.

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

Point of zero flow.—On September 13 and October 8 it was determined that there would be no flow past the station if the stage were to fall below about 1 foot on the sloping gage. Control will probably change.

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

Diversions.—Above all diversions.

Accuracy.—Fair.

Cooperation.—Maintained in cooperation with the State of Utah.

Discharge measurements of Ferron Creek (upper station) near Ferron, Utah, in 1911.

Date.	Hydrographer.	Gage height (inclined gage).	Gage height (vertical staff gage).	Discharge.	Date.	Hydrographer.	Gage height (inclined gage).	Gage height (vertical staff gage).	Discharge.
		Feet.	*Feet.*	*Sec.-ft.*			*Feet.*	*Feet.*	*Sec.-ft.*
June 29	Leonard Tanner.	.....	3.3	134	Sept. 6	Leonard Tanner.	.....	2.64	18.2
July 23	.....do.....	.....	2.98	78.6	Sept. 13	Dort and Tanner	2.10	2.82	30.8
Aug. 24	.....do.....	.....	2.7	21.9	13	.....do.....	2.12	2.90	35.0
Sept. 6	J. C. Dort.....	.....	2.64	18.2	Oct. 8	Leonard Tanner.	1.86	2.61	19.6

NOTE.—Measurements prior to Sept. 13, 1911, refer to a vertical staff gage installed May 6, 1911. Measurements on and after Sept. 13, 1911, have also been referred to the inclined gage 150 feet downstream from the vertical gage.

Daily gage height, in feet, of Ferron Creek (upper station) near Ferron, Utah, for 1911.

[J. H. Christensen, observer.]

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	4.2	3.2	2.8	2.65	2.0	1.7	2.0
2	.....	4.1	3.15	2.8	2.65	1.95	1.7	.....
3	.....	4.25	3.1	2.7	2.65	1.9	.....	.....
4	.....	4.35	3.1	2.7	2.65	1.85	1.7	1.95
5	.....	4.35	3.1	2.7	2.65	1.9	1.75	.....
6	4.5	4.2	3.1	2.7	2.65	1.85	.....	2.35
7	4.45	4.1	3.1	2.7	2.65	1.9	1.7	.....
8	4.25	4.25	3.05	2.7	2.65	1.85	.....	.....
9	4.3	4.05	3.0	2.7	2.6	1.85	.....	2.0
10	4.0	4.0	2.95	2.7	2.6	1.9	2.0	.....
11	3.9	4.05	2.9	2.7	2.6	1.85	1.9	2.35
12	3.9	4.05	2.9	2.9	2.7	1.8	.....	.....
13	3.85	4.05	2.9	2.7	2.1	1.8	1.85	2.4
14	3.9	4.15	2.9	2.7	2.0	1.8	.....	.....
15	3.85	4.0	2.9	4.0	1.9	1.8	1.3	.....
16	3.95	4.6	2.9	3.9	1.9	1.75	.....	2.45
17	3.95	3.9	2.9	2.7	1.9	1.85	.....	.....
18	3.95	3.95	2.9	2.7	1.85	1.8	1.35	2.45
19	3.85	3.9	2.9	2.7	1.85	1.6	2.25	.....
20	3.75	3.95	2.9	2.7	1.85	1.55	2.2	2.45
21	3.9	3.85	2.9	2.65	1.85	1.55	.....	.....
22	4.1	3.8	2.9	2.7	1.85	1.75	2.1	2.35
23	4.35	3.65	2.9	2.7	1.85	1.65	.....	2.15
24	4.25	3.6	.....	2.7	1.85	1.8	.....	.....
25	4.15	3.5	.....	2.7	1.85	1.8	2.1	1.95
26	3.95	3.45	.....	2.7	1.85	1.75	.....	.....
27	3.9	3.4	2.8	2.7	2.22	1.8	1.85	1.9
28	3.95	3.35	2.8	2.7	1.9	1.8	.....	2.8
29	4.15	3.3	2.8	.....	2.5	1.7	1.85	2.7
30	4.3	3.3	2.8	.....	2.75	1.7	.....	.....
31	4.4	.....	.....	.....	.....	1.75	.....	2.45

NOTE.—Relation of gage height to discharge probably affected by ice Dec. 5 to 31. Observer reports ice present Nov. 27. A new gage was established at this station Sept. 13, 1911; after Sept. 12 all gage heights are from this new gage.

Daily discharge, in second-feet, of Ferron Creek (upper station) near Ferron, Utah, for 1911.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	319	102	63	20	27	8	27
2	.....	294	96	63	20	24	8	24
3	.....	332	91	55	20	20	8	22
4	.....	360	91	55	20	17	8	20
5	.....	360	91	55	20	20	11	.....
6	380	319	91	55	20	17	10	.....
7	366	294	91	55	20	20	8	.....
8	332	332	86	55	20	17	14	.....
9	346	282	81	55	17	17	20	.....
10	269	269	76	55	17	20	27	.....
11	246	282	71	55	17	17	20	.....
12	246	282	71	71	23	14	18	.....
13	234	282	71	55	34	14	17	.....
14	246	306	71	55	27	14	9	.....
15	234	269	71	164	20	14	2	.....
16	258	408	71	147	20	11	2	.....
17	258	246	71	23	20	17	2	.....
18	258	258	71	23	17	14	3	.....
19	234	246	71	23	17	6	45	.....
20	212	258	71	23	17	6	42	.....
21	246	234	71	20	17	6	38	.....
22	294	223	71	23	17	11	34	.....
23	360	193	71	23	17	8	34	.....
24	332	184	69	23	17	14	34	.....
25	306	166	67	23	17	14	34	.....

Daily discharge, in second-feet, of Ferron Creek (upper station) near Ferron, Utah., for 1911—Continued.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
26	258	136	65	23	17	11	25	.....
27	246	128	63	23	44	14	17	.....
28	258	121	63	23	20	14	17	.....
29	306	114	63	22	74	8	17	.....
30	346	114	63	21	106	8	17	.....
31	353	.....	.....	20	.....	11	.....	.....

NOTE.—Daily discharge May 6 to Sept. 12 determined from three poorly defined rating curves applicable May 6 to June 25, June 26 to Aug. 14, and Aug. 15 to Sept. 12, respectively. Daily discharge Sept. 13 to Dec. 6 obtained from a well-defined curve. Discharge interpolated for days for which gage heights are missing. Daily discharge Dec. 5 to 31 estimated at 10 second-feet.

Monthly discharge of Ferron Creek (upper station) near Ferron, Utah, for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
May 6–31	380	212	286	14,700	B.
June	408	114	258	15,100	B.
July	102	63	73.3	4,510	B.
August	164	20	46.7	2,870	B.
September	106	17	17.3	1,030	C.
October	27	6	14.3	879	C.
November	45	2	18.1	1,080	D.
December	.....	.....	11.7	719	D.
The period	.....	.....	.....	40,900	

FERRON CREEK NEAR FERRON, UTAH.

Location.—At Westenskow's ranch, about half a mile below the headgates of the North and South canals, and about 2½ miles above the town of Ferron, Utah; probably in sec. 7, T. 20 S., R. 7 E., Salt Lake base and meridian.

Records available.—April 28, 1909, to October 7, 1911.

Drainage area.—153 square miles.

Gage.—Gage readings are obtained by measuring down to the water surface from a fixed point on the footbridge.

Channel.—Practically permanent at medium stages.

Discharge measurements.—Made from a footbridge at gage during high water and by wading at low water.

Point of zero flow.—On September 12 it was determined that there would be no flow past the station if the stage were to fall below about 4 foot. Control may change.

Winter flow.—Ice forms at times during winter months.

Diversions.—Two large canals, the North and South, with a combined capacity of 100 second-feet, divert water above the station, and many small ditches take water both above and below the station.

Accuracy.—The discharge curve is fairly well defined but the estimates can be considered only fair because of diversions made above gage.

Cooperation.—Maintained in cooperation with the State of Utah.

Discharge measurements of Ferron Creek near Ferron, Utah, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Mar. 23	G. H. Canfield	1.40	20.9
25	.....do	1.22	10.22
May 5	Leonard Tanner	2.60	114
June 30	.....do	.80	1.4

Daily gage height, in feet, of Ferron Creek near Ferron, Utah, for 1911.

[James Westenskow, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	1.7	1.5	1.9	1.7	2.0	3.0	0.6	.....	.....	0.9
2	1.7	1.3	1.7	2.6	2.1	2.7	.6	.....	.....	.7
3	1.1	1.1	1.7	2.1	2.3	3.0	.6	.....	.....	.4
4	1.1	1.1	1.4	1.6	2.6	3.2	.5	.....	.....	.2
5	1.1	1.0	1.0	1.4	3.2	3.0	.5	.....	.....	.5
6	1.9	1.0	1.1	1.4	3.0	2.9	.5	.....	.....	.2
7	1.7	1.0	1.1	1.4	3.3	3.0	.5	.....	.....	1.2
8	1.5	1.0	1.5	1.5	3.4	3.0	.....	.....	.....	.....
9	1.5	1.0	1.6	1.5	3.6	2.7	.....	.....	.....	.....
10	1.1	1.0	2.0	1.4	3.6	3.4	1.0	.....	.....	.....
11	1.1	1.0	1.2	1.3	3.6	2.7	.5	.....	.....	.....
12	2.0	1.0	1.0	.9	2.8	2.3	.....	.....	.....	.....
13	2.0	1.3	.7	.9	2.0	2.7	.....	.....	.....	.....
14	2.2	1.1	.7	.9	2.6	3.0	1.4	.....	.....	.....
15	2.2	.7	1.1	.6	2.4	2.7	.....	4.0	.....	.....
16	2.4	1.5	1.3	.8	1.8	2.5	.....	1.9	.....	.....
17	1.8	1.9	1.3	1.1	1.8	2.9	.....	.8	.....	.....
18	1.7	1.1	1.3	1.2	2.1	2.9	.....	.6	.....	.....
19	2.2	1.3	1.5	.9	2.0	2.6	.6	.....	.....	.....
20	2.4	.8	.9	.9	1.8	2.1	.....	.....	.....	.....
21	2.4	.8	1.0	.7	1.9	2.9	.4	.....	.....	.....
22	1.9	1.0	1.7	1.0	2.3	2.6	.....	.....	.....	.....
23	1.9	1.3	1.4	1.6	2.4	2.1	.....	.....	.....	.....
24	1.9	1.1	1.4	2.2	2.4	2.1	.....	.....	.....	.....
25	2.7	1.8	1.25	2.2	3.0	1.9	.....	.....	.....	.....
26	2.7	1.5	1.0	2.0	2.3	1.6	.....	.....	.....	.....
27	2.6	1.9	1.2	1.7	2.3	1.4	.....	.....	2.1	.....
28	2.5	1.9	1.2	1.8	2.4	1.2	.....	.....	.....	.....
29	2.5	.....	2.2	1.8	3.4	.7	.....	.....	3.5	.....
30	2.5	.....	2.4	1.8	3.2	.7	.....	.....	2.6	.....
31	2.7	.....	2.3	.....	3.3	.....	.....	.....	.....	.....

NOTE.—Relation of gage heights to discharge probably affected by ice Jan. 1 to Feb. 28. Channel dry on days for which gage heights are missing prior to Oct. 8.

Daily discharge, in second-feet, of Ferron Creek near Ferron, Utah, for 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	56	42	64	150	0.5	0.0	0.0	2.5
2	42	114	72	123	.5	.0	.0	1.0
3	42	72	88	150	.5	.0	.0	.0
4	21	35	114	170	.2	.0	.0	.0
5	4.0	21	170	150	.2	.0	.0	.2
6	6.5	21	150	141	.2	.0	.0	.0
7	6.5	21	180	150	.2	.0	.0	10
8	28	28	190	150	.0	.0	.0	.....
9	35	28	210	123	.0	.0	.0	.....
10	64	21	210	190	4.0	.0	.0	.....
11	10	15	210	123	.2	.0	.0	.....
12	4.0	2.5	132	88	.0	.0	.0	.....
13	1.0	2.5	64	123	.0	.0	.0	.....
14	1.0	2.5	114	150	21	.0	.0	.....
15	6.5	.5	96	123	.0	250	.0	.....
16	15	1.5	49	105	.0	56	.0	.....
17	15	6.5	49	141	.0	1.5	.0	.....
18	15	10	72	141	.0	.5	.0	.....
19	28	2.5	64	114	.5	.0	.0	.....
20	2.5	2.5	49	72	.0	.0	.0	.....
21	4.0	1.0	56	141	.0	.0	.0	.....
22	42	4.0	88	114	.0	.0	.0	.....
23	21	35	96	72	.0	.0	.0	.....
24	21	80	96	72	.0	.0	.0	.....
25	12	80	150	56	.0	.0	.0	.....
26	4.0	64	88	35	.0	.0	.0	.....
27	10	42	88	21	.0	.0	72	.....
28	10	49	96	10	.0	.0	136	.....
29	80	49	190	1.0	.0	.0	200	.....
30	96	49	170	1.0	.0	.0	114	.....
31	88	.....	180	.....	.0	.0	.....	.....

NOTE.—Daily discharge determined from a poorly defined rating curve.

Monthly discharge of Ferron Creek near Ferron, Utah, for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	[a] 2.5	154	D.
February	.....	.....	[a] 3.5	194	D.
March	96	1.0	25.5	1,570	B.
April	114	.5	30.1	1,790	C.
May	210	49	118	7,260	C.
June	190	1.0	107	6,370	C.
July	21	.0	9.0	55	D.
August	250	.0	9.9	609	D.
September	200	.0	17.4	1,040	D.
The period	.....	.....	.....	19,000	

[a] Estimated.

FERRON CREEK NEAR CASTLEDALE, UTAH.

Location.—About 8 miles below the town of Ferron, Utah, and 4 miles south of Castledale, 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, 1911.

Drainage area.—Not measured.

Gage.—Inclined staff on left bank.

Channel.—Shifting.

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

Point of zero flow.—On September 12 it was determined that there would be no flow past the station if the stage were to fall below about 4.2 feet. Control will change.

Winter flow.—Ice affects the relation of gage height to discharge during the winter months.

Diversions.—Below all diversions, except the Fred Anderson ditch.

Accuracy.—Fair only, because of shifting character of stream bed.

Cooperation.—Maintained in cooperation with the State of Utah.

Discharge measurements of Ferron Creek near Castledale, Utah, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
June 30	Leonard Tanner.....	5.00	20.5	Sept 12	J. C. Dort.....	4.38	0.19
July 25	.....do.....	4.55	2.05	Oct. 5	Leonard Tanner.....	4.89	13.7
Aug. 25	.....do.....	4.40	.27				

NOTE.—Measurements made by wading.

Daily gage height, in feet, of Ferron Creek near Castledale, Utah, for 1911.

[Abinadi Olsen, observer.]

Day.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	4.85	4.35	4.35	4.8	4.8	4.75
2	.....	4.9	4.3	4.35	4.55	5.0	4.75
3	.....	4.85	4.35	4.35	4.65	4.8	5.0
4	.....	4.85	4.35	4.35	4.9	4.8	5.0
5	.....	4.55	4.35	4.35	4.9	4.85	4.95
6	.....	4.45	4.35	4.35	5.0	4.85	4.9
7	.....	4.35	4.35	4.35	5.0	4.8	4.9
8	.....	4.15	.....	4.35	5.0	4.85	4.8
9	.....	4.15	.....	4.35	5.0	4.85	4.8
10	.....	4.35	.....	4.35	5.0	4.8	4.8
11	.....	4.35	.....	4.35	4.95	4.8	4.85
12	5.75	4.45	.....	4.35	4.95	4.8	4.8
13	5.65	4.5	.....	4.35	4.9	.....	4.8
14	5.95	4.35	.....	4.35	4.95	4.65	4.85
15	5.95	4.4	6.05	4.35	4.95	5.1	4.8
16	5.65	4.35	5.45	4.35	4.9	5.2	4.75
17	5.55	4.3	4.95	4.45	4.85	5.1	5.0
18	6.1	4.4	4.45	4.45	4.85	5.0	5.0
19	6.85	5.35	4.4	4.55	4.85	4.95	5.0
20	5.95	4.45	4.35	4.55	.....	4.8	.....
21	5.65	4.35	4.35	4.6	.....	5.0	.....
22	5.55	4.4	4.4	4.55	4.8	4.9	4.6
23	5.6	4.35	4.35	4.55	4.8	.....	.....
24	5.55	4.35	4.4	4.55	4.8	4.9	.....
25	4.95	4.55	4.4	4.55	4.8	4.8	.....
26	4.85	4.55	4.4	4.55	4.8	5.15	.....
27	4.9	4.5	4.35	4.65	4.8	4.5	.....
28	4.95	4.55	4.35	4.65	4.8	4.85	.....
29	4.95	4.6	4.35	5.75	4.8	4.8	.....
30	4.95	4.45	4.35	6.95	4.8	4.8	.....
31	.....	4.5	4.35	.....	4.8	.....	.....

NOTE.—Relation of gage heights to discharge probably affected by ice Nov. 28 to Dec. 31.

Daily discharge, in second-feet, of Ferron Creek near Castledale, Utah, for 1911.

Day.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	11.5	0.2	0.2	9.5	9.5
2	.....	13.5	.2	.2	3.0	19
3	.....	11.5	.2	.2	5.2	9.5
4	.....	11.5	.2	.2	13.5	9.5
5	.....	3.0	.2	.2	13.5	11.5
6	.....	1.2	.2	.2	19	11.5
7	.....	.2	.2	.2	19	9.5
8	.....	.2	.1	.2	19	11.5
9	.....	.2	.1	.2	19	11.5
10	.....	.2	.0	.2	19	9.5
11	.....	.2	.0	.2	16.2	9.5
12	122	1.2	.0	.2	16.2	9.5
13	104	2.0	.2	.2	13.5	7.0
14	158	.2	1.0	.2	16.2	5.2
15	158	.3	176.	.2	16.2	25
16	104	.2	68	.2	13.5	33
17	86	.2	16.2	1.2	11.5	25
18	185	.3	1.2	1.2	11.5	19
19	320	51	.3	3.0	11.5	16.2
20	158	1.2	.2	3.0	11.5	9.5
21	104	.2	.2	4.0	9.5	19
22	86	.3	.3	3.0	9.5	13.5
23	95	.2	.2	3.0	9.5	13.5
24	86	.2	.3	3.0	9.5	13.5
25	16.2	3.0	.3	3.0	9.5	9.5
26	11.5	3.0	.3	3.0	9.5	29
27	13.5	2.0	.2	5.2	9.5	2.0
28	16.2	3.0	.2	5.2	9.5	2.0
29	16.2	4.0	.2	122	9.5	2.0
30	16.2	1.2	.2	338	9.5	2.0
31	.....	2.0	.2	.....	9.5	.....

NOTE.—Daily discharge determined from a fairly well-defined curve drawn through discharge measurements in 1911 and 1912. Discharge estimated for days for which gage heights are missing. Discharge Nov. 28–30 estimated as 2.0 second-feet.

Monthly discharge of Ferron Creek near Castledale, Utah, for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
June 12-30	320	11.5	97.7	3,680	B.
July	51	.2	4.2	258	C.
August	176	.0	8.6	529	C.
September	338	.2	16.7	994	B.
October	19	3.0	12.0	738	B.
November	33	.....	12.6	750	C.
December	.....	.....	a 1.5	92	D.
The period	.....	.....	.....	7,040	

a Estimated.

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 December 31, 1911.

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 estimates of discharge, which have been made only for days when the gage was read, should be reliable.

Cooperation.—During 1911 the station was maintained in cooperation with the United States Forest Service and the State engineer.

Discharge measurements of North Fork of Grand River near Grand Lake, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 20a	R. H. Fletcher	3.40	30.3	Sept. 8	C. L. Chatfield	3.62	43.0
Feb. 15a	.....do	2.42	27.6	15	H. B. Waha	3.63	47.7
Apr. 2a	.....do	3.50	37.0				

a Ice conditions.

Daily gage height, in feet, of North Fork of Grand River near Grand Lake, Colo., for 1911.

[T. O. Smith, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1				3.5	4.15							
2				3.5	4.2							
3					4.1							
4					4.02				3.8	3.8	3.78	
5								3.8				
6					4.6							
7											3.8	
8					4.7		4.6		3.62			
9					5.1							3.45
10					5.1							
11				3.5	4.8		4.5					
12								3.8		3.7		
13					4.9				3.65		4.5	
14							4.45					
15		2.42		3.6		6.4		3.7	3.63			3.4
16					5.2							
17				3.7								
18				3.6						3.75		
19				3.8					3.6			
20	3.4			3.7		5.6					3.5	
21				3.95	5.3							
22				3.92					3.6			
23			3.4			5.25		4.5				
24				4.0						3.73		
25				4.1							4.3	
26				4.1								
27				4.22		4.8					4.0	
28				4.2			4.02					
29				4.28								
30									3.64			
31			3.5									

NOTE.—Ice affected the gage heights from Jan. 1 to Apr. 2 and Nov. 13 to Dec. 31; gage read to top of ice.

Daily discharge, in second-feet, of North Fork of Grand River near Grand Lake, Colo., for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1		132						
2		145						
3		120						
4		104				65	65	63
5					65			
6		275						
7								65
8		315		275		47		
9		510						
10		510						
11	35	360		235				
12					65		55	
13		410				50		
14				218				
15	45		1,340		55	48		
16		570						
17	55							
18	45						60	
19	65					45		
20	55		810					
21	90	630						
22	84					45		
23			600		235			
24	100						58	
25	120							
26	120							
27	150		360					
28	145			104				
29	165							
30						49		
31								

NOTE.—Discharge determined from a well-defined rating curve.

GRAND RIVER NEAR GRANBY, COLO.

Location.—At Switzer's ranch, 4 miles east of Granby, about sec. 22, T. 2 N., R. 76 W. Nearest tributary enters from the south 1 mile above the station; Willow Creek enters Grand River 1 mile below the station.

Records available.—June 9, 1908, to July 23, 1911.

Drainage area.—484 square miles (measured from Hayden's atlas).

Gage.—Vertical and inclined staff.

Channel.—Practically permanent.

Discharge measurements.—Made from a car and cable 300 feet below the gage.

Winter flow.—The river is frozen entirely across for the four winter months; anchor ice also occurs.

Diversions and storage.—Between this station and that on the North Fork near Grand Lake there are court decrees for diversions of 23 second-feet from Grand River, 20 second-feet from the South Fork, and 51 second-feet from Stillwater Creek. There is also a reservoir decree for 31,000 acre-feet of the flood water of the North Fork.

Accuracy.—Conditions favor accurate results, and the estimates should be reliable.

Cooperation.—Station is maintained and the records for 1911 furnished by the State engineer.

Discharge measurements of Grand River near Granby, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 21[a]	R. H. Fletcher	2.50	67.9	Aug. 4	C. L. Chatfield	2.12	235
Feb. 15[a]	do	2.25	87.5	Sept. 8	do	1.80	143
Apr. 3	do	1.60	116				

[a] Ice conditions.

Daily gage height, in feet, of Grand River near Granby, Colo., for 1911.

[J. P. Switzer, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.1	2.9	2.7	2.0	2.4	4.2	3.4	.....	.....
2	2.1	2.9	2.7	1.9	2.85	4.3	3.3	.....	.....
3	2.1	3.0	2.7	1.9	3.05	4.3	3.2	.....	.....
4	2.1	3.0	2.7	1.8	3.2	4.3	3.0	2.1	.....
5	2.1	2.85	2.7	1.8	3.3	4.3	3.0	.....	.....
6	2.1	2.7	2.7	1.8	3.3	4.45	3.0	.....	.....
7	2.1	2.6	2.7	1.85	3.5	4.5	3.0	.....	.....
8	2.1	2.6	2.7	1.9	3.5	4.45	3.0	.....	1.8
9	2.15	2.6	2.7	1.8	3.65	4.4	3.0	.....	.....
10	2.2	2.5	2.7	1.8	3.8	4.4	3.0	.....	.....
11	2.25	2.5	2.8	1.8	3.7	4.3	3.0	.....	.....
12	2.25	2.5	2.8	1.7	3.7	4.3	3.0	.....	.....
13	2.25	2.4	2.95	1.7	3.6	4.2	2.9	.....	.....
14	2.15	2.35	2.95	1.7	3.6	4.4	2.9	.....	.....
15	2.3	2.35	2.95	1.7	3.6	4.65	2.9	.....	.....
16	2.4	2.35	2.85	1.85	3.75	4.8	2.8	.....	.....
17	2.5	2.4	2.85	1.9	3.9	4.7	2.8	.....	.....
18	2.5	2.3	2.9	1.9	3.85	4.45	2.7	.....	.....
19	2.5	2.35	2.9	1.9	3.65	4.1	2.7	.....	.....
20	2.5	2.4	2.8	1.9	3.3	4.0	2.8	.....	.....
21	2.5	2.5	2.8	1.9	3.25	3.85	2.8	.....	.....
22	2.5	2.5	2.8	2.0	3.2	3.8	2.8	.....	.....
23	2.5	2.4	2.8	2.15	3.4	3.7	2.9	.....	.....
24	2.6	2.5	2.8	2.25	3.55	3.7	.....	.....	.....
25	2.8	2.5	2.8	2.3	3.6	3.55	.....	.....	.....
26	2.8	2.6	2.8	2.35	3.65	3.5	.....	.....	.....
27	2.8	2.6	2.5	2.4	3.8	3.5	.....	.....	.....
28	3.0	2.7	2.4	2.5	3.8	3.4	.....	.....	.....
29	3.0	.....	2.3	2.5	3.8	3.4	.....	.....	.....
30	3.0	.....	2.1	2.45	4.05	3.4	.....	.....	.....
31	3.0	.....	2.0	.....	4.2	.....	.....	.....	.....

NOTE.—The gage heights from Jan. 1 to Mar. 28 were affected by ice.

Daily discharge, in second-feet, of Grand River near Granby, Colo., for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.
1	210	360	1,850	1,000	.....	.....
2	180	585	2,000	925	.....	.....
3	180	738	2,000	850	.....	.....
4	150	850	2,000	700	240	.....
5	150	925	2,000	700	.....	.....
6	150	925	2,220	700	.....	.....
7	165	1,100	2,300	700	.....	.....
8	180	1,100	2,220	700	.....	150
9	150	1,250	2,150	700	.....	.....
10	150	1,400	2,150	700	.....	.....
11	150	1,300	2,000	700	.....	.....
12	130	1,300	2,000	700	.....	.....
13	130	1,200	1,850	625	.....	.....
14	130	1,200	2,150	625	.....	.....
15	130	1,200	2,520	625	.....	.....
16	165	1,350	2,800	550	.....	.....
17	180	1,500	2,600	550	.....	.....
18	180	1,450	2,220	500	.....	.....
19	180	1,250	1,720	560	.....	.....
20	180	925	1,600	550	.....	.....
21	180	888	1,450	550	.....	.....
22	210	850	1,400	550	.....	.....
23	260	1,000	1,300	625	.....	.....
24	300	1,150	1,300	595	.....	.....
25	320	1,200	1,150	565	.....	.....
26	340	1,250	1,100	535	.....	.....
27	360	1,400	1,100	505	.....	.....
28	400	1,400	1,000	475	.....	.....
29	400	1,400	1,000	445	.....	.....
30	380	1,660	1,000	410	.....	.....
31	.....	1,850	.....	375	.....	.....

NOTE.—Daily discharge determined from a fairly well defined rating curve. Discharge estimated July 24 to 31.

Monthly discharge of Grand River near Granby, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	65	4,000	D.
February	.....	.....	85	4,720	D.
March	.....	.....	115	7,070	D.
April	400	120	212	12,600	B.
May	1,850	360	1,160	71,300	B.
June	2,800	1,000	1,800	107,000	C.
July	1,000	375	620	38,100	B.
The period	.....	.....	.....	245,000	

NOTE.—Discharge Jan. 1 to Mar. 31 was estimated from 2 discharge measurements and climatologic records.

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; September 23, 1910, to December 31, 1911.

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 character of the channel the estimates of discharge can not be considered better than fair or, possibly, good.

Cooperation.—Station is maintained in cooperation with the United States Forest Service and the State engineer.

Discharge measurements of Grand River at Sulphur Springs, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 17	R. H. Fletcher	[a] 2.90	102	July 29	C. L. Chatfield	2.72	578
Feb. 14	do	[b] 2.70	103	Sept. 5	do	2.10	289
Apr. 3	do	2.09	330	13	H. B. Waha	1.97	228

[a] Ice present. Gage height to top of ice. [b] Ice present. Gage height to water surface.

Daily gage height, in feet, of Grand River at Sulphur Springs, Colo., for 1911.

[J. E. Wolfe, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1			2.72		2.95	5.7	4.85			2.2		
2			2.74		2.75	5.6		2.45	2.25	2.2		
3			2.7	2.09	2.65	5.4	4.6			2.2		
4			2.72		2.75	5.3				2.25	1.75	3.1
5					3.35	5.3	4.9	2.35	2.1	2.2	1.75	
6			2.72		3.95	5.25	4.6			2.2	1.8	
7			2.76		4.2		4.4	2.25		2.2	3.9	
8			2.76		4.15		4.2	2.25			1.85	
9			2.71		4.45		4.0	2.25			1.85	3.1
10			2.74		4.78			2.25			1.9	
11					4.2			2.2		2.2	4.15	3.1
12				1.9	4.0			2.25		2.2	4.85	
13				1.85	3.9				1.97	2.2	4.75	
14		2.7		1.75		5.65		2.3		2.1	4.75	
15		2.7		1.7		5.6		2.25		2.1	4.75	3.05
16		2.7						2.25			4.75	
17	2.9	1.65		1.95		5.45					4.75	
18		1.65		1.85		5.5				2.1	4.75	2.95
19		1.65		2.0			3.25	2.2		2.1	4.85	
20		1.65		2.1			3.2			1.9	4.7	
21		1.64		2.22			3.1	2.2		2.1		2.9
22		1.55		2.3				2.75		2.05		
23		1.6						2.65		1.9	2.85	
24				2.35						2.0		
25		1.74		2.6				2.5			2.85	
26				2.58				2.45			2.85	
27		1.72		2.68								2.9
28		1.7		2.75						1.95		
29				2.98		4.9	2.75	2.2		1.95		
30						4.9				1.9		2.85
31										1.85		

NOTE.—Gage heights Jan. 1 to Mar. 10, Nov. 7, and Nov. 11 to Dec. 31 affected by ice; gage read to top of ice; average thickness of ice Jan. 1 to Mar. 10 was 1.4 feet; average thickness of ice in November was 0.8 foot, and in December 1.2 feet.

Daily discharge, in second-feet, of Grand River at Sulphur Springs, Colo., for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1		745	3,670	2,500			330	
2		610	3,520		445	350	330	
3	286	550	3,220	2,200			330	
4		610	3,080				350	165
5		1,020	3,080	2,560	395	290	330	165
6		1,520	3,010	2,200			330	180
7		1,770		1,980	350		330	
8		1,720		1,770	350			198
9		2,040		1,570	350			198
10		2,420			350			215
11		1,770			330		330	
12	215	1,570			350		330	
13	198	1,480				240	330	
14	165		3,600		370		290	
15	150		3,520		350		290	
16					350			
17	232		3,300					
18	198		3,370				290	
19	250			955	330		290	
20	290			920			215	
21	338			850	330		290	
22	370				610		270	
23					550		215	
24	395						250	
25	520				470			
26	510				445			
27	568							
28	610						232	
29	766		2,560	610	330		232	
30			2,560				215	
31							198	

NOTE.—Daily discharge determined from a fairly well defined rating curve. Estimates made only for days when gage was read.

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 December 31, 1911.

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 freezes entirely across at the station, there was little if any backwater during 1911, as shown by discharge measurements made during the winter. Rapids below the station remained open and thus prevented backwater from ice.

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 reliable estimates of flow.

Cooperation.—Since 1910 this station has been maintained in cooperation with the State engineer.

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Discharge measurements of Grand River near Kremmling, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 17[a]	R. H. Fletcher	1.00	412	Apr. 5	R. H. Fletcher	2.45	1,030
Feb. 9[a]	Fletcher and Russell.	.70	399	July 25	C. L. Chatfield	5.45	1,940
13[a]	R. H. Fletcher	.80	424	Sept. 2	do	2.55	916

[a] Ice conditions.

Daily gage height, in feet, of Grand River near Kremmling, Colo., for 1911.

[H. C. Rogers, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.4	1.5	0.65	1.6	5.2	10.8	7.1	4.15	2.55	2.6	1.45	0.5
2	.55	1.15	.65	2.25	4.75	11.5	7.8	3.95	2.55	3.1	1.7	.75
3	.55	1.35	.65	2.35	4.5	11.7	9.7	3.8	2.6	2.9	1.35	.75
4	.6	.95	.7	2.75	4.7	11.4	9.9	3.7	2.7	2.7	1.25	.45
5	.75	.85	1.0	2.45	5.5	11.7	9.8	3.55	2.75	2.65	1.6	.8
6	.85	.85	1.35	2.25	6.3	11.8	10.7	3.4	2.65	3.5	1.2	.6
7	.8	.8	1.2	2.05	7.5	11.8	10.0	3.25	2.55	3.9	1.4	1.0
8	1.0	.75	1.45	1.4	8.4	12.1	9.2	3.15	2.45	3.45	1.55	1.15
9	.95	.7	2.05	1.75	9.2	12.5	8.6	3.0	2.35	3.3	1.5	.75
10	1.0	.6	1.55	2.05	9.8	12.5	8.0	3.0	2.25	2.95	1.6	1.05
11	.95	.6	2.6	2.0	10.3	11.6	7.3	3.35	2.2	2.75	.45	.9
12	.95	.7	1.6	1.8	8.8	11.4	6.9	3.95	2.15	2.6	.6	.8
13	.85	.75	1.3	1.7	8.4	11.7	6.5	3.7	2.05	2.45	.85	.75
14	.8	.75	1.3	1.4	8.8	11.4	6.5	3.4	2.05	2.35	1.4	.8
15	.8	.7	1.25	1.45	9.3	11.0	6.2	3.15	2.15	2.3	2.0	1.35
16	.8	.6	1.45	1.35	10.0	11.5	6.1	3.0	2.45	2.25	2.05	1.05
17	.8	.8	1.25	1.5	10.2	11.6	6.2	3.05	2.35	2.2	2.05	1.1
18	.85	.65	1.05	1.6	10.4	11.3	6.3	3.05	2.15	2.2	1.9	1.85
19	.8	.65	1.1	1.75	10.9	10.8	6.1	2.95	2.05	2.25	1.75	2.1
20	.7	.65	1.45	2.15	10.6	11.0	6.0	2.9	2.0	2.2	1.9	2.05
21	.85	.55	1.55	2.65	9.4	10.9	5.7	3.15	2.0	2.05	1.8	2.4
22	.8	.5	1.55	3.25	8.5	11.0	6.1	3.75	2.0	2.3	1.6	2.45
23	.7	.6	1.65	3.55	8.0	11.2	6.6	4.15	2.0	1.45	1.3	2.3
24	.7	.6	1.55	4.1	8.0	11.2	6.0	4.8	1.95	1.8	.55	2.25
25	.75	.6	1.25	4.1	8.6	9.5	6.5	4.15	1.9	1.95	.85	2.45
26	.9	.65	1.0	4.1	9.5	8.8	5.2	3.75	1.85	1.8	.85	2.35
27	.95	.6	1.05	4.6	10.0	8.2	5.2	3.45	1.85	1.8	.95	2.3
28	.95	.6	1.15	5.4	9.6	7.9	4.95	3.15	1.9	1.8	.9	2.15
29	.8	.....	1.25	6.0	9.7	7.8	4.7	3.0	1.95	1.7	.55	1.95
30	1.15	.....	1.65	5.6	10.0	7.5	4.5	2.85	2.0	1.75	.45	1.75
31	1.7	.....	1.6	.....	10.4	.....	4.3	2.7	.....	1.6	.....	1.65

NOTE.—Ice present from Jan. 1 to Mar. 12 and Nov. 11 to Dec. 31, but discharge measurements showed little if any backwater. Gage heights Jan. 1 to Apr. 29 and Oct. 21 to Dec. 31 read on a staff gage; gage heights Apr. 30 to Oct. 20 recorded by automatic gage.

Daily discharge, in second-feet, of Grand River near Kremmling, Colo., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	330	590	380	620	2,130	6,350	2,950	1,430	905	920	578	350
2	360	502	380	860	1,900	7,100	3,400	1,360	905	1,070	650	402
3	360	552	380	940	1,800	7,350	4,950	1,300	920	1,010	552	402
4	370	452	390	1,100	1,980	7,000	5,050	1,270	950	950	528	340
5	402	428	465	1,030	2,250	7,350	5,000	1,220	965	935	620	415
6	428	428	552	980	2,730	7,500	5,850	1,160	935	1,200	515	370
7	415	415	515	920	3,460	7,500	5,150	1,120	905	1,340	565	465
8	465	402	550	720	4,150	7,850	4,380	1,080	875	1,180	605	502
9	452	390	550	830	4,850	8,350	3,910	1,040	845	1,130	590	402
10	465	370	550	920	5,400	8,300	3,480	1,040	815	1,020	620	478

Daily discharge, in second-feet, of Grand River near Kremmling, Colo., for 1911—Contd.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
11	452	370	550	900	5,900	7,150	3,020	1,150	800	965	500	440
12	452	390	550	840	4,500	6,900	2,760	1,360	785	920	400	415
13	428	402	540	800	4,100	7,300	2,520	1,270	755	875	450	402
14	415	402	540	720	4,450	6,850	2,520	1,160	755	845	565	415
15	415	390	528	730	4,900	6,400	2,360	1,080	785	830	740	400
16	415	370	578	700	5,550	7,000	2,310	1,040	875	815	755	400
17	415	415	528	750	5,750	7,150	2,360	1,060	845	800	755	400
18	428	380	478	780	5,950	6,750	2,420	1,060	785	800	710	400
19	415	380	490	830	6,550	6,150	2,310	1,020	755	815	665	400
20	390	380	578	980	6,200	6,400	2,250	1,010	740	800	710	400
21	428	360	605	1,100	4,950	6,250	2,090	1,080	740	755	680	380
22	415	350	605	1,300	4,150	6,300	2,310	1,290	740	830	620	380
23	390	370	635	1,420	3,800	6,550	2,580	1,430	740	578	540	380
24	390	370	605	1,620	3,800	6,550	2,250	1,680	725	680	500	380
25	402	370	528	1,620	4,250	4,800	2,520	1,430	710	725	428	350
26	440	380	465	1,620	5,050	4,150	1,860	1,290	695	680	428	350
27	452	370	478	1,820	5,550	3,700	1,860	1,180	695	680	452	350
28	452	370	502	2,220	5,150	3,500	1,750	1,080	710	680	440	350
29	415	.....	528	2,550	5,200	3,450	1,640	1,040	725	650	360	350
30	502	.....	635	2,330	5,500	3,200	1,560	995	740	665	340	350
31	650	.....	620	.....	5,900	.....	1,480	950	.....	620	.....	350

NOTE.—Daily discharge Jan. 1 to Mar. 12 and Nov. 11 to Dec. 31 determined almost directly from the open-season rating curve except during short periods when the increased gage heights indicated the probability of backwater. Discharge Mar. 13 to Apr. 1, Apr. 6 to 30, and July 12 to Nov. 10 was determined from a well-defined curve. Discharge Apr. 2 to 5 and May 1 to July 11 determin d by indirect method for shifting channels.

Monthly discharge of Grand River near Kremmling, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	650	330	426	26,200	B.
February	590	350	405	22,500	B.
March	635	380	525	32,300	B.
April	2,550	620	1,150	68,400	A.
May	6,550	1,800	4,440	273,000	A.
June	8,350	3,200	6,370	379,000	A.
July	5,850	1,480	2,930	180,000	A.
August	1,680	950	1,180	72,600	A.
September	965	695	804	47,800	A.
October	1,340	578	863	53,100	A.
November	755	340	562	33,400	B.
December	502	.....	393	24,200	B.
The period	8,350	330	1,680	1,210,000	

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, 1911.

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

Gage.—Automatic recording gage. Datum unchanged since 1900.

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.—Except at high water, when the swiftness of the current makes it difficult to secure accurate discharge measurements, conditions are favorable for accurate results, and the records are considered excellent.

Cooperation.—During 1911 the station was maintained in cooperation with the United States Forest Service and the Central Colorado Power Co.

Discharge measurements of Grand River at Glenwood Springs, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 5	Russell and Wimmer.	3.20	679	June 14	W. B. Freeman.....	8.35	12,000
Feb. 25	R. H. Fletcher.....	2.85	504	Sept. 25	G. H. Russell.....	3.85	1,100
Mar. 9	Thos. Grieve.....	4.05	1,300	Oct. 14	C. L. Chatfield.....	4.15	1,350
25	E. O. Christiansen...	3.75	1,110	Dec. 19	O. M. Wimmer	3.45	707
May 7	J. B. Stewart.....	6.76	6,340				

Daily gage height, in feet, of Grand River at Glenwood Springs, Colo., for 1911.

[H. H. French, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.0	4.2	3.35	3.8	5.6	8.2	6.3	4.9	4.2	4.2	3.8	2.9
2	3.0	3.8	3.35	4.0	5.4	8.6	6.3	4.8	4.2	4.4	3.8	2.9
3	3.0	3.6	3.35	4.1	5.2	8.6	7.0	4.7	4.2	4.4	3.8	2.95
4	3.1	3.5	3.3	4.2	5.2	8.6	7.4	4.6	4.2	4.3	3.6	3.2
5	3.2	3.5	3.5	4.2	5.4	8.6	7.2	4.6	4.2	4.4	3.6	3.0
6	3.35	3.45	3.6	4.4	6.0	8.8	7.6	4.5	4.2	4.8	3.8	3.0
7	3.3	3.45	3.6	4.2	6.6	8.8	7.5	4.4	4.2	4.9	3.7	3.0
8	3.3	3.3	3.8	4.0	7.0	9.0	7.1	4.4	4.2	4.8	3.6	3.0
9	3.35	3.3	4.0	4.0	7.4	9.0	6.8	4.3	4.0	4.6	3.8	3.1
10	3.45	3.2	4.1	4.0	7.7	9.0	6.6	4.2	4.0	4.4	3.8	3.3
11	3.6	3.3	4.0	4.0	7.8	8.7	6.4	4.4	4.0	4.4	3.8	3.6
12	3.5	3.45	4.0	4.0	7.2	8.6	6.2	4.6	4.0	4.2	3.7	3.4
13	3.35	3.6	3.8	4.0	7.0	8.6	6.0	4.6	4.0	4.2	3.5	3.4
14	3.4	3.5	3.6	3.9	7.2	8.4	6.0	4.5	4.0	4.1	3.7	3.3
15	3.35	3.45	3.6	3.8	7.4	8.2	5.8	4.4	4.0	4.0	3.7	3.4
16	3.4	3.45	3.6	3.8	7.8	8.5	5.8	4.3	4.1	4.0	3.7	3.4
17	3.3	3.4	3.6	3.8	7.8	8.3	5.8	4.3	4.1	4.0	3.8	3.4
18	3.3	3.4	3.8	3.8	8.0	8.2	5.8	4.3	4.0	4.0	3.8	3.5
19	3.3	3.35	3.7	4.0	8.2	8.2	5.8	4.2	4.0	4.0	3.8	3.3
20	3.3	3.35	3.6	4.0	8.1	8.2	5.8	4.2	3.9	4.0	3.8	3.3
21	3.3	3.3	3.6	4.3	7.5	8.3	5.6	4.2	3.9	3.8	3.9	3.3
22	3.2	3.2	3.8	4.5	7.1	8.2	5.6	4.6	4.0	3.7	4.0	3.3
23	3.2	3.2	3.8	4.8	6.9	8.2	5.9	4.8	4.0	3.8	3.9	3.3
24	3.1	3.25	3.8	5.0	7.0	7.8	5.9	5.0	4.0	3.8	3.8	3.3
25	3.3	3.35	3.8	5.0	7.2	7.5	5.6	5.0	3.8	3.8	3.6	3.35
26	3.45	3.3	3.8	5.0	7.7	7.2	5.5	4.8	3.8	3.8	2.9	3.4
27	3.4	3.3	3.7	5.2	7.8	6.8	5.4	4.6	3.8	3.8	3.35	3.4
28	3.45	3.35	3.6	5.4	7.8	6.6	5.4	4.4	3.9	3.8	3.15	3.4
29	3.5	.....	3.6	5.8	7.8	6.6	5.2	4.4	3.9	3.9	2.9	3.4
30	3.8	.....	3.7	5.8	7.9	6.4	5.1	4.3	4.0	3.9	2.85	3.45
31	4.1	.....	3.7	.....	8.0	.....	5.0	4.2	.....	3.8	.....	3.45

Daily discharge, in second-feet, of Grand River at Glenwood Springs, Colo., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	510	1,490	690	1,030	3,770	11,600	5,250	2,540	1,490	1,490	1,030	470
2	510	1,030	690	1,240	3,390	13,400	5,250	2,380	1,490	1,780	1,030	470
3	510	860	690	1,360	3,030	13,400	7,200	2,230	1,490	1,780	1,030	490
4	550	790	660	1,490	3,030	13,400	8,450	2,080	1,490	1,630	860	600
5	600	790	790	1,490	3,390	13,400	7,800	2,080	1,490	1,780	860	510
6	690	755	860	1,780	4,560	14,300	9,150	1,930	1,490	2,380	1,030	510
7	660	755	860	1,490	6,000	14,300	8,800	1,780	1,490	2,540	940	510
8	660	660	1,030	1,240	7,200	15,200	7,500	1,780	1,490	2,380	860	510
9	690	660	1,240	1,240	8,450	15,200	6,600	1,630	1,240	2,080	1,030	550
10	755	600	1,360	1,240	9,500	15,200	6,000	1,490	1,240	1,780	1,030	660
11	860	660	1,240	1,240	9,900	13,800	5,500	1,780	1,240	1,780	1,030	860
12	790	755	1,240	1,240	7,800	13,400	5,000	2,080	1,240	1,490	940	720
13	690	860	1,030	1,240	7,200	13,400	4,560	2,080	1,240	1,490	790	720
14	720	790	860	1,130	7,800	12,500	4,560	1,930	1,240	1,360	940	660
15	690	755	860	1,030	8,450	11,600	4,160	1,780	1,240	1,240	940	720
16	720	755	860	1,030	9,900	13,000	4,160	1,630	1,360	1,240	940	720
17	660	720	860	1,030	9,900	12,100	4,160	1,630	1,360	1,240	1,030	720
18	660	720	1,030	1,030	10,700	11,600	4,160	1,630	1,240	1,240	1,030	790
19	660	690	940	1,240	11,600	11,600	4,160	1,490	1,240	1,240	1,030	660
20	660	690	860	1,240	11,200	11,600	4,160	1,490	1,130	1,240	1,030	660
21	660	660	860	1,630	8,800	12,100	3,770	1,490	1,130	1,030	1,130	660
22	600	600	1,030	1,930	7,500	11,600	3,770	2,080	1,240	940	1,240	660
23	600	600	1,030	2,380	6,900	11,600	4,360	2,380	1,240	1,030	1,130	660
24	550	630	1,030	2,700	7,200	9,900	4,360	2,700	1,240	1,030	1,030	660
25	660	690	1,030	2,700	7,800	8,800	3,770	2,700	1,030	1,030	860	690
26	755	660	1,030	2,700	9,500	7,800	3,580	2,380	1,030	1,030	470	720
27	720	660	940	3,030	9,900	6,600	3,390	2,080	1,030	1,030	690	720
28	755	690	860	3,390	9,900	6,000	3,390	1,780	1,130	1,030	575	720
29	790	.....	860	4,160	9,900	6,000	3,030	1,780	1,130	1,130	470	720
30	1,030	.....	940	4,160	10,300	5,500	2,860	1,630	1,240	1,130	450	755
31	1,360	.....	940	.....	10,700	.....	2,700	1,490	.....	1,030	.....	755

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

Monthly discharge of Grand River at Glenwood Springs, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	1,360	510	701	43,100	B.
February	1,490	600	749	41,600	A.
March	1,360	660	942	57,900	A.
April	4,160	1,030	1,790	107,000	A.
May	11,600	3,030	7,910	486,000	A.
June	15,200	5,500	11,700	696,000	B.
July	9,150	2,700	5,020	309,000	A.
August	2,700	1,490	1,930	119,000	A.
September	1,490	1,030	1,280	76,200	A.
October	2,540	940	1,440	88,500	A.
November	1,240	450	915	54,400	A.
December	860	470	653	40,200	B.
The year	15,200	450	2,920	2,120,000	

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 November 30, 1911.

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 of 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 favor accurate results, and the estimates should be reliable.

Cooperation.—During 1911 station was maintained in cooperation with the United States Reclamation Service, which furnished most of the field data.

Discharge measurements of Grand River near Palisades, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 9	C. L. Chatfield	13.08	2,170	Aug. 23	Harper and Page	13.65	3,220
24	E. O. Christensen	12.75	1,800	Sept. 28	Hoag and Page	13.20	2,360
May 10	S. O. Harper	18.30	15,600	Oct. 16	C. L. Chatfield	13.60	2,720
July 18	....do	15.45	6,830				

Daily gage height, in feet, of Grand River near Palisades, Colo., for 1911.

[I. W. Penny, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	12.3	13.9	12.25	12.8	15.2	18.8	16.8	14.4	13.7	14.2	13.0	13.9
2	12.3	13.2	12.35	13.0	14.8	19.3	16.6	14.0	13.7	14.4	13.0	.....
3	12.3	12.9	12.1	13.3	14.6	19.4	16.6	13.8	13.4	14.2	13.0	.....
4	12.3	12.9	12.25	13.4	14.7	19.6	17.9	13.6	13.0	13.8	12.8	.....
5	12.5	12.8	12.6	13.6	15.1	19.7	17.6	13.4	12.8	16.6	12.8	.....
6	12.5	12.7	12.8	13.8	15.6	19.8	18.0	13.4	12.9	16.0	12.9	.....
7	12.5	12.6	13.2	13.6	16.5	20.0	18.4	13.3	12.9	15.2	12.8	.....
8	12.5	12.5	13.0	13.4	17.1	20.0	17.8	13.2	12.8	14.8	12.8	.....
9	12.5	12.45	13.1	13.3	18.2	20.1	17.1	13.2	12.7	14.6	12.8	.....
10	12.6	12.3	14.0	13.2	18.4	20.2	16.8	13.2	12.6	14.4	12.8	.....
11	15.2	12.3	14.1	13.2	18.0	19.8	16.5	13.3	12.7	14.1	13.0	.....
12	12.9	12.4	13.5	13.2	17.5	19.6	16.1	13.4	12.7	13.8	13.1	.....
13	12.6	12.45	13.0	13.2	17.2	19.8	15.8	13.2	12.6	13.6	12.9	.....
14	12.5	12.4	12.9	13.2	17.3	19.6	15.6	13.3	12.7	13.5	13.0	.....
15	12.6	12.35	12.8	12.9	17.4	19.6	15.4	13.2	12.8	13.5	12.9	.....
16	12.6	12.3	12.6	12.6	17.8	19.7	15.4	13.0	13.0	13.5	13.0	.....
17	12.4	12.25	12.6	12.4	18.2	19.3	15.6	13.1	12.8	13.4	13.0	13.9
18	12.45	12.3	12.6	12.6	18.6	19.2	15.4	13.0	13.0	13.4	12.8	.....
19	12.3	12.25	12.6	13.0	18.6	19.2	15.5	13.0	12.8	13.4	13.0	.....
20	12.3	12.2	12.6	13.2	18.6	19.2	15.5	13.1	12.8	13.3	13.0	.....
21	12.25	12.1	12.6	13.3	17.8	19.2	15.2	13.5	12.8	13.2	13.0	.....
22	12.25	12.1	12.6	13.6	17.2	19.1	15.7	13.2	12.9	13.0	12.8	.....
23	12.2	12.0	12.8	14.0	17.2	19.0	16.2	13.6	12.8	13.0	12.8	.....
24	12.25	12.1	12.8	14.1	17.0	19.0	16.0	13.8	13.0	12.9	12.8	.....
25	13.2	12.15	12.8	14.4	17.7	18.8	15.5	13.9	12.9	13.0	12.8	.....
26	13.0	12.2	12.8	14.4	18.2	18.2	15.4	13.8	13.2	13.0	12.8	.....
27	12.9	12.2	12.6	14.7	18.4	17.8	15.1	13.5	13.0	13.0	12.6	.....
28	13.0	12.3	12.6	15.0	18.7	17.4	15.0	13.4	13.2	13.0	12.6	.....
29	13.1	.....	12.6	15.4	18.9	17.0	14.8	13.1	13.2	13.2	12.7	.....
30	13.2	.....	12.6	15.5	18.4	16.8	14.6	13.0	13.8	13.0	.....	.....
31	13.5	.....	12.8	.....	18.6	.....	14.4	12.9	.....	13.0	.....	.....

NOTE.—Ice affected the gage heights Jan. 1 to 12 and Nov. 30 to Dec. 31.

Daily discharge, in second-feet, of Grand River at Palisades, Colo., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	1,150	3,440	1,220	1,830	6,060	18,100	10,400	4,350	3,110	3,970	2,090
2	1,150	2,360	1,320	2,090	5,170	20,400	9,770	3,610	3,110	4,350	2,090
3	1,150	1,960	1,100	2,500	4,750	20,800	9,770	3,270	2,650	3,970	2,090
4	1,150	1,960	1,220	2,650	4,960	21,800	14,300	2,950	2,090	3,270	1,830
5	1,250	1,830	1,590	2,950	5,830	22,300	13,100	2,650	1,830	9,770	1,830
6	1,250	1,710	1,830	3,270	7,020	22,800	14,700	2,650	1,960	8,060	1,960
7	1,400	1,590	2,360	2,950	9,470	23,800	16,400	2,500	1,960	6,060	1,830
8	1,400	1,480	2,090	2,650	11,300	23,800	13,900	2,360	1,830	5,170	1,830
9	1,400	1,420	2,220	2,500	15,600	24,300	11,300	2,360	1,710	4,750	1,830
10	1,450	1,270	3,610	2,360	16,400	24,800	10,400	2,360	1,590	4,350	1,830
11	1,500	1,270	3,790	2,360	14,700	22,800	9,470	2,500	1,710	3,790	2,090
12	1,500	1,370	2,800	2,360	12,700	21,800	8,330	2,650	1,710	3,270	2,220
13	1,590	1,420	2,090	2,360	11,700	22,800	7,530	2,360	1,590	2,950	1,960
14	1,480	1,370	1,960	2,360	12,000	21,800	7,020	2,500	1,710	2,800	2,090
15	1,590	1,320	1,830	1,960	12,400	21,800	6,530	2,360	1,830	2,800	1,960
16	1,590	1,270	1,590	1,590	13,900	22,300	6,530	2,090	2,090	2,800	2,090
17	1,370	1,220	1,590	1,370	15,600	20,400	7,020	2,220	1,830	2,650	2,090
18	1,420	1,270	1,590	1,590	17,200	19,900	6,530	2,090	2,090	2,650	1,830
19	1,270	1,220	1,590	2,090	17,200	19,900	6,770	2,090	1,830	2,650	2,090
20	1,270	1,180	1,590	2,360	17,200	19,900	6,770	2,220	1,830	2,500	2.090
21	1,220	1,100	1,590	2,500	13,900	19,900	6,060	2,800	1,830	2,360	2,090
22	1,220	1,100	1,590	2,950	11,700	19,400	7,270	2,360	1,960	2,090	1,830
23	1,180	1,030	1,830	3,610	11,700	19,000	8,610	2,950	1,830	2,090	1,830
24	1,220	1,100	1,830	3,790	11,000	19,000	8,060	3,270	2,090	1,960	1,830
25	2,360	1,140	1,830	4,350	13,500	18,100	6,770	3,440	1,960	2,090	1,830
26	2,090	1,180	1,830	4,350	15,600	18,100	6,530	3,270	2,360	2,090	1,830
27	1,960	1,180	1,590	4,960	16,400	13,900	5,830	2,800	2,090	2,090	1,590
28	2,090	1,270	1,590	5,610	17,700	12,400	5,610	2,650	2,360	2,090	1,590
29	2,220	.....	1,590	6,530	18,600	11,000	5,170	2,220	2,360	2,360	1,710
30	2,360	.....	1,590	6,770	16,400	10,400	4,750	2,090	3,270	2,090	1,700
31	2,800	.....	1,830	.....	17,200	.....	4,350	1,960	.....	2,090	.....

NOTE.—Daily discharge throughout the open season determined from a rating curve well defined between 1,200 and 24,000 second-feet. Discharge Jan. 1 to 12 and on Nov. 30 estimated on account of ice.

Monthly discharge of Grand River near Palisades, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	2,800	1,150	1,550	95,300	C.
February	3,440	1,030	1,470	81,600	A.
March	3,790	1,100	1,860	114,000	A.
April	6,770	1,370	3,050	181,000	A.
May	18,600	4,750	12,700	781,000	A.
June	24,800	10,400	19,900	1,180,000	A.
July	16,400	4,350	8,570	527,000	A.
August	4,350	1,960	2,640	162,000	A.
September	3,270	1,590	2,070	123,000	A.
October	9,770	1,960	3,420	210,000	A.
November	2,220	1,590	1,920	114,000	A.
December	.....	.....	1,350	83,000	D.
The period	24,800	.....	5,060	3,650,000	

NOTE.—Mean discharge for December estimated by comparison with dicharge at Kremmling and Glenwood Springs.

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.— May 4, 1911, to November 30, 1911.

Drainage area.—16,800 square miles (measured from Hayden's atlas).

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

Channel.—Apparently permanent, although the data are not sufficient to confirm this definitely.

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.—This station is not completely rated as yet, and estimates of discharge are not available. The base data should be reliable.

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

Discharge measurements of Grand River near Fruita, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Mar. 17	E. O. Christiansen	3.67	3,730
May 4	J. B. Stewart	7.52	14,100
June 12	W. B. Freeman	10.63	32,000
Sept. 24	G. H. Russell	3.24	3,390

Daily gage height, in feet, of Grand River near Fruita, Colo., for 1911.

[P. W. Bryant, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1				10.0	7.7	5.2	3.0	5.9	3.9
2				10.1	7.6	5.0	3.0	5.9	3.8
3				10.2	8.2	4.8	2.9	5.8	3.7
4			7.5	10.4	8.9	4.6	3.2	5.7	3.6
5				10.6	9.1	4.4	3.2	5.8	3.5
6			8.2	10.9	8.9	4.2	3.2	6.7	3.4
7			8.7	11.2	9.4	4.0	3.1	7.4	3.3
8			9.4	11.2	8.9	3.8	3.1	6.8	3.2
9			9.6	11.3	8.4	3.6	3.1	6.6	3.1
10			10.5	11.6	7.8	3.5	2.9	6.0	3.0
11			10.3	11.2	7.4	3.4	2.8	5.5	3.0
12			9.4	10.6	7.0	3.6	2.8	5.2	3.0
13			8.9	10.5	6.9	4.0	2.8	5.0	3.0
14			9.0	10.7	6.7	4.0	2.8	4.8	3.1
15			9.0	10.6	7.1	3.8	2.8	4.8	3.2
16			9.4	10.6	7.0	3.6	3.0	4.7	3.3
17	3.7		9.6	10.4	6.9	3.4	3.2	4.6	3.4
18			9.6	10.2	6.6	3.2	3.2	4.5	3.5
19			9.8	10.3	6.6	3.2	3.1	4.4	3.4
20			9.9	10.1	6.8	3.2	2.8	4.3	3.4
21			9.4	10.3	6.8	3.0	2.7	4.2	3.4
22			9.8	10.4	6.6	3.3	2.7	4.1	3.4
23			8.5	10.2	7.4	4.0	2.8	4.1	3.3
24			8.7	9.9	7.7	4.3	3.1	4.1	3.2
25			9.0	9.4	7.0	4.4	3.2	4.0	3.1
26			9.5	9.0	3.8	4.2	3.4	4.0	3.0
27			9.8	8.5	6.5	4.0	3.6	4.0	2.9
28			9.6	8.2	6.4	3.8	4.2	4.1	.....
29			9.6	8.1	6.2	3.6	4.8	4.2	.....
30			9.6	7.9	5.8	3.4	5.6	4.1	.....
31			9.8	.....	5.6	3.1	.....	4.0	.....

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 November 20, 1911.

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.

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

Cooperation.—During 1911 the station was maintained in cooperation with the United States Forest Service and the State engineer.

Discharge measurements of North Inlet to Grand Lake at Grand Lake, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 20[a]	R. H. Fletcher	3.00	6.2	July 30	C. L. Chatfield	2.48	68
Feb. 15[a]	do	3.00	6.3	Sept. 9	do	2.15	27
Apr. 2[b]	do	2.00	11.3	15	H. B. Waha	2.08	24

[a] Ice present. Gage height to top of ice. [b] Ice present. Gage height to water surface.

Daily gage height, in feet, of North Inlet to Grand Lake at Grand Lake, Colo., for 1911.

[T. O. Smith, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1				2.60	2.42						
2				2.00	2.28		3.50				
3				2.05	2.30	3.50					2.13
4					2.30		3.30	2.35	2.25	2.23	
5					2.41	3.70		2.30			
6				2.10	2.65		3.20				
7				2.15	2.98	3.90		2.30			2.20
8				2.15	3.02		2.90				
9				2.05	3.16	4.00	2.88	2.29	2.15		
10					3.15						2.28
11				2.02	2.80	3.90	2.85				
12					2.80						
13				2.04	2.92	3.85	2.78		2.10	2.10	
14					3.20			2.25			
15		3.00		2.10	3.25	4.30	2.70		2.08		
16				2.10	3.25				2.10		2.40
17				2.06		4.20	2.70				
18				2.06	3.35					2.10	
19				2.08		3.90	2.68		2.00		
20	3.00			2.07	3.00			2.22			2.30
21				2.08	2.90	3.70	2.70				
22				2.18						2.30	
23				2.23	2.74	3.60	2.70	2.70	2.00		
24				2.28							
25				2.29	3.00	3.40	2.65			2.20	
26				2.25		3.20	2.60				
27				2.38	3.20				2.00		
28				2.48		3.10	2.50			2.00	
29				2.49	3.15		2.48		2.00		
30				2.46		3.00	2.48				
31							2.45	2.16			

NOTE.—Gage heights Jan. 1 to Apr. 22, Oct. 22 and 25, and Nov. 7 to Dec. 31, affected by ice. Gage heights Jan. 20 and Feb. 15 read to top of ice; ice on these dates was about 1.5 feet thick; average thickness of ice throughout the month of March was about 1 foot; Apr. 2 ice was 2 feet thick; ice went out of the lake May 8.

Daily discharge, in second-feet, of North Inlet to Grand Lake at Grand Lake, Colo., for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	.....	58	340	300	58	30	23
2	.....	38	370	400	55	32	26
3	.....	40	400	360	52	33	30
4	.....	40	440	320	48	35	33
5	.....	56	490	300	40	33	32
6	.....	102	540	280	40	32	31
7	.....	198	580	220	40	30	30
8	.....	212	600	170	40	29	29
9	.....	264	625	164	39	27	28
10	.....	260	600	160	39	27	27
11	.....	140	580	155	38	26	26
12	.....	140	570	145	37	25	25
13	.....	177	558	135	36	24	24
14	.....	280	670	125	35	23	24
15	.....	300	775	115	35	23	24
16	.....	300	750	115	34	24	24
17	.....	300	725	115	33	23	24
18	.....	340	650	110	33	21	24
19	.....	270	580	110	32	19	.....
20	.....	205	535	115	32	19	.....
21	.....	170	490	115	60	19	.....
22	.....	150	470	115	90	19	.....
23	33	125	445	115	115	19	.....
24	38	155	400	110	105	19	.....
25	39	205	360	102	95	19	.....
26	35	240	280	90	85	19	.....
27	52	280	260	80	75	19	.....
28	67	270	240	70	65	19	.....
29	69	260	220	67	55	19	.....
30	64	292	205	67	45	20	.....
31	.....	320	.....	62	28	.....	.....

NOTE.—Daily discharge determined from a fairly well defined rating curve. Mean discharge Apr. 1–22 estimated 15 second-feet. Mean discharge Oct. 19–31 estimated 20 second-feet. Mean discharge Jan. 1–Mar. 31 estimated at 6 second-feet by means of two discharge measurements and the flow at the outlet. Discharge interpolated for days when gage was not read.

Monthly discharge of North Inlet to Grand Lake at Grand Lake, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	[a] 6.0	369	D.
February	.....	.....	[a] 6.0	333	D.
March	.....	.....	[a] 6.0	369	D.
April	69	.....	24.2	1,440	D.
May	340	38	200	12,300	B.
June	775	205	492	29,300	B.
July	400	62	158	9,720	B.
August	115	28	52.1	3,200	B.
September	35	19	24.2	1,440	B.
October	33	.....	24.0	1,480	C.
The period	.....	.....	.....	60,000	

[a] Estimated.

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 December 31, 1911.

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 excellent, but on account of the natural regulation of Grand Lake, the flow is uniform. This uniformity of flow and permanence of channel indicate that the estimates are good.

Cooperation.—Since its reestablishment in 1910 the station has been maintained in cooperation with the United States Forest Service and the State engineer.

Discharge measurements of Grand Lake Outlet at Grand Lake, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 20[a]	R. H. Fletcher	1.52	12.4	July 31	C. L. Chatfield	2.15	103
Feb. 15[a]	do	1.52	12.3	Sept. 9	do	1.80	40.0
Apr. 2	do	1.50	12.8	16	H. B. Waha	1.72	38.1

[a] Ice conditions.

Daily gage height, in feet, of Grand Lake Outlet at Grand Lake, Colo., for 1911.

[T. O. Smith, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1					2.1							
2			1.4	1.5	2.08		3.4					
3					2.02	3.6					1.6	
4					2.07		3.20	2.05		2.1	1.6	
5					2.12	3.7		2.0				1.45
6					2.28		3.0				1.6	
7					2.48	3.8		1.98				
8					2.75		2.85					
9			1.5	1.58	2.9	3.9			1.85		1.6	
10				1.58	3.0		2.8					
11					2.8	3.8						
12				1.58	2.7		2.7					
13					2.8	3.7			1.75	1.9		
14				1.6	2.7		2.7	1.95				
15		1.52		1.6	2.95	4.0						1.40
16				1.58	3.0		2.65		1.72		1.58	
17				1.58		3.7						
18			1.5	1.59	3.2		2.6			1.85		
19				1.61		3.6			1.68			
20	1.52			1.62	2.8		2.55	1.9			1.5	
21				1.75	2.8	3.5						
22				1.72			2.5			1.75		
23		1.4		1.8	2.5	3.4		2.2	1.63			
24				1.82			2.5					
25			1.45	1.88	2.85	3.2				1.7	1.52	
26				1.9			2.4					
27				1.96	3.0	3.2			1.6		1.5	
28				2.02			2.3			1.7		
29				2.07	3.0	3.0			1.6			
30				2.15		2.95					1.5	
31			1.5				2.3	1.86				

NOTE.—Gage heights affected by ice Jan. 1 to Mar. 18 and Nov. 16 to Dec. 31.

Daily discharge, in second-feet, of Grand Lake Outlet at Grand Lake, Colo., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1			12	15	95	538	450	130	53	53	27	12
2			12	15	91	594	550	115	53	67	26	12
3			12	16	79	650	500	100	53	81	25	12
4			12	17	89	675	450	85	53	95	25	12
5			12	18	99	700	410	75	53	92	25	12
6			12	20	135	725	370	74	53	88	25	12
7			12	21	194	750	330	72	53	84	25	12
8			12	22	275	780	310	72	53	80	25	12
9			12	23	330	810	300	71	53	76	25	12
10			12	23	370	780	290	71	49	72	24	12
11			11	23	290	750	275	69	46	68	23	12
12			11	23	260	725	260	69	43	64	22	12
13			11	24	290	700	260	68	40	60	21	12
14			11	25	260	785	260	68	39	59	20	12
15		12	11	25	350	870	252	67	38	57	19	12
16			11	23	370	785	245	66	37	56	18	12
17			11	23	410	700	238	64	36	54	17	12
18			11	24	450	675	230	63	34	53	16	12
19			11	26	370	650	222	62	33	50	15	12
20	12		11	27	290	625	215	60	32	46	15	12
21			10	40	290	600	208	78	31	43	15	12
22			10	37	245	575	200	96	29	40	15	12
23			10	45	200	550	200	115	28	38	15	12
24			10	48	255	500	200	108	28	36	15	12
25			10	57	310	450	185	101	27	35	15	12
26			10	60	340	450	170	93	26	35	15	12
27			11	69	370	450	155	85	25	35	15	12
28			12	79	370	410	140	77	25	35	15	12
29			13	89	370	370	140	69	25	33	15	12
30			14	105	426	350	140	61	39	31	15	12
31			15		482		140	53		29		12

NOTE.—Daily discharge determined from a well-defined rating curve. Discharge Mar. 1 to 25 and Nov. 16 to Dec. 31 estimated. Discharge interpolated for other days for which gage heights are missing.

Monthly discharge of Grand Lake Outlet at Grand Lake, Colo., for 1911.

[Drainage area, 62 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] 12.0	0.193	0.22	738	C.
February			[a] 12.0	.193	.20	666	C.
March	15	10	11.5	.185	.21	707	B.
April	105	15	35.4	.571	.64	2,110	A.
May	482	79	282	4.55	5.25	17,300	A.
June	870	350	632	10.19	11.37	37,600	B.
July	550	140	268	4.32	4.98	16,500	A.
August	130	53	79.3	1.28	1.48	4,880	B.
September	53	25	39.6	.639	.71	2,360	B.
October	95	29	56.3	.908	1.05	3,460	B.
November	27	15	19.6	.316	.35	1,170	B.
December			12.0	.194	.22	738	C.
The year	870	10	122	1.96	26.68	88,200	

[a] Estimated from 2 discharge measurements and uniform flow of the river.

FRASER RIVER BASIN.

FRASER RIVER NEAR FRASER, COLO.

Location.—Two miles south of Spruce Lodge ranger station, in the Arapahoe National Forest, 10 miles from Fraser post office. Current Creek enters 2 miles above the station, and Jim Creek 3 miles below.

Records available.—May 1, 1908, to September 17, 1911.

Drainage area.—Approximately 9 square miles.

Gage.—An automatic recording gage installed June 29, 1911. A staff gage was used during 1908. July 7, 1909, a second staff gage was installed at a different datum which has remained unchanged. The recording gage reads to the same datum as the second staff gage.

Channel.—Somewhat shifting.

Discharge measurements.—Made from a footbridge.

Winter flow.—No data.

Diversions.—There is a court decree for the diversion of 53 second-feet from Fraser River above the station into Clear Creek on the eastern slope. There is also a provisional decree for a similar diversion of 700 second-feet, which has not yet been made.

Accuracy.—Data insufficient for estimates of discharge.

Cooperation.—Station maintained and records furnished through the courtesy of the Denver Reservoir Irrigation Co.

The following discharge measurement was made by Stanley Krajicek:
June 30, 1911: Gage height, 0.91 foot; discharge, 30.8 second-feet.

Daily gage height, in feet, of Fraser River near Fraser, Colo., for 1911.

[Mrs. H. J. Mills, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	.....	0.20	0.20	0.20	.....	.....	0.95	0.80	0.72
2	.....	.20	.20	.20	0.40	.....	1.10	.80	.72
3	.....	.20	.20	.20	.....	.....	1.16	.80	.72
4	.....	.20	.20	.20	.....	.....	1.22	.80	.72
5	.....	.20	.20	.20	.....	.....	1.46	.80	.72
6	.....	.20	.20	.20	.70	.....	1.47	.80	.72
7	.....	.20	.20	.20	.....	.....	1.42	.79	.72
8	.....	.20	.20	.20	.....	.....	1.32	.77	.71
9	.....	.20	.20	.20	1.00	.....	1.28	.75	.70
10	.....	.20	.20	.20	.....	.....	1.54	.76	.69
11	.....	.20	.20	.20	.....	.....	1.32	.75	.66
12	.....	.20	.20	.20	.....	.....	1.02	.73	.66
13	.....	.20	.20	.20	1.00	.....	1.05	.73	.67
14	.....	.20	.20	.20	.....	.....	1.00	.72	.68
15	.....	.20	.20	.20	.....	.....	.98	.72	.68
16	0.20	.20	.20	.20	.....	.....	.97	.72	.65
17	.20	.20	.20	.20	.....	.....	.96	.72	.65
18	.20	.20	.20	.20	.....	.....	.96	.73	.....
19	.20	.20	.20	.20	.....	.....	.94	.72	.....
20	.20	.20	.20	.20	.....	.....	.91	.74	.....
21	.20	.20	.20	.20	.....	.....	.91	.73	.....
22	.20	.20	.20	.25	.....	.....	.89	.72	.....
23	.20	.20	.20	.....	.....	.....	.89	.75	.....
24	.20	.20	.20	.....	.....	.....	.87	.74	.....
25	.20	.20	.20	.30	.....	.....	.85	.72	.....
26	.20	.20	.20	.....	.....	.....	.85	.73	.....
27	.20	.20	.20	.....	.....	.....	.85	.72	.....
28	.20	.20	.20	.....	.....	.....	.85	.72	.....
29	.20	.....	.20	.30	.....	0.95	.82	.71	.....
30	.20	.....	.20	.....	.....	.93	.80	.71	.....
31	.20	.....	.20	.....	.....	.....	.80	.71	.....

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 December 31, 1911.

Drainage area.—16 square miles (measured from Forest atlas).

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

Diversions.—There are no court decrees for diversions between Fraser and Arrow, but below there is a decree for diversion of 72 second-feet from Fraser River.

Accuracy.—With the exception of some uncertainty in the records derived from application of the upper part of the rating curve the records can be considered fair or possibly good.

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

Discharge measurements of Fraser River near Arrow, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
June 28	Ripple and Wills	1.36	92.8
Sept. 12	H. B. Waha	.90	30.8
Dec. 7[a]	....do	.90	9.6

[a] Ice conditions.

Daily gage height, in feet, and discharge, in second-feet, of Fraser River near Arrow, Colo., for 1910.

[S. S. Linscott, observer.]

Day.	October.		Day.	October.		Day.	October.	
	Gage height.	Discharge.		Gage height.	Discharge.		Gage height.	Discharge.
2	0.8	19	9	0.75	14	16	0.75	14
3	.75	14	10	.75	14	17	.7	8
4	.8	19	11	.75	14	18	.7	8
5	.8	19	12	.75	14	19	.7	8
6	.8	19	13	.75	14	20	.75	14
7	.75	14	14	.75	14	21	.7	8
8	.8	19	15	.75	14	22	.7	8

Daily gage height, in feet, of Fraser River near Arrow, Colo., for 1911.

[L. W. McGrew, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	0.95	2.05	1.35	1.10	1.00	0.85	0.90	0.90
2	.....	.70	2.00	1.50	1.12	1.00	.85	.....	.....
3	0.90	.85	2.05	1.55	1.05	1.00	.85	.....	.....
4	.....	.85	2.15	1.65	1.00	1.00	.85	.90	.90
5	.....	.92	1.80	2.40	.95	.95	.89	.....	.....
6	.....	.90	2.30	2.10	1.05	.92	.90	2.00	.....
7	.90	.92	1.90	1.85	1.05	.....	.90	.....	.90
8	.....	1.00	2.40	1.75	1.00	.....	.90	.....	.....
9	.....	1.25	2.40	1.55	1.00	.90	.85	1.90	.....
10	.....	1.25	2.35	1.50	1.05	.90	.88	1.20	.90

Daily gage height, in feet, of Fraser River near Arrow, Colo., for 1911—Continued.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
11	.90	1.35	2.30	1.45	1.00	0.92	0.85	.....	.....
12	.....	1.20	2.35	1.40	1.00	.90	.85	.....	.....
13	.....	1.15	2.20	1.40	1.00	.90	.85	1.90	.....
14	.....	1.25	2.15	1.35	1.00	.90	.80	.....	0.90
15	.....	1.60	2.15	1.30	.....	.90	.82	.....	.....
16	.....	1.45	2.10	1.35	1.05	.90	.82	1.10	.....
17	.90	1.48	2.00	1.35	1.00	.90	.82	.....	.70
18	.....	1.40	2.10	1.30	1.00	.90	.85	.....	.....
19	.90	1.35	2.00	1.30	.....	.90	.....	.....	.....
20	.....	1.35	1.90	1.30	1.10	.92	.....	.80	.....
21	.....	1.30	2.00	1.25	1.00	.90	.....	.....	.....
22	.....	1.30	1.85	1.25	.....	.85	1.95	.....	.....
23	.80	1.20	1.70	1.30	.....	.....	2.10	.....	.70
24	.....	1.40	1.75	1.25	1.00	.88	1.10	.....	.....
25	.75	1.60	1.55	1.20	1.00	.85	.....	1.10	.....
26	.85	1.55	1.40	1.15	1.00	.85	.90	.....	.70
27	.80	1.60	.....	1.15	1.00	.85	.....	.....	.....
28	.90	1.65	1.50	1.18	1.00	.85	.80	1.00	.....
29	.90	1.80	1.45	1.10	1.00	.89	.....	.....	.....
30	.....	1.90	1.45	1.10	1.00	.91	2.00	.....	.70
31	.....	2.10	.....	1.10	.....	.....	1.00	.....	.....

NOTE.—Gage readings Oct. 22 to Dec. 31 affected by ice.

Daily discharge, in second-feet, of Fraser River near Arrow, Colo., for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	31	38	185	90	57	44	25
2	31	8	178	111	60	44	25
3	31	25	185	118	50	44	25
4	31	25	199	131	44	44	25
5	31	34	151	234	38	38	30
6	31	31	220	192	50	34	31
7	31	34	165	158	50	33	31
8	31	44	234	144	44	32	31
9	31	77	234	118	44	31	25
10	31	77	227	111	50	31	29
11	31	90	220	104	44	34	25
12	31	70	227	97	44	31	25
13	31	64	206	97	44	31	25
14	31	77	199	90	44	31	19
15	31	124	199	84	47	31	21
16	31	104	192	90	50	31	21
17	31	108	178	90	44	31	21
18	31	97	192	84	44	31	25
19	31	90	178	84	50	31	24
20	28	90	165	84	57	34	23
21	25	84	178	77	44	31	22
22	22	84	158	77	44	25	22
23	19	70	138	84	44	27	22
24	16	97	144	77	44	29	22
25	14	124	118	70	44	25	22
26	25	118	97	64	44	25	20
27	19	124	104	64	44	25	20
28	31	131	111	67	44	25	20
29	31	151	104	57	44	30	20
30	34	165	104	57	44	32	20
31	.....	192	.....	57	44	.....	20

NOTE.—Daily discharge determined from a rating curve fairly well defined below 160 second-feet. Above that stage the curve is somewhat uncertain. Discharge estimated Oct. 22 to 31. Discharge interpolated on other days for which gage heights are missing.

Monthly discharge of Fraser River near Arrow, Colo., for 1910–11.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1910.					
October 2-22	19	8	13.8	574	B.
1911.					
April	34	14	28.4	1,690	C.
May	192	8	85.4	5,250	B.
June	234	97	173	10,300	C.
July	234	57	98.8	6,080	B.
August	60	38	46.4	2,850	B.
September	44	25	32.2	1,920	B.
October	31	19	23.7	1,460	C.
November			a 15.0	893	D.
December			a 9.0	553	C.
The period				31,000	

a Estimated from discharge measurements.

WILLIAMS FORK BASIN.

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 December 31, 1911.

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.—As no winter measurements have been made, it is not known if ice causes backwater.

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, estimates of discharge can not be made.

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

The following discharge measurement was made by H. B. Waha:
September 14, 1911: Gage height, 1.50 feet; discharge, 91.2 second-feet.

Daily gage height, in feet, of Williams Fork near Scholl, Colo., for 1911.

[W. M. Thomas, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1.15	1.1	1.15	1.75	3.0	2.35	1.8	1.6	1.5	1.45	1.1
2	.....	1.15	1.1	1.15	1.6	3.05	2.65	1.8	1.6	1.45	1.4	1.1
3	.....	1.15	1.1	1.25	1.65	3.1	2.55	1.7	1.6	1.4	1.4	1.1
4	.....	1.2	1.15	1.25	1.75	3.05	2.5	1.7	1.6	1.4	1.35	1.1
5	.....	1.2	1.15	1.25	1.85	3.1	3.05	1.7	1.6	1.55	1.4	1.1
6	.....	1.15	1.15	1.25	2.15	3.15	2.7	1.7	1.6	1.7	1.35	1.1
7	.....	1.15	1.15	1.25	2.3	3.15	2.5	1.7	1.6	1.65	1.4	1.1
8	.....	1.15	1.2	1.2	2.3	3.15	2.55	1.7	1.6	1.55	1.35	1.1
9	.....	1.15	1.15	.....	2.35	3.1	2.45	1.7	1.5	1.5	1.4	1.1
10	.....	1.15	1.15	.....	2.4	3.05	2.35	1.8	1.5	1.5	1.45	1.1

Daily gage height, in feet, of Williams Fork near Scholl, Colo., for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
11	.....	1.15	1.15	.....	2.25	2.95	2.3	1.8	1.5	1.5	1.3	1.1
12	.....	1.15	1.15	.....	2.15	3.05	2.3	1.7	1.5	1.5	1.25	1.1
13	.....	1.2	1.15	.....	2.15	3.2	2.3	1.7	1.5	1.5	1.3	1.1
14	.....	1.15	1.15	.....	2.2	3.1	2.25	1.7	1.5	1.4	1.3	1.1
15	1.2	1.15	1.15	.....	2.5	3.05	2.2	1.7	1.55	1.5	1.4	1.1
16	1.1	1.1	1.15	.....	2.45	3.1	2.2	1.7	1.5	1.6	1.35	1.1
17	1.15	1.15	1.15	.....	2.45	3.15	2.2	1.6	1.5	1.55	1.35	1.1
18	1.2	1.15	1.15	.....	2.55	2.9	2.2	1.6	1.5	1.5	1.35	1.1
19	1.2	1.1	1.15	.....	2.6	2.9	2.1	1.6	1.4	1.5	1.35	1.1
20	1.2	1.1	1.2	.....	2.4	2.95	2.1	1.7	1.4	1.45	1.35	1.2
21	1.2	1.1	1.2	.....	2.35	2.85	2.15	1.7	1.4	1.4	1.25	1.2
22	1.2	1.1	1.15	.....	2.35	2.85	2.1	1.75	1.4	1.45	1.25	1.2
23	1.2	1.1	1.15	1.65	2.35	2.8	2.1	1.8	1.4	1.4	1.25	1.2
24	1.2	1.1	1.2	1.6	2.45	2.7	2.1	1.75	1.4	1.6	1.25	1.2
25	1.2	1.1	1.15	1.6	2.45	2.7	2.0	1.7	1.4	1.45	1.2	1.2
26	1.2	1.1	1.15	1.65	2.45	2.6	2.0	1.7	1.4	1.5	1.25	1.1
27	1.2	1.1	1.3	1.7	2.55	2.6	2.0	1.7	1.4	1.6	1.2	1.1
28	1.2	1.1	1.2	1.7	2.55	2.5	1.9	1.7	1.4	1.6	1.2	1.1
29	1.25	.....	1.15	1.75	2.7	2.5	1.9	1.65	1.45	1.45	1.15	1.1
30	1.15	.....	1.15	1.85	2.8	2.4	1.9	1.6	1.55	1.45	1.1	1.1
31	1.15	.....	1.2	.....	2.8	.....	1.9	1.6	.....	1.45	.....	1.1

NOTE.—Ice present Jan. 15 to Apr. 8 and Nov. 29 to Dec. 31.

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 31, 1911.

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

Gage.—Vertical staff; location and datum unchanged.

Channel.—Shifting after high water.

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 1911 were taken in the afternoon.

Diversions.—There are court decrees for the diversion of 502 second-feet from Williams Fork between this station and the one near Scholl, and 25 second-feet from tributaries. There is also a storage decree for 80,700 acre-feet from Williams Fork.

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

Cooperation.—During 1911 station was maintained in cooperation with the State engineer.

Discharge measurements of Williams Fork near Sulphur Springs, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 18	R. H. Fletcher	2.98	41.6	July 28	C. L. Chatfield	3.60	135
Feb. 13	do	3.08	56.2	Sept. 4	do	3.38	91
Apr. 4	do	3.25	81.7				

Daily gage height, in feet, of Williams Fork near Sulphur Springs, Colo., for 1911.

[F. A. Field, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.02	3.05	3.00	3.10	3.48	4.42	3.96	3.54	3.30	3.34	3.26	3.15
2	3.02	3.05	3.00	3.12	3.45	4.45	4.31	3.49	3.32	3.29	3.25	3.15
3	3.03	3.02	3.02	3.15	3.41	4.44	4.30	3.49	3.32	3.26	3.02	3.20
4	3.05	3.00	3.00	3.25	3.44	4.46	4.18	3.50	3.42	3.25	3.10	3.15
5	3.06	2.98	3.02	3.20	3.51	4.45	4.42	3.44	3.31	3.35	3.08	3.20
6	3.03	2.97	3.02	3.18	3.80	4.48	4.35	3.40	3.31	3.55	3.08	3.20
7	3.02	2.92	3.02	3.12	3.86	4.48	4.26	3.38	3.30	3.54	3.05	3.25
8	3.03	2.95	3.03	3.12	3.99	4.55	4.15	3.37	3.29	3.44	3.05	3.30
9	3.04	3.00	3.10	3.12	3.98	4.55	4.08	3.38	3.26	3.37	3.08	3.20
10	3.05	3.00	3.10	3.15	4.07	4.55	3.98	3.32	3.23	3.34	3.10	3.20
11	3.08	3.02	3.08	3.12	3.88	4.50	3.95	3.45	3.22	3.30	3.10	3.18
12	3.07	3.01	3.04	3.08	3.82	4.50	3.90	3.46	3.22	3.38	3.10	3.15
13	3.05	3.08	3.02	3.00	3.82	4.50	3.87	3.40	3.25	3.30	3.30	3.12
14	3.03	3.04	3.04	2.95	3.98	4.42	3.84	3.40	3.28	3.35	3.28	3.10
15	3.00	3.02	3.08	3.12	4.02	4.40	3.82	3.38	3.38	3.29	3.30	3.10
16	3.00	3.02	3.11	3.10	4.10	4.42	3.80	3.34	3.28	3.29	3.28	3.12
17	3.02	3.03	3.04	3.08	4.10	4.35	3.88	3.34	3.24	3.28	3.25	3.12
18	2.98	3.03	3.04	3.05	4.15	4.37	3.88	3.30	3.19	3.28	3.28	3.12
19	3.00	3.00	3.08	3.10	4.25	4.30	3.85	3.32	3.20	3.30	3.28	3.12
20	3.05	2.95	3.10	3.05	4.20	4.35	3.78	3.31	3.20	3.28	3.30	3.12
21	3.05	2.95	3.12	3.32	4.15	4.37	3.75	3.46	3.20	3.30	3.30	3.10
22	3.00	3.00	3.12	3.40	4.10	4.50	3.72	3.42	3.20	3.29	3.28	3.10
23	3.02	3.02	3.10	3.45	3.88	4.35	3.85	3.67	3.19	3.29	3.25	3.08
24	3.02	3.00	3.10	3.46	3.85	4.25	3.72	3.54	3.18	3.30	3.20	3.08
25	3.03	3.03	3.08	3.39	4.02	4.18	3.68	3.48	3.19	3.28	3.00	3.08
26	3.04	2.98	3.04	3.36	4.10	4.18	3.62	3.41	3.22	3.28	3.00	3.05
27	3.03	2.98	3.20	3.51	4.10	4.12	3.64	3.38	3.21	3.28	3.10	3.08
28	2.98	3.00	3.10	3.64	4.15	4.05	3.62	3.36	3.20	3 30	3.05	3.08
29	3.04	.....	3.28	3.62	4.15	4.00	3.62	3.33	3.21	3.30	3.05	3.07
30	3.08	.....	3.10	3.50	4.25	3.95	3.58	3.31	3.36	3.29	3.10	3.05
31	3.10	.....	3.12	.....	4.30	.....	3.54	3.30	.....	3.20	.....	3.05

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

Daily discharge, in second-feet, of Williams Fork near Sulphur Springs, Colo., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	44	51	50	62	111	556	277	125	80	86	75
2	44	51	50	64	105	580	472	113	83	79	74
3	45	48	52	68	97	572	465	113	83	75	52
4	47	47	50	81	103	588	389	115	99	74	58
5	48	45	52	74	118	580	556	103	82	88	56
6	45	48	52	71	210	604	502	95	82	128	56
7	44	45	52	64	234	604	439	92	80	125	54
8	45	47	52	64	290	665	372	90	79	103	54
9	46	50	58	64	286	665	335	92	75	90	56
10	47	50	58	68	330	665	286	83	72	86	58
11	50	52	61	64	242	620	272	105	70	80	58
12	49	51	57	61	218	620	250	107	70	92	58
13	47	56	56	54	218	620	238	95	74	80	80
14	45	53	57	51	286	556	226	95	78	88	78
15	43	52	61	64	305	540	218	92	92	79	80
16	43	52	63	62	345	556	210	86	78	79	78
17	44	52	57	61	345	502	242	86	73	78	74
18	41	52	57	58	372	518	242	80	67	78	78
19	43	50	61	62	432	465	230	83	68	80	78
20	47	47	62	58	400	502	202	82	68	78	80
21	47	47	64	92	372	518	191	107	68	80	80
22	43	50	64	105	345	620	180	99	68	79	78
23	44	52	62	115	242	502	230	162	67	79	74
24	44	50	62	117	230	432	180	125	66	80	68
25	45	52	61	104	305	389	166	111	67	78	50
26	49	49	57	98	345	389	146	97	70	78	50
27	47	49	74	118	345	356	153	92	69	78	58
28	45	50	62	153	372	320	146	89	68	80	54
29	49	.....	85	146	372	295	146	84	69	80	54
30	53	.....	62	115	432	272	135	82	89	79	58
31	55	.....	64	.....	465	.....	125	80	.....	68	.....

NOTE.—Daily discharge determined from a rating curve fairly well defined above 3.5 feet. Discharge for quantities below 3.5 feet determined by indirect method.

Monthly discharge of Williams Fork near Sulphur Springs, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	55	41	46.1	2,830	D.
February	56	45	49.9	2,770	D.
March	85	50	59.2	3,640	D.
April	153	51	81.3	4,840	D.
May	465	97	286	17,600	B.
June	665	272	522	31,100	B.
July	472	125	265	16,300	B.
August	162	80	98.7	6,070	D.
September	99	66	75.1	4,470	D.
October	128	68	84.0	5,160	D.
November	80	50	65.3	3,890	D.
December	.....	.....	[a] 55	3,380	D.
The year	665	.....	141	102,000	

[a] Estimated.

BLUE RIVER BASIN.

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, 1911.

Drainage area.—110 square miles (Forest Service 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 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 there are liable to be appreciable diurnal fluctuations at certain seasons, due to alternate melting and freezing, 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 or possibly good.

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

Discharge measurements of Blue River at Dillon, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 9[a]	G. H. Russell	1.60	18.8	Sept. 18	O. M. Wimmer	1.70	57.8
Feb. 8[a]	O. M. Wimmer	1.60	22.8	Dec. 26[a]	H. B. Waha	1.45	35.8
July 13	.....do	2.50	297				

[a] Ice conditions.

Daily gage height, in feet, of Blue River at Dillon, Colo., for 1911.

[I. W. Blundell, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	.....	.....	1.8	2.8	.....	2.1	1.9	.....	1.5	.....
2	.....	1.6	1.1	.....	1.7	2.9	2.8	.....	.....	1.6	1.4	2.9
3	.....	.....	1.0	.....	1.9	2.6	2.8	.....	.....	1.6	1.4	.....
4	.....	.....	.....	1.4	1.9	2.8	.....	2.0	.....	1.7	1.4	2.9
5	.....	.....	.....	1.4	2.1	2.8	2.8	.....	1.9	1.9	.....	.....
6	.....	1.15	.....	1.4	2.45	2.8	3.6	.....	.....	1.9	1.5	2.8
7	.....	.....	1.0	1.4	2.3	2.9	2.9	.....	.....	1.8	1.8	2.6
8	.....	1.6	.....	.....	2.5	2.9	2.8	1.9	1.9	.....	.....	2.7
9	1.6	1.15	1.0	.....	2.5	2.9	.....	.....	.....	1.75	1.5	2.8
10	.....	.....	.....	1.35	2.65	2.8	2.8	.....	.....	1.75	.....	.....
11	.....	.....	1.2	.....	2.4	.....	2.8	.....	.....	1.75	1.7	2.6
12	1.2	.....	.....	1.3	2.3	2.8	.....	1.9	1.9	1.7	.....	1.5
13	.....	1.5	1.1	1.35	2.25	2.8	2.6	.....	.....	1.75	.....	1.6
14	.....	.....	.....	1.34	.....	2.8	.....	1.9	.....	1.8	1.8	1.5
15	.....	1.5	1.1	.....	2.7	2.6	2.6	.....	.....	.....	.....	1.5
16	.....	.....	1.0	1.4	2.65	2.4	.....	.....	.....	1.8	1.8	2.4
17	.....	.....	.....	.....	2.7	2.6	.....	.....	.....	1.7	1.9	.....
18	.....	1.2	1.3	1.42	2.75	.....	2.6	1.85	1.7	1.65	2.1	1.8
19	1.5	.....	1.4	1.35	2.75	2.8	.....	.....	1.9	1.6	.....	1.6
20	.....	1.2	.....	1.48	2.6	2.8	.....	.....	1.9	1.5	2.2	.....
21	.....	.....	.....	1.6	.....	2.8	2.5	.....	1.95	1.4	.....	.....
22	.....	.....	.....	1.55	2.5	2.8	2.5	2.2	1.95	.....	.....	.....
23	.....	1.3	1.6	.....	2.4	2.7	.....	.....	1.9	1.5	2.3	1.5
24	.....	.....	.....	1.7	2.6	2.7	2.4	.....	.....	1.5	2.3	.....
25	1.6	.....	.....	1.65	2.8	.....	.....	2.1	.....	1.5	.....	.....
26	.....	.....	4.2	1.78	2.6	2.7	2.3	.....	1.7	.....	.....	1.45
27	.....	1.0	2.0	2.0	2.5	2.5	2.3	.....	1.6	1.5	.....	.....
28	1.5	.....	.....	.....	.....	2.5	2.3	.....	1.0	1.5	.....	.....
29	.....	.....	3.0	2.1	2.6	2.5	.....	1.9	.....	.....	.....	.....
30	1.5	.....	3.0	.....	2.4	2.4	.....	.....	1.9	1.5	.....	1.4
31	.....	.....	.....	.....	2.8	.....	2.2	.....	.....	1.4	.....	.....

NOTE.—Gage heights Jan. 1 to Mar. 30 and Nov. 7 to Dec. 31 affected by ice.

Daily discharge, in second-feet, of Blue River at Dillon, Colo., for 1910–11.

[I. W. Blundell, observer.]

Day.	1910.		1911.								
	Oct.	Nov.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	34	30	72	405	325	145	90	68	38	.....
2	.....	30	30	58	455	405	135	90	47	30	.....
3	.....	26	30	90	320	405	125	90	47	30	.....
4	.....	27	30	90	405	405	115	90	58	30	.....
5	.....	28	30	145	405	405	108	90	90	34	.....
6	.....	29	30	262	405	840	102	90	90	38	.....
7	.....	30	30	210	455	455	96	90	72	.....	.....
8	.....	30	28	280	455	405	90	90	68	.....	.....
9	.....	30	27	280	455	405	90	90	65	.....	.....
10	.....	30	26	340	405	405	90	90	65	.....	.....
11	.....	26	24	245	405	405	90	90	65	.....	.....
12	.....	23	23	210	405	362	90	90	58	.....	.....
13	.....	23	26	192	405	320	90	85	65	.....	.....
14	.....	23	26	276	405	320	90	80	72	.....	.....
15	38	23	28	360	320	320	88	75	72	.....	.....
16	34	23	30	340	245	320	86	70	72	.....	.....
17	30	23	31	360	320	320	84	64	58	.....	.....
18	30	30	32	382	362	320	81	58	52	.....	.....
19	34	30	26	382	405	306	105	90	47	.....	.....
20	38	30	36	320	405	393	129	90	38	.....	.....
21	36	30	47	300	405	280	152	102	30	.....	.....
22	34	31	42	280	405	280	175	102	34	.....	.....
23	34	32	50	245	360	262	165	90	38	.....	.....
24	34	34	58	320	360	245	155	80	38	.....	.....
25	35	36	54	405	360	228	145	69	38	.....	.....

Daily discharge, in second-feet, of Blue River at Dillon, Colo., for 1910–11—Continued.

Day.	1910.		1911.								
	Oct.	Nov.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
26	36	38	69	320	360	210	132	58	38	.....	36
27	37	38	115	280	280	210	118	47	38	.....	.....
28	38	38	130	300	280	210	104	62	38	.....	.....
29	47	38	145	320	280	198	90	76	38	.....	.....
30	43	38	108	245	245	186	90	90	38	.....	.....
31	38	.....	.....	405	.....	175	90	.....	30	.....	.....

NOTE.—Daily discharge determined from a fairly well defined rating curve. Discharge interpolated for days for which gage heights are missing.

Monthly discharge of Blue River at Dillon, Colo., for 1910–11.

[Drainage area, 110 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.	
1910.							
October, 15-31	47	30	36.2	0.329	0.21	1,220	C.
November	38	23	30.0	.273	.30	1,790	C.
1911.							
January	.....	.....	*a* 20	.182	.21	1,230	D.
February	.....	.....	*a* 20	.182	.19	1,110	D.
March	.....	.....	*a* 20	.182	.21	1,230	D.
April	145	23	46.4	.422	.47	2,760	B.
May	405	58	268	2.44	2.81	16,500	B.
June	455	245	373	3.39	3.78	22,200	B.
July	840	175	333	3.03	3.49	20,500	B.
August	175	81	111	1.01	1.16	6,820	B.
September	102	58	82.3	.748	.83	4,900	B.
October	90	30	53.8	.489	.56	3,310	B.
November	.....	.....	*a* 30	.273	.30	1,790	D.
December	.....	.....	*a* 33	.300	.35	2,030	D.
The year	840	23	116	1.05	14.36	84,400	

a Estimated from measurements and climatological data.

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 December 31, 1911.

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.—As the station has not been completely rated, estimates of discharge can not be made.

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

Discharge measurements of Tenmile Creek at Dillon, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 9[a]	Russell and Wimmer.	1.70	15.4	July 13	O. M. Wimmer.....	2.60	244
Feb. 8[a]	O. M. Wimmer.....	1.70	29.2	Sept. 18	.....do.....	1.90	52.5
Mar. 23[b]	.....do.....	1.52	19.8	Dec. 26[a]	H. B. Waha.....	4.20	12.2

[a] Ice conditions. [b] Slight ice affect.

Daily gage height, in feet, of Tenmile Creek at Dillon, Colo., for 1911.

[I. W. Blundell, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	.....	.....	2.1	3.8	.....	2.2	1.95	.....	1.9	.....
2	.....	1.75	1.0	.....	2.0	4.5	3.4	.....	.....	1.8	1.8	2.1
3	.....	.....	1.0	.....	2.2	4.2	2.4	.....	.....	1.8	1.8	.....
4	.....	.....	.....	1.75	2.15	4.1	.....	2.1	.....	1.8	1.7	2.2
5	.....	.....	.....	1.8	2.45	4.2	4.4	.....	1.95	2.2	.....	.....
6	.....	1.6	.....	1.75	2.95	4.0	4.0	.....	.....	2.1	1.6	2.2
7	.....	.....	1.3	1.7	3.0	4.3	3.2	.....	.....	2.0	2.2	2.2
8	.....	1.7	.....	.....	3.6	3.9	3.0	2.0	1.9	.....	.....	2.2
9	1.7	1.6	1.6	.....	3.6	4.2	.....	.....	.....	1.9	1.9	2.9
10	.....	.....	.....	1.7	3.75	3.6	2.9	.....	.....	1.9	.....	.....
11	.....	.....	1.7	.....	3.4	.....	2.8	.....	.....	1.9	2.0	2.9
12	1.4	.....	.....	1.7	3.25	4.1	.....	2.0	1.9	1.8	.....	2.3
13	.....	1.6	1.6	1.6	3.3	4.0	2.6	.....	.....	1.8	.....	2.3
14	.....	.....	.....	1.7	.....	3.9	.....	2.0	.....	1.9	2.3	2.4
15	.....	1.6	1.65	.....	3.8	3.9	2.6	.....	.....	.....	.....	3.3
16	.....	.....	1.65	1.7	3.7	3.4	.....	.....	.....	1.9	2.2	3.4
17	.....	.....	.....	.....	3.85	3.6	.....	.....	.....	1.9	2.1	.....
18	.....	1.5	1.65	1.7	4.1	.....	2.7	2.0	1.9	1.8	2.35	.....
19	1.9	.....	1.7	1.75	3.5	3.5	.....	.....	1.9	1.8	.....	3.6
20	.....	1.5	.....	1.8	3.2	3.4	.....	.....	1.9	1.8	2.3	3.6
21	.....	.....	.....	1.95	.....	3.2	2.6	.....	1.95	1.8	.....	.....
22	.....	.....	.....	1.9	3.0	3.1	2.6	2.4	1.95	.....	.....	.....
23	.....	1.4	1.5	.....	3.0	3.0	.....	.....	1.9	1.9	2.4	3.2
24	.....	.....	.....	2.1	3.2	3.0	2.5	.....	.....	1.9	2.4	.....
25	1.8	.....	.....	2.0	3.9	.....	.....	2.4	.....	1.8	.....	.....
26	.....	.....	2.1	2.1	3.6	2.9	2.5	.....	1.9	.....	.....	3.6
27	.....	1.2	1.6	2.35	3.2	2.8	.....	.....	1.85	1.9	.....	.....
28	1.8	.....	.....	.....	.....	2.8	2.4	.....	1.8	1.9	.....	.....
29	.....	.....	1.75	2.5	4.0	2.7	.....	2.0	.....	.....	.....	.....
30	1.7	.....	1.8	.....	3.2	2.9	.....	.....	2.0	1.9	.....	3.6
31	.....	.....	.....	.....	4.2	.....	2.3	.....	.....	1.8	.....	.....

NOTE.—Gage heights Jan. 1 to Mar. 13 and Nov. 7 to Dec. 31 affected by ice; average thickness of ice 1.3 feet Jan. 9, 1.1 feet Feb. 8, and 2.5 feet during December.

Daily discharge, in second-feet, of Tenmile Creek at Dillon, Colo., for 1910.

Day.	Oct.	Nov.	Day.	Oct.	Nov.
1	.....	38	16	42	33
2	.....	33	17	42	31
3	.....	42	18	42	29
4	.....	42	19	38	28
5	.....	42	20	33	27
6	.....	42	21	36	26
7	.....	42	22	38	27
8	.....	42	23	38	28
9	.....	40	24	38	29
10	.....	38	25	39	31
11	.....	32	26	40	33
12	.....	26	27	41	33
13	.....	27	28	42	33
14	.....	29	29	53	33
15	42	31	30	48	33
			31	43	.....

Daily discharge, in second-feet, of Tenmile Creek at Dillon, Colo., for 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	40	89	810	490	115	61	55	53	.....
2	.....	39	69	1,160	610	105	61	42	42	.....
3	.....	38	115	1,010	177	97	61	42	42	.....
4	.....	38	102	960	640	89	61	42	33	.....
5	.....	42	194	1,010	1,110	85	61	115	30	.....
6	.....	38	398	910	910	80	58	89	26	.....
7	.....	33	420	1,060	510	75	55	69	.....	.....
8	.....	33	710	860	420	69	53	61	.....	.....
9	.....	33	710	1,010	400	69	53	53	.....	.....
10	.....	33	785	710	375	69	53	53	.....	.....
11	.....	33	610	835	331	69	53	53	.....	.....
12	.....	33	535	960	290	69	53	42	.....	.....
13	.....	26	560	910	249	69	53	42	.....	.....
14	.....	33	685	860	249	69	53	53	.....	.....
15	30	33	810	860	249	69	53	53	.....	.....
16	30	33	760	610	260	69	53	53	.....	.....
17	30	33	835	710	275	69	53	53	.....	.....
18	30	33	960	685	289	69	53	42	.....	.....
19	33	38	660	660	280	95	53	42	.....	.....
20	30	42	510	610	265	120	53	42	.....	.....
21	27	61	465	510	249	150	61	42	.....	.....
22	24	53	420	465	249	177	61	48	.....	.....
23	20	71	420	420	230	177	53	53	.....	.....
24	40	89	510	420	212	177	53	53	.....	.....
25	60	69	860	400	212	177	53	42	.....	.....
26	89	89	710	375	212	150	53	48	.....	12
27	26	160	510	331	195	120	48	53	.....	.....
28	32	186	710	331	177	95	42	53	.....	.....
29	38	212	910	289	165	69	55	53	.....	.....
30	42	150	510	375	155	67	69	53	.....	.....
31	41	.....	1,010	.....	144	64	.....	42	.....	.....

NOTE.—Daily discharge, 1910–1911, computed from a well-defined rating curve. Discharge interpolated for days of missing gage heights. Mean discharge Nov. 7–30, 1911, estimated as 20 second-feet. On basis of one measurement discharge for Dec., 1911, estimated as 15 second-feet.

Monthly discharge of Tenmile Creek at Dillon, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
March 15–31	89	20	36.6	1,230	C.
April	212	26	61.5	3,660	B.
May	1,010	69	566	34,800	B.
June	1,160	289	704	41,900	B.
July	1,110	144	341	21,000	B.
August	177	69	98.2	6,040	B.
September	69	42	55.2	3,280	B.
October	115	42	52.8	3,250	B.
November	53	.....	23.5	1,400	C.
December	.....	.....	[a]15	922	D.
The period	.....	.....	.....	117,000	

[a] Estimated.

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 December 31, 1911.

Drainage area.—92 square miles (Forest Service Atlas.)

Gage.—Vertical staff; location and datum unchanged.

Channel.—Practically permanent.

Discharge measurements.—Made by wading above the bridge.

Winter flow.—Ice gorges cause backwater of varying amount. Discharge measurements are made to determine the flow.

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 there are liable to be appreciable diurnal fluctuations at certain seasons, due to alternate melting and freezing, 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 or possibly good.

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

Discharge measurements of Snake River at Dillon, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 9[a]	Russell and Wimmer	0.60	8.0	July 13	O. M. Wimmer	1.90	223
Feb. 8[a]	O. M. Wimmer	1.32	14.4	Sept. 18	do	.90	26.4
Mar. 23	do	.69	13.5	Dec. 26[a]	H. B. Waha	1.00	33.4

[a] Ice conditions.

Daily gage height, in feet, of Snake River at Dillon, Colo., for 1911.

[I. W. Blundell, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1					0.9	2.3		1.4	1.15		0.9	
2		0.8	0.6		.8	2.5				0.8	.8	2.2
3			.6		1.0	2.2				.8	.8	
4				0.7	1.0	2.5		1.3		.8	.7	2.3
5				.7	1.05	2.5			1.1	1.0		
6		1.15		.8	1.45	2.6				1.0	.8	2.5
7			.6	.7	1.3	2.5				1.0	1.0	2.15
8		1.3			1.6	2.4		1.2	1.0			2.5
9	0.6	1.3	.6		1.6	2.5				.9	.8	2.5
10				.7	1.55	2.1				.9		
11			.65		2.5					.9	.9	1.9
12	.6			.63	1.45	2.6		1.2	1.0	.8		1.9
13		.6	.6	.6	1.35	2.6	1.9			.9		1.8
14				.65		2.6		1.1		.9	1.1	1.7
15		.62	.6		1.8	2.4	1.9					1.8
16			.65	.7	1.75	2.6				.9	.9	1.8
17					1.85	2.2				.9	1.0	
18		.6	.65	.64	2.0		1.9	1.1	.9	.8	1.1	
19	1.5		.7	.65	1.85	2.4			.95	.8		1.0
20		.6		.7	1.7	2.5			.95	.9	1.1	.9
21				.85		2.6	1.8		1.0	1.0		
22				.8	1.6	2.6	1.7	1.5	1.0			
23		1.0	1.0		1.5	2.5			1.0	1.0	1.4	.9
24				.9	1.7	2.5	1.6			1.0	1.8	
25	1.1			.88	1.8			1.4		1.0		
26			1.0	.99	2.0	2.4	1.5		.95			1.0
27		1.0	1.0	1.2	1.8	1.9	1.5		.9	1.0		
28	.8					2.0	1.5		.85	1.0		
29			1.0	1.1	2.3	2.0		1.2				
30	.8		.8		2.0	1.9			1.0	1.0		.9
31					2.4		1.4			.9		

NOTE.—Gage heights Jan. 1 to Feb. 27 and Nov. 7 to Dec. 31 affected by ice; average thickness of ice in December, 1.5 feet. Gage washed out July 1 and replaced July 13.

Daily discharge, in second-feet, of Snake River at Dillon, Colo., for 1910–11.

Day.	Oct.	Nov.	Day.	Oct.	Nov.	Day.	Oct.	Nov.
1910.								
1		17	11		9	21	8	5
2		17	12		7	22	9	5
3		17	13		8	23	9	6
4		17	14		9	24	9	6
5		17	15	11	10	25	9	7
6		17	16	9	11	26	10	7
7		17	17	7	7	27	11	7
8		7	18	7	11	28	11	7
9		9	19	7	9	29	17	7
10		11	20	7	7	30	17	7
						31	17	

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1911.												
1			7	15	25	330	214	95	54	26	25	
2		17	7	14	17	390	214	89	52	17	17	
3			7	12	35	300	214	83	50	17	17	
4			7	11	35	390	214	77	48	17	11	
5			7	11	41	390	214	73	47	35	14	
6			7	17	105	425	214	69	43	35	17	
7			7	11	77	390	214	65	39	35		
8		14	7	11	137	360	214	61	35	30		
9	8		7	11	137	390	214	61	35	25		
10			8	11	126	270	214	61	35	25		
11			9	10	390	344	214	61	35	25		
12			8	8	105	425	214	61	35	17		
13			7	7	86	425	214	54	34	25		
14			7	9	136	425	214	47	32	25		
15			7	10	187	360	214	47	30	25		
16			9	11	174	425	214	47	28	25		
17			9	10	200	300	214	47	26	25		
18			9	9	241	330	214	47	25	17		
19			11	9	200	360	205	64	30	17		
20			17	11	161	390	196	81	30	25		
21			23	21	149	425	187	98	35	35		
22			29	17	137	425	161	115	35	35		
23			35	21	115	390	149	108	35	35		
24			35	25	161	390	137	102	34	35		
25			35	23	187	375	126	95	32	35		
26			35	34	241	360	115	88	30	35		33
27			35	61	187	214	115	79	25	35		
28	17		35	54	258	241	115	70	21	35		
29			35	47	330	241	108	61	28	35		
30	17		17	36	241	214	102	58	35	35		
31			16		360		95	56		25		

NOTE.—Daily discharge interpolated for days for which gage heights are missing. Discharge determined from a fairly well-defined rating curve.

Monthly discharge of Snake River at Dillon, Colo., for 1910–11.

[Drainage area, 92 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.	
1910.							
October 15–31	17	7	10.3	0.112	0.07	347	B.
November	17	5	9.93	.108	.12	591	B.
December	.....	.....	[a]8.0	.087	.10	492	C.
1911.							
January	.....	.....	[b]12	.130	.15	738	D.
February	.....	.....	[b]10	.109	.11	555	D.
March	35	7	15.9	.173	.20	978	B.
April	61	7	18.6	.202	.23	1,110	B.
May	390	17	161	1.75	2.02	9,900	C.
June	425	214	356	3.87	4.32	21,200	C.
July	214	95	183	1.99	2.29	11,300	C.
August	115	47	71.6	.778	.90	4,400	B.
September	54	21	35.1	.381	.43	2,090	B.
October	35	17	27.8	.302	.35	1,710	B.
November	.....	.....	[b]20	.217	.24	1,190	D.
December	.....	.....	[b]25	.272	.31	1,540	D.
The year	425	.....	78.0	.848	11.55	56,700	

[a] Estimated. [b] Estimated from discharge measurements and climatologic data.

EAGLE RIVER BASIN.

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 December 31, 1911.

Drainage area.—74 square miles (measured from topographic sheet).

Gage.—Chain gage, location and datum unchanged.

Channel.—Practically permanent.

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

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

Discharge measurements of Eagle River at Red Cliff, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 8	G. H. Russell	1.00	10.5	July 14	O. M. Wimmer	1.80	93.4
Feb. 10	O. M. Wimmer	1.05	8.5	Sept. 19	do	1.31	20.6
Mar. 29	do	1.32	19.0	Dec. 23	H. B. Waha	1.10	11.4
June 9	do	2.50	32.4				

Daily gage height, in feet, of Eagle River at Red Cliff, Colo., for 1911.

[S. D. Ackley, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1.08	1.1	1.38	2.05	3.35	1.82	1.45	1.4	1.4	1.15	1.15
2	.....	1.05	1.05	.....	2.1	3.5	2.0	1.5	1.4	1.35	.....	.....
3	.....	1.08	1.15	1.4	2.1	3.25	2.0	1.5	.....	1.4	.....	.....
4	.....	1.08	1.15	1.45	1.95	3.1	2.0	1.5	1.4	1.4	1.2	1.2
5	.....	1.05	.....	1.5	2.15	2.9	2.7	1.4	1.4	1.6	.....	1.2
6	.....	1.08	1.05	1.5	2.55	2.85	2.15	.....	1.35	.....	.....	.....
7	.....	1.05	1.15	1.4	2.45	3.0	2.0	1.4	1.3	1.4	1.3	1.2
8	1.0	1.05	1.15	1.4	2.6	2.7	2.0	1.4	.....	.....	1.3	1.2
9	1.0	1.1	1.15	1.4	2.95	2.75	.....	1.45	1.3	1.4	1.2	1.1
10	1.0	1.05	1.2	1.4	3.1	2.75	2.0	1.5	.....	.....	.....	.....
11	.98	1.05	1.2	1.4	.....	2.1	2.0	1.75	1.3	1.4	1.25	1.1
12	.98	1.1	1.15	1.3	2.4	2.2	1.95	1.55	1.3	.....	1.4	1.1
13	1.0	1.05	1.15	1.3	2.45	2.28	1.8	.....	1.3	.....	1.25	1.1
14	1.0	1.05	1.2	1.3	2.5	2.3	1.8	1.4	.....	1.25	1.3	1.1
15	1.0	1.05	1.05	1.35	3.1	2.35	1.8	1.4	1.5	1.3	1.3	1.0
16	1.0	1.1	1.25	.....	2.75	2.4	.....	.....	1.4	1.3	1.2	1.0
17	1.0	1.05	.....	1.35	3.0	2.35	1.75	1.45	.....	1.2	.....	.....
18	1.02	1.05	1.15	1.35	3.2	2.35	1.75	1.4	1.3	.....	1.2	1.1
19	1.1	1.05	.....	1.45	3.7	2.35	1.65	1.45	1.4	1.2	.....	1.1
20	1.0	1.05	1.15	1.55	2.8	2.1	1.65	.....	1.4	1.2	1.3	1.1
21	1.0	1.05	.....	1.65	.....	2.2	1.7	1.65	.....	1.0	1.2	1.1
22	1.02	1.0	1.1	1.8	2.5	2.23	1.85	1.45	1.3	.....	.....	1.1
23	1.12	1.05	1.1	.....	2.25	2.15	.....	1.4	1.3	.....	1.25	1.1
24	1.1	1.05	1.1	1.9	2.3	1.8	1.75	.....	.....	.....	.....	1.1
25	1.1	1.05	1.1	1.96	2.8	1.8	1.7	.....	1.3	.....	1.3	1.15
26	1.1	1.05	.....	2.0	3.15	1.82	1.6	.....	1.3	1.1	.....	1.15
27	1.0	1.1	1.3	2.1	2.6	1.9	1.6	.....	1.3	1.25	1.15	1.15
28	1.05	1.1	1.05	2.2	2.8	1.9	1.6	1.4	1.3	.....	1.2	1.1
29	1.08	.....	1.1	2.15	2.85	1.92	1.65	.....	1.4	.....	1.1	1.1
30	1.08	.....	1.3	.....	3.05	1.9	.....	1.4	1.4	.....	1.15	1.1
31	1.05	.....	1.25	.....	3.1	.....	1.6	1.4	.....	1.15	.....	1.1

NOTE.—Slush ice running in river Oct. 21 and 26.

Daily discharge, in second-feet, of Eagle River at Red Cliff, Colo., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	10	11	12	26	155	675	95	34	28	28	14	14
2	10	10	10	27	170	750	140	40	28	24	14	14
3	10	11	14	28	170	628	140	40	28	28	15	15
4	10	11	14	34	128	560	140	40	28	28	15	15
5	10	10	12	40	188	470	390	28	28	54	16	15
6	10	11	10	40	330	450	188	28	24	41	18	15
7	10	10	14	28	292	515	140	28	20	28	20	15
8	9.0	10	14	28	350	390	140	28	20	28	20	15
9	9.0	12	14	28	492	410	140	34	20	28	15	12
10	9.0	10	15	28	560	410	140	40	20	28	16	12
11	8.8	10	15	28	418	170	140	80	20	28	18	12
12	8.8	12	14	20	275	205	128	47	20	24	28	12
13	9.0	10	14	20	292	233	90	38	20	21	18	12
14	9.0	10	15	20	310	240	90	28	30	18	20	12
15	9.0	10	10	24	560	258	90	28	40	20	20	9.0
16	9.0	12	18	24	410	275	85	31	28	20	15	9.0
17	9.0	10	16	24	515	258	80	34	24	15	15	10
18	10	10	14	24	605	258	80	28	20	15	15	12
19	12	10	14	34	850	258	62	34	28	15	18	12
20	9.0	10	14	47	430	170	62	48	28	15	20	12
21	9.0	10	13	62	370	205	70	62	24	15	15	12
22	10	9.0	12	90	310	216	102	34	20	16	16	12
23	13	10	12	102	222	188	91	28	20	16	18	12
24	12	10	12	115	240	90	80	28	20	16	19	12
25	12	10	12	130	430	90	80	28	20	17	20	14
26	12	10	16	140	582	95	54	28	20	17	17	14
27	9.0	12	20	170	350	115	54	28	20	18	14	14
28	10	12	10	205	430	115	54	28	20	17	15	12
29	11	.....	12	188	450	120	62	28	28	16	12	12
30	11	.....	20	172	538	115	58	28	28	15	15	12
31	10	.....	18	.....	560	.....	54	28	.....	14	.....	12

NOTE.—Discharge determined from a well-defined rating curve. Discharge Jan. 1 to 10 estimated at 10 second-feet; discharge interpolated for other days for which gage heights are missing.

Monthly discharge of Eagle River at Red Cliff, Colo., for 1911.

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	13	8.8	9.99	0.135	0.16	614	B.
February	12	9.0	10.5	.142	.15	583	B.
March	20	10	13.9	.188	.22	855	B.
April	205	20	64.9	.877	.98	3,860	B.
May	850	128	386	5.22	6.02	23,700	B.
June	750	90	298	4.03	4.50	17,700	B.
July	390	54	107	1.45	1.67	6,580	B.
August	80	28	35.0	.473	.55	2,150	B.
September	40	20	24.1	.326	.36	1,430	B.
October	54	14	22	.297	.34	1,350	B.
November	28	12	17.0	.230	.26	1,010	B.
December	15	9	12.6	.170	.20	775	B.
The year	850	8.8	83.4	1.13	15.41	60,600	

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 December 11, 1911, at present site.

Drainage area.—580 square miles (measured from Forest atlas).

Gage.—Vertical staff. Referred to the same datum as the Weather Bureau gage nearby.

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.—Owing to the small number of gage heights the records can not be considered better than fair.

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

Discharge measurements of Eagle River at Eagle, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 18[a]	O. M. Wimmer	0.50	61	July 16	O. M. Wimmer	1.40	773
Feb. 24[a]	do	.95	89	Sept. 21	do	.60	243
Mar. 30	do	.28	118	Dec. 22[a]	H. B. Waha	1.00	158
June 8	do	3.60	2,690				

[a] Ice conditions.

Daily gage height, in feet, of Eagle River at Eagle, Colo., for 1911.

[J. B. Green, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	0.30	.....	1.90	.....	1.80	1.10	.....	.....	.....	.....
2	.....	0.43	.....	0.39	.....	.....	1.70	1.00	.....	.....	.60	.....
3	.....	.....	.25	.....	.....	3.50	1.60	1.00	.....	.....	.....	1.00
4	.....	.47	.....	.40	.....	3.70	.....	.90	.....	.....	.60	.....
5	.....	.....	.22	.....	.....	3.50	.....	.85	.....	.....	.60	1.00
6	.....	.11	.....	.....	2.60	3.50	.....	.80	0.70	.....	.....	.....
7	.....	.....	.....	.37	2.60	3.70	.....	.....	.70	.....	.59	1.00
8	.....	.....	.....	.....	2.70	3.50	.....	.....	.60	0.51	.....	.....
9	.....	.35	.....	.44	2.80	3.50	.....	.....	.55	.....	.60	1.00
10	.....	.....	.....	.....	2.80	.....	.....	.....	.55	.51	.....	.....
11	.....	.30	.27	.....	.....	3.50	.....	.....	.55	.....	.60	1.00
12	.....	.....	.....	.....	.....	3.40	.....	.....	.....	.....	.....	.....
13	.....	.32	.28	.....	.....	.....	.....	.80	.....	.70	.....	.....
14	.....	.....	.....	.50	.....	3.20	.....	.80	.....	.....	.....	.....
15	.....	.39	.....	.....	2.90	.....	.....	.....	.....	.....	.....	.....
16	.....	.....	.....	.....	.....	3.20	1.40	.80	.....	.50	.60	.....
17	0.60	.29	.....	.....	.....	.....	2.00	.....	.....	.....	.60	.....
18	.50	.....	.23	.....	.....	3.20	.....	.....	.50	.....	.....	.....
19	.....	.35	.....	.....	3.50	3.30	.....	.70	.....	.60	.....	.....
20	.....	.....	.22	.65	2.70	.....	.....	.....	.....	.58	.60	.....
21	.....	.75	.....	.....	2.70	3.00	.....	1.20	.60	.56	.....	.....
22	.....	.75	.33	.....	.....	3.20	.....	1.00	.60	.56	.60	1.00
23	.....	.85	.....	1.40	.....	.....	.....	1.10	.60	.....	.....	.....
24	.60	.95	.....	.....	.....	.....	.....	.....	.....	.60	.....	.....
25	.....	.....	.....	.....	2.80	2.70	1.45	1.00	.60	.....	.....	.....
26	.....	.....	.....	.....	.....	2.40	1.50	.90	.60	.60	.....	.....
27	.70	.80	.26	.....	2.80	2.40	.....	.....	.70	.60	.....	.....
28	.50	.....	.....	1.80	3.00	2.20	1.35	.80	.70	.60	.56	.....
29	.....	.....	.....	.....	3.00	1.90	1.20	.....	.65	.65	.....	.....
30	.....	.....	.28	1.50	3.40	1.90	1.25	.....	.60	.65	.....	.....
31	.50	.....	.....	.....	.....	.....	1.10	.....	.....	.....	.....	.....

NOTE.—Gage heights Jan. 17 to Feb. 27 and Dec. 3-31 affected by ice.

Daily discharge, in second-feet, of Eagle River at Eagle, Colo., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	60	125	146	1,180	2,550	1,090	555	336	.....	255	225
2	.....	60	120	161	.....	2,580	1,010	485	329	.....	250	225
3	.....	65	108	163	.....	2,600	930	485	322	.....	250	225
4	.....	65	102	165	.....	2,790	.....	420	315	.....	250	105
5	.....	65	97	162	.....	2,600	.....	390	308	.....	250	105
6	.....	65	95	158	1,770	2,600	.....	360	300	.....	245	190
7	.....	65	90	153	1,770	2,790	.....	360	300	.....	246	190
8	.....	65	95	168	1,860	2,600	.....	360	250	210	250	190
9	.....	65	100	181	1,950	2,600	.....	360	228	210	250	190
10	.....	65	105	185	1,950	2,600	.....	360	228	210	250	190
11	.....	70	115	190	1,960	2,600	.....	360	228	210	250	175
12	.....	70	116	195	1,980	2,500	.....	360	225	250	250	175
13	.....	70	118	200	2,000	2,410	.....	360	222	300	250	175
14	.....	70	114	205	2,020	2,320	.....	360	218	230	250	175
15	.....	70	110	210	2,040	2,320	.....	360	215	205	250	175
16	.....	75	106	210	2,190	2,320	775	360	212	205	250	160
17	.....	75	103	220	2,340	2,320	1,260	340	208	220	250	160
18	61	75	100	230	2,450	2,320	.....	320	205	240	250	160
19	.....	75	98	240	2,600	2,410	.....	300	230	250	250	160
20	.....	75	97	275	1,860	2,260	.....	450	250	241	250	160
21	.....	89	117	325	1,860	2,130	.....	625	250	232	250	158
22	.....	89	137	550	1,880	2,320	.....	485	250	232	250	158
23	.....	89	131	775	1,910	2,160	.....	555	250	241	247	158
24	.....	89	126	835	1,930	2,010	.....	520	250	250	244	150
25	.....	89	121	900	1,950	1,860	812	485	250	250	241	150
26	.....	95	116	960	1,950	1,600	850	420	250	250	238	140
27	.....	95	111	1,020	1,950	1,600	794	390	300	250	235	140
28	.....	95	113	1,090	2,130	1,430	738	360	300	250	232	140
29	.....	.....	116	970	2,130	1,180	625	353	275	275	230	140
30	.....	.....	118	850	2,500	1,180	662	347	250	275	230	140
31	.....	.....	132	.....	2,530	.....	555	341	.....	260	.....	140

NOTE.—Daily discharge determined from a well-defined rating curve. Discharge interpolated for days for which gage heights are missing except certain days in May, July, and October. Discharge for February and December determined from measurements, using gage heights indirectly.

Monthly discharge of Eagle River at Eagle, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	[a] 60.0	3,690	C.
February	95	60	74.8	4,150	B.
March	137	90	111	6,820	B.
April	1,090	146	403	24,000	C.
May 1 and 6-31	2,600	1,180	2,020	108,000	C.
June	2,790	1,180	2,250	134,000	C.
July, 12 days	1,260	555	842	20,000	B.
August	625	300	406	25,000	B.
September	336	205	258	15,400	B.
October 8-31	300	210	239	11,400	B.
November	255	230	246	14,600	B.
December	225	105	165	10,100	C.
The period	.....	.....	.....	377,000	

[a] Estimated from discharge measurement.

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 December 31, 1911.

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.—Data obtained at this station are good.

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

Discharge measurements of Homestake Creek at Red Cliff, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 8[a]	Russell and Wimmer...	0.70	6.6	July 14	O. M. Wimmer.....	1.60	12.2
Feb. 10[a]	O. M. Wimmer.....	.70	10.4	Sept. 19	.....do.....	.60	17.1
Mar. 29	.....do.....	.65	17.4	Dec. 23[a]	H. B. Waha.....	.50	12.4

[a] Ice conditions.

Daily gage height, in feet, of Homestake Creek at Red Cliff, Colo., for 1911.

[S. D. Ackley, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	.....	1.0	1.85	3.35	2.2	1.3	.....	.....	.....	0.7
2	.....	.....	0.6	.....	1.85	3.3	.....	1.2	.....	.....	0.6	.....
3	.....	.....	.....	1.2	1.75	3.25	2.85	1.0	.....	.....	.....	.....
4	.....	.....	.6	1.3	1.8	.....	.....	.....	.....	.....	.....	.7
5	.....	.....	.7	.....	2.4	3.6	2.85	1.0	.....	1.8	.....	.....
6	.....	.....	.7	.....	2.7	3.6	.....	.....	.....	.....	.....	.....
7	.....	.....	.6	1.1	3.0	3.7	2.7	1.0	.....	.....	.....	.7
8	0.7	.....	.....	.....	3.1	.....	3.0	.9	.....	.....	.6	.7
9	.....	.....	.....	.....	3.3	3.4	.....	.....	0.6	1.3	.....	.....
10	.....	0.7	.5	1.0	3.1	3.2	2.05	.....	.....	1.25	.....	.....
11	.....	.8	.5	1.0	.....	.....	2.0	1.1	.....	1.1	.....	.6
12	.....	.....	.....	.9	2.3	.....	1.9	.....	.....	.....	.....	.....
13	.....	.....	.....	.....	2.6	3.4	.....	.....	.6	.9	.....	.5
14	.....	.....	.....	.....	.....	3.05	1.6	.....	.6	.8	.....	.....
15	.....	.....	.5	1.3	2.95	3.9	.....	1.0	.6	.....	.7	.....
16	.....	.....	.....	.....	2.9	3.6	.....	.....	.....	.7	.....	.....
17	.....	.....	.5	1.0	2.95	3.0	1.8	.....	.....	.....	.....	.....
18	.....	.6	.5	1.05	3.2	.....	1.7	.....	.....	.....	.....	.....
19	.....	.6	.....	1.4	3.25	3.25	.....	.....	.6	.....	.....	.5
20	.....	.....	.5	1.5	2.75	3.5	1.7	.....	.....	.....	.....	.....
21	.....	.....	.5	1.7	.....	3.25	1.7	.....	.....	.....	.....	.5
22	.....	.....	.5	1.95	2.1	3.2	2.0	.....	.....	.....	.....	.....
23	.....	.....	1.0	.....	2.3	2.9	.....	.....	.....	.....	.....	.5
24	.....	.....	.6	1.85	2.55	2.8	2.0	.....	.....	.....	.7	.....
25	.....	.6	.6	1.8	2.8	.....	.....	.....	.....	.6	.....	.....
26	.....	.....	.....	1.7	3.0	2.3	1.9	.....	.....	.....	.....	.45
27	.....	.....	.....	2.25	2.7	2.3	1.8	.....	.....	.....	.....	.45
28	.....	.....	.....	2.6	3.0	.....	.....	.....	.7	.....	.....	.45
29	.....	.....	.65	2.5	3.15	2.4	.....	.8	.....	.....	.....	.....
30	.....	.....	.6	.....	3.3	2.25	.....	.....	.8	.....	.7	.45
31	.....	.....	.....	.....	3.15	.....	1.4	.....	.....	.....	.....	.....

NOTE.—Gage heights Jan. 1 to Mar. 7, Mar. 23, and from Dec. 1 to 31, affected by ice.

Daily discharge, in second-feet, of Homestake Creek at Red Cliff, Colo., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	10	45	168	650	250	79	24	53	15	.....
2	.....	.....	10	56	168	630	354	67	23	79	15	.....
3	.....	.....	10	67	149	610	458	45	22	105	15	.....
4	.....	.....	10	79	158	682	458	45	21	132	15	.....
5	.....	.....	10	72	305	755	458	45	20	158	15	.....
6	.....	.....	10	64	405	755	432	45	19	138	15	.....
7	.....	.....	10	56	510	800	405	45	18	119	15	.....
8	6.6	.....	10	52	550	735	510	35	16	99	15	.....
9	.....	.....	10	48	630	670	361	42	15	79	15	.....
10	.....	10	10	45	550	590	212	49	15	73	16	.....
11	.....	.....	10	45	412	616	200	56	15	56	17	.....
12	.....	.....	10	35	275	642	178	53	15	46	18	.....
13	.....	.....	10	50	370	670	150	50	15	35	19	.....
14	.....	.....	10	64	431	530	122	48	15	27	20	.....
15	.....	.....	10	79	492	890	134	45	15	24	20	.....
16	.....	.....	10	62	475	755	146	44	15	20	20	.....
17	.....	.....	10	45	492	510	158	43	15	20	20	.....
18	.....	.....	10	50	590	560	140	42	15	19	20	.....
19	.....	.....	10	93	610	610	140	41	15	18	20	.....
20	.....	.....	10	107	418	710	140	40	15	18	20	.....
21	.....	.....	10	140	312	610	140	39	16	17	20	.....
22	.....	.....	10	189	225	590	200	38	16	16	20	.....
23	.....	.....	12	178	275	475	200	37	17	16	20	12
24	.....	.....	15	168	348	440	200	36	18	15	20	.....
25	.....	.....	15	158	440	358	189	34	19	15	20	.....
26	.....	.....	15	140	510	275	178	32	19	15	20	.....
27	.....	.....	16	262	405	275	158	30	20	15	20	.....
28	.....	.....	17	370	510	290	142	28	20	15	20	.....
29	.....	.....	18	335	570	805	125	27	24	15	20	.....
30	.....	.....	15	252	630	262	109	26	27	15	20	.....
31	.....	.....	30	.....	570	.....	93	25	.....	15	.....	.....

NOTE.—Daily discharge computed from a well-defined rating curve. Discharge interpolated for days for which gage heights are missing.

Monthly discharge of Homestake Creek at Red Cliff, Colo., for 1911.

[Drainage area, 64 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] 8.0	0.125	0.14	492	D.
February	.....	.....	[a] 10.0	.156	.16	555	D.
March	30	10	12.0	.187	.22	738	C.
April	370	45	114	1.78	1.99	6,780	B.
May	630	149	418	6.53	7.53	25,700	B.
June	890	262	575	8.98	10.02	34,200	B.
July	510	93	230	3.59	4.14	14,100	B.
August	79	25	42.3	.661	.76	2,600	C.
September	27	15	18.0	.281	.31	1,070	C.
October	158	15	48.0	.750	.86	2,950	C.
November	20	15	18.2	.284	.32	1,080	C.
December	.....	.....	[a] 13.0	.203	.23	799	D.
The year	890	.....	125	1.95	26.68	91,000	

[a] Estimated from discharge measurements, comparison, and climatologic data.

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 December 31, 1911.

Drainage area.—98 square miles (measured from Forest atlas).

Gage.—Inclined staff.

Channel.—Apparently permanent.

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.

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

Discharge measurements of Gore Creek near Minturn, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
July 15	O. M. Wimmer	1.70	166
Sept. 20	....do	1.10	46.3
Dec. 22[a]	H. B. Waha	1.35	20.2

[a] Ice conditions.

Daily gage height, in feet, and discharge, in second-feet, of Gore Creek near Minturn, Colo., for 1911.

[G. W. Gustafson, observer.]

Day.	July.		September.		October.		November.		December.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1										
2										
3										
4					1.2	58				
5									1.6	
6					1.4	98				
7					1.3	78	1.0	26		
8										
9							1.0	26	1.7	
10					1.25	68	1.0	26		
11										
12					1.2	58				
13					1.2	58				
14							1.3		1.9	
15	1.7	166								
16									1.9	
17										
18							1.1	41		
19										
20			1.1	41						
21										
22							1.5		1.35	
23					1.1	41			1.0	
24							.95	22		
25									1.0	26
26										
27							1.0	26		
28					1.1	41				
29										
30							1.3		1.0	26
31										

NOTE.—Gage heights Nov. 14 and 22 and from Nov. 30 to Dec. 31 affected by ice. Daily discharge determined from a fairly well defined rating curve.

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 December 31, 1911.

Drainage area.—15 square miles (measured from Forest atlas).

Gage.—Vertical staff.

Channel.—Apparently permanent.

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.—Results are fairly good.

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

Discharge measurements of Beaver Creek at Avon, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 25	O. M. Wimmer	0.38	4.6	Sept. 20	O. M. Wimmer	0.56	7.5
Mar. 30	do	.40	5.0	Dec. 22	H. B. Waha	.40	4.6
July 15	do	.68	11.8				

Daily gage height, in feet, of Beaver Creek at Avon, Colo., for 1911.

[I. T. Starbuck, observer.]

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1			0.40	0.70	1.62	0.70	0.60	0.40	0.60	0.50	
2				.65	1.65	.80	.60	.40		.50	0.40
3			.50		1.60	1.20	.60	.40	.60	.50	.40
4		0.33		.72	1.65	1.20	.55	.50		.50	.40
5			.45	.85	1.70	1.20	.45	.50		.50	.40
6				.98	1.65	1.50	.30			.50	.40
7		.25		1.10	1.70	1.30	.12		.60	.50	
8			.50	1.20	1.70	1.15	.04	.40	.60	.50	.40
9				1.32	1.70	1.05	.00	.40	.60	.50	.40
10				1.35	1.60	1.00	.25	.40	.60	.50	.40
11		.35		1.15		.90	.12	.40	.50	.45	.40
12				1.10		.80	.18		.50	.30	.40
13			.40	1.20		.70	.10		.50	.30	.40
14				1.20		.70	.10	.50	.50		.40
15			.40	1.45		.60	.10	.50	.50	.40	.40
16				1.50		.60	.10	.50		.40	.40
17				1.50		.60	.10	.50	.50	.40	.40
18		.30		1.50		.60	.10	.50	.50	.40	.40
19			.45	1.60		.70			.50		.40
20			.45			.70	.20	.56	.40	.40	.40
21			.42			.70	.40		.40	.40	.40
22			.60	1.20		.70		.50	.40	.40	.40
23		.33	.55		1.60	.70	.60	.50	.40		.40
24			.58		1.50	.70	.55	.50	.40	.40	.40
25	0.38	.40	.56				.50	.50	.40	.40	.40
26			.60	1.60	1.00	.60	.50	.40	.40	.40	.40
27			.65	1.50	1.00	.60			.50	.40	.40
28			.69	1.50	1.00	.60	.40		.50	.40	.40
29			.70	1.50	1.00	.60	.40	.50	.50	.40	.40
30		.40		1.50	.80	.65	.40	.55	.50	.40	.40
31				1.62		.60	.40		.50		

Daily discharge, in second-feet, of Beaver Creek at Avon, Colo., for 1911.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		4.0	4.5	12	90	12	9.0	4.5	9.0	6.5	4.5
2		4.0	5.5	11	94	17	9.0	4.5	9.0	6.5	4.5
3		3.9	6.5	12	88	47	9.0	4.5	9.0	6.5	4.5
4		3.8	6.0	13	94	47	7.8	6.5	9.0	6.5	4.5
5		3.6	5.5	20	100	47	5.5	6.5	9.0	6.5	4.5
6		3.3	5.8	29	94	77	3.5	5.8	9.0	6.5	4.5
7		3.0	6.2	38	100	56	2.1	5.2	9.0	6.5	4.5
8		3.3	6.5	47	100	42	1.7	4.5	9.0	6.5	4.5
9		3.6	6.1	58	100	34	1.5	4.5	9.0	6.5	1.5
10		3.8	5.7	61	88	30	3.0	4.5	9.0	6.5	4.5
11		4.0	5.3	42	88	23	2.1	4.5	6.5	5.5	4.5
12		4.0	4.9	38	88	17	2.4	5.2	6.5	3.5	4.5
13		3.9	4.5	47	88	12	2.0	5.8	6.5	3.5	4.5
14		3.8	4.5	47	88	12	2.0	6.5	6.5	4.0	4.5
15		3.7	4.5	72	88	9.0	2.0	6.5	6.5	4.5	4.5
16		3.6	4.8	77	88	9.0	2.0	6.5	6.5	4.5	4.5
17		3.5	5.0	77	88	9.0	2.0	6.5	6.5	4.5	4.5
18		3.5	5.2	77	88	9.0	2.0	6.5	6.5	4.5	4.5
19		3.5	5.5	88	88	12	2.2	7.2	6.5	4.5	4.5
20		3.6	5.5	74	88	12	2.5	8.0	4.5	4.5	4.5
21		3.7	4.9	61	88	12	4.5	7.2	4.5	4.5	4.5
22		3.8	9.0	47	88	12	6.7	6.5	4.5	4.5	4.5
23		3.8	7.8	57	88	12	9.0	6.5	4.5	4.5	4.5
24		4.2	8.5	67	77	12	7.8	6.5	4.5	4.5	4.5
25	4.3	4.5	8.0	78	54	10	6.5	6.5	4.5	4.5	4.5
26		4.5	9.0	88	30	9.0	6.5	4.5	4.5	4.5	4.5
27		4.5	11	77	30	9.0	5.5	5.2	6.5	4.5	4.5
28		4.5	12	77	30	9.0	4.5	5.8	6.5	4.5	4.5
29		4.5	12	77	30	9.0	4.5	6.5	6.5	4.5	4.5
30		4.5	12	77	17	11	4.5	7.8	6.5	4.5	4.5
31		4.5		90		9.0	4.5		6.5		4.5

NOTE.—Daily discharge determined from a fairly well defined rating curve. Discharge interpolated for days for which gage heights are missing.

Monthly discharge of Beaver Creek at Avon, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	a 4.00	246	D.
February	.....	.....	a 4.00	222	D.
March	4.5	3.0	3.88	239	B.
April	12	4.5	6.74	401	B.
May	90	11	56.0	3,440	C.
June	100	17	78.7	4,680	C.
July	77	9.0	20.9	1,290	B.
August	9.0	1.5	4.45	274	B.
September	8.0	4.5	5.91	352	B.
October	9.0	4.5	6.86	422	B.
November	6.5	3.5	5.12	305	B.
December	4.5	4.5	4.50	277	B.
The year	100	.....	16.8	12,100	

a Estimated.

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 1, 1911, to December 31, 1911.

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 some 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.—Although gage heights are scattering, good results have been obtained by means of comparison with flow at other streams and from climatologic data.

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

Discharge measurements of Brush Creek at Eagle, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 18	O. M. Wimmer	0.31	34.8	July 15	O. M. Wimmer	0.60	61.6
Feb. 24	do	.43	41.5	Sept. 21	do	.52	50.1
Mar. 30	do	.36	33.4	Dec. 21 a	H. B. Waha	.55	33.0
June 9	do	1.10	165				

a Ice conditions.

Daily gage height, in feet, of Brush Creek at Eagle, Colo., for 1911.

[J. B. Green, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1					0.70			0.32			0.60	
2				0.39			0.40					
3		0.43				0.70	.64	.20	0.35		.58	1.20
4			0.70			.72	.55					
5						.76	.58				.61	1.20
6		.32			.79	.75		.00			.65	
7						.75		−.10	.35			1.20
8		.40		.32	.79				.35	.50		
9				.38	.80	1.20			.35		.63	
10		.45	.53	.32	.83	1.10			.35	.50		
11		.30	.48			1.03		−.20			.61	1.20
12												
13					.87	1.00				.50	.59	
14		.39	.32							.54		
15				.32	.90	1.00	.60				.60	
16		.38	.33			.90					.60	
17		.33		.32			.60	−.30		.50		
18	0.31	.32				.73						
19		.32			.70			.00	.30	.50	.56	
20		.33	.36		.70	.71		.00		.50		
21					.70			.00	.52	.51		.55
22				.35		.72			.40	.54	.54	
23		.50	.30	.40						.50	.54	
24		.43			.70				.58			
25					.70	.71	.60	.20	.55	.54		
26					.70			.40			.54	
27	.40	.72	.35		.70	.70			.60	.50		
28	.35			.67			.60					
29					.80	.68	.50			.55		
30	.32		.38				.50		.60	.62		
31							.40					

NOTE.—Gage heights affected by ice Feb. 23, 24, 27, and from Dec. 3 to 31.

Daily discharge, in second-feet, of Brush Creek at Eagle, Colo., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	35	36	44	37	77	84	50	32	35	60	62	
2	35	38	45	37	81	80	38	28	34	60	60	
3	35	41	46	36	85	77	68	24	34	58	59	
4	35	38	47	35	88	81	56	21	34	56	62	
5	35	35	48	34	91	88	59	18	34	54	64	
6	35	32	49	33	94	87	59	15	34	52	70	
7	35	35	50	32	94	87	59	11	34	50	68	
8	35	38	51	32	94	140	60	10	34	49	67	
9	35	41	52	36	96	192	60	9	34	49	66	
10	35	44	53	32	102	165	60	8	34	49	65	
11	35	30	47	32	105	148	61	8	34	49	64	
12	35	32	42	32	108	144	61	8	33	49	62	
13	35	34	37	32	110	140	62	7	33	49	61	
14	35	37	32	32	114	140	62	6	32	54	61	
15	35	36	32	32	117	140	62	6	32	52	62	
16	35	36	32	32	107	117	62	5	31	50	62	
17	35	32	32	32	97	100	62	5	31	49	60	
18	35	32	33	32	87	83	62	10	30	49	58	
19	35	32	34	33	77	81	62	15	30	49	57	
20	36	32	35	33	77	79	62	15	41	49	56	
21	36	34	34	34	77	80	62	15	52	50	56	33
22	36	36	32	34	77	81	62	17	38	54	55	
23	37	38	30	38	77	80	62	19	48	49	55	
24	37	39	31	44	77	80	62	22	59	52	55	
25	37	40	32	51	77	79	62	24	56	54	55	
26	38	41	33	58	77	78	62	38	59	52	55	
27	38	42	34	65	77	77	62	38	62	49	50	
28	34	43	34	72	86	76	62	37	62	52	50	
29	33		35	74	96	74	49	37	62	56	50	
30	32		36	76	92	62	49	36	62	65	50	
31	34		36		88		38	36		64		

NOTE.—Discharge determined from a fairly well defined rating curve. Discharge Jan. 1 to 17 estimated at 35 second-feet. Discharge interpolated for days for which gage heights are missing.

Monthly discharge of Brush Creek at Eagle, Colo., for 1911.

[Drainage area, 120 square miles.]

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	38	32	35.3	2,170	C.
February	44	30	36.6	2,030	C.
March	53	30	39.0	2,400	C.
April	76	32	40 4	2,400	B.
May	117	77	90.4	5,560	C.
June	192	62	101	6,010	C.
July	68	38	58.7	3,610	C.
August	38	5	18.7	1,150	C.
September	62	30	40.9	2,430	B.
October	65	49	52.7	3,240	B.
November	70	50	59.2	3,520	B.
December	.....	.....	a 33	2,030	D.
The year	192	5	50.5	36,600	

a Estimated from discharge measurements.

NO NAME CREEK BASIN.

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 December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Practically permanent.

Discharge measurements.—Made by wading near by or from footbridge.

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.—As the station has not yet been completely rated, estimates of discharge can not be made.

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., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 5[a]	Russell and Wimmer	2.35	19.6
Feb. 22	O. M. Wimmer	2.32	19.0
Dec. 20	H. B. Waha	2.43	28.4

a Slight ice effect.

Daily gage height, in feet, of No Name Creek near Glenwood Springs, Colo., for 1911.

[O. O. V. Hann, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	2.35	2.35	.....	2.68	3.57	2.83	2.55	2.43	2.73	2.54	2.51
2	.....	2.40	2.34	2.47	2.65	3.60	2.83	2.55	2.51	2.65	2.55	2.50
3	.....	2.35	.....	2.55	2.64	3.61	2.87	2.51	2.55	2.63	2.51	2.50
4	.....	.....	2.37	2.60	2.69	3.70	2.81	2.49	2.53	2.63	2.40	2.50
5	2.35	.....	.....	2.56	2.80	3.75	2.80	2.47	2.51	2.15	2.53	2.50
6	2.40	.....	.....	2.55	2.85	3.80	2.77	2.45	2.51	2.85	2.53	2.48
7	2.00	.....	.....	2.54	2.87	3.85	2.73	2.45	2.50	2.75	2.44	2.50
8	2.35	.....	.....	2.53	2.93	3.81	2.70	2.43	2.49	2.71	2.55	2.50
9	2.35	.....	.....	2.52	3.07	3.87	2.69	2.43	2.49	2.69	2.54	2.48
10	2.40	.....	.....	2.52	3.01	3.83	2.55	2.43	2.49	2.65	2.53	2.48
11	2.55	.....	2.50	2.51	2.99	3.79	2.63	2.45	2.47	2.63	2.49	2.48
12	2.60	.....	.....	2.51	2.83	3.75	2.60	2.45	2.48	2.63	2.45	2.48
13	2.70	.....	.....	2.50	2.91	3.89	2.60	2.44	2.49	2.63	2.59	2.49
14	2.70	.....	2.45	2.50	2.90	3.80	2.60	2.43	2.49	2.63	2.55	2.47
15	2.35	2.35	.....	2.50	3.00	3.79	2.57	2.42	2.51	.....	2.59	2.49
16	2.35	.....	.....	2.49	3.00	3.65	2.55	2.40	2.49	.....	2.55	2.48
17	2.35	.....	.....	2.51	3.10	3.55	2.57	2.39	2.47	.....	2.43	2.46
18	2.35	.....	2.42	2.52	3.10	3.45	2.53	2.50	2.45	.....	2.51	2.45
19	2.35	.....	.....	2.54	3.15	3.50	2.55	2.50	2.44	.....	2.53	2.44
20	2.35	2.40	.....	2.57	3.10	3.45	2.53	2.51	2.45	.....	2.52	2.43
21	2.40	.....	.....	2.59	3.05	3.55	2.51	2.52	2.43	.....	2.53	2.44
22	2.35	2.32	.....	2.61	3.05	3.40	2.61	2.50	2.19	2.53	2.53	2.43
23	2.35	.....	.....	2.64	3.15	3.25	2.55	2.51	2.19	2.55	2.43	2.42
24	2.35	.....	.....	2.66	3.20	3.15	2.49	2.50	2.20	2.55	2.45	2.43
25	2.35	.....	.....	2.67	3.25	3.05	2.47	2.49	2.51	2.57	2.49	2.41
26	2.35	.....	.....	2.68	3.45	2.99	2.46	2.47	2.55	2.57	2.51	2.43
27	2.40	2.36	.....	2.69	3.40	2.95	2.46	2.46	2.57	2.59	2.50	2.41
28	2.35	.....	.....	2.70	3.40	2.90	2.45	2.45	2.59	2.59	2.49	2.43
29	2.35	.....	.....	2.72	3.50	2.89	2.57	2.45	2.57	2.57	2.73	2.43
30	2.35	.....	.....	2.70	3.50	2.88	2.56	2.45	2.75	2.55	2.53	2.42
31	2.40	.....	.....	.....	3.55	.....	2.55	2.43	.....	2.53	.....	.....

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 1 to December 31, 1911.

Gage.—Vertical staff.

Channel.—As this station is in a flume the channel should be practically permanent.

Discharge measurements.—Made from top of flume.

Diversions.—No water is diverted above the station so far as known.

Accuracy.—Data insufficient for estimates of discharge.

Cooperation.—Station maintained in cooperation with the Glenwood Light & Water Co.

Discharge measurements of Glenwood Light & Water Co.'s flume near Glenwood Springs, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 5	O. M. Wimmer	1.05	18.2
Feb. 22	....do	1.20	19.3
Dec. 20	H. B. Waha	1.20	15.9

Daily gage height, in feet, of Glenwood Light & Water Co.'s flume near Glenwood Springs, Colo., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1.07	1.04	.....	1.12	1.12	1.12	1.12	1.12	1.12	1.20	1.20
2	.....	1.07	1.04	1.10	1.12	1.12	1.12	1.12	1.12	1.12	1.20	1.20
3	.....	1.07	.....	1.11	1.12	1.12	1.12	1.12	1.12	1.12	1.20	1.20
4	.....	.....	1.06	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.20	1.20
5	1.05	.....	.....	1.10	1.12	1.12	1.12	1.12	1.12	1.13	1.20	1.20
6	1.07	.....	.....	1.10	1.12	1.12	1.11	1.12	1.12	1.12	1.20	1.20
7	1.01	.....	.....	1.10	1.12	1.11	1.11	1.12	1.12	1.12	1.20	1.20
8	1.07	.....	.....	1.10	1.12	1.12	1.12	1.12	1.12	1.20	1.20	1.20
9	1.07	.....	.....	1.10	1.13	1.12	1.12	1.12	1.12	1.20	1.20	1.20
10	1.07	.....	.....	1.10	1.12	1.12	1.11	1.12	1.12	1.20	1.20	1.20
11	1.09	.....	1.19	1.10	1.11	1.12	1.12	1.12	1.12	1.20	1.20	1.20
12	1.09	.....	.....	1.10	1.11	1.10	1.12	1.12	1.12	1.20	1.20	1.20
13	1.09	.....	.....	1.09	1.12	1.10	1.12	1.12	1.12	1.20	1.20	1.20
14	1.09	.....	.....	1.09	1.12	1.12	1.12	1.12	1.12	1.20	1.20	1.20
15	1.05	1.10	.....	1.08	1.12	1.12	1.12	1.11	1.12	.....	1.20	1.20
16	1.05	.....	.....	1.08	1.12	1.12	1.12	1.11	1.12	.....	1.20	1.20
17	1.05	.....	.....	1.08	1.12	1.11	1.12	1.11	1.12	.....	1.20	1.20
18	1.07	.....	1.12	1.09	1.12	1.12	1.12	1.12	1.12	.....	1.20	1.20
19	1.07	.....	.....	1.10	1.12	1.12	1.12	1.12	1.12	.....	1.20	1.20
20	1.07	1.15	.....	1.10	1.12	1.11	1.12	1.12	1.12	.....	1.20	1.20
21	1.07	.....	.....	1.10	1.12	1.12	1.12	1.12	1.12	.....	1.20	1.20
22	1.07	1.05	.....	1.11	1.12	1.11	1.12	1.12	.75	1.20	1.20	1.20
23	1.07	.....	.....	1.11	1.12	1.11	1.12	1.12	.75	1.20	1.20	1.20
24	1.07	.....	.....	1.12	1.12	1.10	1.12	1.12	.80	1.20	1.20	1.20
25	1.07	.....	.....	1.12	1.12	1.11	1.12	1.12	1.12	1.20	1.20	1.15
26	1.07	.....	.....	1.12	1.12	1.08	1.12	1.12	1.12	1.20	1.20	1.15
27	1.07	1.05	.....	1.12	1.12	1.12	1.12	1.12	1.12	1.20	1.20	1.15
28	1.07	.....	.....	1.12	1.12	1.12	1.12	1.12	1.12	1.20	1.20	1.20
29	1.07	.....	.....	1.12	1.12	1.12	1.12	1.12	1.12	1.20	1.20	1.20
30	1.07	.....	.....	1.12	1.12	1.12	1.12	1.12	1.12	1.20	1.20	1.20
31	1.07	.....	.....	.....	1.12	.....	1.12	1.12	.....	1.20	.....	.....

ROARING FORK BASIN.

ROARING FORK AT ASPEN, COLO.

Location.—In sec. 7, T. 10 S., R. 84 W., at Aspen; above Castle, Maroon, and Hunter creeks.

Records available.—January 1, 1911, to December 31, 1911.

Drainage area.—109 square miles (measured from topographic sheet).

Gage.—Vertical staff.

Channel.—Practically permanent.

Discharge measurements.—Made by wading except during high water when they are made from bridge near gage.

Winter flow.—Ice causes backwater during the winter months, and 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 from the middle of May to the middle of September.

Accuracy.—Fairly good results have been obtained at this station.

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

Discharge measurements of Roaring Fork at Aspen, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 1[a]	Russell and Wimmer..	0.70	31.7	July 21	O. M. Wimmer.....	1.70	311
Feb. 15	O. M. Wimmer.....	.00	25.3	Sept. 25	.....do.....	.50	67.6
Apr. 2	.....do.....	.40	72.4	Dec. 26[a]	.....do.....	.70	25.1

[a] Ice conditions.

Daily gage height, in feet, of Roaring Fork at Aspen, Colo., for 1911.

[S. C. Swearengin, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.7	0.1	0.0	.....	1.0	3.0	2.0	.....	0.4	.....	.....	.....
2	.7	.1	.0	0.3	.9	3.1	.....	.....	.4	.....	0.3	1.7
3	.7	.0	.0	.4	.9	3.0	2.6	.....	.....	.....	.....	.....
4	.9	.0	.0	.5	1.0	3.3	.....	.....	.4	.....	.....	.....
5	.7	.1	.0	.4	1.4	3.3	.....	.....	.....	.....	.....	1.7
6	.6	.2	.0	.4	1.7	3.4	.....	.....	.....	.....	.....	1.3
7	.5	.2	.0	.4	1.8	3.3	2.3	0.8	.....	.....	.....	.....
8	.6	.2	.1	.4	2.0	3.6	2.3	.8	.3	.....	.4	.....
9	.6	.2	.1	.4	2.2	3.5	.....	.7	.2	.....	.4	1.0
10	.5	.2	.1	.3	2.0	3.2	.....	.8	.2	.....	.4	.....
11	.4	.2	.1	.3	1.7	2.2	1.9	.....	.2	.....	.4	.....
12	.3	.0	.1	.2	.....	.....	.....	.....	.....	.....	.....	1.4
13	.3	.1	.1	.1	1.7	3.55	.....	.....	.....	.....	.8	.....
14	.5	.1	.1	.2	1.7	3.4	.....	.....	.....	0.9	.6	.....
15	.2	.0	.1	.3	1.9	3.5	1.7	.....	.....	.....	.6	1.7
16	.....	.0	.1	.3	1.9	.....	1.8	.8	.....	.....	.4	.....
17	.2	.0	.1	.2	2.0	3.0	2.3	.....	.....	.....	.....	1.5
18	.2	.1	.1	.2	2.1	.....	1.7	.7	.....	.....	.4	.....
19	.7	.0	.1	.2	2.3	3.1	.....	.7	.....	.7	.....	.....
20	.2	.1	.1	.....	2.0	3.1	.....	.....	.6	.....	.4	.....
21	.2	.1	.1	.5	1.8	3.1	1.7	.....	.....	.....	.....	.....
22	.1	.1	.1	.7	1.7	3.2	.....	.....	.6	.....	.3	.....
23	.2	.1	.1	.7	.....	3.2	.....	.....	.7	.....	.4	1.4
24	.....	.1	.1	.8	1.9	3.1	.....	.8	.....	.....	.6	.....
25	.....	.0	.1	.8	2.0	.....	.....	.8	.5	.....	.....	.....
26	.1	.1	.0	.9	2.3	2.4	.....	.7	.....	.....	.....	.7
27	.2	.1	.2	1.0	2.1	2.4	.....	.....	.....	.....	.4	.....
28	.2	.0	.1	1.2	2.3	.....	.....	.....	.6	.5	.....	.....
29	.1	.....	.2	1.2	2.5	.....	.....	.6	.....	.....	.....	.5
30	.0	.....	.3	1.05	2.4	.....	.....	.....	.....	.4	.....	.....
31	.1	.....	.3	.....	2.7	.....	.....	.4	.....	.3	.....	.....

NOTE.—Gage heights from Jan. 1 to Mar. 14, Nov. 13 to 15, Nov. 24, and Dec. 1 to 31 affected by ice.

Daily discharge, in second-feet, of Roaring Fork at Aspen, Colo., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	32	.....	25	52	152	690	390	130	63	.....	52	60
2	.....	.....	25	52	135	720	480	130	63	.....	52	60
3	.....	.....	25	63	135	690	570	125	63	.....	54	60
4	.....	.....	27	75	152	780	550	125	63	.....	56	55
5	.....	.....	27	63	235	780	525	120	60	.....	58	55
6	.....	.....	30	63	310	815	500	120	58	.....	60	50
7	.....	.....	30	63	335	780	480	118	55	.....	62	50
8	.....	.....	30	63	390	885	480	118	52	.....	63	50
9	.....	.....	30	63	450	850	440	102	42	.....	63	50
10	.....	.....	30	52	390	750	400	118	42	.....	63	50
11	.....	.....	33	52	310	750	360	118	42	.....	63	50
12	.....	.....	33	42	310	809	350	118	.....	.....	63	50
13	.....	.....	33	33	310	868	340	118	.....	.....	63	50
14	.....	.....	33	42	310	815	325	118	.....	135	63	50
15	.....	25	33	52	360	850	310	118	.....	127	63	50
16	.....	.....	33	52	360	770	335	118	.....	119	63	45
17	.....	.....	33	42	390	690	480	110	.....	112	63	45
18	.....	.....	33	42	420	705	310	102	.....	105	63	45
19	.....	.....	33	42	480	720	310	102	.....	102	63	45
20	.....	.....	33	58	390	720	310	105	88	99	63	45
21	.....	.....	33	75	335	720	310	108	88	96	58	40
22	.....	.....	33	102	310	750	.....	111	88	93	52	40
23	.....	.....	33	102	335	750	.....	114	102	90	63	40
24	.....	.....	33	118	360	720	.....	118	88	87	63	40
25	.....	.....	33	118	390	615	.....	118	75	84	63	40
26	.....	.....	25	135	480	510	.....	102	80	81	63	25
27	.....	.....	42	152	420	510	.....	97	84	78	63	25
28	.....	.....	33	190	480	480	.....	92	88	75	63	25
29	.....	.....	42	190	540	450	.....	88	88	69	63	25
30	.....	.....	52	161	510	420	.....	76	88	63	63	25
31	.....	.....	52	.....	600	.....	.....	63	.....	52	.....	25

NOTE.—Daily discharge determined from a fairly well defined rating curve. Discharge interpolated for days for which gage heights are missing except for certain days in July, September, and October. Daily discharge for December based on measurement made December 26.

Monthly discharge of Roaring Fork at Aspen, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	[a] 30.0	1,840	D.
February	.....	.....	[a] 25.0	1,390	D.
March	52	25	32.9	2,020	C.
April	190	33	80.3	4,780	C.
May	600	135	358	22,000	C.
June	885	420	712	42,400	C.
July, 21 days	570	310	407	16,900	C.
August	130	63	110	6,760	C.
September, 22 days	102	42	70.9	2,990	C.
October, 18 days	135	52	92.6	3,300	C.
November	63	52	60.9	3,620	C.
December	60	25	44.0	2,710	C.
The period	.....	.....	.....	111,000	

[a] Estimated from discharge measurements.

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, 1911.

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.

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, and the 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 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 20	O. M. Wimmer	1.05	333	June 14	W. B. Freeman	5.70	7,770
21	do	1.05	349	July 17	O. M. Wimmer	3.55	3,240
25	R. H. Fletcher	1.18	426	Sept. 22	do	1.75	863
Mar. 11	Thos. Grieve	1.55	607	26	G. H. Russell	1.72	734
Apr. 1	O. M. Wimmer	1.61	639	Oct. 14	C. L. Chatfield	2.20	1,170
May 7	J. B. Stewart	3.55	3,090	Dec. 19	O. M. Wimmer	1.35	559

Daily gage height, in feet, of Roaring Fork at Glenwood Springs, Colo., for 1911.

[H. H. French, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Sept.	Oct.	Nov.	Dec.
1	.....	1.6	1.1	1.7	2.65	.....	.....	.....	3.2	1.55	.....
2	.....	1.2	1.1	1.75	2.5	.....	.....	.....	2.9	.....	1.5
3	.....	1.2	1.1	.....	2.5	.....	.....	.....	2.6	1.7	1.5
4	.....	1.2	1.15	.....	2.6	.....	.....	.....	2.3	.....	.....
5	.....	1.1	1.2	.....	3.0	5.5	.....	.....	4.4	2.15	1.6
6	.....	1.1	1.3	.....	3.6	5.8	.....	.....	3.8	.....	1.5
7	1.3	1.1	1.3	.....	3.7	.....	.....	.....	3.3	1.5	1.5
8	1.3	1.1	1.3	1.65	4.2	.....	.....	.....	.....	1.7	1.4
9	1.3	1.0	1.75	1.7	4.5	.....	.....	.....	.....	1.7	1.3
10	1.4	1.1	1.7	1.7	4.2	.....	.....	.....	.....	1.7	.....
11	1.6	1.2	1.7	1.7	3.8	.....	.....	.....	2.4	1.65	1.4
12	1.25	.....	1.35	1.65	3.6	.....	.....	.....	2.3	.....	1.3
13	1.2	1.2	1.25	1.6	3.8	.....	.....	.....	2.2	1.5	.....
14	1.2	1.1	1.25	1.55	.....	5.7	.....	.....	2.2	1.65	1.15
15	.....	1.15	1.3	1.45	4.2	.....	.....	1.8	.....	1.5	.....
16	.....	1.15	1.3	.....	4.2	.....	.....	.....	2.1	1.5	1.4
17	.....	1.15	1.3	1.65	4.2	.....	3.6	.....	.....	1.4	.....
18	.....	1.1	1.3	1.6	4.4	.....	.....	1.75	2.0	1.45	1.4
19	.....	1.1	.....	1.7	4.7	.....	.....	1.65	1.9	.....	1.4
20	.....	1.05	1.3	1.95	4.0	.....	.....	.....	.....	.....	1.3
21	.....	1.1	.....	2.1	3.7	.....	.....	1.8	2.2	1.5	1.2
22	.....	.....	1.4	2.3	3.6	.....	.....	1.75	.....	1.5	.....
23	.9	1.05	1.5	2.0	.....	.....	.....	2.0	.....	1.5	.....
24	1.1	.....	.....	2.5	.....	.....	.....	1.9	1.9	1.4	.....
25	1.2	1.2	1.4	2.5	.....	.....	.....	1.8	2.25	1.4	1.4
26	1.2	1.1	.....	2.55	.....	.....	.....	1.9	2.0	.....	1.2
27	1.1	1.1	1.3	2.85	.....	.....	.....	2.0	1.9	1.55	1.1
28	1.1	1.1	1.3	2.95	4.4	.....	.....	2.0	1.8	.....	.....
29	1.1	.....	1.4	3.2	4.6	.....	.....	2.1	1.8	1.1	1.5
30	1.4	.....	1.5	2.9	.....	.....	.....	2.9	1.6	1.3	1.45
31	1.4	.....	1.5	.....	.....	.....	.....	.....	1.7	.....	.....

Daily discharge, in second-feet, of Roaring Fork at Glenwood Springs, Colo., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Sept.	Oct.	Nov.	Dec.
1	350	680	365	750	1,680	.....	.....	.....	2,530	645	545
2	350	420	365	790	1,500	.....	.....	.....	2,040	693	610
3	350	420	365	780	1,500	.....	.....	.....	1,620	750	610
4	350	420	392	770	1,620	.....	.....	.....	1,270	935	645
5	350	365	420	755	2,200	7,290	.....	.....	4,800	1,120	680
6	350	365	480	740	3,250	8,030	.....	.....	3,620	865	610
7	480	365	480	725	3,430	.....	.....	.....	2,710	610	610
8	480	365	480	715	4,400	.....	.....	.....	2,370	750	540
9	480	315	790	750	5,010	.....	.....	.....	2,040	750	480
10	540	365	750	750	4,400	.....	.....	.....	1,710	750	510
11	680	420	750	750	3,620	.....	.....	.....	1,380	715	540
12	450	420	510	715	3,250	.....	.....	.....	1,270	662	480
13	420	420	450	680	3,620	.....	.....	.....	1,170	610	436
14	420	365	450	645	4,050	7,800	.....	.....	1,170	715	392
15	405	392	480	575	4,400	.....	.....	830	1,120	610	466
16	390	392	480	645	4,400	.....	.....	843	1,080	610	540
17	375	392	480	715	4,400	.....	3,250	858	1,040	540	540
18	360	365	480	680	4,800	.....	.....	790	990	575	540
19	345	365	480	750	5,430	.....	.....	715	910	585	540
20	330	340	480	950	4,000	.....	.....	772	1,040	595	480
21	310	365	510	1,080	3,430	.....	.....	830	1,170	610	420
22	290	352	540	1,270	3,250	.....	.....	790	1,080	610	450
23	270	340	610	990	3,510	.....	.....	990	1,000	610	480
24	365	380	575	1,500	3,770	.....	.....	910	910	540	510
25	420	420	540	1,500	4,030	.....	.....	830	1,220	540	540
26	420	365	510	1,560	4,290	.....	.....	910	990	592	420
27	365	365	480	1,960	4,550	.....	.....	990	910	645	365
28	365	365	480	2,120	4,800	.....	.....	990	830	505	488
29	365	.....	540	2,530	5,220	.....	.....	1,080	830	365	610
30	540	.....	610	2,040	5,300	.....	.....	2,040	680	480	575
31	540	.....	610	.....	5,400	.....	.....	.....	750	.....	510

NOTE.—Daily discharge determined from a fairly well defined rating curve. Discharge Jan. 1 to 6 estimated at 350 second-feet. Discharge interpolated for days for which gage heights are missing.

Monthly discharge of Roaring Fork at Glenwood Springs, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	680	270	403	24,800	C.
February	680	315	389	21,600	B.
March	790	365	514	31,600	B.
April	2,530	645	1,040	61,900	B.
May	5,430	1,500	3,820	235,000	C.
September 15-30	2,040	715	948	30,100	B.
October	4,800	680	1,490	91,600	C.
November	1,120	365	653	38,900	B.
December	680	365	521	32,000	C.
The period				568,000	

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 to December 31, 1911.

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 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.—Fair, for period covered.

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

Discharge measurements of Hunter Creek at Aspen, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 17	O. M. Wimmer	0.60	4.1	Sept. 25	O. M. Wimmer	0.62	9.2
Apr. 2	do	1.00	19.2	Dec. 26	do	.30	[a]3.0
July 20	do	1.30	41.2				

[a] Discharge estimated. Ice conditions.

Daily gage height, in feet, of Hunter Creek at Aspen, Colo., for 1911.

[N. S. Ashlock, observer.]

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		0.6			2.7			0.4			
2			1.0		2.8			.2		0.4	
3		.6			2.8						
4		.6			2.7			.3			
5		.6	1.1	2.5	2.9						0.6
6		.7		2.8	2.6						
7		.7	1.1	2.7	2.5	1.8	0.1				.5
8		.6		2.5	2.6	1.6		.1		.6	
9			.9		2.5			.1		.6	1.0
10		.7			2.1					.6	

Daily gage height, in feet, of Hunter Creek at Aspen, Colo., for 1911—Continued.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
11				2.3	2.0	1.4				0.6	
12							0.3				0.5
13				2.0						.9	
14				1.9	2.3					.8	
15			0 8	2.0	2.2	1.6				.9	.5
16			.7	1.9		1.4	.3			.8	
17	0.6			2.2	2.1						.4
18	.6	0.7		2.3						.6	
19	.6			2.4	2.1		.9				
20	.7		1.1	2.1	2.1	1.3		0.7		.8	
21	.6	.7		1.7	2.3						
22	.6		1.2	2.0	2.3					.7	
23	.6	.8			2.3			.8		.7	.4
24	.6			2.0	2.1					.7	
25	.6			1.9			.8	.6			
26	.5			2.3	1.6		.7				.3
27				2.4	1.8					.7	.3
28	.6	.8		2.6			.9				
29											.2
30				2.3					0.5		
31		.8		2.6			.4		.4		

NOTE.—Gage heights Nov. 13 to Dec. 31 affected by ice.

Daily discharge, in second-feet, of Hunter Creek at Aspen, Colo., for 1911.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		7	15	100	342	107		3.0			
2		7	19	150	372	110		1.0		3.0	
3		7	21	200	372	115					
4		7	23	250	342	112		2.0			
5		7	25	282	402	110					
6		9	25	372	312	108					
7		9	25	342	282	107	0.5				
8		7	20	282	312	76		.5		7.0	
9		8	15	262	282	68		.5		7.0	
10		9	15	242	173	60				7.0	
11		9	14	223	148	51				7.0	
12		9	13	186	173	57	2.0				
13		9	13	148	198	63					
14		9	12	127	223	69					
15		9	12	148	198	76					
16		9	9	127	186	51	2.0				
17	7	9	13	198	173	49					
18	7	9	17	223	173	47					
19	7	9	21	252	173	44	15				
20	9	9	25	173	173	41		9.0			
21	7	9	28	90	223						
22	7	10	32	148	223						
23	7	12	35	148	223			12			
24	7	12	40	148	173						
25	7	12	45	127	124		12	7.0			
26	5	12	50	223	76		9.0				3.0
27	6	12	55	252	107						
28	7	12	60	312	107		15				
29		12	65	268	107						
30		12	75	223	107				5.0		
31		12		312			3.0		3.0		

NOTE.—Daily discharge determined from a fairly well defined rating curve. Discharge interpolated for days for which gage heights are missing from Feb. 17 to July 20.

Monthly discharge of Hunter Creek at Aspen, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
February, 12 days	.....	.....	6.92	164	C.
March	12	7	9.48	583	C.
April	75	9	27.9	1,660	C.
May	372	90	211	13,000	C.
June	402	76	216	12,900	C.
July, 20 days	115	.....	76	3 010	C.

CASTLE CREEK NEAR ASPEN, COLO.

Location.—On the highway bridge 4 miles above Aspen, in sec. 35, T. 10 S., R. 85 W., in the Sopris National Forest. No tributary is 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 to December 31, 1911.

Drainage area.—72 square miles (measured from topographic sheets).

Gage.—Vertical staff.

Channel.—Somewhat shifting.

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; there is a court decree for 2 second-feet below the station.

Accuracy.—As the station has not yet been completely rated estimates of discharge can not be made. The base data should be reliable.

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

Discharge measurements of Castle Creek near Aspen, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 16	O. M. Wimmer.....	1.05	32.7	July 20	O. M. Wimmer.....	1.90	24.4
Apr. 3	.....do.....	1.25	45.7	Sept. 25	.....do.....	1.55	10.6
12	.....do.....	1.15	39.7	Dec. 27[a]	.....do.....	.85	40.4

[a] Ice conditions.

Daily gage height, in feet, of Castle Creek near Aspen, Colo., for 1911.

[S. C. Swearingen, observer.]

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	1.15	.....	3.05	.....	.....	.....	.....	.....	.....
2	.....	.....	.....	1.45	3.05	.....	.....	.....	.....	.....	.....
3	.....	.....	1.25	.....	.....	.....	.....	.....	.....	.....	.....
4	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.25	.....
5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
6	.....	.....	.....	1.85	.....	4.55	.....	.....	.....	.....	1.15
7	.....	.....	1.05	.....	.....	.....	.....	.....	.....	.....	.....
8	.....	.....	.....	.....	.....	.....	.....	1.65	.....	.....	.....
9	.....	1.05	.....	2.35	.....	.....	.....	.....	.....	.....	.....
10	.....	.....	.....	.....	3.45	.....	.....	.....	1.35	1.35	.....

Daily gage height, in feet, of Castle Creek near Aspen, Colo., for 1911—Continued.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
11			1.05		4.35						1.15
12			1.15				2.15				
13		1.15		2.05						1.15	
14							2.05				
15			1.05		4.35	2.45					
16	1.05			1.85	3.65					1.15	
17	1.05		1.15	2.05						1.15	1.15
18	1.05										1.15
19											
20	1.15	1.05		2.05	3.85	1.9					
21								1.55	1.25		
22			1.25	1.85						1.15	
23	1.05			1.85				1.65			
24		1.05			3.85						
25	1.05							1.55	1.25		
26			1.45						1.25		
27				2.05						1.15	.85
28											
29			1.45	2.35							1.05
30		1.15									
31				2.85							

NOTE.—Gage height Dec. 27 distorted by ice.

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 just below the station.

Records available.—January 1 to December 31, 1911.

Drainage area.—42 square miles (measured from topographic sheet).

Gage.—Vertical staff.

Channel.—Shifting after high water.

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.—So far as known, no water is diverted above the station; the Roaring Fork Light & Power Co. diverts water just below.

Accuracy.—Estimates made are reliable, but snowslides upstream sometimes choke the channel and hold the water back.

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

Discharge measurements of Maroon Creek near Aspen, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 16	O. M. Wimmer	0.42	22.6	Sept 25	O. M. Wimmer	0.91	82.2
Apr. 12	do	.41	22.8	Dec 27	do	.80	71.8
July 20	do	1.70	257				

Daily gage height, in feet, of Maroon Creek near Aspen, Colo., for 1911.

[S. C. Swearingen, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.5	0.5	.....	.....	.....	.....	.....	.....	1.2	.....	.....	.....
2	.5	.4	.....	.....	0.7	.....	.....	.....	.....	.....	.....	0.7
3	.7	.4	.....	.....	.....	1.9	2.1	.....	.....	.....	.....	.....
4	.6	.5	.....	.....	.8	.....	.....	.....	.....	.....	.....	.....
5	.6	.5	0.4	0.5	.....	2.1	.....	.....	.....	.....	.....	.7
6	.5	.5	.....	.....	.....	2.2	.....	.....	.....	.....	0.8	.....
7	.5	.5	.....	.4	.....	2.1	.....	.....	.....	.....	.....	.....
8	.5	.5	.....	.....	1.1	.....	.....	1.4	.....	.....	.9	.....
9	.5	.5	.4	.....	.....	.....	.....	.....	1.0	.....	.....	.65
10	.6	.5	.4	.....	1.2	2.2	.....	.....	.....	.....	.....	.....
11	.6	.5	.4	.4	.....	.....	.....	.....	.....	1.3	.....	.....
12	.6	.4	.4	.4	.....	.....	.....	1.4	.....	.....	.....	.....
13	.6	.4	.....	.....	1.1	2.3	1.8	.....	.....	1.2	.....	.....
14	.5	.4	.....	.....	.....	.....	.....	.....	.....	.....	.8	.....
15	.5	.4	.4	.4	.....	2.3	.....	.....	.....	.....	.8	.8
16	.5	.4	.4	.....	1.2	.....	1.9	.....	.....	.....	.....	.....
17	.5	.4	.....	.....	.....	2.2	.....	1.3	.....	1.2	.....	.....
18	.5	.5	.....	.4	.....	.....	.....	.....	.....	.....	.8	.....
19	.5	.4	.4	.....	.....	.....	.....	1.3	.....	.....	.....	.6
20	.5	.4	.....	.....	1.4	2.2	1.7	.....	.....	.....	.8	.....
21	.4	.5	.4	.....	.....	2.2	.....	.....	.....	.....	.....	.....
22	.4	.4	.4	.6	.....	2.2	.....	.....	.....	.....	.....	.....
23	.5	.5	.4	.....	.....	2.2	.....	.....	1.0	.....	.8	.....
24	.....	.....	.4	.6	.....	.....	.....	.....	.....	.....	.8	.....
25	.....	.4	.....	.....	1.5	.....	.....	.....	.9	.....	.....	.....
26	.4	.4	.3	.8	.....	.....	.....	1.2	.....	.....	.....	.....
27	.5	.4	.....	.....	1.5	2.0	.....	.....	.....	.....	.....	.8
28	.5	.4	.....	.....	.....	.....	.....	.....	.....	.9	.....	.65
29	.5	.....	.....	.8	.....	.....	.....	1.2	.....	.....	.....	.....
30	.5	.....	.4	.....	.....	.....	.....	.....	.....	.8	.....	.....
31	.5	.....	.....	.....	1.8	.....	1.5	.....	.....	.8	.....	.....

Daily discharge, in second-feet, of Maroon Creek near Aspen, Colo., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	32	32	22	25	60	273	.....	192	134	.....	69	56
2	32	22	22	27	56	281	.....	190	130	.....	69	56
3	56	22	22	28	63	290	350	187	125	.....	69	56
4	44	32	22	30	69	320	.....	184	121	.....	69	56
5	44	32	22	32	81	350	.....	181	116	.....	69	56
6	32	32	22	27	92	385	.....	179	112	.....	69	56
7	32	32	22	22	104	350	.....	176	108	.....	76	54
8	32	32	22	22	116	362	.....	173	103	.....	83	52
9	32	32	22	22	125	373	.....	173	99	.....	80	50
10	44	32	22	22	134	385	.....	173	.....	.....	75	53
11	44	32	22	22	128	397	.....	173	.....	153	72	56
12	44	22	22	22	122	408	.....	173	.....	144	70	59
13	44	22	22	22	116	420	265	169	.....	134	69	62
14	32	22	22	22	122	420	275	165	.....	134	69	65
15	32	22	22	22	128	420	280	161	.....	134	69	69
16	32	22	22	22	134	402	290	157	.....	134	69	62
17	32	22	22	22	144	385	.....	153	.....	134	69	56
18	32	32	22	22	154	385	.....	153	.....	130	69	50
19	32	22	22	27	164	385	.....	153	.....	126	69	44
20	32	22	22	33	173	385	240	150	.....	121	69	48
21	22	32	22	38	177	385	.....	147	.....	116	69	53
22	22	22	22	44	182	385	.....	145	.....	111	69	58
23	32	32	22	44	186	385	.....	142	99	106	69	63
24	28	27	22	44	191	368	.....	140	91	101	69	68
25	26	22	18	56	195	352	.....	137	83	96	68	72
26	22	22	14	69	195	336	.....	134	.....	91	66	70
27	32	22	16	69	195	320	.....	134	.....	87	64	69
28	32	22	18	69	212	325	.....	134	.....	83	62	50
29	32	.....	20	69	230	330	.....	134	.....	76	60	50
30	32	.....	22	65	247	335	.....	134	.....	69	58	50
31	32	.....	24	.....	265	.....	195	134	.....	69	.....	50

NOTE.—Daily discharge determined from a well-defined rating curve. Discharge for days for which gage heights are missing, except for parts of July, September, and October, interpolated by means of climatologic records and comparison with records of flow of other streams.

Monthly discharge of Maroon Creek near Aspen, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	56	22	33.8	2,080	B.
February	32	22	26.5	1,470	B.
March	24	14	21.3	1,310	B.
April	69	22	35.3	2,100	B.
May	265	56	147	9,040	C.
June	420	273	363	21,600	C.
July, 7 days			271	3,770	C.
August	192	134	159	9,780	C.
September, 12 days			110	2,620	B.
October 11–31	153	69	112	4,670	B.
November	83	58	69.2	4,120	B.
December	72	44	57.1	3,510	B.
The period				66,100	

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., a half mile from Snow Mass, Colo. No tributaries between the station and the mouth of the creek.

Records available.—February 21 to December 31, 1911.

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.—Estimates of discharge 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 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 21	O. M. Wimmer	0.32	40.5
Apr. 12	.....do	.30	48.3
July 20	.....do	1.40	303
Sept. 25	.....do	.65	80.1

Daily gage height, in feet, of Snow Mass Creek at Snow Mass, Colo., for 1911.

[Geo. Hutchins, observer.]

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1			0.3	0.6	1.4		1.3	0.6		0.6	
2											
3									1.0		
4				.7							0.5
5			.3		1.85		1.1		1.4		
6										.6	
7							1.0				
8				.9	1.95						
9									1.0		
10			.3			1.6				.6	
11				.85							.5
12			.3		1.8						
13					2.7	1.5				.6	
14							.9		.7		
15		0.4		.8	2.4						
16							.9				
17			.1			1.1			1.7		
18		.4		.9				.5			.5
19					2.1						
20						1.4			.6	.5	
21	0.3	.4					.9				
22				.6			.9	.6			
23					2.6				.6		
24		.3	.2			1.5					
25				.95				.6			
26					2.0					.5	
27		.5								.5	.5
28		.3	.65			1.3	.7	.6			
29		.3		.6	1.7						
30		.4	.7								
31											

NOTE.—Gage heights throughout the month of December slightly affected by ice.

Daily discharge, in second-feet, of Snow Mass Creek at Snow Mass, Colo., for 1911.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1		50	45	90	305	416	270	90	144	90
2		50	45	97	353	412	255	89	162	90
3		50	45	104	402	408	240	88	180	90
4		50	45	110	451	404	225	87	242	90
5		50	45	122	500	400	210	86	305	90
6		50	45	133	518	396	195	85	274	90
7		50	45	144	535	392	180	84	243	90
8		50	45	155	552	388	177	83	212	90
9		50	45	150	533	384	174	82	180	90
10		50	45	146	514	380	171	81	166	90
11		50	45	141	495	367	167	80	152	90
12		50	45	138	475	354	163	79	138	90
13		50	41	135	1,020	340	159	78	124	90
14		50	37	132	923	308	155	77	110	88
15		58	32	130	825	275	155	76	215	86
16		58	27	138	778	242	155	75	320	84
17		58	22	147	732	210	155	74	425	82
18		58	24	155	686	242	155	73	314	79
19		58	26	138	640	274	155	78	202	76
20		58	28	122	718	305	155	82	90	73
21	40	58	30	106	797	314	155	86	90	73
22		54	31	90	876	322	155	90	90	73
23		50	32	116	955	331	148	90	90	73
24		45	33	142	830	340	141	90	90	73
25		54	50	168	705	323	134	90	90	73
26		64	67	148	580	306	126	90	90	73
27		73	84	128	528	288	188	90	90	73
28		45	100	108	476	270	110	90	90	73
29		45	105	90	425	270	105	108	90	73
30		58	110	162	420	270	100	126	90	73
31		52		234		270	95		90	

NOTE.—Daily discharge determined from a well-defined rating curve. Discharge Mar. 1 to 14 estimated at 50 second-feet. Discharge for days for which gage heights are missing interpolated by means of climatologic records and comparison with records of flow of other streams.

Monthly discharge of Snow Mass Creek at Snow Mass, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
February	.....	.....	a 40	2,220	C.
March	73	45	53.1	3,260	C.
April	110	22	47.3	2,810	B.
May	234	90	133	8,180	B.
June	1,020	305	618	36,800	C.
July	416	210	329	20,200	C.
August	270	95	163	10,000	B.
September	126	73	85.9	5,110	B.
October	425	90	167	10,300	B.
November	90	73	82.3	4,900	B.
December	.....	.....	a 60	3,690	D.
The period	.....	.....	.....	107,000	

a Estimated from discharge measurements.

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 to December 31, 1911.

Drainage area.—92 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.—Records at this station are considered reliable.

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

Discharge measurements of Frying Pan Creek at Norrie, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 18	O. M. Wimmer	2.40	29.1
Apr. 11	....do	2.70	45.3
July 21	....do	3.50	179
Sept. 26	....do	2.85	52.8

Daily gage height, in feet, of Frying Pan Creek at Norrie, Colo., for 1911.

[B. I. Beaty, observer.]

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	2.4	2.8	3.3	5.4	4.2	3.4	2.9	.....	2.6	2.9
2	.....	2.45	2.8	3.15	5.45	4.5	3.2	2.9	.....	2.7	2.9
3	.....	2.45	3 1	3.15	5.45	.....	.....	.....	.....	2.5	2.9
4	.....	2.4	3.15	.....	5.3	4.55	3.2	3.0	2.9	2.55	.....
5	.....	2.45	3.1	3.9	5.4	4.4	3.1	2.9	.....	2.7	2.9
6	.....	2.4	3.0	4.05	5.65	4.75	3.1	2.9	3.3	2.7	2.9
7	.....	2.4	3.0	4.6	5.45	4.4	3.0	2.8	3.1	2.9	2.9
8	.....	2.4	3.0	4.75	5 4	4.2	.....	2.8	3.1	2.7	.....
9	.....	2.4	2.9	4.92	5.5	4.25	.....	2.8	3.0	2.8	2.9
10	.....	2.4	2.9	4.55	5.3	4.0	3.1	2.8	3.0	2.7	.....
11	.....	2.4	2.7	4.15	5.4	.....	3.5	2.8	2.9	2.7	2.9
12	.....	2.4	2.8	4.15	5.35	3.9	3.3	2.7	2.9	.....	.....
13	.....	2.5	2.8	4.3	.....	3.8	3.1	2.9	2.9	.....	2.9
14	.....	2.6	2.8	4.4	5.2	3.8	3.0	2.8	2.8	.....	2.9
15	.....	2.6	2.8	4.55	6.05	3.7	.....	.....	2.8	.....	.....
16	.....	2.75	2.8	4.45	5.4	.....	3.0	.....	2.6	3.1	3.0
17	.....	2.6	2.8	4.7	5.2	3.95	3.0	.....	2.8	3.0	.....
18	2.4	2.7	2.9	5.3	5.2	3.8	.....	.....	2.8	2.8	.....
19	2.42	2.7	3.0	5.0	5.25	3.8	2.95	.....	.....	2.8	2.9
20	2.41	2.7	3.1	4.3	5.2	.....	3.1	2.9	2.7	.....	.....

Daily gage height, in feet, of Frying Pan Creek at Norrie, Colo., for 1911—Continued.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
21	2.4	2.8	3.2	4.05	5.2	3.6	3.4	2.9	2.7	2.7	2.85
22	2.4	2.8	3.38	4.05	5.3	.....	3.2	2.9	2.8	2.7	.....
23	2.4	2.7	3.45	4.1	5.0	.....	3.3	3.0	2.7	2.7	2.8
24	2.4	2.8	3.3	4.3	.....	3.9	3.2	2.9	2.7	2.75	2.9
25	2.4	2.8	3.25	5.0	.....	3.7	3.2	2.85	2.65	2.8	.....
26	2.4	2.8	3.4	4.8	.....	3.9	3.1	2.8	2.7	.....	.....
27	.....	2.7	3.6	4.65	.....	.....	3.0	2.8	.....	2.8	2.8
28	.....	2.8	3.8	4.9	4.3	.....	3.0	.....	2.7	2.9	.....
29	.....	2.8	3.85	5.1	4.3	3.5	3.0	2.8	2.7	.....	2.8
30	.....	2.8	3.6	5.0	4.2	.....	.....	3.0	.....	2.9	.....
31	.....	2.8	.....	5.0	.....	.....	2.9	.....	.....	.....	.....

NOTE.—Ice affected the gage heights from Feb. 18 to Mar. 28 and Nov. 9 to Dec. 31.

Daily discharge, in second-feet, of Frying Pan Creek at Norrie, Colo., for 1911.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	25	26	52	130	855	385	150	62	110	37	62
2	25	28	52	101	877	490	110	62	90	44	62
3	25	28	91	101	877	499	110	68	75	31	62
4	25	26	101	193	810	508	110	75	62	34	62
5	25	28	91	285	855	455	91	62	96	44	62
6	25	26	75	332	967	580	91	62	130	44	62
7	25	26	75	525	877	455	75	52	91	62	62
8	25	26	75	580	855	385	80	52	91	44	62
9	25	26	62	648	900	402	85	52	75	52	62
10	25	26	62	508	810	315	91	52	75	44	62
11	25	26	44	368	855	330	175	52	62	44	62
12	25	26	52	368	832	285	130	44	62	45	62
13	25	31	52	420	798	255	91	62	62	46	50
14	25	37	52	455	765	255	75	52	52	47	50
15	25	37	52	508	1,150	225	75	54	52	48	40
16	25	44	52	472	855	262	75	56	37	49	40
17	25	40	52	560	765	300	75	58	52	51	40
18	26	44	62	810	765	255	72	60	52	52	40
19	27	44	75	680	788	255	68	61	48	52	40
20	26	44	91	420	765	228	91	62	44	48	40
21	26	52	110	332	765	200	150	62	44	44	35
22	26	52	146	332	810	228	110	62	52	44	35
23	26	44	162	350	680	256	130	75	44	44	35
24	26	52	130	420	628	285	110	62	44	48	35
25	26	52	120	680	576	225	110	57	40	52	35
26	26	52	150	600	524	285	91	52	44	52	35
27	26	44	200	542	472	249	75	52	44	52	35
28	26	52	255	640	420	212	75	52	44	62	35
29	.....	52	270	720	420	175	75	52	44	62	35
30	.....	52	200	680	385	166	68	75	41	62	35
31	.....	52	.....	680	.....	158	62	.....	39	.....	35

NOTE.—Daily discharge determined from a well-defined rating curve. Discharge Feb. 1 to 17 estimated at 25 second-feet. Discharge interpolated for days for which gage heights are missing and for November and December by comparison with records of flow of other streams and from climatologic data.

Monthly discharge of Frying Pan Creek at Norrie, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
February	27	25	25.4	1,410	C.
March	52	26	38.5	2,370	B.
April	270	44	102	6,070	B.
May	810	101	466	28,700	B.
June	1,150	385	760	45,200	C.
July	508	158	308	18,900	B.
August	175	62	96.0	5,900	B.
September	75	44	58.7	3,490	B.
October	130	37	60.9	3,740	B.
November	62	31	48.0	2,860	C.
December	62	35	47.4	2,910	C.
The period	.....	.....	.....	122,000	

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 to December 31, 1911.

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 are favorable for accurate results, and the results are reliable.

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

Discharge measurements of Frying Pan Creek at Thomasville, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 2[a]	G. H. Russell	0.65	15.8	June 6	O. M. Wimmer	3.20	1,240
Feb. 18	O. M. Wimmer	.50	32.7	July 21	do	1.70	345
Apr. 11	do	.95	102	Sept. 26	do	.90	119

[a] Ice conditions.

Daily gage height, in feet, of Frying Pan Creek at Thomasville, Colo., for 1911.

[W. P. Huffman, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	0.6	0.6	0.9	2.1	.....	2.1	1.4	1.1	1.5	0.6	1.0
2	0.6	.6	.6	1.2	1.5	.....	2.3	1.4	1.1	1.4	.6	1.0
3	.8	.6	.6	1.1	1.8	.....	2.4	1.3	1.1	1.3	.6	1.0
4	.7	.6	.5	1.2	1.9	.....	2.4	1.3	1.2	1.2	.6	1.0
5	.6	.6	.5	1.2	2.1	.....	2.5	1.2	1.1	1.4	.6	.9
6	.6	.6	.5	.9	2.6	3.15	2.4	1.2	1.0	1.6	.6	.8
7	.6	.6	.5	1.0	2.5	3.0	2.3	1.2	1.0	1.5	.6	.8
8	.6	.7	.5	1.0	2.9	3.0	2.2	1.2	.9	1.4	.7	.8
9	.6	.8	.5	1.0	3.5	3.0	2.2	1.15	.9	1.3	.8	.8
10	.6	1.2	.6	1.0	3.0	3.1	2.0	1.2	.9	1.3	.8	.8
11	.6	.6	.6	1.0	2.7	3.0	2.0	1.2	.8	1.2	.7	.8
12	.6	.6	.6	.9	2.6	2.8	1.9	1.4	.8	1.2	.6	.7
13	.6	.6	.6	.9	2.7	3.0	1.8	1.3	.8	1.2	.8	.7
14	.6	.6	.7	.9	2.8	2.7	1.8	1.2	1.0	1.1	.8	1.3
15	.6	.6	.7	.....	2.8	4.0	1.7	1.2	1.1	1.1	.8	1.5
16	.6	.6	.7	.4	2.9	2.9	1.7	1.2	.9	1.0	.8	.6
17	.6	.6	.7	.7	2.9	2.8	2.0	1.2	.9	1.0	.8	.6
18	.6	.6	.65	.9	2.9	2.7	1.8	1.2	.8	.9	.8	.6
19	.6	.6	.65	.9	.....	2.7	1.8	1.2	.8	.8	.8	.6
20	.6	.6	.7	1.2	.....	2.9	1.7	1.2	1.1	.7	.8	.6
21	.6	.6	.7	1.5	.....	2.6	1.6	1.4	1.0	.7	.8	.6
22	.7	.6	.7	1.7	.....	2.6	2.3	1.4	1.0	.9	.8	.6
23	1.2	.6	.7	1.8	.....	2.6	1.9	1.4	1.0	.8	1.0	.6
24	1.2	.6	.7	1.6	.....	2.5	1.7	1.4	.9	.8	1.0	.6
25	.6	.6	.7	1.8	.....	2.5	2.0	1.3	.9	.8	1.0	.6
26	.6	.6	.7	1.6	.....	2.3	1.9	1.3	1.0	.8	1.0	.6
27	.6	.6	.8	2.0	.....	2.2	1.7	1.2	1.0	1.0	1.0	.6
28	.6	.6	.7	2.2	.....	2.1	1.6	1.1	1.0	1.2	1.2	.7
29	.6	.....	.7	2.1	.....	2.1	1.6	1.1	1.0	1.0	1.0	.6
30	.....	.....	.8	.....	.....	2.1	1.6	1.1	1.2	.8	1.0	.6
31	.6	.....	.8	.....	.....	.....	1.5	1.1	.....	.7	.....	.6

NOTE.—Gage heights Jan. 1 to Apr. 1, Nov. 28, and Dec. 14 and 15 affected by ice. Gage washed out by flood May 19; reset to same datum June 6.

Daily discharge, in second-feet, of Frying Pan Creek at Thomasville, Colo., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	16	.....	33	100	530	1,500	530	230	145	265	45	120
2	16	.....	33	170	265	1,500	640	230	145	230	45	120
3	16	.....	33	145	385	1,500	700	200	145	200	45	120
4	16	.....	33	170	430	1,500	700	200	170	170	45	120
5	16	.....	33	170	530	1,500	760	170	145	230	45	100
6	16	.....	33	100	820	1,200	700	170	120	300	45	80
7	17	.....	33	120	760	1,100	640	170	120	265	45	80
8	18	.....	33	120	1,030	1,100	580	170	100	230	60	80
9	19	.....	33	120	1,470	1,100	580	158	100	200	80	80
10	20	.....	45	120	1,100	1,170	480	170	100	200	80	80
11	20	.....	45	120	890	1,100	480	170	80	170	60	80
12	20	.....	45	100	820	960	430	230	80	170	45	60
13	20	.....	45	100	890	1,100	385	200	80	170	80	60
14	20	.....	60	100	960	890	385	170	120	145	80	60
15	20	.....	60	62	960	1,870	340	170	145	145	80	45
16	20	.....	60	25	1,030	1,030	340	170	100	120	80	45
17	20	.....	60	60	1,030	960	480	170	100	120	80	45
18	20	33	52	100	1,030	890	385	170	80	100	80	45
19	20	.....	52	100	1,000	890	385	170	80	80	80	45
20	20	.....	60	170	900	1,030	340	170	145	60	80	45
21	19	.....	60	265	800	820	300	230	120	60	80	45
22	18	.....	60	340	800	820	640	230	120	100	80	45
23	18	.....	60	385	800	820	430	230	120	80	120	45
24	19	.....	60	300	800	760	340	230	100	80	120	45
25	20	.....	60	385	900	760	480	200	100	80	120	45
26	21	.....	60	300	900	640	430	200	120	80	120	45
27	23	.....	80	480	900	580	340	170	120	120	120	45
28	25	.....	60	580	900	530	300	145	120	170	120	60
29	26	.....	60	530	1,000	530	300	145	120	120	120	45
30	28	.....	80	530	1,000	530	300	145	170	80	120	45
31	30	.....	80	.....	1,000	.....	265	145	.....	60	.....	45

NOTE.—Daily discharge determined from a well-defined rating curve. Discharge Jan. 1 to 31, Mar. 1 to Apr. 1, and May 19 to June 5 estimated from current meter measurements, climatologic data, and by comparison with records at other stations on the stream.

Monthly discharge of Frying Pan Creek at Thomasville, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	30	16	19.9	1,220	C.
February	.....	.....	[a]33.0	1,830	C.
March	80	33	51.6	3,170	B.
April	580	25	212	12,600	B.
May	1,470	265	859	52,800	D.
June	1,870	530	1,020	60,700	D.
July	760	265	464	28,500	B.
August	230	145	185	11,400	B.
September	170	80	117	6,960	B.
October	300	60	148	9,100	B.
November	120	45	80.0	4,760	B.
December	120	45	65.2	4,010	B.
The year	1,870	16	271	197,000	

[a] Estimated from discharge measurement.

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 to December 31, 1911.

Drainage area.—42 square miles (measured from topographic sheet).
Gage.—Vertical staff.
Channel.—Permanent.
Discharge measurements.—Made from the bridge during high water and by wading at ordinary stages.
Winter flow.—Ice probably causes backwater during the winter months.
Diversions.—No water is diverted above the station.
Accuracy.—Owing to the scattered gage heights the records can not be considered better than fair or possibly good.
Cooperation.—Station maintained in cooperation with the United States Forest Service.

Discharge measurements of North Fork of Frying Pan Creek near Norrie, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 18[a]	O. M. Wimmer	0.15	7.6
Apr. 11	do	.50	18.4
July 21	do	.80	43.0
Sept. 26	do	.40	11.3

[a] Affected by ice.

Daily gage height, in feet, of North Fork of Frying Pan Creek near Norrie, Colo., for 1911.

[B. I. Beaty, observer.]

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		0.17	0.50	1.30	2.25	1.20		0.35			
2		.15	.50		2.30					0.40	
3		.17	.75	.95	2.30		0.60	.35	0.70		
4		.17					.55	.40			
5		.15	.70	1.60	2.30				.90		
6				1.70		1.70	.50	.30			
7		.15		1.75	2.40					.40	
8			.70	1.90		1.30		.20	.90		
9		.15									0.25
10		.17	.60				.70	.20		.45	
11			.50	1.50			.50		.70		
12		.17		1.50			.70				
13			.50	1.60		.95	.60				.25
14		.20	.55	1.80		.90			.60		
15		.22	.55	1.90	3.60				.50		
16		.22			2.10		.50				.25
17		.23	.45							.60	
18	0.15	.23		2.00	2.00						
19	.17		.50			.90	.50		.50		
20	.16	.24		1.70	2.00			.40			.20
21	.10	.24	.60			.90			.50		
22	.15	.26	.75			1.00	.60	.80			
23	.15	.28		1.55	1.80					.30	.20
24	.15	.30	.90	1.75	1.60		.50				
25	.17	.30		1.85					.50		
26			1.10	2.00	1.40		.40	.40			
27		.30	1.35	1.85			.40				.20
28	.17		1.50			.80	.40	.50	.40	.30	
29		.35		1.95	1.30	.80	.50	.50	.40		.20
30					1.30						
31		.37		2.15		.70					

NOTE.—Ice probably affected gage heights Feb. 18 to Mar. 18.

Daily discharge, in second-feet, of North Fork of Frying Pan Creek near Norrie, Colo., for 1911.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		8	19	113	345	96	32	11	26	13	9
2		8	19	87	360	118	29	11	30	13	9
3		8	39	61	360	140	26	11	34	13	9
4		8	36	121	360	162	22	13	44	13	8
5		8	34	180	360	184	20	11	55	13	8
6		8	34	205	375	205	19	9	55	13	8
7		8	34	218	390	159	22	8	55	13	8
8		8	34	255	400	113	26	7	55	14	8
9		8	30	222	400	102	30	7	48	15	8
10		8	26	188	400	92	34	7	41	16	8
11		8	19	155	400	82	19	7	34	16	8
12		8	19	155	400	72	34	8	32	18	8
13		8	19	180	400	61	26	8	29	19	8
14		8	22	230	400	55	24	9	26	20	8
15		8	22	255	765	55	22	9	19	22	8
16		8	19	263	305	55	19	10	19	24	8
17		8	16	272	292	55	19	10	19	26	8
18	7.6	8	18	280	280	55	19	11	19	24	8
19		8	19	242	280	55	19	12	19	21	7
20		8	22	205	280	55	22	13	19	18	7
21		8	26	192	264	55	24	11	19	15	7
22		8	39	180	247	67	26	9	19	12	7
23		9	47	168	230	64	22	10	19	9	7
24		9	55	218	180	60	19	11	19	9	7
25		9	68	242	156	56	16	12	19	9	7
26		9	81	280	133	52	13	13	17	9	7
27		9	123	242	126	48	13	16	15	9	7
28		10	155	255	120	44	13	19	13	9	7
29		11	141	268	113	44	19	19	13	9	7
30		12	127	293	113	39	16	22	13	9	7
31		12		318		34	14		13		7

NOTE.—Daily discharge determined from a well-defined rating curve. Discharge Mar. 1 to 19 estimated at 8 second-feet; June 8 to 14, 400 second-feet. Discharge for days for which gage heights are missing interpolated by comparison with records at other stations and from climatologic data.

Monthly discharge of North Fork of Frying Pan Creek near Norrie, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January			[a] 5.0	307	D.
February			[a] 7.6	422	D.
March	12		8.58	528	C.
April	155	16	45.4	2,700	A.
May	318	61	211	13,000	B.
June	765	113	308	18,300	C.
July	205	34	81.7	5,020	B.
August	34	13	21.9	1,350	B.
September	22	7	11.1	660	B.
October	55	13	27.6	1,700	B.
November	26	9	14.8	881	C.
December	9	7	7.7	473	C.
The year	765		62.5	45,300	

[a] Estimated.

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 31, 1911.

Drainage area.—77 square miles (measured from Forest atlas).

Gage.—A vertical hook gage graduated to hundredths of a foot.

Channel.—Apparently permanent.

Discharge measurements.—Made by wading during 1911.

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.—As the station has not yet been completely rated estimates of discharge can not be made.

Cooperation.—The field data are furnished through the courtesy of the Colorado-Yule Marble Co.

Discharge measurements of Crystal River at Marble, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Dis. charge.
		Feet.	*Sec.-ft.*
Jan. 6	Russell and Wimmer	1.94	28.5
Mar. 21	Knouse and Lyon	2.01	36.0
27	....do	1.94	29.0
Apr. 1	H. V. Knouse	2.23	56.2

Daily gage height, in feet, of Crystal River at Marble, Colo., for 1911.

[H. V. Knouse, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.92	1.97	1.84	2.25	2.72	4.60	4.42	3.10	2.50	3.88	2.38	2.16
2	1.88	1.97	1.84	2.28	2.62	4.70	4.65	3.12	2.53	3.42	2.34	2.14
3	1.93	1.94	1.84	2.34	2.62	4.86	5.22	3.11	2.52	3.24	2.32	2.06
4	1.93	1.92	1.84	2.41	2.78	4.92	5.18	3.15	2.47	3.01	2.31	2.14
5	1.92	1.89	1.91	2.31	3.12	5.24	4.92	3.18	.....	5.01	2.32	2.12
6	1.92	1.90	1.90	2.26	3.36	5.34	5.28	3.07	.....	4.02	2.31	2.11
7	1.92	1.90	1.86	2.26	3.50	5.40	4.78	2.96	.....	3.57	2.30	2.10
8	1.91	1.87	1.85	2.20	3.70	5.44	4.66	3.04	.....	3.52	2.30	2.11
9	1.95	1.86	1.92	2.21	3.72	5.52	4.39	3.06	2.59	3.30	2.28	2.08
10	1.92	1.84	1.97	2.21	3.74	5.27	4.37	3.21	2.54	3.12	2.32	2.08
11	1.86	1.88	1.98	2.19	3.39	5.51	4.76	3.12	2.55	3.00	2.22	2.09
12	1.94	1.87	1.90	2.16	3.31	5.53	4.10	2.98	2.39	2.90	2.20	2.06
13	1.97	1.92	1.90	2.14	3.40	5.66	4.12	2.96	2.58	2.80	2.33	2.07
14	1.94	1.86	1.84	2.10	3.39	5.51	3.96	2.88	2.56	2.76	2.32	2.01
15	1.94	1.88	1.89	2.12	3.50	5.52	4.07	2.89	2.54	2.66	2.27	2.08
16	2.00	1.90	1.94	2.04	3.55	5.42	4.05	2.85	2.44	2.66	2.26	2.06
17	1.95	1.89	1.96	2.18	3.75	5.04	4.00	2.88	2.41	2.62	2.24	2.03
18	1.95	1.85	1.94	2.22	3.90	5.25	3.98	2.82	2.38	2.59	2.22	2.06
19	1.94	1.90	1.89	2.29	3.90	5.38	3.74	2.78	2.34	2.54	2.24	2.03
20	1.92	1.84	2.00	2.46	3.70	5.34	3.65	2.82	2.45	2.48	2.26	2.03
21	1.93	1.82	1.99	2.55	3.45	5.84	3.81	2.94	2.40	2.48	2.21	2.00
22	1.91	1.80	2.04	2.60	3.36	5.45	4.50	2.82	2.44	.....	2.22	2.02
23	1.98	2.01	2.04	2.68	3.74	5.35	3.80	2.86	2.39	2.50	2.20	2.04
24	1.94	1.86	2.06	2.69	4.02	5.25	3.90	2.80	2.43	2.46	2.20	1.99
25	1.96	1.85	2.04	2.67	4.08	5.00	3.77	2.72	2.44	2.41	2.19	1.98
26	1.94	1.86	1.91	2.80	4.13	4.85	3.68	2.67	2.56	2.40	2.20	2.00
27	1.94	1.86	1.94	2.94	4.03	4.85	3.58	2.59	2.67	2.44	2.20	1.94
28	1.93	1.84	1.96	2.96	4.02	4.88	3.48	2.56	2.86	2.42	2.07	2.00
29	1.98	.....	2.00	3.01	4.26	4.90	3.40	2.54	2.75	2.43	2.10	1.98
30	1.98	.....	2.08	2.82	4.42	4.46	3.37	2.52	3.82	2.39	2.16	1.98
31	1.98	.....	2.16	.....	4.55	.....	3.31	2.53	.....	2.35	.....	1.87

NOTE.—Gage heights during January, February, November, and December very slightly affected by ice.

Daily discharge, in second-feet, of Crystal River at Marble, Colo., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	29	32	25	61	140	975	867	232	100	565	79	51
2	27	32	25	65	122	1,040	1,000	239	105	348	73	48
3	30	30	25	73	122	1,130	1,350	235	104	279	70	40
4	30	29	25	84	152	1,170	1,320	248	95	208	68	48
5	29	28	29	68	239	1,360	1,170	258	99	1,220	70	46
6	29	28	28	62	324	1,430	1,390	224	103	636	68	45
7	29	28	26	62	380	1,460	1,080	195	107	412	67	44
8	29	26	26	55	475	1,490	1,010	216	112	389	67	45
9	31	26	29	56	485	1,540	849	221	116	300	65	42
10	29	25	32	56	495	1,380	837	268	107	239	70	42
11	26	27	33	54	336	1,540	1,070	239	109	205	57	43
12	30	26	28	51	304	1,550	680	200	80	180	55	40
13	32	29	28	48	340	1,630	691	195	114	156	72	41
14	30	26	25	44	336	1,540	605	175	111	148	70	35
15	30	27	28	46	380	1,540	664	178	107	129	63	42
16	34	28	30	38	402	1,480	652	168	89	129	62	40
17	31	28	32	53	500	1,240	625	175	84	122	60	37
18	31	26	30	57	575	1,370	615	161	79	116	57	40
19	30	28	28	66	575	1,450	495	152	73	107	60	37
20	29	25	34	93	475	1,430	450	161	91	96	62	37
21	30	24	33	109	360	1,750	530	190	82	96	56	34
22	29	23	38	118	324	1,500	915	161	89	98	57	36
23	33	35	38	132	495	1,430	525	170	80	100	55	38
24	30	26	40	134	636	1,370	575	156	87	93	55	28
25	32	26	38	131	669	1,220	510	140	89	84	54	33
26	30	26	29	156	696	1,120	465	131	111	82	55	34
27	30	26	30	190	642	1,120	416	116	131	89	55	30
28	30	25	32	195	636	1,140	372	111	170	86	41	34
29	33	.....	34	208	771	1,160	340	107	146	87	44	33
30	33	.....	42	161	867	891	328	104	535	80	51	33
31	33	.....	51	.....	945	.....	304	105	.....	74	.....	26

NOTE.—Daily discharge determined from a well-defined rating curve. Discharge interpolated for days when gage was not read.

Monthly discharge of Crystal River at Marble, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	34	26	30.3	1,860	B.
February	35	23	27.3	1,520	B.
March	51	25	31.3	1,920	B.
April	208	38	90.9	5,410	B.
May	945	122	458	28,200	B.
June	1,750	891	1,350	80,300	B.
July	1,390	304	732	45,000	B.
August	268	104	182	11,200	B.
September	535	73	117	6,960	B.
October	1,220	74	224	13,800	B.
November	79	41	61.3	3,650	B.
December	51	26	38.8	2,390	B.
The year	1,750	23	279	202,000	

ELK RIVER BASIN.

WEST ELK CREEK NEAR NEW CASTLE, COLO.

Location.—At the West Elk ranger station on the southern edge of White River National Forest, in sec. 29, T. 4 S., R. 91 W., 11 miles northwest of New Castle. Nearest tributary, Cherry Creek, enters a short distance above.

Records available.—January 20, 1911, to June 29, 1911, when it was discontinued.

Drainage area.—28 square miles (measured from Hayden's atlas).

Gage.—Vertical staff.

Channel.—Apparently permanent.

Discharge measurements.—Made by wading.

Winter flow.—Effect of ice at this station is probably not severe.

Diversions.—So far as known there are no diversions above the station but there are court decrees for 24 second-feet diversion below.

Accuracy.—As the station has not been completely rated no estimates of discharge can be made.

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

Discharge measurements of West Elk Creek near New Castle, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 20	O. M. Wimmer	1.00	0.9
Feb. 23	do	1.05	1.2
Dec. 19[a]	H. B. Waha	.....	1.0

[a] Ice conditions. Discharge estimated.

Daily gage height, in feet, of West Elk Creek near New Castle, Colo., for 1911.

[Ray L. Allen, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	Day.	Jan.	Feb.	Mar.	Apr.	May.	June.
1	.....	1.01	1.03	.....	1.28	0.98	16	.....	0.98	1.08	1.18	1.30	.95
2	.....	1.00	1.00	1.15	1.30	1.00	17	.....	1.00	1.01	1.25	1.25	.95
3	.....	1.08	1.02	1.20	1.25	.95	18	.....	.98	1.00	1.20	1.18	.....
4	.....	1.00	1.02	1.18	1.25	.95	19	.....	.98	1.10	1.18	1.20	.....
5	.....	1.05	1.01	1.15	1.42	.92	20	1.00	1.00	1.15	1.15	1.17	.90
6	.....	1.00	1.05	1.15	1.40	.95	21	.95	1.00	1.18	.....	1.15	.98
7	.....	1.02	.....	1.12	1.48	.95	22	.95	.98	1.18	1.20	1.10	.....
8	.....	1.00	1.17	1.10	1.50	1.00	23	.95	1.05	1.15	1.28	1.08	.....
9	.....	1.02	1.10	1.15	1.55	.92	24	.85	1.02	1.18	1.15	1.05	.....
10	.....	1.03	1.15	1.18	1.48	.92	25	.....	.98	1.08	1.25	1.00	.....
11	.....	1.00	1.20	1.15	1.38	.95	26	.97	1.00	1.00	1.25	1.00	.....
12	.....	1.00	1.05	1.10	1.50	.95	27	.95	1.02	1.08	1.27	1.00	.95
13	.....	1.00	1.01	1.12	1.40	.....	28	.92	1.05	.98	1.30	1.00	.92
14	.....	1.00	1.10	1.15	1.42	.98	29	.....	.....	1.10	1.20	1.01	.90
15	.....	1.02	1.15	1.10	1.33	.95	30	1.05	.....	1.21	1.25	1.00	.....
							31	1.00	.....	1.20	.....	1.00	.....

NOTE.—Gage heights Jan. 20 to Mar. 25 affected by ice.

MIDDLE ELK CREEK NEAR NEW CASTLE, COLO.

Location.—Opposite the mouth of West Elk Creek, in sec. 22, T. 5 S., R. 91 W., 10 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, 1911.

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.—Somewhat shifting.

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.—The channel at the original site was so unstable that the discharge could not be computed. The rating for the present site has not been completed.

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

Discharge measurements of Middle Elk Creek near New Castle, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 19	O. M. Wimmer.....	0.20	14.5	July 17	O. M. Wimmer.....	0.16	76.7
Feb. 23	.....do.....	.35	14.3	Sept. 22	.....do.....	−.34	22.2
Mar. 31	.....do.....	.30	15.6	Oct. 6[a]	.....do.....	1.58	57.2
June 7	.....do.....	1.82	344	Dec. 19[a]	H. B. Waha.....	1.10	21.2

[a] Discharge measurements taken at the new station established 300 yards upstream from the original station.

Daily gage height, in feet, of Middle Elk Creek near New Castle, Colo., for 1911.

[Ray L. Allen, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1						2.73			−0.22		1.38	
2												
3												
4					1.40							1.20
5							0.51					
6										1.58		
7						1.82						
8			0.35	0.40								
9												
10											1.30	
11		.35			2.47							
12				.45			.24	−0.14				
13			.35									
14								−.19				
15				.42							1.22	
16						1.35						
17					2.75		.16					
18		.35	.30									
19	0.20											1.10
20						1.10				1.35		1.10
21												
22									−.34			
23		.35										
24	.17			.70	2.90		.16					
25		.25	.32					−.24			1.20	
26						.45						
27												
28		.34					.01			1.40		
29				1.45							1.22	
30												
31	.45		.30				−.04					

NOTE.—Gage heights Jan. 1 to Sept. 22 read on the original gage; gage heights Sept. 23 to Dec. 31 read on a gage established 300 yards upstream from the original gage and referred to a new datum.

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, 1911.

Drainage area.—60 square miles (measured from Forest atlas).

Gage.—Vertical staff.

Channel.—Practically permanent.

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.

Diversions.—There are court decrees for diversion of 43 second-feet from East Elk Creek, chiefly above the station.

Accuracy.—Estimates of discharge which have been made only for the days for which gage heights are available should be reliable.

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

Discharge measurements of East Elk Creek near New Castle, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 19	O. M. Wimmer	0.60	8.2	July 17	O. M. Wimmer	0.90	26.1
Feb. 23	do	.75	12.9	Sept. 23	do	.15	3.4
Mar. 31	do	.70	12.9	Oct. 6	do	1.10	36.3
June 7	do	2.70	356	Dec. 19	H. B. Waha	.70	11.5

Daily gage height, in feet, of East Elk Creek near New Castle, Colo., for 1911.

[Ray L. Allen, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1						2.30			0.40		0.98	
2												
3												
4					1.05							0.70
5							1.50					
6										1.10		
7						2.70						
8			0.65	0.85								
9												
10											.85	
11		0.60			1.80							
12				.75			.40	0.00		.95		
13			.62									
14								.00				
15				.68							.80	
16						2.70						
17					1.80		.90					
18		.40	.65									
19	0.60											.70
20						2.40				.80		
21												
22									.32			
23	.75	.75							.15			
24	.75			1.10	2.10		.92					
25		.68	.59					.45			.75	
26						1.90						
27												
28		.60					.88			.98		
29				1.38					.35		.78	
30												
31	.67		.70				.70					

Daily discharge, in second-feet, of East Elk Creek near New Castle, Colo., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1						245			6.0		29	
2												
3												
4					34							12
5							79					
6										3.8		
7						365						
8			10	20								
9												
10											20	
11		9.0			130							
12				14			6.0	2.0		26		
13			10									
14								2.0				
15				11							17	
16						365						
17					130		23					
18		6.0	10									
19	9.0											12
20						275				17		
21												
22									5.2			
23	14	14							3.5			
24	14			38	195		24					
25		11	9.0					6.5			14	
26						150						
27												
28		9.0					22			29		
29				64					5.5		16	
30												
31	11		12				12					

DIVIDE CREEK BASIN.

WEST DIVIDE CREEK AT BEARD'S RANCH, NEAR RAVEN, COLO.

Location.—At Beard's ranch, about sec. 31, T. 7 S., R. 91 W., about 4 miles south of Raven, Colo.

Records available.—July 27, 1909, to September 20, 1909, at a point 1 mile above the present site; April 28, 1910, to August 31, 1911.

Drainage area.—82 square miles (measured from Hayden's atlas).

Gage.—Vertical staff.

Channel.—Fairly permanent.

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

Winter flow.—Ice causes little backwater except for a few days.

Diversions.—The only water diverted above the station is taken out by the Highline canal 1¼ miles above.

Accuracy.—Conditions were favorable for good results, and the estimates should be reliable.

Discharge measurements of West Divide Creek at Beard's ranch, near Raven, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 6	J. B. Stewart	2.50	185
June 13	W. B. Freeman	1.38	39.2

Daily gage height, in feet, of West Divide Creek at Beard's ranch, near Raven, Colo., for 1911.

[J. W. Beard, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1	0.75	1.00	0.81	1.28	1.65	2.10	0.84	0.70
2	.75	1.02	.82	1.32	1.65	2.05	.98	.68
3	.75	.98	.78	1.35	1.72	1.88	1.05	.64
4	.75	.98	.79	1.48	2.00	2.00	1.10	.60
5	.75	.98	.82	1.32	2.35	1.88	.98	.60
6	.75	.92	.85	1.29	2.65	1.85	.94	.60
7	.75	.88	.92	1.22	2.75	1.85	1.12	.55
8	.75	.88	.97	1.30	3.20	1.72	.96	.51
9	.75	.82	1.15	1.30	3.30	1.65	.97	.48
10	.75	.78	1.15	1.20	3.10	1.58	.95	.54
11	.85	.72	1.05	1.28	2.40	1.40	.95	.72
12	.88	.72	1.05	1.24	2.30	1.42	.96	.68
13	.90	.72	.92	1.15	2.50	1.42	.94	.71
14	.95	.72	1.00	1.20	2.60	1.42	.94	.68
15	.88	.72	1.02	1.22	2.55	1.48	.86	.62
16	.82	.78	.98	1.22	2.55	1.42	.88	.58
17	.82	.78	.90	1.32	2.60	1.38	.88	.55
18	.82	.78	.95	1.30	2.50	1.38	.88	.52
19	.82	.78	.95	1.40	2.40	1.56	.85	.52
20	.82	.72	.92	1.45	2.10	1.44	1.02	.48
21	.82	.72	.90	1.55	1.98	1.60	.80	.56
22	.82	.72	.92	1.75	2.00	1.45	1.20	.60
23	.85	.72	.98	1.82	2.10	1.34	1.05	.69
24	.85	.78	1.08	1.82	2.30	1.25	.95	.72
25	.85	.78	1.12	1.78	2.20	1.22	.88	.64
26	.92	.78	1.02	1.70	2.25	1.18	.91	.54
27	.98	.78	1.10	1.75	2.05	1.10	.90	.50
28	.98	.78	1.05	1.92	1.98	1.02	.81	.46
29	1.05	.....	1.00	2.05	2.10	.88	.78	.42
30	1.12	.....	1.15	1.82	2.20	.83	.79	.36
31	1.12	.....	1.12	.....	2.00	.....	.74	.28

NOTE.—Gage heights Jan. 26 to Feb. 6 affected by ice.

Daily discharge, in second-feet, of West Divide Creek at Beard's ranch, near Raven, Colo., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1	7.5	11	9.3	32	66	125	10	6.0
2	7.5	11	9.6	35	66	118	15	5.6
3	7.5	11	8.4	37	73	93	18	4.8
4	7.5	11	8.7	48	110	110	21	4.0
5	7.5	11	9.6	35	162	93	15	4.0
6	7.5	11	10	32	208	90	14	4.0
7	7.5	11	13	27	222	90	22	3.5
8	7.5	11	15	33	310	73	14	3.1
9	7.5	9.6	24	33	330	66	15	2.8
10	7.5	8.4	24	26	290	58	14	3.4
11	10	6.6	18	32	170	41	14	6.6
12	11	6.6	18	29	155	43	14	5.6
13	12	6.6	13	24	185	43	14	6.3
14	14	6.6	16	26	200	43	14	5.6
15	11	6.6	17	27	192	48	11	4.4
16	9.6	8.4	15	27	192	43	11	3.8
17	9.6	8.4	12	35	200	39	11	3.5
18	9.6	8.4	14	33	185	39	11	3.2
19	9.6	8.4	14	41	170	56	10	3.2
20	9.6	6.6	13	46	125	45	17	2.8
21	9.6	6.6	12	55	107	60	9	3.6
22	9.6	6.6	13	77	110	46	26	4.0
23	10	6.6	15	86	125	36	18	5.8
24	10	8.4	20	86	155	30	14	6.6
25	10	8.4	22	81	140	27	11	4.8
26	10	8.4	17	71	148	25	12	3.4
27	10	8.4	21	77	118	21	12	3.0
28	10	8.4	18	99	107	17	9.3	2.6
29	10	.....	16	118	125	11	8.4	2.2
30	10	.....	24	86	140	10	8.7	1.6
31	10	.....	22	.....	110	.....	7.2	.9

NOTE.—Daily discharge determined from a well-defined rating curve. Discharge Jan. 26 to Feb. 6 interpolated.

Monthly discharge of West Divide Creek at Beard's ranch, near Raven, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	14	7.5	9.4	578	B.
February	11	6.6	8.6	478	B.
March	24	8.4	15.5	953	B.
April	118	24	49.8	2,960	B.
May	330	66	161	9,900	B.
June	125	10	54.6	3,250	B.
July	26	7.2	13.6	836	B.
August	6.6	.9	4.02	247	B.
The period				19,200	

WEST DIVIDE CREEK AT RAVEN, COLO.

Location.—At Ewer's ranch, three-fourths of a mile north of Raven, Colo., about sec. 13, T. 7 S., R. 92 W. Nearest tributary, Halls Gulch, enters between the station and Raven.

Records available.—July 27, 1909, to July 30, 1910, at Raven; September 20, 1910, to March 31, 1911, at present site. The records at the two stations are practically comparable, as only Halls Gulch intervenes.

Drainage area.—101 square miles (measured from Hayden's atlas).

Gage.—Vertical staff.

Channel.—Slightly shifting.

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

Winter flow.—Ice causes backwater during a part of the winter period.

Diversions.—There are court decrees for diversions of 174 second-feet from West Divide Creek above the station, and for 114 second-feet between the station and the mouth.

Accuracy.—Data insufficient to warrant estimates of discharge.

Daily gage height, in feet, of West Divide Creek at Raven, Colo., for 1911.

[James Ewers, observer.]

Day.	Jan.	Feb.	Mar.	Day.	Jan.	Feb.	Mar.
1	1.35	2.05	1.60	16	1.60	1.45	1.60
2	1.35	1.60	1.70	17	1.55	1.55	1.70
3	1.35	1.55	1.60	18	1.50	1.55	1.68
4	1.35	1.50	1.50	19	1.50	1.55	1.65
5	1.40	1.45	1.70	20	1.50	1.55	1.55
6	1.45	1.45	1.60	21	1.45	1.48	1.55
7	1.45	1.40	1.80	22	1.45	1.55	1.75
8	1.45	1.45	2.25	23	1.45	1.58	1.70
9	1.45	1.50	2.35	24	1.50	1.70	1.90
10	1.73	1.55	2.35	25	1.55	1.55	1.85
11	2.00	1.55	1.80	26	1.55	1.60	1.75
12	1.85	1.50	1.75	27	1.70	1.55	1.70
13	1.75	1.45	1.70	28	1.90	1.50	1.70
14	1.60	1.45	1.55	29	2.30	.....	1.68
15	1.55	1.45	1.50	30	2.65	.....	1.75
				31	2.05	.....	1.95

NOTE.—Gage heights affected by ice Jan. 10 to 16 and Jan. 27 to Feb. 2.

GUNNISON RIVER BASIN.

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, 1911.
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 at this station are favorable for accurate results, and the records should be reliable.
Cooperation.—Field data are furnished by the United States Reclamation Service.

Discharge measurements of Taylor River at Almont, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 18	O. M. Wimmer	1.70	132	Aug. 10	E. H. Swett	2.32	393
May 11	E. H. Swett	2.78	744	Oct. 26	do	2.08	274
June 20[a]	do	3.50	1,500				

[a] Surface velocity taken. Coefficient of 85 per cent used to reduce velocity.

Daily gage height, in feet, and discharge, in second-feet, of Taylor River at Almont, Colo., for 1910.

[A. D. McKee, observer.]

Day.	July.		Aug.		Sept.		Oct.		Nov.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	.....	.....	2.05	258	1.85	178	1.8	160	1.75	145
2	.....	.....	2.0	235	1.8	160	1.8	160	1.75	145
3	.....	.....	1.95	215	1.85	178	1.8	160	1.75	145
4	.....	.....	1.95	215	2.05	258	1.8	160	1.75	145
5	.....	.....	2.05	258	2.0	235	1.8	160	1.75	145
6	.....	.....	2.0	235	1.95	215	1.8	160	1.75	145
7	.....	.....	2.0	235	1.95	215	1.8	160	1.75	145
8	.....	.....	1.95	215	1.9	195	1.75	145	1.75	145
9	.....	.....	1.9	195	1.9	195	1.75	145	1.75	145
10	.....	.....	1.9	195	1.9	195	1.75	145	1.75	145
11	.....	.....	1.9	195	1.9	195	1.75	145	1.75	145
12	.....	.....	1.9	195	1.9	195	1.75	145	1.7	130
13	.....	.....	2.0	235	1.9	195	1.75	145	1.7	130
14	.....	.....	1.95	215	1.9	195	1.75	145	1.7	130
15	.....	.....	1.9	195	1.9	195	1.75	145	1.7	130
16	.....	.....	1.9	195	1.9	195	1.75	145	1.65	115
17	.....	.....	1.9	195	1.9	195	1.95	215	1.65	115
18	.....	.....	1.9	195	1.9	195	1.9	195	1.65	115
19	.....	.....	1.9	195	1.9	195	1.85	178	1.6	100
20	.....	.....	1.9	195	1.9	195	1.8	160	1.6	100
21	.....	.....	1.9	195	1.9	195	1.8	160	1.6	100
22	.....	.....	1.9	195	1.9	195	1.75	145	1.7	130
23	.....	.....	1.9	195	1.9	195	1.75	145	1.7	130
24	.....	.....	1.9	195	1.9	195	1.75	145	1.7	130
25	.....	.....	1.85	178	1.9	195	1.75	145	1.7	130
26	.....	.....	1.85	178	1.9	195	1.75	145	1.7	130
27	1.9	195	1.85	178	1.85	178	1.75	145	.....	130
28	1.9	195	1.85	178	1.85	178	1.75	145	.....	130
29	1.95	215	1.85	178	1.8	160	1.75	145	.....	130
30	2.15	305	1.85	178	1.8	160	1.75	145	.....	130
31	2.05	258	1.85	178	.....	.....	1.75	145	.....	.....

NOTE.—Daily discharge determined from a well-defined rating curve. Discharge Nov. 27 to 30 estimated. Daily discharge revised and supersedes that published in Water-Supply Paper 289.

Daily gage height, in feet, of Taylor River at Almont, Colo., for 1911.

[Angus McClanahan, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.6	1.7	1.6	.....	2.3	3.55	3.2	2.4	2.1	3.0	2.1	1.85
2	1.6	1.7	1.6	2.0	2.3	3.8	3.2	2.4	2.1	2.5	2.1	1.85
3	1.6	1.7	1.6	2.0	2.3	3.9	3.2	2.4	2.1	2.3	1.8	1.85
4	1.6	1.7	1.6	1.9	2.6	3.9	3.15	2.4	2.1	2.3	1.8	1.85
5	1.6	1.6	1.6	1.8	2.8	4.0	3.3	2.4	2.1	3.0	1.9	1.85
6	1.6	1.6	1.6	1.8	3.05	3.9	3.4	2.3	2.0	2.75	1.8	1.85
7	1.7	1.6	1.8	1.8	3.15	3.9	3.2	2.3	2.0	2.65	1.8	1.85
8	1.7	1.6	1.85	1.8	3.25	3.9	3.2	2.3	2.0	2.5	1.8	1.85
9	1.7	1.6	1.9	1.8	3.4	3.9	3.1	2.3	2.0	2.5	1.9	1.75
10	1.7	1.6	2.0	1.8	3.4	3.9	3.05	2.3	2.0	2.5	2.05	1.8
11	1.8	1.6	2.0	1.8	2.9	3.8	3.0	2.2	2.0	2.5	2.0	1.8
12	1.8	1.6	2.0	1.7	2.9	3.75	2.9	2.2	2.0	2.4	1.85	1.85
13	1.8	1.6	2.0	1.7	2.95	3.7	2.9	2.7	2.0	2.3	1.85	1.8
14	1.8	1.6	1.9	1.7	2.95	3.7	2.8	2.7	2.0	2.3	1.85	1.8
15	1.8	1.6	1.9	1.7	3.0	3.7	2.8	2.7	2.0	2.3	1.85	1.8
16	1.8	1.6	1.7	1.7	3.0	3.5	2.1	2.7	2.0	2.3	1.85	1.8
17	1.7	1.6	1.7	1.7	3.0	3.5	2.1	2.7	2.0	2.3	1.95	2.1
18	1.7	1.6	1.7	1.8	3.15	3.5	2.1	2.7	2.0	2.2	1.95	1.95
19	1.7	1.6	1.7	1.8	3.4	3.4	2.1	2.7	2.0	2.2	1.95	1.95
20	1.7	1.6	1.7	1.8	3.0	3.4	2.0	2.2	2.1	2.0	1.95	1.95
21	1.7	1.6	1.7	1.8	3.0	3.62	2.0	2.2	2.1	2.0	1.95	2.0
22	1.7	1.6	1.8	2.0	3.0	3.5	2.0	2.2	2.15	1.95	1.95	2.1
23	1.8	1.6	1.8	2.1	3.0	3.4	2.7	2.15	2.2	1.95	1.95	2.1
24	1.8	1.6	1.8	2.2	3.2	3.4	2.6	2.1	2.0	2.0	1.95	2.15
25	1.8	1.6	1.8	2.2	3.3	3.2	2.6	2.1	2.0	2.05	1.85	2.1
26	1.9	1.6	1.8	2.4	3.4	3.2	2.6	2.1	2.0	2.1	1.95	2.1
27	1.9	1.6	1.8	2.4	3.4	3.1	2.5	2.1	2.0	2.1	1.95	2.05
28	1.9	1.6	1.8	2.5	3.6	3.1	2.45	2.1	2.0	2.15	1.85	2.1
29	1.9	.....	1.9	2.6	3.4	3.0	2.4	2.1	2.0	2.2	1.85	2.25
30	1.9	.....	1.9	2.3	3.5	3.1	2.4	2.1	2.5	2.1	1.85	2.3
31	1.9	.....	2.0	.....	3.5	.....	2.4	2.1	.....	2.1	.....	2.4

NOTE.—Gage heights distorted by ice Nov. 10 and 11 and Dec. 17 to 31.

Daily discharge, in second-feet, of Taylor River at Almont, Colo., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	100	130	100	235	390	1,560	1,170	450	280	960	280	178
2	100	130	100	235	390	1,860	1,170	450	280	520	280	178
3	100	130	100	235	390	1,990	1,170	450	280	390	160	178
4	100	130	100	195	590	1,990	1,120	450	280	390	160	178
5	100	100	100	160	760	2,120	1,280	450	280	960	195	178
6	100	100	100	160	1,010	1,990	1,390	390	235	715	160	178
7	130	100	160	160	1,120	1,990	1,170	390	235	630	160	178
8	130	100	178	160	1,220	1,990	1,170	390	235	520	160	178
9	130	100	195	160	1,390	1,990	1,060	390	235	520	195	145
10	130	100	235	160	1,390	1,990	1,010	390	235	520	190	160
11	160	100	235	160	860	1,860	960	330	235	520	184	160
12	160	100	235	130	860	1,800	860	330	235	450	178	178
13	160	100	235	130	910	1,740	860	670	235	390	178	160
14	160	100	195	130	910	1,740	760	670	235	390	178	160
15	160	100	195	130	960	1,740	760	670	235	390	178	160
16	160	100	130	130	960	1,500	280	670	235	390	178	160
17	130	100	130	130	960	1,500	280	670	235	390	215	.....
18	130	100	130	160	1,120	1,500	280	670	235	330	215	.....
19	130	100	130	160	1,390	1,390	280	670	235	330	215	.....
20	130	100	130	160	960	1,390	235	330	280	235	215	.....
21	130	100	130	160	960	1,640	235	330	280	235	215	.....
22	130	100	160	235	960	1,500	235	330	305	215	215	.....
23	160	100	160	280	960	1,390	670	305	330	215	215	.....
24	160	100	160	330	1,170	1,390	590	280	235	235	215	.....
25	160	100	160	330	1,280	1,170	590	280	235	258	178	.....
26	195	100	160	450	1,390	1,170	590	280	235	280	215	.....
27	195	100	160	450	1,390	1,060	520	280	235	280	215	.....
28	195	100	160	520	1,620	1,060	485	280	235	305	178	.....
29	195	.....	195	590	1,390	960	450	280	235	330	178	.....
30	195	.....	195	390	1,500	1,060	450	280	520	280	178	.....
31	195	.....	235	.....	1,500	.....	450	280	.....	280	.....	.....

NOTE.—Daily discharge determined from a well-defined rating curve. Discharge Nov. 10 and 11 interpolated. Discharge Dec. 17 to 31 estimated at 160 second-feet.

Monthly discharge of Taylor River at Almont, Colo., for 1910–11.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1910.					
July 27–31	305	195	234	2,320	A.
August	258	178	203	12,500	A.
September	258	160	194	11,500	A.
October	215	145	154	9,470	A.
November	145	100	131	7,800	A.
December	.....	.....	[a] 115	7,070	D.
The period	.....	.....	.....	50,700	
1911.					
January	195	100	145	8,920	A.
February	130	100	104	5,780	B.
March	235	100	161	9,900	A.
April	590	130	234	13,900	A.
May	1,620	390	1,050	64,600	B.
June	2,120	960	1,600	95,200	B.
July	1,390	235	727	44,700	A.
August	670	280	422	25,900	A.
September	520	235	261	15,500	A.
October	960	215	415	25,500	A.
November	280	160	196	11,700	B.
December	178	145	165	10,100	C.
The year	2,120	100	457	332,000	

[a] Estimated.

NOTE.—Monthly discharge for 1910 supersedes that published in Water-Supply Paper 289.

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, 1911.

Drainage area.—963 square miles (measured from Hayden's atlas).

Gage.—Chain gage.

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, but no measurements have been made to determine the variation in amount.

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.

Accuracy.—Estimates are considered only fair.

Cooperation.—Station maintained in cooperation with the State engineer, by whom the field data are furnished.

Discharge measurements of Gunnison River near Gunnison, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 14	O. M. Wimmer	0.40	219	Oct. 3	B. S. Clayton	1.22	941
June 17	do	3.10	3,830	Nov. 22	do	.55	370
Aug. 24	B. S. Clayton	1.00	656	Dec. 13[a]	M. E. Bunger	.50	291

[a] Ice conditions.

Daily gage height, in feet, of Gunnison River near Gunnison, Colo., for 1911.

[Mrs. C. W. Chinery, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.5	0.8	0.9	0.8	.....	2.0	0.7	0.7	1.9	0.75	0.6
2	.4	.8	.8	.9	.....	2.5	.7	.7	1.2	.85	.65
3	.5	.9	.7	1.0	.....	2.8	.7	.7	1.2	.5	.5
4	.5	1.0	.6	1.0	.....	2.5	.6	.6	1.5	.5	.65
5	.5	1.0	.7	1.0	.....	2.9	.....	.6	2.2	.5	.75
6	.8	.9	.7	.9	.....	2.7	.....	.6	1.9	.6	.8
7	.9	.8	.8	.8	.....	2.5	.....	.5	1.6	.5	.85
8	1.2	.7	.9	.7	.....	2.3	.....	.5	1.4	.5	.75
9	1.1	.8	.5	.7	.....	2.3	.....	.5	1.3	.5	.5
10	1.2	.9	.6	.8	.....	2.4	.....	.7	1.35	.5	.5
11	1.1	.5	.7	.8	.....	2.2	.....	.7	1.2	.5	.5
12	1.0	.6	.6	.9	.....	2.1	.....	.7	1.1	.5	.5
13	.9	.7	.5	.8	.....	2.1	.....	.7	1.0	.4	.5
14	.8	.4	.6	.7	.....	2.0	.....	.6	.9	.4	.5
15	1.0	.5	.7	.6	.....	2.0	.....	.7	.9	.4	.4
16	.9	.4	.8	.7	.....	1.8	.....	.7	.8	.4	.4
17	.9	.5	.9	.9	3.1	1.7	.....	.7	.8	.4	.4
18	.8	.6	.8	1.0	.....	1.6	.....	.6	.8	.4	.4
19	.9	.7	.7	.9	.....	1.6	.8	.7	.8	.4	.5
20	1.0	.7	.7	.8	.....	1.5	.8	.7	.8	.5	.5
21	1.1	.7	.7	.8	3.1	1.6	.....	.7	.9	.6	.5
22	.9	.7	.8	.9	3.3	1.6	.....	.7	.9	.5	.5
23	.8	.6	.7	.9	2.9	1.8	.....	.8	.8	.5	.5
24	1.0	.5	.6	.8	2.6	1.7	.....	.8	.85	.5	.5
25	1.1	.6	.6	.7	2.4	.....	.....	.8	.7	.5	.5
26	.9	.6	.7	.8	2.2	.....	.....	.8	.6	.5	.5
27	1.0	.7	.7	.7	2.1	.....	1.0	.7	.5	.5	.5
28	.9	.8	.7	.8	2.1	.....	.9	.7	.4	.5	.5
29	.8	.....	.8	.8	2.2	.....	.8	.8	.9	.6	.5
30	.7	.....	.8	.8	2.0	.....	.7	1.8	.95	.6	.5
31	.9	.....	.9	.....	.....	.....	.8	.....	.8	.....	.5

NOTE.—Ice effect Jan. 1 to Feb. 13 and Dec. 2 to 31.

Daily discharge, in second-feet, of Gunnison River near Gunnison, Colo., for 1911.

Day.	Feb.	Mar.	Apr.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	570	480	.....	2,000	400	400	1,850	440
2	.....	480	570	.....	2,800	400	400	900	525
3	.....	400	670	.....	3,310	400	400	900	265
4	.....	330	670	.....	2,800	330	330	1,280	265
5	.....	400	670	.....	3,480	.....	330	2,320	265
6	.....	440	570	.....	3,140	.....	330	1,850	330
7	.....	480	480	.....	2,800	.....	265	1,420	265
8	.....	570	400	.....	2,480	.....	265	1,150	265
9	.....	265	400	.....	2,480	.....	265	1,020	265
10	.....	330	480	.....	2,640	.....	400	1,080	265
11	.....	400	480	.....	2,320	.....	400	900	265
12	.....	330	570	.....	2,160	.....	400	780	265
13	.....	265	480	.....	2,160	.....	400	670	210
14	210	330	400	.....	2,000	.....	330	570	210
15	265	400	330	.....	2,000	.....	400	570	210
16	210	480	400	.....	1,700	.....	400	480	210
17	265	570	570	3,820	1,560	.....	400	480	210
18	330	480	670	3,820	1,420	.....	330	480	210
19	400	400	570	3,820	1,420	480	400	480	210
20	400	400	480	3,820	1,280	480	400	480	265
21	400	400	480	3,820	1,420	.....	400	570	330
22	400	480	570	4,170	1,420	.....	400	570	265
23	330	400	570	3,480	1,700	.....	480	480	265
24	265	330	480	2,970	1,560	.....	480	525	265
25	330	330	400	2,640	1,200	.....	480	400	265
26	330	400	480	2,320	1,000	.....	480	330	265
27	400	400	400	2,160	800	670	400	265	265
28	480	400	480	2,160	700	570	400	210	330
29	.....	480	480	2,320	600	480	480	570	330
30	.....	480	480	2,000	500	400	1,700	620	330
31	.....	570	.....	.....	400	480	.....	480	.....

NOTE.—Daily discharge determined from a fairly well defined rating curve. Discharge interpolated June 18 to 21 and July 25 to 31.

Monthly discharge of Gunnison River near Gunnison, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
February, 15 days	480	210	334	9,910	C.
March	570	265	418	25,700	C.
April	670	330	505	30,000	C.
June 17–30	.....	.....	3,090	85,900	C.
July	3,300	400	1,850	114,000	C.
August, 11 days	.....	.....	463	10,100	C.
September	1,700	265	432	25,700	C.
October	2,320	210	796	48,900	C.
November	525	210	278	16,500	C.
December	.....	.....	*a* 290	17,800	D.
The period	.....	.....	.....	385,000	

a Estimated from actual discharge measurement.

GUNNISON RIVER AT RIVER PORTAL, COLO.

Location.—About 300 feet above the portal of the Gunnison tunnel of the United States Reclamation Service, about sec. 10, T. 49 N., R. 7 W., New Mexico principal meridian, 21 miles northeast of Montrose. Nearest tributary, Crystal Creek, enters about 4 miles above.

Records available.—April 7, 1905, to November 6, 1911. September 18, 1903, to December 17, 1905, a station was maintained at Cimarron, about 12 miles above. The records at the two points are not directly comparable as Cimarron River and Crystal Creek enter between.

Drainage area.—4,140 square miles (measured from Land Office map).

Gage.—Staff. The original staff gage, which was bolted to the cliff on the right bank of the river, was dislodged by driftwood June 4, 1909; prior to this time there had been no change in location or datum. From June 5 to 19 an old high-water gage, 100 feet upstream, with its datum 10.08 feet lower than that of the original gage, was used, and readings were reduced to the original datum. August 9, 1909, a new staff gage was installed at the original site and datum. This gage was destroyed November 20, 1909, but replaced in 1910, by the gage at present in use.

Channel.—Slightly shifting. Débris from the Gunnison tunnel is dumped into the river below the station.

Discharge measurements.—Made from car and cable near the station.

Winter flow.—Ice covers the river and records are discontinued for about 4 months each year; the ice attains a thickness of 1 to 2 feet.

Diversions.—Between this station and that near Gunnison there are court decrees for the diversion of 55 second-feet from the Gunnison and 580 second-feet from the intervening tributaries. Just below the station is the entrance of the Gunnison tunnel through which 1,300 second-feet will be diverted into Uncompahgre Valley.

Accuracy.—Although the channel shifts slightly, sufficient measurements have been obtained to make the estimates reliable.

Cooperation.—Station is maintained in cooperation with the United States Reclamation Service, by which the field data are furnished.

Discharge measurements of Gunnison River at River Portal, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 21	Christiansen and Swett.	6.05	844	July 16	A. L. B. Moser	9.05	3,850
May 9	Swett and Luney	12.40	8,040	29	....do	8.40	2,920
June 18	Moser and Luney	12.20	8,400	Aug. 2	....do	7.80	2,150
July 9	A. L. B. Moser	10.00	5,620	Sept. 9	....do	6.40	1,040
10	....do	9.60	4,460				

Daily gage height, in feet, of Gunnison River at River Portal, Colo., for 1911.

[U. S. Reclamation Service engineers, observers.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	7.3	8.8	12.0	9.8	8.0	6.6	8.5	6.6
2	.....	7.6	8.6	12.3	10.5	7.8	6.6	8.6	6.8
3	.....	7.6	8.7	12.3	11.2	7.8	6.6	8.1	6.7
4	.....	7.8	9.3	12.4	11.4	7.6	6.8	7.7	6.4
5	.....	7.5	10.2	12.7	10.8	7.5	6.6	7.8	6.6
6	.....	7.2	11.0	13.1	11.2	7.4	6.6	10.8	6.9
7	.....	7.0	11.4	13.1	11.0	7.2	6.4	9.6	.....
8	.....	6.9	11.8	13.3	10.4	7.2	6.4	8.8	.....
9	.....	7.0	12.3	13.6	10.0	7.0	6.3	8.5	.....
10	.....	7.0	12.5	13.5	9.6	7.2	6.2	8.3	.....
11	.....	6.8	11.3	13.0	9.2	7.4	6.3	8.0	.....
12	.....	6.7	10.6	13.1	9.0	7.4	6.3	7.9	.....
13	.....	6.6	10.7	13.1	9.2	7.4	6.4	7.8	.....
14	.....	6.4	10.7	13.0	9.5	7.4	6.4	7.6	.....
15	.....	6.4	11.0	12.7	9.2	7.2	6.5	7.5	.....
16	.....	6.5	10.9	12.7	9.0	7.0	6.6	7.4	.....
17	.....	6.8	11.1	12.2	9.0	7.0	6.4	7.2	.....
18	.....	7.0	11.4	12.0	9.0	7.0	6.3	7.2	.....
19	.....	7.2	12.0	12.1	9.2	6.8	6.3	7.1	.....
20	.....	7.7	11.3	12.2	9.3	6.8	6.3	6.9	.....
21	6.0	8.0	10.4	12.2	9.4	6.8	6.4	6.6	.....
22	.....	8.6	10.0	12.4	9.4	7.2	6.3	6.6	.....
23	.....	8.8	10.2	12.0	10.0	7.6	6.4	6.8	.....
24	.....	9.0	10.8	11.6	9.4	7.6	6.6	7.0	.....
25	.....	8.8	11.1	11.1	9.0	7.4	6.4	6.9	.....
26	.....	9.1	11.6	10.6	9.0	7.2	6.3	6.8	.....
27	.....	9.6	11.4	10.3	8.9	7.0	6.5	7.0	.....
28	.....	9.8	11.3	10.2	8.6	6.9	6.5	7.0	.....
29	.....	10.1	11.4	10.2	8.4	6.8	6.5	7.0	.....
30	.....	9.5	11.4	10.0	8.3	6.8	7.0	6.9	.....
31	.....	.....	11.6	.....	8.2	6.6	.....	6.6	.....

Daily discharge, in second-feet, of Gunnison River at River Portal, Colo., for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	1,720	3,380	8,410	4,780	2,420	1,180	3,000	1,180
2	2,000	3,120	8,940	5,860	2,200	1,180	3,120	1,320
3	2,000	3,250	8,940	7,020	2,200	1,180	2,530	1,250
4	2,200	4,050	9,110	7,360	2,000	1,320	2,100	1,040
5	1,900	5,390	9,640	6,350	1,900	1,180	2,200	1,180
6	1,630	6,680	10,300	7,020	1,800	1,180	6,350	1,400
7	1,470	7,360	10,300	6,680	1,630	1,040	4,480	.....
8	1,400	8,060	10,700	5,700	1,630	1,040	3,380	.....
9	1,470	8,940	11,200	5,080	1,470	985	3,000	.....
10	1,470	9,280	11,000	4,480	1,630	925	2,760	.....
11	1,320	7,190	11,200	3,910	1,800	985	2,420	.....
12	1,250	6,020	10,300	3,640	1,800	985	2,310	.....
13	1,180	6,180	10,300	3,910	1,800	1,040	2,200	.....
14	1,040	6,180	10,200	4,330	1,800	1,040	2,000	.....
15	1,040	6,680	9,640	3,910	1,630	1,110	1,900	.....
16	1,110	6,520	9,640	3,640	1,470	1,180	1,800	.....
17	1,320	6,850	8,760	3,640	1,470	1,040	1,630	.....
18	1,470	7,360	8,410	3,640	1,470	985	1,630	.....
19	1,630	8,410	8,580	3,910	1,320	985	1,550	.....
20	2,100	7,190	8,760	4,050	1,320	985	1,400	.....
21	2,420	5,700	8,760	4,190	1,320	1,040	1,180	.....
22	3,120	5,080	9,110	4,190	1,630	985	1,180	.....
23	3,380	5,390	8,410	5,080	2,000	1,040	1,320	.....
24	3,640	6,350	7,710	4,190	2,000	1,180	1,470	.....
25	3,380	6,850	6,850	3,640	1,800	1,040	1,400	.....
26	3,780	7,710	6,020	3,640	1,630	985	1,320	.....
27	4,480	7,360	5,540	3,510	1,470	1,110	1,470	.....
28	4,780	7,190	5,390	3,120	1,400	1,110	1,470	.....
29	5,240	7,360	5,390	2,880	1,320	1,110	1,470	.....
30	4,330	7,360	5,080	2,760	1,320	1,470	1,400	.....
31	.....	7,710	.....	2,640	1,180	.....	1,180	.....

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

Monthly discharge of Gunnison River at River Portal, Colo., for 1911.

[Drainage area, 4,140 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.	
April	5,240	1,040	2,310	0.558	0.62	137,000	A.
May	9,280	3,120	6,520	1.57	1.81	401,000	B.
June	11,200	5,080	8,750	2.11	2.35	521,000	B.
July	7,360	2,640	4,480	1.08	1.24	275,000	A.
August	2,420	1,180	1,670	.403	.46	103,000	A.
September	1,470	925	1,090	.263	.29	64,900	A.
October	6,350	1,180	2,150	.519	.60	132,000	A.
November 1-6	1,400	1,040	1,230	.297	.07	14,600	A.
The period						1,650,000	

EAST RIVER AT ALMONT, COLO.

Location.—At highway bridge at Almont, 200 feet above the junction of East and Taylor rivers.

Records available.—April 15 to October 8, 1905; July 27, 1910, to December 31, 1911.

Drainage area.—295 square miles (measured from Forest atlas).

Gage.—Vertical staff. No determined relation between datum of present gage and that of gage used in 1905.

Channel.—Practically permanent.

Discharge measurements.—Made from bridge.

Winter flow.—Ice causes backwater during the winter months but no measurements have been made to determine the variation in amount.

Diversions.—There are court decrees for 78 second-feet from East River above the station, and 52 second-feet from tributaries.

Accuracy.—Conditions are favorable for accurate results, and 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 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 18	O. M. Wimmer	0.76	60	Aug. 10	E. H. Swett	1.72	376
May 11	E. H. Swett	2.50	1,060	Oct. 26	do	1.30	166
June 20	do	2.90	1,490				

Daily gage height, in feet, and discharge, in second-feet, of East River at Almont, Colo., for 1910.

Day.	July.		August.		September.		October.		November.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1			1.4	205	1.0	110	0.9	90	0.9	90
2			1.4	205	.95	100	.9	90	.85	80
3			1.4	205	.95	100	.9	90	.85	80
4			1.4	205	1.2	150	.9	90	.85	80
5			1.35	190	1.15	140	.9	90	.85	80
6			1.25	162	1.1	130	.9	90	.85	80
7			1.25	162	1.1	130	.85	80	.85	80
8			1.2	150	1.1	130	.85	80	.85	80
9			1.2	150	1.1	130	.85	80	.85	80
10			1.2	150	1.05	120	.85	80	.85	80

Daily gage height, in feet, and discharge, in second-feet, of East River at Almont, Colo., for 1910—Continued.

Day.	July.		August.		September.		October.		November.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
11	.....	.....	1.2	150	1.05	120	0.85	80	0.85	80
12	.....	.....	1.2	150	1.0	110	.85	80	.8	70
13	.....	.....	1.3	175	1.0	110	.85	80	.8	70
14	.....	.....	1.25	162	1.0	110	.85	80	.8	70
15	.....	.....	1.25	162	1.0	110	.85	80	.8	70
16	.....	.....	1.2	150	1.0	110	.85	80	.75	60
17	.....	.....	1.25	162	1.0	110	1.05	120	.75	60
18	.....	.....	1.2	150	.95	100	1.0	110	.75	60
19	.....	.....	1.2	150	.95	100	1.0	110	.7	50
20	.....	.....	1.2	150	95	100	1.0	110	.7	50
21	.....	.....	1.15	140	.9	90	1.0	110	.7	50
22	.....	.....	1.15	140	.9	90	.95	100	.75	60
23	.....	.....	1.15	140	.9	90	.95	100	.8	70
24	.....	.....	1.15	140	.9	90	1.0	110	.9	90
25	.....	.....	1.15	140	.9	90	1.0	110	.9	90
26	.....	.....	1.1	130	.9	90	1.0	110	.85	80
27	1.15	140	1.1	130	.9	90	.95	100	.....	80
28	1.2	150	1.1	130	.9	90	.95	100	.....	80
29	1.35	190	1.05	120	.9	90	.95	100	.....	80
30	1.4	205	1.05	120	.9	90	.95	100	.....	80
31	1.4	205	1.0	110	.....	.....	.9	90	.....	.....

NOTE.—Daily discharge determined from a well-defined rating curve. Discharge Nov. 27 to 30 estimated at 80 second-feet.

Daily gage height, in feet, of East River at Almont, Colo., for 1911.

[Angus McClanahan, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.7	0.8	0.7	.....	1.9	3.2	2.6	1.7	1.3	2.1	1.2	1.05
2	.7	.8	.7	1.2	1.9	3.3	2.5	1.7	1.3	1.8	1.2	1.05
3	.7	.8	.7	1.2	2.0	3.3	2.5	1.6	1.3	1.7	1.1	1.05
4	.7	.8	.7	1.2	2.2	3.3	2.4	1.6	1.3	1.7	1.1	1.05
5	.7	.7	.7	1.2	2.4	3.6	2.55	1.6	1.2	2.0	1.2	1.15
6	.7	.7	.7	1.2	2.55	3.5	3.1	1.6	1.2	1.9	1.1	1.15
7	.8	.7	.7	1.1	2.65	3.45	2.45	1.6	1.2	1.8	1.0	1.1
8	.8	.7	.8	1.1	2.85	3.75	2.45	1.5	1.2	1.8	1.0	1.05
9	.8	.7	.8	1.1	3.05	3.6	2.35	1.5	1.2	1.8	1.0	1.15
10	.8	.7	.8	1.1	3.05	.....	2.3	1.4	1.2	1.6	1.1	1.1
11	.9	.7	.8	1.1	2.5	3.8	2.3	1.5	1.2	1.6	1.1	1.15
12	.9	.7	.8	1.1	2.4	3.75	2.2	1.6	1.2	1.6	1.0	1.15
13	.9	.7	.8	1.1	2.5	3.7	2.2	1.6	1.2	1.5	1.05	1.05
14	.9	.7	.7	1.0	2.45	3.7	2.1	1.6	1.2	1.5	1.05	1.05
15	.9	.7	.65	1.0	2.55	3.7	2.1	1.6	1.2	1.5	1.05	1.05
16	.9	.7	.6	1.1	2.55	3.5	2.8	1.6	1.2	1.5	1.05	1.05
17	.7	.7	.6	1.2	2.55	3.5	2.8	1.6	1.2	1.5	1.0	1.1
18	.7	.7	.6	1.2	2.75	3.05	2.8	1.6	1.2	1.4	1.05	1.1
19	.7	.7	.6	1.3	2.9	3.0	2.8	1.6	1.2	1.4	1.15	1.05
20	.7	.7	.6	1.3	2.45	3.05	2.7	1.6	1.3	1.3	1.15	1.05
21	.7	.7	.7	1.4	2.45	3.22	2.7	1.6	1.3	1.3	1.15	1.15
22	.7	.7	.75	1.6	2.4	3.05	2.7	1.6	1.3	1.25	1.15	1.2
23	.7	.7	.8	1.65	2.5	2.85	2.0	1.6	1.4	1.25	1.15	1.25
24	.8	.7	.9	1.8	2.8	2.8	1.9	1.6	1.4	1.3	1.05	1.25
25	.8	.7	.85	1.9	2.85	2.65	1.9	1.5	1.3	1.2	.95	1.25
26	.9	.7	.9	1.95	2.95	2.5	1.8	1.45	1.3	1.25	1.05	1.25
27	.9	.7	.9	2.15	2.9	2.4	1.8	1.4	1.3	1.25	1.05	1.35
28	.9	.7	.9	2.2	2.9	2.4	1.8	1.4	1.4	1.3	.95	1.35
29	.9	.....	1.0	2.3	2.9	2.5	1.7	1.4	1.4	1.3	1.05	1.25
30	.9	.....	1.2	2.0	2.85	2.45	1.7	1.4	1.5	1.2	1.05	1.2
31	.9	.....	.....	.....	3.0	.....	1.7	1.3	.....	1.2	.....	1.1

NOTE.—Gage heights Jan. 11 to 15, 26 to 31, and Nov. 19 to 23; Dec. 5-6, 9, 11, 12, and 21 to 30 affected by ice.

Daily discharge, in second-feet, of East River at Almont, Colo., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	50	70	50	150	505	1,820	1,160	355	175	670	150	120
2	50	70	50	150	505	1,940	1,060	355	175	425	150	120
3	50	70	50	150	585	1,940	1,060	295	175	355	130	120
4	50	70	50	150	760	1,940	960	295	175	355	130	120
5	50	50	50	150	960	2,300	1,110	295	150	585	150	124
6	50	50	50	150	1,110	2,180	1,710	295	150	505	130	127
7	70	50	50	130	1,220	2,120	1,010	295	150	425	110	130
8	70	50	70	130	1,440	2,480	1,010	245	150	425	110	120
9	70	50	70	130	1,660	2,300	910	245	150	425	110	125
10	70	50	70	130	1,660	2,420	860	205	150	295	130	130
11	60	50	70	130	1,060	2,540	860	245	150	295	130	127
12	60	50	70	130	960	2,480	760	295	150	295	110	124
13	60	50	70	130	1,060	2,420	760	295	150	245	120	120
14	60	50	50	110	1,010	2,420	670	295	150	245	120	120
15	60	50	42	110	1,110	2,420	670	295	150	245	120	120
16	60	50	35	130	1,110	2,180	1,380	295	150	245	120	120
17	50	50	35	150	1,110	2,180	1,380	295	150	245	110	130
18	50	50	35	150	1,320	1,660	1,380	295	150	205	120	130
19	50	50	35	175	1,490	1,600	1,380	295	150	205	120	120
20	50	50	35	175	1,010	1,660	1,270	295	175	175	120	120
21	50	50	50	205	1,010	1,840	1,270	295	175	175	120	121
22	50	50	60	295	960	1,660	1,270	295	175	162	120	122
23	50	50	70	325	1,060	1,440	585	295	205	162	120	123
24	70	50	90	425	1,380	1,380	505	295	205	175	120	124
25	70	50	80	505	1,440	1,220	505	245	175	150	100	125
26	70	50	90	545	1,540	1,060	425	225	175	162	120	126
27	70	50	90	715	1,490	960	425	205	175	162	120	127
28	70	50	90	760	1,490	960	425	205	205	175	100	128
29	70	.....	90	860	1,490	1,060	355	205	205	175	120	129
30	70	.....	110	585	1,440	1,010	355	205	245	150	120	130
31	70	.....	150	.....	1,600	.....	355	175	.....	150	.....	130

NOTE.—Daily discharge determined from a well-defined rating curve. Discharge interpolated for days on which the gage heights were affected by ice.

Monthly discharge of East River near Almont, Colo., for 1910-11.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1910.					
July 27-31	205	140	178	1,760	B.
August	205	110	154	9,470	B.
September	150	90	107	6,370	B.
October	120	80	94.2	5,790	B.
November	90	50	73.7	4,390	B.
December	.....	.....	a 60.0	3,690	D.
The period	.....	.....	.....	31,500	
1911.					
January	70	50	59.7	3,670	B.
February	70	50	52.9	2,940	B.
March	150	35	64.7	3,980	B.
April	860	110	268	15,900	B.
May	1,660	505	1,180	72,600	B.
June	2,540	960	1,850	110,000	B.
July	1,710	355	898	55,200	B.
August	355	175	272	16,700	B.
September	245	150	169	10,100	B.
October	670	150	279	17,200	B.
November	150	100	122	7,260	B.
December	130	120	124	7,620	B.
The year	2,540	35	445	323,000	

a Estimated.

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 14, 1911.

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.—Conditions are favorable for accurate results but because of missing gage heights the estimates can not be considered better than fair.

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

Discharge measurements of Cement Creek near Crested Butte, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 16	O. M. Wimmer	0.35	12.0	Oct. 28	O. M. Wimmer	0.50	28.2
June 19	do	1.40	184	Dec. 14	H. B. Waha	.45	20.8
Sept. 7	do	.55	26.2				

Daily gage height, in feet, of Cement Creek near Crested Butte, Colo., for 1911.

[P. L. Snodgrass, observer.]

Day.	Jan.	Feb.	Mar.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.3	0.35		0.8		1.3	0.8	0.6	0.6	0.4	
2	.3	.3		.6	1.6	1.2	.8	.6	.65	.4	
3	.3	.3		.7	1.6	1.4			.6	.45	
4	.3	.4		.9	1.7		.8		.6	.4	0.4
5	.3	.4		.9	1.7	1.5		.6	.65	.4	.4
6	.3	.3		.9		1.4			.7	.4	.4
7	.3	.3		.8		1.3	.8	.55	.7		.4
8	.3	.3		.9		1.3		.55	.65	.45	
9	.3	.3		1.0	1.8			.55	.6	.4	
10	.3	.3		1.0	1.8	1.1				.4	.4
11	.3	.4		1.2		1.1	.7	.55	.55	.4	.4
12	.3	.4						.55			
13	.3	.3		1.0		1.1					
14	.3	.3		.9				.52	.5		.45
15	.3	.4				.9	.7				
16	.3	.4	0.4	1.0		.95		.5	.5		
17	.3	.3	.35					.5	.45		
18	.3	.4	.4				.65				
19	.3	.35	.35	1.1	1.4	.9	.6	.55	.45		
20	.3	.35	.35	1.2				.55			
21	.3	.35	.35	1.1			.65		.45		
22	.4	.35	.4		1.4	.9	.7	.55	.45		
23	.3	.35	.35		1.25	.9		.55	.45		
24	.3	.35	.45		1.2	.9	.6		.45		
25	.3	.3	.4	1.3	1.3			.52	.5		
26	.35	.3	.35	1.3	1.3	.8			.5		
27	.3	.3	.35			.8		.55	.55		
28	.4	.3	.35		1.3	.8	.6	.55	.5		
29	.4		.35	1.4	1.2	.8		.55	.4		
30	.4		.4	1.4	1.3	.8		.7	.45		
31	.3		.4						.4		

Daily discharge, in second-feet, of Cement Creek near Crested Butte, Colo., for 1910.

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1	.....	11	11	.....	11	21	.....	11
2	.....	11	12	.....	11	22	.....	11
3	.....	11	13	.....	11	23	17	11
4	.....	11	14	.....	11	24	11	11
5	.....	11	15	.....	11	25	11	11
6	.....	11	16	.....	11	26	11	11
7	.....	11	17	.....	11	27	17	11
8	.....	11	18	.....	11	28	15	11
9	.....	11	19	.....	11	29	14	11
10	.....	11	20	.....	11	30	13	11
						31	.....	11

Daily discharge, in second-feet, of Cement Creek near Crested Butte, Colo., for 1911.

Day.	Jan.	Feb.	Mar.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	11	14	12	61	216	160	61	35	35	17	17
2	11	11	12	35	232	138	61	35	41	17	17
3	11	11	12	47	232	184	61	35	35	21	17
4	11	17	12	77	258	196	61	35	35	17	17
5	11	17	12	77	258	208	61	35	41	17	17
6	11	11	13	77	265	184	61	32	47	17	17
7	11	11	13	61	272	160	61	30	47	19	17
8	11	11	13	77	279	160	58	30	41	21	17
9	11	11	13	96	285	182	54	30	35	17	17
10	11	11	13	96	285	116	50	30	32	17	17
11	11	17	14	138	274	116	47	30	30	17	17
12	11	17	14	117	263	116	47	30	28	17	18
13	11	11	14	96	252	116	47	28	26	17	20
14	11	11	14	77	241	97	47	27	25	17	21
15	11	17	14	86	230	77	47	26	25	17	20
16	11	17	17	96	219	86	45	25	25	17	19
17	11	11	14	102	208	82	43	25	21	17	18
18	11	17	17	109	197	79	41	28	21	17	17
19	11	14	14	116	184	77	35	30	21	17	16
20	11	14	14	138	184	77	38	30	21	17	16
21	11	14	14	116	184	77	41	30	21	17	16
22	17	14	17	127	184	77	47	30	21	17	16
23	11	14	14	138	149	77	41	30	21	17	16
24	11	14	21	149	138	77	35	28	21	17	16
25	11	11	17	160	160	69	35	27	25	17	16
26	14	11	14	160	160	61	35	28	25	17	16
27	11	11	14	168	160	61	35	30	30	17	16
28	17	11	14	176	160	61	35	30	25	17	16
29	17	.....	14	184	138	61	35	30	17	17	16
30	17	.....	17	184	160	61	35	47	21	17	16
31	11	.....	17	200	.....	61	35	.....	17	.....	16

NOTE.—Daily discharge determined from a fairly well defined rating curve. Discharge for days for which there are no gage heights estimated by interpolation, comparison with records at other stations, and from climatologic data.

Monthly discharge of Cement Creek near Crested Butte, Colo., for 1910–11.

[Drainage area, 32 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.	
1910.							
November 23–30	17	11	13.6	0.425	0.13	216	C.
December	11	11	11.0	.344	.40	676	C.
1911.							
January	17	11	11.9	.372	.43	732	C.
February	17	11	13.2	.413	.43	733	C.
March	21	12	14.3	.447	.52	879	C.
April	.....	.....	[a] 30.0	.938	1.05	1,790	D.
May	200	35	114	3.56	4.10	7,010	C.
June	285	138	214	6.69	7.46	12,700	C.
July	208	61	108	3.38	3.90	6,640	C.
August	61	35	46.3	1.45	1.67	2,850	C.
September	47	25	30.5	.953	1.06	1,810	B.
October	47	17	28.3	.884	1.02	1,740	B.
November	21	17	17.3	.541	.60	1,030	C.
December	21	16	17.0	.531	.61	1,050	C.
The year	285	11	53.7	1.68	22.85	39,000	

[a] Estimated by comparison with other streams.

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, 1911.

Drainage area.—54 square miles (measured from Forest atlas).

Gage.—Vertical staff.

Channel.—Slightly shifting.

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.—Conditions are favorable for fairly accurate results, and the records are considered fair or possibly good.

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

Discharge measurements of Quartz Creek near Pitkin, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 15	O. M. Wimmer	0.60	23.9	Oct. 27	O. M. Wimmer	0.87	37.0
June 16	.....do	1.65	185	Dec. 13[a]	H. B. Waha	.65	24.2
Sept. 6	.....do	.80	37.3				

[a] Ice conditions.

Daily gage height, in feet, of Quartz Creek near Pitkin, Colo., for 1911.

[J. B. Cammann, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	0.7	0.5	0.6	1.0	1.7	1.4	1.1	0.8	.....	0.7	0.7
2	.....	.7	.5	.6	.95	1.7	1.4	1.1	.8	.....	.7	.7
3	.....	.7	.5	.6	.95	1.7	1.35	.95	.8	0.9	.7	.7
4	.....	.6	.5	.6	1.0	1.8	1.3	.....	.8	.9	.7	.7
5	.....	.6	.5	.....	1.05	.....	1.3	.95	.8	1.0	.....	.7
6	.....	.6	.5	.....	1.1	.....	1.3	.9	.8	1.1	.7	.7
7	.....	.6	.55	.....	1.2	.....	1.3	.9	.....	1.1	.7	.7
8	.....	.6	.55	.....	1.4	.....	1.25	.9	.....	1.1	.7	.7
9	.....	.65	.55	.....	1.4	.....	1.25	.9	.....	1.1	.7	.7
10	.....	.65	.55	.....	1.4	.....	1.25	.9	.8	1.1	.7	.....
11	.....	.65	.55	.....	1.4	.....	1.25	.9	.8	1.1	.7	.7
12	.....	.6	.55	.....	1.25	.....	1.25	.9	.8	1.0	.....	.7
13	.....	.55	.55	.....	1.4	.....	1.25	.9	.8	.9	.....	.7
14	.....	.5	.55	.....	1.3	.....	1.2	.9	.8	.9	.....	.7
15	.....	.5	.6	.65	1.3	.....	.....	.....	.8	.8	.....	.7
16	.....	.5	.55	.65	1.3	1.65	.....	.9	.8	.8	.....	.7
17	0.58	.5	.55	.65	.....	.....	1.2	.....	.75	.8	.....	.7
18	.58	.5	.5	.65	.....	.....	1.15	.9	.75	.8	.....	.7
19	.58	.5	.5	.65	1.3	.....	1.1	.9	.75	.8	.7	.65
20	.58	.5	.5	.65	1.3	.....	1.1	.9	.75	.....	.7	.65
21	.58	.5	.5	.....	1.3	.....	1.2	.....	.75	.7	.8	.65
22	.5	.5	.5	.....	1.3	.....	1.25	.....	.75	.....	.7	.65
23	.5	.5	.5	.....	1.3	.....	1.3	.....	.75	.7	.7	.65
24	.5	.5	.5	.....	1.3	.....	.....	.....	.75	.7	.7	.65
25	.5	.5	.5	.....	1.3	.....	1.2	.....	.....	.7	.7	.65
26	.5	.5	.5	.....	1.3	.....	1.15	.....	.....	.7	.8	.65
27	.5	.5	.5	1.05	1.4	.....	1.15	.8	.....	.7	.9	.65
28	.5	.5	.55	1.0	1.5	.....	1.1	.8	.....	.7	1.0	.65
29	.6	.....	.6	1.0	1.5	.....	1.1	.8	.....	.7	.7	.7
30	.7	.....	.6	1.0	1.5	.....	1.1	.8	.....	.7	.8	.65
31	.7	.....	.6	.....	1.5	.....	1.1	.8	.....	.7	.....	.65

NOTE.—Gage heights Nov. 27 and 28 affected by backwater from an ice jam. Effect of ice during January and December very slight.

Daily discharge, in second-feet, of Quartz Creek near Pitkin, Colo., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	27	20	23	50	208	112	61	33	38	27	27
2	.....	27	20	23	46	208	112	61	33	40	27	27
3	.....	27	20	23	46	208	102	46	33	41	27	27
4	.....	23	20	23	50	252	91	46	33	41	27	27
5	.....	23	20	23	56	.....	91	46	33	50	27	27
6	.....	23	20	23	61	.....	91	41	33	61	27	27
7	.....	23	22	23	74	.....	91	41	33	61	27	27
8	.....	23	22	24	112	.....	82	41	33	61	27	27
9	.....	25	22	24	112	.....	82	41	33	61	27	27
10	.....	25	22	24	112	.....	82	41	33	61	27	27
11	.....	25	22	24	112	.....	82	41	33	61	27	27
12	.....	23	22	25	82	.....	82	41	33	50	27	27
13	.....	22	22	25	112	.....	82	41	33	41	27	27
14	.....	20	22	25	91	.....	74	41	33	41	27	27
15	.....	20	23	25	91	.....	74	41	33	33	27	27
16	.....	20	22	25	91	189	74	41	33	33	27	27
17	22	20	22	25	91	.....	74	41	30	33	27	27
18	22	20	20	25	91	.....	68	41	30	33	27	27
19	22	20	20	25	91	.....	61	41	30	33	27	25
20	22	20	20	25	91	.....	61	41	30	30	27	25
21	22	20	20	30	91	.....	74	40	30	27	33	25
22	20	20	20	35	91	.....	82	38	30	27	27	25
23	20	20	20	40	91	.....	91	37	30	27	27	25
24	20	20	20	44	91	.....	82	36	30	27	27	25
25	20	20	20	48	91	.....	74	35	32	27	27	25

Daily discharge, in second-feet, of Quartz Creek near Pitkin, Colo., for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
26	20	20	20	52	91	.....	68	34	33	27	33	25
27	20	20	20	56	112	.....	68	33	34	27	31	25
28	20	20	22	50	138	.....	61	33	35	27	29	25
29	23	.....	23	50	138	.....	61	33	36	27	27	27
30	27	.....	23	50	138	.....	61	33	37	27	33	25
31	27	.....	23	.....	138	.....	61	33	.....	27	.....	25

NOTE.—Discharge determined from a fairly well defined rating curve. Discharge Jan. 1 to 16 estimated at 20 second-feet. Discharge interpolated for days for which gage heights are missing.

Monthly discharge of Quartz Creek near Pitkin, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	27	.....	20.9	1,290	C.
February	27	20	22.0	1,220	B.
March	23	20	21.1	1,300	B.
April	56	23	31.2	1,860	C.
May	138	46	92.6	5,690	C.
June, 5 days	252	189	213	2,110	C.
July	112	61	79.1	4,860	C.
August	61	33	40.6	2,500	C.
September	37	30	32.5	1,930	B.
October	61	27	38.7	2,380	B.
November	33	27	27.8	1,650	B.
December	27	25	26.2	1,610	B.
The period	.....	.....	.....	28,400	

SAPINERO CREEK[1] 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, Colo. No tributaries below the station.

Records available.—March 17, 1911, to December 31, 1911.

Drainage area.—84 square miles (measured from Forest atlas).

Gage.—Vertical staff.

Channel.—Somewhat shifting after high water.

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

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

Diversions.—Water sufficient to irrigate approximately 300 acres is diverted above the station.

Accuracy.—Gage heights are somewhat fragmentary, but the available records are good.

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

Discharge measurements of Sapinero Creek at Sapinero, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 17	O. M. Wimmer	0.42	31.6	Oct. 24	O. M. Wimmer	−0.10	18.8
June 18	do	1.46	283	Dec. 15[a]	H. B. Waha	.32	11.9
Sept. 4	do	−.18	18.9				

[a] Ice conditions.

[1] Known locally as Soap Creek.

Daily gage height, in feet, of Sapinero Creek at Sapinero, Colo., for 1911.

[John Schuttler, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		1.03	1.4	1.95			−0.28	−0.03	−0.1	0.2
2		1.16	1.25	1.9			− .28	.1	− .1	.4
3		1.18		1.95				.1		.4
4				1.95		0.04		.22	− .2	.22
5						.04		.47		.05
6		1.03				−.04		.52		
7		.9				−.04				.1
8		.88				−.06				.15
9		.96				−.06		.22		.12
10		.93						.22		.15
11		.88	1.9					.17		.2
12		.86	1.55				− .28	.12		.2
13		.78	1.8	2.05			− .28	.07		
14		.76	1.75	1.9			− .23			.35
15		.76	1.85	1.95				.02		.35
16		.8	1.95	1.8	0.34			.02		.4
17	0.4	1.0	1.95	1.7				.02		
18	.35	1.08		1.46				− .07		.65
19	.4							− .08		.6
20	.35		1.5					− .08		.6
21			1.31				− .28	− .08		.22
22			1.16				− .28	− .08		.2
23			1.36		.42	−.16	− .23	− .18		.15
24	.65	1.8	1.75		.34	−.16				
25	.62	1.75	1.85		.34	−.21				
26	.5	1.9	2.0		.34	−.26				.7
27	.5	2.05	1.8		.34	−.26			.3	
28	.53	2.15	1.75		.24	−.26			.25	
29	.66	2.05			.24			− .13	.3	.7
30	.78	1.7	1.7		.24			− .18	.55	
31	.9		1.8			−.26				

NOTE.—Gage heights affected by ice Nov. 27 to Dec. 31.

Daily discharge, in second-feet, of Sapinero Creek at Sapinero, Colo., for 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1		172	265	408		32	14	22	19
2		205	228	395		30	14	28	19
3		210	247	408		28	14	28	
4		198	266	408		25	14	36	16
5		185	285			25	14	64	
6		172	304			21	14	72	
7		141	323			21	14	60	
8		136	342			21	14	48	
9		155	360			21	14	36	
10		148	378			21	14	36	
11		136	395			21	14	32	
12		131	304			21	14	29	
13		112	369	434		20	14	26	
14		108	356	395		20	15	25	
15		108	382	408		20	15	24	
16		117	408	369	46	19	15	24	
17	32	165	408	343		19	15	24	
18	28	185	369	283		19	14	20	
19	32	215	330			18	14	20	
20	28	246	291			18	14	20	
21	42	277	242			18	14	20	
22	56	308	205			17	14	20	
23	69	338	255		56	17	15	17	
24	82	369	356		46	17	15	17	
25	76	356	382		46	16	16	17	

Daily discharge, in second-feet, of Sapinero Creek at Sapinero, Colo., for 1911—Contd.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
26	48	395	421	.....	46	14	17	17	.....
27	48	434	369	.....	46	14	18	18	.....
28	55	460	356	.....	37	14	19	18	.....
29	85	434	350	.....	37	14	20	18	.....
30	112	343	343	.....	37	14	21	17	.....
31	141	.....	369	.....	34	14	.....	18	.....

NOTE.—Daily discharge determined from two fairly well-defined rating curves, one applicable Mar. 17 to June 4, the other June 13 to Nov. 4.

Monthly discharge of Sapinero Creek at Sapinero, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
March, 15 days	141	28	62.3	1,850	B.
April	460	108	232	13,800	B.
May	421	205	331	20,400	C.
June, 10 days	408	283	385	7,630	B.
July, 10 days	56	34	43.1	855	B.
August	32	14	19.6	1,210	C.
September	21	14	15.1	898	C.
October	72	17	28.1	1,730	B.
November	.....	.....	a 14.0	833	D.
December	.....	.....	a 12.0	738	D.
The period	.....	.....	.....	49,900	

a Estimated from discharge measurements.

UNCOMPAHGRE RIVER BASIN.

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, 1911. 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 to approximately 6 second-feet and is returned to the river below the station.

Accuracy.—Records for stages below 55 second-feet are good, but those above that point are somewhat uncertain.

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

Discharge measurements of Uncompahgre River at Ouray, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 25	O. M. Wimmer.....	0.20	6.0	Oct. 26	O. M. Wimmer.....	0.80	33.5
Mar. 20	.....do.....	.40	12.1	Dec. 18	H. B. Waha.....	.45	14.1
Sept. 3	.....do.....	.80	42.6				

Daily gage height, in feet, of Uncompahgre River at Ouray, Colo., for 1911.

[T. J. Watkins, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	0.4	.....	1.15	1.0	2.6	2.0	1.5	0.8	2.4	0.8	0.4
2	.....	.0	.....	1.05	1.0	2.5	2.1	.....	.8	1.8	.7	.4
3	.....	.1	.....	.9	1.0	2.5	2.3	.....	.8	1.6	.7	.4
4	.....	.2	.....	.7	1.3	2.8	2.0	1.5	.8	1.6	.7	.4
5	.....	.1	0.5	.7	1.7	3.2	2.0	.....	.8	5.9	.8	.4
6	.....	.0	.4	.7	2.0	3.2	2.1	.....	.8	2.8	.8	.4
7	.....	.0	.2	.6	1.9	3.1	2.0	.....	.7	2.5	.8	.35
8	.....	.0	.3	.6	2.1	3.1	1.9	.....	.7	2.0	.8	.35
9	.....	.0	.2	.6	2.1	3.1	1.9	.....	.7	1.6	.8	.35
10	.....	.0	.2	.4	2.1	3.0	1.9	.....	.7	1.5	.7	.3
11	.....	.1	.2	.55	1.8	3.0	1.8	1.4	.7	1.4	.6	.3
12	.....	.1	.2	.6	1.7	3.1	1.9	1.4	.7	1.3	.7	.35
13	.....	.0	.3	.4	1.7	3.1	3.4	1.3	.7	1.2	.8	.35
14	.....	.....	.2	.5	1.6	3.0	2.3	1.3	.7	1.1	.8	.35
15	.....	.....	.1	.4	1.6	2.9	2.4	1.2	.7	1.0	.7	.35
16	.....	.....	.2	.6	1.7	2.9	2.4	1.0	.7	1.0	.8	.35
17	.....	.....	.3	.8	1.9	2.8	2.4	1.0	.7	1.0	.6	.45
18	.....	.....	.3	.9	2.1	2.8	2.5	1.0	.7	1.0	.6	.4
19	.....	.0	.3	1.0	2.2	2.7	2.4	.9	.7	.9	.6	.4
20	.....	.0	.4	1.0	1.9	2.7	2.2	.9	.6	.8	.6	.35
21	.....	.....	.4	1.1	1.7	2.6	2.0	.9	.7	.7	.5	.35
22	.....	.....	.4	1.3	1.6	2.6	2.0	.9	.7	.7	.5	.3
23	.....	.....	.45	1.4	1.7	2.5	2.0	.9	.8	.6	.45	.25
24	.....	.....	.5	1.4	2.1	2.6	1.9	.9	.6	.6	.4	.25
25	0.2	.....	.4	1.3	2.3	2.4	1.9	.9	.6	.6	.4	.25
26	.2	.....	.35	1.3	2.4	2.5	1.8	.9	.8	.7	.35	.25
27	.0	.....	.35	1.5	2.2	2.4	1.7	.9	.9	.8	.35	.3
28	.3	.....	.35	1.4	2.4	2.3	1.6	.9	1.0	.9	.35	.3
29	.25	.....	.45	1.5	2.4	2.2	1.6	.9	1.3	.9	.4	.3
30	.25	.....	.6	1.3	2.5	2.2	1.6	.8	1.7	.8	.4	.3
31	.3	.....	.9	.....	2.7	.....	1.5	.8	.....	.8	.....	.3

Daily discharge, in second-feet, of Uncompaghre River at Ouray, Colo., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	12	10	68	53	325	191	110	32	277	32	12
2	.....	2	10	58	53	300	211	110	32	155	25	12
3	.....	4	10	43	53	300	254	110	32	124	25	12
4	.....	6.5	10	25	85	375	191	110	32	124	25	12
5	.....	4	16	25	139	475	191	108	32	(a)	32	12
6	.....	2	12	25	191	475	211	106	32	375	32	12
7	.....	2	6.5	20	172	450	191	104	25	300	32	10
8	.....	2	9	20	211	450	172	102	25	191	32	10
9	.....	2	6.5	20	211	450	172	100	25	124	32	10
10	.....	2	6.5	12	211	425	172	98	25	110	25	9
11	.....	4	6.5	18	155	425	155	97	25	97	20	9
12	.....	4	6.5	20	139	450	172	97	25	85	25	10
13	.....	2	9	12	139	450	525	85	25	74	32	10
14	.....	2	6.5	16	124	425	254	85	25	63	32	10
15	.....	2	4	12	124	400	277	74	25	53	25	10
16	.....	2	6.5	20	139	400	277	53	25	53	32	10
17	.....	2	9	32	172	375	277	53	25	53	20	14
18	.....	2	9	43	211	375	300	53	25	53	20	12
19	.....	2	9	53	232	350	277	43	25	43	20	12
20	.....	2	12	53	172	350	232	43	20	32	20	10
21	.....	4	12	63	139	325	191	43	25	25	16	10
22	.....	4	12	85	124	325	191	43	25	25	16	9
23	.....	4	14	97	139	300	191	43	32	20	14	7.8
24	.....	4	16	97	211	325	172	43	20	20	12	7.8
25	6.5	4	12	85	254	277	172	43	20	20	12	7.8
26	6.5	4	10	85	277	300	155	43	32	25	10	7.8
27	2	4	10	110	232	277	139	43	43	32	10	9
28	9	4	10	97	277	254	124	43	53	43	10	9
29	7.8	4	14	110	277	232	124	43	85	43	12	9
30	7.8	.....	20	85	300	232	124	32	139	32	12	9
31	9	.....	43	.....	350	.....	110	32	.....	32	.....	9

[a] Discharge not known, as the rating curve has not been developed to this stage.

NOTE.—Daily discharge Feb. 14 to 18 estimated at 2 second-feet; Feb. 21 to 28, 4 second-feet, and Mar. 1 to 4, at 10 second-feet. Discharge interpolated for other days for which gage heights are missing.

Monthly discharge of Uncompahgre River at Ouray, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January 25-31	9	2	6.94	96	B.
February	12	2	3.26	188	B.
March	43	4	11.2	689	A.
April	110	12	50.3	2,990	A.
May	350	53	179	11,000	B.
June	475	232	362	21,500	C.
July	525	110	206	12,700	B.
August	110	32	70.7	4,350	B.
September	139	20	33.7	2,000	A.
October 30 days	(a)	20	90.1	5,360	B.
November	32	10	22.1	1,320	A.
December	14	7.8	10.1	621	A.
The period				62,800	

a Maximum discharges for the year occurred October 5, but the amount is not known.

UNCOMPAHGRE RIVER NEAR FORT CRAWFORD, COLO.

Location.—On the north line of sec. 23, T. 48 N., R. 9 W., New Mexico principal meridian, 2 miles north of Fort Crawford, Colo. Nearest important tributary, Happy Canyon Creek, enters about 8 miles downstream.

Records available.—July 11, 1910, to October 31, 1911. From October 2, 1907, to October 31, 1910, a station was maintained half a mile west of Fort Crawford, but the records at the two stations are not directly comparable as diversions amounting to 200 second-feet and more during the irrigation season are made between the two points.

Drainage area.—497 square miles.

Gage.—Vertical staff.

Channel.—Somewhat shifting; frequent measurements necessary.

Discharge measurements.—Made from the bridge.

Winter flow.—During the winter months observations are discontinued because of ice.

Diversions.—Beside the diversions mentioned previously many other diversions are made above and below the station. 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 Uncompahgre River above this point.

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

Cooperation.—Station is maintained in cooperation with the United States Reclamation Service, by which the field data are furnished.

Discharge measurements of Uncompahgre River near Fort Crawford, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 20	Christiansen and Swett	2.10	108	July 11	E. H. Swett	3.30	400
Apr. 18	E. H. Swett	2.10	112	26	do	3.25	351
26	do	2.45	169	Aug. 23	do	3.12	348
May 15	do	2.05	110	Sept. 8	do	2.30	129
31	do	3.32	365	11	do	2.32	135
June 13	do	4.90	1,030	Oct. 3	do	3.47	435
22	do	4.30	846				

Daily gage height, in feet, of Uncompahgre River near Fort Crawford, Colo., for 1911.

[W. F. Hurlburt, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	2.50	1.75	3.30	3.40	3.25	2.08	5.00
2	2.65	1.65	3.30	3.75	3.10	2.02	4.10
3	2.55	1.55	3.35	4.30	2.55	2.05	3.80
4	2.65	1.60	3.30	4.25	2.35	2.25	3.30
5	2.43	2.10	3.85	4.05	2.45	2.22	5.00
6	2.50	3.00	4.35	4.05	2.40	2.12	5.10
7	2.35	2.45	4.30	4.10	2.45	2.22	4.60
8	2.20	2.85	4.35	3.80	2.15	2.03	3.65
9	2.15	2.95	4.65	3.65	2.10	1.88	3.50
10	2.05	2.80	4.60	3.50	2.45	2.25	3.45
11	1.80	2.20	4.70	3.35	2.60	2.16	3.35
12	1.95	2.00	4.85	3.15	2.60	2.20	3.25
13	1.87	2.10	4.60	4.45	2.75	2.15	3.15
14	1.75	.....	4.90	4.60	2.43	2.18	3.05
15	1.60	2.30	3.90	4.15	2.42	2.35	2.95
16	1.77	2.20	4.05	3.75	2.40	2.30	2.85
17	2.10	2.40	3.90	3.40	2.32	2.25	2.75
18	2.10	2.45	3.90	3.45	2.35	2.35	2.80
19	2.22	2.50	4.35	4.10	2.50	2.28	2.80
20	2.50	2.20	4.30	4.10	2.40	2.25	2.70
21	2.43	2.00	4.05	3.85	2.40	2.23	2.65
22	2.54	1.95	4.25	3.80	2.55	2.30	2.60
23	2.62	1.95	4.10	3.80	3.05	2.30	2.60
24	2.32	2.40	4.20	3.25	2.60	2.29	2.50
25	2.32	3.30	4.15	2.95	2.50	2.22	2.50
26	2.50	3.05	3.85	3.05	2.32	2.15	2.55
27	2.53	2.55	3.80	3.30	2.22	2.38	2.70
28	2.65	2.40	3.85	2.95	2.18	2.55	2.50
29	2.62	2.80	3.75	2.90	2.09	2.60	2.60
30	2.00	3.20	3.40	.....	2.10	3.80	2.60
31	.....	3.40	.....	3.60	2.10	.....	2.50

Daily discharge, in second-feet, of Uncompahgre River near Fort Crawford, Colo., for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	174	66	378	412	362	107	1,120
2	204	56	378	540	316	99	686
3	184	47	395	777	184	103	560
4	204	51	378	754	149	133	378
5	162	110	580	664	166	128	1,120
6	174	288	800	664	157	113	1,170
7	149	166	777	686	166	128	920
8	125	250	800	560	118	100	501
9	118	275	944	501	110	81	446
10	103	237	920	446	166	133	429
11	71	125	968	395	193	119	395
12	90	96	1,040	331	193	125	362
13	79	110	920	848	226	118	331
14	66	126	1,070	920	162	122	302
15	51	141	600	708	160	149	275
16	68	125	664	540	157	141	250
17	110	157	600	412	144	133	226
18	110	166	600	429	149	149	237
19	128	174	800	686	174	138	237
20	174	125	777	686	157	133	214
21	162	96	664	580	157	130	204
22	182	90	754	560	184	141	193
23	197	90	686	560	302	141	193
24	144	157	731	362	193	139	174
25	144	378	708	275	174	128	174
26	174	302	580	302	144	118	184
27	180	184	560	378	128	154	214
28	204	157	580	275	122	184	174
29	197	237	540	262	109	193	193
30	96	346	412	372	110	560	193
31	.....	412	.....	482	110	.....	174

NOTE.—Discharge determined from a well-defined rating curve.

Monthly discharge of Uncompahgre River near Fort Crawford, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April	204	51	141	8,390	B.
May	412	47	172	10,600	B.
June	1,070	378	687	40,900	B.
July	920	262	528	32,500	B.
August	362	109	172	10,600	B.
September	560	81	145	8,630	B.
October	1,170	174	394	24,200	B.
The period				136,000	

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 October 31, 1911.

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.—Sufficient discharge measurements were made during 1911 to enable computation of discharges by indirect method for shifting channels; the estimates may be considered fair.

Cooperation.—Station is 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 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 21	Christiansen and Swett.	2.95	114	July 18	E. H. Swett	3.75	292
Apr. 12	E. H. Swett	2.70	77.2	31	do	4.02	357
28	do	3.12	174	Aug. 14	do	3.05	124
May 17	do	2.50	44.3	28	do	2.80	73.2
19	do	3.00	122	Sept. 26	do	2.67	58.1
June 3	do	3.65	280	Oct. 10	do	3.50	370
13	do	5.40	922	14	do	3.01	234
28	do	4.58	469	23	do	2.60	147

Daily gage height, in feet, of Uncompahgre River at Montrose, Colo., for 1911.

[Alfred Reeves, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	.....	3.30	2.38	3.30	4.00	3.15	2.47	5.95
2	.....	3.35	2.30	3.52	4.60	3.55	2.42	4.80
3	.....	3.34	2.37	3.60	4.80	3.75	.....	4.45
4	.....	3.42	2.58	3.60	4.65	3.65	.....	4.08
5	.....	3.23	2.97	4.50	4.80	3.58	2.82	5.64
6	.....	3.15	3.45	4.60	4.65	3.10	2.70	5.55
7	.....	3.05	3.35	4.60	4.65	2.65	2.68	4.35
8	.....	2.99	3.30	4.80	4.40	2.40	2.52	3.90
9	.....	2.90	3.23	4.75	4.10	2.40	2.35	3.68
10	.....	2.84	3.03	5.10	4.20	2.80	2.50	3.49
11	.....	2.64	2.50	5.00	3.85	2.96	2.47	3.22
12	.....	2.61	2.27	5.30	3.70	2.92	2.44	3.14
13	.....	2.54	2.33	5.15	4.45	3.05	2.59	3.08
14	.....	2.35	2.20	5.30	5.30	2.92	2.68	2.99
15	.....	2.26	2.46	4.65	4.25	2.72	2.91	2.92
16	.....	2.27	2.29	4.70	4.25	2.55	2.78	2.82
17	.....	2.69	2.43	4.50	4.00	2.45	2.70	2.78
18	.....	2.66	2.40	4.05	3.80	2.37	2.70	2.76
19	.....	3.07	2.55	6.20	4.55	2.35	2.70	2.76
20	.....	3.15	2.45	7.30	4.70	2.54	2.72	2.72
21	2.95	3.34	2.25	5.90	4.50	2.72	2.69	2.72
22	.....	3.32	2.05	6.35	4.20	2.82	2.74	2.68
23	.....	3.00	2.06	6.10	4.45	3.05	2.82	2.62
24	.....	2.90	2.75	5.80	4.20	2.82	2.80	2.60
25	.....	2.91	3.33	5.55	3.70	2.75	2.81	2.54
26	.....	3.30	3.25	4.55	3.80	2.65	2.84	2.55
27	.....	3.30	2.88	4.45	3.65	2.70	2.86	2.62
28	.....	3.25	2.55	4.25	3.45	2.70	2.90	2.64
29	.....	3.00	3.02	3.50	3.25	2.70	3.25	2.60
30	.....	2.70	3.28	2.90	3.35	2.65	4.12	2.58
31	.....	.....	3.35	.....	4.10	2.56	.....	2.54

Daily discharge, in second feet, of Uncompahgre River at Montrose, Colo., for 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	.....	185	33	185	280	145	32	1,280
2	.....	198	27	240	480	238	27	730
3	.....	195	32	260	550	288	44	580
4	.....	215	57	260	530	262	61	440
5	.....	171	119	560	590	245	79	1,270
6	.....	155	222	595	530	135	60	1,220
7	.....	135	198	595	530	52	57	630
8	.....	123	185	670	450	25	37	440
9	.....	105	171	650	350	25	20	440
10	.....	96	131	790	380	75	35	367
11	.....	66	45	750	270	107	32	286
12	.....	62	25	875	275	99	29	265
13	.....	51	29	810	502	125	44	250
14	.....	31	20	875	830	99	57	228
15	.....	24	41	612	432	63	97	210
16	.....	25	26	630	432	40	72	189
17	.....	74	38	560	355	30	60	181
18	.....	69	35	398	300	22	60	177
19	.....	139	52	1,290	538	20	60	177
20	.....	155	40	1,840	595	39	63	169
21	115	195	24	1,140	520	63	58	169
22	.....	190	12	1,360	415	79	66	161
23	.....	125	12	1,240	502	125	79	149
24	.....	105	82	1,050	415	79	75	145
25	.....	107	192	940	275	68	77	136
26	.....	185	175	500	300	52	83	138
27	.....	185	102	460	262	60	87	149
28	.....	175	52	360	212	60	95	133
29	.....	125	129	160	165	60	165	145
30	.....	75	181	50	188	52	391	142
31	.....	.....	198	.....	385	41	.....	136

NOTE.—Daily discharge determined by indirect method for shifting channels. Discharge interpolated Sept. 3 and 4.

Monthly discharge of Uncompahgre River at Montrose, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April	215	24	125	7,440	C.
May	222	12	86.6	5,320	C.
June	1,840	50	690	41,100	C.
July	830	165	414	25,500	C.
August	288	20	92.7	5,700	C.
September	391	27	73.4	4,370	C.
October	1,280	136	360	22,100	C.
The period				112,000	

UNCOMPAHGRE RIVER NEAR DELTA, COLO.

Location.—At highway bridge on range line between R. 95 and R. 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 October 31, 1911.

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 of discharge must be rated as fair or, possibly, for certain periods, good, as sufficient measurements have not been made to give data for using the indirect method for shifting channels to the fullest extent.

Cooperation.—Station maintained in cooperation with the United States Reclamation Service, by which the field data are furnished.

Discharge measurements of Uncompahgre River near Delta, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 20	E. H. Swett	2.11	74.0	July 21	E. H. Swett	3.44	605
May 4	do	2.39	117	Aug. 3	do	2.14	147
25	do	2.30	98.0	30	do	1.71	48.8
July 7	do	3.40	392	Oct. 13	do	2.84	511

Daily gage height, in feet, of Uncompahgre River near Delta, Colo., for 1911.

[Mrs. W. J. Lance, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	2.75	2.60	2.05	2.50	2.29	1.64	4.44
2	2.95	2.15	2.00	2.95	2.24	1.64	4.29
3	2.90	2.25	2.10	3.60	2.24	1.69	3.54
4	2.75	2.50	2.25	4.25	1.94	1.74	3.29
5	2.75	2.80	2.75	3.75	1.69	1.74	4.24
6	2.85	2.80	2.95	3.60	1.64	1.74	5.34
7	2.90	3.35	3.15	3.45	1.64	1.74	4.14
8	2.60	3.50	3.10	3.50	1.54	1.74	3.44
9	2.55	3.80	3.30	3.20	1.54	1.74	3.24
10	2.40	3.50	3.35	3.25	1.52	1.74	3.19
11	2.25	3.10	3.80	2.85	1.69	1.79	3.04
12	2.10	2.75	3.65	2.50	1.66	1.74	2.94
13	2.00	2.55	3.75	2.75	1.72	1.79	2.84
14	1.90	2.50	3.80	.....	1.69	1.64	2.84
15	1.90	2.50	3.60	.....	1.64	2.04	2.74
16	1.80	2.30	3.35	.....	1.54	2.04	2.64
17	1.75	2.20	3.25	.....	1.54	2.04	2.59
18	1.75	2.25	3.00	.....	1.54	2.04	2.54
19	1.80	2.30	3.40	.....	1.54	2.04	2.44
20	2.15	2.30	3.70	.....	1.54	2.04	2.39
21	2.40	2.25	3.75	3.54	1.59	2.04	2.34
22	2.75	2.30	4.00	3.44	1.64	2.09	2.29
23	2.95	2.30	3.90	3.64	1.89	2.39	2.29
24	2.90	2.10	3.95	3.44	1.74	2.24	2.29
25	2.50	2.35	3.95	3.19	1.74	2.24	2.24
26	2.65	2.35	3.60	3.14	1.69	2.24	2.24
27	2.75	2.20	3.35	3.14	1.59	2.34	2.29
28	3.00	2.10	3.10	2.84	1.74	2.49	2.44
29	3.00	2.10	2.85	2.54	1.74	2.69	2.34
30	2.75	2.00	2.65	2.54	1.79	3.09	2.34
31	.....	2.10	.....	2.34	1.74	.....	2.24

NOTE.—Gage washed out July 14 and replaced July 21.

Daily discharge, in second-feet, of Uncompahgre River near Delta, Colo., for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	192	155	62	135	187	36	1,240
2	218	78	55	245	172	36	1,170
3	230	92	70	470	172	44	810
4	192	135	92	770	95	53	660
5	192	205	192	538	44	53	1,140
6	218	205	245	470	36	53	1,740
7	230	372	275	410	36	80	1,130
8	155	430	290	490	21	80	770
9	145	560	355	370	21	80	673
10	115	430	450	390	18	80	650
11	92	290	560	255	44	90	583
12	70	192	492	195	39	80	538
13	55	145	538	260	49	90	496
14	45	135	560	310	44	60	496
15	45	135	470	360	36	150	456
16	35	100	372	410	21	150	416
17	30	85	338	460	21	150	396
18	30	92	260	510	21	150	376
19	35	100	390	560	21	150	336
20	78	100	515	610	21	150	316
21	115	92	338	653	28	150	296
22	192	100	650	608	36	190	277
23	245	100	605	698	83	290	277
24	230	70	628	608	53	240	277
25	135	108	628	501	53	240	264

Daily discharge, in second-feet, Uncompahgre River near Delta, Colo., for 1911—Contd.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
26	168	108	470	481	44	240	264
27	192	85	372	481	28	270	277
28	260	70	290	364	53	320	336
29	260	70	218	262	53	400	296
30	192	55	168	262	63	570	296
31	.....	70	.....	202	53	.....	264

NOTE.—Daily discharge determined as follows: Apr. 1 to July 7 from a fairly well defined rating curve; July 8 to 20 and Sept. 7 to Oct. 6 by indirect method for shifting channels; July 21 to Sept. 6 and Oct. 7 to 31 from poorly defined rating curves. Discharge interpolated July 14 to 20.

Monthly discharge of Uncompahgre River near Delta, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April	260	30	146	8,690	B.
May	560	55	160	9,840	B.
June	650	55	365	21,700	C.
July	770	135	430	26,400	D.
August	187	18	53.8	3,310	D.
September	570	36	158	9,400	D.
October	1,740	264	565	34,700	C.
The period	.....	.....	.....	114,000	

CANON 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 to December 31, 1911.

Drainage area.—26 square miles (measured on topographic sheets).

Gage.—Vertical staff.

Channel.—Shifting, after highwater.

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

Winter flow.—Ice causes practically no backwater at this station.

Diversions.—No water is diverted above the station.

Accuracy.—Station fairly well rated except for high stages.

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

Discharge measurements of Canon Creek at Ouray, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 25	O. M. Wimmer.....	0.21	7.9	Sept. 3	O. M. Wimmer.....	0.65	44.9
Mar. 20	.....do.....	.23	9.9	Oct. 25	.....do.....	.50	28.5
June 22	.....do.....	2.10	278	Dec. 18	H. B. Waha.....	.20	10.3

Daily gage height, in feet, of Canon Creek at Ouray, Colo., for 1911.

[T. J. Watkins, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	0.25	.....	0.85	0.7	1.5	1.8	1.3	0.6	2.0	0.4	0.2
2	.....	.2	.....	.7	.7	1.5	1.9	1.3	.6	1.6	.4	.2
3	.....	.2	.....	.8	.6	1.5	1.8	1.3	.6	1.3	.4	.2
4	.....	.25	.....	.7	.7	1.8	1.7	1.2	.6	1.3	.4	.2
5	.....	.1	0.2	.5	1.0	2.0	1.6	.....	.6	3.9	.3	.2
6	.....	.1	.2	.5	1.1	2.1	1.6	.....	.5	2.2	.3	.2
7	.....	.2	.2	.5	1.1	2.2	1.6	.....	.5	1.7	.3	.2
8	.....	.15	.2	.4	1.2	2.2	1.6	.....	.5	1.5	.4	.2
9	.....	.2	.2	.4	1.2	2.1	1.6	.....	.5	1.5	.35	.2
10	.....	.3	.2	.4	1.1	2.0	1.6	.....	.5	1.3	.3	.2
11	.....	.3	.2	.45	1.1	2.1	1.6	1.1	.5	1.2	.25	.2
12	.....	.2	.2	.4	1.0	2.2	1.6	1.1	.5	1.1	.3	.2
13	.....	.2	.2	.4	1.0	2.1	2.6	1.0	.5	1.0	.35	.2
14	.....	.2	.2	.4	.9	2.1	2.0	1.0	.5	.9	.35	.2
15	.....	.25	.25	.4	.9	2.0	2.0	.9	.5	.9	.3	.2
16	.....	.3	.3	.4	1.0	2.0	2.0	.9	.5	.8	.3	.2
17	.....	.....	.25	.5	1.1	1.9	2.0	.9	.5	.8	.25	.2
18	.....	.....	.3	.55	1.1	1.9	2.0	.8	.5	.8	.25	.2
19	.....	.2	.25	.6	1.2	1.9	2.1	.8	.5	.7	.25	.2
20	.....	.2	.25	.7	1.1	1.8	2.0	.8	.5	.6	.25	.2
21	.....	.....	.25	.7	1.0	1.8	1.8	.8	.5	.4	.25	.15
22	.....	.....	.25	.8	.9	1.8	1.6	1.3	.6	.4	.2	.15
23	.....	.....	.25	.95	1.0	1.7	1.6	1.1	.6	.4	.2	.15
24	.....	.....	.25	.9	1.3	1.7	1.6	1.0	.6	.4	.2	.15
25	.2	.....	.25	.8	1.2	1.8	1.6	.9	.6	.4	.2	.15
26	.2	.....	.25	.8	1.3	1.7	1.5	.8	.7	.4	.2	.15
27	.2	.....	.25	.9	1 2	1.8	1.5	.8	.8	.5	.2	.15
28	.2	.....	.25	.9	1.3	1.6	1.4	.8	.9	.5	.2	.15
29	.25	.....	.3	1.0	1.4	1.5	1.4	.7	1.1	.5	.2	.15
30	.25	.....	.4	.8	1.5	1.4	1.4	.6	1.5	.4	.2	.15
31	.25	.....	.7	.....	1.5	.....	1.3	.6	.....	.4	.....	.15

Daily discharge, in second-feet, of Canon Creek at Ouray, Colo., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	11	8.0	70	50	172	224	138	38	260	20	8.0
2	.....	8.0	8.0	50	50	172	242	138	38	189	20	8.0
3	.....	8.0	8.0	63	38	172	224	138	38	138	20	8.0
4	.....	11	8.0	50	50	224	206	122	38	138	20	8.0
5	.....	4.0	8.0	28	92	260	189	120	38	510	14	8.0
6	.....	4.0	8.0	28	107	278	189	118	28	296	14	8.0
7	.....	8.0	8.0	28	107	296	189	116	28	206	14	8.0
8	.....	6.0	8.0	20	122	296	189	114	28	172	20	8.0
9	.....	8.0	8.0	20	122	278	189	112	28	172	17	8.0
10	.....	14	8.0	20	107	260	189	110	28	138	14	8.0
11	.....	14	8.0	24	107	278	189	107	28	122	11	8.0
12	.....	8.0	8.0	20	92	296	189	107	28	107	14	8.0
13	.....	8.0	8.0	20	92	278	368	92	28	92	17	8.0
14	.....	8.0	8.0	20	77	278	260	92	28	77	17	8.0
15	.....	11	11	20	77	260	260	77	28	77	14	8.0
16	.....	14	14	20	92	260	260	77	28	63	14	8.0
17	.....	12	11	28	107	242	260	77	28	63	11	8.0
18	.....	10	14	33	107	242	260	63	28	63	11	8.0
19	.....	8.0	11	38	122	242	278	63	28	50	11	8.0
20	.....	8.0	11	50	107	224	260	63	28	38	11	8.0
21	.....	8.0	11	50	92	224	224	63	28	20	11	6.0
22	.....	8.0	11	63	77	224	189	138	38	20	8.0	6.0
23	.....	8.0	11	84	92	206	189	107	38	20	8.0	6.0
24	.....	8.0	11	77	138	206	189	92	38	20	8.0	6.0
25	8.0	8.0	11	63	122	224	189	77	38	20	8.0	6.0
26	8.0	8.0	11	63	138	206	172	63	50	20	8.0	6.0
27	8.0	8.0	11	77	122	224	172	63	63	28	8.0	6.0
28	8.0	8.0	11	77	138	189	155	63	77	28	8.0	6.0
29	11	.....	14	92	155	172	155	50	107	28	8.0	6.0
30	11	.....	20	63	172	155	155	38	172	20	8.0	6.0
31	11	.....	50	.....	172	.....	138	38	.....	20	.....	6.0

NOTE.—Daily discharge determined from a fairly well defined rating curve. Discharge Jan. 1 to 24 estimated at 8 second-feet. Discharge interpolated for other days for which gage heights are missing.

Monthly discharge of Canon Creek at Ouray, Colo., for 1911.

[Drainage area, 26 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	.....	.....	8.29	0.319	0.37	510	C.
February	14	6.0	8.82	.339	.35	490	B.
March	50	8.0	11.5	.442	.51	707	B.
April	92	20	45.3	1.74	1.94	2,700	B.
May	172	38	105	4.04	4.66	6,460	C.
June	296	155	235	9.04	10.10	14,000	C.
July	368	138	211	8.12	9.36	13,000	C.
August	138	38	91.5	3.52	4.06	5,630	C.
September	172	28	42.0	1.62	1.81	2,500	B.
October	510	20	104	4.00	4.61	6,400	C.
November	20	8.0	12.9	.496	.55	768	B.
December	8	6.0	7.29	.280	.32	448	B.
The year	368	6.0	73.6	2.83	38.64	53,600	

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 Canon Creek, enters some distance above the station.

Records available.—August 27, 1910, to December 31, 1911.

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 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 11[a]	Grieve and Clayton	2.38	66	May 19	B. S. Clayton	5.70	2,690
12[a]	do	2.40	69	June 25	do	4.75	1,350
Mar. 17	B. S. Clayton	2.92	212	Aug. 28	do	2.95	240
Apr. 17	do	4.00	888	Nov. 12	do	2.69	150
May. 18	do	5.30	2,140	Dec. 12[a]	do	2.92	88

[a] Ice condition.

Daily gage height, in feet, of Dolores River at Dolores, Colo., for 1911.

[Mrs. J. I. Hughes, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.7	2.9	2.35	3.9	4.55	5.15	4.15	3.85	2.8	5.65	.....	3.1
2	2.8	2.7	2.35	3.95	4.6	5.05	4.35	3.7	2.8	4.95	.....	3.15
3	2.8	2.6	2.3	3.9	4.85	5.05	4.35	3.6	2.8	.....	.....	3.0
4	2.85	2.6	2.35	3.9	5.15	5.1	4.2	3.55	2.85	.....	.....	3.1
5	2 9	2 55	2.45	3.75	5.55	5.15	4.0	3.5	2.8	.....	.....	3.2
6	3.0	2.5	2.45	3.7	5.8	5.25	3.95	3.4	2.7	.....	.....	3.2
7	3.0	2.4	2.4	3.65	5.75	5.15	4.25	3.3	2.7	.....	.....	3.15
8	2.95	2.5	2.45	3.6	5.85	5.15	4.2	3.25	2.7	.....	.....	3.15
9	2.95	2.45	2.5	3.55	5.9	5.35	4.05	3.2	2.7	.....	.....	2.9
10	3.0	2.55	2.85	3.55	5.8	5.3	3.85	3.25	2.65	.....	.....	3.1
11	3.15	2.65	3.2	3.65	5.5	5.2	3.7	3.35	2.6	.....	.....	3.0
12	3.2	2.45	2.9	3.7	5.4	5.1	3.75	3.35	2.6	.....	2.8	3.0
13	3.2	2.35	2.75	3.65	5.4	5.0	4.3	3.3	2.65	.....	2.8	.....
14	3.15	2.35	2.7	3.65	5.2	5.1	4.6	3.15	2.7	.....	2.8	.....
15	3.1	2.35	2.75	3.7	5.2	5.1	4.35	3.05	2.75	.....	2.75	.....
16	3.15	2.3	2.85	3.85	5.15	4.95	4.1	3.05	2.7	.....	2.95	.....
17	3.2	2.3	2.95	4.0	5.25	4.75	4.1	3.05	2.6	.....	2.8	.....
18	3.15	2.4	3.0	4.1	5.35	4.65	3.9	3.0	2.55	.....	2.8	.....
19	3.05	2.35	2.95	4.25	5.6	4.6	4.5	3.05	2.5	.....	2.9	.....
20	3.05	2.3	3.05	4.45	5.2	4.65	4.9	3.0	2.4	.....	3.0	.....
21	3.0	2.3	3.10	4.6	4.9	4.6	4.75	3.0	2.45	.....	2.95	.....
22	3.05	2.55	3.2	4.9	4.95	4.7	4.6	3.2	2.6	.....	2.9	.....
23	2.9	2.35	3.25	4.95	5.2	4.55	4.55	3.25	2.95	.....	3.0	.....
24	3.1	2.4	3.3	4.7	5.4	4.55	4.4	3.1	2.85	.....	2.9	.....
25	3.15	2.5	3.35	4.7	5.4	4.5	4.75	3.0	2.65	.....	3.0	.....
26	3.2	2.4	3.2	4.9	5.35	4.3	5.35	3.0	2.5	.....	3.0	.....
27	3.15	2.4	3.1	5.0	5.25	4.25	4.9	2.9	2.9	.....	2.9	.....
28	3.05	2.35	3.2	5.15	5.2	4.3	4.75	2.9	3.05	.....	2.8	.....
29	3.15	.....	3.35	5.2	5.15	4.2	4.5	2.85	3.35	.....	2.8	.....
30	3.15	.....	3.55	4.75	5.0	4.15	4.35	2.8	4.35	.....	3.1	.....
31	3.0	.....	3.75	.....	5.0	.....	4.0	2.8	.....	.....	.....	.....

NOTE.—Gage heights affected by ice Jan. 1 to Feb. 12 and Dec. 11 to 31.

Daily discharge, in second-feet, of Dolores River at Dolores, Colo., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	80	65	74	805	1,390	2,008	895	695	180	2,095	.....	180
2	80	65	74	848	1,440	1,902	1,042	605	180	1,510	.....	200
3	80	65	67	805	1,690	1,902	1,042	545	180	.....	.....	150
4	80	65	74	805	2,008	1,955	930	515	195	.....	.....	150
5	80	65	92	692	2,452	2,008	795	485	180	.....	.....	150
6	80	65	92	655	2,740	2,115	762	430	150	.....	.....	125
7	80	65	82	618	2,682	2,008	968	380	150	.....	.....	125
8	80	65	92	580	2,798	2,008	930	358	150	.....	.....	100
9	80	65	102	548	2,855	2,225	828	335	150	.....	.....	100
10	75	65	195	548	2,740	2,170	695	358	137	.....	.....	100
11	75	65	340	618	2,395	2,060	605	405	124	.....	.....	90
12	75	70	210	655	2,280	1,955	635	405	124	.....	180	88
13	75	74	165	618	2,280	1,850	1,005	380	137	.....	180	.....
14	75	74	150	618	2,060	1,955	1,230	312	150	.....	180	.....
15	75	74	165	655	2,060	1,955	1,042	270	165	.....	165	.....
16	70	67	195	768	2,008	1,770	860	270	150	.....	230	.....
17	70	67	230	890	2,115	1,540	860	270	124	.....	180	.....
18	70	82	250	975	2,225	1,420	730	250	113	.....	180	.....
19	70	74	230	1,105	2,510	1,350	1,155	270	102	.....	210	.....
20	70	67	270	1,292	2,060	1,380	1,470	250	82	.....	250	.....
21	60	67	295	1,440	1,745	1,300	1,350	250	92	.....	230	.....
22	60	113	340	1,745	1,798	1,380	1,230	335	124	.....	210	.....
23	60	74	368	1,798	2,060	1,220	1,192	358	230	.....	250	.....
24	60	82	395	1,540	2,280	1,200	1,080	290	195	.....	210	.....
25	60	102	425	1,540	2,280	1,120	1,350	250	137	.....	250	.....
26	60	82	340	1,745	2,225	1,005	1,840	250	102	.....	250	.....
27	60	82	290	1,850	2,115	968	1,470	210	210	.....	210	.....
28	60	74	340	2,008	2,060	1,005	1,350	210	270	.....	180	.....
29	60	.....	425	2,060	2,008	930	1,155	195	405	.....	180	.....
30	60	.....	548	1,590	1,850	895	1,042	180	1,042	.....	180	.....
31	60	.....	692	.....	1,850	.....	795	180	.....	.....	.....	.....

NOTE.—Daily discharge estimated, because of backwater from ice, Jan. 1 to Feb. 12.

Monthly discharge of Dolores River at Dolores, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January	80	60	70	4,324
February	113	65	73	4,046
March	692	67	245	15,092
April	2,060	548	1,080	64,292
May	2,855	1,390	2,163	133,014
June	2,225	895	1,619	96,315
July	1,840	605	1,043	64,131
August	695	180	339	20,818
September	1,042	82	191	11,364
October 1–2	2,095	1,510	1,800	7,150
November 12–30	250	165	206	7,745
December 1–12	200	88	130	2,090
The period				430,381

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 31, 1911.

Drainage area.—304 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 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 13	Grieve and Clayton	0.40	61	Aug 26	B. S. Clayton	1.40	243
Mar. 16	B. S. Clayton	.48	72	Oct. 5	do	5.20	1,740
Apr. 15	do	1.00	166	Nov. 24	do	.67	94
May 20	do	2.10	513	Dec. 16[a]	M. E. Bunger	1.70	56
June 24	do	2.50	634				

[a] Ice conditions.

Daily gage height, in feet, of San Miguel River at Placerville, Colo., for 1911.

[John E. Stanquist, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.0	0.60	0.45	1.05	1.55	2.45	2.6	.....	1.15	3.3	0.95	0.7
2	1.6	.55	.45	1.05	1.5	2.4	3.05	.....	1.1	2.55	1.0	.7
3	1.6	.45	.4	1.15	1.7	2.45	2.9	.....	1.15	2.1	.9	.75
4	.5	.45	.45	1.15	2.0	2.6	3.0	.....	1.15	1.7	.9	.9
5	.4	.5	.5	.95	2.15	2.85	2.75	.....	1.1	4.35	1.0	.9
6	.6	.5	.45	.95	2.35	3.05	2.7	.....	1.0	3.95	.95	.85
7	.8	.4	.45	.9	2.4	2.9	2.75	.....	1.0	2.85	.9	.85
8	.7	.4	.45	.85	2.5	3.05	2.6	.....	1.0	2.35	1.0	.8
9	.6	.4	.45	.85	2.6	3.1	2.6	1.75	.95	2.15	1.0	.75
10	.6	.45	.7	.8	2.55	3.0	2.45	1.8	1.0	2.0	1.0	.8
11	.6	.45	.6	.85	2.45	3.1	2.25	1.85	1.0	1.9	.8	.7
12	.5	.45	.45	.85	2.3	3.1	2.2	1.85	1.0	1.75	.7	.7
13	.5	.45	.5	.8	2.3	3.0	3.9	1.85	1.05	1.7	1.05	.95
14	.5	.4	.5	.75	2.2	3.1	.....	1.7	1.15	1.6	.9	1.45
15	.5	.4	.5	.8	2.15	2.85	.....	1.65	1.15	1.55	.9	1.8
16	.6	.35	.5	.95	2.1	2.55	.....	1.65	1.1	1.45	.9	2.15
17	.5	.35	.5	1.15	2.15	2.45	.....	1.65	1.0	1.45	.9	1.85
18	.5	.4	.45	1.2	2.2	2.4	.....	1.55	.95	1.35	.9	1.8
19	.5	.4	.45	1.4	2.5	2.55	.....	1.55	.9	1.3	.9	.95
20	.5	.4	.5	1.6	2.1	2.6	.....	1.55	.9	1.15	.85	.85
21	.5	.35	.55	1.8	2.1	2.65	.....	1.7	.85	1.1	.85	1.2
22	.5	.4	.55	1.75	2.1	2.8	.....	2.05	.85	1.15	.85	1.75
23	.45	.4	.55	1.65	2.1	2.65	.....	1.8	1.05	1.15	.8	1.8
24	.45	.4	.55	1.7	2.3	2.65	.....	1.7	.9	1.15	.75	2.4
25	.45	.45	.55	1.7	2.4	2.5	.....	1.55	.85	1.1	.7	2.35
26	.45	.45	.45	1.7	2.4	2.5	.....	1.5	1.0	1.15	.75	2.75
27	.45	.35	.55	1.9	2.2	2.6	.....	1.35	1.2	1.1	.7	3.25
28	.45	.4	.65	1.8	2.25	2.8	.....	1.3	1.45	1.1	.6	3.55
29	.55	.....	.7	1.8	2.3	2.7	.....	1.25	1.4	1.15	.65	3.65
30	.55	.....	.8	1.6	2.45	2.65	.....	1.2	2.35	1.0	.75	3.55
31	.45	.....	.9	.....	2.4	.....	.....	1.15	.....	.95	.....	3.7

NOTE.—Gage heights affected by ice Jan. 1 to 3 and Nov. 30 to Dec. 31. The gage was washed out July 14.

Daily discharge, in second-feet, of San Miguel River at Placerville, Colo., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	75	91	68	184	322	635	670	.....	184	988	142	85
2	75	83	68	184	306	615	868	.....	173	650	152	85
3	75	68	60	209	370	632	798	.....	184	478	133	85
4	75	68	68	209	472	695	844	.....	184	340	133	80
5	60	75	75	160	529	780	733	.....	173	1,540	152	80
6	91	75	68	160	606	890	712	.....	152	1,318	142	80
7	127	60	68	148	626	820	733	.....	152	776	133	75
8	108	60	68	138	666	885	670	.....	152	571	152	75
9	91	60	68	138	706	910	670	356	142	496	152	75
10	91	68	108	127	686	860	610	372	152	442	152	70
11	91	68	91	138	646	910	533	389	152	406	115	70
12	75	68	68	138	586	908	514	389	152	356	100	70
13	75	68	75	127	586	858	1,292	389	162	340	162	60
14	75	60	75	118	548	906	.....	340	184	308	133	60
15	75	60	75	127	529	788	.....	324	184	293	133	60
16	91	54	75	160	510	662	.....	324	173	263	133	56
17	75	54	75	199	529	620	.....	324	152	263	133	55
18	75	60	68	222	548	600	.....	293	142	234	133	55
19	75	60	68	276	666	658	.....	293	133	221	133	55
20	75	60	75	338	510	678	.....	293	133	184	124	55
21	75	54	83	404	510	700	.....	340	124	173	124	50
22	75	60	83	387	510	760	.....	460	124	184	124	50
23	68	60	83	354	510	700	.....	372	162	184	115	50
24	68	60	83	370	586	700	.....	340	133	184	108	50
25	68	68	83	370	626	630	.....	293	124	173	100	50
26	68	68	68	370	626	630	.....	278	152	184	108	55
27	68	54	83	438	548	670	.....	234	196	173	100	55
28	68	60	100	404	562	754	.....	221	263	173	85	55
29	83	.....	108	404	580	712	.....	208	248	184	92	55
30	83	.....	127	338	638	691	.....	196	571	152	92	55
31	68	.....	148	.....	615	.....	.....	184	.....	142	.....	55

NOTE.—Daily discharge estimated, because of backwater from ice, Jan. 1 to 3 and Nov. 30 to Dec. 31.

Monthly discharge of San Miguel River at Placerville, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January	127	60	78.8	4,850
February	91	54	64.4	3,580
March	148	60	81.1	4,990
April	438	118	245	14,600
May	706	306	557	34,200
June	910	600	742	44,200
July 1-13	1,292	514	742	19,100
August 9-31	480	184	314	14,300
September	571	124	177	10,500
October	1,540	142	399	24,500
November	162	85	126	7,500
December	85	50	63.4	3,900
The period				186,000

FREMONT RIVER BASIN.

FREMONT RIVER NEAR THURBER, UTAH.

Location.—At the ranch of John Smith, in sec. 6, T. 29 S., R. 4 E., Salt Lake meridian, 2 miles below the town of Thurber.

Records available.—May 13, 1909, to December 31, 1911.

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 control.—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 are only approximate at times, because of the shifting character of the stream bed and probable effect of backwater at gage.

Cooperation.—Maintained in cooperation with the State of Utah.

The following discharge measurement was made by J. C. Dort:
August 7, 1911: Gage height, 5.13 feet, discharge, 60.8 second-feet.

Daily gage height, in feet, of Fremont River near Thurber, Utah, for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	6.2	5.75	5.5	6.7	5.25	4.95	4.9	5.25	5.2	5.25	5.3	5.55
2	6.0	5.7	5.5	6.9	5.25	4.95	4.95	5.3	5.2	5.25	5.3	5.4
3	5.95	5.65	5.6	6.8	5.3	4.9	4.9	5.25	5.25	5.3	5.25	5.45
4	6.05	5.65	5.8	6.85	5.35	4.85	4.85	5.25	5.25	5.3	5.25	5.4
5	5.95	5.6	5.9	5.6	5.4	4.85	4.85	5.2	5.3	5.35	5.25	5.35
6	5.55	5.6	5.9	5.6	5.4	4.9	4.8	5.2	5.3	5.3	5.3	5.4
7	5.6	5.55	5.95	5.2	5.45	4.9	4.85	5.25	5.25	5.35	5.3	5.4
8	5.7	5.5	5.9	5.0	5.45	4.95	4.8	5.25	5.25	5.3	5.3	5.35
9	5.8	5.55	5.9	5.1	5.4	4.9	4.9	5.2	5.2	5.35	5.35	5.35
10	5.9	5.5	5.85	5.0	5.45	4.85	4.95	5.2	5.2	5.35	5.35	5.4

Daily gage height, in feet, of Fremont River near Thurber, Utah, for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
11	5.9	5.5	5.85	5.0	5.45	4.85	5.0	5.25	5.25	5.3	5.3	5.4
12	5.85	5.6	5.9	5.0	5.45	4.9	5.0	5.3	5.25	5.3	5.35	5.35
13	5.9	5.55	5.9	4.9	5.4	4.9	5.0	5.35	5.25	5.3	5.4	5.35
14	5.95	5.55	5.95	4.95	5.45	4.95	5.05	5.35	5.3	5.25	5.4	5.3
15	5.9	5.5	5.95	4.9	5.6	4.9	5.05	5.3	5.25	5.25	5.45	5.35
16	5.85	5.5	5.95	4.9	5.6	4.85	5.1	5.25	5.3	5.3	5.4	5.4
17	5.9	5.55	5.9	4.9	5.55	4.9	5.1	5.25	5.25	5.25	5.45	5.45
18	5.85	5.6	5.9	4.95	5.5	4.95	5.15	5.2	5.25	5.25	5.4	5.4
19	5.8	5.55	5.95	4.95	5.5	4.95	5.2	5.25	5.25	5.3	5.35	5.4
20	5.75	5.5	5.9	5.0	5.5	5.0	5.1	5.25	5.3	5.3	5.4	5.35
21	5.80	5.5	5.8	5.0	5.55	5.05	5.1	5.3	5.25	5.3	5.4	5.4
22	5.65	5.6	5.85	5.0	5.5	5.1	5.05	5.3	5.2	5.25	5.45	5.4
23	5.6	5.55	5.6	5.2	5.45	5.05	5.1	5.25	5.25	5.3	5.4	5.45
24	5.8	5.5	5.6	5.2	5.4	5.05	5.15	5.25	5.3	5.25	5.45	5.4
25	5.8	5.5	5.6	5.25	5.35	5.0	5.15	5.3	5.3	5.3	5.5	5.45
26	5.85	5.5	5.65	5.25	5.35	4.9	5.2	5.25	5.35	5.3	5.55	5.5
27	5.85	5.5	5.9	5.25	5.3	4.9	5.2	5.25	5.35	5.3	5.55	5.45
28	5.85	5.55	5.9	5.25	5.2	4.95	5.25	5.2	5.4	5.25	5.6	5.5
29	5.8	.....	6.1	5.25	5.15	4.9	5.2	5.2	5.4	5.25	5.55	5.55
30	5.85	.....	6.2	5.2	5.1	4.95	5.25	5.25	5.35	5.3	5.5	5.6
31	5.75	.....	6.7	.....	5.0	.....	5.25	5.25	.....	5.3	.....	5.55

NOTE.—Relation of gage heights to discharge probably affected by ice Jan. 1 to Feb. 19 and Nov. 24 to Dec. 31.

Daily discharge, in second-feet, of Fremont River near Thurber, Utah, for 1911.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	113	312	77	38	32	77	70	77	84
2	.....	113	348	77	38	38	84	70	77	84
3	.....	128	330	84	32	32	77	77	84	77
4	.....	158	339	91	28	28	77	77	84	77
5	.....	174	128	98	28	28	70	84	91	77
6	.....	174	128	98	32	23	70	84	84	84
7	.....	182	70	106	32	28	77	77	91	84
8	.....	174	43	106	38	23	77	77	84	84
9	.....	174	46	98	32	32	70	70	91	91
10	.....	166	43	106	28	38	70	70	91	91
11	.....	182	43	106	28	43	77	77	84	84
12	.....	174	43	106	32	43	84	77	84	91
13	.....	174	32	98	32	43	91	77	84	98
14	.....	182	38	106	38	50	91	84	77	98
15	.....	182	32	128	32	50	84	77	77	106
16	.....	182	32	128	28	46	77	84	84	98
17	.....	174	32	120	32	46	77	77	77	106
18	.....	174	38	113	38	53	70	77	77	98
19	.....	182	38	113	38	70	77	77	84	91
20	113	174	43	113	43	46	77	84	84	98
21	113	158	43	120	50	46	84	77	84	98
22	128	166	43	113	46	50	84	70	77	106
23	120	128	70	106	50	46	77	77	84	98
24	113	128	70	98	50	53	77	84	77	.....
25	113	128	77	91	43	53	84	84	84	.....
26	113	136	77	91	32	70	77	91	84	.....
27	113	174	77	84	32	70	77	91	84	.....
28	120	174	77	70	38	77	70	98	77	.....
29	.....	206	77	53	32	70	70	98	77	.....
30	.....	223	70	46	38	77	77	91	84	.....
31	.....	312	.....	43	.....	77	77	.....	84	.....

NOTE.—Daily discharge determined from a poorly defined curve. Discharge Feb. 1 to 19 estimated at 95 second-feet; discharge Nov. 24 to 30 estimated at 85 second-feet.

Monthly discharge of Fremont River near Thurber, Utah, for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	[a] 80	4,920	D.
February	.....	.....	102	5,660	C.
March	312	113	170	10,500	B.
April	348	32	94.6	5,630	B.
May	128	43	96.3	5,920	B.
June	50	28	35.9	2,140	C.
July	77	23	47.8	2,940	C.
August	91	70	77.7	4,780	B.
September	98	70	82.8	4,930	B.
October	91	77	82.7	5,080	B.
November	.....	.....	89.9	5,350	C.
December	.....	.....	[a] 60.0	3,690	D.
The year	348	.....	84.7	61,600	

[a] Estimated.

MUDDY CREEK NEAR EMERY, UTAH.

Location.—At Jacobsen's ranch, about 1 mile above the boundary line of the Manti Forest Reserve, in the NE. ¼ NE. ¼ sec. 21, T. 21 S., R. 6 E., Salt Lake base and meridian.

Records available.—May 1 to July 31, 1909; July 23, 1910, to December 31, 1911.

Drainage area.—87 square miles.

Gage.—Inclined staff.

Channel.—Shifting.

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

Winter flow.—Ice affects relation of gage height to discharge for long periods during the months of December, January, and February.

Diversions.—The station is above the headgates of the Emery, Independence Co., and Lower canals, and is near a proposed reservoir site; records indicate the natural flow of the stream and the amount of water available for storage.

Accuracy.—Poor because of shifting character of the stream bed.

Cooperation.—Maintained in cooperation with the State of Utah.

Discharge measurements of Muddy Creek near Emery, Utah, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 24	G. H. Canfield	1.59	19.2	Sept. 7	J. C. Dort	1.51	20.6
May 4	Leonard Tanner	2.22	90.3	7	Leonard Tanner	1.51	19.7
29	do	2.30	114	Oct. 9	do	1.95	19.2
July 21	do	2.10	57.3				

Daily gage height, in feet, of Muddy Creek near Emery, Utah, for 1911.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.2	1.3	2.0	2.9	2.5	2.4	2.3	1.4	.....	.....	.....
2	1.25	1.4	1.8	2.4	2.6	2.4	2.3	1.4	.....	1.6	1.4
3	1.1	1.4	1.8	2.3	2.6	2.4	2.2	1.5	.....	.....	.....
4	1.1	1.4	1.9	3.0	2.35	2.6	2.2	1.5	.....	1.6	1.4
5	1.3	1.5	1.8	3.2	2.3	2.5	2.2	1.5	.....	.....	.....
6	1.1	1.5	1.6	3.4	2.45	2.4	2.2	1.5	.....	1.6	.....
7	1.3	1.6	1.5	2.4	2.2	2.4	2.2	1.5	.....	.....	1.4
8	1.2	1.5	1.5	2.3	2.2	2.3	2.2	1.5	2.0	1.6	.....
9	1.2	1.6	1.2	2.5	2.4	2.3	2.2	1.5	2.0	.....	1.4
10	1.2	1.6	1.2	3.5	2.15	2.3	2.15	1.5	2.0	1.6	.....
11	1.1	1.7	1.1	2.5	2.4	2.2	2.15	1.5	2.0	1.5	.....
12	1.1	1.7	1.2	2.2	2.5	2.2	2.15	1.5	1.9	1.7	1.4
13	1.3	1.8	1.0	2.3	2.6	2.2	2.1	1.5	1.9	1.6	.....
14	1.3	1.9	1.0	2.3	2.5	2.2	2.1	1.5	1.9	.....	1.4
15	1.2	1.9	1.0	2.6	2.5	2.2	2.1	1.5	1.8	1.6	.....
16	1.1	2.0	1.0	2.3	2.7	2.2	2.1	1.5	1.8	.....	1.4
17	1.1	2.0	1.6	3.2	2.4	2.3	2.2	1.5	.....	.....	.....
18	1.1	2.2	1.7	2.4	2.5	2.2	2.0	1.5	1.8	1.7	1.4
19	1.2	2.0	1.9	2.3	2.6	3.2	2.0	1.5	1.8	.....	.....
20	1.2	2.0	2.0	2.5	2.4	2.5	2.0	1.5	.....	1.6	.....
21	1.1	1.6	2.1	2.6	2.5	2.3	4.2	1.5	1.8	.....	.....
22	1.2	1.5	2.4	3.3	2.6	2.5	2.0	1.5	.....	1.5	1.4
23	1.2	1.6	2.5	2.6	2.5	2.4	1.6	1.5	1.8	.....	.....
24	1.2	1.6	2.5	2.4	2.5	2.4	1.6	1.5	1.7	.....	1.4
25	1.1	1.7	2.5	3.5	2.5	2.3	1.6	1.5	.....	1.5	.....
26	1.3	1.8	2.4	2.6	2.5	2.3	1.5	1.5	1.7	.....	.....
27	1.3	1.8	1.8	2.5	2.5	2.2	1.5	.....	.....	1.5	1.4
28	1.3	2.0	2.6	3.2	2.45	3.7	1.5	.....	1.7	.....	.....
29	.....	2.1	2.7	2.3	2.4	2.6	1.5	.....	1.7	1.5	.....
30	.....	2.1	2.8	3.2	2.4	2.4	1.5	.....	.....	.....	1.4
31	.....	2.3	.....	2.5	.....	2.3	1.4	.....	1.7	.....	.....

NOTE.—Relation of gage height to discharge affected by ice Jan. 1 to 27 and during December.

Daily discharge, in second-feet, of Muddy Creek near Emery, Utah, for 1911.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	3.0	6.0	61	209	141	118	89	15	20	6
2	4.5	10	37	124	158	118	89	15	20	4
3	1.0	10	37	108	158	118	73	20	20	4
4	1.0	10	48	226	116	137	73	20	20	4
5	6.0	15	37	260	108	121	73	20	20	4
6	1.0	15	21	294	132	105	73	20	20	4
7	6.0	21	15	124	92	105	73	20	20	4
8	3.0	15	15	108	92	89	73	20	22	4
9	3.0	21	3.0	141	124	89	73	20	22	4
10	3.0	21	3.0	311	84	89	66	20	22	4
11	1.0	28	1.0	141	124	73	66	20	22	2
12	1.0	28	3.0	92	141	73	66	20	16	7
13	6.0	37	.0	108	158	73	58	20	16	4
14	6.0	48	.0	108	141	73	58	20	16	4
15	3.0	48	.0	158	141	73	58	20	11	4
26	1.0	61	.0	108	175	73	58	20	11	5
17	1.0	61	21	260	124	89	73	20	11	6
18	1.0	92	28	124	134	73	45	20	11	7
19	3.0	61	48	108	150	234	45	20	11	6
20	3.0	61	61	141	118	121	45	20	11	4
21	1.0	21	76	158	134	89	404	20	11	3
22	3.0	15	124	277	150	121	73	20	11	2
23	3.0	21	141	158	134	105	28	20	11	2
24	3.0	21	141	124	134	105	28	20	7	2
25	1.0	28	141	311	134	89	28	20	7	2
26	6.0	37	124	158	134	89	20	20	7	2
27	6.0	37	37	141	134	73	20	20	7	2
28	6.0	61	158	260	126	319	20	20	7	2
29	.....	76	175	108	118	137	20	20	7	2
30	.....	76	192	260	118	105	20	20	7	2
31	.....	108	.....	141	.....	89	15	.....	7	.....

NOTE.—Daily discharge determined from a curve fairly well defined for all stages. Discharge interpolated for days for which gage heights are missing.

Monthly discharge of Muddy Creek near Emery, Utah, for 1911.

[Drainage area, 87 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 2	0.023	0.03	123	D.
February	6.0	1.0	3.1	.036	.04	172	D.
March	108	6.0	37.7	.438	.50	2,320	D.
April	192	.0	58.3	.671	.75	3,470	D.
May	311	92	172	1.98	2.28	10,600	D.
June	175	92	131	1.51	1.68	7,800	D.
July	319	73	109	1.25	1.44	6,700	D.
August	404	15	64.6	.743	.86	3,970	D.
September	20	15	19.7	.226	.25	1,170	D.
October	22	7	13.9	.159	.18	855	D.
November	7	2	3.7	.043	.05	220	D.
December			a 2	.023	.03	123	D.
The year	404	0	51.8	.595	8.09	37,500	

a Estimated.

MUDDY CREEK (LOWER STATION) NEAR EMERY, UTAH.

Location.—At the county bridge about 2½ miles north of Emery, Utah, in the NE. ¼ sec. 35, T. 21 S., R. 6 E., Salt Lake base and meridian.

Records available.—June 6, 1911, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Chain gage attached to the highway bridge.

Channel.—Shifting.

Discharge measurements.—At high stages, made from the bridge; at other stages by wading.

Winter flow.—Ice affects the relation of gage height to discharge during the winter months.

Diversions.—Below all diversions except a few small ditches.

Accuracy.—Poor.

Cooperation.—Maintained in cooperation with the State of Utah.

Discharge measurements of Muddy Creek (lower station) near Emery, Utah, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
June 6	Leonard Tanner	2.55	74.8	Sept. 9	Leonard Tanner	1.49	2.99
July 21	do	1.58	2.6	Oct. 10	do	1.68	3.47
Sept. 9	J. C. Dort	1.49	2.8				

Daily gage height, in feet, of Muddy Creek (lower station) near Emery, Utah, for 1911.

[R. Jacobsen, observer.]

Day.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		2.0	1.2	1.3	1.6		
2		1.4	1.2	1.45	1.75	1.5	1.3
3		2.7	1.2	1.3	1.6		
4		2.4	1.35	1.3	1.6	1.5	1.4
5		2.55	1.2	1.3	1.6		
6	2.48	2.5		1.3	1.7	1.4	
7	2.15	1.4		1.45	1.85		1.4
8	2.2	1.4		1.3	1.7	1.4	
9	2.15	1.2		1.3	1.7		1.4
10	2.3	1.35		1.3	1.7	1.4	

Daily gage height, in feet, of Muddy Creek (lower station) near Emery, Utah, for 1911— Continued.

Day.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
11	2.15	1.2	2.1	1.3	1.6	1.4	.....
12	2.1	1.2	.....	1.45	1.6	1.5	.....
13	2.1	1.2	.....	1.3	1.6	1.5	.....
14	2.15	1 2	.....	1.2	1.6	.....	1.4
15	2.25	1.35	.....	1.2	1.6	1.5	.....
16	2.1	1.2	.....	1.2	1.5	.....	1.4
17	2.15	1.2	.....	.....	.....	.....	.....
18	.....	1.2	.....	.....	1.5	1.5	1.4
19	.....	1.2	.....	.....	1.5	.....	.....
20	.....	1.7	.....	.....	.....	1.5	.....
21	.....	1.45	3.5	.....	1.5	.....	.....
22	.....	1.45	1.6	.....	.....	1.5	1.4
23	2.1	1.4	1.75	.....	1.5	.....	.....
24	2.1	1.35	1.6	.....	1.4	.....	1.4
25	2.25	1.45	1.6	.....	.....	1.4	.....
26	2.1	1.3	1.6	.....	1.4	.....	.....
27	2.1	1.4	1.5	1.55	.....	1.5	1.4
28	2.1	2.7	1.65	1.5	1.4	.....	.....
29	2.1	1.6	1.5	1.6	1.5	1.4	.....
30	2.15	1.35	1.4	1.4	.....	.....	1.3
31	.....	1.2	1.4	.....	1.5	.....	.....

NOTE.—Relation of gage height to discharge probably affected by ice during last of November and all of December.

Daily discharge, in second-feet, of Muddy Creek (lower station) near Emery, Utah, for 1911.

Day.	June.	July.	Aug.	Sept.
1	.....	27	2	3.0
2	.....	4	2	4.5
3	.....	102	2	3.0
4	.....	62	3.5	3.0
5	.....	80	2	3.0
6	72	74	2	3.0
7	39	4	2	4.5
8	43	4	4	3.0
9	39	2	8	3.0
10	52	3.5	12	3.0
11	39	2	35	2.5
12	35	2	16	3.0
13	35	2	6	2.5
14	39	2	4	2.0
15	48	3.5	6	2.0
16	35	2	2	2.0
17	39	2	2	2.0
18	38	2	4	2.0
19	38	2	15	2.0
20	37	10	20	2.0
21	36	4.5	262	2.0
22	36	4.5	6	3.0
23	35	4	12	3.0
24	35	3.5	6	4.0
25	48	4.5	5.5	4.0
26	35	3	5.0	3.5
27	35	4	5.0	3.5
28	35	102	6.0	3.5
29	35	6	5.0	4.0
30	39	3.5	4.0	3.0
31	.....	2	3.5	.....

NOTE.—Daily discharge determined from a poorly defined curve applicable June 6 to Aug. 23; indirect method for shifting channels used for period Aug. 2 to Sept. 30. Discharge estimated for days for which no gage heights are given.

Monthly discharge of Muddy Creek (lower station) near Emery, Utah, for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
June 6–30	72	35	39.5	1,960	C.
July	102	2	17.2	1,060	C.
August	262	.....	15.1	928	D.
September	.....	.....	3.0	178	D.
October	.....	.....	a 3.5	215	D.
November	.....	.....	a 3.5	208	D.
December	.....	.....	a 2.0	123	D.
The period	.....	.....	.....	4,670	

a Estimated because of unstable conditions at low water.

IVIE CREEK NEAR EMERY, UTAH.

Location.—In sec. 5 or 6, T. 24 S., R. 5 E., Salt Lake base and meridian, about 1½ miles from Oak Spring ranch, 15 miles southwest of Emery and 3 miles below the confluence of Red Creek and Clear Creek.

Records available.—May 3 to December 31, 1911.

Drainage area.—Not accurately known.

Gage.—Vertical staff on left bank.

Channel.—Shifting.

Discharge measurements.—Made by wading about 50 feet below the gage.

Winter flow.—Ice affects the relation of gage height to discharge during January and February; at times the creek is frozen to the bottom.

Diversions.—Oak Spring ranch ditch, 1½ miles above the gage, diverts practically all the flow of Ivie Creek except during two or three weeks of high water in the spring and occasional periods of short floods.

Accuracy.—Measurements and gage heights insufficient for estimates of discharge.

Cooperation.—Maintained in cooperation with the State of Utah.

Discharge measurements of Ivie Creek near Emery, Utah, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 3	Leonard Tanner.....	1.6	10.7	Sept. 8	J. C. Dort.....	1.70	a.04

a Estimated.

Daily gage height, in feet, of Ivie Creek near Emery, Utah, for 1911.

[B. W. Harmon, observer.]

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	.....	.....	.....	.....	.....	.....
2	1.85	.....	.....	.....	.....	.....	.....
3	1.6	1.5	.....	.....	.....	.....	.....
4	1.65	.....	.....	.....	.....	.....	.....
5	.....	.....	.....	.....	.....	.....	.....
6	1.75	.....	.....	.....	.....	.....	.....
7	.....	.....	.....	.....	.....	.....	.....
8	1.8	.....	.....	.....	.....	.....	.....
9	.....	.....	.....	.....	.....	.....	.....
10	1.6	.....	.....	.....	.....	.....	.....

Daily gage height, in feet, of Ivie Creek near Emery, Utah, for 1911—Continued.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
11				6.8		2.1	
12	1.6			1.4			
13	1.5			4.7			
14	1.5	1.8					
15							
16	1.5	1.75					
17							
18	1.5	1.5					3.0
19		2.1	4.0				2.8
20	1.5	1.7	1.5				
21		4.3					
22	1.5	3.0					
23		1.8					
24	1.5	1.5			1.6		
25							
26							
27	1.5						
28			2.4				
29			1.4		3.9		
30							
31							

ESCALANTE RIVER BASIN.

ESCALANTE CREEK NEAR ESCALANTE, UTAH.

Location.—About 2 miles below the town of Escalante, Utah, in sec. 9, T. 35 S., R. 3 E. Salt Lake meridian; just below the mouth of Winslow or Pine Creek.

Records available.—August 5, 1909, to December 31, 1911.

Drainage area.—315 square miles.

Gage.—Vertical staff.

Channel.—Shifts during the sudden short flooods to which the stream is subject.

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

Winter flow.—Ice affects the relation of gage height to discharge at times during the winter months.

Diversions.—All of the low-water flow is used for irrigation above the station; the records at this point show the amount of unappropriated and waste waters.

Accuracy.—Poor owing to shifting character of stream bed and lack of discharge measurements. Yearly total is probably correct within an accurary of C, but daily and monthly discharge during certain periods is apt to be in error to a greater amount than this.

Cooperation.—Maintained in cooperation with the State of Utah.

The following discharge measurement was made by J. C. Dort:
August 10, 1911: Gage height, 2.42 feet; discharge, 10.85 second-feet.

Daily gage height, in feet, of Escalante Creek near Escalante, Utah, for 1911.

[D. C. Schurtz, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.6	2.5		2.5							2.5	
2			2.65		2.55			2.1	3.0	2.3		2.45
3	3.6	2.7		2.45			2.15					
4			2.65		2.6				2.3	2.2	2.5	2.4
5	3.6	2.55		2.5		2.4	2.05	2.1			2.5	
6			2.6		2.6				2.4			2.3
7	3.6	2.5		2.5						2.2		
8			4.3		2.55	2.3	2.15	2.35				
9	3.6	2.45							2.45	2.6	2.4	2.9
10	3.0		3.5	2.35	2.8	2.3	2.1	2.4				

Daily gage height, in feet, of Escalante Creek near Escalante, Utah, for 1911—Contd.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
11	3.0	2.45	.....	.....	.....	.....	.....	.....	2.2	.....	2.3	.....
12	.....	.....	2.7	2.4	2.6	2.1	2.05	4.4	.....	.....	.....	2.6
13	2.65	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.4	.....
14	.....	2.5	2.6	2.4	2.55	2.5	.....	2.4	2.1	.....	.....	.....
15	2.7	.....	.....	.....	.....	.....	2.15	.....	.....	.....	2.55	2.7
16	.....	2.55	2.5	2.35	2.5	.....	.....	2.45	2.1	.....	.....	2.9
17	2.6	.....	.....	2.4	.....	2.55	2.05	3.2	.....	.....	.....	2.6
18	.....	2.6	2.5	.....	2.5	.....	.....	.....	2.3	.....	2.6	.....
19	.....	.....	.....	2.35	.....	2.20	2.0	3.4	.....	.....	2.4	2.9
20	2.55	2.55	2.55	.....	2.45	.....	.....	.....	2.35	.....	.....	.....
21	.....	.....	2.7	2.35	.....	2.1	.....	2.55	.....	.....	.....	.....
22	2.65	2.45	.....	.....	2.45	.....	7.55	.....	.....	.....	2.35	.....
23	.....	.....	2.65	2.4	.....	.....	.....	.....	2.25	.....	.....	2.9
24	2.55	2.5	.....	.....	2.4	2.05	5.9	5.3	.....	.....	.....	.....
25	4.1	.....	2.6	2.35	.....	.....	7.3	.....	.....	2.4	2.4	.....
26	.....	2.55	.....	.....	2.3	2.05	4.1	2.6	.....	.....	2.9	2.9
27	2.75	.....	2.5	1.8	.....	.....	.....	.....	3.0	.....	.....	.....
28	.....	2.6	.....	.....	.....	2.0	.....	.....	3.2	6.2	.....	2.8
29	3.5	.....	2.5	1.8	2.3	.....	6.2	2.6	3.2	.....	2.4	.....
30	2.8	.....	.....	1.8	.....	2.05	.....	.....	7.0	2.55	.....	2.8
31	.....	.....	2.5	.....	2.2	.....	2.2	2.4	.....	.....	.....	.....

Daily discharge, in second-feet, of Escalante Creek near Escalante, Utah, for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	25	34	25	28	15	9	5	27	8	15	12
2	.....	31	34	23	28	16	11	4	43	8	15	13
3	.....	37	34	22	29	17	12	4	26	7	15	12
4	.....	32	34	23	31	18	11	4	8	6	15	11
5	.....	28	32	25	31	20	10	4	9	6	15	9
6	.....	26	31	25	31	19	11	6	11	6	14	8
7	.....	25	31	25	30	18	12	8	12	6	13	16
8	.....	23	240	22	28	17	12	10	12	12	12	24
9	.....	22	178	20	36	17	12	10	13	19	11	36
10	.....	22	115	18	44	17	11	11	9	15	10	31
11	.....	22	37	20	38	14	10	11	6	15	8	25
12	.....	23	37	20	31	11	10	218	5	15	10	19
13	34	24	34	20	30	18	11	11	4	15	11	21
14	35	25	31	20	28	25	11	11	4	15	14	23
15	37	26	28	19	26	26	12	12	4	15	17	24
16	34	28	25	18	25	27	10	13	4	15	18	20
17	31	30	25	20	25	28	10	59	6	15	18	19
18	30	31	25	20	25	21	9	68	8	15	19	.....
19	29	30	26	18	24	14	8	78	9	15	11	.....
20	28	28	28	18	22	13	8	48	10	15	10	.....
21	31	25	37	18	22	11	8	17	9	15	10	.....
22	34	22	36	19	22	10	810	17	8	15	10	.....
23	31	24	34	20	21	10	655	17	7	15	10	.....
24	28	25	34	20	20	10	500	388	16	15	11	.....
25	30	26	31	18	18	10	769	19	25	11	11	.....
26	35	28	28	18	17	10	168	19	34	11	36	.....
27	40	30	25	44	17	9	200	19	43	11	27	.....
28	41	31	25	44	17	8	400	19	59	557	19	30
29	43	.....	25	44	17	8	557	19	59	17	11	30
30	44	.....	25	44	16	8	6	15	710	17	11	30
31	35	.....	25	.....	14	.....	6	11	.....	16	.....	30

NOTE.—Daily discharge determined from a number of poorly defined rating curves and by the indirect method for shifting channels. Mean discharge Jan. 1–12 and Dec. 18–27 estimated 25 second-feet. Discharge estimated for days when gage was not read.

Monthly discharge of Escalante Creek near Escalante, Utah, for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January			30.6	1,880
February	37	22	26.8	1,490
March	240	25	44.6	2,740
April	44	18	23.7	1,410
May	44	14	25.5	1,570
June	28	8	15.5	922
July	810	6	138	8,480
August	388	4	37.3	2,290
September	710	4	40.0	2,380
October	557	6	30.4	1,870
November	36	8	14.2	845
December	36	8	22.4	1,380
The year	810	4	37.7	27,300

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 to December 31, 1911.

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 and a new gage installed November 23 100 yards below the new highway bridge. The relation between 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.

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.—As the station has not yet been completely rated, estimates of discharge can not be presented.

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

Discharge measurements of San Juan River at Pagosa Springs, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 29[a]	O. M. Wimmer	1.23	98.0	Aug. 31	O. M. Wimmer	[b] 1.65	321
June 25	do	[b] 3.60	1,670	Nov. 23	H. B. Waha	[c] 2.10	208

[a] Ice conditions. [b] To datum of second gage. [c] Third-gage datum.

Daily gage height, in feet, of San Juan River at Pagosa Springs, Colo., for 1911.

[R. W. Smith, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	0.70	2.45	2.70	4.05	3.70	2.20	1.60	3.50	.....	1.85
2	.....	.....	.80	.....	2.75	4.25	5.20	2.15	1.50	3.00	.....	1.85
3	.....	.....	.79	.....	2.85	4.25	4.35	2.05	1.48	2.62	.....	2.05
4	.....	.....	.70	.....	3.15	4.25	4.15	1.95	1.45	2.45	.....	1.85
5	.....	.....	.....	.....	3.58	4.35	4.05	1.80	1.40	.....	.....	1.85
6	.....	.....	1.00	2.38	4.10	4.45	3.50	1.80	1.40	.....	.....	1.85
7	.....	.....	.98	2.30	4.18	4.40	3.25	1.70	1.40	.....	.....	1.92
8	.....	.....	1.09	2.20	4.55	4.90	3.15	1.65	1.35	.....	.....	1.82
9	.....	.....	1.07	2.10	4.60	4.95	3.00	1.60	1.35	.....	.....	1.85
10	.....	1.10	1.28	2.05	4.25	4.60	2.85	1.55	1.35	.....	.....	.....
11	.....	.....	1.64	2.10	3.75	4.45	2.80	1.55	1.30	.....	.....	1.80
12	.....	.....	1.35	2.18	3.80	4.35	2.70	1.55	1.28	.....	.....	1.50
13	.....	.....	1.25	2.12	3.65	4.30	3.00	1.50	1.25	.....	.....	1.75
14	.....	.....	1.28	2.25	3.40	4.22	3.15	1.50	1.20	.....	.....	1.38
15	.....	.....	1.32	2.30	3.55	4.10	2.90	1.45	1.45	.....	.....	1.42
16	.....	.....	1.38	2.50	3.55	4.00	2.85	1.40	1.30	.....	.....	1.50
17	.....	.....	1.42	2.60	3.65	3.65	2.80	1.40	1.25	.....	.....	.....
18	.....	.....	1.50	2.35	3.80	3.45	2.65	1.40	1.20	.....	.....	1.70
19	.....	.70	1.60	2.55	3.90	3.70	3.00	1.45	1.40	.....	.....	1.70
20	.....	.80	1.60	2.80	3.65	3.80	3.50	1.40	1.60	.....	.....	1.65
21	.....	.71	1.58	3.15	3.80	4.20	3.40	1.90	1.45	.....	.....	.....
22	.....	.70	1.65	3.20	3.32	4.15	3.10	2.65	1.40	.....	.....	1.50
23	.....	1.70	1.60	3.20	3.55	3.95	3.10	2.35	1.38	.....	2.10	.....
24	.....	1.60	1.68	3.10	3.78	3.75	3.15	2.20	1.32	.....	1.70	.....
25	.....	.....	1.82	2.95	3.90	3.50	3.00	2.00	1.25	.....	1.88	.....
26	.....	.....	.....	3.12	3.78	3.25	2.85	1.80	2.13	.....	1.80	1.50
27	.....	.....	1.68	3.35	3.70	3.25	2.70	2.00	1.72	.....	1.78	1.45
28	.....	.....	1.88	3.25	3.70	3.25	2.75	1.90	1.60	.....	1.58	1.45
29	1.55	.....	2.08	3.28	3.65	3.20	2.65	1.75	1.60	.....	1.60	1.45
30	1.70	.....	2.30	2.80	3.65	3.80	2.45	1.70	2.90	.....	1.90	1.80
31	1.55	.....	2.50	.....	3.85	.....	2.35	1.65	.....	.....	.....	.....

NOTE.—Ice present Jan. 29 to Feb. 24 and Nov. 23 to Dec. 30. Gage heights Jan. 29 to Mar. 7 read on gage No. 1. Mar. 8 to Oct. 5 gage No. 2 was read; gage heights Nov. 23 to Dec. 31 were read on the third gage. The three gages are independent and bear no relation to each other.

SAN JUAN RIVER AT ARBOLES, COLO.

Location.—At Arboles, Colo., above Piedra River.

Records available.—August 21, 1910, to December 31, 1911.

Drainage area.—1,394 square miles.

Gage.—Inclined staff.

Channel.—Probably permanent.

Discharge measurements.—Made from car and cable.

Winter flow.—No data.

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

Discharge measurements of San Juan River at Arboles, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 21	Clayton and Turner	1.40	182	May 26	B. S. Clayton	3.94	3,040
Mar. 25	B. S. Clayton	2.83	1,570	July 1	do	4.50	3,590
Apr. 24	do	3.72	2,580	Sept. 1	do	1.91	494
May 17	do	4.10	3,300	Dec. 18[a]	do	.60	267

[a] Ice conditions.

Daily gage height, in feet, of San Juan River at Arboles, Colo., for 1911.

[L. E. Smack, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.2	1.8	1.5	3.55	3.5	4.05	4.85	2.7	2.0	1.75	1.75	1.95
2	1.2	1.95	1.55	3.75	3.25	4.6	5.8	2.5	2.0	2.3	1.7	1.95
3	1.15	1.9	1.7	3.6	3.3	4.65	4.7	2.5	1.95	3.05	1.65	2.0
4	1.1	1.9	2.0	3.5	3.5	4.6	4.4	2.35	1.9	4.75	1.7	2.0
5	1.1	1.95	3.0	3.55	4.0	4.7	4.1	2.25	1.9	16.0	1.7	1.9
6	1.15	1.85	3.55	3.0	4.3	4.7	3.95	2.1	1.9	12.0	1.75	1.9
7	1.2	1.85	3.2	2.85	4.7	4.65	3.65	2.0	1.8	7.0	1.75	1.9
8	1.45	1.8	3.0	2.7	4.9	4.7	3.4	2.0	1.8	5.1	1.95	1.95
9	.....	1.75	2.75	2.5	5.0	5.2	3.2	2.0	1.8	4.45	1.95	2.0
10	.....	1.7	3.1	2.55	4.8	4.95	3.05	2.0	1.8	4.0	1.9	2.0
11	.....	1.7	3.5	2.55	4.6	4.7	3.05	2.0	1.8	3.45	1.85	1.9
12	.....	1.7	3.2	2.8	4.3	4.5	3.2	2.0	1.8	3.0	1.8	1.8
13	.....	1.7	2.65	2.75	4.05	4.5	3.0	1.95	1.9	3.0	1.8	1.8
14	.....	1.7	2.6	2.55	3.9	4.45	4.0	1.95	1.9	3.0	1.8	1.75
15	.....	1.65	2.6	2.65	3.6	4.4	4.15	1.9	1.8	2.55	1.85	1.7
16	.....	1.65	2.95	2.8	3.8	4.55	3.9	1.85	1.7	2.55	1.95	1.7
17	.....	1.7	3.0	2.9	4.05	4.55	3.4	1.9	1.7	2.5	2.0	1.7
18	.....	1.4	2.95	2.9	4.1	4.5	4.1	1.8	1.6	2.55	2.0	.....
19	.....	1.4	3.0	2.95	4.3	3.9	4.3	1.8	1.6	2.35	2.05	.....
20	1.6	1.4	2.85	2.8	4.0	4.1	3.55	1.85	3.15	2.35	1.95	.....
21	1.6	1.35	3.0	3.35	3.55	4.35	5.25	1.85	2.0	2.5	1.85	.....
22	1.55	1.3	2.95	3.75	3.55	4.4	4.4	2.75	1.9	2.85	1.85	.....
23	1.6	1.3	2.75	3.55	3.75	4.45	3.85	3.85	1.8	2.85	1.8	.....
24	1.65	1.3	2.55	3.65	3.9	4.4	3.5	3.2	1.7	2.55	1.7	.....
25	1.65	1.4	2.7	3.55	4.15	4.1	3.6	2.5	1.7	2.5	1.7	.....
26	1.7	1.4	2.85	3.7	4.05	3.9	3.45	2.55	3.7	2.5	1.65	.....
27	1.7	1.4	2.6	3.9	4.0	3.65	3.4	2.5	3.0	2.45	1.7	.....
28	1.65	1.5	2.65	3.75	3.95	3.6	3.25	2.45	2.0	2.45	1.7	.....
29	1.6	.....	2.7	3.8	3.75	3.55	3.25	2.55	3.75	2.35	1.65	.....
30	1.6	.....	2.9	3.6	3.85	3.7	3.1	2.35	4.0	2.4	1.5	.....
31	1.7	.....	3.2	.....	3.85	.....	2.9	2.0	.....	2.2	.....	.....

NOTE.—Ice present Jan. 1 to Feb. 17 and Dec. 1 to 31.

Daily discharge, in second-feet, of San Juan River at Arboles, Colo., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	100	125	230	2,450	2,380	3,195	4,140	1,310	580	385	727	550
2	100	125	260	2,745	2,030	4,050	5,880	1,080	580	870	695	550
3	100	125	350	2,520	2,240	4,130	4,210	1,080	535	1,755	685	500
4	100	125	580	2,380	2,380	4,050	3,730	920	490	4,290	695	450
5	100	125	1,690	2,450	3,120	4,210	3,270	820	490	25,000	695	450
6	100	125	2,450	1,690	3,570	4,210	3,045	670	490	11,300	727	400
7	100	125	1,960	1,495	4,210	4,130	2,595	580	420	5,800	727	400
8	100	135	1,690	1,310	4,530	4,210	2,240	580	420	3,710	865	350
9	125	135	1,370	1,080	4,690	5,030	1,960	580	420	3,055	865	350
10	125	150	1,820	1,135	4,370	4,610	1,755	580	420	2,655	830	300
11	125	150	2,380	1,135	4,050	4,210	1,755	580	420	2,095	795	300
12	125	150	1,960	1,430	3,570	3,890	1,960	580	420	1,695	760	300
13	125	150	1,250	1,370	3,195	3,890	1,690	535	490	1,695	760	270
14	125	150	1,190	1,135	2,970	3,810	3,120	535	490	1,695	760	270
15	125	150	1,190	1,250	2,520	3,730	3,345	490	420	1,320	795	270

Daily discharge, in second-feet, of San Juan River at Arboles, Colo., for 1911—Contd.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
16	125	150	1,625	1,430	2,820	3,970	2,970	455	350	1,320	865	267
17	125	150	1,690	1,560	3,195	3,970	2,240	490	350	1,280	900	267
18	125	180	1,625	1,560	3,270	3,890	3,270	420	290	1,320	900	267
19	125	180	1,690	1,625	3,570	2,970	3,570	420	290	1,160	935	267
20	135	180	1,495	1,430	3,120	3,270	2,450	455	1,890	1,160	865	267
21	135	160	1,690	2,170	2,450	3,650	5,115	455	580	1,280	795	267
22	135	140	1,625	2,745	2,450	3,730	3,730	1,370	490	1,568	795	267
23	135	140	1,370	2,450	2,745	3,810	2,895	2,895	420	1,568	760	267
24	135	140	1,135	2,595	2,970	3,680	2,380	1,960	350	1,320	695	267
25	135	180	1,310	2,450	3,345	3,260	2,520	1,080	350	1,280	695	267
26	135	180	1,495	2,670	3,195	2,840	2,310	1,135	2,670	1,280	665	267
27	135	180	1,190	2,970	3,120	2,450	2,240	1,080	1,690	1,240	695	267
28	125	230	1,250	2,745	3,045	2,350	2,030	1,025	580	1,240	695	267
29	125	.....	1,310	2,820	2,745	2,250	2,030	1,135	2,740	1,160	665	267
30	125	.....	1,560	2,520	2,895	2,430	1,820	920	3,120	1,200	575	267
31	125	.....	1,960	.....	2,895	.....	1,560	580	.....	1,045	.....	267

NOTE.—Discharge Jan. 1 to 19 estimated; discharge for December estimated from discharge measurement. Discharge estimated Oct. 5, only approximate.

Monthly discharge of San Juan River at Arboles, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January	135	100	121	7,448
February	230	125	151	8,400
March	2,450	230	1,432	88,046
April	2,970	1,080	1,977	117,650
May	4,690	2,030	3,150	193,696
June	5,030	2,250	3,662	217,934
July	5,880	1,560	2,833	174,198
August	2,895	420	864	53,147
September	3,120	290	775	46,116
October	25,000	385	2,827	173,955
November	935	575	762	45,337
December	550	267	322	19,879
The year	25,000	100	1,583	1,145,741

SAN JUAN RIVER NEAR BLOOMFIELD, N. NEX.

Location.—At suspension bridge, 1½ miles below Bloomfield, N. Mex., in T. 29 N., R. 11 W., New Mexico principal meridian. Nearest tributary, Canyon Largo, enters 10 miles above.

Records available.—September 28, 1909, to October 3, 1911. From December 9, 1908, to October 31, 1910, a station was maintained at Blanco, 11 miles upstream. The records at Bloomfield and Blanco are very nearly comparable, as the only intervening tributary is Canyon Largo, and this carries water only during a small portion of the year.

Drainage area.—5,190 square miles (measured from Land Office map).

Gage.—Automatic recording gage installed February 11, 1910, which was washed out July 22, 1911, replaced August 12, 1911, about 150 feet below its former location, and again washed out October 4, 1911. The original gage was of the wire type, attached to the bridge and referred to the same datum.

Channel.—Very shifting.

Discharge measurements.—Made from suspension bridge.

Diversions.—Considerable water diverted for irrigation above the station.

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

Floods.—On October 6, 1911, the river reached a stage of 12 feet, which was the highest reached sice the station was established. It is estimated that the flow was about 80,000 second-feet at the maximum stage. A flood stage was reached September 8, 1909, but it was not of such magnitude as that of October 6, 1911.

Accuracy.—On account of the shifting of the channel the estimates have been prepared by the indirect method, and can not be considered better than fair.

Cooperation.—Station maintained in cooperation with the Territorial engineer.

Discharge measurements of San Juan River near Bloomfield, N. Mex., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 24	G. H. Russell	3.05	402	May 30	J. B. Stewart	4.90	6,370
Feb. 23	do	3.03	395	Aug. 11	W. B. Freeman	4.10	1,110
Apr. 7	E. O. Christiansen	5.12	4,740	12	do	4.30	1,120

Daily gage height, in feet, of San Juan River near Bloomfield, N. Mex., for 1911.

[S. P. Walton, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	3.15	3.5	3.3	5.4	4.6	5.25	5.6	4.6	4.8	6.0
2	3.15	3.6	3.3	5.3	4.55	5.6	6.7	4.5	4.7	.....
3	3.15	3.45	3.35	5.2	4.65	5.55	6.5	4.5	4.5	5.35
4	3.2	3.3	3.45	5.2	4.8	5.55	5.95	4.4	4.55	.....
5	3.2	3.3	4.05	5.3	5.15	5.65	5.3	4.3	4.65	.....
6	3.2	3.3	5.75	5.0	5.5	5.7	4.65	.....	4.6	.....
7	3.6	3.15	5.4	5.1	5.9	5.6	4.4	.....	4.55	.....
8	3.9	3.05	4.5	4.9	5.9	5.6	4.3	.....	4.55	.....
9	3.95	3.05	4.5	4.7	6.25	5.9	4.05	4.3	4.55	.....
10	4.05	3.1	4.7	4.7	6.25	6.0	3.8	4.1	4.55	.....
11	5.2	3.05	5.45	4.6	5.8	5.75	3.7	4.1	4.55	.....
12	5.35	3.05	4.6	4.7	5.55	5.65	4.1	4.5	4.45	.....
13	4.35	3.15	3.95	4.7	5.45	5.5	5.9	4.5	4.4	.....
14	4.55	3.15	3.85	4.5	5.35	5.5	6.4	4.65	4.55	.....
15	3.8	3.1	3.9	4.4	5.3	5.45	4.3	4.65	4.65	.....
16	3.7	3.15	4.15	4.6	5.35	5.3	4.8	4.5	4.6	.....
17	4.4	3.1	4.3	4.9	5.35	5.2	4.7	4.45	4.55	.....
18	3.7	3.2	4.4	4.95	5.35	4.85	4.05	4.5	4.65	.....
19	3.45	3.2	4.45	4.8	5.4	4.8	5.9	4.45	4.7	.....
20	3.45	3.2	4.45	4.95	5.35	5.05	6.4	4.45	5.35	.....
21	3.25	3.15	4.4	5.15	5.1	5.2	6.45	4.35	5.0	.....
22	3.15	3.1	4.4	5.3	4.9	5.35	5.1	5.0	4.95	.....
23	3.1	3.05	4.35	5.4	5.05	5.3	5.2	5.8	4.9	.....
24	3.1	3.05	4.15	5.3	5.35	5.15	.....	4.9	4.95	.....
25	3.2	3.15	4.25	5.0	5.45	4.85	.....	4.7	4.9	.....
26	3.5	3.25	4.5	4.9	5.35	4.6	.....	4.75	4.8	.....
27	3.85	3.2	4.3	5.15	5.15	4.4	.....	4.8	5.0	.....
28	3.35	3.3	4.25	5.25	5.0	4.4	.....	4.95	5.2	.....
29	3.35	.....	4.55	5.2	5.0	4.3	.....	5.0	4.95	.....
30	3.55	.....	4.8	5.05	5.05	4.5	.....	4.9	5.4	.....
31	3.55	.....	5.0	.....	5.15	.....	4.6	4.85	.....	.....

NOTE.—Some backwater from ice Jan. 1 to 14. The automatic gage was washed out July 22. All gage heights from July 22 to Aug. 11 read on a chain gage which was referred to the same datum as the automatic gage. Gage heights after Aug. 11 from automatic gage. Maximum gage height July 2, 8.2 feet; maximum gage height July 13, 10.0 feet; maximum gage height July 21, 10.1 feet; maximum gage height Oct. 6 about 12.0 feet.

Daily discharge, in second-feet, of San Juan River near Bloomfield, N. Mex., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	.....	800	615	5,780	2,920	7,300	6,900	2,020	2,000	6,100
2	.....	910	615	5,380	2,780	8,800	12,200	1,820	1,780	.....
3	.....	752	660	5,000	3,090	8,600	11,200	1,820	1,400	3,580
4	.....	615	752	5,000	3,580	8,600	8,500	1,620	1,490	.....
5	.....	615	1,580	5,380	5,550	9,050	5,600	1,450	1,680	.....
6	.....	615	7,360	4,250	7,000	9,300	3,200	1,450	1,580	.....
7	.....	490	5,780	4,620	8,800	8,800	2,500	1,450	1,490	.....
8	.....	412	2,620	3,900	8,800	8,800	2,300	1,450	1,490	.....
9	.....	412	2,620	3,250	10,600	10,200	1,700	1,450	1,490	.....
10	.....	450	3,250	3,250	10,600	10,000	1,000	1,120	1,490	.....
11	.....	412	5,990	2,920	9,100	8,900	900	1,120	1,490	.....
12	.....	412	2,920	3,250	8,000	8,450	1,500	1,400	1,320	.....
13	.....	490	1,390	3,250	7,600	7,750	7,800	1,400	1,440	.....
14	.....	490	1,220	2,620	7,100	7,750	10,100	1,680	1,490	.....
15	1,150	450	1,300	2,350	6,900	7,550	1,900	1,680	1,680	.....
16	1,020	490	1,780	2,920	7,100	6,900	3,200	1,400	1,580	.....
17	2,350	450	2,100	3,900	7,700	6,450	2,900	1,320	1,490	.....
18	1,020	530	2,350	4,080	7,700	5,000	1,450	1,400	1,680	.....
19	752	530	2,490	3,580	7,900	4,800	7,800	1,320	1,780	.....
20	752	530	2,490	4,080	7,700	5,200	9,500	1,320	3,580	.....
21	572	490	2,350	4,810	6,600	5,750	9,800	1,180	2,500	.....
22	490	450	2,350	5,380	5,750	6,400	3,850	2,500	2,370	.....
23	450	412	2,220	5,780	6,400	6,200	4,200	5,250	2,250	.....
24	450	412	1,780	5,380	8,300	5,550	3,920	2,250	2,370	.....
25	530	490	1,990	4,250	8,700	4,450	3,640	1,780	2,250	.....
26	800	572	2,620	3,900	8,300	3,600	3,370	1,890	2,000	.....
27	1,220	530	2,100	4,810	7,400	2,900	3,100	2,000	2,500	.....
28	660	615	1,990	5,190	6,800	2,900	2,830	2,380	3,080	.....
29	660	.....	2,780	5,000	6,800	2,600	2,560	2,500	2,370	.....
30	660	.....	3,580	4,440	7,000	3,050	2,290	2,250	3,750	.....
31	660	.....	4,250	.....	6,850	.....	2,020	2,120	.....	.....

NOTE.—Discharge interpolated for days of missing gage heights. Daily discharge determined as follows: Jan. 15 to May 4 from a fairly well-defined rating curve; May 5 to July 30, by the indirect method for shifting channels; July 31 to Aug. 11, from the 1910 curve; Aug. 12 to Oct. 3 from curve drawn through one measurement and parallel to the 1910 curve.

Monthly discharge of San Juan River at Bloomfield, N. Mex., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January 15-31	2,350	450	835	28,200	B.
February	910	412	530	29,400	B.
March	7,360	615	2,510	154,000	B.
April	5,780	2,350	4,260	253,000	B.
May	10,600	2,780	7,080	435,000	C.
June	10,200	2,600	6,720	400,000	C.
July	12,200	900	4,640	285,000	C.
August	5,250	1,120	1,800	111,000	C.
September	3,750	1,320	1,960	117,000	C.
The period	.....	.....	.....	1,810,000	

SAN JUAN RIVER AT SHIPROCK, N. MEX.

Location.—At highway bridge one-fourth mile south of Shiprock Indian agency, about sec. 13, T. 12 N., R. 2 W. Navajo principal meridian. The nearest tributary, Chaco River, which enters a short distance above, is an intermittent stream carrying water only during certain portions of the year.

Records available.—January 14 to October 6, 1911, when the station was discontinued.

Drainage area.—13,070 square miles (from Land Office map).

Gage.—Chain gage.

Channel.—The measurements made do not indicate any change, but it is probable that changes occur during high water.

Discharge Measurements.—Made from bridge and by wading.

Winter flow.—Practically no ice.

Diversions.—Considerable water is diverted above this station for irrigation.

Floods.—During the first week of October, 1911, the most severe flood of many years occurred. The crest of this flood was approximately 22 feet on the gage.

Accuracy.—Prior to the flood of October conditions were favorable for reliable results.

Cooperation.—Station was maintained in cooperation with the Territorial engineer and the United States Indian Service.

Discharge measurements of San Juan River at Shiprock, N. Mex., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 14	Carroll and Burnham	6.25	2,180
Apr. 9	E. O. Christiansen	7.70	5,250
May 29	Burnham and Edwards	9.60	10,900
June 1	J. B. Stewart	9.40	10,200

Daily gage height, in feet, of San Juan River at Shiprock, N. Mex., for 1911.

[L. L. Burrell, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	.....	5.8	5.55	8.1	8.8	9.6	8.6	6.5	4.95	10.4
2	.....	5.75	5.5	8.3	8.6	9.9	10.7	6.3	4.75	10.7
3	.....	5.7	5.55	9.0	8.4	9.9	10.2	6.05	4.8	10.0
4	.....	5.7	6.3	8.8	8.6	9.9	10.4	6.0	5.05	9.2
5	.....	5.6	6.6	8.7	9.0	10.0	10.3	5.75	5.0	11.6
6	.....	5.6	8.5	8.6	9.8	10.4	10.1	5.4	4.95	[a]19.0
7	.....	5.55	9.3	8.2	10.3	10.2	9.8	5.5	5.0	.....
8	.....	5.4	8.2	8.1	10.6	10.5	9.4	5.35	4.9	.....
9	.....	5.35	7.3	7.8	10.8	10.6	9.5	5.1	4.65	.....
10	.....	5.35	7.7	7.8	10.8	10.6	9.2	5.1	4.7	.....
11	.....	5.3	8.3	7.6	10.6	10.6	9.0	5.05	4.65	.....
12	.....	5.4	8.6	7.3	9.9	10.0	9.0	5.25	4.6	.....
13	.....	5.45	7.4	7.8	9.6	10.0	10.0	5.1	5.15	.....
14	6.25	5.4	6.8	7.6	9.5	9.8	11.7	5.1	5.2	.....
15	6.1	5.35	6.6	7.6	9.4	10.0	9.6	5.05	5.2	.....
16	5.8	5.35	6.6	7.4	9.4	9.6	9.0	4.85	5.15	.....
17	6.6	5.35	6.8	7.8	9.6	9.4	10.4	4.8	5.05	.....
18	6.0	5.35	7.1	8.4	9.6	9.1	8.8	4.85	5.1	.....
19	5.65	5.4	7.2	8.2	9.8	8.9	10.1	4.75	5.7	.....
20	5.55	5.3	7.4	8.3	9.9	9.0	12.2	4.65	6.3	.....
21	5.55	5.35	7.6	8.5	9.6	9.3	10.0	4.7	6.0	.....
22	5.45	5.3	7.5	8.6	9.2	9.4	9.8	4.7	5.25	.....
23	5.4	5.15	7.5	9.3	8.8	9.6	8.3	7.6	4.95	.....
24	5.3	5.05	7.4	9.2	9.0	9.2	8.0	6.5	4.8	.....
25	5.45	5.05	7.4	8.9	9.7	9.0	8.3	5.8	5.15	.....
26	5.65	5.4	7.4	8.7	9.6	8.8	8.4	5.7	4.9	.....
27	6.0	5.4	7.4	8.8	9.5	8.2	8.0	5.55	4.9	.....
28	5.7	5.5	7.2	9.4	9.6	8.0	7.5	5.55	6.0	.....
29	5.4	.....	7.4	9.3	9.4	8.0	7.3	5.55	6.2	.....
30	5.4	.....	7.4	9.1	9.2	8.0	7.0	5.3	7.3	.....
31	5.9	.....	8.0	.....	9.5	.....	6.8	5.2	.....	.....

[a] Maximum gage height about 22.0 feet.

Daily discharge, in second-feet, of San Juan River at Shiprock, N. Mex., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	.....	1,450	1,110	6,280	8,300	10,900	7,700	2,800	512	13,600
2	.....	1,380	1,050	6,820	7,700	11,900	14,700	2,250	375	14,700
3	.....	1,300	1,110	8,950	7,100	11,900	12,900	1,820	400	12,200
4	.....	1,300	2,250	8,300	7,700	11,900	13,600	1,750	600	9,600
5	.....	1,180	2,800	8,000	8,950	12,200	13,200	1,380	550	18,000
6	.....	1,180	7,400	7,700	11,600	13,600	12,600	950	512	47,600
7	.....	1,110	9,920	6,550	13,200	12,900	11,600	1,050	550	.....
8	.....	950	6,550	6,280	14,300	14,000	9,250	900	475	.....
9	.....	900	4,250	5,450	15,000	14,300	10,600	650	325	.....
10	.....	900	5,200	5,450	15,000	14,300	9,600	650	350	.....
11	.....	850	6,820	4,950	14,300	14,300	8,950	600	325	.....
12	.....	950	7,700	4,250	11,900	12,200	8,950	800	300	.....
13	.....	1,000	4,480	5,450	10,900	12,200	12,200	650	700	.....
14	2,160	950	3,200	4,950	10,600	11,600	18,400	650	750	.....
15	1,900	900	2,800	4,950	9,250	12,200	10,900	600	750	.....
16	1,450	900	2,800	4,480	9,250	10,900	8,950	438	700	.....
17	2,800	900	3,200	5,450	10,900	9,250	13,600	400	600	.....
18	1,750	900	3,800	7,100	10,900	9,280	8,300	438	650	.....
19	1,240	950	4,020	6,550	11,600	8,620	12,600	375	1,300	.....
20	1,110	850	4,480	6,820	11,900	8,950	20,400	325	2,250	.....
21	1,110	900	4,950	7,400	10,900	9,920	12,200	350	1,750	.....
22	1,000	850	4,700	7,700	9,600	9,250	11,600	350	800	.....
23	950	700	4,700	9,920	8,300	10,900	6,820	4,950	512	.....
24	850	600	4,480	9,600	8,950	9,600	6,000	2,600	400	.....
25	1,000	600	4,480	8,620	11,200	8,950	6,820	1,450	700	.....
26	1,240	950	4,480	8,000	10,900	8,300	7,100	1,300	475	.....
27	1,750	950	4,480	8,300	10,600	6,550	6,000	1,110	475	.....
28	1,300	1,050	4,020	9,250	10,900	6,000	4,700	1,110	1,750	.....
29	950	.....	4,480	9,920	9,250	6,000	4,250	1,110	2,080	.....
30	950	.....	4,480	9,280	9,600	6,000	3,600	850	4,250	.....
31	1,600	.....	6,000	.....	10,600	.....	3,200	750	.....	.....

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

Monthly discharge of San Juan River at Shiprock, N. Mex., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January 14-31	2,800	850	1,400	50,000	C.
February	1,450	600	979	54,400	C.
March	9,920	1,050	4,390	270,000	C.
April	9,920	4,250	7,090	422,000	C.
May	15,000	7,100	10,700	658,000	C.
June	14,300	6,000	10,600	631,000	C.
July	20,400	3,200	10,000	615,000	C.
August	4,950	325	1,140	70,100	C.
September	4,250	300	872	51,900	C.
October 1-6	47,600	9,600	19,300	230,000	D.
The period	.....	.....	.....	3,050,000	

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 to December 31, 1911.

Drainage area.—171 square miles (measured from Hayden's atlas).

Gage.—Vertical staff.

Channel.—Data too meager to determine.

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.—As the station has not yet been completely rated estimates of discharge can not be presented.
Cooperation.—Station is maintained in cooperation with the United States Forest Service.

The following discharge measurement was made by H. B. Waha:
November 24, 1911: Gage height, 1.60 feet; discharge, 95.6 second-feet.

Daily gage height, in feet, of Navajo River at Chromo, Colo., for 1911.

[N. B. Price, observer.]

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1		1.8	11		1.6	21		2.15
2		1.6	12		1.6	22		2.3
3		1.55	13		1.6	23		2.15
4		1.55	14		1.65	24	1.6	2.7
5		1.65	15		1.65	25	1.6	3.5
6		1.6	16		1.85	26	1.6	3.7
7		1.55	17		2.25	27	1.6	3.65
8		1.55	18		2.45	28	1.6	3.4
9		1.55	19		2.25	29	1.8	3.4
10		1.55	20		2.2	30	1.8	3.2
						31		3.5

NOTE.—Ice present Nov. 29 to Dec. 1 and Dec. 16 to 31.

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 to December 31, 1911.
Drainage area.—376 square miles (measured from Hayden's atlas).
Gage.—Vertical staff.
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.—As this station has not been completely rated estimates of discharge can not be presented.
Cooperation.—Station maintained in cooperation with the United States Forest Service.

The following discharge measurement was made by H. B. Waha:
November 26, 1911: Gage height, 1.85 feet; discharge, 162 second-feet.

Daily gage height, in feet, of Piedra River at Piedra, Colo., for 1911.

[Allen Snyder, observer.]

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1			11			21		
2		2.0	12			22		
3			13			23		
4		1.95	14			24		
5			15			25		
6		1.8	16			26	1.85	
7			17			27		
8			18			28	1.9	
9			19			29	1.9	
10			20			30	2.0	
						31		

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, 1911.

Drainage area.—650 square miles.

Gage.—Vertical staff.

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 are furnished complete for publication by the State engineer.

Discharge measurements of Piedra River at Arboles, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 21	Clayton and Turner	1.18	131	Sept. 1	B. S. Clayton	1.95	320
Mar. 22	B. S. Clayton	2.90	843	Nov. 16	do	3.60	364
Apr. 23	do	4.50	2,000	Dec. 18[a]	do		174
May 25	do	4.55	1,960				

[a] Ice conditions.

Daily gage height, in feet, of Piedra River at Arboles, Colo., for 1911.

[L. E. Smack, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.0	1.5	1.3	4.65	3.5	4.45	4.9	2.45	2.0	2.3	3.75	3.5
2	1.0	1.65	1.3	4.85	3.35	4.6	5.05	2.3	2.0	2.45	3.75	3.5
3	1.0	1.6	1.5	4.7	3.75	4.75	4.55	2.25	1.9	3.5	3.7	3.5
4	1.05	1.45	1.8	4.5	3.95	4.75	3.95	2.15	1.9	4.25	3.6	3.5
5	1.05	1.4	2.25	4.95	4.55	4.85	3.95	2.1	1.85	14.0	3.6	3.4
6	1.1	1.3	2.85	4.35	4.95	4.75	3.65	2.0	1.8	10.0	3.6	3.4
7	1.1	1.25	2.3	4.8	5.35	4.6	3.55	2.0	1.8	7.5	3.6	3.4
8	1.2	1.2	2.45	4.7	5.55	4.6	3.45	1.95	1.8	7.0	3.6	3.35
9	1.2	1.1	2.6	4.55	5.75	4.65	3.15	1.9	1.7	4.75	3.55	3.3
10	1.2	1.2	2.5	3.85	5.25	4.65	3.1	1.9	1.7	4.50	3.45	3.3
11	1.5	1.3	3.1	3.75	4.95	4.55	3.65	1.9	1.6	4.75	3.45	3.25
12	1.5	1.3	2.7	3.7	4.6	4.45	3.45	1.85	1.55	4.0	3.45	3.25
13	2.0	1.2	2.65	3.75	4.35	4.45	4.05	1.8	1.5	4.0	3.45	3.2
14	2.0	1.25	2.75	3.55	4.2	4.4	3.85	1.8	1.5	4.0	3.5	3.2
15	2.0	1.3	2.75	3.65	4.25	4.3	3.9	1.75	1.6	4.0	3.4	3.2
16	2.5	1.3	2.9	3.8	4.2	4.3	3.55	1.7	1.55	4.0	3.4	3.2
17	2.45	1.35	3.0	4.05	4.3	4.45	3.35	1.6	1.5	3.9	3.65	3.0
18	2.2	1.35	2.95	4.25	4.5	4.4	3.5	1.6	1.5	3.85	3.7	.....
19	2.2	1.4	2.9	4.15	4.65	3.9	4.1	1.6	1.5	3.85	3.7	.....
20	1.15	1.2	2.85	4.25	4.5	4.05	4.15	1.55	2.05	3.8	3.6	.....
21	1.1	1.1	2.75	4.35	4.0	4.1	4.35	1.5	1.85	3.8	3.6	.....
22	1.1	1.1	3.0	4.65	4.1	4.1	3.9	2.05	1.75	3.8	3.6	.....
23	1.0	1.2	2.9	4.75	4.2	4.2	3.5	2.8	1.75	4.0	3.55	.....
24	1.05	1.3	2.8	4.35	4.4	4.0	3.5	2.45	1.65	4.05	3.55	.....
25	1.1	1.2	2.9	4.3	4.55	3.85	3.6	2.35	1.6	4.05	3.5	.....
26	1.5	1.2	2.95	4.6	4.4	3.6	3.4	2.2	2.5	4.0	3.5	.....
27	1.45	1.15	2.85	4.65	4.25	3.6	3.4	2.8	2.0	4.1	3.6	.....
28	1.4	1.3	2.75	4.5	4.2	3.65	3.2	2.85	2.0	4.0	3.65	.....
29	1.2	.....	3.2	4.45	4.2	3.55	3.0	2.85	3.55	4.05	3.8	.....
30	1.15	.....	3.35	4.3	4.2	3.8	3.0	2.35	4.15	4.0	3.65	.....
31	1.2	.....	3.8	.....	4.25	.....	2.6	2.0	.....	3.85	.....	.....

NOTE.—Ice formed on the stream Dec. 18 and existed to the end of the year.

Daily discharge, in second-feet, of Piedra River at Arboles, Colo., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	100	175	130	2,082	1,240	1,932	2,275	572	345	490	425	330
2	100	215	130	2,235	1,135	2,045	2,395	490	345	572	425	330
3	100	200	175	2,120	1,415	2,158	2,008	465	305	1,240	405	330
4	102	162	265	1,970	1,558	2,158	1,558	415	305	1,782	365	330
5	102	150	465	2,315	2,008	2,235	1,558	390	285	9,370	365	295
6	105	130	808	1,858	2,315	2,158	1,345	345	265	6,250	365	295
7	105	122	490	2,195	2,635	2,045	1,275	345	265	2,570	365	295
8	115	115	572	2,120	2,795	2,045	1,205	325	265	2,210	365	278
9	115	105	655	2,008	2,955	2,082	1,002	305	230	855	348	260
10	115	115	600	1,485	2,555	2,082	970	305	230	735	312	260
11	175	130	970	1,415	2,315	2,008	1,345	305	200	855	312	242
12	175	130	710	1,380	2,045	1,932	1,205	285	188	525	312	242
13	345	115	685	1,415	1,858	1,932	1,632	265	175	525	312	225
14	345	122	745	1,275	1,745	1,895	1,485	265	175	525	330	225
15	345	130	745	1,345	1,782	1,820	1,520	248	200	525	295	225
16	600	130	840	1,450	1,745	1,820	1,275	230	188	525	295	225
17	572	140	905	1,632	1,820	1,932	1,135	200	175	485	385	160
18	440	140	872	1,782	1,970	1,895	1,240	200	175	465	405	174
19	440	150	840	1,708	2,082	1,520	1,670	200	175	465	405	174
20	110	115	808	1,782	1,970	1,632	1,708	188	368	445	365	174
21	105	105	745	1,858	1,595	1,670	1,858	175	285	445	365	174
22	105	105	905	2,082	1,670	1,670	1,520	368	248	445	365	174
23	100	115	840	2,158	1,745	1,745	1,240	775	248	525	348	160
24	102	130	775	1,858	1,895	1,595	1,240	572	215	545	348	160
25	105	115	840	1,820	2,008	1,485	1,310	518	200	545	330	160
26	175	115	872	2,045	1,895	1,310	1,170	440	600	525	330	160
27	162	110	808	2,082	1,782	1,310	1,170	775	345	565	365	150
28	150	130	745	1,970	1,745	1,345	1,035	808	345	525	385	150
29	115	.....	1,035	1,932	1,745	1,275	905	808	1,275	545	445	150
30	110	.....	1,135	1,820	1,745	1,450	905	518	1,708	525	385	150
31	115	.....	1,450	.....	1,782	.....	655	345	.....	465	.....	150

NOTE.—Discharge Oct. 5 and Dec. 18 to 31 estimated; estimate for Oct. 5 only approximate.

Monthly discharge of Piedra River at Arboles, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January	600	100	192	11,802
February	215	105	133	7,371
March	1,450	130	728	44,757
April	2,315	1,275	1,840	109,482
May	2,955	1,135	1,921	118,116
June	2,235	1,275	1,806	107,466
July	2,395	655	1,381	84,920
August	808	175	401	24,684
September	1,708	175	344	20,487
October	9,370	445	1,196	73,525
November	445	295	361	21,465
December	330	150	220	13,501
The year	9,370	100	881	637,575

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 October 4, 1911.

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 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 18	Clayton and Turner..	2.22	110	June 29	B. S. Clayton.....	4.35	1,120
Mar. 21	B. S. Clayton.....	3.10	455	Sept. 1	.....do.....	2.40	180
Apr. 22	.....do.....	4.00	1,070	Nov. 15	.....do.....	(a)	272
May 24	.....do.....	4.80	1,990	Dec. 16	.....do.....	(a)	167

a Gage washed out.

Daily gage height, in feet, of Los Pinos River near Ignacio, Colo., for 1911.

[Mrs. C. F. Werner, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	1.85	2.4	2.2	3.95	4.0	5.25	5.1	3.05	2.4	4.5
2	1.85	2.2	2.25	4.0	4.1	5.3	5.4	3.0	2.4	4.05
3	1.9	2.2	2.35	3.9	4.0	5.15	5.7	2.95	2.4	4.05
4	1.9	2.3	2.3	3.95	3.95	5.3	5.35	2.9	2.6	4.0
5	2.0	2.2	2.8	3.95	4.5	5.55	5.0	2.75	2.7	(a)
6	2.0	2.2	2.95	3.85	4.95	5.65	4.75	2.55	2.6	.....
7	2.0	2.2	2.85	3.55	5.0	5.45	4.65	2.45	2.5	.....
8	2.0	2.15	2.9	3.6	5.05	5.45	4.5	2.2	2.45	.....
9	2.0	2.05	3.05	3.5	5.15	5.6	4.4	2.1	2.4	.....
10	2.05	2.0	3.25	3.4	5.25	5.8	4.35	2.05	2.4	.....
11	2.55	2.1	3.4	3.55	4.9	5.7	4.2	2.1	2.3	.....
12	2.65	2.1	3.2	3.45	4.7	5.45	4.25	2.0	2.3	.....
13	2.55	2.15	3.0	3.3	4.7	5.1	4.7	2.0	2.7	.....
14	2.4	2.15	2.9	3.4	4.45	5.3	5.15	2.0	2.8	.....
15	2.3	2.15	2.95	3.5	4.65	5.05	4.4	1.95	2.75	.....
16	2.15	2.15	2.75	3.55	4.7	5.1	4.35	1.9	2.6	.....
17	2.15	2.1	2.9	3.75	4.65	4.7	4.05	1.9	2.6	.....
18	2.45	2.1	2.95	3.7	4.75	4.7	4.15	1.9	2.5	.....
19	2.3	2.2	3.1	3.7	4.8	5.1	4.55	1.8	2.6	.....
20	2.2	2.2	3.2	4.05	4.6	4.5	4.35	1.9	2.7	.....
21	2.15	2.2	3.15	4.1	4.65	5.0	4.45	1.8	2.6	.....
22	2.15	2.2	3.3	4.1	4.5	5.4	4.2	2.7	2.55	.....
23	2.05	2.25	3.25	4.2	4.75	5.1	4.2	3.05	2.55	.....
24	2.05	2.25	3.15	4.25	4.7	4.95	4.6	2.95	2.7	.....
25	2.25	2.25	3.2	4.2	4.9	4.75	4.6	2.7	2.7	.....
26	2.45	2.25	3.15	4.25	4.9	4.4	4.35	2.45	3.2	.....
27	2.35	2.25	3.15	4.2	4.7	4.3	4.05	2.35	3.4	.....
28	2.25	2.25	3.25	4.25	4.65	4.55	4.0	2.4	3.2	.....
29	2.3	.....	3.55	4.2	4.75	4.35	3.75	2.4	3.25	.....
30	2.25	.....	3.4	4.25	4.5	4.45	3.35	2.3	4.4	.....
31	2.3	.....	3.8	.....	4.75	.....	3.20	2.3	.....	.....

a Gage washed out by flood.

Daily discharge, in second-feet, of Los Pinos River near Ignacio, Colo., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	65	170	120	1,032	1,075	2,615	1,890	380	170	2,460
2	65	120	130	1,075	1,165	2,690	2,310	360	170	1,825
3	70	120	155	995	1,075	2,470	2,780	340	170	1,825
4	70	140	140	1,032	1,032	2,690	2,235	320	225	1,760
5	85	120	305	1,032	1,605	3,080	1,760	270	255	.....
6	85	120	372	950	2,192	3,245	1,472	210	225	.....
7	85	120	328	720	2,260	2,920	1,375	182	195	.....
8	85	110	350	755	2,330	2,920	1,240	120	182	.....
9	85	92	420	685	2,470	3,160	1,160	100	170	.....
10	92	85	530	620	2,615	3,500	1,122	92	170	.....
11	215	100	620	720	2,125	3,330	1,015	100	145	.....
12	248	100	500	652	1,855	2,920	1,050	85	145	.....
13	215	110	395	560	1,855	2,400	1,420	85	225	.....
14	170	110	350	620	1,545	2,690	1,955	85	285	.....
15	140	110	372	685	1,790	2,330	1,160	78	270	.....
16	110	110	285	720	1,855	2,400	1,122	70	225	.....
17	110	100	350	870	1,790	1,855	918	70	225	.....
18	185	100	372	830	1,922	1,855	982	70	195	.....
19	140	120	445	830	1,990	2,400	1,285	60	225	.....
20	120	120	500	1,120	1,725	1,605	1,122	70	255	.....
21	110	120	472	1,165	1,790	2,260	1,200	60	225	.....
22	110	120	560	1,165	1,605	2,840	1,015	255	210	.....
23	92	130	530	1,265	1,922	2,400	1,015	380	210	.....
24	92	130	472	1,320	1,855	2,160	1,330	340	255	.....
25	130	130	500	1,265	2,125	1,840	1,330	255	255	.....
26	185	130	472	1,320	2,125	1,380	1,122	182	445	.....
27	155	130	472	1,265	1,855	1,220	918	158	540	.....
28	130	130	530	1,320	1,790	1,420	885	170	445	.....
29	140	.....	720	1,265	1,922	1,120	730	170	468	.....
30	130	.....	620	1,320	1,605	1,200	515	145	1,160	.....
31	140	.....	910	.....	1,922	.....	445	145	.....	.....

Monthly discharge of Los Pinos River near Ignacio, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January	248	65	124	7,644
February	170	85	118	6,540
March	910	120	429	26,374
April	1,320	560	976	58,052
May	2,615	1,032	1,832	112,635
June	3,500	1,120	2,364	140,658
July	2,780	445	1,286	79,097
August	380	60	174	10,725
September	1,160	145	279	16,602
October 1-4	2,460	1,760	1,968	15,610
The period	.....	.....	.....	473,937

ANIMAS RIVER AT TACOMA, COLO.

Location.—200 feet south of the Denver & Rio Grande Railroad bridge No. 171a at Tacoma, Colo. Nearest tributary, Canon Creek, enters from the east one-half mile above the station.

Records available.—March 25, 1908, to November 27, 1909, and February 1 to October 5, 1911.

Drainage area.—408 square miles (Hayden's atlas).

Gage.—Automatic recording gage.

Channel.—Shifts during high water.

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

Diversions.—No data.

Cooperation.—Station is maintained and records are furnished by the San Juan Water & Power Co.

Discharge measurements of Animas River at Tacoma, Colo., in 1908 and 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1908.		*Feet.*	*Sec.-ft.*	1908.		*Feet.*	*Sec.-ft.*
Feb. 26	J. A. Clay	2.00	180	Dec. 9	E. C. Myers	2.00	165
Mar. 31	G. Weaver	2.40	255				
May 21	E. C. Myers	3.92	1,140	1911.			
June 12	do	5.22	3,080	Mar. 25	Chay and Maris	1.00	239
July 17	do	3.53	800	Sept. 2	O. M. Wimmer	1.70	426
Oct. 18	do	2.20	225				

Daily gage height, in feet, of Animas River at Tacoma, Colo., for 1908–9 and 1911.

[Engineers San Juan Water & Power Co., observers.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1908.										
1	.....	2.4	3.4	4.4	4.3	3.6	2.7	2.25	2.1	2.0
2	.....	2.45	3.55	4.7	4.2	4.1	2.7	2.2	2.1	1.95
3	.....	2.55	3.55	4.75	4.0	3.6	2.7	2.2	2.1	2.0
4	.....	2.65	3.25	4.75	4.1	3.4	2.65	2.2	2.1	2.0
5	.....	2.7	3.05	4.75	4.25	3.4	2.55	2.15	2.1	2.0
6	.....	2.75	3.0	4.65	4.25	3.35	2.6	2.15	2.1	2.0
7	.....	2.65	3.05	4.2	4.2	3.2	2.55	2.2	2.05	2.0
8	.....	2.6	3.35	4.1	3.95	3.2	2.55	2.2	2.05	2.0
9	.....	2.6	3.5	4.9	3.9	3.15	2.5	2.15	2.05	1.95
10	.....	2.65	3.45	5.5	3.85	3.1	2.55	2.15	2.0	1.9
11	.....	2.75	3.3	5.9	4.0	3.15	2.45	2.15	2.0	1.85
12	.....	2.9	3.35	5.6	4.0	3.05	2.4	2.1	2.0	1.85
13	.....	3.1	3.15	5.7	4.0	2.95	2.3	2.1	2.0	1.85
14	.....	3.3	3.1	5.8	3.85	3.15	2.3	2.1	2.05	1.85
15	.....	3.35	3.1	5.6	3.8	3.25	2.3	2.05	2.05	1.9
16	.....	3.35	3.35	5.7	3.75	3.25	2.25	2.1	2.05	1.9
17	.....	3.35	3.8	5.55	3.7	4.6	2.25	2.15	2.1	1.8
18	.....	3.3	4.2	5.25	3.6	4.7	2.2	2.2	2.05	1.7
19	.....	3.3	4.55	5.5	3.45	4.5	2.2	2.2	2.0	1.7
20	.....	3.4	4.5	5.15	3.3	4.0	2.25	2.15	2.0	1.75
21	.....	3.55	4.1	5.35	3.2	3.75	2.3	2.15	2.05	1.8
22	.....	3.6	4.0	5.35	3.1	3.6	2.25	2.1	1.95	1.85
23	.....	3.35	3.7	5.35	3.1	3.5	2.2	2.1	1.95	1.95
24	.....	3.2	3.55	5.35	3.1	3.35	2.2	2.15	2.05	1.95
25	2.4	3.15	3.65	5.4	3.05	3.2	2.35	2.15	2.0	1.9
26	2.45	3.0	3.9	5.35	3.1	3.05	2.35	2.1	2.0	1.9
27	2.5	2.95	3.8	5.3	3.15	3.0	2.3	2.1	2.0	1.85
28	2.45	2.95	3.7	5.15	3.05	3.0	2.3	2.15	2.0	1.85
29	2.45	2.95	3.8	4.9	3.1	2.95	2.25	2.1	2.0	1.85
30	2.4	3.05	4.4	4.55	3.25	2.8	2.25	2.1	2.0	1.85
31	2.4	.....	4.6	.....	3.45	2.7	.....	2.1	.....	1.9

Daily gage height, in feet, of Animas River at Tacoma, Colo., for 1908–9 and 1911—Con.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1909.											
1	1.9	1.9	1.9	2.2	2.95	3.9	.....	3.25	4.15	.....	4.3
2	1.9	1.95	1.95	2.3	3.05	4.9	.....	3.25	4.0	.....	4.3
3	1.9	1.95	2.0	2.45	3.5	6.6	.....	3.2	4.0	.....	4.3
4	1.9	1.9	2.0	2.45	4.2	7.15	5.35	3.15	4.0	.....	4.3
5	1.9	1.9	2.05	2.35	4.65	8.0	5.35	3.1	.....	.....	4.3
6	1.9	1.95	2.05	2.3	4.65	.....	5.1	3.15	.....	.....	4.3
7	1.9	1.95	2.1	2.3	4.75	.....	4.7	3.15	.....	.....	4.3
8	1.9	1.9	2.0	2.25	4.9	.....	4.5	3.15	.....	.....	4.3
9	1.9	1.9	2.0	2.45	4.1	.....	4.4	3.1	.....	4.8	4.25
10	1.9	1.9	2.0	2.5	4.4	.....	4.25	3.15	.....	4.7	4.25
11	1.9	1.95	2.0	2.45	4.2	.....	4.05	3.2	.....	4.75	4.25
12	1.8	1.95	1.95	2.4	4.2	.....	3.95	3.1	.....	4.75	4.25
13	1.85	1.95	1.95	2.45	4.2	.....	3.8	3.1	.....	4.7	4.25
14	1.95	1.9	2.0	2.7	4.15	.....	3.75	3.15	.....	4.7	4.25
15	1.95	1.9	2.05	3.25	4.1	.....	3.85	3.25	.....	4.6	4.25
16	1.9	1.9	2.1	3.8	4.3	.....	3.5	3.55	.....	4.6	4.25
17	1.85	1.9	2.1	4.15	4.65	.....	3.5	3.3	.....	4.6	4.25
18	1.9	1.9	2.1	4.55	5.15	.....	3.4	3.25	.....	4.55	4.25
19	1.85	1.9	2.1	4.3	5.15	.....	3.4	3.35	.....	4.55	4.25
20	1.9	1.9	2.1	3.7	4.9	.....	3.45	3.45	.....	4.55	4.25
21	1.9	1.9	2.1	3.35	4.35	.....	3.85	3.45	.....	4.55	4.25
22	1.85	1.9	2.1	3.1	4.4	.....	4.1	3.25	.....	4.55	4.25
23	1.75	1.9	2.1	2.95	4.35	.....	4.2	3.35	.....	4.55	4.25
24	1.65	1.85	2.1	2.9	4.0	.....	4.2	3.55	.....	4.5	4.25
25	1.75	1.9	2.2	2.85	4.2	.....	4.1	3.35	.....	4.5	4.25
26	1.9	1.9	2.25	3.15	4.85	.....	4.7	3.5	.....	4.5	4.25
27	1.95	1.9	2.2	3.4	5.45	.....	4.0	3.65	.....	4.4	4.25
28	1.95	1.9	2.15	3.4	5.2	.....	3.7	3.5	.....	4.4	.....
29	1.9	.....	2.15	3.25	4.35	.....	3.5	3.7	.....	4.4	.....
30	1.85	.....	2.15	3.1	3.55	.....	3.4	4.15	.....	4.4	.....
31	1.85	.....	2.15	.....	3.75	.....	3.35	4.15	.....	4.3	.....

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1911.									
1	0.69	0.60	1.62	2.04	3.71	3.90	2.55	1.65	5.15
2	.66	.60	1.75	2.14	3.75	4.05	2.55	1.60	4.15
3	.66	.62	1.71	2.25	3.79	4.00	2.40	1.65	3.35
4	.67	.62	1.77	2.58	4.08	4.00	2.30	1.75	3.00
5	.65	.66	1.66	2.88	4.38	3.85	2.30	1.70	8.85
6	.62	.66	1.46	3.21	4.58	3.70	2.25	1.65	.....
7	.58	.65	1.35	3.25	4.54	3.65	2.15	1.65	.....
8	.58	.65	1.33	3.42	4.66	3.60	2.05	1.60	.....
9	.62	.71	1.27	3.46	4.12	3.45	2.05	1.60	.....
10	.65	.73	1.25	3.25	3.92	3.40	2.25	1.50	.....
11	.62	.88	1.27	3.00	.....	3.15	2.25	1.50	.....
12	.66	.77	1.29	3.92	.....	3.15	2.15	1.55	.....
13	.62	.73	1.33	3.96	.....	3.85	2.15	1.95	.....
14	.65	.75	1.29	3.75	.....	4.00	2.00	1.90	.....
15	.65	.79	1.31	2.71	.....	3.60	2.00	1.90	.....
16	.65	.83	1.50	2.71	3.70	3.50	2.00	1.95	.....
17	.65	.92	1.69	2.96	3.75	3.25	1.90	1.80	.....
18	.60	.92	1.71	3.08	3.65	3.25	1.95	1.70	.....
19	.65	.94	1.88	3.46	4.05	3.80	1.95	1.70	.....
20	.62	.96	1.96	2.79	3.90	3.80	1.95	1.60	.....
21	.58	.96	2.08	2.71	4.10	3.60	2.00	1.55	.....
22	.56	.98	2.19	2.92	4.05	3.50	2.25	1.60	.....
23	.50	1.00	2.27	3.04	4.00	3.45	2.25	1.95	.....
24	.54	.96	2.06	3.50	4.05	3.30	2.05	1.80	.....
25	.62	.96	2.04	3.50	3.85	3.30	2.05	1.65	.....
26	.48	1.00	2.25	3.33	3.75	3.25	1.95	2.15	.....
27	.60	1.00	2.42	3.21	3.85	3.15	1.90	2.55	.....
28	.56	1.00	2.46	3.33	3.80	3.00	1.85	2.50	.....
29	.....	1.12	2.40	3.42	3.65	2.90	1.75	2.60	.....
30	.....	1.27	2.12	3.46	3.80	2.75	1.75	4.25	.....
31	.....	1.48	.....	3.54	.....	2.60	1.70	.....	.....

NOTE.—June 5 to July 3, 1909, the gage was not in place because of a flood. A flood on Sept. 5, 1909, washed the gage out. Gage washed out by floods June 11 to 15, 1911. A flood Oct. 6, 1911, took the gage out and changed the channel completely.

Daily discharge, in second-feet, of Animas River at Tacoma, Colo., for 1908–9.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1908.										
1	.....	270	720	1,660	1,530	860	370	228	190	170
2	.....	285	825	2,110	1,410	1,300	370	215	190	160
3	.....	315	825	2,190	1,200	860	370	215	190	170
4	.....	350	630	2,190	1,300	720	350	215	190	170
5	.....	370	525	2,190	1,470	720	315	202	190	170
6	.....	390	500	2,030	1,470	690	330	202	190	170
7	.....	350	525	1,410	1,410	600	315	215	180	170
8	.....	330	690	1,300	1,160	600	315	215	180	170
9	.....	330	790	2,430	1,110	575	300	202	180	160
10	.....	350	755	3,600	1,060	550	315	202	170	150
11	.....	390	660	4,480	1,200	575	285	202	170	140
12	.....	450	690	3,820	1,200	525	270	190	170	140
13	.....	550	575	4,040	1,200	475	240	190	170	140
14	.....	660	550	4,260	1,060	575	240	190	180	140
15	.....	690	550	3,820	1,020	630	240	180	180	150
16	.....	690	690	4,040	980	630	228	190	180	150
17	.....	690	1,020	3,710	940	1,950	228	202	190	130
18	.....	660	1,410	3,070	860	2,110	215	215	180	110
19	.....	660	1,880	3,600	755	1,800	215	215	170	110
20	.....	720	1,800	2,880	660	1,200	228	202	170	120
21	.....	825	1,300	3,280	600	980	240	202	180	130
22	.....	860	1,200	3,280	550	860	228	190	160	140
23	.....	690	940	3,280	550	790	215	190	160	160
24	.....	600	825	3,280	550	690	215	202	180	160
25	270	575	900	3,380	525	600	255	202	170	150
26	285	500	1,110	3,280	550	525	255	190	170	150
27	300	475	1,020	3,170	575	500	240	190	170	140
28	285	475	940	2,880	525	500	240	202	170	140
29	285	475	1,020	2,430	550	475	228	190	170	140
30	270	525	1,660	1,880	630	410	228	190	170	140
31	270	.....	1,950	.....	755	370	.....	190	.....	150

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.
1909.						
1	150	150	150	215	475	1,110
2	150	160	160	240	525	2,430
3	150	160	170	285	790	6,150
4	150	150	170	285	1,410	7,520
5	150	150	180	255	2,030	9,650
6	150	160	180	240	2,030	.....
7	150	160	190	240	2,180	.....
8	150	150	170	228	2,430	.....
9	150	150	170	285	1,300	.....
10	150	150	170	300	1,660	.....
11	150	160	170	285	1,410	.....
12	130	160	160	270	1,410	.....
13	140	160	160	285	1,410	.....
14	160	150	170	370	1,360	.....
15	160	150	180	630	1,300	.....
16	150	150	190	1,020	1,530	.....
17	140	150	190	1,360	2,030	.....
18	150	150	190	1,880	2,880	.....
19	140	150	190	1,530	2,880	.....
20	150	150	190	940	2,430	.....
21	150	150	190	690	1,600	.....
22	140	150	190	550	1,660	.....
23	120	150	190	475	1,600	.....
24	105	140	190	450	1,200	.....
25	120	150	215	430	1,410	.....
26	150	150	228	575	2,350	.....
27	160	150	215	720	3,490	.....
28	160	150	202	720	2,970	.....
29	150	.....	202	630	1,600	.....
30	140	.....	202	550	825	.....
31	140	.....	202	.....	980	.....

NOTE.—Daily discharge determined from a well-defined rating curve. Owing to changed channel conditions and insufficient measurements no estimates of discharge have been made for 1911.

Monthly discharge of Animas River at Tacoma, Colo., for 1908.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1908.					
March 25-31	300	270	280	3,880	B.
April	860	270	517	30,800	B.
May	1,950	500	951	58,500	B.
June	4,480	1,300	2,970	177,000	B.
July	1,470	525	947	58,200	B.
August	2,110	370	795	48,900	B.
September	370	215	269	16,000	B.
October	228	180	201	12,400	B.
November	190	160	177	10,500	B.
December	170	110	148	9,100	B.
The period				425,000	
1909.					
January	160	105	145	8,920	B.
February	160	140	152	8,440	B.
March	228	150	185	11,400	B.
April	1,880	215	566	33,700	B.
May	3,490	475	1,710	105,000	B.
June 1-5	9,650	1,110	5,370	53,300	C.
The period				221,000	

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 September 2, 1911.

Drainage area.—694 square miles (Hayden's atlas).

Gage.—Automatic recording gage.

Channel.—Liable to shift during high water.

Discharge measurements.—Made from bridge.

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.

Accuracy.—Estimates for 1911 based on measurements during 1911 are fair, but no estimates have been made for 1910 as no measurements were made during that year.

Cooperation.—Records furnished through the courtesy of the San Juan Water & Power Co.

Discharge measurements of Animas River at Durango, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 24	R. M. Owens	2.70	177	Apr. 4	Chay and Nale	4.20	1,290
27	O. M. Wimmer	2.86	220	Sept. 2	O. M. Wimmer	3.70	490
Mar. 30	Chay and Hale	3.70	801				

Daily gage height, in feet, of Animas River at Durango, Colo., for 1910–11.

[Engineers San Juan Water & Power Co., observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	3.0	3.0	2.9	3.7	5.0	6.15	3.9	3.3	2.9	2.9	2.8	2.4
2	3.0	2.9	2.9	3.7	4.8	5.9	3.9	3.3	2.9	2.9	2.8	2.4
3	3.0	3.0	2.95	3.8	4.5	5.85	3.8	3.3	2.9	2.9	2.8	2.4
4	3.0	2.9	3.2	3.7	4.5	5.6	3.8	3.35	2.9	2.9	2.9	2.4
5	3.0	2.9	3.4	3.65	4.65	5.5	3.8	3.85	2.9	2.9	2.9	2.4
6	3.0	3.0	3.6	3.6	4.7	5.35	3.7	3.5	2.9	2.9	2.8	2.4
7	3.0	3.0	3.8	3.6	4.8	5.15	3.6	3.4	2.9	2.9	2.8	2.4
8	3.25	2.9	3.9	3.65	5.0	5.15	3.6	3.3	2.9	2.8	2.8	2.4
9	3.3	2.9	3.9	3.7	5.25	5.1	3.55	3.3	2.9	2.8	2.8	2.4
10	3.2	2.95	3.7	3.7	5.7	5.0	3.5	3.3	2.9	2.8	2.8	2.4
11	3.2	2.9	3.75	3.8	6.0	5.0	3.4	3.3	2.9	2.8	2.8	2.4
12	3.2	2.9	3.75	3.8	6.0	5.0	3.4	3.3	2.9	2.8	2.8	2.4
13	3.1	2.9	3.85	3.9	5.7	4.85	3.4	3.25	2.9	2.8	2.8	2.4
14	3.2	2.9	3.9	3.9	5.55	5.0	3.35	3.4	2.9	2.8	2.8	2.4
15	3.2	2.9	3.9	3.8	5.35	5.0	3.3	3.3	2.9	2.8	2.8	2.4
16	3.2	2.9	3.9	3.7	5.1	4.7	3.35	3.3	2.9	2.8	2.8	2.4
17	3.1	2.9	3.9	3.6	4.8	4.5	3.3	3.2	2.9	2.8	2.8	2.4
18	3.1	2.9	3.9	3.6	4.8	4.3	3.35	3.0	2.9	2.8	2.7	2.4
19	3.1	2.9	4.0	3.9	4.9	4.45	3.3	2.9	2.9	2.8	2.6	2.4
20	3.0	2.9	4.1	4.3	4.9	4.35	3.3	2.9	2.9	2.8	2.5	2.4
21	3.0	2.9	4.2	4.5	4.9	4.3	3.3	2.9	2.9	2.8	2.5	2.4
22	2.95	2.9	4.4	4.4	4.8	4.3	3.3	2.9	2.9	2.8	2.5	2.4
23	2.95	2.9	4.5	4.4	4.55	4.3	3.3	2.9	2.9	2.8	2.5	2.4
24	3.0	2.9	4.45	4.6	4.5	4.3	3.3	2.9	2.9	2.8	2.5	2.4
25	3.0	2.9	4.3	4.9	4.6	4.0	3.4	2.9	2.9	2.8	2.5	2.4
26	3.0	2.9	4.2	5.2	4.5	3.8	3.4	2.9	2.9	2.8	2.5	2.4
27	3.0	2.9	4.0	5.2	4.8	3.85	3.4	2.9	2.9	2.8	2.5	2.4
28	2.95	2.9	3.9	5.4	5.4	4.15	3.3	2.9	2.9	2.8	2.4	2.4
29	3.0	.....	3.8	5.5	5.8	4.4	3.35	2.9	2.9	2.8	2.4	2.4
30	3.0	.....	3.8	5.3	6.1	4.1	3.4	2.9	2.9	2.8	2.4	2.4
31	3.0	.....	3.7	.....	6.25	.....	3.55	2.9	.....	2.8	.....	2.4

[P. V. Sheridan, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1911.									
1	2.6	2.8	2.65	4.0	4.45	6.0	5.4	4.4	.....
2	2.6	2.8	2.6	4.0	4.5	6.0	5.8	4.25	3.7
3	2.6	2.8	2.7	4.1	4.45	6.0	5.8	4.05	.....
4	2.6	2.7	2.7	4.15	4.7	6.2	5.8	3.95	.....
5	2.6	2.7	2.75	4.1	4.45	6.4	5.6	3.9	.....
6	2.6	2.7	2.8	.....	5.7	6.8	5.5	3.85	.....
7	2.6	2.7	2.8	.....	5.8	6.5	5.5	3.75	.....
8	2.6	2.7	2.8	.....	6.0	6.5	5.4	3.75	.....
9	2.6	2.7	2.8	.....	6.0	6.9	5.2	3.6	.....
10	2.6	2.7	2.85	.....	6.2	7.0	5.1	3.65	.....
11	2.3	2.7	2.9	.....	5.7	6.7	4.85	3.6	.....
12	2.6	2.75	3.0	.....	5.5	6.6	4.75	3.8	.....
13	2.6	2.75	3.0	.....	5.4	6.6	5.6	.....	.....
14	2.6	2.7	2.95	.....	5.5	6.6	5.8	.....	.....
15	2.6	2.7	2.9	.....	5.3	6.2	5.4	.....	.....
16	2.6	2.7	2.95	.....	5.0	6.2	5.4	.....	.....
17	2.6	2.7	3.12	.....	5.6	6.0	5.2	.....	.....
18	2.6	2.7	3.1	.....	5.5	5.8	5.1	.....	.....
19	2.6	2.7	3.1	.....	5.8	5.9	5.4	.....	.....
20	2.6	2.85	3.2	.....	5.4	6.1	5.4	.....	.....
21	2.6	2.8	3.25	.....	5.1	5.8	5.6	.....	.....
22	2.6	2.8	3.35	.....	5.1	5.8	5.4	.....	.....
23	2.6	2.7	3.3	.....	5.5	6.0	5.3	.....	.....
24	2.7	2.7	3.3	.....	5.8	6.0	5.3	.....	.....
25	2.7	2.7	3.3	.....	6.0	5.8	5.5	.....	.....
26	2.7	2.7	3.3	.....	5.8	5.5	5.6	.....	.....
27	2.7	2.7	3.3	.....	5.6	5.6	5.2	.....	.....
28	2.7	2.7	3.3	.....	5.7	5.6	4.95	.....	.....
29	2.75	.....	3.4	.....	5.8	5.6	4.75	.....	.....
30	2.75	.....	3.65	.....	5.8	5.3	4.6	.....	.....
31	2.75	.....	3.85	.....	5.7	.....	4.5	.....	.....

Daily discharge, in second-feet, of Animas River at Durango, Colo., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	165	210	175	1,080	1,510	3,000	2,410	1,460	.....
2	165	210	165	1,080	1,560	3,000	2,800	1,320	810
3	165	210	185	1,180	1,510	3,000	2,800	1,130	.....
4	165	185	185	1,220	1,740	3,200	2,800	1,040	.....
5	165	185	198	1,180	1,510	3,400	2,600	990	.....
6	165	185	210	.....	2,700	3,800	2,500	945	.....
7	165	185	210	.....	2,800	3,500	2,500	855	.....
8	165	185	210	.....	3,000	3,500	2,410	855	.....
9	165	185	210	.....	3,000	3,900	2,220	720	.....
10	165	185	225	.....	3,200	4,000	2,120	765	.....
11	165	185	240	.....	2,700	3,700	1,890	720	.....
12	165	198	280	.....	2,500	3,600	1,790	900	.....
13	165	198	280	.....	2,410	3,600	2,600	.....	.....
14	165	185	260	.....	2,500	3,600	2,800	.....	.....
15	165	185	240	.....	2,320	3,200	2,410	.....	.....
16	165	185	260	.....	2,030	3,200	2,410	.....	.....
17	165	185	348	.....	2,600	3,000	2,220	.....	.....
18	165	185	335	.....	2,500	2,800	2,120	.....	.....
19	165	185	335	.....	2,800	2,900	2,410	.....	.....
20	165	225	400	.....	2,410	3,100	2,410	.....	.....
21	165	210	435	.....	2,120	2,800	2,600	.....	.....
22	165	210	510	.....	2,120	2,800	2,410	.....	.....
23	165	185	470	.....	2,500	3,000	2,320	.....	.....
24	185	185	470	.....	2,800	3,000	2,320	.....	.....
25	185	185	470	.....	3,000	2,800	2,500	.....	.....
26	185	185	470	.....	2,800	2,500	2,600	.....	.....
27	185	185	470	.....	2,600	2,600	2,220	.....	.....
28	185	185	470	.....	2,700	2,600	1,980	.....	.....
29	198	.....	550	.....	2,800	2,600	1,790	.....	.....
30	198	.....	765	.....	2,800	2,320	1,650	.....	.....
31	198	.....	945	.....	2,700	.....	1,560	.....	.....

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

Monthly discharge of Animas River at Durango, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	198	165	171	10,500	C.
February	225	185	192	10,700	C.
March	945	165	354	21,800	C.
April 1–5	.....	.....	1,150	11,400	C.
May	3,200	1,510	2,460	151,000	C.
June	4,000	2,320	3,130	186,000	C.
July	2,800	1,560	2,330	143,000	C.
August 1–12	1,460	720	975	23,200	C.

ANIMAS RIVER AT AZTEC, N. MEX.

Location.—At the highway bridge in sec. 9, T. 30 N., R. 11 W., one-half mile west of Aztec. No important tributaries between the station and the mouth of the river, about 12 miles below.

Records available.—June 21 to December 14, 1904; June 8, 1907, to December 31, 1911.

Drainage area.—1,300 square miles (measured from Land Office map).

Gage.—Vertical staff. The gage was originally placed at a wooden bridge one-half mile below the present site, but was transferred to its present position September 13, 1908. There is no determined relation between the two gage datums.

Channel.—Shifting during high water, but fairly permanent at other times.

Discharge measurements.—Made from bridge and by wading.

Winter flow.—Ice forms to a considerable depth along the edges during the greater part of the winter months, but the river seldom freezes across. Slush ice is of frequent occurrence.

Diversions.—Between Durango and Aztec many ditches divert water for irrigation.

Flood discharge.—Two severe floods have occurred on the Animas since records have been maintained. That of September 6, 1909, reached a maximum stage of 11 feet with a corresponding discharge of 16,000 second-feet; that of October 6, 1911, a stage of 13.5 feet with an approximate discharge of 30,000 second-feet. The latter flood is the severest that has occurred in many years.

Accuracy.—Prior to the October flood, conditions were favorable for reliable results. A change in the channel was caused by the flood, and for the remainder of the year the estimates can not be considered better than fair.

Cooperation.—During 1911 station was maintained in cooperation with the Territorial engineer and W. G. Black, Aztec, N. Mex.

Discharge measurements of Animas River at Aztec, N. Mex., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 24	G. H. Russell	3.61	224	June 3	J. B. Stewart	7.50	4,250
Feb. 24	do	3.60	189	Aug. 13	W. B. Freeman	4.60	794
Apr. 8	E. O. Christiansen	5.15	1,260	Nov. 21	G. H. Russell	2.89	537

Daily gage height, in feet, of Animas River at Aztec, N. Mex., for 1911.

[H. S. Wattles, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.8	3.8	3.8	6.1	5.9	7.5	7.2	5.8	4.3	7.8	3.1	2.8
2	3.8	3.85	3.8	6.4	5.7	7.6	7.0	5.5	4.2	8.4	3.1	2.8
3	3.75	3.7	3.8	6.2	5.7	7.6	7.7	5.4	4.2	7.8	3.1	2.7
4	3.7	3.75	3.8	6.0	5.9	7.8	7.4	5.3	4.2	6.4	3.1	2.7
5	3.7	3.8	4.1	5.9	6.5	8.0	7.0	5.1	4.2	9.8	3.1	2.7
6	3.7	3.85	5.0	5.7	7.0	8.2	7.0	5.0	4.2	.....	3.0	2.7
7	3.7	3.8	5.0	5.5	7.2	8.4	6.9	4.9	4.2	7.8	3.0	2.7
8	3.7	3.7	4.8	5.3	7.4	8.2	7.0	4.8	4.2	6.0	3.0	2.7
9	3.7	3.75	5.0	5.1	7.6	8.4	6.8	4.7	4.1	5.5	3.0	2.7
10	3.7	3.6	5.1	5.1	7.6	8.4	6.5	4.7	4.1	5.0	3.0	2.6
11	4.0	3.6	5.5	5.0	7.2	8.3	6.3	4.7	4.1	4.6	3.0	2.6
12	.....	3.6	5.1	5.0	6.9	8.3	6.5	4.7	4.1	4.4	2.9	2.6
13	.....	3.65	4.9	5.0	6.8	8.3	6.8	4.6	4.5	4.2	2.9	2.6
14	.....	3.7	4.9	5.0	6.8	8.1	7.8	4.6	4.4	4.0	2.9	2.6
15	.....	3.75	4.85	5.0	6.6	8.0	7.3	4.5	4.4	3.9	2.9	2.6
16	.....	3.7	4.85	5.0	6.5	7.8	7.5	4.5	4.4	3.8	2.9	2.5
17	.....	3.75	5.1	5.0	6.7	7.5	6.8	4.4	4.4	3.7	2.9	2.5
18	.....	3.7	5.2	5.1	7.0	7.4	6.6	4.3	4.3	3.6	2.8	2.5
19	.....	3.75	5.1	5.4	7.2	7.2	7.6	4.3	5.4	3.5	2.8	2.5
20	.....	3.7	5.2	5.8	7.2	7.3	7.7	4.3	4.4	3.4	2.8	2.5
21	.....	3.75	5.2	6.0	6.6	7.5	7.0	4.3	4.3	3.3	2.8	2.5
22	.....	3.8	5.3	6.0	6.6	7.7	7.4	4.45	4.3	3.2	2.9	2.5
23	.....	3.85	5.3	6.4	6.8	7.6	6.9	5.0	4.2	3.2	2.9	2.4
24	3.7	3.65	5.3	6.3	7.1	7.4	6.8	4.9	4.5	3.2	2.9	2.3
25	3.75	3.7	5.3	5.9	7.3	7.3	7.8	4.6	4.4	3.2	2.9	2.2
26	3.8	3.7	5.3	5.8	7.3	7.0	7.3	4.5	4.3	3.2	2.8	2.1
27	3.7	3.7	5.2	6.0	7.1	6.7	7.1	4.5	5.0	3.3	2.8	2.0
28	3.75	3.8	5.1	6.2	7.2	6.7	6.7	4.5	5.0	3.8	2.8	2.3
29	3.8	.....	5.3	6.3	7.2	6.8	6.4	4.4	5.0	3.4	2.8	2.3
30	3.95	.....	5.5	6.2	7.2	6.8	6.2	4.4	6.3	3.2	2.8	2.3
31	3.8	.....	5.7	.....	7.3	.....	6.0	4.3	.....	3.2	.....	2.3

NOTE.—Slight backwater from ice Jan. 1 to 11 and Dec. 23 to 31. Peak height Oct. 6, 13.5 feet, obtained from flood marks.

Daily discharge, in second-feet, of Animas River at Aztec, N. Mex., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	280	280	2,330	2,090	4,250	3,800	1,970	560	4,700	600	490
2	.....	305	280	2,720	1,860	4,400	3,500	1,640	500	5,640	600	490
3	.....	240	280	2,460	1,860	4,400	4,550	1,530	500	4,700	600	460
4	.....	260	280	2,210	2,090	4,700	4,100	1,420	500	2,720	600	460
5	.....	280	440	2,090	2,850	5,000	3,500	1,220	500	8,500	600	460
6	.....	305	1,120	1,860	3,500	5,320	3,500	1,120	500	14,500	560	460
7	.....	280	1,120	1,640	3,800	5,640	3,370	1,030	500	5,500	560	460
8	.....	240	940	1,420	4,100	5,320	3,500	940	500	3,000	560	460
9	.....	260	1,120	1,220	4,400	5,640	3,240	850	440	2,400	560	460
10	.....	210	1,220	1,220	4,400	5,640	2,850	850	440	1,900	560	430
11	.....	210	1,640	1,120	3,800	5,480	2,590	850	440	1,500	560	430
12	.....	210	1,220	1,120	3,370	5,480	2,850	850	440	1,350	520	430
13	.....	225	1,030	1,120	3,240	5,480	3,240	770	690	1,200	520	430
14	.....	240	1,030	1,120	3,240	5,160	4,700	770	620	1,100	520	430
15	.....	260	985	1,120	2,980	5,000	3,950	690	620	1,040	520	430
16	.....	240	985	1,120	2,850	4,700	4,250	690	620	980	520	400
17	.....	260	1,220	1,120	3,110	4,250	3,240	620	620	920	520	400
18	.....	240	1,320	1,220	3,500	4,100	2,980	560	560	860	490	400
19	.....	260	1,220	1,530	3,800	3,800	4,400	560	1,530	800	490	400
20	.....	240	1,320	1,970	3,800	3,950	4,550	560	620	750	490	400
21	.....	260	1,320	2,210	2,980	4,250	3,500	560	560	700	490	400
22	.....	280	1,420	2,210	2,980	4,550	4,100	655	560	650	520	400
23	.....	305	1,420	2,720	3,240	4,400	3,370	1,120	500	650	520	.....
24	240	225	1,420	2,590	3,650	4,100	3,240	1,030	690	650	520	.....
25	260	240	1,420	2,090	3,950	3,950	4,700	770	620	650	520	.....
26	280	240	1,420	1,970	3,950	3,500	3,950	690	560	650	490	.....
27	240	240	1,320	2,210	3,650	3,110	3,650	690	1,120	700	490	.....
28	260	280	1,220	2,460	3,800	3,110	3,110	690	1,120	980	490	.....
29	280	.....	1,420	2,590	3,800	3,240	2,720	620	1,120	750	490	.....
30	355	.....	1,640	2,460	3,800	3,240	2,460	620	2,590	650	490	.....
31	280	.....	1,860	.....	3,950	.....	2,210	560	.....	650	.....	.....

NOTE.—Daily discharge determined as follows: Discharge Jan. 1 to 23, estimated at 225 second-feet; discharge Jan. 24 to Oct. 5, from a well-defined rating curve; discharge after Oct. 6, from a poorly defined curve. Mean discharge Oct. 6 estimated; crest discharge was about 30,000 second-feet. Discharge Dec. 23 to 31 estimated at 350 second-feet.

Monthly discharge of Animas River at Aztec, N. Mex., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	238	14,600	C.
February	305	210	254	14,100	B.
March	1,860	280	1,130	69,500	B.
April	2,720	1,120	1,840	109,000	B.
May	4,400	1,860	3,370	207,000	B.
June	5,640	3,110	4,500	268,000	B.
July	4,700	2,210	3,540	218,000	B.
August	1,970	560	887	54,500	B.
September	2,590	440	705	42,000	B.
October	14,500	650	2,310	142,000	D.
November	600	490	532	31,700	C.
December	490	.....	411	25,300	C.
The year	14,500	.....	1,650	1,200,000	

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 December 31, 1911.

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.—As the station has not been completely rated estimates of discharge can not be presented.

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

The following discharge measurement was made by H. B. Waha:

November 28, 1911: Gage height, 1.80 feet; discharge, 67.3 second-feet.

The following gage heights were also obtained: December 10, 1.9 feet; December 22, 2.1 feet; December 27, 2.0 feet. Gage heights December 22 and 27 read to top of ice.

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 October 4, 1911.

Drainage area.—136 square miles (State engineer's report).

Gage.—Vertical staff.

Channel.—Shifting 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 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 21	B. S. Clayton	2.72	256	Aug. 30	B. S. Clayton	1.68	52.2
May 23	do	4.04	626	Dec. 15[a]	do	2.25	27
June 27	do	3.12	330				

[a] Ice conditions.

Daily gage height, in feet, of Florida River near Durango, Colo., for 1911.

[Thomas Cash, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	1.4	1.35	1.4	2.6	2.6	4.45	3.65	2.45	1.65	4.5
2	1.4	1.3	1.35	2.5	2.6	4.35	4.35	2.3	1.6	3.3
3	1.4	1.3	1.35	2.4	2.65	4.35	4.3	2.2	1.65	2.7
4	1.55	1.3	1.35	2.55	2.9	4.5	4.0	2.1	1.7	2.4
5	1.5	1.35	1.35	2.4	3.25	4.65	3.5	2.1	1.7	.....
6	1.5	1.3	1.4	2.4	3.5	4.7	3.2	2.0	1.65	.....
7	1.45	1.4	1.35	2.35	3.6	4.55	3.6	1.9	1.6	.....
8	1.4	1.5	1.4	2.3	3.9	4.55	3.15	1.9	1.6	.....
9	1.4	1.6	1.4	2.2	4.0	4.7	2.95	1.9	1.8	.....
10	1.4	1.5	1.5	2.15	3.9	4.7	2.85	1.9	2.2	.....
11	1.4	1.5	1.65	2.2	3.7	4.7	2.6	1.9	1.65	.....
12	1.4	1.35	1.6	2.3	3.6	4.6	2.9	1.8	1.6	.....
13	1.35	1.35	1.65	2.25	3.6	4.25	3.35	1.9	1.7	.....
14	1.3	1.35	1.7	2.2	3.4	4.45	3.55	1.8	1.7	.....
15	1.3	1.4	1.7	2.25	3.2	4.3	3.3	1.75	1.75	.....
16	1.4	1.4	1.7	2.35	3.3	4.05	3.1	1.8	1.7	.....
17	1.35	1.35	1.8	2.55	3.7	3.7	2.9	1.7	1.65	.....
18	1.3	1.35	1.85	2.5	3.9	3.85	2.75	1.7	1.6	.....
19	1.2	1.5	1.9	2.55	4.15	4.0	3.3	1.8	1.6	.....
20	1.2	1.5	1.9	2.7	3.6	3.85	3.4	1.7	1.7	.....

Daily gage height, in feet, of Florida River near Durango, Colo., for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
21	1.3	1.4	1.9	2.8	3.45	4.25	3.5	1.7	1.6	.....
22	1.25	1.4	1.95	3.0	3.7	4.15	3.25	1.95	1.6	.....
23	1.3	1.5	1.9	3.0	4.1	3.9	3.3	1.9	1.7	.....
24	1.25	1.5	1.85	2.8	4.3	3.8	3.3	1.8	1.7	.....
25	1.3	1.4	1.9	2.7	4.1	3.7	4.2	1.8	1.65	.....
26	1.3	1.4	1.9	2.8	3.8	3.35	3.75	1.8	2.05	.....
27	1.25	1.4	1.9	2.9	3.7	3.3	3.4	1.8	2.15	.....
28	1.3	1.4	2.0	2.8	4.0	3.3	3.2	1.75	2.05	.....
29	1.3	.....	2.2	2.85	4.1	3.3	2.9	1.7	2.2	.....
30	1.3	.....	2.4	2.65	4.0	3.2	2.7	1.7	3.55	.....
31	1.3	.....	2.45	.....	4.1	.....	2.6	1.65	.....	.....

Daily discharge, in second-feet, of Florida River near Durango, Colo., for 1911.

Day.	Jan.	Feb	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	23	20	23	226	226	746	474	178	46	727
2	23	17	20	202	226	716	682	147	40	376
3	23	17	20	178	238	716	667	128	46	232
4	23	17	20	214	303	760	577	111	51	167
5	23	20	20	178	399	804	431	111	51	.....
6	23	17	23	178	470	818	350	94	46	.....
7	23	17	20	167	499	774	460	78	40	.....
8	23	17	23	156	586	774	338	78	40	.....
9	23	17	23	135	615	818	290	78	64	.....
10	23	20	31	125	586	818	266	78	128	.....
11	23	20	46	135	528	818	210	78	46	.....
12	23	20	40	156	499	789	278	64	40	.....
13	20	20	46	146	499	687	390	78	51	.....
14	17	20	51	135	441	745	446	64	51	.....
15	17	20	51	146	385	695	376	58	58	.....
16	17	20	51	167	413	620	325	64	51	.....
17	20	20	64	214	528	516	278	51	46	.....
18	17	20	72	202	586	557	244	51	40	.....
19	13	20	80	214	658	600	376	64	40	.....
20	13	20	80	251	499	554	403	51	51	.....
21	17	20	80	277	456	668	431	51	40	.....
22	15	23	88	330	528	638	363	86	40	.....
23	17	23	80	330	644	562	376	78	51	.....
24	15	23	72	277	702	531	376	64	51	.....
25	17	23	80	251	644	500	637	64	46	.....
26	17	23	80	277	557	396	504	64	102	.....
27	15	23	80	303	528	376	403	64	120	.....
28	17	23	97	277	615	376	350	58	102	.....
29	17	.....	135	290	644	376	278	51	128	.....
30	17	.....	178	238	615	350	232	51	446	.....
31	17	.....	190	.....	644	.....	210	46	.....	.....

Monthly discharge of Florida River near Durango, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January	23	15	19	1,172
February	23	17	20	1,111
March	190	20	63	3,896
April	330	125	213	12,645
May	702	226	508	31,262
June	818	350	637	37,880
July	682	210	388	23,843
August	178	46	77	4,724
September	446	40	72	4,268
October 1–4	727	167	376	2,979
The period	.....	.....	.....	123,780

LA PLATA RIVER NEAR LA PLATA, N. MEX.

Location.—At highway bridge in sec. 3, T. 31 N., R. 13 W. New Mexico principal meridian, 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 July 21, 1911.

Drainage area.—Approximately 340 square miles.

Gage.—Chain gage; location and datum unchanged.

Channel.—Extremely shifting.

Discharge measurements.—Made from the bridge and 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.—Measurements insufficient for estimates of discharge.

Cooperation.—During 1911 this station was maintained in cooperation with the Territorial engineer.

Discharge measurements of La Plata River near La Plata, N. Mex., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 23	G. H. Russell	3.54	2.3	Apr. 6	E. O. Christiansen	3.48	156
Feb. 22	do	3.44	4.2	May 29	J. B. Stewart	2.63	19
Mar. 30	C. D. Miller	3.56	140				

Daily gage height, in feet, of La Plata River near La Plata, N. Mex., for 1911.

[Frank Williams, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.
1	3.5	4.1	3.75	3.8	3.6	2.6	2.3
2	3.55	4.1	3.75	4.1	3.4	2.6	3.0
3	3.6	4.1	3.75	3.8	3.4	2.5	2.6
4	3.6	3.9	3.75	3.7	3.5	2.5	2.6
5	3.6	3.9	3.75	3.65	3.6	2.5	2.7
6	3.6	3.8	4.4	3.5	3.7	2.5	2.65
7	3.6	3.7	4.2	3.4	3.2	2.5	2.65
8	3.6	3.7	4.2	3.4	3.1	2.7	2.6
9	3.6	3.7	4.25	3.4	3.3	2.6	2.6
10	3.6	3.7	4.4	3.45	3.4	2.6	2.6
11	4.7	3.7	4.5	3.4	3.5	2.6	3.0
12	4.95	3.7	3.4	3.5	3.6	2.6	3.5
13	3.7	3.7	3.4	3.55	3.5	2.6	8.0
14	3.7	3.7	3.1	3.5	3.2	2.9	7.0
15	3.7	3.7	3.0	3.5	3.0	2.95	4.0
16	3.7	3.7	2.9	3.4	3.0	3.0	3.0
17	3.7	3.7	3.1	3.4	2.9	3.0	3.4
18	3.7	3.7	3.15	3.9	2.85	2.9	3.55
19	3.7	3.7	3.2	3.8	2.9	2.9	5.4
20	3.7	3.7	3.1	3.8	2.7	2.8	4.3
21	3.65	3.7	3.3	3.9	2.8	2.8	4.7
22	3.6	3.7	3.3	3.4	2.7	2.75	.....
23	3.5	4.1	3.3	3.6	2.6	2.6	.....
24	3.5	4.5	3.2	3.6	2.5	2.6	.....
25	3.7	3.8	3.3	3.7	2.5	2.5	.....
26	3.9	3.7	3.3	3.6	2.5	2.5	.....
27	3.9	3.9	3.0	3.8	2.5	2.3	.....
28	3.9	3.75	3.1	3.6	2.5	2.25	.....
29	3.9	.....	3.3	3.6	2.6	2.3	.....
30	3.9	.....	3.5	3.7	2.6	2.25	.....
31	4.1	.....	3.7	.....	2.6	.....	.....

WEST MANCOS RIVER NEAR MANCOS, COLO.

Location.—At Crane's ranch, about sec. 14, T. 36 N., R. 13 W., New Mexico principal meridian, 4 miles above Mancos, Colo. Nearest tributary, East Fork, enters 2 miles below.

Records available.—September 18, 1910, to December 5, 1911.

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

Gage.—Vertical staff.

Channel.—Liable to change during high water.

Discharge measurements.—Made by wading.

Diversions.—No data.

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

Discharge measurements of West Mancos River near Mancos, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 19	B. S. Clayton	0.93	31.0	June 25	B. S. Clayton	1.48	92.0
Apr. 19	do	1.39	103	Aug. 28	do	1.16	28.2
May 22	do	1.58	133				

Daily gage height, in feet, of West Mancos River near Mancos, Colo., for 1911.

[W. H. Crane, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.2	1.8	1.6	1.45	1.5	0.9	2.35	1.8	1.6
2	1.2	1.8	1.7	1.45	1.4	.9	1.8	1.8	1.6
3	1.2	1.85	1.7	1.45	1.4	.9	1.6	1.75	1.6
4	1.15	1.85	1.7	1.45	1.25	.9	1.5	1.75	1.6
5	1.15	1.9	1.8	1.45	1.25	.85	3.25	1.7	1.6
6	1.2	1.9	1.8	1.4	1.3	.85	2.95	1.7	.....
7	1.2	2.0	1.8	1.4	1.25	.85	2.55	1.7	.....
8	1.1	2.0	1.8	1.4	1.25	.85	2.05	1.7	.....
9	1.1	2.0	1.8	1.4	1.25	.85	2.3	1.7	.....
10	1.1	1.9	1.8	1.4	1.3	.85	2.2	1.7	.....
11	1.1	1.85	1.8	1.4	1.25	.85	2.1	1.7	.....
12	1.1	1.85	1.8	1.6	1.2	.8	2.1	1.7	.....
13	1.15	1.85	1.8	1.5	1.2	.8	2.0	1.7	.....
14	1.2	1.85	1.8	1.5	1.2	.8	2.0	1.7	.....
15	1.2	1.85	1.85	1.45	1.2	.8	2.0	1.7	.....
16	1.25	1.85	1.9	1.45	1.2	.8	2.0	1.7	.....
17	1.3	1.85	1.8	1.45	1.2	.8	1.95	1.7	.....
18	1.35	1.8	1.75	1.45	1.2	.8	1.95	1.7	.....
19	1.4	1.8	1.65	1.75	1.2	.8	1.9	1.7	.....
20	1.5	1.7	1.65	1.7	1.2	.8	1.9	1.7	.....
21	1.5	1.7	1.6	1.7	1.2	.8	1.9	1.7	.....
22	1.6	1.65	1.6	1.6	1.2	.8	1.9	1.7	.....
23	1.6	1.65	1.5	1.55	1.1	.8	1.9	1.7	.....
24	1.6	1.65	1.4	1.5	1.1	.8	1.9	1.65	.....
25	1.6	1.65	1.4	2.1	1.1	.8	1.85	1.65	.....
26	1.6	1.6	1.4	1.9	1.1	.8	1.85	1.65	.....
27	1.65	1.6	.....	1.8	1.15	.9	1.85	1.65	.....
28	1.65	1.6	.....	1.5	1.1	.95	1.8	1.65	.....
29	1.7	1.6	.....	2.0	1.1	1.0	1.8	1.6	.....
30	1.7	1.6	1.45	1.7	1.1	1.95	1.8	1.6	.....
31	.....	1.65	.....	1.6	1.1	.....	1.8	.....	.....

Daily discharge, in second-feet, of West Mancos River near Mancos, Colo., for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Day.	Apr.	May.	June.	July.	Aug.	Sept.
1	63	197	143	86	96	13	16	72	211	225	86	31	9
2	63	197	169	86	77	13	17	80	211	197	86	31	9
3	63	211	169	86	77	13	18	90	197	183	86	31	9
4	56	211	169	86	52	13	19	99	197	156	153	31	9
5	56	225	197	86	35	11	20	120	169	156	142	31	9
6	63	225	197	77	39	11	21	120	169	143	142	31	9
7	63	253	197	77	35	11	22	143	156	143	118	31	9
8	48	253	197	77	35	11	23	143	156	120	107	24	9
9	48	253	197	77	35	11	24	143	156	99	96	24	9
10	48	225	197	77	39	11	25	143	156	99	252	24	9
11	48	211	197	77	35	11	26	143	143	99	196	24	9
12	48	211	197	118	31	9	27	156	143	96	168	28	13
13	56	211	197	96	31	9	28	156	143	96	96	24	16
14	63	211	197	96	31	9	29	169	143	96	224	24	18
15	63	211	211	86	31	9	30	169	143	86	142	24	114
							31	.....	156	.....	118	24	.....

NOTE.—Discharge interpolated for days for which gage heights are missing. Estimates of the discharge were not made after Oct. 1 on account of changes in the channel after the high water of the first part of October, as no discharge measurements were made after this flood.

Monthly discharge of West Mancos River near Mancos, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April	169	48	93	5,544
May	253	143	192	11,810
June	225	86	161	9,570
July	252	77	113	6,942
August	96	24	36	2,214
September	114	9	14	843
The period	.....	.....	.....	36,923

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, 1911.

Drainage area.—1,010 square miles.

Gage.—Inclined staff.

Channel.—Shifting.

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.—No important diversions above the station; records show very closely the total run-off of the Virgin River basin above this point.

Accuracy.—Poor, because of shifting character of stream bed and lack of discharge measurements.

Cooperation.—Maintained in cooperation with the State of Utah.

Discharge measurements of Virgin River at Virgin, Utah, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 12	G. C. Baldwin	3.99	647
Sept. 27	J. C. Dort	3.65	380
28	.....do	3.14	211

Daily gage height, in feet, of Virgin River at Virgin, Utah, for 1911.

[Niles Earl, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	3.3	.....	4.65	3.45	.....	2.95	2.7	3.65	2.65	.....
2	3.2	3.4	.....	.....	.....	3.5	2.9	2.95	2.75	.....	2.6	2.6
3	.....	3.3	3.3	4.6	4.4	.....	.....	2.9	2.75	.....	.....	2.6
4	3.25	3.5	.....	4.7	4.65	3.4	2.85	.....	2.75	3.6	2.6	2.6
5	3.15	.....	.....	4.2	.....	.....	2.85	2.75	.....	.....	2.6	2.65
6	3.15	3.4	3.2	4.45	4.4	3.35	.....	2.75	2.75	2.7	2.65	2.6
7	3.1	3.2	.....	.....	4.45	3.3	2.8	.....	.....	2.7	.....	.....
8	.....	3.25	3.4	4.1	4.65	.....	.....	.....	2.7	2.65	2.65	2.6
9	3.2	3.3	8.2	.....	.....	.....	2.75	2.7	2.8	2.65	.....	.....
10	3.25	3.2	5.5	4.3	4.2	.....	2.75	2.7	.....	.....	2.6	.....
11	5.0	.....	.....	4.45	.....	3.2	.....	2.65	.....	2.7	2.65	2.6
12	.....	3.4	.....	.....	4.0	.....	2.8	.....	2.8	2.75	2.5	.....
13	3.0	.....	3.8	4.15	4.0	3.15	2.85	.....	.....	.....	.....	2.65
14	2.9	3.5	.....	4.1	4.2	3.4	2.85	2.7	2.75	2.7	.....	2.6
15	.....	3.3	3.5	3.6	4.0	.....	.....	.....	.....	2.7	2.6	2.65
16	3.4	3.3	3.6	3.95	.....	3.25	2.85	2.65	2.8	.....	.....	.....
17	.....	.....	3.7	4.1	4.0	.....	2.9	.....	2.75	2.7	2.6	.....
18	2.8	3.4	3.7	4.25	.....	3.2	.....	2.7	.....	.....	2.6	2.6
19	2.9	.....	.....	4.5	.....	.....	10.3	2.7	2.7	2.7	.....	2.7
20	3.0	3.35	3.85	.....	3.95	3.1	3.65	2.65	.....	.....	2.65	2.7
21	.....	3.3	.....	4.6	3.95	3.0	3.6	.....	2.85	2.65	.....	.....
22	2.9	3.25	3.95	4.1	.....	.....	.....	2.7	2.8	2.7	2.65	2.65
23	.....	3.3	4.1	.....	.....	3.0	3.35	.....	2.75	.....	.....	.....
24	3.1	3.3	.....	.....	3.85	.....	3.2	2.7	2.7	.....	2.6	2.6
25	9.0	3.25	4.2	4.45	.....	3.0	.....	2.7	2.75	2.75	2.6	.....
26	3.7	3.4	4.2	4.65	.....	3.0	3.0	2.7	2.7	.....	.....	2.6
27	.....	3.4	4.0	4.5	3.8	2.95	2.95	2.8	3.65	2.65	2.6	2.6
28	3.2	3.5	.....	4.2	3.8	2.95	.....	2.7	3.14	2.7	.....	2.55
29	3.0	.....	4.3	4.15	.....	.....	3.0	.....	.....	.....	2.6	2.6
30	5.0	.....	.....	.....	3.6	2.9	.....	2.7	11.0	2.6	2.65	2.65
31	10.0	.....	4.25	.....	.....	.....	.....	.....	.....	.....	.....	.....

Daily discharge, in second-feet, of Virgin River at Virgin, Utah, for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	170	500	254	950	1,280	300	160	170	126	420	144	140
2	175	284	254	1,100	1,160	316	160	170	134	410	136	136
3	184	254	254	1,230	1,030	300	156	160	134	400	136	136
4	194	316	240	1,330	1,280	284	151	147	134	395	136	136
5	148	300	230	830	1,160	276	151	134	134	274	136	144
6	148	284	226	1,080	1,030	269	146	134	134	152	144	136
7	140	226	255	908	1,080	254	142	130	130	152	144	136
8	158	240	284	735	1,280	245	138	128	126	144	144	136
9	175	254	6,350	832	1,060	235	134	126	142	144	140	136
10	194	226	2,350	930	830	230	134	126	142	148	136	136
11	1,700	255	700	1,080	738	226	138	120	142	152	144	136
12	175	284	500	931	645	220	142	122	142	160	122	140
13	112	300	482	782	645	214	151	124	138	156	128	144
14	88	316	399	735	830	284	151	126	134	152	132	136
15	172	254	316	356	645	262	151	123	138	152	136	144
16	256	254	356	604	645	240	151	120	142	152	136	140
17	164	269	414	735	645	233	160	123	134	152	136	138
18	72	284	414	880	630	226	200	126	130	152	136	136
19	88	276	468	1,130	615	214	9,500	126	126	152	140	152
20	112	269	522	1,180	604	202	385	120	138	148	144	152
21	100	254	562	1,230	604	180	356	123	151	144	144	148
22	88	240	604	735	580	180	312	126	142	152	144	144
23	114	254	735	850	550	180	269	126	134	156	140	140
24	140	254	782	970	522	180	226	126	126	158	136	136
25	7,550	240	830	1,080	500	180	203	126	134	160	136	136
26	414	284	830	1,280	490	180	180	126	126	152	136	136
27	320	284	645	1,130	482	170	170	142	385	144	136	136
28	226	316	788	830	482	170	175	126	211	152	136	129
29	180	.....	930	782	418	165	180	126	400	144	136	136
30	1,700	.....	905	900	354	160	175	126	10,600	136	144	144
31	9,050	.....	880	.....	327	.....	170	126	.....	140	.....	140

NOTE.—Daily discharge determined from three fairly well defined rating curves which meet at gage height 3.9; above gage height 3.9 the curve is applicable Jan. 1 to Dec. 31.

Monthly discharge of Virgin River at Virgin, Utah, for 1911.

[Drainage area, 1,010 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	9,050	72	791	0.783	0.90	48,600	C.
February	.....	226	278	.275	.29	15,400	B.
March	6,350	226	766	.758	.87	47,100	B.
April	1,330	356	938	.929	1.04	55,800	B.
May	1,280	.....	746	.739	.85	45,900	B.
June	316	160	226	.224	.25	13,400	B.
July	9,500	134	484	.479	.55	29,800	B.
August	170	120	131	.130	.15	8,060	B.
September	10,600	126	504	.499	.56	30,000	C.
October	420	136	189	.187	.22	11,600	C.
November	144	122	138	.137	.15	8,210	C.
December	152	129	144	.143	.16	8,850	C.
The year	10,600	72	446	.442	5.99	323,000	

SANTA CLARA CREEK NEAR CENTRAL, UTAH.

Location.—At R. H. Hunt's ranch, in sec. 14, T. 39 S., R. 16 W. Salt Lake base and meridian, 6 miles below Pine Valley, and about 1 mile southeast of Central post office.

Records available.—April 21, 1909, to December 31, 1911.

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 affects relation of gage height to discharge slightly at times during the winter months.

Diversions.—The Eightmile Flat canal, which has a maximum capacity of 3.5 second-feet, is the only diversion above the station.

Accuracy.—Fair except for periods of shifting channel.

Cooperation.—Maintained in cooperation with the State of Utah.

Discharge measurements of Santa Clara Creek near Central, Utah, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 14	G. C. Baldwin	4.08	80.3	Sept. 30	J. C. Dort	4.32	109
15	do	4.12	76.2	30	do	4.14	102
Sept. 29	J. C. Dort	3.32	12.3	30	do	4.85	389

Daily gage height, in feet, of Santa Clara Creek near Central, Utah, for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.2	4.1	3.35	4.0	3.8	3.95	3.5	3.4	3.3	3.8	3.3	3.3
2	3.15	3.8	3.35	4.0	3.85	3.95	3.5	3.35	3.3	3.7	3.3	3.3
3	3.15	3.75	3.35	4.1	3.85	3.95	3.5	3.3	3.25	3.6	3.3	3.3
4	3.15	3.75	3.6	4.2	3.85	3.95	3.5	3.35	3.25	3.6	3.3	.....
5	3.2	3.7	3.4	4.1	3.95	3.95	3.5	3.35	3.25	3.6	3.3	3.3
6	3.2	3.65	3.45	4.1	4.1	3.95	3.5	3.35	3.25	3.5	3.3	.....
7	3.2	3.55	3.45	4.0	4.2	3.95	3.5	3.3	3.25	3.45	3.3	3.3
8	3.2	3.4	3.55	4.0	4.3	3.95	3.5	3.3	3.25	3.45	3.3	.....
9	3.2	3.45	4.0	4.0	4.3	3.95	3.5	3.3	3.25	3.45	3.3	3.3
10	4.9	3.5	4.65	4.0	4.25	3.95	3.45	3.25	3.25	3.45	3.3	3.3
11	.....	3.5	4.3	4.0	4.15	3.8	3.45	3.3	3.25	3.45	3.3	.....
12	.....	3.45	3.9	3.95	4.1	3.8	3.45	3.3	3.3	3.45	3.3	3.2
13	.....	3.45	3.8	3.9	4.1	4.1	3.45	3.3	3.3	3.45	3.3	3.2
14	3.2	3.4	3.7	3.8	4.1	4.1	3.45	3.3	3.3	3.45	3.3	.....
15	3.2	3.4	3.7	3.8	4.06	4.05	3.45	3.3	3.3	3.45	3.3	.....
16	3.2	3.45	3.65	3.75	4.0	4.05	3.45	3.25	3.3	3.4	3.3	3.3
17	3.2	3.5	3.75	3.7	4.0	4.0	3.45	3.25	3.3	3.4	3.3	3.3
18	3.2	3.4	3.7	3.7	3.95	3.9	3.58	3.25	3.3	3.35	3.3	.....
19	3.2	3.4	3.75	3.75	3.95	3.9	3.5	3.25	3.3	3.35	3.3	3.2
20	3.2	3.4	3.75	3.75	4.0	3.9	3.5	3.25	3.3	3.35	3.3	3.2
21	3.15	3.35	3.75	3.8	4.0	3.9	3.65	3.3	3.3	3.35	3.3	3.2
22	3.2	3.3	3.75	3.8	4.0	3.85	3.5	3.3	3.3	3.35	3.3	.....
23	3.3	3.3	3.8	3.8	4.0	3.8	3.5	3.3	3.3	3.35	3.3	3.2
24	3.3	3.4	3.8	3.8	4.0	3.8	3.5	3.25	3.3	3.35	3.3	.....
25	4.1	3.35	3.85	3.8	3.95	3.75	3.5	3.3	3.3	3.35	3.3	3.2
26	3.6	3.35	3.85	3.8	3.9	3.75	3.5	3.3	3.3	3.35	3.3	3.25
27	3.4	3.35	3.9	3.85	3.9	3.65	3.5	3.3	3.3	3.35	3.3	.....
28	3.35	3.35	3.9	3.85	3.9	3.6	3.5	3.3	3.3	3.35	3.3	3.25
29	4.0	.....	3.9	3.9	3.9	3.55	3.5	3.3	3.3	3.35	3.3	.....
30	3.65	.....	3.9	3.8	3.9	3.5	3.45	3.3	4.2	3.3	3.3	3.25
31	5.0	.....	4.0	.....	3.95	.....	3.45	3.3	.....	3.3	3.3	3.25

Daily discharge, in second-feet, of Santa Clara Creek near Central, Utah, for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	7	163	24	66	46	61	23	17	12	57	12	12
2	7	96	24	66	51	61	23	14	12	46	12	12
3	7	87	24	78	51	61	23	12	10	36	12	12
4	7	87	61	91	51	61	23	14	10	36	12	12
5	7	78	31	78	61	61	23	14	10	36	12	12
6	7	70	38	78	78	61	23	14	10	27	12	12
7	7	53	38	66	91	61	23	12	10	23	12	12
8	7	31	53	66	106	61	23	12	10	23	12	12
9	7	38	66	66	106	61	23	12	10	23	12	12
10	406	45	184	66	98	61	20	10	10	23	12	12
11	200	45	106	66	84	46	20	12	10	23	12	10
12	50	38	56	61	78	46	20	12	12	23	12	8
13	20	38	46	56	78	78	20	12	12	23	12	8
14	7	31	38	46	78	78	20	12	12	23	12	8
15	7	31	38	46	68	72	20	12	12	23	12	10
16	7	38	34	42	66	72	20	10	12	19	12	12
17	7	45	42	38	66	66	20	10	12	19	12	12
18	7	31	38	38	61	56	29	10	12	16	12	10
19	7	31	42	42	61	56	23	10	12	16	12	8
20	7	31	42	42	66	56	23	10	12	16	12	8
21	7	24	42	46	66	56	34	12	12	16	12	8
22	7	18	42	46	66	51	23	12	12	16	12	8
23	18	18	46	46	66	46	23	12	12	16	12	8
24	18	31	46	46	66	46	23	10	12	16	12	8
25	163	24	51	46	61	42	23	12	12	16	12	8
26	61	24	51	46	56	42	23	12	12	16	12	10
27	31	24	56	51	56	34	23	12	12	16	12	10
28	24	24	56	51	56	30	23	12	12	16	12	10
29	139	.....	56	56	56	26	23	12	12	16	12	10
30	70	.....	56	46	56	23	20	12	114	12	12	10
31	440	.....	66	.....	61	.....	20	12	.....	12	.....	10

NOTE.—Daily discharge determined from two fairly well defined rating curves, one applicable Jan. 1 to Mar. 8 and Oct. 1 to Dec. 31, and the other Mar. 9 to Sept. 29. Discharge Sept. 30 determined by indirect method for shifting channels.

Monthly discharge of Santa Clara Creek near Central, Utah, for 1911.

[Drainage area, 84 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	440	7	57.0	0.679	0.78	3,500	C.
February	163	18	46.2	.550	.57	2,570	B.
March	184	24	51.4	.612	.71	3,160	B.
April	91	38	55.9	.665	.74	3,330	B.
May	106	46	68.1	.811	.94	4,190	B.
June	78	23	54.4	.648	.72	3,240	B.
July	29	20	22.6	.269	.31	1,390	B.
August	17	10	12.0	.143	.16	738	B.
September	114	10	14.8	.176	.20	881	B.
October	57	12	22.5	.268	.31	1,380	B.
November	12	12	12.0	.143	.16	714	B.
December	12	8	10.1	.120	.14	621	B.
The year	440	7	35.5	.424	5.74	25,700	

SANTA CLARA CREEK NEAR ST. GEORGE, UTAH.

Location.—About 2 miles west of St. George and 3 miles above mouth of creek, in sec. 27, T. 42 S., R. 16 W. Salt Lake base and meridian.

Records available.—April 16, 1909, to December 31, 1911.

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.—Records for 1911, except discharge measurements, withheld until additional data can be obtained.

Cooperation.—Maintained in cooperation with the State of Utah.

Discharge measurements of Santa Clara Creek near St. George, Utah, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 11	G. C. Baldwin	3.82	80.45
Sept. 25	J. C. Dort	4.57	3.67

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, 1911.

Drainage area.—Not measured.

Gage.—Staff gage in four sections; the two low-water sections are on the right bank a short distance above the cable; the remainder of the gage is bolted to cliffs on the left bank just above the cable.

Channel.—Shifting sand.

Discharge measurements.—Made from car and cable just below gage and by wading.

Accuracy.—Discharge measurements insufficient for estimates of daily discharge.

Discharge measurements of Bill Williams River near Swansea, Ariz., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 5	C. C. Jacob	3.70	25
Oct. 21	do	3.65	15

Daily gage height, in feet, of Bill Williams River near Swansea, Ariz., for 1911.

[L. G. Martinez, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.5	3.1	3.2	3.7	3.7	.....	3.7	3.7	3.7	3.6	3.6
2	2.5	3.2	3.2	3.7	3.7	.....	3.7	3.7	3.9	3.5	3.6
3	2.5	3.4	3.1	3.7	3.7	.....	3.7	3.7	3.9	3.5	3.6
4	2.5	3.5	3.1	3.7	3.7	.....	3.7	3.7	3.7	3.5	3.6
5	2.5	.....	3.1	3.7	3.7	.....	3.7	3.7	3.7	3.5	3.6
6	2.5	.....	3.5	3.7	3.7	.....	3.7	3.7	4.6	3.5	3.6
7	2.4	4.2	3.6	3.7	3.7	.....	3.7	3.7	3.9	3.5	3.6
8	2.4	4.0	3.7	3.7	3.7	.....	3.7	3.7	3.9	3.4	3.6
9	2.4	3.8	3.6	3.7	3.7	.....	3.7	3.7	3.7	3.4	3.6
10	2.4	3.8	3.5	3.7	3.7	.....	3.7	3.7	3.7	3.4	3.6
11	2.4	3.6	3.4	3.7	3.7	.....	3.7	3.7	3.6	3.4	3.6
12	.....	3.5	.....	3.7	3.7	.....	3.7	3.7	3.6	3.5	3.6
13	.....	3.5	.....	3.7	3.7	.....	3.7	3.7	3.6	3.5	3.6
14	.....	3.4	4.3	3.7	3.7	.....	3.7	3.7	3.6	3.5	3.5
15	3.3	3.4	4.1	3.7	3.7	.....	3.7	3.7	3.6	3.5	3.5
16	.....	3.4	4.0	3.7	3.7	.....	3.7	3.7	3.6	3.5	3.5
17	.....	3.3	4.0	3.7	3.7	.....	3.7	3.7	3.6	3.5	3.45
18	3.0	3.3	3.9	3.7	3.7	.....	3.7	3.7	3.6	3.5	3.45
19	3.0	3.3	3.9	3.7	3.7	2.7	3.7	3.7	3.6	3.6	3.45
20	3.0	3.3	3.2	3.7	3.7	3.3	3.7	3.7	3.6	3.6	3.45
21	3.0	3.2	3.8	3.7	3.7	4.4	3.7	3.7	3.6	3.6	3.45
22	3.0	3.2	3.8	3.7	3.7	4.1	3.7	3.7	3.6	3.6	3.45
23	3.0	3.2	3.8	3.7	3.7	3.8	3.7	3.7	3.6	3.6	3.45
24	3.0	3.2	3.8	3.7	3.7	4.0	3.7	3.7	3.6	3.6	3.45
25	3.0	3.2	3.7	3.7	3.7	4.2	3.7	3.7	3.6	3.6	3.45
26	3.0	3.2	3.7	3.7	3.7	4.1	3.7	3.7	3.6	3.6	3.35
27	3.0	3.2	3.7	3.7	3.6	4.0	3.7	3.7	3.6	3.6	3.15
28	3.3	3.2	3.7	3.7	3.6	3.8	3.7	3.7	3.8	3.6	3.15
29	3.3	.....	3.7	3.7	3.6	3.7	3.7	3.7	3.8	3.6	3.15
30	3.3	.....	3.7	3.7	3.6	3.7	3.7	3.7	3.7	3.6	3.05
31	3.3	.....	3.7	.....	.....	3.7	3.7	.....	3.6	.....	3.05

GILA RIVER BASIN.

GILA RIVER NEAR REDROCK, N. MEX.

Location.—Four miles northeast of Redrock post office, near the eastern edge of T. 18 N., R. 18 W., New Mexico principal meridian, in the Middle Box Canyon. Nearest important tributary is Mancos Draw, an intermittent stream which enters 12 miles above the station. A number of large washes come into the river above and below the station, and during flood stages carry large quantities of water.

Records available.—May 14, 1908, to December 31, 1911.

Drainage area.—3,500 square miles (measured from Land Office map).

Gage.—Automatic recording gage. The original staff gage was located at the mouth of the canyon. On July 16, 1909, readings on this gage were discontinued and a Friez automatic gage, reading to a new datum was installed at the present site. The Friez gage was washed out by the flood of July 23, 1911, and a Barrett and Lawrence automatic gage, reading to the same datum, was established in its place October 3, 1911, but was not put into operation until December 1, 1911. All gage heights July 23, to November 30, 1911, were read on a staff gage attached to the automatic float box and refer to the datum of the automatic gages.

Channel.—Extremely shifting.

Discharge measurements.—Made from car and cable 400 feet below the gage, and at low stage by wading.

Winter flow.—Except for a fringe of ice along the edges of the river, ice does not interfere with the accuracy of the results.

Diversions.—A number of large irrigation ditches and reservoirs divert water above the station.

Flood flow.—On July 23, 1911, a very severe flood occurred in the valley. Owing partly to a log jam the maximum stage at the station was about 22 feet with a discharge of about 18,000 second-feet.

Accuracy.—Owing to the extremely shifting character of the channel and to lack of sufficient discharge measurements, reliable estimates of discharge for 1911 can not be made.

Cooperation.—Station maintained in cooperation with the Territorial engineer and Thomas Lyons, Gila, N. Mex.

Discharge measurements of Gila River near Redrock, N. Mex., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 2	C. D. Miller	2.48	206	Aug. 15	G. H. Russell	0.25	38.0
Mar. 27	G. H. Russell	3.60	855	Nov. 28	A. S. Kirkpatrick	.50	95.0
May 25	do	1.70	82.3				

Daily gage height, in feet, of Gila River near Redrock, N. Mex., for 1911.

[R. A. Jernigan, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Nov.	Dec.
1	1.8			3.2	1.85	1.5	1.6				0.95
2	1.8	2.48		3.2	1.85	1.5	1.6		1.6		.95
3	1.8			3.1	1.8	1.55	1.6				1.2
4	1.75	1.5	3.3	3.1	1.75	1.5	1.6				1.2
5	1.75		3.45	3.0	1.7	1.5	1.6		.5		1.2
6	1.7		4.1	2.9	1.7	1.5	1.6				1.2
7	1.7		4.0	2.9	1.9	1.5	1.6		.85		1.2
8	1.7		4.0	2.85	1.8	1.5	1.6				1.2
9	1.7		3.5	2.85	1.8	1.5	1.6		8.0		1.2
10	1.7		3.2	2.9	1.85	1.45	2.0				1.2
11	1.8	2.1	3.0	2.9	1.85	[a]3.0	[b]3.2		6.4		1.2
12	3.0		3.05	2.9	1.85	1.8	2.9	1.0			1.2
13	3.0		3.0	2.85	1.9	1.75	3.4				1.2
14	3.0		3.0	2.75	1.9	1.7	3.4	.3			1.2
15			3.0	2.55	1.9	1.7	3.1	.25			1.2
16			2.9	2.5	1.85	1.7	2.75		1.5		1.2
17			2.9	2.5	1.85	1.65	3.0	2.0			1.2
18		2.0	2.9	2.4	1.8	1.6	2.7		2.0		1.2
19			2.85	2.3	1.8	1.6	2.75	4.0			1.2
20			2.85	2.25	1.8	1.6	2.6				1.2
21			2.85	2.25	1.8	1.6	2.55		1.8		1.2
22			2.85	2.2	1.75	1.95	2.65	2.0			1.1
23			3.0	2.15	1.75	1.8			1.6		1.0
24			3.5	2.1	1.7	1.7		2.4			.8
25		2.2	3.5	2.1	1.7	1.65		4.0	1.7		1.0
26			3.75	2.1	1.65	1.6		2.0	2.0		1.0
27			3.65	2.1	1.65	1.6					1.0
28	3.0		3.55	2.05	1.55	1.55			1.8	0.5	1.0
29			3.4	1.95	1.6	1.5					1.0
30			3.35	1.9	1.55	1.45			2.0		1.0
31			3.25		1.5						1.0

[a] Maximum gage height, 6.1 feet. [b] Maximum gage height, 5.0 feet.

NOTE.—Gage heights somewhat affected by ice Jan. 1 to 11 and Dec. 25 to 31.

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., Gila and Salt River base and meridian, 8 miles above mouth of San Francisco River.

Records available.—November 6, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Inclined staff bolted to conglomerate rock on right bank.

Channel.—Shifting sand.

Discharge measurements.—Made from car and cable 50 feet below gage, and by wading.

Diversions.—About 7,000 acres of land irrigated from this stream above the station.

Accuracy.—Full reliance can not be placed in the gage height record previous to November 12, 1911. Discharge measurements during 1911 insufficient for estimates of flow.

Discharge measurements of Gila River at Guthrie, Ariz., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 17	C. C. Jacob	6.02	239	Aug. 28	C. C. Jacob	5.40	197
Mar. 15	do	6.70	413	Sept. 22	do	5.45	149
Apr. 14	do	6.66	146	Nov. 11	do	5.70	169
July 12	do	7.15	310	Dec. 12	do	5.60	130

Daily gage height, in feet, of Gila River at Guthrie, Ariz., for 1911.

[Amelia Short, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.3	5.7	5.95	7.05	6.2	5.9	6.7	5.9	5.4	6.7	6.0	5.55
2	5.3	6.0	6.9	7.1	6.2	5.9	6.5	5.75	5.3	6.6	5.9	5.54
3	5.3	6.0	7.0	7.2	6.2	5.9	6.35	5.55	5.3	6.6	5.9	5.52
4	5.3	6.0	7.15	7.1	6.1	5.9	6.2	5.45	5.3	6.5	5.9	5.56
5	5.3	6.0	7.1	7.05	6.1	5.9	6.2	5.4	5.05	6.6	5.9	5.57
6	5.3	5.9	7.1	7.0	6.1	5.9	6.1	5.3	5.0	7.15	5.9	5.57
7	5.3	5.9	7.8	6.95	6.1	5.9	6.0	5.25	5.0	8.0	5.9	.....
8	5.3	5.9	7.7	6.9	6.0	5.9	6.0	5.15	5.0	6.55	5.8	.....
9	5.3	5.9	7.5	6.85	6.0	5.9	6.0	5.1	5.0	6.3	5.75	5.60
10	5.3	5.9	7.7	6.9	6.0	5.9	6.15	5.1	7.9	6.0	5.7	5.61
11	5.3	5.9	7.7	6.8	5.95	6.6	6.8	5.0	6.7	5.9	5.68	5.60
12	5.4	5.9	7.0	6.75	5.95	6.8	7.4	5.0	6.05	5.8	5.70	5.60
13	5.85	5.9	7.0	6.7	5.95	6.6	7.75	5.0	5.6	5.7	5.66	5.61
14	5.65	5.8	7.0	6.65	5.95	6.7	7.6	5.0	5.5	5.6	5.66	5.60
15	5.9	5.7	6.7	6.65	5.9	6.5	7.85	5.0	5.8	5.6	5.66	5 60
16	5.9	5.6	6.65	6.6	5.9	6.5	7.75	5.0	5.45	5.6	5.67	5.60
17	5.9	5.6	6.4	6.7	5.9	6.4	7.85	4.8	5.3	5.5	5.68	5.59
18	5.9	5.6	6.4	6.65	5.9	6.4	7.55	4.6	5.25	5.5	5.64	5.58
19	5.7	5.9	6.5	6.55	5.9	6.4	7.9	4.6	5.2	5.5	5.62	5.58
20	5.6	5.9	6.4	6.4	5.9	6.4	7.95	4.6	6.85	5.5	5.64	5.56
21	5.7	5.9	6.25	6.4	5.9	6.3	7.75	4.55	6.4	5.4	5.62	5.56
22	5.7	5.9	6.2	6.3	5.9	6.35	7.6	4.55	5.5	5.5	5.60	5.56
23	5.7	5.9	6.3	6.2	5.9	6.2	7.4	5.15	5.4	5.5	5.60	5.56
24	5.7	5.9	6.4	6.2	5.9	6.25	9.8	5.25	5.4	5.5	5.59	5.57
25	5.8	5.9	6.8	6.1	5.9	6.2	10.8	5.45	5.4	5.5	5.59	5.57
26	7.05	5.9	7.3	6.1	5.9	6.15	6.6	5.85	5.4	5.4	5.59	5.57
27	6.8	5.9	7.35	6.1	5.9	6.1	6.95	5.55	5.6	5.5	5.58	5.57
28	7.0	5.9	7.4	6.15	5.9	6.1	6.7	5.4	5.6	5.5	5.56	5.56
29	6.3	.....	7.35	6.1	5.9	6.1	6.45	5.4	5.5	6.4	5.56	5.56
30	6.3	.....	7.3	6.2	5.9	6.0	6.25	5.75	5.6	5.9	5.54	5.55
31	6.3	.....	7.2	.....	5.9	6.7	6.0	5.45	.....	5.9	.....	5.55

GILA RIVER AT SAN CARLOS, ARIZ.

Location.—Below Arizona & Eastern Railroad bridge on San Carlos Indian Reservation, about 1 mile east of San Carlos, and one-half mile above mouth of San Carlos River.

Records available.—1899 to 1905 at a point about 1 mile below present site; August 17, 1910, to February 5, 1911, when station was discontinued.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to west pier of railroad bridge. On September 7, 1910, a staff gage was installed at old trestle bent, 600 feet below bridge, at an independent datum. The relation between these gages has been established and all gage heights are referred to the datum of the new gage.

Channel.—Shifting sand.

Discharge measurements.—Made from railroad bridge and by wading.

Accuracy.—Estimates of discharge not prepared, as results have not been satisfactory.

Daily gage height, in feet, of Gila River at San Carlos, Ariz., for 1911.

[J. B. Stone, observer.]

Day.	Jan.	Feb.	Day.	Jan.	Feb.	Day.	Jan.	Feb.
1	11.0	11.8	11	11.25	.....	21	11.8	.....
2	11.0	11.8	12	11.6	.....	22	11.8	.....
3	11.0	11.8	13	11.9	.....	23	11.8	.....
4	11.0	11.8	14	12.2	.....	24	11.8	.....
5	11.0	11.7	15	12.0	.....	25	11.8	.....
6	11.0	.....	16	12.0	.....	26	11.8	.....
7	11.0	.....	17	11.9	.....	27	11.8	.....
8	11.0	.....	18	11.8	.....	28	11.8	.....
9	11.0	.....	19	11.8	.....	29	11.8	.....
10	11.0	.....	20	11.8	.....	30	11.8	.....
						31	11.8	.....

GILA RIVER AT KELVIN, ARIZ.

Location.—About half a mile below mouth of Mineral Creek, 1 mile below Kelvin, Ariz.,[1] and 25 miles above Florence, Ariz.

Records available.—January 26 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Inclined staff bolted to basalt ledge on right bank opposite observer's home. This gage was destroyed by the March flood and was replaced by painting the section directly on the rock about 10 feet downstream from original gage. On November 23 an inclined staff for low water was bolted to the rock to which the first gage was attached. The original datum has been maintained.

Channel.—Shifting sand.

Discharge measurements.—Made from the public car and cable about three-fourths of a mile above gage, and by wading.

Diversions.—About 7,000 acres of land irrigated from this stream above the station.

Accuracy.—Although channel shifts, the control is fairly permanent between floods. Results are considered good for a station of this type. Estimates have been prepared from curves covering periods between floods.

[1] Ray Junction on Arizona & Eastern Railroad.

Discharge measurements of Gila River at Kelvin, Ariz., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 27	C. C. Jacob	4.60	490	Sept. 12	C. C. Jacob	3.98	50
Feb. 17	do	4.50	460	Oct. 5	do	5.79	1,030
Mar. 22	do	4.90	576	6	do	6.20	1,600
Apr. 25	do	4.00	71	30	do	7.18	3,920
May 24	do	3.70	6.6	Nov. 24	do	4.71	211
July 26	do	10.05	12,700	Dec. 20	do	4.79	272
27	do	7.05	3,560				

Daily gage height, in feet, of Gila River at Kelvin, Ariz., for 1911.

[H. Measom, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	4.55	4.4	5.05	4.0	3.5	4.0	5.4	3.9	5.3	5.95	4.5
2	.....	4.5	4.5	5.0	4.0	3.5	4.0	4.9	3.8	5.4	5.8	4.5
3	.....	4.4	4.7	5.0	3.9	3.5	3.8	4.65	3.6	5.2	5.5	4.5
4	.....	5.15	5.0	5.0	3.9	3.5	3.7	4.5	4.25	5.2	5.4	4.5
5	.....	5.65	5.05	4.9	3.9	3.5	3.7	4.5	4.65	5.65	5.35	4.5
6	.....	4.95	7.5	4.9	3.9	3.5	3.6	4.5	4.3	7.0	5.3	4.4
7	.....	4.6	8.0	4.8	3.9	3.5	3.6	4.55	4.0	7.25	5.3	4.4
8	.....	4.75	8 0	4.7	3.9	3.5	3.5	4.7	3.8	6.9	5.25	4.4
9	.....	4.6	7.5	4.7	3.9	3.5	3.35	4.6	3.6	6.15	5.1	4.4
10	.....	4.5	7.5	4.7	3.9	3.5	3.05	4.55	3.5	5.6	5.1	4.4
11	.....	4.45	6.75	4.7	3.8	3.5	2.9	4.5	3.4	5.5	5.0	4.4
12	.....	4.4	6.0	4.6	3.8	3.5	3.4	4.45	3.95	5.25	5.0	4.4
13	.....	4.4	5.9	4.5	3.8	3.5	5.15	4.4	5.25	5.2	5.0	4.4
14	.....	4.35	5.85	4.45	3.8	4.3	5.0	4.4	5.9	5.2	4.9	4.45
15	.....	4.3	5.8	4.4	3.8	4.2	4.8	4.4	7.2	5.15	4.8	4.5
16	.....	4.45	5.8	4.4	3.8	4.2	5.0	4.3	5.95	5.1	4.8	4.6
17	.....	4.5	5.7	4.3	3.75	4.0	6.5	4.3	5.65	5.0	4.8	4.6
18	.....	4.5	5.7	4.3	3.7	3.95	6.35	4.2	5.6	5.0	4.7	4.7
19	.....	4.7	5.7	4.2	3.7	3.85	6.55	4.2	5.75	5.0	4.6	4.8
20	.....	4.8	5.6	4.2	3.65	3.8	6.1	4.15	5.9	5.0	4.5	4.75
21	.....	4.75	5.3	4.2	3.6	3.7	6.35	4.0	5.4	5.0	4.5	4.7
22	.....	4.65	5.0	4.2	3.6	3.85	6.35	5.0	5.55	5.0	4.5	4.7
23	.....	4.6	4.85	4.2	3.6	3.7	5.75	4.9	5.2	4.9	4.55	4.7
24	.....	4.5	4.95	4.2	3.6	3.7	5.4	4.5	4.95	4.9	4.7	4.7
25	.....	4.5	5.0	4.1	3.6	3.7	5.4	4.25	4.8	4.8	4.7	4.8
26	4.5	4.5	4.9	4.0	3.6	3.65	9.8	4.0	4.7	4.8	4.7	4.9
27	4.55	4.4	4.9	4.0	3.6	3.5	7.75	5.0	4.5	4.85	4.6	4.9
28	4.65	4.45	5.15	4.0	3.55	3.1	7.25	5.3	4.8	5.25	4.6	4.9
29	4.5	.....	5.3	4.0	3.5	2.85	6.3	4.65	5.35	6.05	4.6	4.8
30	4.7	.....	5.25	4.0	3.5	3.35	5.85	4.3	5.5	7.05	4.6	4.8
31	4.7	.....	5.2	.....	3.5	.....	5.6	4.0	.....	6.95	.....	4.7

Daily discharge, in second-feet, of Gila River at Kelvin, Ariz., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	470	380	695	64	4	64	1,000	38	575	1,240	145
2	.....	440	440	655.	64	4	64	575	21	655	1,060	145
3	.....	380	570	655	38	4	21	390	7	500	740	145
4	.....	935	800	655	38	4	12	290	159	500	655	145
5	.....	1,420	845	575	38	4	12	290	390	885	615	145
6	.....	760	4,720	575	38	4	7	290	180	3,220	575	120
7	.....	500	6,070	500	38	4	7	322	64	3,900	575	120
8	.....	605	6,070	425	38	4	4	425	21	2,980	538	120
9	.....	500	4,640	425	38	4	2	355	7	1,520	430	120
10	.....	440	4,640	425	38	4	0	322	4	830	430	120
11	.....	410	2,930	425	21	4	0	290	3	740	365	120
12	.....	380	1,680	355	21	4	3	260	51	538	365	120
13	.....	380	1,550	290	21	4	778	230	865	500	365	120
14	.....	350	1,490	260	21	180	655	230	1,550	500	310	132
15	.....	320	1,430	230	21	138	500	230	3,890	465	260	145

Daily discharge, in second-feet, of Gila River at Kelvin, Ariz., for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
16	.....	410	1,430	230	21	138	655	180	1,240	430	260	175
17	.....	440	1,310	180	16	64	2,460	180	885	365	260	175
18	.....	440	1,310	180	12	51	2,210	138	830	365	215	215
19	.....	570	1,310	138	12	30	2,550	138	1,000	365	175	260
20	.....	640	1,200	138	10	21	1,820	119	1,180	365	145	238
21	.....	605	910	138	7	12	2,210	64	655	365	145	215
22	.....	535	655	138	7	30	2,210	655	785	365	145	215
23	.....	500	538	138	7	12	1,370	575	500	310	160	215
24	.....	440	615	138	7	12	1,000	290	338	310	215	215
25	.....	440	655	100	7	12	1,000	159	260	260	215	260
26	440	440	575	64	7	10	11,800	64	215	260	215	310
27	470	380	575	64	7	4	5,340	655	145	285	175	310
28	535	410	778	64	6	1	4,010	910	260	538	175	310
29	440	.....	910	64	4	0	2,130	390	615	1,380	175	260
30	570	.....	865	64	4	2	1,490	180	740	3,350	175	260
31	570	.....	820	.....	4	.....	1,200	64	.....	3,100	.....	215

NOTE.—Daily discharge determined from three fairly well defined rating curves applicable Jan. 26–Mar. 8, Mar. 9–Sept. 15, and Sept. 16–Dec. 31, respectively.

Monthly discharge of Gila River near Kelvin, Ariz., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January 26-31	570	440	504	6,000	B.
February	1,420	320	519	28,800	B.
March	6,070	380	1,700	105,000	B.
April	695	64	299	17,800	B.
May	64	4	21.8	1,340	C.
June	180	0	25.6	1,520	D.
July	11,800	0	1,470	90,400	C.
August	1,000	64	331	20,400	B.
September	3,890	3	563	33,500	B.
October	3,900	260	991	60,900	B.
November	1,240	145	379	22,600	B.
December	310	120	187	11,500	B.
The period	.....	.....	.....	400,000	

SAN FRANCISCO RIVER AT ALMA, N. MEX.

Location.—About half a mile southwest of Alma, in sec. 4, T. 11 N., R. 20 W. Nearest tributary, Mineral Creek, enters a short distance above.

Records available.—October 18, 1904, to December 31, 1907; January 1, 1909, to August 12, 1911, when the station was discontinued.

Drainage area.—1,670 square miles (from Land Office map).

Gage.—Vertical staff; site and datum differ somewhat from those of the original gage.

Channel.—Extremely shifting.

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

Winter flow.—The flow of this river is practically unaffected by ice.

Diversions.—A few small ditches divert water above the station.

Accuracy.—Owing to the shifting character of the channel and lack of sufficient measurements, estimates of discharge can not be made.

Cooperation.—From its reestablishment in 1909 the station was maintained in cooperation with the Territorial engineer.

Discharge measurements of San Francisco River at Alma, N. Mex., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 30	C. D. Miller	[a] 2.05	37.4
Mar. 29	G. H. Russell	1.90	158

[a] Gage height taken from observer's book.

Daily gage height, in feet, of San Francisco River at Alma, N. Mex., for 1911.

[Louise Graham, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1	2.0	2.05	2.0	2.05	1.25	.....	1.87	1.65
2	2.0	1.5	2.05	1.95	1.25	.....	1.05	1.5
3	2.0	1.95	2.05	1.85	1.2	.....	2.25	1.45
4	2.0	1.95	2.05	1.85	1.2	.....	1.95	1.2
5	2.0	1.95	3.4	1.85	1.25	.....	1.2	1.1
6	2.0	1.95	4.0	1.95	1.2	.....	1.1	1.05
7	2.0	2.0	2.8	1.85	1.1	.....	1.1	1.05
8	2.0	1.95	2.5	1.9	1.1	.....	1.1	1.1
9	2.0	1.95	2.4	1.95	1.15	.....	1.05	1.15
10	2.0	1.65	2.4	2.0	1.05	.....	1.0	1.1
11	3.5	1.95	2.5	2.0	1.05	.....	1.0	1.85
12	2.05	2.05	2.8	1.95	1.05	.....	1.05	1.25
13	2.0	1.45	2.35	1.95	1.05	1.7	1.15	.....
14	2.0	1.45	2.0	2.0	1.0	1.7	2.15	.....
15	2.0	1.45	2.0	1.95	1.05	1.7	2.05	.....
16	2.0	1.55	2.05	2.0	1.05	1.7	2.25	.....
17	2.0	1.45	2.0	1.95	1.0	1.7	1.95	.....
18	2.0	1.5	2.0	1.95	1.05	1.65	2.05	.....
19	2.0	2.0	2.8	1.95	1.05	1.5	3.95	.....
20	1.4	1.95	2.45	2.0	1.05	1.65	3.65	.....
21	1.45	1.95	2.4	1.95	1.05	.....	3.0	.....
22	2.05	2.0	2.1	1.95	1.0	.....	3.95	.....
23	2.0	1.85	2.1	1.85	1.0	.....	2.05	.....
24	2.0	1.95	2.1	1.75	1.05	.....	2.25	.....
25	2.0	1.85	2.1	1.7	1.05	.....	2.85	.....
26	2.45	1.8	2.05	1.65	1.0	.....	2.9	.....
27	2.15	1.75	2.05	1.35	1.05	.....	2.05	.....
28	2.05	1.95	2.05	1.25	.....	.....	2.95	.....
29	2.05	.....	2.05	1.25	.....	.....	2.05	.....
30	2.05	.....	2.05	1.2	.....	.....	1.95	.....
31	2.05	.....	2.05	.....	.....	.....	1.95	.....

NOTE.—No flow on days from Jan. 1 to Aug. 12, for which the gage heights are missing.

SAN FRANCISCO RIVER AT DAM ABOVE CLIFTON, ARIZ.

Location.—At the diversion dam of the Arizona Copper Co., and 6½ miles above junction with Gila River. Station was moved upstream January 16, 1911.

Records available.—October 24, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Painted on inclined crest of dam and on vertical face of right abutment. From October 24, 1910, to January 16, 1911, observations were made on vertical staff fastened to retaining wall on left bank just above the highway bridge at Clifton. On the latter date it was removed to the diversion dam 1½ miles farther upstream. The original gage at the dam was a vertical staff in two sections bolted to the upstream face of dam and right abutment. The vertical staff was damaged by high water, and the painted gage was installed at the same datum November 13, 1911.

Discharge measurements.—Made from highway bridge at Clifton and by wading.

Diversions.—A small amount of water is used for irrigation one-fourth mile above Arizona Copper Co.'s dam. At the dam, about 14 second-feet is diverted to develop power and is returned to the river above the bridge at Clifton.

Accuracy.—The station was moved to the diversion dam because the channel at the bridge is somewhat shifting. On account of frequent repairs to the dam and difficulty of obtaining gage readings the results have not been satisfactory, and estimates of daily or monthly discharge have not been prepared.

Discharge measurements of San Francisco River at dam above Clifton, Ariz., in 1911.

Date.	Hydrographer.	Gage height (bridge).	Measured discharge.	Gage height (dam).	Total discharge at dam.
		Feet.	*Sec.-ft.*	*Feet.*	*Sec.-ft.*
Jan. 13	C. C. Jacob	6.02	556	.....	556
16	.....do	(e)	155	6.98	a 167
Feb. 7	.....do	(e)	276	7.12	a 288
Mar. 14	.....do	(e)	559	7.40	a 571
Apr. 13	.....do	(e)	212	7.00	a 224
13	.....do	(e)	186	7.00	b 225
July 10	.....do	(e)	44	6.88	a 56
11	.....do	5.55	1,240	8.30	1,240
Aug. 25	.....do	4.45	241	6.95	241
26	.....do	4.55	313	7.25	313
Sept. 21	.....do	4.20	119	7.05	c 129
Nov. 13	.....do	.....	115	7.18	c 126
Dec. 11	.....do	.....	81	7.04	d 91

a Includes 12 second-feet discharge in canal.
b Includes 39 second-feet discharge in canal.
c Includes 10.4 second-feet discharge in canal.
d Includes 9.7 second-feet discharge in canal.
e No water at gage.

Daily gage height, in feet, of San Francisco River at Clifton, Ariz., for 1911.

[Peter Riley, observer.]

Day.	Jan.	Feb.	Mar.	Day.	Jan.	Feb.	Mar.
1	5.6	.....	.....	16	.....	.....	.....
2	5.55	.....	.....	17	.....	.....	.....
3	5.4	.....	.....	18	.....	.....	.....
4	5.4	.....	.....	19	.....	.....	.....
5	5.4	5.65	.....	20	.....	.....	.....
6	5.5	.....	5.9	21	.....	.....	.....
7	5.5	.....	6.0	22	.....	.....	.....
8	5.5	.....	.....	23	.....	.....	.....
9	5.5	.....	.....	24	.....	.....	.....
10	5.55	.....	.....	25	.....	.....	.....
11	6.05	.....	.....	26	.....	.....	.....
12	6.5	.....	.....	27	.....	.....	.....
13	5.9	.....	.....	28	.....	.....	.....
14	5.7	.....	.....	29	.....	.....	.....
15	.....	.....	.....	30	.....	.....	.....
				31	.....	.....	.....

Daily gage height, in feet, of San Francisco River at dam above Clifton, Ariz., for 1911.

[D. D. Potter and Bee Wilkerson, observers.]

Day.	Jan.	Feb.	Mar.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	.....	.....	7.10	7.10	7.2	7.1	7.1
2	.....	.....	.....	.....	7.02	7.00	7.05	7.1	7.1
3	.....	.....	6.9	.....	7.00	6.98	7.0	7.1	7.1
4	.....	.....	7.35	.....	6.98	6.98	7.0	7.1	7.1
5	.....	.....	7.9	.....	6.98	6.95	9.1	7.1	7.1
6	.....	.....	9.5	.....	6.98	6.98	8.65	7.1	7.1
7	.....	.....	11.2	.....	6.95	6.90	7.55	7.1	7.1
8	.....	.....	10.0	.....	6.88	6.88	7.35	7.1	7.1
9	.....	.....	9.95	.....	6.85	6.85	7.3	7.1	7.1
10	.....	.....	9.0	6.9	6.92	6.88	7.2	7.1	7.1

Daily gage height, in feet, of San Francisco River at dam above Clifton, Ariz., for 1911— Continued.

Day.	Jan.	Feb.	Mar.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
11	.....	.....	7.9	7.28	6.92	6.90	7.1	7.1	7.07
12	.....	.....	7.9	7.15	6.92	6.98	7.1	7.12	7.1
13	.....	6.9	7.5	6.95	6.95	7.02	7.1	7.1	7.1
14	.....	6.9	7.5	6.88	7.02	7.10	7.1	7.1	7.1
15	.....	6.85	7.4	7.43	7.00	7.68	7.1	7.1	7.1
16	7.0	6.85	7.3	7.15	7.00	8.15	7.1	7.1	7.1
17	6.9	6.9	7.3	8.10	6.88	7.65	7.1	7.1	7.1
18	6.9	7.0	7.2	7.52	6.90	7.00	7.1	7.1	7.1
19	6.9	7.0	7.2	8.20	6.88	7.60	7.1	7.1	7.1
20	6.8	6.95	7.15	7.65	6.90	7.15	7.1	7.1	7.1
21	6.85	6.9	7.1	7.28	6.90	7.05	7.1	7.1	7.1
22	7.2	6.9	7.1	7.28	6.88	7.05	7.1	7.1	7.1
23	7.1	6.9	7.05	7.10	7.05	7.00	7.1	7.1	7.1
24	7.4	6.9	7.3	7.00	6.95	7.00	7.1	7.1	7.1
25	7.3	.....	7.7	8.05	7.00	6.95	7.1	7.1	7.1
26	7.1	.....	7.6	7.45	7.05	6.95	7.1	7.1	7.1
27	7.0	.....	7.6	7.70	7.00	6.95	7.1	7.1	7.1
28	6.9	.....	7.55	7.45	7.00	7.00	7.1	7.1	7.1
29	.....	.....	7.5	7.45	7.00	7.15	10.0	7.1	7.1
30	.....	.....	7.4	7.20	7.00	7.63	9.1	7.1	7.1
31	.....	.....	7.35	7.12	7.00	.....	8.1	.....	7.1

WHITEWATER CREEK NEAR MOGOLLON, N. MEX.

Location.—At the power house of the Socorro Mines Co., 3 miles south of Mogollon, 500 feet below the confluence of north and south forks, in sec. 4, T. 11 S., R. 19 W., below all tributaries.

Records available.—October 1, 1909, to December 31, 1911.

Drainage area.—34 square miles (measured from topographic sheet).

Gage.—Vertical staff gage on right bank, half a mile below the old weir gage, installed May 30, 1911.

Channel.—Fairly permanent except during high water.

Discharge measurements.—Made by wading at nearly all stages.

Winter flow.—Little if any backwater from ice during the winter months.

Diversions.—All water used in the power plant is returned above the gage.

Accuracy.—Owing to the shifting character of the channel during high water and to lack of discharge measurements, no estimates of discharge have been made from the staff gage readings. The estimates made prior to September 30, 1911, are by weir.

Cooperation.—From October 1, 1909, to September 30, 1911, records of daily discharge over a weir installed at this point by the Socorro Mines Co. were kept and furnished through their courtesy.

The following discharge measurement was made by G. H. Russell.

May 30, 1911: Gage height, 1.08 feet (old weir gage read 0.65); discharge, 10.4 second-feet.

Daily gage height, in feet, of Whitewater Creek near Mogollon, N. Mex., for 1911.

[J. P. Warren, observer.]

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1.10	1.04	1.12	0.85	1.18	1.75	1.30
2	.....	1.05	.84	1.08	.82	1.14	1.58	1.30
3	.....	1.00	.84	1.02	.84	1.08	1.40	1.30
4	.....	1.03	1.00	1.00	.81	1.00	1.30	1.30
5	.....	.90	.94	1.00	.81	2.40	1.30	1.30
6	.....	.90	1.04	1.00	.81	2.75	1.30	1.30
7	.....	.95	.98	92	.79	2.60	1.30	1.30
8	.....	.95	1.02	.92	.78	2.05	1.30	1.30
9	.....	.90	1.15	.91	.77	1.80	1.30	1.30
10	.....	.90	1.45	.90	.91	1.70	1.30	1.30

Daily gage height, in feet, of Whitewater Creek near Mogollon, N. Mex., for 1911—Con.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
11	.....	.90	1.75	.91	.91	1.60	1.30	1.30
12	.....	.95	1.35	.91	.88	1.50	1.30	1.30
13	.....	.96	1.35	.90	.88	1.45	1.30	1.20
14	.....	.97	1.25	.84	.88	1.35	1.30	1.28
15	.....	.88	1.15	.85	.98	1.40	1.30	1.22
16	.....	.88	1.10	.85	.88	1.35	1.30	1.30
17	.....	.89	1.20	.85	.84	1.25	1.30	1.30
18	.....	.83	1.10	.88	.85	1.25	1.30	1.30
19	.....	.83	1.10	.86	.86	1.30	1.30	1.30
20	.....	.88	1.20	.85	.85	1.30	1.30	1.30
21	.....	.87	1.20	.88	.85	1.30	1.25	1.30
22	.....	.86	1.10	.86	.84	1.30	1.20	1.30
23	.....	.84	1.10	.85	.86	1.30	1.20	1.30
24	.....	.81	1.20	.86	.84	1.30	1.20	1.30
25	.....	.80	1.40	.90	.80	1.28	1.20	1.30
26	.....	.80	1.30	.90	.91	1.30	1.20	1.30
27	.....	.80	1.60	.90	.88	1.36	1.20	1.30
28	.....	.80	1.50	.90	1.50	2.20	1.20	1.30
29	.....	.82	1.35	.86	1.07	2.10	1.15	1.30
30	1.08	.86	1.25	.85	1.00	1.95	1.15	1.30
31	.....	.....	1.20	.85	.....	1.85	.....	1.30

NOTE.—These gage heights refer to the staff gage installed May 30, 1911, and have no relation to the discharge given in the table which follows.

Daily discharge, in second-feet, of Whitewater Creek near Mogollon, N. Mex., for 1911.

Day.	Jan.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.0	.....	35	15	9.8	3.3	10	3.2
2	1.6	.....	35	14	8.8	2.3	9.5	1.7
3	1.1	.....	36	14	8.8	6.2	7.5	1.7
4	1.1	.....	35	16	6.4	5.4	7.0	1.7
5	1.7	.....	29	18	6.4	5.4	6.6	1.7
6	2.0	.....	20	.....	6.4	4.8	5.3	1.7
7	2.0	.....	20	.....	7.1	5.4	3.9	1.2
8	2.0	.....	20	.....	7.1	6.2	4.3	1.1
9	2.0	.....	20	.....	4.3	10	3.9	1.1
10	42	.....	20	.....	4.3	.....	3.3	3.7
11	.....	.....	21	.....	7.9	14	3.3	2.9
12	.....	.....	21	.....	12	20	3.3	2.5
13	42	.....	21	20	7.7	17	3.1	2.5
14	23	32	20	18	4.5	13	2.9	9.1
15	15	32	19	18	3.6	9.5	2.9	2.8
16	15	32	18	15	3.3	10	2.9	3.6
17	15	35	17	14	3.6	9.5	2.8	2.4
18	9.6	32	18	14	3.1	8.3	2.5	2.0
19	26	32	18	14	3.1	10	3.2	2.1
20	29	32	18	14	3.9	12	2.9	2.0
21	29	33	17	13	3.5	10	2.9	2.0
22	17	32	14	11	3.7	9.1	2.4	1.9
23	17	.....	19	8.8	2.9	11	2.0	2.0
24	20	.....	20	9.9	2.4	15	2.4	1.9
25	20	.....	20	14	1.9	.....	2.9	1.2
26	17	37	20	14	2.0	.....	3.7	2.9
27	15	36	20	14	2.0	.....	2.9	2.4
28	15	37	19	11	1.9	.....	2.9	.....
29	15	35	18	9.1	2.0	20	3.7	14
30	15	37	18	9.1	2.9	18	2.0	18
31	14	35	.....	9.1	.....	.....	2.0	.....

NOTE.—Daily discharge determined from a weir and furnished by the Socorro Mines Co. No readings taken on the weir from Feb. 1 to Mar. 13. On Jan. 11 and 12 and Mar. 23 to 25 the discharge was above the capacity of the weir. From May 6 to 12, July 10, 25 to 28, and 31, and Sept. 28 the discharge over the weir was above 21 second-feet.

Monthly discharge of Whitewater Creek near Mogollon, N. Mex., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January, 29 days	42	1.1	14.7	846
March, 15 days	37	32	33.9	1,010
April	36	14	21.5	1,280
May, 24 days	20	8.8	13.6	647
June	12	1.9	4.9	292
July, 25 days	20	2.3	10.2	505
August	10	2.0	3.9	240
September, 29 days	18	1.1	3.3	190
The period				5,010

SAN CARLOS RIVER AT SAN CARLOS, ARIZ.

Location.—At Arizona & Eastern Railroad bridge a short distance above junction with Gila River, on the San Carlos Indian Reservation, half a mile east of San Carlos.

Records available.—August 17, 1910, to January 12, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to right pier of railroad bridge, downstream end.

Channel.—Shifting sand.

Discharge measurements.—Made from railroad bridge and by wading.

Accuracy.—On account of shifting character of stream, results are unsatisfactory, and no estimates have been prepared.

Daily gage height, in feet, of San Carlos River near San Carlos, Ariz., for 1911.

[J. B. Stone, observer.]

Day.	Jan.	Day.	Jan.	Day.	Jan.
1	10.2	5	10.2	9	10.2
2	10.2	6	10.2	10	10.35
3	10.2	7	10.2	11	12.05
4	10.2	8	10.2		

SAN PEDRO RIVER NEAR LEWIS SPRINGS, ARIZ.

Location.—About one-third mile below Charleston station, on the El Paso & Southwestern Railroad, in sec. 2, T. 21 S., R. 21 E., Gila and Salt River base and meridian, 6 miles above Fairbank, and 5 miles below Lewis Springs.

Records available.—January 27, 1904, to August 31, 1906; November 9, 1910, to November 26, 1911, when station was discontinued.

Drainage area.—Not measured.

Gage.—Inclined staff on right bank at proposed damsite about 1,000 feet below abandoned smelter, used 1910–11. Different gages at slightly different locations were used during 1904–1906.

Channel.—Shifting sand.

Discharge measurements.—Made from car and cable about one-fourth mile above gage.

Diversions.—About 50 acres irrigated from San Pedro River above the station.

Accuracy.—Measurements insufficient for estimates of discharge.

Discharge measurements of San Pedro River near Lewis Springs, Ariz., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 19	C. C. Jacob.....	3.88	23	Aug. 23	C. C. Jacob.....	4.66	70
Mar. 11	.....do.....	3.82	15	Sept. 26	.....do.....	4.57	25
Apr. 11	.....do.....	3.80	18	Nov. 15	.....do.....	4.65	12
July 14	.....do.....	4.70	100				

Daily gage height, in feet, of San Pedro River near Lewis Springs, Ariz., for 1911.

[M. Clymer, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	4.0	3.9	4.1	3.8	3.7	3.7	.....	4.0	4.4	4.6	4.6
2	3.75	3.9	4.0	3.8	3.7	3.7	.....	4.0	4.4	5.0	4.6
3	3.75	3.9	3.9	3.8	3.7	3.7	.....	4.0	4.4	4.6	4.6
4	3.95	3.9	3.9	3.8	3.7	3.7	.....	4.0	5.2	4.65	4.6
5	3.95	3.7	3.9	3.8	3.7	3.7	.....	4.0	4.45	8.75	4.6
6	3.95	3.7	3.9	3.8	3.75	3.7	.....	4.0	4.4	6.25	4.6
7	3.96	3.7	3.9	3.8	3.9	3.65	.....	4.0	4.4	5.0	4.6
8	3.9	3.7	3.9	3.8	3.8	3.65	.....	5.7	4.4	4.7	4.6
9	3.9	3.7	3.9	3.8	3.8	3.6	.....	4.0	4.4	4.7	4.6
10	3.9	3.7	3.9	3.8	3.8	3.6	.....	5.0	5.25	4.65	4.6
11	3.9	3.7	3.8	3.8	3.8	6.0	.....	4.25	4.8	4.65	4.6
12	3.9	3.7	.....	3.8	3.8	4.5	.....	4.0	5.25	4.65	4.6
13	3.9	3.7	3.6	3.8	3.8	4.0	.....	4.5	7.4	4.65	4.6
14	3.55	3.7	3.8	3.8	3.8	4.0	5.3	4.5	7.75	4.6	4.6
15	3.65	3.7	3.8	3.8	3.8	4.0	4.9	4.5	5.35	4.6	4.6
16	3.9	3.7	3.8	3.8	3.8	3.95	4.65	4.4	5.25	4.6	4.6
17	3.9	3.7	3.8	3.8	3.75	3.9	4.6	4.3	5.6	4.6	4.6
18	3.9	4.1	3.8	3.8	3.75	3.9	5.8	4.3	6.8	4.6	4.6
19	3.9	3.95	3.8	3.8	3.7	4.4	5.5	4.3	5.3	4.6	4.6
20	3.85	3.9	3.8	3.8	3.7	4.25	6.25	5.5	4.8	4.6	4.6
21	3.9	3.9	3.8	3.8	3.7	4.0	5.25	6.25	4.6	4.6	4.6
22	3.9	3.9	3.8	3.8	3.7	3.95	4.9	4.6	4.6	4.6	4.6
23	3.9	3.9	3.8	3.8	3.7	3.85	4.6	4.7	4.6	4.6	4.6
24	3.9	3.9	3.8	3.75	3.7	3.65	4.55	4.5	4.6	4.6	4.6
25	3.9	3.9	3.8	3.75	3.7	3.5	4.5	5.7	4.55	4.6	4.6
26	3.9	3.9	3.8	3.75	3.7	3.65	4.45	6.0	4.75	4.6	4.6
27	3.9	3.9	3.8	3.7	3.7	3.8	4.3	4.5	4.6	5.3	.....
28	3.9	3.9	3.8	3.7	3.7	3.8	4.1	4.5	4.6	4.7	.....
29	3.9	.....	3.8	3.7	3.7	3.8	4.0	4.5	4.6	4.8	.....
30	3.9	.....	3.8	3.7	3.7	3.8	4.0	4.5	4.5	4.65	.....
31	3.9	.....	3.8	.....	3.7	.....	4.0	4.45	.....	4.6	.....

SAN PEDRO RIVER NEAR FAIRBANK, ARIZ.

Location.—At Boquillas diversion dam, in southern part of San Juan de las Boquillas grant, 2 miles above Fairbank.

Records available.—November 15 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Painted on vertical face of wing wall at left end of dam.

Channel.—Shifting sand

Discharge measurements.—Made from suspension footbridge 600 feet below dam and by wading.

Diversions.—Some water is used for irrigation above Charleston. Two irrigation canals divert water at the dam.

Accuracy.—Data insufficient for estimates of discharge.

Discharge measurements of San Pedro River near Fairbank, Ariz., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Nov. 15[a]	C. C. Jacob	3.70	12
Dec. 15	do	4.10	17

[a] Made from footbridge one-fourth mile above the station near Lewis Springs.

Daily gage height, in feet, of San Pedro River near Fairbank, Ariz., for 1911.

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1		4.2	11		4.5	21	4.1	4.1
2		4.2	12		4.5	22	4.1	4.1
3		4.2	13		4.5	23	4.1	4.1
4		4.2	14		4.2	24	4.1	4.1
5		4.2	15	3.7	4.2	25	4.0	4.1
6		4.5	16	3.8	4.2	26	4.0	4.4
7		4.5	17	3.8	4.2	27	4.0	4.4
8		4.5	18	4.2	4.1	28	4.1	4.0
9		4.5	19	4.2	4.1	29	4.1	3.9
10		4.5	20	4.1	4.1	30	4.1	3.9
						31		3.9

SANTA CRUZ RIVER NEAR NOGALES, ARIZ.

Location.—Just below proposed dam site on Yerba Buena ranch, about 7 miles northeast of Nogales, half a mile above the city pumping plant.

Records available.—March 22, 1907, to December 31, 1911; fragmentary.

Drainage area.—Not measured.

Gage.—Inclined staff fastened to large cottonwood tree on right bank a short distance below intake of small irrigation ditch.

Channel.—Shifting sand.

Discharge measurements.—Made from car and cable about 100 feet above gage, and by wading.

Diversions.—About 140 acres of land irrigated from this stream above the station. A small ditch takes water just above the station for irrigation a short distance below. At low stages a temporary ditch is built on the right bank; when this ditch is in operation the gage shows only the height of the water in the ditch.

Accuracy.—Because of the effect of the temporary ditch and the extremely shifting character of the stream bed, no estimates of discharge can be prepared from the data obtained.

Cooperation.—Gage height record furnished by officials of Santa Cruz County and the Nogales Board of Trade.

Discharge measurements of Santa Cruz River near Nogales, Ariz., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 21	C. C. Jacob	3.67	2.0	Nov. 16	C. C. Jacob	3.60	5.1
May 16	do	3.55	.65	Dec. 17	do	4.10	8.6
Aug. 30	do	3.30	2.0				

Daily gage height, in feet, of Santa Cruz River near Nogales, Ariz., for 1911.

[J. H. Harrison, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.2	3.2	3.3	3.0	2.7	2.2	.....	3.2	3.8	3.4	3.4
2	3.2	3.2	3.3	3.0	2.65	2.2	.....	3.2	3.4	3.4	3.4
3	3.2	3.2	3.3	3.0	2.6	2.2	.....	3.2	3.2	3.4	3.4
4	3.2	3.2	3.3	3.0	2.6	2.1	.....	3.2	3.2	3.4	3.4
5	3.2	3.2	3.3	3.0	2.6	2.1	.....	3.2	4.8	3.4	3.4
6	3.2	3.2	3.25	3.0	2.6	2.1	.....	3.2	4.6	3.4	3.4
7	3.2	3.2	3.25	3.0	2.55	2.1	4.3	3.2	4.1	3.4	3.4
8	3.2	3.2	3.2	3.0	2.55	2.1	3.0	3.2	3.9	3.4	3.4
9	3.2	3.2	3.2	3.0	2.55	2.1	2.7	3.2	3.9	3.4	3.4
10	3.2	3.2	3.2	3.0	2.5	2.1	2.7	3.2	3.8	3.35	3.4
11	3.4	3.2	3.2	2.9	2.5	2.1	2.5	3.2	3.8	3.4	3.4
12	3.4	3.2	3.15	2.9	2.5	2.1	2.5	3.2	3.8	3.4	3.4
13	3.4	3.2	3.15	2.9	2.5	2.0	.....	4.0	.....	3.4	3.4
14	3.4	3.2	3.1	2.9	2.5	2.0	.....	3.4	3.7	3.4	3.4
15	3.4	3.2	3.1	.....	2.5	2.0	.....	5.1	3.6	3.4	3.4
16	3.35	3.2	3.1	2.9	2.4	2.0	.....	4.2	3.6	3.6	3.4
17	3.3	3.3	3.1	2.8	2.4	2.0	.....	4.4	3.6	3.55	3.4
18	3.3	3.3	3.0	2.8	2.35	.....	.....	3.4	3.5	3.5	3.4
19	3.3	3.3	3.0	2.75	2.35	.....	.....	3.3	3.5	3.5	.....
20	3.3	3.25	3.0	2.75	2.3	.....	3.8	3.2	3.5	3.5	3.4
21	3.25	3.25	3.0	2.7	2.3	.....	4.4	3.2	3.5	3.45	3.4
22	3.25	3.2	3.0	2.7	2.3	.....	4.1	3.4	3.4	3.45	3.5
23	3.2	3.2	3.0	2.7	2.3	.....	3.2	3.3	3.4	3.45	3.55
24	3.2	3.2	3.0	2.7	.....	.....	2.8	3.3	3.4	3.45	3.55
25	3.2	.....	3.0	2.7	.....	.....	2.8	3.3	3.4	3.45	3.55
26	3.2	3.2	3.0	2.7	.....	.....	5.0	3.3	3.4	3.4	3.5
27	3.2	3.2	3.0	2.7	2.3	.....	3.7	3.3	3.4	3.4	3.5
28	3.2	3.2	3.0	2.7	2.3	.....	3.2	3.3	3.4	3.4	3.55
29	3.2	.....	3.0	2.7	2.2	.....	3.1	4.4	3.4	3.4	3.55
30	3.2	.....	3.0	2.7	2.2	.....	3.1	4.1	3.45	3.4	3.55
31	3.2	.....	3.0	.....	2.2	.....	3.1	.....	.....	.....	3.55

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, 1911.

Drainage area.—Not measured.

Gage.—Painted on bridge pier on left bank. During 1911 main channel was near right bank and gage heights were obtained by measuring from bench mark on bridge to water surface.

Channel.—Shifting sand.

Discharge measurements.—Made from bridge or by wading.

Accuracy.—Gage heights too fragmentary and uncertain for publication; estimates of daily discharge can not be presented.

Cooperation.—Data furnished by Arizona experiment station through G. E. P. Smith, irrigation engineer.

Discharge measurements of Santa Cruz River at Tucson, Ariz., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Aug. 21	F. C. Kelton	0.34	159	Sept. 15	F. C. Kelton	1.10	416
22	do	1.18	606	18	do	1.08	341
22	do	1.20	550	18	do	.60	243
24	do	—.25	*a* 12				

a Estimated.

RILLITO CREEK NEAR TUCSON, ARIZ.

Location.—At Oracle Road Bridge, in sec. 23, T. 13 S., R. 13 E., about 4 miles north of Tucson, Ariz.

Records available.—1909 to 1911.

Drainage area.—Not measured.

Gage.—Water-stage register (French manufacture) attached to right abutment of bridge.

Channel.—Wide and shallow; shifting sand.

Discharge measurements.—Made from bridge or by wading.

Accuracy.—Results are approximate; estimates of daily discharge are not of sufficient completeness and accuracy to publish. No gage heights available.

Cooperation.—Data furnished by Arizona experiment station through G. E. P. Smith, irrigation engineer.

Discharge measurements of Rillito Creek near Tucson, Ariz., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 12	F. C. Kelton	3.85	129	July 17	F. C. Kelton	4.00	520
12	do	3.70	88	17	do	3.85	290
12	do	3.69	64	17	do	3.75	205

SALT RIVER BASIN.

SALT AND VERDE RIVERS AT McDOWELL, ARIZ.

The following estimates of monthly discharge are published as furnished by the United States Reclamation Service. For description of irrigation plan of the Salt River project in Arizona, see Tenth Annual Report of the Reclamation Service.

Estimated monthly discharge of Salt and Verde rivers for 1911.

Month.	Salt River near Roosevelt, Ariz. (drainage area 5,756 square miles).		Verde River at McDowell, Ariz. (drainage area 6,000 square miles).	
	Mean discharge in second-feet.	Run-off, total in acre-feet.	Mean discharge in second-feet.	Run-off, total in acre-feet.
January	66,898	132,691	90,009	178,534
February	81,080	160,820	72,086	142,976
March	135,076	267,919	73,518	145,820
April	33,429	66,306	12,900	25,587
May	17,481	34,673	14,874	29,501
June	8,663	19,166	8,509	16,878
July	19,102	37,888	13,756	27,284
August	10,790	21,402	7,580	15,034
September	7,352	14,582	16,551	32,829
October	28,074	55,684	21,108	41,868
November	11,863	23,530	15,304	30,356
December	7,246	14,372	18,291	37,529
The year	35,671	849,033	30,374	724,196

VERDE RIVER NEAR CAMP VERDE, ARIZ.

Location.—Just below power plant of Arizona Power Co. at Camp Childs, Ariz., about 19 miles southeast of Camp Verde, Ariz., and about 3 miles above mouth of Fossil Creek.

Records available.—February 26 to December 31, 1911.

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; apparently permanent.

Discharge measurements.—Made from car and cable 1 mile above gage.

Diversions.—About 60 second-feet of water diverted from Fossil Creek used for power development and returned to the river above the gage.

Accuracy.—No estimates can be prepared until additional discharge measurements are made.

Cooperation.—Gage height record furnished by the United States Reclamation Service.

The following discharge measurement was made by C. C. Jacob:
August 5, 1911: Gage height, 5.02 feet; discharge, 208 second-feet.

Daily gage height, in feet, of Verde River near Camp Verde, Ariz., for 1911.

[O. O. Stevens, R. C. Ricketts, observers.]

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	5.45	4.5	3.35	3.5	3.75	.....	5.1	5.5	5.5	5.2
2	.....	5.45	4.5	3.3	3.6	3.9	.....	5.0	5.7	5.4	5.2
3	.....	5.9	4.4	3.3	3.55	4.0	.....	5.0	5.6	5.4	5.2
4	.....	6.05	4.3	3.3	3.6	4.5	.....	5.0	5.5	5.4	5.2
5	.....	10.95	4.15	3.3	3.6	4.0	.....	5.0	6.4	5.25	5.2
6	.....	12.75	4.1	3.3	3.55	3.9	5.0	4.9	7.9	5.4	5.2
7	.....	11.2	4.1	3.3	3.55	4.9	5.0	4.9	6.45	5.3	5.2
8	.....	8.0	4.05	3.3	3.5	5.3	5.0	4.85	5.9	5.25	5.2
9	.....	7.5	3.85	3.4	3.55	4.2	4.9	4.9	5.55	5.2	5.2
10	.....	7.3	3.8	3.4	3.5	3.9	5.2	4.9	5.45	5.2	5.2
11	.....	13.75	3.7	3.35	3.45	3.75	5.0	4.9	5.4	5.2	5.2
12	.....	8.7	3.65	3.35	3.4	3.65	4.75	5.5	5.3	5.2	5.2
13	.....	7.2	3.5	3.3	3.6	3.75	4.9	5.4	5.3	5.2	5.2
14	.....	6.55	3.5	3.35	3.55	3.55	4.9	5.7	5.3	5.2	5.2
15	.....	6.15	3.5	3.4	3.5	3.5	4.9	5.5	5.2	5.2	5.2
16	.....	5.95	3.5	3.4	3.5	3.6	4.9	5.3	5.2	5.2	5.2
17	.....	5.7	3.5	3.4	3.5	4.3	4.8	5.2	5.2	5.2	5.2
18	.....	5.45	3.5	3.4	3.4	5.5	5.0	5.1	5.2	5.2	5.3
19	.....	5.25	3.5	3.4	3.4	4.4	4.9	5.1	5.2	5.2	5.3
20	.....	5.15	3.5	3.4	3.6	5.6	4.9	5.5	5.2	5.2	5.3
21	.....	5.1	3.4	3.4	4.0	6.5	5.25	5.55	5.2	5.2	5.3
22	.....	5.0	3.4	3.4	3.65	6.9	5.9	5.3	5.2	5.25	5.3
23	.....	5.0	3.4	3.4	3.55	6.0	5.7	5.45	5.2	5.25	5.3
24	.....	4.95	3.3	3.4	3.6	5.5	5.85	5.1	5.1	5.2	5.3
25	5.5	4.9	3.3	3.4	3.5	6.6	5.8	5.2	5.1	5.2	5.3
26	5.45	4.9	3.3	3.4	3.5	5.55	5.5	5.2	5.15	5.2	5.3
27	5.45	4.8	3.2	3.5	3.5	5.1	5.4	5.2	5.4	5.2	5.3
28	5.45	4.75	3.2	3.5	3.35	5.65	5.6	5.1	5.6	5.2	5.3
29	.....	4.7	3.3	3.55	3.4	5.3	5.4	5.15	5.85	5.2	5.3
30	.....	4.7	3.3	3.5	3.45	5.1	5.3	5.2	5.75	5.2	5.3
31	.....	4.65	.....	3.5	.....	5.0	5.2	.....	5.5	.....	5.3

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., Gila and Salt River base and meridian, 4 miles below mouth of Castle Creek and 22 miles northwest of Glendale.

Records available.—November 10, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Painted on the upstream face of the dam at the right of the opening for each channel. At low and medium stages the stream flows through the larger opening, which is near the right bank. The openings in the dam were made during the flood of 1895, when a portion of the masonry near each end was washed out.

Channel.—Shifting sand.

Discharge measurements.—Made by wading.

Accuracy.—Measurements insufficient for estimates of daily and monthly discharge for 1911. Full reliance can not be placed on the gage-height record after January 26, 1911.

Cooperation.—Gage-height record is furnished by the Beardsley Irrigation Co., A. L. Harris, engineer, through the watchman at the dam.

Discharge measurements of Agua Fria River near Glendale, Ariz., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Mar. 7	C. C. Jacob	24.65	658
May 5	do	21.50	3.5
Oct. 10	do	22.85	2.7
Dec. 21	do	22.10	6.2

Daily gage height, in feet, of Agua Fria River near Glendale, Ariz., for 1911.

[R. Jones, observer.]

Day.	Jan.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	21.2	.....	21.5	21.5	22.8	22.8	24.0	22.1	22.1
2	21.2	.....	21.5	21.5	22.8	22.8	22.9	22.1	22.1
3	21.2	.....	21.5	21.5	22.8	22.8	22.9	22.1	22.1
4	21.2	.....	21.5	21.5	22.8	22.8	22.9	22.1	22.1
5	21.2	21.5	21.5	21.5	22.8	22.8	22.95	22.1	22.1
6	21.05	21.5	21.5	21.5	22.8	22.8	22.95	22.1	22.1
7	21.05	21.5	21.5	21.5	22.8	22.8	23.0	22.1	22.1
8	21.0	21.5	21.5	21.5	22.8	22.8	22.9	22.1	22.1
9	21.0	21.5	21.5	21.5	22.8	22.8	22.9	22.1	22.1
10	22.75	21.5	21.5	21.5	22.8	22.8	22.9	22.1	22.1
11	30.05	21.5	21.5	21.5	22.8	22.8	22.9	22.1	22.1
12	25.15	21.5	21.5	21.5	22.8	22.8	22.9	22.1	22.1
13	23.75	21.5	21.5	21.5	22.8	22.8	22.9	22.1	22.1
14	23.1	21.5	21.5	21.5	22.8	22.8	22.9	22.1	22.1
15	23.0	21.5	21.5	21.5	22.8	22.8	22.9	22.1	22.1
16	22.85	21.5	21.5	22.05	22.8	22.8	22.9	22.1	22.1
17	22.75	21.5	21.5	25.05	22.8	22.8	22.9	22.1	22.1
18	22.7	21.5	21.5	22.75	22.8	22.8	22.9	22.1	22.1
19	22.7	21.5	21.5	25.1	22.8	22.8	22.9	22.1	22.1
20	22.65	21.5	21.5	22.35	22.9	22.8	22.9	22.1	22.1
21	22.65	21.5	21.5	25.6	22.95	22.8	22.9	22.1	22.1
22	22.6	21.5	21.5	25.6	23.0	22.8	22.9	22.1	22.1
23	22.6	21.5	21.5	23.5	25.0	22.8	22.9	22.1	22.1
24	22.5	21.5	21.5	23.5	23.0	22.8	22.9	22.1	22.1
25	22.55	21.5	21.5	.....	23.0	22.8	22.9	22.1	22.1
26	22.6	21.5	21.5	.....	22.9	22.8	22.9	22.1	22.1
27	.....	21.5	21.5	.....	22.9	22.9	23.4	22.1	22.1
28	.....	21.5	21.5	.....	22.8	22.9	26.2	22.1	22.1
29	.....	21.5	21.5	.....	22.8	22.9	23.2	22.1	22.1
30	.....	21.5	21.5	.....	22.8	23.0	23.0	22.1	22.1
31	.....	21.5	.....	.....	22.8	.....	23.0	.....	22.1

NOTE.—Gage heights for period Jan. 27 to May 4 not published, as they are very uncertain.

HASSAYAMPA RIVER NEAR WICKENBURG, ARIZ.

Location.—Half a mile below Brills station, on the Atchison, Topeka & Santa Fe Railway, in sec. 20, T. 7 N., R. 4 W., Gila and Salt River base and meridian, about 4 miles below Wickenburg, Ariz.

Records available.—November 23, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff bolted to bedrock on right bank one-half mile below Brill's ranch. May 10, 1911, a vertical staff at an independent datum was installed opposite ranch house, half a mile above original gage. See note to gage-height table.

Channel.—Shifting sand.

Discharge measurements.—Made by wading.

Diversions.—Small ditch diverts water for irrigation at Wickenburg.

Accuracy.—Measurements insufficient for the preparation of discharge estimates.

Discharge measurements of Hassayampa River near Wickenburg, Ariz., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 5	C. C. Jacob	4.65	5.6	July 17	C. C. Jacob	4.05	3.5
Feb. 21	do	(a)	6.4	Aug. 15	do	4.05	3.0
Apr. 4	do	(a)	8.5	Dec. 28	do	3.88	1.0
May 10	do	4.00	5.8	29	do	4.03	4.1

a No water at gage.

Daily gage height, in feet, of Hassayampa River near Wickenburg, Ariz., for 1911.

Day.	Jan.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.70	.....	3.95	4.02	.....	4.06	4.05	4.02	4.02
2	4.70	.....	4.20	4.10	.....	3.95	4.08	4.02	4.02
3	4.70	.....	4.02	4.10	.....	3.98	4.08	4.02	4.02
4	4.65	.....	4.00	4.18	.....	4.08	4.08	4.02	4.02
5	4.60	.....	4.05	4.08	.....	4.08	4.08	4.02	4.02
6	4.64	.....	4.05	4.02	.....	4.08	4.08	4.02	4.02
7	4.66	.....	4.05	4.00	.....	4.06	4.02	4.02	4.02
8	4.62	.....	4.25	4.05	.....	4.04	4.02	4.02	4.02
9	4.66	.....	4.05	4.05	.....	4.04	4.02	4.02	.....
10	5.05	4.00	4.05	4.02	.....	4.06	4.02	4.02	4.02
11	5.75	4.10	4.05	4.02	.....	4.06	4.02	4.02	4.02
12	.....	4.10	4.05	4.08	.....	4.15	4.02	4.02	4.02
13	.....	4.10	4.05	4.09	.....	4.09	4.02	4.02	4.02
14	.....	4.10	4.25	4.05	.....	4.08	4.02	4.02	4.02
15	.....	4.10	3.98	4.08	4.00	4.10	4.02	4.02	4.02
16	.....	4.08	3.98	4.09	4.08	4.06	4.02	4.02	4.02
17	.....	4.08	3.98	4.20	4.09	4.02	4.02	4.02	4.02
18	.....	4.05	3.98	4.12	4.06	4.02	4.02	4.02	4.02
19	.....	4.08	3.98	.....	4.04	4.04	4.02	4.02	.....
20	.....	4.08	3.98	.....	4.12	4.02	4.02	4.02	.....
21	.....	4.08	4.00	.....	4.10	4.02	4.02	4.02	.....
22	.....	4.08	4.00	.....	4.38	4.02	4.02	4.02	.....
23	.....	4.10	4.02	.....	.....	4.02	4.02	4.02	.....
24	.....	4.12	4.05	.....	4.15	4.02	4.02	4.02	.....
25	.....	4.12	4.05	.....	4.05	4.02	4.02	4.02	.....
26	.....	4.12	4.05	.....	4.08	4.02	4.02	4.02	.....
27	.....	4.12	4.05	.....	4.09	4.02	4.02	4.02	.....
28	.....	4.10	4.05	.....	4.15	4.02	7.50	4.02	.....
29	.....	4.08	4.05	.....	4.09	4.02	4.02	4.02	4.03
30	.....	4.02	4.00	.....	4.06	4.23	4.02	4.02	.....
31	.....	4.05	.....	.....	4.06	.....	4.02	.....	.....

NOTE.—Jan. 12, river cut a new channel and no further records were obtained until May 10, when a gage was installed half a mile above the old gage. Gage not read Aug. 23 on account of flood. Gage heights Sept. 30 and Oct. 28 estimated by hydrographer.

SALTON SINK.

Stream-flow data for the Salton Sink basin, which previous to 1910 were published with the Colorado River data, are now presented in the report for the Great Basin (Water-Supply Paper 310), of which the sink is logically a part.

WHITE RIVER[1] NEAR DOUGLAS, ARIZ.

Location.—At electric railway bridge in sec. 11, T. 24 S., R. 27 E., about 1½ miles west of Douglas, Ariz.

Records available.—August to December, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to pile bent of bridge in center of channel.

Channel.—Shifting sand.

Discharge measurements.—Made from bridge or by wading.

Accuracy.—Estimates of daily discharge are not considered sufficiently accurate for publication.

Cooperation.—Gage height record furnished by Arizona experiment station through G. E. P. Smith, irrigation engineer.

Discharge measurements of White River near Douglas, Ariz., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Sept. 25	Jacob and Smith	3.50	3.5
Nov. 14	Jacob and Ballard	3.70	1.3
Dec. 14	C. C. Jacob	3.58	1.1

Daily gage height, in feet, of White River near Douglas, Ariz., for 1911.

Day.	Aug.	Sept.	Oct.	Day.	Aug.	Sept.	Oct.	Day.	Aug.	Sept.	Oct.
1	.....	3.43	3.68	11	.....	3.68	.....	21	.....	4.09	.....
2	.....	3.41	3.65	12	.....	3.51	.....	22	.....	3.80	.....
3	.....	3.40	3.65	13	.....	5.92	.....	23	.....	3.68	.....
4	.....	3.35	3.65	14	.....	4.87	.....	24	3.55	3.65	.....
5	.....	3.50	9.74	15	.....	3.60	.....	25	3.80	3.55	.....
6	.....	4.31	5.81	16	.....	3.50	.....	26	6.20	3.55	.....
7	.....	3.72	4.43	17	.....	6.90	.....	27	6.50	4.57	.....
8	.....	3.51	3.92	18	.....	6.44	.....	28	4.30	3.68	.....
9	.....	3.48	3.72	19	.....	7.48	.....	29	4.30	4.67	.....
10	.....	4.18	3.60	20	.....	4.92	.....	30	3.80	3.75	.....
								31	3.55	.....	.....

FLOOD OF OCTOBER, 1911, IN THE REGION OF THE SAN JUAN, SAN MIGUEL, AND LA PLATA MOUNTAINS.

By G. H. Russell and G. A. Gray.

From September 25 to October 6, 1911, rain was general over a large portion of the Rocky Mountain region and was heavy, increasing with the elevation, on the slopes of the San Juan, San Miguel, and La Plata Mountains, from which flow the headwaters of San Juan, Dolores, Chama, Rio Grande, and Gunnison Rivers. Until October 5, however, the fall had at no time been excessive, and the rivers and

[1] White River flows southward into Mexico and discharges into the Gulf of California.

their tributaries were easily carrying the run-off within their banks, but on that day a very heavy downpour occurred on the higher slopes of the ranges, above altitude 7,000 feet.

At Gladstone, Colo., elevation 10,500 feet, the United States Weather Bureau recorded 8.05 inches for the day. Below this elevation the precipitation diminished, although as far down as Pagosa Springs it amounted to 3.67 inches and at Uncompahgre 3.70 inches.

All the precipitation was in the form of rain, which carried with it to the streams any snow that had previously fallen on the upper slopes. The exceptionally heavy run-off caused by such a combination of phenomena, poured into streams already full to their banks, resulted in extraordinarily high stages on all rivers heading in the region.

Chama River overflowed its banks, inundated all bottom lands, and caused considerable damage to ranches and bridges along its course. At Chama, N. Mex., the Denver & Rio Grande Railroad bridge and several hundred feet of track were taken out.

Conejos River also left its banks and did considerable damage. The channel at Jacob's ranch shifted entirely away from the gage and bridge to which the gage was attached. The maximum discharge at this point was probably close to 6,000 second-feet.

The Rio Grande at Wason and Del Norte, Colo., reached a height never before recorded. At Del Norte the State engineer's gage registered a maximum of 5.9 feet, the estimated maximum discharge being 12,000 second-feet. At Wason the State's automatic gage registered 7.05, the maximum discharge being close to 8,000 second-feet.

Some damage was done to ranches and also irrigation in the vicinity of Del Norte and Monte Vista, Colo. The roadbed of the Creede branch of the Denver & Rio Grande Railroad was so damaged that traffic was delayed for several days.

Dolores River at Dolores reached a height of 10.2 feet on the State engineer's gage, or about 8 feet above low-water stage. The estimated discharge at this stage is about 10,000 second-feet. The Rio Grande Southern Railroad suffered the greatest loss in this valley, much of its track being entirely destroyed and all more or less damaged for a stretch of 35 miles. Agriculturists along the course also sustained severe losses.

On San Miguel and Uncompahgre rivers conditions were similar to those on the other streams, but the damage was probably not so great.

The San Juan and its upper tributaries reached stages that exceeded any in memory or tradition. The Animas at Durango registered 13.6 feet on the State engineer's gage, or 11.5 feet above low water. At Aztec, N. Mex., flood marks showed the river to have reached a height of 13.5 feet, or 10.5 feet above normal. The maximum dis-

Miscellaneous measurements in Colorado River drainage basin in 1911—Continued.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
June 13	High line canal	West Divide Creek.	Beard's ranch near Raven, Colo.	1.13	35.9
Mar. 18	Gunnison River	Grand River	Whitewater, Colo	[a] 14.80	1,290
14	Tomichi Creek	Gunnison River.	Gunnison, Colo	.79	164
20	Uncompahgre River	do	8 miles north of Montrose, Colo.	2.15	148
20	do	do	8 miles south of Montrose, Colo.	2.10	108
19	Nigger Gulch	do	Stratler, Colo		0
19	Alkali Creek	do	Mouth		0
19	Roubideau Creek	do	Denver & Rio Grande R. R. crossing.		[b] 12.0
19	Escalante Creek	do	Mouth		0
19	Wells Gulch	do	do		0
19	Deer Creek	do	do		0
19	Big Dominguez Creek	do	do		[b] 1.0
19	Kumali Creek	do	do		[b] .5
19	Indian Creek	Kumali Creek.	do		0
19	Whitewater Creek	Gunnison River.	Whitewater, Colo		[b] .5
May 3	Oak Spring ranch ditch.	Fremont River.	Emery, Utah	1.3	8.6
June 3	do	do	do	1.15	4.45
July 23	do	do	do	1.05	2.8
Sept. 8	do	do	do	1.0	.72
Oct. 11	do	do	do	.98	1.63
May 2	Red Creek	do	do		19.2
Oct. 11	do	do	do		1.41
11	Deer Creek	do	do		.78
11	do	do	do		.41
11	do	do	do		.39
May 2	Clear Creek	do	do		1.6
June 7	Miller ditch	do	Miller's ranch near Emery, Utah		4.24
7	Muddy Creek	do	Lewis ranch near Emery, Utah		40.8
Sept. 8	Quitchumpah Creek	do	County road near Emery, Utah		.10
Oct. 11	do	do	do		1.42
May 9	Bill Williams River	Colorado River	Near Swansea, Ariz		1.3
Dec. 2	Gila River	do	Winkelman, Ariz		84
Sept. 2	Animas River	San Juan River.	Durango, Colo	3.70	4.90
Nov. 24	Little Navajo River	Navajo River	Chromo, Colo		19.0
Jan. 31	Mangus Creek	Gila River	Silver City and Mogollon road, N. Mex.		[b] .5
31	Duck Creek	do	Near Cliff, N. Mex		[b] 2.0
30	Whitewater Creek	Rio San Francisco.	Glenwood, N. Mex		7.4
Nov. 2	Chase Creek	do	Clifton, Ariz		[c] 5.3
Dec. 2	Arizona Copper Co. flume.	do	do		[c] 14.0
Feb. 3[d]	San Jose canal	Gila River	2 miles below headworks, near Solomonville, Ariz.		56
3[d]	Montezuma canal	do	Near Solomonville, Ariz		38
3[d]	Union canal	do	do		[e] 166
Aug. 22	San Pedro River	do	At railroad bridge at Benson, Ariz.		48
Dec. 2	do	do	Winkelman, Ariz		11
May 1	Verde River	Salt River	At former United States Reclamation Service gaging station at McDowell, Ariz.	7.45	129
May 20	do	do	do	7.35	106
Dec. 8	do	do	do	8.20	197
Apr. 4	Hassayampa River	Gila River	½ mile below Wickenburg, Ariz.		1.0

[a] The gage height was taken from a reference point.
[b] Discharge estimated.
[c] This measurement was included in the measurement made on San Francisco River at Clifton, Ariz., at the regular United States Geological Survey gaging station.
[d] Canals full.
[e] Floats.

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