DEPARTMENT OF THE INTERIOR
FRANKLIN K. LANE, Secretary

UNITED STATES GEOLOGICAL SURVEY
GEORGE OTIS SMITH, Director

WATER-SUPPLY PAPER 359

SURFACE WATER SUPPLY OF THE UNITED STATES
1913

PART IX. COLORADO RIVER BASIN

NATHAN C. GROVER, Chief Hydraulic Engineer

ROBERT FOLLANSBEE, E. A. PORTER, and G. A. GRAY, District Engineers

Prepared in cooperation with
THE STATES OF ARIZONA, UTAH, AND NEW MEXICO

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ILLUSTRATIONS.

SURFACE WATER SUPPLY OF COLORADO RIVER BASIN, 1913.

AUTHORIZATION AND SCOPE OF WORK.

This volume is one of a series of 12 reports presenting results of measurements of flow made on streams in the United States during 1913. Six of the reports for 1913 contain data for the year ending September 30, and the other six for the calendar year, as indicated in the table on page 8.

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 years ending June 30, 1895–1914.

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 1914, inclusive	150,000

In the execution of the work many private and State organizations have cooperated, either by furnishing data or by assisting financially in collecting the data. Acknowledgements for cooperation of the first kind are made in connection with the description of each station affected and of the second kind on page 17.

Measurements of stream flow have been made at about 3,000 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. On July 1, 1913, 1,388 gaging stations were being maintained by the Survey and the cooperating organizations, and during the year many miscellaneous discharge measurements were made at other points. In connection with this work, data were also collected in regard to precipitation, evaporation, storage reservoirs, river profiles, and water power in many sections of the country, and will be made available in the regular water-supply papers from time to time.

PUBLICATIONS.

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

Prior to 1901 gage heights and discharge measurements were published in water-supply papers or bulletins, and estimates of monthly discharge in annual reports; since 1901 both classes of data have been published in water-supply papers, and they are now being published in 12 parts, as shown in the following table:

Papers on surface water supply of the United States, 1913.

Part.	No.	Title.	Year used.
I	351	North Atlantic basins	Calendar year.
II	352	South Atlantic and eastern Gulf of Mexico basins	Do.
III	353	Ohio River basin	Year ending Sept. 30.
IV	354	St. Lawrence River basin	Calendar year.
V	355	Upper Mississippi River and Hudson Bay basins	Year ending Sept. 30.
VI	356	Missouri River basin	Calendar year.
VII	357	Lower Mississippi River basin	Do.
VIII	358	Western Gulf of Mexico basins	Year ending Sept. 30.
IX	359	Colorado River basin	Calendar year.
X	360	Great Basin	Year ending Sept. 30.
XI	361	Pacific basins in California	Do.
XII	362	North Pacific basins	Do.

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

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

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

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

NOTE.—No data regarding stream flow are given in the fifteenth and seventeenth annual reports.

The following table gives, by years and drainage basins, the numbers of the papers on surface water supply published from 1899 to 1913. 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 1913, are published in Water-Supply Papers 97, 124, 165, 201, 241, 261, 281, 301, 321, and 351, which contain records for the New England streams from 1903 to 1913. Results of miscellaneous measurements are published by drainage basins.

Numbers of water-supply papers containing results of stream measurements, 1899–1913.

	1899[a]	1900[b]	1901	1902	1903	1904	1905	1906	1907–8	1909	1910	1911	1912	1913
North Atlantic	35	47, [c]48	65, 75	82	97	[d]124, [e]125, [f]126	[d]165, [e]166, [f]167	[d]201, [e]202, [f]203	241	261	281	301	321	351
South Atlantic and eastern Gulf of Mexico	[g]35, 36	48	65, 75	[g]82, 83	[g]97, 98	[f]126, 127	[f]167, 168	[f]203, 204	242	262	282	302	322	352
Ohio River basin	36	48, [h]49	65, 75	83	98	128	169	205	243	263	283	303	323	353
St. Lawrence River and Great Lakes	36	49	65, 75	[i]82, 83	97	129	170	206	244	264	284	304	324	354
Hudson Bay and Upper Mississippi River	36	49	[j]65, 66, 75	[j]83, 85	[j]98, 99, [k]100	[j]128, 130	171	207	245	265	285	305	325	255
Missouri River	[l]36, 37	49, [m]50	66, 75	84	99	130, [n]131	172	208	246	266	286	306	326	356
Lower Mississippi River	37	50	[j]65, 66, 75	[j]83, 84	[j]98, 99	[j]128, 131	[j]169, 173	[j]205, 209	247	267	287	307	327	357
Western Gulf of Mexico	37	50	66, 75	84	99	132	174	210	248	268	288	308	328	358
Colorado River	[o]37, 38	50	66, 75	85	100	133	175, [p]177	211	249	269	289	309	329	359
Great Basin	38, [q]39	51	66, 75	85	100	133, [r]134	176, [r]177	212, [r]213	250, [r]251	270, [r]271	290, [r]291	310	330	360
California	38, [s]39	51	66, 75	85	100	134	177	213	251	271	291	311	331	361
North Pacific	38	51	66, 75	85	100	135	[t]177, 178	214	252	272	292	312	[u]332	[u]362

[a] Rating tables and index to Water-Supply Papers 35–39 contained in Water-Supply Paper 39.
[b] Rating tables and index to Water-Supply Papers 47–52 and data on precipitation, wells, and irrigation in California and Utah contained in Water-Supply Paper 52.
[c] Wissahickon and Schuylkill Rivers to James River.
[d] New England rivers only.
[e] Hudson River to Delaware River, inclusive.
[f] Susquehanna River to Yadkin River, inclusive.
[g] James River only.
[h] Scioto River.
[i] Lake Ontario and tributaries to St. Lawrence River proper.
[j] Tributaries of Mississippi from east.
[k] Hudson Bay only.
[l] Gallatin River.
[m] Loup and Platte Rivers near Columbus, Nebr., and all tributaries below junction with Platte.
[n] Platte and Kansas Rivers.
[o] Green and Gunnison Rivers and Grand River above junction with Gunnison.
[p] Below junction with Gila.
[q] Mohave River only.
[r] Great Basin in California, excepting Truckee and Carson drainage basins.
[s] Kings and Kern Rivers only.
[t] Rogue, Umpqua, and Siletz Rivers only.
[u] In three parts: *A*, Pacific basins in Washington and upper Columbia River; *B*, Snake River basin; *C*, Lower Columbia River and Pacific basins in Oregon.

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

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

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

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

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

Albany, N. Y., Room 18, Federal Building.
Atlanta, Ga., Post Office Building.
Madison, Wis., Railroad Commission, Capitol Building.
St. Paul, Minn., Old Capitol Building.
Helena, Mont., Montana National Bank Building.
Denver, Colo., 302 Chamber of Commerce Building.
Salt Lake City, Utah, 421 Federal Building.
Boise, Idaho, 615 Idaho Building.
Portland, Oreg., 416 Couch Building.
Tacoma, Wash., 406 Federal Building.
San Francisco, Cal., 328 Customhouse.
Los Angeles, Cal., 619 Federal Building.
Phoenix, Ariz., 417 Fleming Building.
Austin, Tex., Old Post Office Building.
Honolulu, Hawaii, Kapiolani Building.

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

DEFINITION OF TERMS.

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

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

mental unit from which others are computed by the use of the factors given in the tables of convenient equivalents (p. 12–14).

"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.

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

The following terms used in these reports are not in common use and may be defined as follows:

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

"Control," "controlling section," and "point of control" are terms used to designate the section or sections of the stream below the gage which determine the discharge relation at the gage. It should be noted that the control may not be the same section or sections at all stages.

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

CONVENIENT EQUIVALENTS.

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

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

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

NOTE.—For part of a month multiply the figure for one day by the number of days.

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

Discharge in 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 part of a month multiply the figure for one day by the number of days.

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

Discharge in second-feet.	Run-off in millions of cubic feet.				
	1 day.	28 days.	29 days.	30 days.	31 days.
1	0.0864	2.419	2.506	2.592	2.678
2	.1728	4.838	5.012	5.184	5.356
3	.2592	7.257	7.518	7.776	8.034
4	.3456	9.676	10.024	10.368	10.712
5	.4320	12.095	12.530	12.960	13.390
6	.5184	14.514	15.036	15.552	16.068
7	.6048	16.933	17.542	18.144	18.746
8	.6912	19.352	20.048	20.736	21.424
9	.7776	21.771	22.554	23.328	24.102

NOTE.—For part of a month multiply the figure 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 (365 days) covers 1 square mile 1.131 feet or 13.572 inches deep.

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

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 covers 1 square mile 0.03719 inch deep.

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 equal 18.7 United States gallons per second.

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

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

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

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

100 United States gallons per minute equal 0.223 second-feet.

100 United States gallons per minute for one day equal 0.442 acre-feet.

1,000,000 United States gallons per day equal 1.55 second-feet.

1,000,000 United States gallons equal 3.07 acre-feet.
1,000,000 cubic feet equal 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.

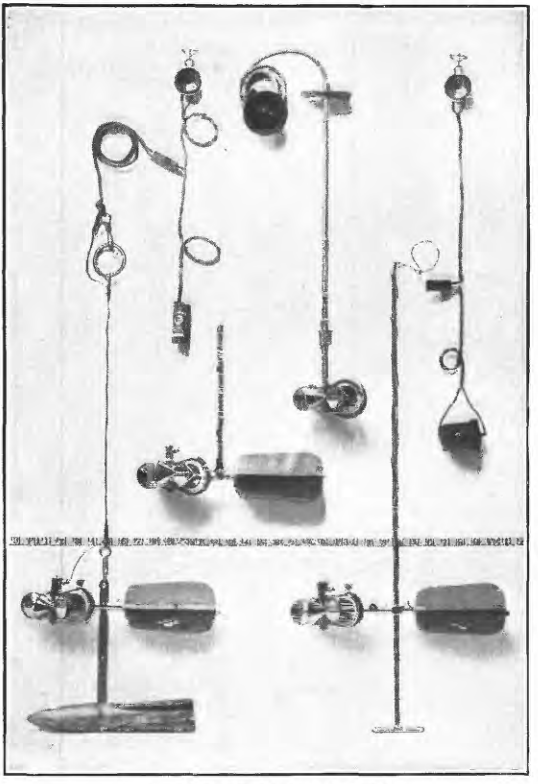
To calculate water power quickly: $\frac{\text{Sec.-ft.} \times \text{fall in feet}}{11}$ = net horsepower on water wheel realizing 80 per cent of theoretical power.

EXPLANATION OF DATA.

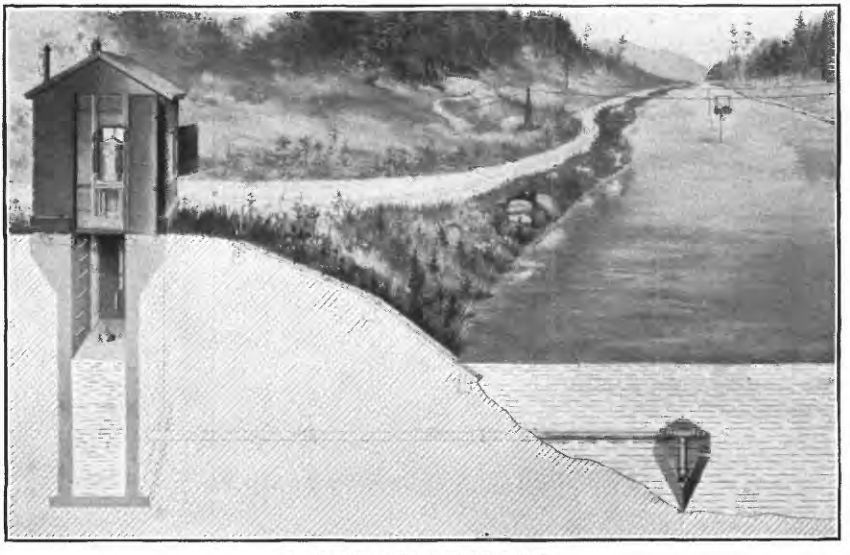
For each regular current-meter gaging station the following data are given: Description of the station, list of discharge measurements, table of daily gage height, table of daily discharge, table of monthly and yearly discharge and run-off. For stations located at weirs or dams the gage-height table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

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

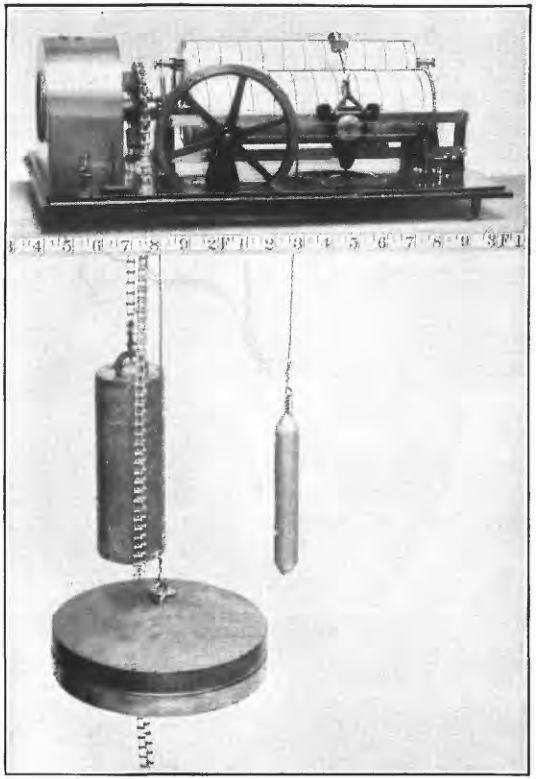
The table of daily gage height shows the daily fluctuations of the surface of the river as found from the mean of the gage readings taken each day, usually in the morning and in the evening, though at many stations only one reading is made each day. At a comparatively few stations automatic gages are used, some of which give a continuous record of river stage in the form of an hydrograph, and others a record printed at regular intervals, from which the mean daily gage height can be computed. The gage height given in the table represents the elevation of the surface of the water above the zero of the gage. When the discharge relation is affected by ice or by backwater from obstructions all gage heights are published as recorded, with suitable footnotes. The rating



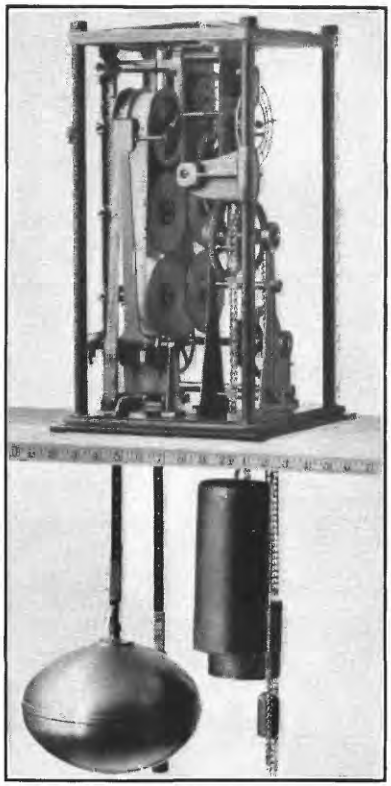
A. PRICE CURRENT METERS.



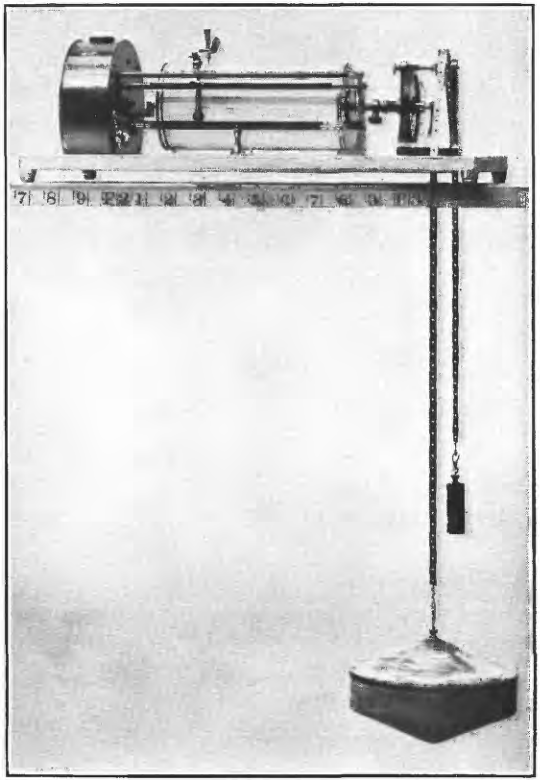
B. TYPICAL GAGING STATIONS.



A. STEVENS.



B. GURLEY.



C. FRIEZ.

AUTOMATIC GAGES.

In the table of monthly discharge the column headed "Maximum" gives the mean flow, as determined from the rating table, for the day when the mean gage height was highest. As the gage height is the mean for the day, it does not indicate correctly the stage when the water surface was at crest height, and the corresponding discharge was consequently larger than given in the maximum column. Likewise, in the column of "Minimum" the quantity given is the mean flow for the day when the mean gage height was lowest. The column headed "Mean" is the average flow in cubic feet for each second during the month. On this the computations for the remaining columns, which are defined on pages 11 and 12, are based.

ACCURACY OF FIELD DATA AND COMPUTED RESULTS.

The accuracy of stream-flow data depends on (1) the permanence of channel and of the relation between discharge and stage, and (2) on the accuracy of observation of stage, measurements of discharge, and interpretation of 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 curves used, and an accuracy column is inserted in the monthly discharge table. For the rating curves "well defined" indicates, in general, that the rating is probably accurate within 5 per cent; "fairly well defined," within 10 per cent; "poorly defined" or "approximate," within 15 to 25 per cent. These notes are very general and are based on the plotting of the individual measurements with reference to the mean rating curve.

The accuracy column in the monthly discharge table does not apply to the estimate of maximum or minimum discharge nor to that for any one day, but to the monthly mean. It is based on the accuracy of the rating, the probable reliability of the observer, the number of gage readings per day, the range of the fluctuation in stage, and knowledge of local conditions. In this column A indicates that the mean monthly flow is probably accurate within 5 per cent; B, within 10 per cent; C, within 15 per cent; D, within 25 per cent. Special conditions are covered by footnotes.

Even though the monthly means for any station may represent with a high degree of accuracy the quantity of water flowing past the gage, the figures showing discharge per square mile and depth of run-off in inches may be subject to gross errors which result from including in the measured drainage area large noncontributing districts or omitting estimates of water diverted for irrigation or other use. "Second-feet per square mile" and "run-off, depth in inches" have therefore, not been computed for streams draining areas in which the annual rainfall is less than 20 inches, nor for streams draining areas

table is not applicable for such periods unless the proper corrections to the gage heights are known and applied. Attention is called to the fact that the zero of the gage is placed at an arbitrary datum without reference to zero flow or the bottom of the river. In general the zero is somewhat below the lowest known stage to avoid negative readings.

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

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

The 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 height and daily discharge by plotting gage heights in feet as ordinates and discharge in second-feet as abscissas.

The table of daily discharge determined from the rating table gives the discharge in second-feet corresponding to the mean of the gage readings observed each day.

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

DIVISION OF WORK.

The field data in Colorado were collected under the direction of Robert Follansbee, district engineer, by R. H. Fletcher.

The data in Utah and Nevada were collected under the direction of E. A. Porter, district engineer, by Lynn Crandall, W. R. King, C. L. Batchelder, Leonard Tanner, and C. W. Bennett.

In New Mexico the data were collected under the direction of G. A. Gray, district engineer, by Frank O'Brien, C. J. Emerson, and E. L. Redding.

In Arizona the data were collected under the direction of H. D. McGlashan and G. A. Gray, district engineers, by C. C. Jacob and W. Richins.

Ratings, computations, and special estimates were made for stations in Colorado by Robert Follansbee, assisted by R. H. Fletcher; in Utah and Nevada by E. A. Porter, assisted by Lynn Crandall and Miss Ruby Christenson; and in Arizona and New Mexico by G. A. Gray, assisted by W. R. King.

The data were reviewed and prepared for publication by H. J. Dean.

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

STATION RECORDS.

GREEN RIVER AND THE MAIN COLORADO.

GREEN RIVER NEAR BRIDGEPORT, UTAH.

Location.—In the SE. ¼ SW. ¼ sec. 3, T. 1 N., R. 25 E., at the ferry of the Park Live Stock Co., 3 miles south of Bridgeport. Willow Creek enters from the left about one-eighth mile below station.

Records available.—October 12, 1911, to December 31, 1913.

Drainage area.—15,800 square miles.

Gage.—Staff in three sections—two vertical and one inclined.

Control.—Gravel and sand; liable to shift at high stages.

Discharge measurements.—Made from ferryboat or from car on ferry cable.

Winter flow.—Discharge relation affected by ice.

Regulation.—None.

Accuracy.—Winter records approximate only; others good.

Discharge measurements of Green River near Bridgeport, Utah, during 1913.

[Made by W. R. King.]

Date.		Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 18		7.50	6,060
18		7.49	5,940

in which the precipitation exceeds 20 inches if such computations might be uncertain or misleading because of the presence of large noncontributing districts in the measured drainage area, of omitting estimates of water diverted for irrigation or other use, or of artificial control or unusual natural control of the flow of the river above the gaging station. All values of "second-feet per square mile" and "run-off, depth in inches" previously published by the Survey should be used with extreme caution, and such values in this report should be used with care because of possible inherent sources of error not known to the Survey.

In general the base data collected each year by the Survey engineers are published, not only to comply with the law, but also to afford any engineer the means of analyzing in detail the results of the computations. The table of monthly discharge is so arranged as to give only a general idea of the flow at the station and should not be used for other than preliminary estimates. The tables of daily discharge allow more detailed studies of the variation in flow. It should be borne in mind, however, that the observations in each succeeding year may be expected to throw new light on data already collected and published.

COOPERATION.

The work in Utah, Arizona, and New Mexico was carried on under cooperative agreements between the United States Geological Survey and the States.

Special acknowledgments are due to W. D. Beers, State engineer of Utah, J. A. French, State engineer of New Mexico, and R. G. Forbes, director of the State agricultural experiment station of Arizona.

The United States Forest Service furnished the gage-height record for 33 stations in the Grand River drainage basin in Colorado.

The State engineer of Colorado paid the salaries of the gage observers at 8 stations in the Grand River and San Juan River drainage basins in Colorado.

The Colorado-Yule Marble Co. furnished gage heights on Crystal River at Marble, Colo.

The Glenwood Light & Water Co. furnished gage heights on No Name Creek near Glenwood Springs, Colo.

The Uinta Development Co. paid the observer on Blacks Fork, near Urie, Wyo.

The Colorado Power Co. furnished the automatic gage on Grand River at Glenwood Springs, Colo.

Boulware, Johnson & Converse rendered financial assistance on Gila River near Silver City, N. Mex.

The Socorro Mines Co. assisted in collecting the data on Whitewater Creek, near Mogollon, N. Mex.

Daily gage height, in feet, of Green River near Bridgeport, Utah, for 1913.

[Clarence Hunter and Charles R. Sparks, observers.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	7.2	11.0	11.0	6.6	.....	4.2	3.8
2	.....	7.4	11.6	10.9	6.6	.....	4.4	3.8
3	.....	7.2	12.0	10.0	6.4	.....	4.4	3.8
4	.....	7.0	11.9	9.6	6.2	.....	4.2	3.8
5	.....	6.8	11.7	9.2	6.0	.....	4.3	3.8
6	.....	6.7	11.6	8.9	5.8	.....	4.6	3.8
7	.....	6.4	11.6	8.6	5.8	.....	4.8	3.7
8	.....	6.0	11.3	8.4	5.8	.....	4.8	3.7
9	.....	6.6	11.2	8.2	5.6	.....	4.8	3.8
10	6.5	6.8	11.0	8.0	5.6	.....	4.8	3.8
11	6.4	7.2	10.9	7.9	5.4	.....	4.8	3.8
12	6.5	7.6	10.7	7.8	5.3	.....	4.8	3.8
13	6.3	7.9	10.8	7.6	5.2	.....	4.7	3.8
14	6.2	8.1	10.9	7.5	5.2	4.7	4.5	3.9
15	6.7	8.4	10.5	7.3	5.2	4.8	4.4	4.0
16	7.4	8.1	9.8	7.1	5.1	4.6	4.6	4.1
17	7.6	7.8	9.4	6.8	5.0	4.6	4.7	4.0
18	7.8	7.5	9.2	6.6	4.9	4.5	4.8	3.7
19	8.0	7.5	9.3	6.4	(a)	4.3	4.8	3.6
20	7.8	7.6	9.3	6.2	.....	4.2	4.8	3.5
21	7.5	7.6	9.2	6.8	.....	4.0	4.8	3.5
22	7.1	7.6	9.1	7.6	.....	4.1	4.7	3.4
23	7.0	7.7	9.0	8.3	.....	4.2	4.6	.....
24	7.2	7.6	8.9	8.2	.....	4.2	4.3	.....
25	7.0	7.6	8.8	7.9	.....	4.2	3.9	.....
26	6.8	7.8	9.3	7.6	.....	4.0	3.8	.....
27	7.0	8.2	10.1	7.4	.....	3.9	3.8	.....
28	7.0	8.6	10.3	7.3	.....	4.0	3.9	.....
29	7.2	9.3	10.6	7.1	.....	3.85	3.8	.....
30	7.2	10.1	10.9	6.8	.....	3.8	3.8	.....
31	.....	10.4	.....	6.6	.....	.....	3.8	.....

a Gage broken and was not repaired until September 14.

Daily discharge, in second-feet, of Green River near Bridgeport, Utah, for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	5,520	12,000	12,000	4,600	.....	1,620	1,270
2	.....	5,840	13,200	11,820	4,600	.....	1,800	1,270
3	.....	5,520	14,000	10,200	4,310	.....	1,800	1,270
4	.....	5,200	13,800	9,480	4,030	.....	1,620	1,270
5	.....	4,900	13,400	8,760	3,750	.....	1,710	1,270
6	.....	4,750	13,200	8,240	3,490	.....	2,000	1,270
7	.....	4,310	13,200	7,760	3,490	.....	2,220	1,190
8	.....	3,750	12,600	7,440	3,490	.....	2,220	1,190
9	.....	4,600	12,400	7,120	3,230	.....	2,220	1,270
10	4,450	4,900	12,000	6,800	3,230	.....	2,220	1,270
11	4,310	5,520	11,820	6,640	2,970	.....	2,220	1,270
12	4,450	6,160	11,460	6,480	2,840	.....	2,220	1,270
13	4,170	6,640	11,640	6,160	2,710	.....	2,110	1,270
14	4,030	6,960	11,820	6,000	2,710	2,110	1,900	1,350
15	4,750	7,440	11,100	5,680	2,710	2,220	1,800	1,440
16	5,840	6,960	9,840	5,360	2,580	2,000	2,000	1,530
17	6,160	6,480	9,120	4,900	2,460	2,000	2,110	1,440
18	6,480	6,000	8,760	4,600	2,340	1,900	2,220	1,190
19	6,800	6,000	8,940	4,310	.....	1,710	2,220	1,110
20	6,480	6,160	8,940	4,030	.....	1,620	2,220	1,030
21	6,000	6,160	8,760	4,900	.....	1,440	2,220	1,030
22	5,360	6,160	8,580	6,160	.....	1,530	2,110	950
23	5,200	6,320	8,400	7,280	.....	1,620	2,000	.....
24	5,520	6,160	8,240	7,120	.....	1,620	1,710	.....
25	5,200	6,160	8,080	6,640	.....	1,620	1,350	.....
26	4,900	6,480	8,940	6,160	.....	1,440	1,270	.....
27	5,200	7,120	10,380	5,840	.....	1,350	1,270	.....
28	5,200	7,760	10,740	5,680	.....	1,440	1,350	.....
29	5,520	8,940	11,280	5,360	.....	1,310	1,270	.....
30	5,520	10,380	11,820	4,900	.....	1,270	1,270	.....
31	.....	10,920	.....	4,600	.....	.....	1,270	.....

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

Monthly discharge of Green River near Bridgeport, Utah, for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	[a] 850	52,300	D.
February	.....	.....	[a] 800	44,400	D.
March	.....	.....	[a] 1,800	111,000	D.
April	6,800	.....	[a] 5,070	302,000	B.
May	10,900	3,750	6,330	389,000	A.
June	14,000	8,080	10,900	649,000	A.
July	12,000	4,030	6,720	413,000	A.
August	4,600	.....	[a] 2,720	167,000	B.
September	.....	.....	[a] 1,850	110,000	B.
October	2,220	1,270	1,860	114,000	B.
November	1,530	.....	[a] 1,120	68,900	B.
December	.....	.....	[a] 750	46,100	D.
The year	14,000	.....	3,410	2,470,000	

[a] Estimated.

GREEN RIVER AT LITTLE VALLEY, UTAH.

Location.—In sec. 5, T. 22 S., R. 16 E., at Little Valley ferry, 4 miles downstream from Greenriver railroad station.

Records available.—December 18, 1910, to December 31, 1913. Records, showing practically the same discharge, at Elgin, about 4 miles above, for 1894–1899; 1905–1911.

Drainage area.—41,000 square miles.

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

Control.—Fairly permanent; shifts at measuring section.

Discharge measurements.—Made from car on ferry cable.

Winter flow.—Ice affects discharge relation for periods during December, January, and February.

Diversions.—Below all diversions.

Accuracy.—Rating curve well defined; diurnal fluctuation of stage makes accuracy uncertain at times.

Discharge measurements of Green River at Little Valley, Utah, for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 10	W. R. King	4.65	12,200	Nov. 27	Batchelder and Bennett	1.18	2,520
June 10	do	7.00	23,300				
Aug. 29	Lynn Crandall	.93	2,360	28	do	1.05	2,510

Daily gage height, in feet, of Green River at Little Valley, Utah, for 1913.

[R. A. Brown and S. E. Calkins, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.4	1.0	2.1	3.5	3.9	7.8	5.8	3.6	0.9	1.4	1.4	1.1
2	3.4	1.0	2.1	4.0	4.0	7.9	5.8	3.5	.9	1.4	1.4	1.1
3	3.0	1.0	2.1	6.3	4.7	7.9	5.8	3.4	1.0	1.4	1.4	1.2
4	3.0	1.0	2.1	6.4	5.5	7.9	5.7	3.2	1.6	1.3	1.5	1.2
5	2.0	1.0	2.1	6.0	5.6	7.9	5.6	2.9	1.8	1.6	1.5	1.2
6	1.0	1.0	2.1	6.0	5.6	7.7	5.6	2.6	2.1	1.5	1.5	1.1
7	1.0	1.0	1.8	6.0	5.3	7.6	5.5	2.5	2.2	1.6	1.5	1.0
8	1.0	1.0	1.7	5.2	5.0	7.3	5.4	2.4	3.8	1.8	1.4	1.0
9	1.0	1.0	1.6	4.2	4.8	7.1	5.7	2.4	2.6	1.9	1.4	.8
10	1.0	1.0	1.6	3.7	4.8	7.0	5.9	2.4	1.9	2.1	1.4	.7
11	1.0	1.0	1.6	4.5	5.3	6.8	6.1	2.3	2.6	2.1	1.4	.6
12	1.0	1.0	1.6	4.5	5.3	6.6	6.2	2.2	2.6	2.1	1.4	.8
13	1.0	1.0	1.6	4.4	5.8	6.5	6.0	2.2	1.6	2.2	1.5	.9
14	1.0	1.0	1.6	3.7	6.2	6.4	6.0	2.1	1.6	2.2	1.8	.3
15	1.0	1.0	1.5	3.7	6.5	6.4	6.0	2.1	1.8	2.1	1.8	.25
16	1.0	1.0	2.1	4.0	6.6	6.3	5.9	2.0	1.7	1.8	1.8	.05
17	1.0	2.1	2.5	4.0	6.7	6.1	5.9	1.9	1.8	1.8	1.8	.1
18	1.0	2.1	2.5	4.4	6.6	6.1	5.8	1.8	1.7	1.8	1.8	.1
19	1.0	2.1	2.8	4.9	6.1	5.8	5.7	1.8	1.8	1.7	1.7	.1
20	1.0	2.1	2.9	5.5	5.7	5.4	5.6	1.8	1.8	1.7	1.7	.05
21	1.0	2.1	2.8	5.7	5.7	5.2	5.3	1.6	1.8	1.6	1.7	.1
22	1.0	2.1	2.8	5.5	5.7	5.2	5.1	1.5	1.7	1.6	1.6	.05
23	1.0	2.1	2.8	5.5	5.7	5.2	5.0	1.4	1.6	1.6	1.6	.05
24	1.0	2.1	2.8	5.8	5.7	5.0	4.8	1.3	1.6	1.6	1.6	.0
25	1.0	2.1	2.8	5.8	5.9	5.0	4.7	1.2	1.6	1.6	1.5	1.65
26	1.0	2.1	2.8	5.4	6.0	4.9	4.6	1.1	1.8	1.5	1.5	1.5
27	1.0	2.1	2.8	5.0	6.0	4.9	4.5	1.5	1.6	1.5	1.3	1.4
28	1.0	2.1	2.8	4.4	6.3	4.9	4.4	1.1	1.5	1.5	1.2	1.5
29	1.0	.....	2.1	4.0	7.1	6.2	4.2	1.0	1.5	1.5	1.2	1.5
30	1.0	.....	2.1	3.9	7.3	7.0	4.0	.9	1.4	1.4	1.2	1.6
31	1.0	.....	2.1	.....	7.5	.....	3.8	1.0	.....	1.4	.....	1.4

NOTE.—Discharge relation affected by ice Jan. 1–5, Feb. 17 to Mar. 8, and Dec. 25–31.

Daily discharge, in second-feet, of Green River at Little Valley, Utah, for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	2,400	.....	7,800	9,100	26,100	16,400	8,100	2,240	3,040	3,040	2,560
2	.....	2,400	.....	9,460	9,460	26,700	16,400	7,800	2,240	3,040	3,040	2,560
3	.....	2,400	.....	18,700	12,000	26,700	16,400	7,500	2,400	3,040	3,040	2,720
4	.....	2,400	.....	19,100	15,200	26,700	16,000	6,900	3,390	2,880	3,210	2,720
5	.....	2,400	.....	17,300	15,600	26,700	15,600	6,040	3,770	3,390	3,210	2,720
6	2,400	2,400	.....	17,300	15,600	25,600	15,600	5,380	4,340	3,210	3,210	2,560
7	2,400	2,400	.....	17,300	14,400	25,100	15,200	5,160	4,540	3,390	3,210	2,400
8	2,400	2,400	.....	14,000	13,200	23,500	14,800	4,940	8,760	3,770	3,040	2,400
9	2,400	2,400	3,390	10,200	12,400	22,500	16,000	4,940	5,380	3,960	3,040	2,090
10	2,400	2,400	3,390	8,420	12,400	22,000	16,800	4,940	3,960	4,340	3,040	1,940
11	2,400	2,400	3,390	11,300	14,400	21,000	17,700	4,740	5,380	4,340	3,040	1,800
12	2,400	2,400	3,390	11,300	14,400	20,100	18,200	4,540	5,380	4,340	3,040	2,090
13	2,400	2,400	3,390	10,900	16,400	19,600	17,300	4,540	3,390	4,540	3,210	2,240
14	2,400	2,400	3,390	8,420	18,200	19,100	17,300	4,340	3,390	4,540	3,770	1,420
15	2,400	2,400	3,210	8,420	19,600	19,100	17,300	4,340	3,770	4,340	3,770	1,360
16	2,400	2,400	4,340	9,460	20,100	18,700	16,800	4,150	3,580	3,770	3,770	1,160
17	2,400	.....	5,160	9,460	20,600	17,700	16,800	3,960	3,770	3,770	3,770	1,200
18	2,400	.....	5,160	10,900	20,100	17,700	16,400	3,770	3,580	3,770	3,770	1,200
19	2,400	.....	5,820	12,800	17,700	16,400	16,000	3,770	3,770	3,580	3,580	1,200
20	2,400	.....	6,040	15,200	16,000	14,800	15,600	3,770	3,770	3,580	3,580	1,160
21	2,400	.....	5,820	16,000	16,000	14,000	14,400	3,390	3,770	3,390	3,580	1,200
22	2,400	.....	5,820	15,200	16,000	14,000	13,600	3,210	3,580	3,390	3,390	1,160
23	2,400	.....	5,820	15,200	16,000	14,000	13,200	3,040	3,390	3,390	3,390	1,160
24	2,400	.....	5,820	16,400	16,000	13,200	12,400	2,880	3,390	3,390	3,390	1,120
25	2,400	.....	5,820	16,400	16,800	13,200	12,000	2,720	3,390	3,390	3,210	.....
26	2,400	.....	5,820	14,800	17,300	12,800	11,700	2,560	3,770	3,210	3,210	.....
27	2,400	.....	5,820	13,200	17,300	12,800	11,300	3,210	3,390	3,210	2,880	.....
28	2,400	.....	5,820	10,900	18,700	12,800	10,900	2,560	3,210	3,210	2,720	.....
29	2,400	.....	4,340	9,460	22,500	18,200	10,200	2,400	3,210	3,210	2,720	.....
30	2,400	.....	4,340	9,100	23,500	22,000	9,460	2,240	3,040	3,040	2,720	.....
31	2,400	.....	4,340	.....	24,500	.....	8,760	2,400	.....	3,040	.....	.....

NOTE.—Discharge determined from a well-defined rating curve. Discharge estimated on account of ice as follows: Jan. 1–5, 1,800 second-feet; Feb. 17–28, 2,000 second-feet; Mar. 1–8, 2,400 second-feet; Dec. 25–31, 1,130 second-feet.

Monthly discharge of Green River at Little Valley, Utah., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	2,400	.....	2,300	141,000	C.
February	.....	.....	2,230	124,000	C.
March	6,040	.....	4,160	256,000	C.
April	19,100	7,800	12,800	762,000	C.
May	24,500	9,100	16,500	1,010,000	B.
June	26,700	12,800	19,400	1,150,000	A.
July	18,200	8,760	14,700	904,000	A.
August	8,100	2,240	4,330	266,000	A.
September	8,760	2,240	3,830	228,000	A.
October	4,540	2,880	3,560	219,000	B.
November	3,770	2,720	3,250	193,000	C.
December	2,720	.....	1,680	103,000	C.
The year	26,700	.....	7,420	5,360,000	

COLORADO RIVER AT YUMA, ARIZ.

Location.—In sec. 35, T. 16 S., R. 22 E., at Southern Pacific Co.'s railroad bridge at Yuma, about 1½ miles below mouth of Gila River.

Records available.—April 1, 1878, to December 31, 1913.

Drainage area.—242,000 squre miles.[1]

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

Control.—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 good.

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

Discharge measurements of Colorado River at Yuma, Ariz., for 1913.

[Made by Cloyd, Pierce, and Schobinger.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Jan. 2	15.20	4,600	Feb. 25	16.40	6,600
4	15.10	3,850	27	16.70	7,100
7	15.00	3,600	Mar. 1	17.45	11,700
9	15.10	3,900	4	16.35	8,300
11	15.35	4,700	6	16.30	8,000
14	15.45	4,800	8	16.30	7,300
16	14.95	3,600	11	16.60	8,600
18	14.10	2,680	13	16.55	8,200
21	14.10	2,770	15	16.80	8,400
23	14.30	2,900	18	16.70	9,200
25	14.50	2,980	20	16.80	8,500
28	15.65	4,600	22	16.85	8,700
30	16.00	5,000	25	16.70	8,300
Feb. 1	16.10	5,600	27	16.70	8,500
4	16.10	5,300	29	16.90	10,300
6	16.10	5,400	Apr. 1	16.90	10,700
8	16.30	5,500	3	16.80	9,800
11	16.30	6,400	5	17.00	10,500
13	16.30	5,600	8	17.70	15,700
15	16.40	6,000	10	19.90	31,600
18	16.20	5,800	12	19.65	29,800
20	16.15	5,900	15	19.50	30,900
22	16.40	6,200	17	18.70	35,000

[1] Measured on a map compiled from best available maps of Colorado River basin and considered accurate. Formerly published as 225,000 square miles.

Discharge measurements of Colorado River at Yuma, Ariz., for 1913—Continued.

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
Apr. 19	18.25	21,800
22	19.05	27,500
24	19.90	33,700
26	20.65	38,400
29	20.90	38,500
May 1	20.70	38,200
3	19.60	31,200
6	19.10	28,900
8	19.80	34,000
10	20.10	35,900
13	19.65	33,700
15	20.00	37,000
17	20.30	39,400
20	21.20	45,300
22	21.70	49,200
24	21.60	46,200
27	20.90	42,600
29	20.35	39,000
31	20.30	39,100
June 3	21.15	46,900
5	21.70	51,800
9	22.40	63,000
10	22.80	63,200
12	22.75	61,200
14	22.15	55,800
17	21.05	46,500
19	20.85	44,900
21	20.65	42,600
24	20.30	39,700
26	20.10	38,200
28	20.00	35,700
July 1	19.20	30,800
2	19.00	28,100
5	18.70	27,600
8	19.40	30,400
10	19.00	28,000
12	18.70	25,600
16	17.80	18,300
17	17.60	17,300
19	17.40	16,900
22	17.00	14,600
24	16.70	13,400
26	16.80	13,200
29	17.40	15,100
31	17.70	16,600
Aug. 2	17.50	16,700
5	17.30	15,300
7	17.10	13,600
9	17.00	12,400
12	16.80	10,300
14	16.40	8,300
16	16.20	7,600
19	15.80	6,200
21	15.75	6,100
23	16.20	6,700
Aug. 26	15.70	5,800
28	15.75	6,000
30	15.55	5,100
Sept. 2	15.65	5,500
4	16.05	6,600
6	16.55	7,900
9	15.50	5,100
11	15.35	4,900
13	16.90	12,500
16	18.10	18,800
18	17.30	14,600
20	16.75	11,100
23	16.10	8,900
25	16.05	8,200
27	15.85	7,000
30	15.90	7,800
Oct. 2	16.90	12,900
4	16.60	9,500
7	16.30	8,400
9	16.40	8,600
11	18.65	21,700
14	16.60	10,800
16	16.10	9,400
18	16.20	10,200
21	16.00	8,900
23	16.15	8,500
25	16.25	8,000
28	16.20	7,400
30	16.30	7,300
Nov. 1	16.30	7,100
4	16.40	7,100
6	16.40	7,300
8	16.40	7,500
11	16.35	6,600
13	16.70	7,600
15	16.80	8,500
18	17.10	9,600
20	17.00	8,900
22	16.70	9,800
25	16.60	9,100
28	16.50	8,200
29	16.45	8,200
Dec. 2	16.60	7,800
4	16.60	8,400
6	16.47	8,000
9	16.30	7,100
11	16.30	7,000
13	16.30	6,600
16	16.15	6,700
18	16.20	6,500
20	16.10	6,200
23	16.10	5,100
27	15.85	4,900
30	15.09	4 500

Daily gage height, in feet, of Colorado River at Yuma, Ariz., for 1913.

[Cloyd and Pierce, observers.]

Daily gage height, in feet, and discharge, in second-feet, of Blacks Fork near Urie, Wyo., for 1913.

[Joseph Anderson, observer.]

Day.	August.		September.		October.		November.		December.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1			0.80	107	0.30	17	0.46	39	0.48	
2			.50	45	.30	17	.44	36	.48	
3			.31	18	.31	18	.56	56	.54	
4			.32	20	.55	54	.50	45	.60	
5			.22	10	.72	89	.46	39	.60	
6			.20	8	.61	65	.52	49	.60	
7			.46	39	.51	47	.62	67	.61	
8			.62	67	.51	47	.58	59	.64	
9			.52	49	.39	29	.54	52	.68	
10			.40	30	.41	32	.49	44	.68	
11			.32	20	.48	42	.49	44	.70	
12			.34	22	.48	42	.50	45	.70	
13			.32	20	.52	49	.50	45	.70	
14			.30	17	.58	59	.52	49	.70	
15			.30	17	.59	61	.31	18	.75	
16			.30	17	.59	61	.39	29	.82	
17			.29	16	.49	44	.36	25	.82	
18			.28	15	.52	49	.36	25	.88	
19			.22	10	.58	59	.49	44	.75	
20			.24	12	.58	59	.46	39	.75	
21	0.20	8	.21	9	.52	49	.41	32		
22	.20	8	.26	13	.52	49	.41	32		
23	.19	7	.25	12	.48	42	.42	33		
24	.20	8	.30	17	.49	44	.42	33		
25	.20	8	.31	18	.50	45	.55	54		
26	.20	8	.31	18	.48	42	.44	36		
27	.20	8	.31	18	.48	42	.44	36		
28	.20	8	.31	18	.48	42	.42	33		
29	.20	8	.30	17	.35	24	.52	49		
30	.45	38	.30	17	.44	36	.52	49		
31	.70	84			.46	39				

NOTE.—Discharge determined from a well-defined rating curve based on 2 measurements made in 1913 and 4 made in 1914. Discharge relation affected by ice during December.

Monthly discharge of Blacks Fork near Urie, Wyo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
August 21-31	84	7	17.5	382	A.
September	107	8	23.9	1,420	A.
October	89	17	45.0	2,770	A.
November	67	18	41.2	2,450	B.
The period				7,020	

YAMPA RIVER BASIN.

YAMPA RIVER AT YAMPA, COLO.

Location.—At Yampa, near the bridge connecting the town with the Denver & Salt Lake Railroad station.

Records available.—May 17, 1910, to December 10, 1913.

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

Gage.—Vertical staff.

Control.—Shifting during high water.

Discharge measurements.—Made from the highway bridge.

Winter flow.—Discharge relation affected by backwater from ice; observations discontinued.

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

Cooperation.—Records furnished and station maintained by the State engineer.

Discharge measurements of Yampa River at Yampa, Colo., during 1913.

[Made by C. L. Chatfield.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Feb. 24	(a)	18	July 14	−0.05	0.4
Apr. 22	0.77	36	Sept. 3	.48	11.9
May 19	.30	5.6	Sept. 25	.52	15
July 6	.00	.5			

a Discharge relation affected by ice.

Daily gage height, in feet, of Yampa River at Yampa, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	0.90	0.90	0.00	0.05	0.60	0.60	0.70	0.75
2	.....	.90	.80	.00	.00	.65	.60	.70	.75
3	.....	.90	.75	.00	.00	.65	.60	.70	.75
4	.....	.90	.70	.00	.00	.65	.60	.70	.75
5	.....	.95	.70	.00	.00	.65	.60	.70	.75
6	.....	1.0	.70	.00	.00	.65	.60	.70	.75
7	.....	1.0	.70	.00	.00	.65	.60	.70	.75
8	0.45	1.0	.70	.00	.00	.65	.70	.70	.75
9	.50	.90	.60	.00	.00	.65	.70	.70	.75
10	.60	1.0	.50	.00	.00	.65	.70	.70	.75
11	.70	1.1	.55	.00	.00	.65	.70	.70	.....
12	.75	1.15	.40	.05	.15	.65	.70	.70	.....
13	.85	1.0	.35	.05	.25	.65	.70	.70	.....
14	.95	.90	.35	.00	.45	.65	.65	.75	.....
15	.90	.85	.35	.00	.55	.65	.65	.75	.....
16	.85	.80	.30	.00	.55	.65	.65	.75	.....
17	.85	.80	.30	.05	.65	.65	.65	.70	.....
18	.80	.80	.30	.10	.65	.65	.65	.70	.....
19	.80	.80	.25	.20	.60	.60	.65	.70	.....
20	.80	.75	.15	.30	.60	.60	.65	.70	.....
21	.80	.70	.15	.45	.60	.60	.65	.70	.....
22	.80	.70	.10	.50	.60	.60	.65	.70	.....
23	.75	.65	.00	.60	.60	.60	.65	.70	.....
24	.70	.70	.00	.75	.60	.60	.65	.70	.....
25	.70	.70	.00	.75	.65	.60	.65	.70	.....
26	.80	.70	.00	.75	.65	.60	.70	.70	.....
27	.80	.75	.00	.75	.60	.60	.70	.70	.....
28	.85	.80	.00	.65	.60	.60	.70	.70	.....
29	.90	.90	.00	.60	.60	.60	.70	.70	.....
30	.90	.90	.00	.50	.60	.60	.70	.70	.....
31	.....	.90	.....	.35	.60	.....	.70	.....	.....

Daily discharge, in second-feet, of Yampa River at Yampa, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	54	54	0.5	1.0	20	20	30	36
2	.....	54	41	.5	.5	25	20	30	36
3	.....	54	36	.5	.5	25	20	30	36
4	.....	54	30	.5	.5	25	20	30	36
5	.....	62	30	.5	.5	25	20	30	36
6	.....	70	30	.5	.5	25	20	30	36
7	.....	70	30	.5	.5	25	20	30	36
8	11	70	30	.5	.5	25	30	30	36
9	13	54	20	.5	.5	25	30	30	36
10	20	70	13	.5	.5	25	30	30	36
11	30	89	16	.5	.5	25	30	30	.....
12	36	100	8.5	1.0	2.2	25	30	30	
13	48	70	7.0	1.0	4.2	25	30	30	.....
14	62	54	7.0	.5	11	25	25	36	.....
15	54	48	7.0	.5	16	25	25	36	.....
16	48	41	5.5	.5	16	25	25	36	.....
17	48	41	5.5	1.0	25	25	25	30	.....
18	41	41	5.5	1.5	25	25	25	30	.....
19	41	41	4.2	3.0	20	20	25	30	.....
20	41	36	2.2	5.5	20	20	25	30	.....
21	41	30	2.2	11	20	20	25	30	.....
22	41	30	1.5	13	20	20	25	30	.....
23	36	25	.5	20	20	20	25	30	.....
24	30	30	.5	36	20	20	25	30	.....
25	30	30	.5	36	25	20	25	30	.....
26	41	30	.5	36	25	20	30	30	.....
27	41	36	.5	36	20	20	30	30	.....
28	48	41	.5	25	20	20	30	30	.....
29	54	54	.5	20	20	20	30	30	.....
30	54	54	.5	13	20	20	30	30	.....
31	.....	54	.....	7.0	20	.....	30	.....	.....

Monthly discharge of Yampa River at Yampa, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April 8–30	62	11	39.5	1,800
May	100	25	51.2	3,150
June	54	0.5	13.0	774
July	36	.5	8.81	542
August	25	.5	12.1	744
September	25	20	22.8	1,360
October	30	20	25.8	1,590
November	36	30	30.6	1,820
December 1–10	36	36	36.0	714
The period	.....	.....	.....	12,500

NOTE.—Monthly discharge computed by engineers of the United States Geological Survey.

YAMPA RIVER AT STEAMBOAT SPRINGS, COLO.

Location.—At the lower steel bridge at Steamboat Springs. Nearest tributary, Spring Creek, which enters a short distance above station.

Records available.—March 1, 1910, to December 20, 1913. A station was also maintained at this point by the United States Geological Survey from May 3, 1904, to October 31, 1906.

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

Gage.—Automatic recording.

Control.—Practically permanent.

Discharge measurements.—Made from the steel bridge.

Winter flow.—Discharge relation little affected by ice, as hot springs flow into river near station.

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

Cooperation.—Records furnished and station maintained by the State engineer.

Discharge measurements of Yampa River at Steamboat Springs, Colo., for 1913.

[Made by C. L. Chatfield.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Feb. 22	[a] 1.40	111	June 4	3.42	1,399
Apr. 24	2.65	727	June 20	2.30	522
Apr. 29	3.02	1,093	July 17	1.55	178
May 1	3.12	1,278	Aug. 14	1.27	114
May 9	3.62	1,678	Nov. 18	1.43	147

[a] Discharge relation affected by ice.

Daily gage height, in feet, of Yampa River at Steamboat Springs, Colo., for 1913.

[L. E. Nelson, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	3.3	3.7	1.6	1.25	1.0	1.1	1.0	1.05
2	.....	3.4	3.65	1.5	1.2	1.1	1.05	1.0	1.05
3	.....	3.2	3.6	1.4	1.15	1.1	1.05	1.0	1.0
4	.....	3.3	3.5	1.35	1.15	1.1	1.05	1.0	1.0
5	.....	3.4	3.5	1.3	1.15	1.1	1.2	1.0	1.0
6	.....	3.5	3.3	1.3	1.25	1.1	1.25	1.0	1.0
7	.....	3.6	3.15	1.2	1.1	1.1	1.1	1.0	1.0
8	.....	3.7	3.2	1.1	1.1	1.1	1.15	1.0	1.0
9	.....	3.8	3.15	1.1	1.05	1.15	1.15	1.0	1.0
10	2.0	3.9	3.0	1.2	1.05	1.15	1.15	1.0	1.0
11	2.0	4.05	3.05	1.2	1.05	1.15	1.15	1.0	1.0
12	2.15	4.15	2.8	1.15	1.2	1.1	1.2	1.05	1.0
13	2.9	4.1	2.7	1.1	1.25	1.05	1.2	1.15	1.0
14	3.05	3.8	2.65	1.15	1.2	1.05	1.2	1.15	1.0
15	3.4	3.4	2.6	1.3	1.15	1.1	1.15	1.15	1.0
16	3.5	3.5	2.5	1.3	1.1	1.05	1.15	1.1	1.0
17	3.35	3.6	2.5	1.5	1.1	1.05	1.05	1.05	1.0
18	3.45	3.7	2.5	1.4	1.1	1.05	1.05	1.0	1.0
19	3.5	3.75	2.4	1.5	1.1	1.05	1.05	1.0	1.0
20	3.4	3.45	2.3	1.4	1.1	1.0	1.05	1.0	1.0
21	3.3	3.2	2.2	1.7	1.1	.95	1.05	1.0	.....
22	3.25	3.25	2.0	1.6	1.05	1.0	1.1	1.05	.....
23	2.9	4.15	2.15	1.9	1.0	1.05	1.1	1.05	.....
24	2.7	4.1	2.35	2.4	1.05	1.1	1.15	1.05	.....
25	2.8	4.3	2.55	1.9	1.0	1.15	1.2	1.05	.....
26	2.6	4.3	2.65	1.7	1.0	1.15	1.15	1.05	.....
27	2.7	4.3	2.45	1.5	1.0	1.1	1.1	1.05	.....
28	2.8	4.2	2.15	1.5	1.0	1.1	1.1	1.05	.....
29	3.15	4.3	1.95	1.4	.90	1.1	1.05	1.05	.....
30	3.3	4.0	1.7	1.3	.90	1.05	1.0	1.05	.....
31	.....	3.7	.....	1.3	.95	.....	1.0	.....	.....

Daily discharge, in second-feet, of Yampa River at Steamboat Springs, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1,360	1,760	190	108	70	85	70	78
2	.....	1,460	1,710	160	100	85	78	70	78
3	.....	1,260	1,660	135	92	85	78	70	70
4	.....	1,360	1,560	125	92	85	78	70	70
5	.....	1,460	1,560	115	92	85	100	70	70
6	.....	1,560	1,360	115	108	85	108	70	70
7	.....	1,660	1,215	100	85	85	85	70	70
8	.....	1,760	1,260	85	85	85	92	70	70
9	.....	1,870	1,215	85	78	92	92	70	70
10	350	1,980	1,080	100	78	92	92	70	70
11	350	2,145	1,125	100	78	92	92	70	70
12	430	2,255	900	92	100	85	100	78	70
13	990	2,200	820	85	108	78	100	92	70
14	1,125	1,870	780	92	100	78	100	92	70
15	1,460	1,460	740	115	92	85	92	92	70
16	1,560	1,560	660	115	85	78	92	85	70
17	1,410	1,660	660	160	85	78	78	78	70
18	1,510	1,760	660	135	85	78	78	70	70
19	1,560	1,815	590	160	85	78	78	70	70
20	1,460	1,510	525	135	85	70	78	70	70
21	1,360	1,260	460	225	85	62	78	70	.....
22	1,310	1,310	350	190	78	70	85	78	.....
23	990	2,255	430	305	70	78	85	78	.....
24	820	2,200	558	590	78	85	92	78	.....
25	900	2,430	700	305	70	92	100	78	.....
26	740	2,430	780	225	70	92	92	78	.....
27	820	2,430	625	160	70	85	85	78	.....
28	900	2,310	430	160	70	85	85	78	.....
29	1,215	2,430	328	135	55	85	78	78	.....
30	1,360	2,090	225	115	55	78	70	78	.....
31	.....	1,760	.....	115	62	.....	70	.....	.....

Monthly dicharge of Yampa River at Steamboat Springs, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April 10-30	1,560	350	1,080	45,000
May	2,430	1,260	1,830	113,000
June	1,760	225	891	53,000
July	590	85	159	9,780
August	108	55	83.3	5,120
September	92	62	82.0	4,880
October	108	70	87.0	5,350
November	92	70	75.6	4,500
December 1-20	78	70	70.8	2,810
The period	.....	.....	.....	243,000

NOTE.—Monthly discharge computed by engineers of the United States Geological Survey.

YAMPA RIVER AT CRAIG, COLO.

Location.—One mile south of Craig at steel bridge on road to Hamilton. Nearest tributary, Fortification Creek, which enters a short distance above station.

Records available.—April 1, 1910, to November 30, 1913. A station was also maintained at this point bythe United States Geological Survey from May 25, 1901, to September 4, 1902, and from April 30, 1904, to October 31, 1906.

Drainage area.—1,730 square miles.

Gage.—Chain gage.

Control.—Slightly shifting.

Discharge measurements.—Made from highway bridge.

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

Cooperation.—Records furnished and station maintained by the State engineer.

Discharge measurements of Yampa River at Craig, Colo., for 1913.

[Made by C. L. Chatfield.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Feb. 10	(a)	166	July 25	3.66	1,219
May 16	5.19	3,405	Aug. 25	2.24	106
May 26	6.18	5,451	Sept. 9	2.50	225
May 31	6.40	5,778	Oct. 14	2.65	339

a Discharge relation affected by ice.

Daily gage height, in feet, of Yampa River at Craig, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	5.0	6.65	6.25	3.3	2.7	2.3	2.5	2.6
2	4.8	6.55	5.75	3.25	2.7	2.3	2.5	2.6
3	4.6	5.65	5.7	3.15	2.65	2.35	2.5	2.6
4	4.7	5.15	5.5	3.05	2.6	2.4	2.5	2.7
5	4.75	5.1	5.15	3.0	2.6	2.4	2.6	2.7
6	4.7	5.3	5.1	3.0	2.6	2.3	2.6	2.7
7	4.75	5.4	5.15	2.95	2.5	2.4	2.6	2.7
8	4.55	5.9	4.9	2.85	2.5	2.45	2.6	2.6
9	3.65	6.1	4.8	2.8	2.5	2.55	2.7	2.6
10	3.45	6.0	4.8	2.8	2.5	2.4	2.6	2.6
11	3.5	6.15	4.95	2.8	2.5	2.4	2.6	2.6
12	3.75	6.2	4.9	2.8	2.5	2.4	2.6	2.6
13	4.05	6.3	4.6	2.75	2.5	2.4	2.6	2.6
14	4.45	6.1	4.45	2.7	2.5	2.4	2.6	2.6
15	4.85	5.55	4.45	2.65	2.5	2.4	2.6	2.7
16	5.1	5.25	4.45	2.6	2.5	2.4	2.7	2.7
17	5.2	5.05	4.4	2.6	2.45	2.4	2.7	2.6
18	5.25	5.1	4.35	2.8	2.4	2.4	2.7	2.7
19	5.55	5.55	4.4	2.9	2.35	2.4	2.6	2.6
20	5.2	5.55	4.3	2.9	2.3	2.4	2.6	2.7
21	5.15	5.25	4.1	2.9	2.2	2.4	2.6	2.7
22	5.1	5.0	4.0	2.9	2.2	2.45	2.6	2.7
23	4.95	4.85	3.85	2.9	2.2	2.4	2.6	2.7
24	4.95	5.2	3.7	3.3	2.2	2.4	2.6	.....
25	4.85	5.9	3.8	3.5	2.2	2.5	2.6	.....
26	4.7	6.1	4.05	3.25	2.2	2.5	2.6	.....
27	4.5	6.3	3.8	3.05	2.2	2.5	2.6	.....
28	4.85	6.3	3.7	3.0	2.2	2.5	2.6	.....
29	5.35	6.2	3.55	2.9	2.15	2.5	2.6	2.7
30	5.65	6.25	3.45	2.7	2.1	2.5	2.6	.....
31	.....	6.25	.....	2.7	2.2	.....	2.6	.....

Daily discharge, in second-feet, of Yampa River at Craig, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	3,000	6,645	5,580	885	390	145	260	325
2	2,700	6,375	4,360	835	390	145	260	325
3	2,420	4,150	4,250	745	358	172	260	325
4	2,560	3,240	3,860	658	325	200	260	390
5	2,630	3,160	3,240	615	325	200	325	390
6	2,560	3,490	3,160	615	325	145	325	390
7	2,630	3,670	3,240	575	260	200	325	390
8	2,350	4,700	2,850	498	260	230	325	325
9	1,238	5,190	2,700	460	260	292	390	325
10	1,030	4,940	2,700	460	260	200	325	325
11	1,080	5,320	2,925	460	260	200	325	325
12	1,345	5,450	2,850	460	260	200	325	325
13	1,685	5,710	2,420	425	260	200	325	325
14	2,210	5,190	2,210	390	260	200	325	325
15	2,775	3,955	2,210	358	260	200	325	390
16	3,160	3,405	2,210	325	260	200	390	390
17	3,320	3,080	2,140	325	230	200	390	325
18	3,405	3,160	2,070	460	200	200	390	390
19	3,955	3,955	2,140	535	172	200	325	325
20	3,320	3,955	2,000	535	145	200	325	390
21	3,240	3,405	1,745	535	95	200	325	390
22	3,160	3,000	1,625	535	95	230	325	390
23	2,925	2,775	1,455	535	95	200	325	390
24	2,925	3,320	1,290	885	95	200	325	390
25	2,775	4,700	1,400	1,080	95	260	325	390
26	2,560	5,190	1,685	835	95	260	325	390
27	2,280	5,710	1,400	658	95	260	325	390
28	2,775	5,710	1,290	615	95	260	325	390
29	3,580	5,450	1,132	535	72	260	325	390
30	4,150	5,580	1,030	390	50	260	325	390
31	.....	5,580	.....	390	95	.....	325	.....

NOTE.—Daily discharge interpolated Nov. 24 to 28 and 30.

Monthly discharge of Yampa River at Craig, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April	4,150	1,030	2,660	158,000
May	6,645	2,775	4,490	276,000
June	5,580	1,030	2,440	145,000
July	1,080	325	568	34,900
August	390	50	208	12,800
September	292	145	211	12,600
October	390	260	325	20,000
November	390	325	364	21,700
The period	.....	.....	.....	681,000

NOTE.—Monthly discharge computed by engineers of the United States Geological Survey.

ELK RIVER AT HINMAN PARK, COLO.

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

Records available.—May 25, 1912, to November 15, 1913.

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

Gage.—Bristol automatic gage.

Control.—Rough but permanent.

Discharge measurements.—Made from cable and car.

Winter flow.—Observations discontinued.

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

Discharge measurements of Elk River at Hinman Park, Colo., for 1913.

[Made by C. L. Chatfield.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
May 6	1.30	361	July 30	0.35	105
June 9	1.60	470	Aug. 21	.10	51

Daily gage height, in feet, of Elk River at Hinman Park, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	1.30	2.50	1.05	0.25	0.05	0.10	0.20
2	.....	1.45	2.55	1.00	.20	.00	.10	.30
3	.....	1.75	2.35	.95	.15	.00	.20	.30
4	.....	1.75	2.45	.95	.05	.00	.25	.20
5	.....	1.80	2.60	.90	.10	.00	.30	.20
6	.....	2.00	2.65	.80	.10	.00	.30	.10
7	.....	2.15	2.55	.60	.05	.25	.15	.10
8	.....	2.15	2.30	.65	.10	.20	.15	.05
9	.....	2.05	2.00	.65	.10	.20	.20	.05
10	.....	1.95	1.75	.65	.20	.20	.30	.05
11	.....	1.50	1.40	.70	.35	.25	.30	.00
12	.....	1.55	1.40	.80	.35	.20	.25	.00
13	.....	2.05	1.40	.60	.30	.20	.10	.05
14	.....	1.75	1.40	.60	.40	.05	.10	.10
15	.....	1.10	1.55	.60	.40	.00	.10	—.10
16	.....	1.05	1.60	.55	.30	.20	.05	.....
17	.....	1.25	1.55	.50	.20	.05	.05	.....
18	.....	2.00	1.60	.55	.00	.00	.05	.....
19	.....	2.20	1.55	.65	.00	.15	.05	.....
20	.....	2.20	1.50	.40	.00	.05	.05	.....
21	.....	2.35	1.35	.45	.00	.15	.05	.....
22	.....	2.60	1.35	.40	.05	.10	.05	.....
23	.....	2.80	1.40	.40	.05	.10	.05	.....
24	0.65	2.90	1.50	.40	.05	.05	.05	.....
25	.90	2.40	1.50	.45	.00	.00	.05	.....
26	1.10	2.25	1.45	.45	.00	.10	.05	.....
27	1.05	2.20	1.50	.40	.05	.10	.00	.....
28	1.00	2.10	1.20	.35	.00	.10	.05	.....
29	1.20	2.10	1.20	.30	.10	.10	.00	.....
30	1.35	2.00	1.05	.30	.00	.05	.05	.....
31	.....	1.95	.....	.20	.00	.....	.05	.....

Daily discharge, in second-feet, of Elk River at Hinman Park, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	330	1,025	245	82	60	65	75
2	.....	392	1,062	230	75	55	65	90
3	.....	538	920	218	70	55	75	90
4	.....	538	990	218	60	55	82	75
5	.....	565	1,100	205	65	55	90	75
6	.....	690	1,138	180	65	55	90	65
7	.....	788	1,062	140	60	82	70	65
8	.....	788	885	150	65	75	70	60
9	.....	722	690	150	65	75	75	60
10	.....	658	538	150	75	75	90	60
11	.....	415	370	160	98	82	90	55
12	.....	438	370	180	98	75	82	55
13	.....	722	370	140	90	75	65	60
14	.....	538	370	140	105	60	65	65
15	.....	260	438	140	105	55	65	50
16	.....	245	460	130	90	75	60	.....
17	.....	312	438	120	75	60	60	.....
18	.....	690	460	130	55	55	60	.....
19	.....	820	438	150	55	70	60	.....
20	.....	820	415	105	55	60	60	.....
21	.....	920	350	112	55	70	60	.....
22	.....	1,100	350	105	60	65	60	.....
23	.....	1,255	370	105	60	65	60	.....
24	150	1,335	415	105	60	60	60	.....
25	205	955	415	112	55	55	60	.....
26	260	852	392	112	55	65	60	.....
27	245	820	415	105	60	65	55	.....
28	230	755	295	98	55	65	60	.....
29	295	755	295	90	65	65	55	.....
30	350	690	245	90	55	60	60	.....
31	.....	658	.....	75	55	.....	60	.....

Monthly discharge of Elk River at Hinman Park, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April 24–30	350	150	248	3,440
May	1,340	245	689	42,400
June	1,140	245	569	33,900
July	245	75	142	8,730
August	105	55	69.1	4,250
September	82	55	64.8	3,860
October	90	55	67.4	4,140
November 1–15	90	50	66.7	1,980
The period	.....	.....	.....	103,000

NOTE.—Monthly discharge computed by engineers of the United States Geological Survey.

ELK RIVER NEAR CLARK, COLO.

Location.—At Kinney's ranch, 2 miles above Clark post office.
Records available.—May 1, 1910, to November 10, 1913.
Drainage area.—206 square miles (Revised by State engineer).
Gage.—Chain gage.
Control.—Rough but permanent.
Diversions.—There are court decrees for the diversion of 4 second-feet from Elk River above station and of 25 second-feet from tributaries entering above.
Cooperation.—Station maintained by the State engineer in cooperation with the Elk River Irrigation & Construction Co. Records furnished by the State engineer.

Discharge measurements of Elk River near Clark, Colo., during 1913.

[Made by C. L. Chatfield.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Feb. 18	(a)	53	July 29	2.50	119
May 7	4.85	1,117	Aug. 20	2.18	71
June 9	4.50	928	Nov. 1	2.25	81

a Discharge relation affected by ice.

Daily gage height, in feet, of Elk River near Clark, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	2.30	3.90	4.90	3.70	2.25	2.45	2.35	2.35
2	2.35	4.90	5.05	3.50	2.40	2.40	2.20	2.35
3	2.50	4.40	4.90	3.35	2.65	2.20	2.35	2.35
4	2.60	4.55	4.85	3.45	2.55	2.25	2.60	2.15
5	2.20	4.45	4.75	3.35	2.45	2.40	2.75	2.20
6	2.45	4.85	4.60	3.35	2.75	2.45	2.70	2.25
7	2.55	4.90	4.75	3.10	2.60	2.40	2.60	2.25
8	2.60	5.05	4.90	3.05	2.35	2.45	2.50	2.40
9	2.50	5.10	4.85	2.95	2.45	2.25	2.40	2.60
10	2.55	4.70	4.60	2.95	2.65	2.50	2.60	2.35
11	2.50	4.80	4.30	2.90	2.50	2.20	2.75	.....
12	2.55	5.00	3.90	2.80	2.50	2.45	2.65	.....
13	2.80	4.50	4.05	2.75	2.45	2.60	2.65	.....
14	2.95	4.40	4.05	2.75	2.40	2.35	2.50	.....
15	3.15	4.55	4.00	2.75	2.50	2.30	2.55	.....
16	3.65	4.30	3.50	2.70	2.45	2.40	2.45	.....
17	3.50	4.55	3.65	2.90	2.40	2.35	2.45	.....
18	3.60	4.60	3.45	2.80	2.50	2.25	2.60	.....
19	3.90	4.85	3.20	2.80	2.30	2.50	2.75	.....
20	4.20	4.85	3.50	2.80	2.20	2.25	2.25	.....
21	4.35	5.00	3.60	2.80	2.35	2.30	2.25	.....
22	4.20	4.95	3.50	2.85	2.45	2.35	2.30	.....
23	4.05	4.90	3.65	3.00	2.60	2.40	2.40	.....
24	3.60	5.00	3.70	3.20	2.55	2.35	2.40	.....
25	3.30	4.95	3.70	2.95	2.45	2.55	2.35	.....
26	3.50	4.95	3.45	2.85	2.45	2.45	2.20	.....
27	3.50	4.70	3.70	2.75	2.40	2.45	2.25	.....
28	3.30	5.05	3.35	2.60	2.55	2.30	2.55	.....
29	4.35	5.45	3.50	2.55	2.45	2.45	2.50	.....
30	4.35	5.75	3.50	2.45	2.45	2.10	2.55	.....
31	.....	4.90	.....	.....	2.55	.....	2.35	.....

Daily discharge, in second-feet, of Elk River near Clark, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	85	600	1,185	510	78	110	92	92
2	92	1,185	1,300	420	100	100	70	92
3	120	860	1,185	362	150	70	92	92
4	140	950	1,150	400	130	78	140	62
5	70	890	1,080	362	110	100	172	70
6	110	1,150	980	362	172	110	160	78
7	130	1,185	1,080	275	140	100	140	78
8	140	1,300	1,185	260	92	110	120	100
9	120	1,340	1,150	230	110	78	100	140
10	130	1,045	980	230	150	120	140	92
11	120	1,115	805	215	120	70	172	.....
12	130	1,260	600	185	120	110	150	.....
13	185	920	670	172	110	140	150	.....
14	230	860	670	172	100	92	120	.....
15	292	950	645	172	120	85	130	.....
16	488	805	420	160	110	100	110	.....
17	420	950	488	215	100	92	110	.....
18	465	980	400	185	120	78	140	.....
19	600	1,150	310	185	85	120	172	.....
20	750	1,150	420	185	70	78	78	.....
21	832	1,260	465	185	92	85	78	.....
22	750	1,222	420	200	110	92	85	.....
23	670	1,185	488	245	140	100	100	.....
24	465	1,260	510	310	130	92	100	.....
25	345	1,222	510	230	110	130	92	.....
26	420	1,222	400	200	110	110	70	.....
27	420	1,045	510	172	100	110	78	.....
28	345	1,300	362	140	130	85	130	.....
29	832	1,648	420	130	110	110	120	.....
30	832	1,948	420	110	110	60	130	.....
31	.....	1,185	.....	100	130	.....	92	.....

Monthly discharge of Elk River near Clark Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April	832	70	358	21,300
May	1,950	600	1,130	69,500
June	1,300	310	707	42,100
July	510	100	235	14,400
August	172	70	115	7,070
September	140	60	97.2	5,780
October	172	70	117	7,190
November 1–10	140	62	89.6	1,780
The period	.....	.....	.....	169,000

NOTE.—Monthly discharge computed by engineers of the United States Geological Survey.

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 enter for several miles above station.

Records available.—May 1, 1910, to November 30, 1913. A station was also maintained at this point by the United States Geological Survey from May 2, 1904, to August 16, 1906.

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

Gage.—Chain gage.

Control.—Fairly permanent.

Discharge measurements.—Made from highway bridge.

Diversions.—There are court decrees for diversions of 111 second-feet from Elk River between this station and the one near Clark, Colo., and 62 second-feet from intervening tributaries; no decrees for diversions below station.

Cooperation.—Records furnished and station maintained by the State engineer.

Discharge measurements of Elk River near Trull, Colo., for 1913.

[Made by C. L. Chatfield.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Feb. 17	(a)	63	June 18	7.43	1,334
May 8	8.02	1,820	July 19	5.80	312
13	8.28	2,098			

a Discharge relation affected by ice.

Daily gage height, in feet, of Elk River near Trull, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	7.45	8.80	6.35	5.10	5.10	5.00	5.15
2	.....	7.55	8.40	6.30	5.10	5.10	5.00	5.15
3	.....	7.40	8.30	6.15	5.10	5.10	5.00	5.20
4	.....	7.50	8.20	6.25	5.20	5.10	5.00	5.20
5	.....	7.65	8.20	6.20	5.15	5.10	5.05	5.20
6	.....	7.65	8.20	6.15	5.25	5.10	5.10	5.20
7	.....	7.50	8.10	5.95	5.20	5.10	5.20	5.20
8	.....	7.50	7.75	5.90	5.25	5.10	5.20	5.20
9	.....	7.50	7.75	5.80	5.15	5.10	5.20	5.20
10	.....	7.50	7.80	5.80	5.20	5.10	5.20	5.20
11	.....	7.55	8.05	5.75	5.15	5.10	5.20	5.20
12	6.15	7.80	7.45	5.65	5.20	5.10	5.20	5.20
13	6.65	8.00	7.35	5.60	5.20	5.10	5.20	5.20
14	6.35	7.80	7.25	5.60	5.20	5.10	5.20	5.20
15	6.35	7.60	7.55	5.55	5.20	5.10	5.20	5.20
16	6.65	7.50	7.25	5.50	5.15	5.10	5.20	5.20
17	7.05	7.50	7.55	5.75	5.20	5.10	5.20	5.20
18	7.35	7.50	7.65	5.65	5.15	5.10	5.20	5.20
19	7.35	7.70	7.55	5.65	5.10	5.10	5.20	5.20
20	7.45	7.70	7.25	5.65	5.15	5.00	5.20	5.20
21	7.45	7.75	7.15	5.65	5.20	5.00	5.20	5.20
22	7.55	7.65	7.00	5.70	5.10	5.00	5.20	5.20
23	7.60	7.60	6.95	5.85	5.10	5.00	5.20	5.20
24	7.30	7.40	7.00	6.15	5.15	5.10	5.20	5.20
25	6.75	8.40	7.20	5.80	5.20	5.10	5.20	5.20
26	7.35	8.40	7.05	5.70	5.05	5.10	5.20	5.20
27	7.35	8.80	6.95	5.60	5.10	5.05	5.20	5.20
28	7.35	8.55	6.85	5.50	5.10	5.00	5.20	5.20
29	7.80	8.70	6.85	5.40	5.10	5.00	5.20	5.20
30	7.80	9.00	6.50	5.30	5.10	5.10	5.20	5.20
31	.....	8.85	.....	5.20	5.10	.....	5.20	.....

Daily discharge, in second-feet, of Elk River near Trull, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	1,345	2,600	585	100	100	80	110
2	.....	1,428	2,200	555	100	100	80	110
3	.....	1,305	2,100	475	100	100	80	120
4	.....	1,385	2,005	528	120	100	80	120
5	.....	1,512	2,005	500	110	100	90	120
6	.....	1,512	2,005	475	132	100	100	120
7	.....	1,385	1,910	378	120	100	120	120
8	.....	1,385	1,598	355	132	100	120	120
9	.....	1,385	1,598	310	110	100	120	120
10	.....	1,385	1,640	310	120	100	120	120
11	.....	1,428	1,862	290	110	100	120	120
12	475	1,640	1,345	252	120	100	120	120
13	768	1,815	1,265	235	120	100	120	120
14	585	1,640	1,188	235	120	100	120	120
15	585	1,470	1,428	220	120	100	120	120
16	768	1,385	1,188	205	110	100	120	120
17	1,040	1,385	1,428	290	120	100	120	120
18	1,265	1,385	1,512	252	110	100	120	120
19	1,265	1,555	1,428	252	100	100	120	120
20	1,345	1,555	1,188	252	110	80	120	120
21	1,345	1,598	1,112	252	120	80	120	120
22	1,428	1,512	1,005	270	100	80	120	120
23	1,470	1,470	962	332	100	80	120	120
24	1,225	1,305	1,005	475	110	100	120	120
25	832	2,200	1,150	310	120	100	120	120
26	1,265	2,200	1,040	270	90	100	120	120
27	1,265	2,600	962	235	100	90	120	120
28	1,265	2,350	898	205	100	80	120	120
29	1,640	2,500	898	175	100	80	120	120
30	1,640	2,805	670	145	100	100	120	120
31	.....	2,650	.....	120	100	.....	120	.....

Monthly discharge of Elk River near Trull, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April 12-30	1,640	475	1,130	42,600
May	2,800	1,300	1,690	104,000
June	2,600	670	1,440	85,700
July	585	120	314	19,300
August	132	90	110	6,760
September	100	80	95.7	5,690
October	120	80	113	6,950
November	120	110	119	7,080
The period	.....	.....	.....	278,000

NOTE.—Monthly discharge computed by engineers of the United States Geological Survey.

MAD CREEK NEAR STEAMBOAT SPRINGS, COLO.

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

Records available.—July 1, 1912, to October 31, 1913.

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

Gage.—Vertical staff.

Control.—Rough, but permanent.

Discharge measurements.—Made from bridge.

Winter flow.—Observations discontinued.

Cooperation.—Station maintained by State engineer in cooperation with Mr. F. A. Metcalf, of Steamboat Springs; records published are furnished by the State engineer.

Discharge measurements of Mad Creek near Steamboat Springs, Colo., for 1913.

[Made by C. L. Chatfield.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
May 5	2.00	181	June 18	2.28	310
7	2.22	243	Aug. 1	1.00	16
June 6	2.40	410	22	.71	6.1
9	2.35	365			

Daily gage height, in feet, of Mad Creek near Steamboat Springs, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	0.10	2.0	.....	1.8	0.80	0.65	0.85
2	.10	2.0	.....	1.75	.75	.65	.80
3	.10	2.1	.....	1.7	.75	.65	.80
4	.10	2.1	.....	1.7	.80	.65	.85
5	.10	2.1	.....	1.6	.85	.60	.90
6	.10	2.0	.....	1.5	.90	.60	.95
7	.10	2.25	.....	1.5	.90	.70	.....
8	.10	2.3	2.4	1.55	.85	.70	1.10
9	.10	2.3	2.4	1.5	.80	.80	1.05
10	.10	2.4	2.4	1.5	.85	.70	1.00
11	.10	2.4	2.55	1.5	.85	.70	.95
12	.10	2.5	2.5	1.5	.90	.70	.85
13	.20	2.6	2.15	1.4	.80	.70	1.05
14	.25	2.4	2.15	1.55	.80	.70	1.1
15	.30	2.4	2.4	1.45	.80	.70	1.05
16	.30	2.2	2.35	1.3	.70	.70	1.05
17	.35	2.0	2.5	1.3	.70	.70	1.05
18	.35	2.2	2.4	1.3	.70	.70	1.0
19	.35	2.2	2.4	1.3	.70	.65	1.05
20	.50	2.0	2.15	1.2	.70	.65	.95
21	.50	2.0	2.1	1.35	.70	.70	.95
22	.50	2.1	2.05	1.3	.65	.70	1.05
23	.60	2.3	2.1	1.45	.65	.75	.95
24	.70	2.3	2.05	1.4	.65	.80	.95
25	.40	2.3	2.45	1.3	.65	.90	.90
26	.80	2.3	2.2	1.2	.65	.90	.90
27	1.4	2.4	2.1	1.15	.70	.90	.90
28	2.0	2.5	2.0	1.1	.70	.90	.95
29	2.0	2.6	1.95	1.05	.65	.90	.90
30	2.0	2.7	1.85	.90	.65	.90	.90
31	.....	2.8	.....	.80	.65	.....	.95

Daily discharge, in second-feet, of Mad Creek near Steamboat Springs, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	2	182	.....	126	8	5.5	10
2	2	182	.....	114	7	5.5	8
3	2	222	.....	103	7	5.5	8
4	2	222	.....	103	8	5.5	10
5	2	222	.....	83	10	5	12
6	2	182	.....	66	12	5	14.5
7	2	304	.....	66	12	6	19
8	2	335	405	74	10	6	23
9	2	335	405	66	8	8	20
10	2	405	405	66	10	6	17
11	2	405	538	66	10	6	14.5
12	2	490	490	66	12	6	10
13	2.5	585	247	52	8	6	20
14	2.8	405	247	74	8	6	23
15	3	405	405	59	8	6	20
16	3	272	370	40	6	6	20
17	3.2	182	490	40	6	6	20
18	3.2	272	405	40	6	6	17
19	3.2	272	405	40	6	5.5	20
20	4	182	247	31	6	5.5	14.5
21	4	182	222	46	5	6	14.5
22	4	222	202	40	5.5	6	20
23	5	335	222	59	5.5	7	14.5
24	6	335	202	52	5.5	8	14.5
25	3.5	335	448	40	5.5	12	12
26	8	335	272	31	5.5	12	12
27	52	405	222	27	6	12	12
28	182	490	182	23	6	12	14.5
29	182	585	167	20	5.5	12	12
30	182	690	139	12	5.5	12	12
31	.....	815	.....	8	5.5	.....	14.5

NOTE.—Discharge Oct. 7 interpolated.

Monthly discharge of Mad Creek near Steamboat Springs, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April	182	2	22.6	1,340
May	815	182	348	21,400
June 8–30	538	139	319	14,600
July	126	8	55.9	3,440
August	12	5.5	7.42	456
September	12	5	7.20	428
October	23	8	15.3	941

NOTE.—Monthly discharge computed by engineers of the United States Geological Survey.

ELK HEAD CREEK NEAR CRAIG, COLO.

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

Records available.—April 17, 1910, to December 13, 1913. A station was also maintained at this point by the United States Geological Survey from April 27 to September 7, 1906.

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

Gage.—Chain gage.

Control.—Practically permanent.

Diversions.—There are court decrees for the diversion 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 diversion of 177,000 acre feet from Elk Head Creek and a diversion of 587 second-feet from the North Fork.

Cooperation.—Records furnished and station maintained by the State engineer.

Discharge measurements of Elk Head Creek near Craig, Colo., for 1913.

[Made by C. L. Chatfield.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Feb. 10	(a)	11	June 2	4.80	93
May 15	6.14	288	July 19	3.50	.8

a Discharge relation affected by ice.

Daily gage height, in feet, of Elk Head Creek near Craig, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	8.6	4.95	3.5	3.6	3.4	3.6	3.7	3.8
2	.....	8.0	4.8	3.5	3.6	3.4	3.6	3.7	3.8
3	.....	7.4	4.7	3.5	3.6	3.4	3.6	3.8	3.8
4	.....	7.4	4.6	3.5	3.6	3.4	3.6	3.8	3.8
5	.....	7.25	4.55	3.5	3.5	3.4	3.6	3.8	3.8
6	.....	7.6	4.45	3.5	3.5	3.4	3.75	3.8	3.8
7	.....	7.95	4.4	3.5	3.5	3.4	3.95	3.8	3.8
8	.....	7.8	4.3	3.5	3.5	3.4	3.85	3.8	3.8
9	.....	7.35	4.3	3.5	3.5	3.4	3.75	3.8	3.8
10	.....	7.2	4.3	3.5	3.5	3.4	3.7	3.8	3.8
11	5.1	7.2	4.25	3.5	3.5	3.4	3.7	3.8	3.8
12	5.5	7.05	4.25	3.5	3.5	3.4	3.7	3.8	3.8
13	6.0	6.95	4.2	3.5	3.5	3.4	3.7	3.8	3.8
14	6.5	6.55	4.2	3.5	3.5	3.4	3.7	3.8	.....
15	7.15	6.15	4.2	3.5	3.5	3.4	3.7	3.95	.....
16	7.45	6.0	4.2	3.5	3.5	3.4	3.7	3.9	.....
17	7.7	5.95	4.2	3.5	3.5	3.4	3.7	3.9	.....
18	7.85	5.85	4.0	3.5	3.5	3.4	3.7	3.9	.....
19	8.1	5.85	3.9	3.5	3.45	3.4	3.7	3.9	.....
20	8.2	5.8	3.7	3.5	3.45	3.4	3.7	3.9	.....
21	8.5	5.85	3.7	3.55	3.45	3.4	3.7	3.85	.....
22	7.95	5.75	3.7	3.8	3.45	3.4	3.7	3.8	.....
23	7.5	5.6	3.7	4.0	3.45	3.4	3.8	3.8	.....
24	6.8	5.85	3.7	3.9	3.4	3.8	3.8	3.8	.....
25	6.5	5.85	3.7	3.75	3.4	3.65	3.8	3.8	.....
26	6.05	5.6	3.6	3.75	3.4	3.6	3.7	3.8	.....
27	6.95	5.6	3.6	3.7	3.4	3.6	3.7	3.8	.....
28	7.5	5.5	3.6	3.7	3.4	3.6	3.7	3.8	.....
29	8.35	5.4	3.6	3.7	3.4	3.6	3.7	3.8	.....
30	9.1	5.15	3.55	3.6	3.4	3.6	3.7	3.8	.....
31	.....	5.0	.....	3.6	3.4	.....	3.7	.....	.....

Daily discharge, in second-feet, of Elk Head Creek near Craig, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	788	101	1	4	0.5	4	7	10
2	.....	655	83	1	4	.5	4	7	10
3	.....	530	72	1	4	.5	4	10	10
4	.....	530	62	1	4	.5	4	10	10
5	.....	500	58	1	1	.5	4	10	10
6	.....	570	49	1	1	.5	8.5	10	10
7	.....	644	45	1	1	.5	18	10	10
8	.....	611	38	1	1	.5	12	10	10
9	.....	520	38	1	1	.5	8.5	10	10
10	.....	490	38	1	1	.5	7	10	10
11	120	490	34	1	1	.5	7	10	10
12	179	460	34	1	1	.5	7	10	10
13	263	440	31	1	1	.5	7	10	10
14	355	364	31	1	1	.5	7	10	.....
15	480	290	31	1	1	.5	7	18	.....
16	540	263	31	1	1	.5	7	15	.....
17	590	254	31	1	1	.5	7	15	.....
18	622	236	20	1	1	.5	7	15	.....
19	677	236	15	1	.5	.5	7	15	.....
20	699	228	7	1	.5	.5	7	15	.....
21	765	236	7	2.5	.5	.5	7	12	.....
22	644	220	7	10	.5	.5	7	10	.....
23	550	195	7	20	.5	.5	10	10	.....
24	412	236	7	15	.5	10	10	10	.....
25	355	236	7	8.5	.5	5.5	10	10	.....
26	272	195	4	8.5	.5	4	7	10	.....
27	440	195	4	7	.5	4	7	10	.....
28	550	179	4	7	.5	4	7	10	.....
29	732	163	4	7	.5	4	7	10	.....
30	904	127	2.5	4	.5	4	7	10	.....
31	.....	107	.....	4	.5	.....	7	.....	.....

Monthly discharge of Elk Head Creek near Craig, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April 11–30	904	120	507	20,100
May	788	107	361	22,200
June	101	2.5	30.2	1,800
July	20	1	3.66	225
August	4	0.5	1.18	72.6
September	10	.5	1.57	93.4
October	18	4	7.42	456
November	18	7	11.0	655
December 1–13	10	10	10.0	258
The period	.....	.....	.....	45,900

NOTE.—Monthly discharge computed by engineers of the United States Geological Survey.

FORTIFICATION CREEK AT CRAIG, COLO.

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

Records available.—March 5, 1910, to December 6, 1913. A station was also maintained at this point by the United States Geological Survey from June 12, 1905, to July 30, 1906.

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

Gage.—Chain gage.

Control.—Very shifting.

Discharge measurements.—Made from bridge.

Diversions.—There are court decrees for the diversion 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.—Records furnished and station maintained by the State engineer.

Discharge measurements of Fortification Creek at Craig, Colo., for 1913.

[Made by C. L. Chatfield.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
May 18	3.80	52
May 30	3.40	28

Daily gage height, in feet, of Fortification Creek at Craig, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	6.15	3.20	.....	.....	2.65	2.60	2.60	3.30
2	.....	5.75	2.95	.....	.....	.....	2.60	2.60	3.30
3	.....	5.30	2.80	.....	.....	.....	2.50	2.90	3.30
4	.....	5.30	2.55	.....	.....	.....	2.50	3.00	3.30
5	.....	5.00	2.50	.....	.....	.....	3.80	3.00	3.10
6	.....	5.20	2.50	.....	.....	.....	3.55	2.85	3.10
7	.....	5.70	2.45	.....	.....	.....	3.25	2.90	.....
8	.....	5.50	2.40	.....	.....	2.90	3.00	2.95	.....
9	.....	5.30	2.40	.....	.....	4.15	2.90	2.95	.....
10	.....	5.20	2.50	.....	.....	2.95	3.10	2.95	.....
11	.....	5.15	2.65	.....	.....	2.65	3.05	2.85	.....
12	3.75	5.05	2.60	.....	.....	2.55	3.00	2.85	.....
13	4.55	4.90	2.70	.....	.....	2.55	3.00	3.05	.....
14	5.30	4.65	2.65	.....	.....	2.60	2.90	3.20	.....
15	5.95	4.25	2.60	.....	.....	2.60	2.85	3.10	.....
16	5.80	3.85	2.40	.....	.....	2.75	2.90	3.05	.....
17	5.80	3.75	.....	.....	.....	2.75	2.90	2.95	.....
18	5.90	3.80	.....	.....	.....	2.65	2.90	2.95	.....
19	5.95	3.85	.....	.....	.....	2.65	2.75	2.90	.....
20	6.05	3.75	.....	4.40	.....	2.50	2.60	2.90	.....
21	6.30	3.70	.....	3.45	.....	2.50	2.60	3.10	.....
22	5.85	3.50	.....	2.95	.....	2.50	2.95	3.25	.....
23	5.15	3.50	.....	2.85	.....	4.00	2.90	3.25	.....
24	4.60	3.50	.....	3.90	.....	3.15	2.85	3.20	.....
25	4.40	3.55	.....	3.40	.....	3.05	2.90	3.20	.....
26	4.40	3.60	.....	2.95	.....	2.80	2.90	3.25	.....
27	4.55	3.75	.....	.....	.....	2.80	2.90	3.30	.....
28	5.05	3.65	.....	.....	.....	2.60	3.00	3.40	.....
29	6.05	3.50	.....	.....	.....	2.70	3.00	3.25	.....
30	6.15	3.50	.....	.....	.....	2.70	2.90	3.30	.....
31	.....	3.30	.....	.....	3.55	.....	2.75	.....	.....

Daily discharge, in second-feet, of Fortification Creek at Craig, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	210	18	0	0	2	1	1	12
2	.....	175	12	0	0	0	1	1	12
3	.....	140	9	0	0	0	.5	4	12
4	.....	140	6	0	0	0	.5	6	12
5	.....	120	5	0	0	0	25	6	7
6	.....	130	3	0	0	0	17	3	7
7	.....	170	2	0	0	0	10	4	.....
8	.....	150	2	0	0	3	6	5	.....
9	.....	140	2	0	0	35	4	5	.....
10	.....	130	3	0	0	5	7	5	.....
11	.....	130	2	0	0	2	7	3	.....
12	50	122	1	0	0	1	6	3	.....
13	92	110	2	0	0	1	6	7	.....
14	140	100	2	0	0	1	4	9	.....
15	190	75	1	0	0	1	3	7	.....
16	180	55	0	0	0	2	4	7	.....
17	180	50	0	0	0	2	4	5	.....
18	185	55	0	0	0	2	4	5	.....
19	190	55	0	0	0	2	2	4	.....
20	200	50	0	40	0	.5	1	4	.....
21	220	50	0	10	0	.5	1	7	.....
22	180	30	0	10	0	.5	5	10	.....
23	130	30	0	10	0	32	4	10	.....
24	95	30	0	9	0	8	3	9	.....
25	85	40	0	8	0	7	4	9	.....
26	85	45	0	0	0	3	4	10	.....
27	92	50	0	0	0	3	4	12	.....
28	122	30	0	0	0	1	6	14	.....
29	200	30	0	0	0	2	6	10	.....
30	210	30	0	0	0	2	4	12	.....
31	.....	25	.....	0	17	.....	2	.....	.....

Monthly discharge of Fortication Creek at Craig, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April 12-30	220	50	149	5,620
May	210	25	87.5	5,380
June	18	0	2.3	137
July	40	0	2.8	172
August	17	0	.5	31
September	35	0	3.95	235
October	25	.5	5.03	309
November	14	1	6.6	393
December 1-6	12	7	10.3	123
The period	.....	.....	.....	12,400

NOTE.—Monthly discharge computed by engineers of the United States Geological Survey.

WILLIAMS RIVER AT HAMILTON, COLO.

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

Records available.—April 15, 1910, to November 30, 1913. A station was also maintained at this point by the United States Geological Survey from April 29, 1904, to October 31, 1906.

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

Gage.—Chain gage.

Control.—Shifting.

Discharge measurements.—Made from highway bridge.

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

Cooperation.—Records furnished and station maintained by the State engineer.

Discharge measurements of Williams River at Hanmilton, Colo., for 1913.

[Made by C. L. Chatfield.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Feb. 8	(a)	42	July 24	3.90	317
May 25	4.95	658	Oct. 22	2.95	72
May 26	5.54	864			

[a] Discharge relation affected by ice.

Daily gage height, in feet, of Williams River at Hamilton, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	5.8	5.25	5.05	3.05	2.8	2.5	2.8	2.5
2	5.55	5.35	4.65	3.0	2.8	2.65	2.8	2.5
3	5.65	5.05	4.55	2.95	2.75	2.55	2.8	2.45
4	4.05	4.65	4.45	2.85	2.75	3.55	2.9	2.45
5	4.0	4.80	4.5	2.8	2.8	3.3	2.8	2.4
6	3.95	5.35	4.4	2.75	2.8	2.95	2.8	2.4
7	3.75	5.65	4.35	2.65	2.8	2.9	2.8	2.45
8	3.65	5.4	4.15	2.65	2.7	3.0	2.8	2.4
9	3.3	5.4	4.15	2.6	2.7	2.8	2.8	2.4
10	3.35	5.6	4.2	2.65	2.7	2.75	2.8	2.4
11	3.6	6.1	4.2	2.6	2.7	2.7	2.8	2.3
12	3.65	6.1	4.15	2.6	2.7	2.75	2.8	2.3
13	3.8	6.15	3.9	2.6	2.7	2.75	2.9	2.3
14	3.85	5.45	3.85	2.6	2.7	2.75	3.0	2.4
15	4.1	5.25	3.8	2.6	2.6	2.8	2.8	2.35
16	4.25	5.1	3.8	2.65	2.6	2.7	2.8	2.35
17	4.45	4.9	3.7	2.6	2.6	2.75	2.7	2.35
18	4.75	5.05	3.7	3.05	2.6	2.7	2.7	2.3
19	4.8	5.25	3.7	3.5	2.6	2.7	2.7	2.3
20	4.85	5.25	3.6	3.35	2.6	2.7	2.6	2.3
21	4.85	4.45	3.55	3.45	2.6	2.7	2.6	2.4
22	4.55	4.25	3.5	3.4	2.6	2.85	2.6	2.5
23	4.45	4.45	3.5	3.7	2.6	2.9	2.55	2.45
24	4.10	4.95	3.5	3.9	2.5	2.8	2.45	2.4
25	4.05	5.15	3.5	3.3	2.5	2.8	2.45	2.35
26	4.05	5.25	3.4	3.1	2.5	2.8	2.5	2.35
27	4.35	5.25	3.3	2.95	2.5	2.8	2.5	2.35
28	4.85	5.05	3.2	2.85	2.5	2.8	2.5	2.35
29	5.05	5.25	3.15	2.8	2.5	2.8	2.5	2.35
30	5.60	5.3	3.15	2.8	2.5	2.8	2.6	2.3
31	.....	5.2	.....	2.8	2.5	.....	2.6	.....

Daily discharge, in second-feet, of Williams River at Hamilton, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	985	755	678	135	95	50	95	50
2	875	795	538	125	95	72	95	50
3	918	678	505	118	88	58	95	45
4	358	538	475	102	88	235	110	45
5	345	590	490	95	95	185	95	40
6	332	795	460	88	95	118	95	40
7	282	918	445	72	95	110	95	45
8	258	815	385	72	80	125	95	40
9	185	815	385	65	80	95	95	40
10	195	895	400	72	80	88	95	40
11	245	1,125	400	65	80	80	95	30
12	258	1,125	385	65	80	88	95	30
13	295	1,150	320	65	80	88	110	30
14	308	835	308	65	80	88	125	40
15	370	755	295	65	65	95	95	35
16	415	695	295	72	65	80	95	35
17	475	625	270	65	65	88	80	35
18	572	678	270	135	65	80	80	30
19	590	755	270	225	65	80	80	30
20	608	755	245	195	65	80	65	30
21	608	475	235	215	65	80	65	40
22	505	415	225	205	65	102	65	50
23	475	475	225	270	65	110	58	45
24	370	642	225	320	50	95	45	40
25	358	715	225	185	50	95	45	35
26	358	755	205	145	50	95	50	35
27	445	755	185	118	50	95	50	35
28	608	678	165	102	50	95	50	35
29	678	755	155	95	50	95	50	35
30	895	775	155	95	50	95	65	30
31	.....	735	.....	95	50	.....	65	.....

Monthly discharge of Williams River at Hamilton, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April	985	185	472	28,100
May	1,150	415	751	46,200
June	678	155	327	19,500
July	320	65	123	7,560
August	95	50	70.8	4,350
September	235	50	98.0	5,830
October	125	45	80.4	4,940
November	50	30	38.0	2,260
The period	.....	.....	.....	119,000

NOTE.—Monthly discharge computed by engineers of the United States Geological Survey.

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

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

Records available.—May 8, 1912, to November 15, 1913.

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

Gage.—Bristol automatic gage.

Channel.—Permanent.

Discharge measurements.—Made from bridge.

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

Discharge measurements of Middle Fork of Little Snake River near Battle Creek, Colo., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 12	C. L. Chatfield	(a)	15.5	Aug. 26	C. L. Chatfield	0.30	10.2
June 10	do	1.85	203	Oct. 17	Chatfield and Finley	.57	14
July 28	do	.59	23				

a Discharge relation affected by ice.

Daily gage height, in feet, of Middle Fork of Little Snake River near Battle Creek, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	3.1	2.35	1.5	0.55	0.45	0.65	0.65
2	.....	2.7	2.3	1.5	.50	.55	.65	.60
3	.....	2.6	2.1	1.45	.50	.50	.70	.60
4	.....	2.65	2.1	1.4	.55	.40	.95	.55
5	.....	2.9	2.0	1.35	.50	.45	1.0	.60
6	.....	3.3	2.0	1.4	.60	.45	.80	.55
7	.....	3.35	1.9	1.4	.60	.55	.65	.60
8	.....	3.25	2.0	1.45	.50	.45	.75	.50
9	.....	3.45	1.95	1.4	.50	.50	.75	.60
10	.....	3.65	1.75	.....	.50	.50	.70	.55
11	.....	3.65	1.8	.....	.45	.40	.70	.55
12	.....	3.6	1.7	.....	.45	.40	.65	.60
13	.....	3.4	1.75	1.45	.45	.35	.85	.60
14	.....	3.1	1.7	1.45	.40	.40	.95	.60
15	1.75	2.8	1.65	1.60	.40	.55	.90	.55
16	1.8	2.7	1.6	1.55	.40	.45	.65	.....
17	1.95	2.7	1.6	1.7	.40	.40	.70	.....
18	2.25	2.85	1.6	1.7	.35	.40	.60	.....
19	2.5	2.8	1.6	.....	.40	.40	.60	.....
20	2.5	2.65	1.65	.....	.40	.40	.55	.....
21	2.55	2.45	1.65	.....	.40	.40	.55	.....
22	2.4	2.25	1.65	.....	.40	.55	.60	.....
23	2.05	2.2	1.6	.95	.40	.70	.60	.....
24	1.9	2.2	1.65	1.0	.40	.60	.65	.....
25	1.9	2.15	1.8	.75	.35	.55	.70	.....
26	2.0	2.2	1.7	.75	.35	.60	.50	.....
27	2.25	2.1	1.6	.65	.30	.60	.65	.....
28	2.7	2.25	1.55	.60	.25	.60	.60	.....
29	3.05	2.1	1.55	.60	.25	.60	.70	.....
30	3.3	2.15	1.5	.55	.30	.60	.70	.....
31	.....	2.2	.....	.55	.50	.....	.60	.....

Daily discharge, in second-feet, of Middle Fork of Little Snake River near Battle Creek, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	563	328	120	20	16	26	26
2	.....	431	313	120	18	20	26	23
3	.....	401	261	110	18	18	29	23
4	.....	416	261	100	20	13	45	20
5	.....	497	235	92	18	16	49	23
6	.....	629	235	100	23	16	35	20
7	.....	648	209	100	23	20	26	23
8	.....	612	235	110	18	16	32	18
9	.....	684	222	100	18	18	32	23
10	.....	758	174	.....	18	18	29	20
11	.....	758	186	.....	16	13	29	20
12	.....	740	163	.....	16	13	26	23
13	.....	666	174	110	16	12	38	23
14	.....	563	163	110	13	13	45	23
15	174	464	152	140	13	20	41	20
16	186	431	140	130	13	16	26	.....
17	222	431	140	163	13	13	29	.....
18	300	480	140	163	12	13	23	.....
19	371	464	140	.....	13	13	23	.....
20	371	416	152	.....	13	13	20	.....
21	386	356	152	.....	13	13	20	.....
22	342	300	152	.....	13	20	23	.....
23	248	287	140	45	13	29	23	.....
24	209	287	152	49	13	23	26	.....
25	209	274	186	32	12	20	29	.....
26	235	287	163	32	12	23	18	.....
27	300	261	140	26	10	23	26	.....
28	431	300	130	23	9	23	23	.....
29	546	261	130	23	9	23	29	.....
30	629	274	120	20	10	23	29	.....
31	.....	284	.....	20	18	.....	23	.....

Monthly discharge of Middle Fork of Little Snake River near Battle Creek, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April 15–30	629	174	322	10,200
May	758	261	459	28,200
June	328	120	182	10,800
August	23	9	15.0	922
September	29	12	17.7	1,050
October	49	18	29.0	1,780
November 1–15	26	18	21.9	652

NOTE.—Monthly discharge computed by engineers of the United States Geological Survey.

LITTLE SNAKE RIVER NEAR DIXON, WYO.

Location.—About sec. 6, T. 12 N., R. 90 W., 1 miles west of Dixon, Wyo. Nearest tributary above, Cottonwood Creek, enters a short distance east of Dixon; nearest tributary below, Beaver Creek, enters a mile or less downstream.

Records available.—May 27, 1910, to November 30, 1913.

Drainage area.—1,290 square miles (State engineer's report).

Gage.—Chain gage.

Control.—Shifts slightly during high water.

Cooperation.—Records furnished and station maintained by the State engineer of Colorado.

Discharge measurements of Little Snake River near Dixon, Wyo., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 11	C. L. Chatfield	(a)	99	July 26	C. L. Chatfield	0.80	93
13	do	(a)	92	Aug. 26	do	.40	10.5
May 29	do	4.70	2,330	Oct. 16	Chatfield and Finley	1.07	147
June 11	do	2.97	993				

a Discharge relation affected by ice.

Daily gage height, in feet, of Little Snake River near Dixon, Wyo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	4.0	4.8	3.95	1.05	0.40	0.40	0.65	1.0
2	3.9	4.45	3.85	1.0	.50	.60	.65	1.05
3	3.65	3.75	3.6	.90	.50	.55	.60	1.0
4	3.45	3.9	3.35	.85	.45	.55	.70	1.05
5	2.2	3.8	3.2	.80	.45	.60	1.0	1.05
6	2.6	4.3	3.05	.75	.45	60.	1.15	1.0
7	2.4	4.75	2.95	.70	.40	.60	1.0	1.0
8	2.05	4.7	2.75	.65	.45	.60	1.0	.95
9	2.0	4.6	2.65	.65	.35	.60	1.0	.90
10	1.9	4.8	2.6	.60	.40	.70	1.0	.90
11	1.85	5.1	2.8	.45	.50	.70	.95	.90
12	2.6	5.05	2.55	.50	.45	.60	.90	1.0
13	3.2	5.15	2.4	.50	.40	.60	.95	1.05
14	3.95	4.75	2.25	.50	.40	.60	1.1	1.0
15	4.45	4.25	2.2	.40	.45	.60	1.1	1.10
16	4.4	3.9	2.1	.50	.40	.65	1.0	1.0
17	4.65	3.75	1.95	.60	.35	.70	.9	1.0
18	4.35	3.85	1.9	.70	.35	.60	1.0	1.0
19	4.55	4.25	1.9	.70	.40	.60	.9	1.0
20	4.65	4.05	1.75	.70	.30	.55	1.0	1.0
21	4.8	3.9	1.65	.60	.35	.50	1.05	1.1
22	4.45	3.65	1.5	.75	.40	.55	1.0	1.0
23	3.75	3.7	1.45	.70	.40	.60	1.0	.95
24	3.0	3.9	1.3	1.15	.40	.70	.90	1.0
25	2.85	4.2	1.55	1.1	.30	.70	.90	1.1
26	2.9	4.6	1.85	.80	.40	.70	1.0	1.15
27	3.55	4.65	1.5	.70	.35	.70	.90	1.1
28	4.15	4.45	1.3	.65	.30	.70	.90	1.0
29	4.5	4.5	1.3	.60	.35	.70	.80	1.0
30	4.85	4.3	1.25	.50	.40	.60	.80	1.0
31	.....	4.15	.....	.50	.35	.....	1.0	.....

Daily discharge, in second-feet, of Little Snake River near Dixon, Wyo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	1,620	2,270	1,583	111	11	11	42	100
2	1,546	1,969	1,511	100	20	34	42	111
3	1,373	1,441	1,340	82	20	27	34	100
4	1,241	1,546	1,177	74	16	27	49	111
5	508	1,476	1,084	65	16	34	100	111
6	720	1,850	991	57	16	34	135	100
7	612	2,226	929	49	11	34	100	100
8	441	2,182	807	42	16	34	100	91
9	420	2,096	749	42	10	34	100	82
10	382	2,270	720	34	11	49	100	82
11	363	2,550	836	16	20	49	91	82
12	720	2,500	693	20	16	34	82	100
13	1,084	2,600	612	20	11	34	91	111
14	1,583	2,226	533	20	11	34	122	100
15	1,969	1,811	508	11	16	34	122	122
16	1,928	1,546	462	20	11	42	100	100
17	2,139	1,441	401	34	10	49	82	100
18	1,889	1,511	382	49	10	34	100	100
19	2,053	1,811	382	49	11	34	82	100
20	2,139	1,657	325	49	8	27	100	100
21	2,270	1,546	289	34	10	20	111	122
22	1,969	1,373	238	57	11	27	100	100
23	1,441	1,406	223	49	11	34	100	91
24	960	1,546	178	135	11	49	82	100
25	867	1,772	255	122	8	49	82	122
26	898	2,096	363	65	11	49	100	135
27	1,307	2,139	238	49	10	49	82	122
28	1,733	1,969	178	42	8	49	82	100
29	2,010	2,010	178	34	10	49	65	100
30	2,315	1,850	163	20	11	34	65	100
31	.....	1,733	.....	20	10	.....	100	.....

Monthly discharge of Little Snake River near Dixon, Wyo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April	2,320	363	1,350	80,300
May	2,600	1,370	1,880	116,000
June	1,580	163	611	36,400
July	135	11	50.7	3,120
August	20	8	12.3	756
September	49	11	36.6	2,180
October	135	34	88.5	5,440
November	135	82	103	6,130
The period	.....	.....	.....	250,000

NOTE.—Monthly discharge computed by engineers of the United States Geological Survey.

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

Location.—In sec. 28, T. 12 N., R. 86 W., at Gardner's ranch, 10 miles above Battle Creek. No important tributary below station.

Records available.—May 8, 1912, to November 15, 1913.

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

Gage.—Bristol automatic gage.

Control.—Practically permanent.

Discharge measurements.—Made from bridge.

Diversions.—There are decrees for adjudicated diversion of 8 second-feet from the South Fork of Little Snake River.

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

Discharge measurements of South Fork of Little Snake River near Battle Creek, Colo., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 13	C. L. Chatfield	(a)	5.4	Aug. 26	C. L. Chatfield	0.70	2.24
June 10	do	1.20	25	Oct. 17	Chatfield and Finley	.97	9.8
July 28	do	.78	3.12				

a Discharge relation affected by ice.

Daily gage height, in feet, of South Fork of Little Snake River near Battle Creek, Colo., for 1913.

[Ed. Turner, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	1.9	1.65	0.90	0.75	0.80	0.85	0.90
2	.....	1.8	1.6	.85	.70	.80	.85	.90
3	.....	1.7	1.55	.80	.70	.80	.85	.95
4	.....	1.7	1.5	.85	.70	.75	.95	.90
5	.....	1.7	1.5	.85	.75	.80	1.1	.90
6	.....	1.8	1.5	.75	.80	.80	1.0	.95
7	.....	1.8	1.45	.75	.75	.75	.95	.95
8	.....	1.8	1.4	.75	.75	.80	.95	.95
9	.....	1.85	1.3	.70	.70	.85	.95	.90
10	.....	1.9	1.25	.75	.70	.75	1.0	.90
11	.....	1.7	1.2	.80	.70	.75	1.0	.90
12	.....	1.8	1.15	.75	.70	.75	.95	.90
13	.....	1.9	1.2	.70	.70	.75	.95	.95
14	.....	1.8	1.15	.70	.70	.75	.95	1.0
15	1.85	1.75	1.1	.75	.70	.80	.95	.95
16	1.8	1.7	1.05	.75	.70	.75	.90	.....
17	1.85	1.75	1.0	.75	.70	.75	.95	.....
18	1.85	1.75	1.05	.80	.70	.75	.90	.....
19	1.9	1.75	1.0	.85	.75	.75	.90	.....
20	1.6	1.75	1.05	.75	.75	.75	.90	.....
21	2.05	1.75	1.05	.80	.75	.75	.95	.....
22	1.85	1.70	1.05	.80	.75	.80	1.0	.....
23	1.7	1.70	.95	.80	.80	.90	.95	.....
24	1.7	1.75	.95	1.0	.75	.85	.95	.....
25	1.65	1.75	.90	.85	.75	.80	1.0	.....
26	1.5	1.75	1.05	.80	.70	.85	.95	.....
27	1.8	1.75	1.0	.75	.65	.85	.95	.....
28	1.8	1.70	.95	.70	.65	.85	.95	.....
29	1.9	1.7	.95	.70	.70	.85	.95	.....
30	1.9	1.7	.90	.70	.75	.85	1.0	.....
31	.....	1.7	.....	.70	.80	.....	.95	.....

Daily discharge, in second-feet, of South Fork of Little Snake River near Battle Creek, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	164	113	8	3	4	6	8
2	.....	143	103	6	2	4	6	8
3	.....	123	94	4	2	4	6	10
4	.....	123	84	6	2	3	10	8
5	.....	123	84	6	3	4	20	8
6	.....	143	84	3	4	4	13	10
7	.....	143	74	3	3	3	10	10
8	.....	143	65	3	3	4	10	10
9	.....	154	48	2	2	6	10	8
10	.....	164	40	3	2	3	13	8
11	.....	123	32	4	2	3	13	8
12	.....	143	26	3	2	3	10	8
13	.....	164	32	2	2	3	10	10
14	.....	143	26	2	2	3	10	13
15	154	133	20	3	2	4	10	10
16	143	123	16	3	2	3	8	.....
17	154	133	13	3	2	3	10	.....
18	154	133	16	4	2	3	8	.....
19	164	133	13	6	3	3	8	.....
20	103	133	16	3	3	3	8	.....
21	196	133	16	4	3	3	10	.....
22	154	123	16	4	3	4	13	.....
23	123	123	10	4	4	8	10	.....
24	123	133	10	13	3	6	10	.....
25	113	133	8	6	3	4	13	.....
26	84	133	16	4	2	6	10	.....
27	143	133	13	3	1.5	6	10	.....
28	143	123	10	2	1.5	6	10	.....
29	164	123	10	2	2	6	10	.....
30	164	123	8	2	3	6	13	.....
31	.....	123	.....	2	4	.....	10	.....

Monthly discharge of South Fork of Little Snake River near Battle Creek, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April 15–30	196	84	142	4,510
May	164	123	135	8,300
June	113	8	37.2	2,210
July	13	2	4.0	246
August	4	1.5	2.52	155
September	8	3	4.2	250
October	20	6	10.3	633
November 1–15	13	8	9.1	271
The period	.....	.....	.....	16,600

NOTE.—Monthly discharge computed by engineers of the United States Geological Survey.

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

Location.—In sec. 22, T. 11 N., R. 89 W., at Baxter's ranch, 10 miles south of Slater.
Records available.—May 6, 1912, to November 2, 1913.
Drainage area.—80 square miles (State engineer's report).
Gage.—Bristol automatic gage.
Control.—Practically permanent.
Discharge measurements.—Made from bridge.
Diversions.—There are court decrees for the diversion of 14 second-feet from Slater Creek, all below the station.
Cooperation.—Station maintained by State engineer in cooperation with the Elk River Irrigation & Construction Co. Records published as furnished by the State engineer.

Discharge measurements of Slater Creek at Baxter's ranch, near Slater, Colo., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 10	W. P. Finley	2.00	135	July 27	C. L. Chatfield	1.20	15
June 11	C. L. Chatfield	2.30	128	Sept. 27	W. P. Finley	1.30	22
24	W. P. Finley	1.23	25				

Daily gage height, in feet, of Slater Creek at Baxter's ranch, near Slater, Colo., for 1913.

[F. D. Baxter, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	2.8	1.95	1.2	1.35	1.4	1.4	1.35
2	.....	2.8	1.75	1.25	1.3	1.55	1.45	1.3
3	.....	2.7	1.8	1.25	1.3	1.35	1.4	.....
4	.....	2.75	1.75	1.2	1.3	1.35	1.35	.....
5	.....	2.9	1.7	1.15	1.35	1.35	1.25	.....
6	.....	2.75	1.7	1.1	1.35	1.3	1.25	.....
7	2.0	2.5	1.85	1.1	1.4	1.25	1.25	.....
8	1.95	2.45	2.2	1.15	1.4	1.35	1.3	.....
9	1.85	2.45	2.25	1.15	1.4	1.3	1.3	.....
10	1.8	2.6	2.3	1.25	1.3	1.2	1.3	.....
11	1.8	2.7	2.3	1.3	1.3	1.25	1.35	.....
12	1.8	2.55	2.3	1.3	1.35	1.3	1.35	.....
13	1.75	2.5	2.3	1.3	1.35	1.2	1.35	.....
14	1.75	2.4	2.3	1.3	1.4	1.25	1.4	.....
15	1.65	2.4	1.5	1.3	1.4	1.3	1.35	.....
16	1.3	2.6	1.2	1.3	1.4	1.3	1.4	.....
17	1.2	2.65	1.25	1.25	1.35	1.35	1.45	.....
18	1.25	2.75	1.4	1.25	1.35	1.25	1.55	.....
19	1.35	2.7	1.4	1.25	1.35	1.15	1.3	.....
20	2.0	2.7	1.35	1.25	1.35	1.2	1.4	.....
21	2.6	2.7	1.3	1.25	1.4	1.25	1.4	.....
22	2.8	2.7	1.3	1.2	1.5	1.2	1.3	.....
23	2.9	2.7	1.3	1.15	1.55	1.25	1.35	.....
24	2.85	2.7	1.25	1.1	1.45	1.25	1.4	.....
25	2.6	2.55	1.1	1.15	1.45	1.3	1.35	.....
26	2.5	2.5	1.25	1.2	1.5	1.35	1.35	.....
27	2.55	2.4	1.3	1.2	1.45	1.4	1.4	.....
28	2.65	2.35	1.2	1.3	1.4	1.55	1.4	.....
29	2.75	2.3	1.0	1.4	1.5	1.45	1.4	.....
30	2.85	2.25	.9	1.35	1.5	1.35	1.4	.....
31	.....	2.2	.....	1.4	1.35	.....	1.45	.....

Daily discharge, in second-feet, of Slater Creek at Baxter's ranch, near Slater, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	305	99	17	25	28	28	25
2	.....	305	65	20	22	40	32	22
3	.....	276	73	20	22	25	28	.....
4	.....	290	65	17	22	25	25	.....
5	.....	336	57	15	25	25	20	.....
6	.....	290	57	13	25	22	20	.....
7	108	220	82	13	25	20	20	.....
8	99	208	150	15	28	25	22	.....
9	82	208	161	15	28	22	22	.....
10	73	248	172	20	22	17	22	.....
11	73	276	172	22	22	20	25	.....
12	73	234	172	22	25	22	25	.....
13	65	220	172	22	25	17	25	.....
14	65	195	172	22	28	20	28	.....
15	50	195	35	22	28	22	25	.....
16	22	248	17	22	28	22	28	.....
17	17	262	20	20	25	25	32	.....
18	20	290	28	20	25	20	40	.....
19	25	276	28	20	25	15	22	.....
20	108	276	25	20	25	17	28	.....
21	248	276	22	20	28	20	28	.....
22	305	276	22	17	35	17	22	.....
23	336	276	22	15	40	20	25	.....
24	320	276	20	13	32	20	28	.....
25	248	234	13	13	32	22	25	.....
26	220	220	20	17	35	25	25	.....
27	234	195	22	17	32	28	28	.....
28	262	182	17	22	28	40	28	.....
29	290	172	11	28	35	32	28	.....
30	320	161	10	25	35	25	28	.....
31	.....	150	.....	28	25	.....	32	.....

Monthly discharge of Slater Creek at Baxter's ranch, near Slater, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April 7-30	336	17	153	7,280
May	336	150	244	15,000
June	172	10	66.7	3,970
July	28	13	19.1	1,170
August	40	22	27.7	1,700
September	40	15	23.3	1,390
October	40	20	26.3	1,620
The period	.....	.....	.....	32,100

NOTE.—Monthly discharge computed by engineers of the United States Geological Survey.

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

Location.—About sec. 26, T. 11 N., R. 90 W., in Colorado, 2 miles northeast of Ryan's ranch house and 22 miles southeast of Baggs, Wyo. No important tributary below station.

Records available.—May 4, 1912, to November 8, 1913.

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

Gage.—Bristol automatic.

Control.—Small cobblestones; especially constructed for the station.

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

Discharge measurements of Willow Creek at Ryan's ranch, near Baggs, Wyo., for 1913.

Date.	Made by.	Gage height.	Discharge.	Date.	Made by.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 28	Chatfield and Finley.	0.62	44	July 26	C. L. Chatfield.....	−0.18	4.24
June 24	W. P. Finley.....	.30	8.9	Sept. 27	W. P. Finley.....	− .50	3.02

Daily gage height, in feet, of Willow Creek at Ryan's ranch, near Baggs, Wyo., for 1913.

[C. C. Ryan, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	0.45	0.55	0.30	−0.15	−0.40	−0.55	−0.25
2	.....	.35	.50	.25	− .15	− .35	− .55	− .25
3	.....	.30	.45	.20	− .20	− .30	− .50	− .25
4	.....	.30	.40	.20	− .15	− .35	− .40	− .25
5	.....	.25	.40	.25	− .20	− .30	− .35	− .30
6	.....	.35	.40	.20	− .20	− .45	− .35	− .40
7	.....	.40	.40	.25	− .25	− .45	− .35	− .35
8	.....	.40	.40	.25	− .25	− .40	− .35	− .25
9	.....	.50	.35	.20	− .25	− .35	− .30	.....
10	.....	.60	.30	.25	− .25	− .40	− .30	.....
11	.....	.60	.35	.25	− .35	− .45	− .30	.....
12	.....	.60	.30	.20	− .35	− .50	− .25	.....
13	.....	.55	.40	.35	− .35	− .45	− .40	.....
14	.....	.45	.35	.35	− .30	− .45	− .45	.....
15	.....	.45	.15	.30	− .30	− .35	− .45	.....
16	0.25	.45	.15	.25	− .40	− .45	− .45	.....
17	.30	.50	.25	.25	− .35	− .55	− .50	.....
18	.25	.60	.25	.25	− .30	− .55	− .45	.....
19	.35	.50	.30	.20	− .30	− .50	− .45	.....
20	.35	.45	.30	.15	− .30	− .50	− .45	.....
21	.35	.40	.25	.15	− .35	− .60	− .40	.....
22	.35	.40	.20	.10	− .35	− .55	− .40	.....
23	.20	.50	.15	.05	− .35	− .60	− .45	.....
24	.25	.65	.25	.00	− .35	− .60	− .30	.....
25	.15	.60	.30	− .05	− .35	− .60	− .30	.....
26	.20	.60	.30	− .15	− .45	− .55	− .30	.....
27	.30	.65	.35	− .15	− .40	− .50	− .30	.....
28	.40	.70	.40	− .15	− .40	− .55	− .30	.....
29	.45	.65	.30	− .15	− .40	− .55	− .30	.....
30	.45	.65	.30	− .15	− .35	− .60	− .30	.....
31	.....	.60	.....	− .15	− .30	.....	− .25	.....

Daily discharge, in second-feet, of Willow Creek at Ryan's ranch, near Baggs, Wyo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	26	36	9	4.4	3.2	2.9	3.8
2	.....	19	31	7.5	4.4	3.4	2.9	3.8
3	.....	16	26	8	4.0	3.5	3.0	3.8
4	.....	16	22	8	4.4	3.4	3.2	3.8
5	.....	14	22	9	4.0	3.5	3.4	3.5
6	.....	19	22	8	4.0	3.1	3.4	3.2
7	.....	22	19	9	3.8	3.1	3.4	3.4
8	.....	22	19	9	3.8	3.2	3.4	3.8
9	.....	31	16	8	3.8	3.4	3.5	.....
10	.....	42	13	9	3.8	3.2	3.5	.....
11	.....	42	16	10.5	3.4	3.1	3.5	.....
12	.....	42	13	9	3.4	3.0	3.8	.....
13	.....	36	15	15	3.4	3.1	3.2	.....
14	.....	26	13	15	3.5	3.1	3.1	.....
15	.....	26	7	13	3.5	3.4	3.1	.....
16	14	26	7	10.5	3.2	3.1	3.1	.....
17	16	31	9	10.5	3.4	2.9	3.0	.....
18	14	42	9	10.5	3.5	2.9	3.1	.....
19	19	31	11	11	3.5	3.0	3.1	.....
20	19	26	11	10	3.5	3.0	3.1	.....
21	19	22	7.5	10	3.4	2.8	3.2	.....
22	19	22	6	8	3.4	2.9	3.2	.....
23	11	31	5.2	7	3.4	2.8	3.1	.....
24	14	48	7.5	6	3.4	2.8	3.5	.....
25	10	42	9	5.4	3.4	2.8	3.5	.....
26	11	42	9	4.4	3.1	2.9	3.5	.....
27	16	48	11	4.4	3.2	3.0	3.5	.....
28	22	54	13	4.4	3.2	2.9	3.5	.....
29	26	48	9	4.4	3.2	2.9	3.5	.....
30	26	48	9	4.4	3.4	2.8	3.5	.....
31	.....	42	.....	4.4	3.5	.....	3.8	.....

Monthly discharge of Willow Creek at Ryan's ranch, near Baggs, Wyo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April 16–30	26	10	17.1	509
May	54	14	32.3	1,990
June	36	5.2	14.1	839
July	15	4.4	8.46	520
August	4.4	3.1	3.58	220
September	3.5	2.8	3.07	183
October	3.8	2.9	3.31	204
November 1–8	3.8	3.2	3.64	57.8
The period	.....	.....	.....	4,520

NOTE.—Monthly discharge computed by engineers of the United States Geological Survey.

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

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

Records available.—May 1, 1912, to November 8, 1913.

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

Gage.—Bristol automatic gage.

Control.—Probably permanent.

Discharge measurements.—Made from footbridge.

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

Discharge measurements of Fourmile Creek at Ryan's ranch, near Baggs, Wyo., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 28	Chatfield and Finley.	0.90	13.4	July 26	C. L. Chatfield.....	0.50	1.69
June 23	W. P. Finley.....	.60	2.97	Sept. 26	W. P. Finley.....	.40	2.37

Daily gage height, in feet, of Fourmile Creek at Ryan's ranch, near Baggs, Wyo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	1.30	0.80	0.70	0.50	0.55	0.40	0.45
2	.....	1.20	.80	.55	.55	.60	.40	.50
3	.....	1.15	.80	.60	.50	.70	.50	.50
4	.....	1.15	.85	.50	.45	.65	.45	.50
5	.....	1.20	.85	.50	.55	.65	.50	.55
6	.....	1.25	.85	.55	.60	.65	.40	.50
7	.....	1.30	.80	.55	.55	.65	.45	.45
8	.....	1.30	.75	.50	.55	.65	.50	.50
9	.....	1.30	.80	.50	.55	.75	.50	.....
10	.....	1.35	.80	.55	.55	.70	.50	.....
11	.....	1.35	.80	.55	.50	.70	.55	.....
12	.....	1.30	.80	.55	.55	.70	.60	.....
13	.....	1.20	.80	.55	.55	.65	.50	.....
14	.....	1.15	.75	.60	.55	.70	.50	.....
15	.....	1.10	.70	.60	.50	.75	.50	.....
16	.....	1.10	.60	.60	.50	.75	.45	.....
17	1.05	1.00	.60	.60	.40	.70	.50	.....
18	1.15	.95	.60	.65	.40	.75	.50	.....
19	1.20	.95	.60	.65	.40	.75	.45	.....
20	1.15	.90	.60	.60	.35	.70	.40	.....
21	1.20	.90	.65	.60	.35	.55	.40	.....
22	1.15	.85	.60	.55	.35	.60	.40	.....
23	1.05	.90	.60	.60	.35	.50	.40	.....
24	1.05	.95	.60	.65	.35	.30	.45	.....
25	1.00	1.00	.75	.60	.40	.30	.45	.....
26	1.10	.95	.75	.55	.40	.45	.35	.....
27	1.10	.95	.75	.50	.40	.45	.40	.....
28	1.30	.90	.70	.50	.45	.40	.45	.....
29	1.30	.90	.85	.50	.45	.40	.45	.....
30	1.30	.85	1.05	.45	.55	.45	.45	.....
31	.....	.80	.....	.45	.55	.....	.45	.....

Daily discharge, in second-feet, of Fourmile Creek at Ryan's ranch, near Baggs, Wyo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	53	8.5	5.5	2.5	3	1.5	.2
2	.....	40	8.5	3	3.0	3.5	1.5	2.5
3	.....	34	8.5	3.5	2.5	5.5	2.5	2.5
4	.....	34	11	2.5	2	4.5	2	2.5
5	.....	40	11	2.5	3	4.5	2.5	3
6	.....	46	11	3	3.5	4.5	1.5	2.5
7	.....	53	8.5	3	3	4.5	2	2
8	.....	53	7	2.5	3	4.5	2.5	2.5
9	.....	53	8.5	2.5	3	7	2.5	.....
10	.....	60	8.5	3	3	5.5	2.5	.....
11	.....	60	8.5	3	2.5	5.5	3	.....
12	.....	53	8.5	3	3	5.5	3.5	.....
13	.....	40	8.5	3	3	4.5	2.5	.....
14	.....	34	7	3.5	3	5.5	2.5	.....
15	.....	29	5.5	3.5	2.5	7	2.5	.....
16	.....	29	3.5	3.5	2.5	7	2	.....
17	24	20	3.5	3.5	1.5	5.5	2.5	.....
18	34	17.2	3.5	4.5	1.5	7	2.5	.....
19	40	17.2	3.5	4.5	1.5	7	2	.....
20	34	13.5	3.5	3.5	1.2	5.5	1.5	.....
21	40	13.5	4.5	3.5	1.2	3	1.5	.....
22	34	11	3.5	3	1.2	3.5	1.5	.....
23	24	13.5	3.5	3.5	1.2	2.5	1.5	.....
24	24	17.2	3.5	4.5	1.2	1.0	2	.....
25	20	20	7	3.5	1.5	1.0	2	.....
26	29	17.2	7	3	1.5	2.0	1.2	.....
27	29	17.2	7	2.5	1.5	2.0	1.5	.....
28	53	13.5	5.5	2.5	2	1.5	2	.....
29	53	13.5	11	2.5	2	1.5	2	.....
30	53	11	24	2	3	2.0	2	.....
31	.....	8.5	.....	2	3	.....	2	.....

Monthly discharge of Fourmile Creek at Ryan's ranch, near Baggs, Wyo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April 17–30	53	20	35.1	975
May	60	8.5	30.2	1,860
June	24	3.5	7.43	442
July	5.5	2	3.19	196
August	3.5	1.2	2.26	139
September	7	1	4.23	252
October	3.5	1.5	2.09	129
November 1–8	3	2	2.44	39
The period	.....	.....	.....	4,030

NOTE.—Monthly discharge computed by engineers of the United States Geological Survey.

ASHLEY CREEK BASIN.

ASHLEY CREEK NEAR VERNAL, UTAH.

Location.—In sec. 13, T. 3 S., R. 20 E., about 1 mile below the Ashley Creek power plant, and about 15 miles north of Vernal; 2½ miles above entrance of Dry Fork.

Records available.—Fragmentary records October 8, 1911, to December 31, 1913; March 18, 1900, to December 31, 1904, records available for point below mouth of Dry Fork.

Drainage area.—107 square miles.

Gage.—Vertical staff on right bank until June 28, 1913, when it was washed out by a flood. New gage installed October 1, 1913, at the power plant about 1 mile above old gage and just above mouth of tailrace.

Control.—Shifts during high water.

Discharge measurements.—Made by wading.

Winter flow.—Discharge relation affected by ice during greater part of winter.

Diversions.—None above station.

Regulation.—Operation of power plant probably does not affect flow.

The following discharge measurement was made by King and Siddoway:
May 16, 1913: Gage height, 2.72 feet; discharge, 308 second-feet.

Daily gage height, in feet, of Ashley Creek near Vernal, Utah, for 1913.

[Grant Carpenter and F. A. Siddoway, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1					2.4					0.85	0.6	
2												
3												
4												
5		1.5								.85		
6			1.5									0.35
7												
8					3.2							
9											.5	
10	1.5											
11												
12										.75		
13			1.5			2.5						
14												.2
15	1.5											
16				1.7	2.72						.5	
17												
18												
19										.6		
20			1.5									
21												.2
22												
23	1.5										.45	
24				2.2								
25												
26		1.5								.6		
27												
28			1.5									.15
29												
30											.4	
31												

NOTE.—Gage washed out by high water June 28, 1913. Readings on new gage at the power plant beginning Oct. 1.

Daily discharge, in second-feet, of Ashley Creek near Vernal, Utah, for 1913.

Date.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1					195					81	61	
2												
3												
4												
5		34								81		
6			34									45
7												
8					530							
9											55	
10	34											
11												
12										72		
13			34			225						
14												37
15	34											
16				51	308						55	
17												
18												
19										61		
20			34									
21												37
22												
23	34										51	
24				140								
25												
26		34								61		
27												
28			34									34
29												
30											48	
31												

NOTE.—Discharge January to June determined from a poorly defined curve; October to December from a fairly well defined curve. Flow of the tailrace which is fairly constant at about 29 second-feet is included in the discharge estimates after Oct. 1 to make comparable with records before that date.

DUCHESNE RIVER BASIN.

DUCHESNE RIVER AT MYTON, UTAH.

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

Records available.—October 26, 1899, to November 30, 1910; July 26, 1911, to December 31, 1913.

Drainage area.—2,750 square miles.

Gage.—Chain gage attached to upstream side of bridge.

Control.—Cobblestones; fairly permanent.

Discharge measurements.—Made from highway bridge.

Winter flow.—Stream frozen over in the vicinity of the gage during greater part of winter.

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

Accuracy.—Records good except during winter.

Discharge measurements of Duchesne River at Myton, Utah, for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 13	W. R. King	3.90	2,240	Sept. 3	H. W. Sheley	2.45	694
15	do	3.77	1,960	10	do	3.10	1,160
25	do	4.92	3,960	13	do	2.60	802
Sept. 2	H. W. Sheley	2.35	638				

Daily gage height, in feet, of Duchesne River at Myton, Utah, for 1913.

[Abe Smith, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.0	3.1	2.85	3.0	2.9	4.4	3.6	1.78	1.78	2.2	2.0	2.0
2	2.0	3.0	2.85	2.95	2.85	4.4	3.5	1.68	2.4	2.15	1.98	2.0
3	1.95	2.95	2.85	2.5	2.65	4.2	3.4	1.60	2.5	2.1	2.3	1.88
4	2.15	2.85	2.85	2.2	2.55	4.1	3.2	1.62	2.3	2.1	2.25	1.92
5	2.2	2.95	2.9	2.15	2.65	3.8	3.0	1.70	2.1	2.5	2.2	1.98
6	2.05	2.95	3.0	2.15	2.65	3.7	2.8	1.68	2.0	2.4	2.2	1.9
7	2.0	2.85	3.0	2.1	2.8	3.6	2.7	1.60	2.15	2.2	2.1	1.92
8	1.85	2.9	3.2	2.05	3.1	3.4	2.5	1.52	2.8	2.2	2.1	1.98
9	2.0	2.9	3.4	2.0	3.2	3.4	2.5	1.50	3.4	2.2	2.1	1.92
10	2.25	2.95	3.6	2.0	3.3	3.4	2.5	1.62	3.2	2.2	2.1	1.9
11	2.6	2.9	3.5	2.0	3.4	3.3	2.3	1.60	2.9	2.2	2.0	1.82
12	2.7	2.85	3.4	2.05	3.7	3.1	2.2	1.58	2.75	2.1	2.0	1.8
13	2.75	2.9	3.2	2.05	3.8	3.0	2.0	1.70	2.6	2.2	2.3	1.8
14	2.8	2.95	3.1	2.25	3.8	2.9	1.98	1.68	2.55	2.3	2.25	1.78
15	2.9	2.95	2.8	2.4	3.8	2.9	1.95	1.60	2.65	2.3	2.1	1.8
16	2.9	3.0	2.75	2.5	3.7	2.95	1.92	1.55	2.45	2.3	2.0	2.0
17	2.9	3.0	2.75	2.4	3.5	2.9	1.90	1.42	2.3	2.3	2.05	2.0
18	2.9	3.0	2.7	2.55	3.6	2.8	1.88	1.40	2.2	2.25	2.0	2.0
19	2.95	2.95	2.6	2.7	3.7	2.75	2.0	1.38	2.2	2.2	2.0	1.75
20	2.85	2.9	2.35	2.55	3.8	2.8	2.2	1.40	2.1	2.2	2.0	1.7
21	2.95	2.85	2.25	2.4	3.7	2.7	3.0	1.40	2.0	2.2	2.0	1.7
22	3.1	2.8	2.1	2.35	3.6	2.6	2.7	1.35	2.0	2.15	1.92	1.62
23	3.2	2.8	2.1	2.5	4.0	2.55	2.95	1.38	2.1	2.1	1.8	1.68
24	3.3	2.75	2.0	2.45	4.4	2.5	2.7	1.72	2.2	2.1	1.78	1.75
25	3.3	2.85	2.05	2.35	4.9	2.65	2.5	1.62	2.2	2.0	1.8	1.75
26	3.2	2.9	2.0	2.3	5.2	3.2	2.15	1.55	2.2	2.05	1.98	1.98
27	3.3	2.85	2.0	2.35	5.0	4.6	2.0	1.48	2.2	2.0	1.95	1.98
28	3.2	2.75	2.15	2.55	5.0	5.4	2.05	1.48	2.2	2.1	1.9	1.92
29	3.2	.....	2.1	2.7	5.1	4.6	1.92	1.48	2.15	2.1	1.78	1.8
30	3.2	.....	2.6	2.85	4.8	4.0	1.98	1.62	2.1	1.98	1.8	1.82
31	3.2	.....	3.2	.....	4.6	.....	1.80	1.95	.....	2.05	.....	1.88

NOTE.—Discharge relation affected by ice Jan. 1 to Mar. 23, Dec. 1–10, 16–18, and 26–28.

Daily discharge, in second-feet, of Duchesne River at Myton, Utah, for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	.....	1,110	1,030	2,830	1,790	328	328	536	428	.....
2	.....	.....	.....	1,070	991	2,830	1,660	289	664	508	418	.....
3	.....	.....	.....	732	839	2,570	1,530	260	732	480	598	.....
4	.....	.....	.....	536	767	2,440	1,300	267	598	480	567	.....
5	.....	.....	.....	508	839	2,050	1,110	296	480	732	536	.....
6	.....	.....	.....	508	839	1,920	952	289	428	664	536	.....
7	.....	.....	.....	480	952	1,790	876	260	508	536	480	.....
8	.....	.....	.....	454	1,200	1,530	732	234	952	536	480	.....
9	.....	.....	.....	428	1,300	1,530	732	228	1,530	536	480	.....
10	.....	.....	.....	428	1,410	1,530	732	267	1,300	536	480	.....
11	.....	.....	.....	428	1,530	1,410	598	260	1,030	536	428	345
12	.....	.....	.....	454	1,920	1,200	536	254	914	480	428	336
13	.....	.....	.....	454	2,050	1,110	428	296	802	536	598	336
14	.....	.....	.....	567	2,050	1,030	418	289	767	598	567	328
15	.....	.....	.....	664	2,050	1,030	404	260	839	598	480	336
16	.....	.....	.....	732	1,920	1,070	390	244	698	598	428	320
17	.....	.....	.....	664	1,660	1,030	380	204	598	598	454	320
18	.....	.....	.....	767	1,790	952	371	198	536	567	428	320
19	.....	.....	.....	876	1,920	914	428	192	536	536	428	316
20	.....	.....	.....	767	2,050	952	536	198	480	536	428	296
21	.....	.....	.....	664	1,920	876	1,110	198	428	536	428	296
22	.....	.....	.....	631	1,790	802	876	184	428	508	390	267
23	.....	.....	.....	732	2,310	767	1,070	192	480	480	336	289
24	.....	.....	428	698	2,830	732	876	304	536	480	328	316
25	.....	.....	454	631	3,480	839	732	267	536	428	336	316
26	.....	.....	428	598	3,880	1,300	508	244	536	454	418	320
27	.....	.....	428	631	3,610	3,090	428	222	536	428	404	320
28	.....	.....	508	767	3,610	4,160	454	222	536	480	380	320
29	.....	.....	480	876	3,740	3,090	390	222	508	480	328	336
30	.....	.....	802	991	3,350	2,310	418	267	480	418	336	345
31	.....	.....	1,300	.....	3,090	.....	336	404	.....	454	.....	371

NOTE.—Discharge determined from a well-defined curve. Discharge estimated on account of ice Dec. 16–18 and 26–28.

Monthly discharge of Duchesne River at Myton, Utah, for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	[a] 280	17,200	D.
February	.....	.....	[a] 300	16,700	D.
March	1,300	.....	[a] 408	25,100	C.
April	1,110	428	662	39,400	A.
May	3,880	767	2,020	124,000	A.
June	4,160	732	1,660	98,800	A.
July	1,790	336	745	45,800	A.
August	404	184	253	15,600	A.
September	1,530	328	657	39,100	A.
October	732	418	525	32,300	A.
November	598	328	445	26,400	A.
December	.....	.....	[a] 321	19,700	B.
The year	4,160	184	691	500,000	

[a] Estimated.

LAKE FORK NEAR MYTON, UTAH.

Location.—In sec. 21, T. 3 S., R. 2 W., Uinta special base and meridian, 300 feet below a county highway bridge, 3 miles northwest of Myton, and about one-half mile above the mouth of Lake Fork.

Records available.—July 3, 1900, to December 31, 1903; June, 1907, to November 30, 1910; July 26, 1911, to December 31, 1913.

Drainage area.—468 square miles.

Gage.—Inclined staff installed September 8, 1912, at same datum as chain gage previously used. Several gages and datums have been used since station was established.

Control.—Fairly permanent.

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

Winter flow.—Discharge relation affected by ice during practically the entire winter.

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

Accuracy.—Records good except when stream is frozen.

Discharge measurements of Lake Fork near Myton, Utah, for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 14	W. R. King	3.46	479	Sept. 1	H. W. Sheley	1.82	88.5
14	do	3.30	437	15	do	2.94	346

Daily gage height, in feet, of Lake Fork near Myton, Utah, for 1913.

[James McAffee, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.15	3.0	2.75	2.48	2.08	4.4	4.6	1.2	1.65	2.4	2.2	2.2
2	2.15	3.0	2.8	2.08	2.08	4.2	3.8	1.2	2.3	2.4	2.1	2.1
3	2.15	3.0	2.8	2.38	2.08	4.0	3.7	1.0	2.4	2.4	2.8	2.0
4	2.15	3.0	2.85	2.28	2.18	4.0	3.6	1.0	2.4	2.4	2.5	2.3
5	2.15	3.0	2.85	2.38	2.28	3.9	3.4	1.7	2.2	2.8	2.4	2.4
6	2.25	3.0	2.9	2.28	2.38	3.8	2.8	1.2	2.0	2.7	2.4	2.3
7	2.25	3.0	2.9	2.18	2.38	3.6	2.7	1.0	2.1	2.6	2.4	2.3
8	2.35	3.0	2.9	2.08	2.43	3.6	2.5	1.1	2.5	2.6	2.3	2.2
9	2.4	2.95	2.95	2.08	2.48	3.4	2.4	1.1	4.3	2.6	2.3	2.2
10	2.45	2.95	2.95	2.18	2.6	3.15	2.3	1.0	3.7	2.5	2.3	2.2
11	2.45	2.95	3.0	2.08	2.7	2.85	2.0	1.0	3.5	2.4	2.3	2.2
12	2.5	3.0	3.0	2.08	2.75	2.75	1.9	1.0	3.4	2.4	2.3	2.3
13	2.55	3.0	3.0	2.08	2.9	2.6	1.6	1.1	3.2	2.4	2.6	2.3
14	2.6	2.95	2.95	2.08	3.4	2.55	1.4	1.6	3.0	2.6	2.4	2.3
15	2.6	2.95	2.8	2.08	3.3	2.5	1.6	1.4	2.9	2.6	2.3	.....
16	2.6	2.95	2.65	2.08	3.45	2.45	1.5	1.1	2.8	2.6	2.2	2.3
17	2.6	2.95	2.7	2.18	3.6	2.5	1.4	1.2	2.7	2.6	2.2	.....
18	2.65	2.9	2.65	2.18	4.2	2.45	1.4	1.2	2.6	2.5	2.2	2.2
19	2.7	2.9	2.65	2.28	5.6	2.4	1.4	1.2	2.5	2.5	2.2	.....
20	2.7	2.9	2.6	2.18	5.5	2.4	1.8	1.3	2.4	2.5	2.3	2.7
21	2.75	2.85	2.5	2.18	5.3	2.35	3.3	1.3	2.3	2.5	2.2	.....
22	2.75	2.75	2.5	2.08	5.0	2.2	2.9	1.2	2.3	2.5	2.2	2.6
23	2.8	2.75	2.5	2.08	4.8	2.1	2.1	1.2	2.3	2.5	1.8	2.5
24	2.8	2.75	2.3	2.18	4.7	2.0	2.9	1.2	2.4	2.5	1.8	.....
25	2.85	2.7	2.23	2.18	4.8	2.0	2.6	1.1	2.5	2.5	1.7	2.6
26	2.9	2.7	2.08	2.18	4.8	3.5	2.2	1.1	2.4	2.5	1.8	2.8
27	2.95	2.75	2.08	2.28	4.8	5.7	2.0	1.0	2.5	2.3	2.1	.....
28	2.95	2.75	2.08	2.28	5.0	7.2	1.9	1.0	2.5	2.4	2.1	2.5
29	2.95	.....	2.28	2.33	5.0	5.6	1.6	1.0	2.4	2.4	2.1	2.3
30	2.95	.....	2.6	2.18	4.6	4.6	1.4	1.0	2.3	2.3	2.1	2.2
31	3.0	.....	3.05	.....	.....	.....	1.3	1.3	.....	2.2	.....	.....

NOTE.—Discharge relation affected by ice Jan. 1 to Mar. 25 and Dec. 20–31.

Daily discharge, in second-feet, of Lake Fork near Myton, Utah, for 1913.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	174	96	890	1,070	23	68	198	155	155
2	.....	96	96	800	684	23	176	198	136	136
3	.....	152	96	710	640	12	198	198	305	118
4	.....	131	113	710	596	12	198	198	222	176
5	.....	152	131	665	514	74	155	305	198	198
6	.....	131	152	620	305	23	118	277	198	176
7	.....	113	152	540	277	12	136	249	198	176
8	.....	96	163	540	222	17	222	249	176	155
9	.....	96	173	460	198	17	922	249	176	155
10	.....	113	202	372	176	12	640	222	176	155
11	.....	96	228	271	118	12	554	198	176	155
12	.....	96	242	242	102	12	514	198	176	176
13	.....	96	286	202	62	17	436	198	249	176
14	.....	96	460	190	40	62	365	249	198	176
15	.....	96	425	178	62	40	335	249	176	176
16	.....	96	480	167	50	17	305	249	155	176
17	.....	113	540	173	40	23	277	249	155	166
18	.....	113	800	167	40	23	249	222	155	155
19	.....	131	1,550	156	40	23	222	222	155	140
20	.....	113	1,480	156	87	30	198	222	176	.....
21	.....	113	1,360	146	474	30	176	222	155	.....
22	.....	96	1,190	116	335	23	176	222	155	.....
23	.....	96	1,090	99	136	23	176	222	87	.....
24	.....	113	1,040	84	335	23	198	222	87	.....
25	.....	113	1,090	84	249	17	222	222	74	.....
26	96	113	1,090	520	155	17	198	222	87	.....
27	96	131	1,090	1,680	118	12	222	176	136	.....
28	96	131	1,190	2,710	102	12	222	198	136	.....
29	131	141	1,190	1,650	62	12	198	198	136	.....
30	202	113	990	1,070	40	12	176	176	136	.....
31	337	.....	940	.....	30	30	.....	155	.....	.....

NOTE.—Discharge determined as follows: Mar. 26 to June 25 and June 29 to Dec. 19 from a fairly well defined rating curve; June 26–28 by the indirect method for shifting channels.

Monthly discharge of Lake Fork near Myton, Utah, for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	[a] 70.0	4,300	D.
February	.....	.....	[a] 70.0	3,890	D.
March	337	.....	[a] 95.4	5,870	D.
April	174	96	115	6,840	A.
May	1,550	96	649	39,900	A.
June	2,710	84	546	32,500	B.
July	1,070	30	237	14,600	B.
August	74	12	22.4	1,380	B.
September	922	68	275	16,400	B.
October	305	155	220	13,500	B.
November	305	74	163	9,700	B.
December	198	.....	[a] 146	9,000	C.
The year	2,710	12	218	158,000	

[a] Estimated.

WHITE RIVER BASIN.

NORTH FORK OF WHITE RIVER NEAR BUFORD, COLO.

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

Records available.—May 24, 1910, to December 10, 1913. From July 18, 1903, to October 31, 1906, a gaging station was also maintained by the United States Geological Survey just below Ute Creek, 5 miles above present station; these records are very nearly comparable with those for the station now maintained, as there are no important tributaries between the two points.

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

Gage.—Vertical staff.

Control.—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. There are also decrees for the diversion of 33 second-feet from tributaries entering above the station.

Cooperation.—Records published and station maintained by the State engineer.

Discharge measurements of North Fork of White River near Buford, Colo., for 1913.

[Made by C. L. Chatfield.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.ft.*		*Feet.*	*Sec.ft.*
Feb. 6	(a)	211	July 23	1.12	310
May 22	1.48	429	Oct. 20	.55	186
23	1.65	506			

a Discharge relation affected by ice.

Daily gage height, in feet, of North Fork of White River near Buford, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	2.0	2.2	1.0	0.70	0.55	0.55	0.50	0.50
2	.....	1.9	2.15	.90	.70	.55	.55	.50	.50
3	.....	1.55	2.05	.90	.70	.60	.55	.50	.50
4	.....	1.6	2.0	.90	.70	.55	.60	.50	.50
5	.....	1.75	1.9	.80	.70	.60	.60	.50	.50
6	.....	2.1	1.9	.80	.70	.60	.60	.50	.55
7	.....	2.1	1.8	.75	.70	.60	.55	.55	.55
8	.....	2.0	1.7	.80	.70	.60	.50	.50	.50
9	.....	1.9	1.7	.80	.60	.60	.55	.50	.50
10	.....	2.2	1.7	.80	.60	.60	.50	.60	.50
11	0.70	2.3	1.7	.80	.60	.60	.60	.60	.....
12	.70	2.3	1.65	.70	.60	.55	.65	.60	.....
13	.85	2.2	1.6	.70	.60	.55	.65	.65	.....
14	.90	2.05	1.5	.70	.60	.60	.60	.60	.....
15	1.25	1.8	1.4	.75	.60	.55	.60	.60	.....
16	1.35	1.65	1.5	.75	.60	.55	.60	.60	.....
17	1.40	1.65	1.4	.85	.60	.55	.55	.60	.....
18	1.45	1.85	1.4	1.0	.60	.60	.50	.60	.....
19	1.5	1.7	1.4	.95	.60	.50	.55	.50	.....
20	1.5	1.7	1.4	1.1	.60	.50	.60	.50	.....
21	1.6	1.5	1.3	1.0	.60	.50	.60	.60	.....
22	1.4	1.4	1.2	1.0	.60	.50	.55	.50	.....
23	1.15	1.6	1.2	1.2	.55	.60	.55	.50	.....
24	1.1	1.8	1.2	1.2	.55	.60	.50	.50	.....
25	1.1	2.0	1.3	1.0	.55	.60	.50	.55	.....
26	1.1	1.95	1.2	1.0	.55	.60	.50	.55	.....
27	1.6	2.0	1.1	.85	.55	.60	.60	.55	.....
28	1.8	2.0	1.1	.80	.55	.55	.50	.50	.....
29	2.15	2.15	1.1	.80	.55	.55	.50	.50	.....
30	2.05	2.3	1.0	.70	.55	.55	.50	.50	.....
31	.....	2.2	.....	.70	.55	.....	.50	.....	.....

Daily discharge, in second-feet, of North Fork of White River near Buford, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	655	780	275	210	185	185	178	178
2	.....	605	748	250	210	185	185	178	178
3	.....	450	685	250	210	192	185	178	178
4	.....	470	655	250	210	185	192	178	178
5	.....	538	605	230	210	192	192	178	178
6	.....	715	605	230	210	192	192	178	185
7	.....	715	560	220	210	192	185	185	185
8	.....	655	515	230	210	192	178	178	178
9	.....	605	515	230	192	192	185	178	178
10	.....	780	515	230	192	192	178	192	178
11	210	850	515	230	192	192	192	192	.....
12	210	850	492	210	192	185	201	192	.....
13	240	780	470	210	192	185	201	201	.....
14	250	685	430	210	192	192	192	192	.....
15	345	560	395	220	192	185	192	192	.....
16	378	492	430	220	192	185	192	192	.....
17	395	492	395	240	192	185	185	192	.....
18	412	582	395	275	192	192	178	192	.....
19	430	515	395	262	192	178	185	178	.....
20	430	515	395	300	192	178	192	178	.....
21	470	430	360	275	192	178	192	192	.....
22	395	395	330	275	192	178	185	178	.....
23	315	470	330	330	185	192	185	178	.....
24	300	560	330	330	185	192	178	178	.....
25	300	655	360	275	185	192	178	185	.....
26	300	630	330	275	185	192	178	185	.....
27	470	655	300	240	185	192	192	185	.....
28	560	655	300	230	185	185	178	178	.....
29	748	748	300	230	185	185	178	178	.....
30	685	850	275	210	185	185	178	178	.....
31	.....	780	.....	210	185	.....	178	.....	.....

Monthly discharge of North Fork of White River near Buford, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April 11-30	748	210	392	15,600
May	850	395	624	38,400
June	780	275	457	27,200
July	330	210	247	15,200
August	210	185	195	12,000
September	192	178	188	11,200
October	201	178	186	11,400
November	201	178	184	10,900
December 1-10	185	178	179	3,550
The period	.....	.....	.....	145,000

NOTE.—Monthly discharge computed by engineers of the United States Geological Survey.

WHITE RIVER AT MEEKER, COLO.

Location.—In sec. 29, T. 1 N., R. 93 W., at Reis Bridge, since October 20, 1913, previous to that date, 3 miles farther downstream, in sec. 23, T. 1 N., R. 94 W., at Van Cleave's ranch, one-half mile southeast of Meeker. Nearest tributary above, Curtis Creek; nearest below, Sulphur Creek.

Records available.—May 7, 1910, to November 14, 1913. A station was also maintained at this point by the United States Geological Survey from May 24, 1901, to October 31, 1906.

Drainage area.—634 square miles. (Area for lower station.)

Gage.—Automatic recording gage.

Control.—Permanent at original station. Data insufficient to determine control for new location.

Discharge measurements.—Made from highway bridge.

Diversions.—There are court decrees for the diversion of 186 second-feet from White River above the station and 59 second-feet from tributaries entering above. There are also decrees for the diversion of 198 second-feet from White River below the station. During the winter of 1912–13 the Meeker power canal was finished and an average of 90 second-feet was diverted three-fourths mile above the old station. Although the station was not moved above this diversion until October 20, 1913, an allowance was made so that the records for the entire year include the amount diverted by the power canal.

Cooperation.—Records furnished and station maintained by the State engineer.

Discharge measurements of White River at Meeker, Colo., for 1913.

[Made by C. L. Chatfield.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Feb. 7	(a)	362	July 23	1.20	554
May 21	2.10	1,027	Sept. 11	.87	370
24	2.32	1,306	Oct. 21	.78	305

a Discharge relation affected by ice.

Daily gage height, in feet, of White River at Meeker, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	1.70	3.0	1.45	0.90	0.90	0.85	0.65
2	.....	1.7	3.0	1.4	.90	.95	.85	.65
3	.....	1.55	2.85	1.35	.85	.85	.90	.60
4	.....	1.4	2.7	1.35	.85	.90	.90	.60
5	.....	1.5	2.65	1.35	.90	.85	.90	.60
6	.....	1.75	2.5	1.3	.85	.90	.90	.65
7	.....	2.0	2.35	1.25	.85	.90	.85	.65
8	.....	1.9	2.25	1.25	.85	.80	.90	.65
9	.....	1.9	2.2	1.25	.85	.80	.90	.65
10	.....	2.05	2.2	1.3	.85	.90	.85	.60
11	.....	2.25	2.25	1.25	.85	.90	.90	.60
12	.....	2.2	2.15	1.25	.80	.90	.90	.60
13	1.0	2.25	2.15	1.2	.80	.95	.90	.65
14	1.1	2.10	2.05	1.15	.80	1.0	.85	.70
15	1.25	1.85	2.0	1.2	.80	.95	.85	.....
16	1.25	1.65	1.95	1.2	.80	.95	.85	.....
17	1.4	1.6	2.0	1.2	.75	.90	.85	.....
18	1.35	1.65	1.8	1.3	.75	.85	.85	.....
19	1.45	2.05	1.85	1.35	.75	.85	.85	.....
20	1.5	2.1	1.85	1.4	.70	.85	.75	.....
21	1.6	2.05	1.8	1.4	.70	.80	.60	.....
22	1.5	2.0	1.75	1.3	.75	.90	.60	.....
23	1.3	2.15	1.7	1.35	.80	1.0	.70	.....
24	1.15	2.3	1.7	1.3	.75	.90	.70	.....
25	1.1	2.35	1.75	1.2	.75	.90	.70	.....
26	1.05	2.55	1.75	1.15	.75	.95	.65	.....
27	1.15	2.7	1.75	1.05	.75	.9	.65	.....
28	1.45	2.7	1.65	1.0	.80	.85	.65	.....
29	1.65	2.85	1.6	1.0	.85	.80	.65	.....
30	1.85	3.3	1.55	.95	.90	.85	.65	.....
31	.....	3.15	.....	.95	.90	.....	.65	.....

Daily discharge, in second-feet, of White River at Meeker, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	860	1,830	700	395	395	370	272
2	.....	860	1,830	670	395	420	370	272
3	.....	762	1,705	640	370	370	395	250
4	.....	670	1,585	640	370	395	395	250
5	.....	730	1,545	640	395	370	395	250
6	.....	892	1,430	610	370	395	395	272
7	.....	1,065	1,318	580	370	395	370	272
8	.....	995	1,242	580	370	345	395	272
9	.....	995	1,205	580	370	345	395	272
10	.....	1,100	1,205	610	370	395	370	250
11	.....	1,242	1,242	580	370	395	395	250
12	.....	1,205	1,170	580	345	395	395	250
13	445	1,242	1,170	550	345	420	395	272
14	495	1,135	1,100	522	345	445	370	295
15	580	960	1,065	550	345	420	370	.....
16	580	828	1,030	550	345	420	370	.....
17	670	795	1,065	550	322	395	370	.....
18	640	828	925	610	322	370	370	.....
19	700	1,100	960	640	322	370	370	.....
20	730	1,135	960	670	300	370	320	.....
21	795	1,100	925	670	300	345	250	.....
22	730	1,065	892	610	322	395	250	.....
23	610	1,170	860	640	345	445	295	.....
24	522	1,280	860	610	322	395	295	.....
25	495	1,318	892	550	322	395	295	.....
26	470	1,468	892	522	322	420	272	.....
27	522	1,585	892	470	322	395	272	.....
28	700	1,585	828	445	345	370	272	.....
29	828	1,705	795	445	370	345	272	.....
30	960	2,080	762	420	395	370	272	.....
31	.....	1,958	.....	420	395	.....	272	.....

Monthly discharge of White River at Meeker, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April 13–30	960	445	637	22,700
May	2,080	670	1,150	70,700
June	1,830	762	1,140	67,800
July	700	420	576	35,400
August	395	300	351	21,600
September	445	345	390	23,200
October	395	250	342	21,000
November 1–14	295	250	264	7,330
The period	.....	.....	.....	270,000

NOTE.—Monthly discharge computed by engineers of the United States Geological Survey.

SOUTH FORK OF WHITE RIVER NEAR BUFORD, COLO.

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

Records available.—June 1, 1910, to November 30, 1913. A station was also maintained at this point by the United States Geological Survey from July 25, 1903, to October 31, 1906.

Drainage area.—148 square miles (measured on Hayden's atlas).

Gage.—Vertical staff.

Control.—Fairly permanent.

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

Winter flow.—Ice causes backwater during the winter; observations discontinued.

Diversions.—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 also a diversion of 9.2 second-feet from tributaries entering above the station.

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

Discharge measurements of South Fork of White River near Buford, Colo., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharg.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 22	C. L. Chatfield	1.95	487	July 22	C. L. Chatfield	0.75	199
23	do	2.60	644	Oct. 21	do	.45	166
24	do	3.00	804				

Daily gage height, in feet, of South Fork of White River near Buford, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	0.80	1.0	5.40	1.35	0.75	0.45	0.50	0.45
2	.80	1.0	5.25	1.35	.75	.45	.50	.45
3	.80	1.0	4.55	1.25	.75	.50	.50	.45
4	.80	1.05	4.1	1.25	.75	.50	.50	.40
5	.80	1.1	3.5	1.2	.70	.50	.50	.40
6	.85	1.4	3.3	1.1	.70	.50	.50	.40
7	.90	1.9	3.1	1.0	.65	.45	.50	.35
8	.90	1.75	2.9	1.0	.65	.45	.40	.35
9	1.0	1.75	2.9	1.0	.65	.45	.40	.30
10	1.0	2.2	2.6	1.0	.60	.40	.50	.30
11	1.0	2.4	2.4	1.0	.60	.40	.50	.35
12	1.1	2.65	2.4	.95	.60	.40	.40	.40
13	1.1	2.95	2.3	.95	.60	.40	.40	.45
14	1.1	2.75	2.4	.90	.50	.40	.50	.45
15	1.15	2.65	2.35	.90	.50	.40	.45	.40
16	1.15	2.5	2.2	1.0	.50	.40	.45	.40
17	.90	2.05	2.1	1.0	.50	.40	.40	.40
18	.95	2.2	2.05	1.0	.45	.40	.40	.40
19	.95	2.2	2.0	1.0	.40	.40	.40	.40
20	1.0	2.05	2.0	1.0	.40	.40	.45	.40
21	.95	2.0	1.95	1.0	.40	.40	.45	.40
22	.95	2.05	1.95	1.0	.40	.40	.50	.40
23	1.0	2.4	1.85	1.0	.40	.40	.50	.40
24	.95	3.05	1.75	.95	.40	.45	.50	.40
25	.85	3.1	1.75	.95	.40	.45	.50	.40
26	.90	4.05	1.65	.90	.40	.50	.45	.40
27	.80	4.4	1.65	.90	.40	.45	.45	.45
28	.80	4.2	1.55	.90	.40	.40	.45	.45
29	.80	4.8	1.45	.80	.40	.40	.45	.45
30	.95	5.4	1.45	.80	.40	.40	.45	.45
31	.....	5.4	.....	.75	.40	.....	.45	.....

Daily discharge, in second-feet, of South Fork of White River near Buford, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	216	260	1,644	342	205	142	152	142
2	216	260	1,586	342	205	142	152	142
3	216	260	1,325	318	205	152	152	142
4	216	272	1,165	318	205	152	152	131
5	216	283	959	306	194	152	152	131
6	227	354	894	283	194	152	152	131
7	238	483	831	260	184	142	152	120
8	238	443	769	260	184	142	131	120
9	260	443	769	260	184	142	131	110
10	260	564	678	260	173	131	152	110
11	260	620	620	260	173	131	152	120
12	283	693	620	249	173	131	131	131
13	283	784	592	249	173	131	131	142
14	283	723	620	238	152	131	152	142
15	294	693	606	238	152	131	142	131
16	294	649	564	260	152	131	142	131
17	238	524	537	260	152	131	131	131
18	249	564	524	260	142	131	131	131
19	249	564	510	260	131	131	131	131
20	260	524	510	260	131	131	142	131
21	249	510	496	260	131	131	142	131
22	249	524	496	260	131	131	152	131
23	260	620	470	260	131	131	152	131
24	249	816	443	249	131	142	152	131
25	227	831	443	249	131	142	152	131
26	238	1,148	417	238	131	152	142	131
27	216	1,271	417	238	131	142	142	142
28	216	1,200	392	238	131	131	142	142
29	216	1,416	366	216	131	131	142	142
30	249	1,644	366	216	131	131	142	142
31	.....	1,644	.....	205	131	.....	142	.....

Monthly discharge of South Fork of White River near Buford, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April	294	216	246	14,600
May	1,640	260	696	42,800
June	1,640	366	688	40,900
July	342	205	262	16,100
August	205	131	158	9,720
September	152	131	137	8,150
October	152	131	144	8,850
November	142	110	132	7,860
The period	.....	.....	.....	149,000

NOTE.—Monthly discharge computed by engineers of the United States Geological Survey.

PRICE RIVER BASIN.

PRICE RIVER NEAR HELPER, UTAH.

Location.—In sec. 36, T. 13 S., R. 9 E., at settlement known locally as Spring Glenn, 2½ miles south of Helper, about 2 miles above 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 the mouth of White Creek.

Records available.—February 21, 1904, to December 31, 1913.

Drainage area.—530 square miles.

Gage.—Vertical staff on left bank.

Control.—Shifting during sudden floods.

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

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

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

Floods.—Maximum recorded flood occurred July 19, 1913, with a discharge of about 4,500 second-feet.

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

Accuracy.—Records good.

Discharge measurements of Price River near Helper, Utah, for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 4	W. R. King	3.10	194	Aug. 28	Lynn Crandall	2.82	41
June 12	do	3.20	182	30	do	2.74	33.2
July 2	M. D. Anderson	3.00	110	Nov. 11	Bennett and Batchelder.	2.72	42.3
26	do	3.00	74	Dec. 31	C. L. Batchelder	2.54	23.6

Daily gage height, in feet, at Price River near Helper, Utah, for 1913.

[Mrs. Ada Ostberg and David S. Rowley, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.6	2.6	3.2	4.75	3.70	3.45	3.75	3.00	2.78	2.75	2.70	2.70
2	2.65	2.6	2.6	5.3	3.68	3.40	3.25	3.34	2.70	2.70	2.70	2.70
3	3.55	2.6	2.7	3.25	3.60	3.55	3.00	3.10	2.90	2.70	2.80	2.90
4	2.6	2.7	2.65	3.12	3.50	3.65	3.00	3.10	2.90	2.68	2.80	2.80
5	2.6	2.6	2.7	3.50	3.60	3.65	3.00	3.10	2.80	2.80	2.80	2.60
6	2.6	2.55	2.65	3.40	3.60	3.65	3.00	3.10	2.85	2.80	2.79	2.60
7	2.6	2.6	2.6	3.05	3.59	3.58	2.98	3.05	2.95	2.80	2.78	2.70
8	2.6	2.5	2.7	3.12	3.61	3.52	2.98	3.05	4.6	2.80	2.78	2.62
9	2.65	2.55	2.7	3.20	3.78	3.30	3.00	3.38	3.00	2.80	2.78	2.65
10	2.65	2.6	2.8	3.18	3.80	3.25	3.05	3.12	2.88	2.80	2.78	2.60
11	2.7	2.65	2.7	3.60	3.85	3.20	3.00	2.95	2.80	2.80	2.73	2.50
12	2.6	2.65	2.7	3.68	3.85	3.20	2.95	2.85	2.78	2.80	2.78	2.58
13	2.6	2.7	2.7	3.60	3.92	3.15	2.91	2.90	2.75	2.80	2.88	2.51
14	2.6	2.65	2.7	3.70	3.95	3.75	2.90	2.90	2.75	2.70	2.83	2.50
15	2.6	2.65	2.7	3.75	3.85	3.10	2.90	2.88	2.88	2.70	2.82	.....
16	2.6	2.65	2.7	3.80	3.80	3.00	2.90	2.80	2.80	2.70	2.80	.....
17	2.55	2.6	2.75	3.70	3.79	3.00	2.90	2.72	2.71	2.72	2.75	2.60
18	2.5	2.65	2.8	3.80	3.75	3.00	2.95	2.65	2.70	2.80	2.78	.....
19	2.5	2.7	2.8	3.65	3.75	3.10	5.52	2.70	2.70	2.78	2.78	.....
20	2.5	2.65	2.75	3.50	3.72	3.10	3.10	2.68	2.70	2.78	2.80	2.60
21	2.55	2.6	2.8	3.80	3.70	3.20	3.19	2.68	2.70	2.75	2.75	2.80
22	2.6	2.6	2.6	3.52	3.62	3.20	3.30	2.70	2.70	2.70	2.75	.....
23	2.6	2.6	2.7	3.50	3.58	3.00	3.80	2.65	2.70	2.70	2.40	.....
24	2.5	2.55	2.75	3.80	3.58	3.00	3.20	3.15	2.85	2.70	2.60	2.60
25	3.5	2.55	2.7	3.45	3.60	3.00	3.18	2.80	2.80	2.70	2.80	.....
26	2.8	2.5	2.8	3.45	3.68	3.10	3.00	2.80	2.80	2.70	2.75	.....
27	2.7	2.5	2.8	3.50	3.70	3.12	2.95	2.80	2.80	2.70	2.75	2.62
28	2.7	2.55	2.75	3.60	3.70	3.20	2.95	2.82	2.75	2.72	2.72	2.62
29	2.7	.....	2.75	3.70	3.60	3.80	3.05	2.70	2.75	2.70	2.90	2.55
30	2.65	.....	4.4	3.70	3.65	3.10	3.00	2.75	2.7	2.70	2.65	.....
31	2.6	.....	3.65	.....	3.61	.....	3.03	2.70	.....	2.70	.....	2.54

NOTE.—On July 19 river rose to a height of 8.0 feet on the gage. Discharge relation affected by ice Jan. 3, 11, 25–29; Feb. 4, 13, 19; Mar. 1; Nov. 25, 29; Dec. 3, 4, 9, and 21.

Daily discharge, in second-feet, of Price River near Helper, Utah, for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	18	18	16	1,370	480	318	514	77	39	48	41	41
2	24	18	18	2,020	466	288	206	172	29	41	41	41
3	21	18	29	264	412	380	110	99	58	41	55	35
4	18	18	24	203	348	446	110	99	58	39	55	35
5	18	18	29	410	412	446	110	99	42	55	55	29
6	18	14	24	348	412	446	110	99	53	55	54	29
7	18	18	18	176	406	399	106	88	75	55	52	41
8	18	9	29	203	419	361	106	88	1,140	55	52	31
9	24	14	29	238	534	232	110	191	100	55	52	21
10	24	18	42	229	548	206	125	104	71	55	52	29
11	21	24	29	474	582	180	110	68	55	55	45	21
12	18	24	29	527	582	180	100	50	52	55	52	27
13	18	24	29	474	630	160	92	58	48	55	71	22
14	18	24	29	540	650	514	90	58	48	41	61	21
15	18	24	29	575	582	140	90	55	71	41	59	24
16	18	24	29	610	548	110	90	42	55	41	55	26
17	14	18	36	540	541	110	90	32	42	44	48	29
18	9	24	42	610	514	110	100	24	41	55	52	29
19	9	24	42	507	514	140	2,100	29	41	52	52	29
20	9	24	36	410	494	140	99	27	41	52	55	29
21	14	18	42	596	480	180	121	27	41	48	48	29
22	18	18	18	398	426	180	153	29	41	41	48	29
23	18	18	29	373	399	110	450	24	41	41	16	29
24	9	14	36	554	399	110	123	111	65	41	29	29
25	11	14	29	318	412	110	118	42	55	41	30	29
26	14	9	42	318	466	140	77	42	55	41	48	30
27	16	9	42	348	480	148	68	42	55	41	48	31
28	18	14	36	412	480	180	68	45	48	44	44	31
29	20	.....	36	480	412	548	88	29	48	41	35	25
30	24	.....	943	480	446	140	77	36	41	41	35	25
31	18	.....	416	.....	419	.....	84	29	.....	41	.....	24

NOTE.—Discharge determined by indirect method for shifting channels. Discharge estimated for days on which discharge relation was affected by ice.

Monthly discharge of Price River near Helper, Utah, for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	24	9	17.2	1,060	C.
February	24	9	18.2	1,010	C.
March	943	16	72.8	4,480	B.
April	2,020	176	500	29,800	B.
May	650	348	480	29,500	B.
June	548	110	238	14,200	B.
July	2,100	68	193	11,900	B.
August	191	24	65.0	4,000	A.
September	1,140	29	88.3	5,250	B.
October	55	39	46.8	2,880	B.
November	71	16	48.0	2,860	B.
December	41	21	29.1	1,790	C.
The year	2,100	9	150	109,000	

NOTE.—A flood occurred July 19 which lasted 1½ hours; maximum discharge approximately 4,500 second-feet.

SAN RAFAEL RIVER BASIN.

HUNTINGTON CREEK (HEAD OF SAN RAFAEL RIVER) NEAR HUNTINGTON, UTAH.

Location.—In sec. 6, T. 17 S., R. 8 E., at the Cunha ranch, about 7 miles northwest of Huntington; below all main tributaries except Fish Creek.

Records available.—May 3, 1909, to December 31, 1913.

Drainage area.—158 squre miles.

Gage.—Stevens automatic May 1 to November 24, 1913; vertical and inclined staffs during other periods.

Control.—Shifting at extremely high stages.

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

Winter flow.—Stream frozen over during greater part of winter; estimates of discharge approximate.

Diversions.—Above all diversions from main stream except Cunha's ditch. Several small ditches divert from tributaries above station.

Regulation.—A small storage reservoir on Huntington Creek above station controls slightly the distribution of flow.

Accuracy.—Records fair except during winter.

Discharge measurements of Huntington Creek near Huntington, Utah, for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 5	W. R. King	2.80	69.1	June 27	C. T. Cannon	3.70	177
27	do	3.53	252	July 27	O. M. Gibbens	3.36	119
30	do	3.76	310	Aug. 16	do		63.6
May 9	do	4.18	337	21	Lynn Crandall	2.92	60.6
June 3	do	4.41	282	27	do	2.93	64.8
9	do	4.16	225	Nov. 14	Batchelder and Bennett	2.58	36.7
26	King and Cannon	3.61	168				

NOTE.—Beginning Apr. 30, gage heights refer to datum of automatic gage.

Daily gage height, in feet, of Huntington Creek near Huntington, Utah, for 1913.

[Joseph Cunha, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.0	3.3	3.0	2.65	3.74	4.6	3.6	.....	2.85	.....	2.69	.....
2	3.0	.....	3.0	2.75	3.36	4.52	3.61	.....	3.01	.....	2.77	.....
3	3.0	3.3	3.05	2.75	3.4	4.47	3.48	.....	3.17	.....	2.83	.....
4	3.1	3.3	3.05	2.85	3.48	4.42	3.38	.....	2.97	.....	2.77	.....
5	3.1	3.3	3.05	2.85	3.65	4.34	3.34	.....	2.86	.....	2.73	.....
6	3.1	3.3	3.05	2.95	3.73	4.28	3.3	.....	2.87	.....	2.72	.....
7	3.1	3.3	3.05	2.95	4.22	4.26	3.3	.....	2.97	.....	2.71	.....
8	3.1	3.3	3.05	3.05	4.3	4.22	3.48	.....	3.44	.....	2.70	2.5
9	3.2	.....	3.05	3.05	4.43	4.13	3.5	.....	3.16	2.64	.....	.....
10	3.2	.....	3.05	3.05	4.6	4.09	3.61	.....	3.01	2.78	.....	3.0
11	3.2	3.3	3.0	3.10	4.7	4.00	3.48	.....	2.99	2.78	.....	.....
12	.....	3.2	3.0	3.15	4.72	3.98	3.42	.....	2.99	2.86	.....	3.5
13	3.2	3.2	3.05	3.15	4.52	3.9	.....	.....	3.01	2.84	2.75	.....
14	3.2	3.2	3.05	3.25	4.31	3.93	.....	.....	3.11	2.83	2.72	.....
15	.....	3.2	3.0	3.25	4.31	3.95	.....	.....	.....	2.80	2.64	.....
16	3.2	.....	2.9	3.15	4.38	3.93	.....	2.93	.....	2.77	2.57	.....
17	3.2	.....	2.9	3.15	4.39	3.95	.....	.....	.....	2.73	2.74	.....
18	3.2	3.2	2.8	3.25	4.41	4.01	.....	.....	.....	2.76	2.71	.....
19	.....	3.2	2.8	3.25	4.39	3.94	.....	.....	.....	2.75	2.72	.....
20	3.2	3.2	2.9	3.25	4.29	3.93	.....	.....	.....	2.72	2.72	.....
21	3.2	3.2	2.8	3.15	4.22	3.87	.....	2.92	.....	2.72	2.70	.....
22	3.2	3.2	2.8	3.15	4.28	3.81	.....	2.92	.....	2.68	2.46	3.2
23	3.2	3.2	2.75	3.25	4.47	3.73	.....	2.97	.....	2.67	2.53	.....
24	3.2	3.1	2.75	3.25	4.62	3.68	.....	3.06	.....	2.68	2.70	.....
25	3.2	3.1	2.75	3.25	4.7	3.65	.....	3.07	2.89	2.68	.....	.....
26	.....	3.1	2.65	3.15	4.77	3.67	.....	2.93	2.82	2.61	.....	.....
27	.....	3.0	2.65	3.53	4.74	3.74	3.38	2.92	2.78	2.67	.....	.....
28	3.3	3.0	2.65	.....	4.78	3.65	3.4	2.89	2.72	2.68	.....	.....
29	3.3	.....	2.65	4.0	4.73	3.58	3.21	2.93	2.69	2.66	.....	3.05
30	3.3	.....	2.65	3.85	4.62	3.48	3.16	2.90	2.66	2.69	.....	.....
31	3.3	.....	2.65	.....	4.62	.....	3.14	3.00	.....	2.71	.....	.....

NOTE.—Beginning May 1, gage heights refer to datum of automatic gage. Gage heights during December read on staff gage. Discharge relation affected by ice Jan. 1 to Mar. 25 and Dec. 10–31.

Daily discharge, in second-feet, of Huntington Creek near Huntington, Utah, for 1913.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	46	248	358	162	85	58	44	44	.....
2	.....	61	120	328	164	85	72	44	51	.....
3	.....	61	126	309	140	85	92	44	56	.....
4	.....	80	140	291	123	85	68	44	51	.....
5	.....	80	173	266	116	85	58	44	47	.....
6	.....	100	192	249	110	75	59	46	47	.....
7	.....	100	356	243	110	75	68	48	46	.....
8	.....	122	390	232	140	75	133	46	45	32
9	.....	122	448	208	144	75	90	41	44	.....
10	.....	122	528	201	164	75	72	51	42	.....
11	.....	134	578	184	140	70	70	51	48	.....
12	.....	146	588	187	130	70	70	58	51	.....
13	.....	146	490	173	125	65	72	57	48	.....
14	.....	170	394	187	125	65	83	56	47	.....
15	.....	170	394	198	125	65	81	53	41	.....
16	.....	146	425	201	125	65	79	51	36	.....
17	.....	146	430	212	125	65	77	47	48	.....
18	.....	170	439	239	125	65	75	50	46	.....
19	.....	170	430	224	125	64	73	49	47	.....
20	.....	170	386	230	125	64	72	47	47	.....
21	.....	146	356	218	125	64	70	47	45	.....
22	.....	146	342	212	125	64	68	44	30	.....
23	.....	170	403	192	125	68	66	43	34	.....
24	.....	170	434	180	125	78	63	44	45	.....
25	.....	170	434	173	125	79	61	44	.....	.....
26	46	146	429	177	125	65	55	39	.....	.....
27	46	245	417	195	123	64	51	43	.....	.....
28	46	322	434	173	126	61	47	44	.....	.....
29	46	398	413	158	97	65	44	42	.....	.....
30	46	345	366	140	90	62	42	44	.....	.....
31	46	.....	366	.....	88	71	.....	46	.....	.....

NOTE.—Discharge determined from three fairly well defined rating curves and by the indirect method for shifting channels. For days for which gage heights are missing, discharge estimated by comparison with records at nearby station.

Monthly discharge of Huntington Creek near Huntington, Utah, for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	a 25.0	1,540	D.
February	.....	.....	a 30.0	1,670	D.
March	.....	.....	a 41.2	2,530	D.
April	398	46	157	9,340	B.
May	588	120	376	23,100	B.
June	358	140	218	13,000	B.
July	164	88	126	7,750	C.
August	85	61	70.9	4,360	C.
September	133	42	69.6	4,140	B.
October	58	39	46.8	2,880	B.
November	56	.....	a 43.2	2,570	B.
December	.....	.....	a 48.0	2,950	D.
The year	588	.....	105	75,800	

a Estimated by hydrograph comparison with adjacent stations.

HUNTINGTON CREEK NEAR CASTLEDALE, UTAH.

Location.—In sec. 33, T. 18 S., R. 9 E., about 5½ miles east of Castledale, and about 6 miles southeast of Huntington; about 4 miles above mouth of Cottonwood Creek.

Records available.—May 12, 1911, to December 31, 1913.

Drainage area.—350 square miles.

Gage.—Stevens automatic May 2 to November 15, 1913; vertical staff during other periods.

Control.—Sand and gravel; liable to shift during medium or high stages.

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

Winter flow.—Discharge relation at times affected by ice.

Diversions.—Station is below all diversions and shows unutilized flow of the stream.

Accuracy.—Records poor owing to unreliable gage heights.

Discharge measurements of Huntington Creek near Castledale, Utah, for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 26	W. R. King	3.19	164	Aug. 22	Lynn Crandall	1.70	7.4
June 4	do	2.51	99.2	26	do	1.74	9.2
8	do	2.02	40.9	Nov. 15	Batchelder and Bennett	2.02	34.6
28	C. T. Cannon	2.15	40.5				
28	King and Cannon	2.16	48.9	18	do	2.00	34.3

Daily gage height, in feet, of Huntington Creek near Castledale, Utah, for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.6	2.90	3.07			1.80			
2		2.90	3.13			1.95			
3		2.97	2.96			1.90			1.8
4		2.99	2.42			1.83		1.85	
5		3.11	2.78			1.79			
6		3.49	2.98			1.77		1.85	
7		3.53	2.30			1.80			1.8
8		3.64	2.21			5.5			
9		3.59	2.18					1.87	
10		3.57	2.26						1.85
11		3.88	2.43						
12		4.10	2.72	1.78					
13		3.95	2.46	1.78				1.85	1.9
14		3.33	2.39	1.78					
15		3.16	2.50	1.76				2.02	
16		3.15	2.37	1.75					1.9
17		3.22	2.34	1.61				1.85	
18		3.27	2.32	1.88				2.00	1.85
19		3.33	2.31	1.90			1.82		
20		3.12	2.31						
21		2.61	2.31					1.80	
22		2.48	2.31		1.70				
23		2.60	2.31		1.71		1.80		
24		2.93	2.31		1.70				1.87
25		3.32	2.08		1.74				
26	3.19	3.55	2.01		1.72			1.82	
27		3.35	2.04		1.72		1.80		1.85
28		3.26	2.12		1.72				1.8
29		3.41	2.11		1.72			1.80	
30		3.45	2.04		1.72		1.85		
31		3.18			1.73				

NOTE.—Flood occurred Sept. 3, which reached a maximum gage height of approximately 11.3 feet.

Daily discharge, in second-feet, of Huntington Creek near Castledale, Utah, for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	85	123	146	.....	.....	13	.....	22	18
2	.....	123	154	.....	.....	24	.....	22	18
3	.....	132	131	.....	.....	20	.....	22	18
4	.....	135	65	.....	.....	15	.....	22	18
5	.....	152	107	.....	.....	12	.....	22	18
6	.....	211	133	.....	.....	12	.....	22	18
7	.....	218	53	.....	.....	13	.....	22	18
8	.....	237	45	.....	.....	580	.....	23	19
9	.....	228	42	.....	.....	.....	.....	23	21
10	.....	225	49	.....	.....	.....	.....	23	22
11	.....	278	66	.....	.....	.....	.....	23	23
12	.....	315	100	12	.....	.....	.....	22	24
13	.....	290	70	12	.....	.....	.....	22	25
14	.....	186	62	12	.....	.....	.....	28	25
15	.....	159	74	11	.....	.....	.....	35	25
16	.....	158	60	10	.....	.....	.....	28	25
17	.....	168	57	4.4	.....	.....	.....	22	23
18	.....	176	55	19	.....	.....	.....	33	22
19	.....	186	54	20	.....	.....	19	28	22
20	.....	153	54	.....	.....	.....	19	23	22
21	.....	86	54	.....	.....	.....	18	18	23
22	.....	72	54	.....	8	.....	18	18	23
23	.....	85	54	.....	8.5	.....	18	18	23
24	.....	127	54	.....	8	.....	18	19	23
25	.....	184	33	.....	10	.....	18	19	23
26	164	222	28	.....	9	.....	18	19	22
27	.....	189	30	.....	9	.....	18	19	22
28	.....	175	37	.....	9	.....	19	18	18
29	.....	199	36	.....	9	.....	21	18	20
30	.....	205	30	.....	9	.....	22	18	20
31	.....	162	.....	.....	9.5	.....	22	.....	26

NOTE.—Discharge determined from a fairly well-defined rating curve, except as follows: For days for which gage geights are missing, estimated by comparison with records at nearby stations; July 1–11 estimated at 20 second-feet; July 20–31, 12 second-feet; Aug. 1–21, 10 second-feet; Sept. 9–30, 20 second-feet, Oct. 1–18, 18 second-feet.

Monthly discharge of Huntington Creek near Castledale, Utah, for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
May	315	72	179	11,000	B.
June	154	28	66.2	3,940	B.
July	.....	.....	15.0	922	D.
August	.....	.....	9.65	593	D.
September	580	.....	37.6	2,240	D.
October	.....	.....	18.5	1,140	D.
November	35	18	22.4	1,330	C.
December	26	18	21.5	1,320	C.
The period	.....	.....	.....	22,500	

NOTE.—A flood occurred Sept. 8; maximum discharge approximately 1,750 second-feet.

SAN RAFAEL RIVER NEAR GREENRIVER, UTAH.

Location.—In sec. 27, T. 22 S., R. 14 E., at the county bridge near the Tomlinson ranch, on the main road from Greenriver to Hanksville, about 16 miles southwest of Greenriver.

Records available.—May 5, 1909, to December 31, 1913.

Drainage area.—1,690 square miles.

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

Control.—Mud; shifting.

Discharge measurements.—Made by wading or from cable.

Winter flow.—Discharge relation affected by ice.

Diversion.—None below station; records indicate total run-off from the San Rafael drainage after all present rights are satisfied.

Accuracy.—Records only fair, owing to lack of discharge measurements.

Discharge measurements of San Rafael River near Greenriver, Utah, for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 11	W. R. King	2.26	94.2	Aug. 29	Lynn Crandall	1.53	19.3
June 11	do	4.00	493	Nov. 26	Batchelder and Bennett.	2.34	82.4

Daily gage height, in feet, of San Rafael River near Greenriver, Utah, for 1913.

[Paul Herron and Mrs. W. E. Tomlinson, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	3.2	2.5	4.8	5.5	5.2	3.2	2.1	2.0	2.0	2.0	2.55
2	.....	3.2	2.8	4.6	6.1	5.4	3.0	1.88	3.35	2.1	2.1	2.52
3	.....	3.2	2.5	3.7	6.1	5.6	2.9	1.0	3.3	2.25	2.22	2.45
4	.....	3.2	2.5	3.10	5.8	5.7	2.7	0.75	3.0	2.05	4.2	2.45
5	2.7	3.2	2.65	2.72	4.9	4.2	2.6	0.85	3.05	2.35	3.35	2.45
6	2.7	3.2	2.55	2.85	4.2	4.6	2.4	1.05	3.8	2.55	3.1	2.4
7	2.7	3.2	2.45	2.68	4.1	4.6	2.35	1.4	1.95	3.05	2.8	2.22
8	2.7	3.2	2.45	2.6	4.0	4.6	2.25	1.45	4.0	2.85	2.55	2.2
9	2.7	3.2	2.35	2.5	4.0	4.4	2.12	1.4	6.8	2.5	2.5	2.2
10	2.7	3.2	2.45	2.35	4.1	4.1	2.22	1.45	4.4	2.25	2.4	2.3
11	2.7	3.2	2.45	2.25	4.6	4.0	2.18	4.2	3.5	2.25	2.4	2.3
12	2.7	3.2	2.35	2.2	4.6	4.0	2.2	3.5	3.45	2.25	2.32	2.3
13	2.7	3.2	2.25	2.5	5.0	3.9	2.1	2.25	2.95	2.3	2.5	2.3
14	2.7	3.2	2.35	2.9	4.8	3.75	2.15	1.95	3.1	2.2	2.65	2.3
15	2.7	3.2	2.4	3.15	4.5	3.55	2.05	1.85	2.95	2.25	2.65	2.3
16	2.7	3.2	2.55	3.0	4.5	3.55	2.0	1.7	3.15	2.4	2.58	2.35
17	2.7	3.2	2.45	3.3	4.4	3.6	2.0	1.6	2.15	2.3	2.4	2.3
18	2.7	3.2	2.35	3.2	4.6	3.25	2.0	1.55	2.35	2.25	2.4	2.3
19	2.7	3.2	2.35	3.60	4.6	2.9	2.35	1.25	2.4	2.25	2.38	2.25
20	2.7	3.2	2.55	3.2	4.8	2.7	3.3	1.0	2.3	2.2	2.42	2.25
21	2.7	3.2	2.6	3.0	4.8	2.40	3.45	0.95	2.15	2.1	2.48	2.2
22	2.7	3.2	2.55	3.2	5.0	2.3	3.6	0.6	2.0	2.1	2.4	2.3
23	2.7	3.0	2.6	3.25	5.3	2.3	3.75	0.6	1.85	2.05	2.4	.....
24	2.7	3.0	2.55	3.0	5.4	2.22	3.9	1.63	1.75	2.0	2.4	.....
25	2.7	3.0	2.55	3.25	5.6	2.3	3.65	1.15	1.55	2.0	2.35	.....
26	2.7	2.9	2.6	3.3	5.6	2.3	3.05	1.4	1.3	2.0	2.34	.....
27	2.7	2.75	2.55	3.3	5.6	2.45	2.9	1.4	0.9	1.95	.....	.....
28	3.1	2.65	2.5	3.5	5.8	3.1	2.7	.....	1.25	1.98	2.3	.....
29	3.1	.....	2.55	3.8	5.9	3.4	2.35	1.75	1.3	2.0	2.3	.....
30	3.1	.....	2.5	4.4	5.9	3.2	2.2	1.6	2.0	2.1	2.32	.....
31	3.15	.....	2.75	.....	5.4	.....	2.1	1.8	.....	2.0	.....	.....

NOTE.—Discharge relation affected by ice during January and February and Dec. 10–31.

Daily discharge, in second-feet, of San Rafael River near Greenriver, Utah, for 1913.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	135	1,060	1,570	1,140	224	44	39	46	46	120
2	205	930	1,980	1,280	178	33	265	54	54	114
3	135	480	1,910	1,420	158	6	250	68	65	100
4	135	285	1,570	1,490	120	4	178	50	645	100
5	168	185	940	580	102	4	189	82	315	100
6	145	218	580	765	70	7	138	120	240	90
7	125	175	540	765	65	14	36	228	170	65
8	125	155	500	765	56	16	500	180	120	63
9	105	135	500	665	46	14	2,560	110	110	63
10	125	105	540	540	54	16	740	69	90	.....
11	125	88	765	500	50	580	360	69	90	.....
12	105	80	765	500	52	310	345	69	78	.....
13	88	135	1,000	460	44	56	202	75	110	.....
14	105	230	880	460	48	36	240	63	140	.....
15	115	300	715	325	42	32	202	69	140	.....
16	145	255	715	325	39	24	255	90	126	.....
17	125	345	665	340	39	20	58	75	90	.....
18	105	315	765	237	39	18	82	69	90	.....
19	105	445	765	158	65	11	90	69	87	.....
20	145	315	880	120	250	6	75	63	94	.....
21	155	255	880	70	295	6	58	54	106	.....
22	145	315	1,000	60	340	2	46	54	90	.....
23	155	330	1,210	60	400	2	37	50	90	.....
24	145	255	1,280	54	460	21	32	46	90	.....
25	145	330	1,420	60	360	9	24	46	82	.....
26	155	345	1,420	60	189	14	18	46	81	.....
27	145	345	1,420	77	158	14	8	43	78	.....
28	135	410	1,570	200	120	20	17	45	75	.....
29	145	520	1,650	280	65	26	18	46	75	.....
30	135	810	1,650	224	52	20	46	54	78	.....
31	192	.....	1,280	.....	44	29	.....	46	.....	.....

NOTE.—Discharge determined from three fairly well-defined rating curves; interpolated Aug. 28.

Monthly discharge of San Rafael River near Greenriver, Utah, for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	[a] 40	2,460	D.
February	.....	.....	[a] 50	2,780	D.
March	205	88	136	8,360	B.
April	1,060	80	338	20,100	B.
May	1,980	500	1,080	66,400	B.
June	1,490	54	464	27,600	B.
July	460	39	136	8,360	B.
August	580	2	52.8	3,250	B.
September	2,560	8	237	14,100	B.
October	228	43	72.5	4,460	B.
November	645	46	125	7,440	B.
December	120	.....	[a] 65.1	4,000	C.
The year	2,560	2	234	169,000	

[a] Estimated.

NOTE.—A flood occurred Sept. 9, which lasted for a few hours and had a maximum discharge of approximately 3,800 second-feet.

COTTONWOOD CREEK NEAR ORANGEVILLE, UTAH.

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

Records available.—May 1, 1909, to December 31, 1913.

Drainage area.—240 square miles.

Gage.—Inclined staff. Beginning November 24, 1913, gage heights refer to a gage installed 800 feet downstream at a new datum.

Control.—Shifting.

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

Floods.—Large floods of short duration occur during August and September.

Winter flow.—Discharge relation affected by ice at times during winter.

Diversions.—Johnson's ditch is only diversion above station.

Accuracy.—Records only fair, owing to shifting channel and infrequent readings of gage.

Discharge measurements of Cottonwood Creek near Orangeville, Utah, for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 6	W. R. King	5.76	42.8	June 6	W. R. King	7.45	605
May 4	do	6.51	149	Aug. 23	Lynn Crandall	5.71	37.0
June 5	do	7.46	569	Nov. 20	Batchelder and Bennett	[a] 5.70	27.8

[a] Gage installed on this date read 3.40 feet.

Daily gage height, in feet, of Cottonwood Creek near Orangeville, Utah, for 1913.

[Robert Johnson, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	.....	7.0	6.5	.....	6.5	6.0	5.6	5.8	.....	3.4
2	6.3	.....	.....	6.0	6.6	8.0	6.5	.....	6.1	5.8	.....	3.4
3	7.5	5.7	5.8	.....	6.6	7.9	6.5	.....	6.0	5.8	.....	3.5
4	6.5	.....	5.7	6.0	6.5	7.7	.....	6.0	5.8	5.8	5.7	.....
5	.....	5.7	.....	6.0	6.7	7.5	6.4	6.0	5.7	.....	5.7	3.9
6	6.5	5.7	5.7	5.8	7.0	7.6	.....	5.9	5.7	.....	5.7	4.0
7	.....	.....	.....	5.9	7.2	7.5	6.4	5.9	9.2	5.7	5.7	.....
8	6.6	5.7	5.7	5.9	7.2	.....	6.4	5.9	6.2	5.7	5.7	4.0
9	6.6	.....	.....	6.0	7.3	7.3	6.5	5.9	6.0	5.7	.....	.....
10	.....	.....	5.8	6.0	7.4	7.1	.....	.....	5.8	5.7	5.7	4.0
11	6.7	5.7	5.8	6.5	.....	7.0	6.3	5.9	5.8	5.7	.....	4.0
12	.....	5.7	.....	6.8	7.7	.....	6.3	.....	5.8	.....	5.7	.....
13	6.5	5.7	5.9	.....	7.8	6.8	.....	.....	5.8	5.7	.....	4.2
14	6.5	.....	5.8	6.4	7.5	6.9	6.3	5.8	.....	5.7	5.7	.....
15	6.5	5.7	5.7	.....	7.7	.....	.....	5.8	.....	5.7	5.7	4.4
16	.....	.....	.....	6.4	7.8	6.9	6.2	5.8	5.8	5.7	.....	.....
17	6.3	5.8	.....	6.6	7.8	6.9	6.2	.....	5.8	5.7	.....	4.2
18	6.0	.....	5.7	.....	.....	6.9	6.2	5.8	5.8	5.7	5.7	4.3
19	.....	5.8	5.6	6.2	7.7	6.9	6.2	5.8	5.7	.....	5.7	.....
20	.....	5.8	5.6	.....	7.7	.....	.....	5.8	5.7	5.7	5.7	4.1
21	6	.....	5.5	6.4	7.5	6.9	6.2	5.7	.....	5.7	.....	.....
22	6	5.9	5.5	6.2	7.8	.....	6.2	5.7	5.9	5.7	5.4	4.5
23	.....	.....	.....	6.1	8.0	6.8	6.8	5.7	5.8	5.7	.....	4.7
24	5.9	5.8	5.5	6.0	8.2	6.8	.....	.....	5.8	.....	4.0	4.7
25	5.9	5.7	5.5	6.0	.....	6.7	.....	5.7	5.8	5.7	.....	.....
26	.....	5.7	5.7	6.5	8.0	.....	6.0	.....	5.8	.....	3.5	4.7
27	5.8	.....	.....	.....	8.0	6.9	.....	5.7	5.8	5.7	.....	4.6
28	.....	5.8	5.8	6.8	8.2	6.7	6.0	.....	.....	5.7	3.3	.....
29	5.8	.....	5.7	6.7	8.1	.....	6.0	5.7	5.8	5.7	3.0	4.7
30	5.8	.....	.....	6.8	8.0	.....	6.0	5.7	5.8	.....	.....	4.7
31	5.8	.....	.....	.....	8.0	.....	6.0	.....	.....	5.7	.....	.....

NOTE.—Beginning Nov. 24 gage heights refer to datum of new gage. Discharge relation affected by ice Jan. 1 to Mar. 20 Nov. 24-26, and Dec. 1-31.

Daily discharge, in second-feet, of Cottonwood Creek near Orangeville, Utah, for 1913.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	314	148	1,030	148	70	31	34	28
2	.....	70	172	1,030	148	70	83	34	28
3	.....	70	172	944	148	70	70	34	28
4	.....	70	148	776	138	70	48	34	28
5	.....	70	200	614	128	70	39	32	28
6	.....	48	314	692	128	58	39	30	28
7	.....	58	416	614	128	58	1,980	28	28
8	.....	58	416	545	128	58	67	28	28
9	.....	70	476	476	148	58	47	28	28
10	.....	70	542	362	130	58	34	28	28
11	.....	148	659	314	112	58	34	28	28
12	.....	232	776	273	112	58	34	28	28
13	.....	180	860	232	112	50	34	28	28
14	.....	128	614	270	112	48	34	28	28
15	.....	128	776	270	104	48	34	28	28
16	.....	128	860	270	97	48	34	28	28
17	.....	172	860	270	97	48	34	28	28
18	.....	134	818	270	97	48	34	28	28
19	.....	97	776	270	97	48	28	28	28
20	.....	112	776	270	97	48	28	28	28
21	24	128	614	270	97	39	34	28	28
22	24	97	860	251	97	39	40	28	16
23	24	83	1,030	232	232	39	34	28	20
24	24	70	1,200	232	100	39	34	28	28
25	24	70	1,120	200	80	39	34	28	28
26	30	148	1,030	235	70	39	34	28	28
27	39	190	1,030	270	70	39	34	28	26
28	48	232	1,200	200	70	39	34	28	22
29	39	200	1,110	182	70	39	34	28	14
30	50	232	1,030	165	70	39	34	28	21
31	100	.....	1,030	.....	70	35	.....	28	.....

NOTE.—Discharge determined from three fairly well defined curves, except as follows: For days for which gage heights are missing, estimated by comparison with records at near-by stations; Nov. 24–26, estimated on account of ice.

Monthly discharge of Cottonwood Creek near Orangeville, Utah, for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	[a] 25	1,540	D.
February	.....	.....	[a] 25	1,390	D.
March	100	.....	[a] 29.9	1,840	C.
April	314	48	127	7,560	B.
May	1,200	148	711	43,700	B.
June	1,030	165	401	23,900	B.
July	232	70	111	6,820	B.
August	70	35	50.5	3,110	B.
September	1,980	28	104	6,190	B.
October	34	28	29.0	1,780	B.
November	28	14	26.4	1,570	C.
December	.....	.....	[a] 28.5	1,750	D.
The year	1,980	.....	140	101,000	

[a] Estimated by hydrograph comparison with adjacent stations.

FERRON CREEK NEAR FERRON, UTAH.

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

Records available.—May 6, 1911, to December 31, 1913; records also available for measurements at the Westingkow ranch, several miles below, April 28, 1909, to October 7, 1911.

Drainage area.—151 square miles.

Gage.—Inclined staff.

Control.—Sand and gravel; shifting at high stages.

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

Winter flow.—Discharge relation affected by ice.

Diversions.—None above station except the Peterson ranch ditch.

Accuracy.—Records fair.

Discharge measurements of Ferron Creek near Ferron, Utah, for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 7	W. R. King	1.71	18.4	Aug. 24	Lynn Crandall	1.68	27.8
May 5	do	2.62	141	Nov. 21	C. W. Bennett	1.68	11.9
June 6	do	2.98	273	21	C. L. Batchelder	1.68	11.4

Daily gage height, in feet, of Ferron Creek near Ferron, Utah, for 1913.

[A. R. Peterson, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1.95	.....	.....	2.64	3.30	2.38	1.84	1.61	1.75	1.68	1.97
2	2.3	.....	.....	.....	2.48	3.20	2.33	1.82	1.62	1.76	1.70	.....
3	.....	2.3	.....	.....	2.44	3.15	2.30	1.82	1.65	1.76	1.75	.....
4	3.0	.....	.....	.....	2.44	3.20	2.28	1.79	1.58	1.77	.....	.....
5	.....	.....	.....	.....	2.56	3.05	2.27	1.80	1.57	1.85	1.70	.....
6	.....	.....	.....	.....	2.68	3.00	2.22	1.78	1.59	1.60	.....	1.92
7	.....	.....	.....	1.69	2.69	3.00	2.22	1.72	4.30	1.65	1.70	.....
8	1.7	2.1	.....	1.64	2.98	3.00	2.26	1.71	2.05	1.66	.....	.....
9	.....	.....	.....	1.57	2.94	2.88	2.20	1.69	1.85	1.67	.....	1.95
10	.....	.....	.....	1.61	3.15	2.81	2.17	1.79	1.81	1.57	1.54	.....
11	2.2	.....	.....	1.79	3.2	2.69	2.15	1.70	1.80	1.68	.....	.....
12	.....	1.8	.....	1.89	3.3	2.65	2.07	1.70	1.80	1.75	.....	1.94
13	.....	.....	.....	1.94	3.25	2.62	2.09	1.68	1.78	1.78	.....	.....
14	2.8	.....	.....	2.00	3.0	2.71	2.02	1.65	1.88	1.78	1.63	.....
15	.....	2.3	.....	2.07	2.99	2.63	2.01	1.63	1.79	1.78	.....	.....
16	.....	.....	.....	2.04	3.1	2.62	2.00	1.60	1.76	1.68	.....	1.95
17	.....	.....	.....	2.27	3.1	2.62	1.98	1.60	1.75	1.64	1.67	.....
18	2.5	.....	.....	2.28	3.25	2.63	1.98	1.60	1.74	1.61	.....	.....
19	.....	2.75	.....	2.08	3.15	2.68	1.96	1.60	1.74	1.70	.....	1.95
20	.....	.....	.....	2.08	2.9	2.61	1.97	1.60	1.73	1.74	.....	.....
21	.....	.....	.....	2.17	2.8	2.58	1.97	1.61	1.72	1.74	1.68	.....
22	1.95	.....	.....	2.15	2.89	2.58	2.53	1.61	1.71	1.72	.....	.....
23	.....	.....	.....	2.09	3.15	2.55	2.35	1.59	1.74	1.72	.....	2.28
24	.....	.....	.....	2.15	3.4	2.55	2.02	1.69	1.77	1.73	1.75	.....
25	1.95	.....	.....	2.22	3.35	2.55	1.95	1.62	1.76	1.73	.....	.....
26	.....	.....	.....	2.34	3.3	2.54	1.92	1.61	1.77	1.60	.....	.....
27	.....	.....	.....	2.49	3.3	2.53	1.89	1.59	1.79	1.50	.....	2.15
28	.....	.....	.....	2.56	3.35	2.50	1.88	1.58	1.78	1.67	1.58	.....
29	2.0	.....	.....	2.67	3.35	2.43	1.87	1.61	1.75	1.47	.....	2.05
30	.....	.....	.....	2.67	3.3	2.39	1.86	1.58	1.75	1.70	.....	2.24
31	.....	.....	.....	.....	3.3	.....	1.85	1.71	.....	1.70	.....	.....

NOTE.—Discharge relation affected by ice during January, February, and December.

Daily discharge, in second-feet, of Ferron Creek near Ferron, Utah, for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	12	150	360	121	41	23	16	12
2	12	114	332	111	39	23	17	13
3	12	107	318	105	39	25	17	16
4	12	107	332	102	36	21	17	14
5	12	131	290	100	37	20	24	13
6	12	159	276	91	35	22	9	13
7	18	162	276	91	30	650	11	13
8	16	237	276	98	29	54	11	10
9	13	226	242	88	27	28	12	9
10	14	284	223	83	36	23	8	7
11	25	298	192	80	28	19	12	7
12	34	326	182	68	28	19	16	8
13	39	312	175	71	27	18	18	9
14	45	242	198	62	25	26	18	10
15	53	239	178	60	24	18	18	10
16	49	270	175	59	22	17	12	11
17	80	270	175	57	22	16	11	12
18	81	312	178	57	22	15	9	12
19	54	284	178	55	22	15	13	12
20	54	216	172	56	22	15	15	12
21	65	190	165	56	23	14	15	12
22	62	213	165	154	23	14	14	12
23	55	284	158	115	22	15	14	13
24	62	355	158	62	27	17	15	14
25	72	346	158	54	23	17	15	12
26	90	338	156	50	23	17	9	10
27	116	343	154	47	22	18	6	9
28	131	364	147	46	21	18	12	8
29	157	370	132	45	23	16	5	9
30	157	360	123	44	21	16	13	9
31	.....	360	.....	42	29	.....	13	.....

NOTE.—Discharge determined from three fairly well defined curves and by the indirect method for shifting channels except as follows: Apr. 1–6, estimated; for days for which gage heights are missing during November, interpolated.

Monthly discharge of Ferron Creek near Ferron, Utah, for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	[a] 8.0	492	D.
February	.....	.....	[a] 8.0	444	D.
March	.....	.....	[a] 12.0	738	D.
April	157	12	53.8	3,200	B.
May	370	107	257	15,800	B.
June	360	123	208	12,400	A.
July	154	42	75.2	4,620	A.
August	41	21	27.4	1,680	A.
September	650	14	41.0	2,440	B.
October	24	5	13.4	824	A.
November	16	7	11.0	655	B.
December	.....	.....	[a] 9.0	553	D.
The year	650	.....	60.6	43,800	

[a] Estimated.

FERRON CREEK NEAR CASTLEDALE, UTAH.

Location.—In sec. 35, T. 19 S., R. 8 E., about 8 miles below the town of Ferron, 7 miles southeast of Castledale, at a point locally known as Paradise; 2 miles below diversion of Paradise canal.

Records available.—June 22, 1911, to December 31, 1913.

Drainage area.—237 square miles.

Gage.—Inclined staff on left bank.

Control.—Gravel; shifting.

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

Winter flow.—Discharge relation affected by ice during winter.

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

Regulation.—Flow affected at times by manipulation of headgates of the various canals above station.

Accuracy.—Records only fair, owing to shifting of stream bed.

Discharge measurements of Ferron Creek near Castledale, Utah, for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec. ft.*			*Feet.*	*Sec. ft.*
Apr. 7	W. R. King	6.52	20.9	Nov. 19	Batchelder and Bennett.	6.42	17.7
May 3	do	6.61	27.0				
Aug. 25	Lynn Crandall	6.23	4.0	19	do	6.40	15.8
June 6	W. R. King	7.22	140				

Daily gage height, in feet, of Ferron Creek near Castledale, Utah, for 1913.

[De Lon Olsen, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1						6.4			6.8			
2					7.7	7.3	6.4		6.5	6.4	6.4	
3	7.4				6.6	6.8	6.6	6.1	6.4	6.5		
4						6.7	6.5	6.0	6.2	6.4	6.3	6.3
5			8.6	6.4		6.2	6.3	6.0	6.4	6.4	6.4	6.25
6			8.6	6.6	6.4	7.2		6.4	7.2	6.2	6.3	6.2
7		8.3		6.5	8.1		6.1	6.0	8.5	6.3		
8		8.2		6.6			6.5	6.0	6.8	6.3	6.3	
9				6.5	6.8	6.4	6.2			6.4		
10	7.6			6.6	7.2		6.1	6.0	6.5			
11	7.6	8.3		6.6		6.9	6.6	6.0	6.6	6.4	6.2	6.2
12		8.3		6.4		6.8		5.9	6.4	6.4	6.3	6.1
13			8.8				6.4		6.3	6.4	6.2	6.15
14			8.8		6.8	6.1		6.0		6.3	6.3	
15							6.3	6.0		6.4		
16					7.8	6.6	6.2	6.0				
17			6.2		7.5	6.4				6.3	6.2	
18	8.2		6.2	6.6			7.4			6.4	6.3	6.2
19			8.0	6.7	7.3	6.7	7.2	6.4	6.5	6.4	6.4	6.3
20			8.0		7.6	6.3	6.3			6.3	6.2	6.3
21					7.3	6.2			6.3	6.4	6.3	
22	8.6	8.5			7.4		6.2		6.4		6.2	
23	8.5	8.5				6.9	6.0	6.7	6.4	6.4		
24				7.0		6.3	6.2		6.3	6.3	6.2	
25			6.3	6.7		6.7	6.2	6.1	6.5		6.3	
26			6.3		7.2	7.0	6.0		6.4	6.3		6.8
27		8.6	6.6		8.0	6.5	6.5			6.4	6.2	6.7
28	8.9	8.6	6.2		7.4	6.9	6.0	6.2	6.5	6.4	6.3	
29	8.0					6.5	6.0		6.4	6.3	6.3	6.4
30					6.9	6.4	6.0	6.3		6.4		6.7
31							6.0					6.5

NOTE.—Discharge relation affected by ice Jan. 1 to Mar. 15 and Dec. 21–31 and probably Mar. 19 and 20.

Daily discharge, in second-feet, of Ferron Creek near Castledale, Utah, for 1913.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	10	80	10	10	1	61	16	16	10
2	.....	10	242	158	10	2	16	16	16	10
3	.....	10	28	61	28	2	10	25	13	10
4	.....	10	20	44	16	1	4	16	10	10
5	.....	10	20	4	6	1	10	11	16	8
6	.....	28	10	138	4	10	144	6	10	6
7	.....	16	326	100	2	1	423	10	10	6
8	.....	28	100	100	16	1	77	10	10	6
9	.....	16	61	10	4	1	50	16	9	6
10	.....	28	138	70	2	1	25	16	7	6
11	.....	28	120	78	28	1	40	16	6	6
12	.....	10	100	61	19	0.5	16	16	10	4
13	.....	12	80	50	10	1	10	16	6	5
14	.....	14	61	2	8	1	12	10	10	6
15	.....	18	150	20	6	1	14	16	8	6
16	.....	20	263	28	4	1	16	13	7	6
17	4	24	200	10	10	0	18	10	6	6
18	4	28	180	40	179	0	21	16	10	6
19	.....	44	158	44	138	10	25	16	16	10
20	.....	50	221	6	6	0	18	10	6	10
21	.....	60	158	4	5	0	10	16	10	.....
22	.....	70	179	70	4	0	16	16	6	.....
23	.....	80	168	78	1	44	16	16	6	.....
24	.....	98	158	6	4	20	10	10	6	.....
25	6	44	148	44	4	2	25	10	10	.....
26	6	80	138	98	1	0	16	10	8	.....
27	28	80	305	16	16	0	20	16	6	.....
28	4	80	179	78	1	4	25	16	10	.....
29	.....	80	130	16	1	0	16	10	10	.....
30	.....	80	78	10	1	6	16	16	10	.....
31	.....	.....	70	.....	1	10	.....	16	.....	.....

NOTE.—Discharge determined from two fairly well-defined rating curves and by the indirect method for shifting channels; Apr. 1 to Dec. 20, estimated for days for which gage heights are missing.

Monthly discharge of Ferron Creek near Castledale, Utah, for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	[a] 9	553	D.
February	.....	.....	[a] 10	555	D.
March	.....	.....	[a] 12	738	D.
April	98	10	38.9	2,310	C.
May	326	10	138	8,480	C.
June	158	2	48.5	2,890	D.
July	179	1	17.6	1,080	C.
August	44	0	3.9	240	B.
September	423	4	39.3	2,340	B.
October	25	6	14.0	861	B.
November	16	6	9.5	565	B.
December	.....	.....	[a] 8.2	504	C.
The year	423	0	29.1	21,100	

[a] Estimated.

NOTE.—A flood occurred Sept. 7 which lasted several hours; maximum discharge, approximately 900 second-feet.

GRAND RIVER BASIN.

NORTH FORK OF GRAND RIVER NEAR GRAND LAKE, COLO.

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

Records available.—July 29, 1904, to September 30, 1909; September 20, 1910, to November 30, 1913.

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

Gage.—Vertical staff; read once daily.

Control.—Practically permanent.

Discharge measurements.—Made from highway bridge at gage.

Winter flow.—Ice forms along banks but springs keep river open.

Diversions.—There are court decrees for the diversion of 699 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. Under this decree 12,200 acre-feet were diverted in 1913. There is also a reservoir decree for 19,000 acre-feet from the flood water.

Accuracy.—Owing to the high altitude of the station (8,450 feet) there is liable to be considerable diurnal fluctuation at certain seasons on account of the alternate melting and freezing; mean daily gage height based on one reading between 7 and 8 a. m. may be considerably in error; estimates are rated as fair or good; rating curve good.

The following discharge measurement was made by R. H. Fletcher:

July 31, 1913: Gage height, 3.98 feet; discharge, 82 second-feet.

Daily gage height, in feet, of North Fork of Grand River near Grand Lake, Colo., for 1913.

[Mrs. Ethel M. Curry, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	3.40	4.45	5.50	4.45	3.90	3.80	3.90	3.58
2	.....	3.35	4.42	5.30	4.38	3.88	3.85	3.95	3.50
3	.....	3.40	4.40	5.20	4.35	3.88	3.85	3.85	3.68
4	.....	3.60	4.28	5.20	4.30	3.85	3.80	3.95	3.42
5	.....	3.55	4.32	5.10	4.28	4.00	3.80	3.98	3.78
6	.....	3.50	4.45	5.05	4.22	3.90	3.85	3.95	3.78
7	.....	3.60	4.55	5.00	4.20	3.90	3.88	3.90	3.72
8	.....	3.60	4.60	4.90	4.30	3.82	3.90	3.92	3.80
9	.....	3.55	4.60	4.90	4.22	3.78	3.95	3.85	3.78
10	.....	3.78	4.60	4.90	4.28	3.90	4.02	3.80	3.75
11	.....	4.05	4.60	4.90	4.22	3.80	3.95	3.78	3.75
12	.....	3.80	4.80	4.90	4.18	3.88	4.00	3.70	3.68
13	.....	3.60	4.95	4.80	4.06	3.85	4.00	3.95	3.72
14	.....	3.60	4.80	4.70	4.18	3.82	3.95	3.92	3.70
15	.....	3.78	4.55	4.85	4.22	3.78	4.02	3.90	3.55
16	.....	4.30	4.50	4.95	4.25	3.75	4.08	3.88	3.85
17	.....	4.30	4.48	4.85	4.28	3.72	4.02	3.85	3.88
18	.....	4.30	4.55	4.85	4.30	3.70	3.95	3.82	3.65
19	.....	4.22	4.70	4.90	4.22	3.70	3.88	3.82	3.60
20	.....	4.10	4.65	4.85	4.18	3.68	3.82	3.82	3.68
21	.....	4.15	4.55	4.80	4.25	3.80	3.82	3.78	3.65
22	.....	4.20	4.60	4.70	4.35	3.78	3.80	3.80	3.62
23	.....	4.20	4.65	4.65	4.45	3.72	3.85	3.85	4.10
24	.....	3.90	4.70	4.60	4.65	3.78	3.82	3.82	4.62
25	.....	3.92	4.95	4.80	4.48	3.75	3.82	3.85	3.70
26	.....	3.85	5.15	4.70	4.30	3.70	3.88	3.80	3.75
27	.....	3.95	5.30	4.65	4.18	3.72	3.85	3.78	3.72
28	.....	4.12	5.20	4.60	4.06	3.70	3.82	3.72	3.65
29	.....	4.35	5.25	4.55	4.00	3.70	3.82	3.82	3.60
30	3.35	4.38	5.40	4.50	3.98	3.68	3.88	3.75	4.10
31	3.35	.....	5.40	.....	3.95	3.75	.....	3.68	.....

NOTE.—Discharge relation affected by ice Apr. 10–12 and Nov. 23–24, 30.

Daily discharge, in second-feet, of North Fork of Grand River near Grand Lake, Colo., for 1913.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1		30	208	740	208	75	62	75	41
2		28	197	620	184	72	68	82	35
3		30	190	560	174	72	68	68	49
4		42	154	560	159	68	62	82	31
5		38	165	505	154	90	62	87	60
6		35	208	478	137	75	68	82	60
7		42	242	450	132	75	72	75	53
8		42	260	395	159	65	75	78	62
9		38	260	395	137	60	82	68	60
10		38	260	395	154	75	94	62	56
11		38	260	395	137	62	82	60	56
12		38	345	395	127	72	90	51	49
13		42	422	345	101	68	90	82	53
14		42	345	300	127	65	82	78	51
15		60	242	370	137	60	94	75	38
16		159	225	422	146	56	105	72	68
17		159	218	370	154	53	94	68	72
18		159	242	370	159	51	82	65	46
19		137	300	395	137	51	72	65	42
20		109	280	370	127	49	65	65	49
21		120	242	345	146	62	65	60	46
22		132	260	300	174	60	62	62	44
23		132	280	280	208	53	68	68	44
24		75	300	260	280	60	65	65	44
25		78	422	345	218	56	65	68	51
26		68	532	300	159	51	72	62	56
27		82	620	280	127	53	68	60	53
28		114	560	260	101	51	65	53	46
29		174	590	242	90	51	65	65	42
30	28	184	680	225	87	49	72	56	42
31	28	.....	680	.....	82	56	.....	49	.....

NOTE.—Discharge determined from a fairly well defined curve. Discharge estimated Apr. 10–12 and Nov. 23–24, 30.

Monthly discharge of North Fork of Grand River near Grand Lake, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April	184	28	82.2	4,890	B.
May	680	154	329	20,200	C.
June	740	225	389	23,100	C.
July	280	82	149	9,160	C.
August	90	49	61.8	3,800	B.
September	105	62	74.5	4,430	B.
October	87	49	68.0	4,180	B.
November	72	31	50.0	2,980	B.
The period	.....	.....	.....	72,700	

GRAND RIVER AT SULPHUR SPRINGS, COLO.

Location.—In sec. 2, T. 1 N., R. 78 W., at the bridge connecting the Denver & Salt Lake Railway station with the town of Sulphur Springs. Nearest important tributary, Beaver Creek, enters 2 miles below.

Records available.—July 22, 1904, to September 30, 1909; September 23, 1910, to December 31, 1913.

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

Gage.—Chain gage.

Control.—Fairly permanent during 1913.

Discharge measurements.—Made from bridge or by wading.

Winter flow.—River is frozen over during the winter.

Diversions.—Between this station and the mouth of North Fork there are court decrees for the diversions of 96 second-feet from Grand River; also a reservoir decree for 31,300 acre-feet from the floodwaters of the Grand.

Accuracy.—Owing to few gage heights, estimates are rated as only fair or possibly good.

Discharge measurements of Grand River at Sulphur Springs, Colo., for 1913.

Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 11	R. H. Fletcher	4.32	1,870
July 3	....do	3.38	907
Oct. 9	Robert Follansbee	2.46	388

Daily gage height, in feet, of Grand River at Sulphur Springs, Colo., for 1913.

[W. M. Thomas, observer.]

Day.	May.	Jnne.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	5.75	.....	2.65	2.1	.....	2.1	2.6
2	.....	5.3	.....	2.6	.....	.....	2.1	.....
3	.....	5.2	3.4	2.6	2.2	2.4	.....	.....
4	.....	5.1	.....	.....	.....	2.45	2.0	.....
5	3.85	.....	.....	.....	.....	2.35	.....	.....
6	4.05	4.85	.....	.....	2.3	.....	.....	4.1
7	3.95	4.8	.....	2.45	2.2	2.4	2.0	.....
8	4.05	4.5	.....	.....	.....	2.4	2.0	.....
9	3.95	.....	.....	2.4	.....	2.45	2.0	.....
10	4.0	4.5	.....	2.4	.....	2.45	2.0	.....
11	4.3	.....	.....	.....	.....	2.4	.....	2.9
12	4.4	.....	.....	.....	.....	2.4	2.1	.....
13	4.5	.....	.....	.....	2.3	.....	.....	.....
14	4.4	.....	2.8	.....	2.3	.....	.....	.....
15	3.9	4.15	.....	.....	.....	.....	2.1	3.3
16	3.7	4.25	.....	2.25	2.5	.....	1.95	.....
17	3.7	.....	.....	2.25	.....	.....	2.0	3.4
18	3.7	.....	.....	.....	.....	2.2	.....	.....
19	.....	.....	.....	.....	.....	2.2	2.0	.....
20	.....	.....	.....	2.15	2.25	.....	.....	3.4
21	3.8	4.2	.....	.....	.....	2.25	.....	.....
22	3.6	4.1	.....	.....	.....	2.2	1.95	.....
23	.....	4.0	.....	2.1	.....	.....	.....	.....
24	4.4	4.0	.....	2.1	.....	.....	.....	.....
25	4.55	4.0	3.7	.....	.....	2.1	.....	.....
26	5.0	4.0	3.4	.....	.....	2.1	.....	3.4
27	5.45	3.8	3.3	.....	.....	.....	2.2	.....
28	5.4	3.8	3.1	.....	.....	.....	.....	.....
29	.....	3.7	3.1	.....	.....	.....	.....	.....
30	.....	3.7	2.8	.....	.....	.....	.....	.....
31	5.85	.....	2.8	2.1	.....	.....	.....	3.1

NOTE.—Discharge relation affected by ice during December.

Daily discharge, in second-feet, of Grand River at Sulphur Springs, Colo., for 1913.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	3,760	1,110	472	246	325	246
2	.....	3,100	1,020	447	250	350	246
3	.....	2,960	935	447	280	357	230
4	.....	2,820	820	429	292	378	215
5	1,340	2,650	805	412	305	337	215
6	1,540	2,480	890	395	317	347	215
7	1,440	2,420	875	378	280	357	215
8	1,540	2,050	860	368	286	357	215
9	1,440	2,050	845	357	292	378	215
10	1,490	2,050	830	357	298	378	215
11	1,820	2,050	700	368	304	357	230
12	1,930	2,000	650	400	310	357	246
13	2,050	1,900	600	380	317	360	246
14	1,930	1,650	550	345	317	355	246
15	1,380	1,650	700	310	400	350	246
16	1,190	1,760	900	298	400	325	201
17	1,190	1,820	1,100	298	375	300	215
18	1,190	2,000	1,100	286	349	280	215
19	1,220	1,950	1,000	275	324	280	215
20	1,250	1,800	980	263	298	289	210
21	1,280	1,700	1,020	280	298	298	206
22	1,100	1,600	1,020	270	295	280	201
23	1,520	1,490	1,080	246	290	275	200
24	1,930	1,490	1,250	246	290	255	205
25	2,110	1,490	1,190	246	295	246	220
26	2,680	1,490	935	246	295	246	240
27	3,310	1,280	860	246	300	246	280
28	3,240	1,280	725	246	300	246	280
29	3,460	1,190	725	246	298	246	280
30	3,680	1,190	550	246	300	246	280
31	3,900	.....	550	246	.....	246	.....

NOTE.—Discharge determined from a rating curve well defined above 350 second-feet, but somewhat uncertain below. Discharge estimated for days for which gage heights are missing by comparison with Grand River near Kremmling, Colo. For December no estimates made on account of unknown effect of ice.

Monthly discharge of Grand River at Sulphur Springs, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
May 5–31	3,900	1,100	1,930	103,000	B.
June	3,760	1,190	1,970	117,000	B.
July	1,250	550	877	53,900	D.
August	472	246	324	19,900	C.
September	400	246	307	18,300	C.
October	378	246	311	19,100	B.
November	280	200	230	13,700	B.
The period	.....	.....	.....	345,600	

GRAND RIVER NEAR KREMMLING, COLO.

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

Records available.—July 24, 1904, to December 31, 1913.

Drainage area.—2,380 square miles.

Gage.—Automatic recording gage; during winter, staff gage.

Control.—Somewhat shifting on account of scouring at high stages and silting at low.

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

Winter flow.—River frozen over at station, but rapids below remain open and prevent backwater except for short intervals when affected by ice jams.

Storage.—Station is located at proposed Kremmling reservoir site. With a 200-foot dam at the mouth of Gore Canyon, the capacity of the reservoir would be 2,200,000 acre-feet.

Diversions.—There are court decrees for the diversion of 35 second-feet from Grand River between this station and that at Sulphur Springs.

Accuracy.—Conditions favorable for accurate results; estimates good except for winter.

Cooperation.—During 1913 station was maintained in cooperation with the State engineer.

Discharge measurements of Grand River near Kremmling, Colo., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 25	C. L. Chatfield	(a)	260	July 1	R. H. Fletcher	6.7	2,660
May 10	R. H. Fletcher	8.6	3,830	31	....do	3.9	1,320

a Discharge relation affected by ice.

Daily gage height, in feet, of Grand River near Kremmling, Colo., for 1913.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	12.4	6.8	3.65	2.3	2.3	2.1	1.35
2	.....	12.1	6.4	.....	2.4	2.75	1.95	1.5
3	.....	.....	6.2	3.25	2.4	2.9	1.85	.....
4	.....	11.0	5.9	3.2	2.45	2.8	1.85	.9
5	.....	10.5	5.8	3.15	2.55	3.0	1.8	.9
6	.....	10.2	5.6	3.05	2.6	3.05	1.65	1.0
7	.....	9.8	5.5	3.05	2.95	2.95	1.9	1.1
8	.....	9.2	5.4	2.95	3.3	2.7	2.05	1.0
9	.....	9.0	5.4	2.85	3.4	2.6	1.5	1.4
10	8.6	9.2	5.4	2.75	3.35	2.6	1.7	1.05
11	9.3	9.8	5.5	2.75	3.05	2.5	1.9	1.0
12	9.6	10.4	4.75	2.85	2.85	2.3	1.7	1.0
13	10.2	9.4	4.45	3.2	2.9	2.4	1.85	1.05
14	9.4	9.4	4.2	3.05	2.7	2.5	2.05	1.0
15	8.4	8.5	4.4	2.85	2.75	2.5	2.05	1.1
16	7.8	8.9	4.85	2.7	3.25	2.45	1.85	1.0
17	7.8	9.0	5.3	2.55	3.15	2.35	1.95	1.1
18	7.9	9.2	5.9	2.45	2.95	2.2	1.9	1.1
19	8.3	9.8	6.0	2.4	2.7	2.05	2.0	1.1
20	8.4	9.7	5.5	2.35	2.45	1.95	1.8	1.0
21	8.1	9.1	5.3	2.35	2.3	2.05	1.7	1.1
22	7.6	8.7	5.5	2.45	2.2	2.1	1.55	.....
23	7.5	8.5	5.5	2.45	2.25	2.1	1.15	1.1
24	8.5	8.3	6.0	2.35	2.3	2.1	1.05	.....
25	9.3	8.1	6.6	2.3	2.3	.....	.....	.....
26	10.2	8.0	6.1	2.35	2.25	1.75	1.3	.....
27	11.2	7.8	5.5	2.3	2.2	1.65	1.8	1.2
28	11.6	7.6	4.95	2.3	2.2	1.75	1.65	.....
29	11.6	7.6	4.35	2.4	2.2	1.85	2.05	1.15
30	12.0	7.3	4.0	2.55	2.25	1.9	1.85	.....
31	12.3	.....	3.75	2.35	.....	2.05	.....	1.25

NOTE.—Discharge relation affected by ice during December. Gage heights for November and December were read on a staff gage by an unreliable observer and are somewhat uncertain.

Daily discharge, in second-feet, of Grand River near Kremmling, Colo., for 1913.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	7,730	2,720	1,250	812	812	752
2	.....	7,370	2,480	1,180	843	955	708
3	.....	6,740	2,370	1,120	843	1,000	678
4	.....	6,120	2,200	1,100	859	971	678
5	.....	5,600	2,160	1,080	891	1,040	664
6	.....	5,300	2,060	1,050	907	1,050	622
7	.....	4,920	2,000	1,050	1,020	1,020	693
8	.....	4,380	1,960	1,020	1,130	939	737
9	.....	4,220	1,960	987	1,170	907	580
10	3,900	4,380	1,960	955	1,150	907	636
11	4,470	4,920	2,000	955	1,050	875	693
12	4,740	5,500	1,660	987	987	812	636
13	5,300	4,560	1,540	1,100	1,000	843	678
14	4,560	4,560	1,440	1,050	939	875	737
15	3,760	3,830	1,520	987	955	875	737
16	3,340	4,140	1,700	939	1,120	859	678
17	3,340	4,220	1,900	891	1,080	828	708
18	3,410	4,380	2,200	859	1,020	782	693
19	3,690	4,920	2,260	843	939	737	722
20	3,760	4,830	2,000	828	859	708	664
21	3,550	4,300	1,900	828	812	737	636
22	3,200	3,980	2,000	859	782	752	594
23	3,140	3,830	2,000	859	797	752	487
24	3,830	3,690	2,260	828	812	752	461
25	4,470	3,550	2,600	812	812	676	494
26	5,300	3,480	2,320	828	797	650	526
27	6,340	3,340	2,000	812	782	622	664
28	6,780	3,200	1,750	812	782	650	622
29	6,780	3,200	1,500	843	782	678	737
30	7,250	3,020	1,380	891	797	693	678
31	7,610	.....	1,290	828	.....	737	.....

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

Monthly discharge of Grand River near Kremmling, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
May 10–31	7,610	3,140	4,660	203,000	A.
June	7,730	3,020	4,610	274,000	A.
July	2,720	1,290	1,970	121,000	A.
August	1,250	812	949	58,400	A.
September	1,170	782	918	54,600	A.
October	1,050	622	822	50,500	B.
November	752	461	653	38,900	C.
December	.....	.....	375	23,100	D.
The period	.....	.....	.....	824,000	

NOTE.—Discharge for December estimated by comparison with record of Grand River at Glenwood Springs.

GRAND RIVER AT GLENWOOD SPRINGS, COLO.

Location.—Near the electric power house at Glenwood Springs. No Name Creek enters Grand River about 2 miles above station, and Roaring Fork one-half mile below.

Records available.—May 12 to July 17, 1899; Janury 1, 1900, to December 31, 1913.

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

Gage.—Friez automatic. Since 1902 a number of automatic gages, referred to datum of staff gage installed in 1900, have been used. Chain gage, installed at railroad bridge, just above mouth of Roaring Fork, used previous to 1900.

Control.—Practically permanent during 1913.

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

Winter flow.—Discharge relation not affected by ice; hot water from springs keeps river open.

Regulation.—The Shoshone power plant of the Colorado Power Co., 6 miles upstream, controls the flow during the day at low water, but has insufficient pondage to control it for more than a few hours.

Diversions.—Between this station and the one near Kremmling there are court decrees for a diversion of 13 second-feet of water from Grand River for irrigation, 1,250 second-feet absolute for power, and 14,400 second-feet conditional for power.

Accuracy.—Records excellent; daily discharge for 1913 determined from the hourly discharges taken from the automatic-gage record.

Discharge measurements of Grand River at Glenwood Springs, Colo., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 20	Follansbee and Fletcher	3.61	994	May 2	R. H. Fletcher	6.68	6,050
21	Robert Follansbee	2.34	246	Sept. 5	do	4.00	1,270

Daily gage height, in feet, of Grand River at Glenwood Springs, Colo., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	3.34	3.15	4.70	6.2	8.5	5.90	4.60	4.10	4.10	3.80	3.55
2	.....	3.38	2.76	5.40	6.4	8.4	5.70	4.45	4.10	4.20	3.89	3.45
3	.....	3.39	2.93	5.70	6.3	8.1	5.50	4.40	3.98	4.35	3.82	3.40
4	.....	3.22	2.99	5.10	6.1	7.9	5.40	4.35	3.95	4.35	3.80	3.40
5	.....	3.16	2.95	4.50	6.0	7.6	5.30	4.30	3.88	4.35	3.85	.....
6	.....	3.24	2.86	4.50	6.2	7.5	5.20	4.25	4.05	4.45	3.85	.....
7	.....	3.30	2.91	4.90	6.5	7.3	5.20	4.20	4.05	4.35	3.84	3.30
8	.....	3.09	3.08	4.95	6.7	7.0	5.10	4.30	4.25	4.25	3.82	3.35
9	.....	3.00	3.21	4.55	6.7	6.9	5.10	4.30	4.30	4.25	3.90	3.30
10	.....	3.20	3.51	4.15	6.7	7.0	5.10	4.30	4.35	4.20	3.76	3.20
11	.....	3.18	3.33	3.95	7.0	7.2	5.20	4.30	4.35	4.20	3.68	3.10
12	.....	3.17	3.33	4.00	7.4	7.4	5.10	4.30	4.25	4.15	3.72	3.10
13	.....	3.20	3.52	4.15	7.6	7.1	5.00	4.30	.....	4.10	3.76	3.10
14	.....	3.21	3.34	4.45	7.6	6.8	4.85	4.25	4.20	4.20	4.00	3.05
15	.....	3.23	3.30	5.30	7.2	6.7	4.80	4.15	4.15	4.20	3.97	2.97
16	.....	3.29	3.31	4.65	6.7	6.8	4.90	4.10	4.08	4.20	3.90	3.10
17	.....	3.17	3.32	5.80	6.5	6.9	5.10	3.98	4.20	4.15	3.90	3.20
18	.....	3.35	3.33	5.90	6.5	6.9	5.40	3.91	4.15	.....	3.70	3.25
19	.....	3.28	3.34	5.90	6.7	7.1	5.50	3.91	4.00	.....	3.70	3.20
20	3.57	3.34	3.35	5.95	6.8	7.1	5.55	3.89	4.05	.....	3.82	.....
21	3.24	3.19	3.36	5.90	6.7	6.9	5.40	3.89	3.99	3.90	3.80	.....
22	3.52	3.02	3.38	5.90	6.4	6.8	5.50	3.99	4.05	3.94	3.80	.....
23	3.42	3.09	3.37	5.70	6.4	6.6	5.45	3.99	4.10	3.89	.....	.....
24	3.42	3.37	3.48	5.35	6.8	6.5	5.90	3.99	4.10	3.92	.....	.....
25	3.28	3.06	3.39	5.05	7.3	6.5	6.05	3.90	4.10	3.95	3.45	2.98
26	3.13	3.35	3.38	4.95	7.6	6.3	5.70	3.86	4.10	3.95	3.70	3.15
27	3.43	3.26	3.34	4.90	7.9	6.3	5.40	3.91	4.10	3.91	3.72	3.33
28	3.30	3.29	3.30	5.15	8.0	6.3	5.20	3.83	4.05	3.87	3.70	3.23
29	3.31	.....	3.49	5.55	8.0	6.2	5.00	3.80	4.15	3.82	3.68	3.11
30	3.32	.....	3.27	5.95	8.4	6.2	4.80	3.90	4.10	3.81	3.58	3.17
31	3.45	.....	3.99	.....	8.4	.....	4.80	4.00	.....	3.78	.....	3.14

Daily discharge, in second-feet, of Grand River at Glenwood Springs, Colo., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	741	587	2,120	5,120	12,100	4,240	2,060	1,370	1,400	1,110	857
2	.....	735	426	3,320	5,480	11,600	3,880	1,940	1,270	1,500	1,150	803
3	.....	782	463	3,820	5,300	10,600	3,630	1,800	1,050	1,790	1,090	798
4	.....	667	480	2,770	4,760	9,620	3,410	1,750	1,030	1,740	1,050	800
5	.....	647	491	2,110	4,550	8,920	3,200	1,630	1,070	1,710	1,130	785
6	.....	681	474	1,930	4,950	8,370	3,130	1,560	1,310	1,820	1,130	775
7	.....	696	502	2,540	5,700	7,740	2,970	1,570	1,360	1,780	1,110	757
8	.....	621	573	2,630	6,310	6,730	2,900	1,610	1,560	1,650	1,100	785
9	.....	556	701	2,040	6,190	6,420	2,830	1,610	1,680	1,540	1,200	715
10	.....	613	907	1,420	6,210	6,550	2,870	1,610	1,700	1,520	1,050	667
11	.....	641	696	1,220	6,930	7,430	2,940	1,610	1,730	1,490	1,000	618
12	.....	609	782	1,260	8,140	8,220	2,900	1,610	1,580	1,440	1,060	623
13	.....	649	828	1,420	8,870	7,140	2,660	1,640	1,440	1,420	1,080	616
14	.....	665	698	1,780	8,840	6,310	2,450	1,620	1,360	1,480	1,290	612
15	.....	703	691	2,670	7,470	6,080	2,400	1,460	1,290	1,510	1,250	529
16	.....	650	710	3,820	5,140	6,440	2,540	1,350	1,380	1,480	1,180	597
17	.....	696	710	4,120	5,610	6,650	2,860	1,260	1,510	1,430	1,200	652
18	.....	782	710	4,320	5,730	6,680	3,410	1,230	1,440	1,390	1,010	688
19	.....	679	740	4,300	6,280	7,240	3,620	1,120	1,320	1,390	1,000	684
20	890	705	740	4,540	6,550	7,400	3,730	1,170	1,290	1,390	1,090	600
21	714	665	790	4,420	6,120	6,760	3,410	1,190	1,270	1,240	1,070	650
22	841	612	755	4,430	5,600	6,320	3,510	1,260	1,380	1,190	1,080	640
23	773	601	733	3,980	5,550	6,000	3,460	1,260	1,450	1,190	900	630
24	784	743	810	3,300	6,470	5,700	4,270	1,230	1,430	1,190	850	600
25	694	622	734	2,820	7,820	5,590	4,660	1,210	1,430	1,210	803	542
26	627	725	748	2,660	8,820	5,290	4,010	1,150	1,390	1,220	984	723
27	805	676	711	2,570	9,940	5,120	3,450	1,200	1,400	1,180	1,030	770
28	706	698	695	2,940	10,300	5,020	3,070	1,130	1,400	1,160	1,010	704
29	749	.....	830	3,680	10,400	4,840	2,670	940	1,430	1,100	998	660
30	701	.....	778	4,500	11,100	4,690	2,410	1,180	1,360	1,090	883	629
31	757	.....	1,370	.....	11,500	.....	2,220	1,280	.....	1,050	.....	639

NOTE.—Daily discharge is the mean of the hourly discharges which were determined from a well-defined rating curve. Discharge for days for which gage heights are missing, estimated by comparison with the discharge near Kremmling.

Monthly discharge of Grand River at Glenwood Springs, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January 20-31	890	627	753	17,9000	B.
February	782	556	674	37,400	B.
March	1,370	426	705	43,300	B.
April	4,540	1,220	2,980	177,000	B.
May	11,500	4,550	7,020	432,000	B.
June	12,100	4,690	7,120	424,000	A.
July	4,660	2,220	3,220	198,000	A.
August	2,060	940	1,430	87,900	A.
September	1,730	1,030	1,390	82,700	A.
October	1,820	1,050	1,410	86,700	A.
November	1,290	803	1,060	63,100	A.
December	857	529	682	41,900	A.
The period	.....	.....	.....	1,690,00	

GRAND RIVER NEAR PALISADES, COLO.

Location.—In sec. 2, T. 11 S., R. 98 W., at the State bridge, 2 miles above Palisades. Nearest tributary of importance, Plateau Creek, enters about 6 miles above.

Records available.—April 9, 1902, to December 31, 1913.

Drainage area.—8,550 square miles.

Gage.—Chain gage; unchanged.

Control.—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 accuracy.

Winter flow.—River usually freezes over during part of the year, but the effect on the discharge relation is slight except for short periods.

Diversions.—Between Palisades and the Glenwood Springs station there are court decrees for the diversion of 1,828 second-feet from Grand River, 628 second-feet of which are for irrigation and 1,200 second-feet for pumping. The proposed high-line canal of the United States Reclamation Service will divert 700 second-feet 7 miles above the Palisades station. A decree for this diversion has not yet been given.

Accuracy.—Conditions favorable for accurate results; estimates reliable.

Cooperation.—Station maintained and data furnished by United States Reclamation Service.

Discharge measurements of Grand River near Palisades, Colo., for 1913.

Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
July 8	Page and Page	14.3	4,440
Sept. 17	Page and Anderson	13.2	2,340
Nov. 12	Page and Thomas	12.6	1,640

Daily gage height, in feet, of Grand River near Palisades, Colo., for 1913.

[I. W. Penny, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	14.05	16.05	19.15	15.7	13.35	12.35	13.0	12.6	12.6
2	.....	14.55	16.3	18.15	15.5	13.2	12.25	12.8	12.8	12.4
3	.....	14.95	16.55	18.8	15.2	13.25	12.45	13.0	12.85	12.3
4	.....	14.50	15.9	18.55	15.05	13.1	12.6	13.15	12.7	12.35
5	.....	14.00	15.85	18.35	14.95	12.95	12.45	13.2	12.7	12.3
6	13.4	13.40	15.8	17.95	14.75	12.85	12.45	13.3	12.7	12.1
7	13.3	14.25	16.6	17.5	14.55	12.8	13.1	13.45	12.8	12.15
8	13.2	14.45	16.85	17.3	14.55	12.75	13.15	13.2	12.65	12.1
9	13.0	14.40	17.0	17.35	14.45	12.8	13.15	13.2	12.6	12.1
10	13.15	13.60	17.1	17.45	14.45	12.85	13.75	13.15	12.5	12.1
11	13.2	13.60	17.5	17.75	14.35	12.95	13.45	13.1	12.5	12.25
12	13.25	13.65	18.0	17.6	14.3	12.8	13.25	13.1	12.55	12.3
13	13.2	13.75	18.35	17.45	14.1	12.95	13.15	13.15	12.6	12.5
14	13.0	13.75	18.6	16.65	13.85	13.15	13.15	13.2	12.7	12.7
15	13.0	14.00	17.75	16.6	13.8	12.9	13.15	13.1	13.3	12.65
16	12.9	14.65	16.95	17.05	13.8	12.8	13.1	13.1	13.0	12.55
17	12.85	15.25	16.6	16.9	13.9	12.75	13.25	13.1	12.6	12.35
18	12.8	15.60	16.55	17.2	14.45	12.65	13.2	13.05	12.8	12.4
19	12.55	15.60	16.8	17.45	14.85	12.55	13.1	12.95	12.7	12.45
20	12.5	15.70	16.75	17.55	15.0	12.45	13.0	12.9	12.6	12.6
21	12.45	15.75	16.75	17.45	14.75	12.5	12.95	12.9	12.75	12.7
22	12.35	15.75	16.8	16.8	13.80	12.55	14.0	12.9	12.7	.....
23	12.45	15.55	16.85	16.5	14.5	12.75	13.75	12.8	12.65	.....
24	12.4	15.15	17.2	16.55	14.5	12.7	13.3	12.8	12.5	13.0
25	12.6	14.65	17.6	16.5	15.35	12.65	13.2	12.8	12.35	.....
26	12.65	14.55	18.2	16.4	15.15	12.4	13.2	12.8	12.35	.....
27	12.7	14.4	18.85	16.1	14.65	12.4	13.1	12.8	12.35	.....
28	12.55	14.75	19.05	16.25	14.45	12.9	13.1	12.7	12.45	.....
29	12.65	15.05	18.95	16.2	14.1	12.4	12.9	12.6	12.7	13.2
30	12.95	15.65	19.00	15.95	13.8	12.25	12.85	12.65	12.55	.....
31	13.05	.....	19.25	.....	13.45	12.4	.....	12.6	.....	.....

NOTE.—Discharge relation affected by ice Dec. 20–31.

Daily discharge, in second-feet, of Grand River near Palisades, Colo., for 1913.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	3,880	8,950	20,300	7,880	2,620	1,370	2,120	1,640	1,640
2	.....	4,920	9,740	20,300	7,300	2,390	1,280	1,880	1,880	1,420
3	.....	5,840	10,600	18,800	6,470	2,460	1,480	2,120	1,940	1,320
4	.....	4,810	8,480	17,800	6,080	2,250	1,640	2,320	1,760	1,370
5	.....	3,780	8,340	17,000	5,840	2,060	1,480	2,390	1,760	1,320
6	2,700	2,700	8,180	15,400	5,360	1,940	1,480	2,540	1,760	1,150
7	2,540	4,280	10,700	13,800	4,920	1,880	2,250	2,780	1,880	1,190
8	2,390	4,700	11,500	13,100	4,920	1,820	2,320	2,390	1,700	1,150
9	2,120	4,600	12,000	13,200	4,700	1,880	2,460	2,390	1,640	1,150
10	2,320	3,030	12,400	13,600	4,700	1,940	3,300	2,320	1,530	1,150
11	2,390	3,030	13,800	14,700	4,500	2,060	2,780	2,250	1,530	1,280
12	2,460	3,120	15,600	14,100	4,390	1,880	2,460	2,250	1,580	1,320
13	2,390	3,300	17,000	13,600	3,980	2,060	2,320	2,320	1,640	1,530
14	2,120	3,300	18,000	10,900	3,480	2,320	2,320	2,390	1,760	1,760
15	2,120	3,780	14,700	10,700	3,390	2,000	2,320	2,250	2,540	1,700
16	2,000	5,140	11,900	12,200	3,390	1,880	2,250	2,250	2,120	1,580
17	1,940	6,610	10,700	11,700	3,580	1,820	2,460	2,250	1,640	1,370
18	1,880	7,590	10,600	12,700	4,700	1,700	2,390	2,180	1,880	1,420
19	1,580	7,590	11,400	13,600	5,600	1,580	2,250	2,060	1,760	1,480
20	1,530	7,880	11,200	13,900	5,960	1,480	2,120	2,000	1,640	.....
21	1,480	8,030	11,200	13,600	5,360	1,530	2,060	2,000	1,820	.....
22	1,370	8,030	11,400	11,400	3,390	1,580	3,780	2,000	1,760	.....
23	1,480	7,440	11,500	10,400	4,810	1,820	2,300	1,880	1,700	.....
24	1,420	6,340	12,700	10,600	4,810	1,760	2,540	1,880	1,530	.....
25	1,640	5,140	14,100	10,400	6,880	1,700	2,390	1,880	1,370	.....
26	1,700	4,920	16,400	10,100	6,340	1,420	2,390	1,880	1,370	.....
27	1,760	4,600	19,000	9,100	5,140	1,420	2,250	1,880	1,370	.....
28	1,580	5,360	19,900	9,580	4,700	2,000	2,250	1,760	1,480	.....
29	1,700	6,080	19,500	9,420	3,980	1,420	2,000	1,640	1,760	.....
30	2,060	7,730	19,700	8,640	3,390	1,280	1,940	1,700	1,580	.....
31	2,180	.....	20,800	.....	2,780	1,420	.....	1,640	.....	.....

NOTE.—Discharge determined from a well-defined rating curve. No estimates made Dec. 20–31, on account of unknown effect of ice.

Monthly discharge of Grand River near Palisades, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
March 6–31	2,700	1,370	1,960	101,000
April	8,030	2,700	5,250	312,000
May	20,800	8,180	13,300	818,000
June	20,300	8,640	13,200	786,000
July	7,880	2,780	4,930	303,000
August	2,620	1,280	1,850	114,000
September	3,780	1,280	2,250	134,000
October	2,780	1,640	2,120	130,000
November	2,540	1,370	1,710	102,000
December 1–19	1,760	1,150	1,380	52,000
The period	.....	.....	.....	2,850,000

GRAND RIVER NEAR FRUITA, COLO.

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

Records available.—Flood records during 1908, 1909, and 1910; continuous records, April 1, 1911, to December 13, 1913.

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

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

Control.—Practically permanent.

Discharge measurements.—Made from the highway bridge.

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

Diversions.—Between the Palisades station and Fruita there are court decrees for the diversion of 788 second-feet from Grand River. Below Fruita there are no adjudicated diversions from Grand River.

Maximum stage.—Maximum stage since establishment of station, 15 feet, occurred June 9, 1909; highest stage known was about 18.5 feet on July 4, 1884.

Accuracy.—Conditions are favorable for accurate results and estimates are reliable. For years prior to 1911 estimates have been made on the assumption that the channel has remained unchanged, as the measurements since 1911 have shown little change in the channel.

Cooperation.—Gage heights furnished through courtesy of United States Weather Bureau.

Discharge measurements of Grand River near Fruita, Colo., for 1913.

[Made by R. H. Fletcher.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-feet.*
May 5	7.35	13,800
Sept. 2	2.40	2,320

Daily gage height, in feet, of Grand River near Fruita, Colo., for 1908–1913.

Day.	Apr.	May.	June.	July.	Day.	Apr.	May.	June.	July.
1908.					1909.				
1	3.95	4.95	7.35	7.45	16	4.05	8.75	12.65	7.35
2	3.95	5.05	7.55	7.35	17	4.45	8.95	12.45	6.95
3	3.95	5.45	7.75	6.65	18	5.75	9.15	12.95	6.95
4	3.95	6.25	7.85	6.55	19	6.75	9.45	13.15	6.85
5	3.95	6.25	8.35	6.35	20	7.05	10.05	13.55	6.95
6	3.95	5.85	8.65	6.35	21	6.75	10.45	13.75	6.45
7	4.35	5.75	8.65	6.15	22	6.15	10.55	13.75	6.45
8	4.55	5.85	8.45	6.75	23	5.15	10.65	13.15	6.35
9	4.55	5.95	8.05	6.55	24	4.55	10.95	12.95	6.35
10	4.55	6.85	8.45	6.45	25	4.45	10.45	12.75	6.35
11	4.65	6.65	9.35	6.15	26	3.95	10.15	12.75	6.95
12	4.85	6.25	9.85	5.95	27	4.95	10.15	12.15	6.85
13	5.05	6.25	9.95	6.05	28	6.55	10.65	12.05	6.75
14	5.55	6.15	9.75	5.85	29	6.75	10.85	11.65	6.35
15	5.85	6.05	9.55	5.75	30	6.75	10.55	11.45	5.95
16	6.35	5.95	9.65	5.95	31	.....	10.05	.....	5.85
17	6.75	6.05	9.45	5.85	1910.				
18	6.55	6.45	9.55	5.35	1	3.95	9.75	10.45	5.95
19	6.55	6.95	9.35	5.25	2	3.95	9.25	10.85	5.85
20	6.75	7.65	8.45	5.25	3	4.15	8.95	10.85	5.75
21	6.85	8.15	7.95	4.75	4	4.45	8.35	10.95	5.45
22	6.95	7.85	8.25	4.95	5	4.15	8.45	10.75	5.35
23	7.15	7.65	8.75	4.95	6	3.95	8.45	10.35	5.75
24	7.25	7.45	8.85	4.45	7	3.95	8.35	9.95	5.35
25	6.75	7.65	8.75	4.25	8	3.95	8.35	9.75	5.25
26	6.35	7.35	8.65	4.25	9	3.95	8.95	9.45	5.15
27	5.85	7.45	8.75	3.95	10	4.55	9.55	9.15	5.05
28	5.45	7.35	8.45	3.95	11	4.55	10.05	8.85	5.05
29	5.25	7.05	8.45	3.95	12	5.15	10.15	8.75	4.95
30	5.05	6.85	7.65	5.25	13	5.95	10.25	8.75	4.85
31	.....	6.75	.....	3.95	14	6.45	9.95	8.45	4.75
1909.					15	6.75	9.85	8.45	4.55
1	3.95	6.15	9.35	11.45	16	5.95	9.45	8.25	4.55
2	3.95	4.95	8.95	11.15	17	5.55	8.95	8.15	4.55
3	3.95	5.45	9.05	10.95	18	5.55	8.45	7.85	4.45
4	3.95	5.45	9.85	11.05	19	6.15	8.35	7.65	4.45
5	3.95	6.75	11.25	11.05	20	6.65	8.25	7.45	4.45
6	3.95	7.85	12.45	11.25	21	7.45	8.25	7.15	4.45
7	3.95	8.45	13.45	10.85	22	7.55	8.05	7.05	4.35
8	3.95	8.95	13.95	10.55	23	7.55	7.95	6.95	4.25
9	3.95	9.35	14.95	9.75	24	7.45	7.85	6.75	4.25
10	3.95	8.95	14.45	9.25	25	7.85	7.85	6.45	4.25
11	3.95	9.55	13.45	8.85	26	8.45	7.95	6.15	4.05
12	3.95	9.75	12.95	8.85	27	8.85	8.25	5.95	3.95
13	3.95	9.65	12.95	8.15	28	9.15	8.45	6.35	4.25
14	3.95	9.95	13.15	7.95	29	9.55	9.15	6.35	4.25
15	3.95	8.85	12.75	7.45	30	9.85	9.95	5.95	4.45
					31	.....	10.75	.....	4.85

Daily gage height, in feet, of Grand River near Fruita, Colo., for 1908–1913—Continued.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1911.							
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	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	6.8	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	.....

Daily gage height, in feet, of Grand River near Fruita, Colo., for 1908–1913—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1912.												
1	.....	3.7	2.8	3.8	5.6	13.2	11.6	8.0	3.8	3.6	3.8	3.1
2	.....	3.7	2.8	3.5	6.7	12.7	11.1	8.0	4.0	3.6	3.8	3.1
3	.....	3.7	2.8	3.7	7.1	13.0	10.6	7.7	3.7	3.5	3.6	3.2
4	.....	3.7	2.8	4.2	7.1	13.5	10.1	7.2	3.6	3.5	3.6	3.0
5	.....	3.6	3.0	4.9	6.8	14.0	9.6	6.6	3.4	3.9	3.7	2.8
6	.....	3.7	3.2	5.0	6.4	14.2	9.2	6.5	3.4	3.8	3.6	.....
7	.....	3.6	3.3	4.9	6.4	14.2	9.0	6.2	3.4	3.8	3.6	.....
8	.....	3.6	3.2	4.9	7.0	13.9	9.2	5.8	3.5	3.9	3.6	.....
9	.....	3.7	3.1	5.2	7.8	14.0	9.3	5.6	3.2	3.9	3.6	.....
10	.....	3.7	3.0	5.5	8.2	14.2	9.2	5.2	3.0	4.0	3.6	.....
11	.....	3.8	2.9	5.7	8.3	13.6	9.2	5.2	3.2	4.0	3.8	.....
12	.....	3.7	2.9	5.1	8.6	13.1	9.2	5.0	3.4	4.1	3.8	.....
13	.....	3.7	2.9	4.9	8.4	12.4	9.0	4.8	3.3	4.05	3.7	.....
14	3.5	3.6	2.9	4.6	7.9	12.0	9.1	4.6	3.4	3.95	3.6	.....
15	3.5	3.6	2.8	4.2	7.6	11.6	9.3	4.6	3.2	3.85	3.6	.....
16	3.5	3.7	2.8	4.2	7.8	11.4	9.2	5.1	3.6	3.85	3.4	.....
17	3.5	3.7	2.7	4.1	8.7	10.8	9.0	5.6	3.8	3.85	3.4	.....
18	3.5	3.8	2.7	4.4	9.6	10.7	8.6	5.3	3.8	3.85	3.3	.....
19	3.6	3.7	2.8	4.0	10.6	10.1	8.5	4.9	3.9	3.8	3.3	.....
20	3.7	3.6	5.0	4.1	11.4	9.8	8.2	4.6	3.9	3.75	3.2	.....
21	3.7	3.5	4.2	4.3	12.2	9.6	8.3	4.4	3.9	3.75	3.2	.....
22	3.7	3.4	3.6	4.0	12.8	9.9	8.2	4.3	3.9	3.8	3.1	.....
23	3.7	3.3	3.5	3.7	12.9	10.4	8.0	4.2	3.9	3.75	3.0	.....
24	3.7	3.2	3.6	3.6	13.0	11.0	8.6	4.0	3.8	3.7	3.2	.....
25	3.8	3.1	3.2	3.9	13.2	11.4	8.0	3.6	3.7	3.7	3.2	.....
26	3.7	3.0	3.2	4.7	13.4	11.8	8.0	3.6	3.8	3.6	3.0	.....
27	3.6	2.9	3.5	4.6	13.6	11.9	8.1	3.6	3.8	3.7	3.0	.....
28	3.5	2.8	3.2	4.6	13.2	11.8	8.0	4.0	3.8	3.9	2.9	.....
29	3.5	2.7	3.4	4.6	12.8	11.7	8.1	3.8	3.8	4.05	2.9	.....
30	3.6	.....	3.6	5.3	12.9	11.6	7.9	3.4	3.8	4.1	2.8	.....
31	3.8	.....	3.6	.....	13.2	.....	7.9	4.0	.....	3.95	.....	.....
1913.												
1	.....	.....	.....	5.2	8.05	9.75	6.54	3.7	2.45	3.65	3.15	2.8
2	.....	.....	.....	5.7	8.25	9.75	6.05	3.4	2.45	3.65	3.15	2.8
3	.....	.....	.....	6.0	8.0	9.55	5.85	3.25	2.4	3.75	3.25	2.8
4	.....	.....	.....	5.9	7.7	9.3	5.65	3.05	2.6	3.9	3.25	2.85
5	.....	.....	.....	5.1	7.45	9.05	5.4	3.05	2.6	3.9	3.2	2.9
6	.....	.....	.....	5.25	7.7	8.75	5.3	2.95	2.55	3.95	3.1	3.0
7	.....	.....	.....	5.2	8.25	8.5	5.15	2.8	2.9	4.0	3.1	2.8
8	.....	.....	.....	5.6	8.6	8.2	4.9	2.6	.....	3.95	3.0	2.85
9	.....	.....	.....	5.3	8.55	7.9	4.8	2.7	.....	3.85	3.05	2.75
10	.....	.....	.....	4.85	8.5	8.05	4.7	2.75	.....	3.8	3.05	2.65
11	.....	.....	.....	4.2	8.75	8.25	4.75	2.45	.....	3.8	2.95	2.5
12	.....	.....	3.75	4.2	9.2	8.7	4.8	2.5	3.85	3.8	2.9	2.45
13	.....	.....	3.6	4.55	9.5	8.65	4.75	2.65	3.75	3.7	3.3	2.3
14	.....	.....	3.2	5.4	9.45	8.9	4.4	2.9	3.55	3.7	3.55	.....
15	.....	.....	2.9	6.05	8.95	7.7	4.1	2.95	3.55	3.75	3.5	.....
16	.....	.....	2.9	6.85	8.25	7.85	4.05	2.8	3.5	3.7	3.3	.....
17	.....	.....	2.85	7.5	7.8	8.05	4.3	2.65	3.5	3.7	3.15	.....
18	.....	.....	3.1	7.75	7.75	8.1	4.6	2.45	3.55	3.55	3.25	.....
19	.....	.....	2.95	7.8	8.05	8.2	4.95	2.35	3.5	3.45	3.1	.....
20	.....	.....	3.15	8.0	8.3	8.35	5.45	2.2	3.35	3.35	3.15	.....
21	.....	.....	3.2	8.05	8.0	8.25	5.65	2.15	3.2	3.3	3.2	.....
22	.....	.....	2.95	7.95	7.45	8.0	5.3	2.4	3.2	3.3	3.25	.....
23	.....	.....	2.9	7.5	7.3	7.75	5.4	2.7	4.15	3.3	3.15	.....
24	.....	.....	3.0	7.15	7.8	7.6	5.6	2.6	4.15	3.3	3.0	.....
25	.....	.....	2.7	6.65	8.4	7.45	5.8	2.7	4.05	3.3	2.75	.....
26	.....	.....	2.8	6.1	8.95	7.15	5.7	2.75	3.9	3.3	2.75	.....
27	.....	.....	2.75	5.8	9.5	7.0	5.4	2.4	3.9	3.2	3.05	.....
28	.....	.....	2.7	6.5	9.95	6.95	4.85	2.45	3.9	3.1	3.15	.....
29	.....	.....	2.7	7.2	9.7	6.85	4.5	2.45	3.7	3.1	3.05	.....
30	.....	.....	3.45	7.95	9.8	6.95	4.05	2.15	3.8	3.1	2.95	.....
31	.....	.....	4.35	.....	9.9	.....	3.9	2.5	.....	3.1	.....	.....

NOTE.—Gage heights for 1908–1910 have been taken from United States Weather Bureau records, being reduced 0.05 foot to conform to the change in datum May 3, 1911.

Daily discharge, in second-feet, of Grand River near Fruita, Colo., for 1908–1913.

Day.	Apr.	May.	June.	July.	Day.	Apr.	May.	June.	July.
1908.					1909.				
1	4,560	6,630	13,600	14,000	16	4,760	20,200	46,600	13,600
2	4,560	6,860	14,400	13,600	17	5,560	21,300	45,100	12,200
3	4,560	7,790	15,200	11,200	18	8,540	22,400	48,800	12,200
4	4,560	9,920	15,700	10,900	19	11,500	24,200	50,300	11,900
5	4,560	9,920	18,100	10,200	20	12,600	27,900	53,300	12,200
6	4,560	8,800	19,700	10,200	21	11,500	30,600	54,800	10,500
7	5,350	8,540	19,700	9,620	22	9,620	31,300	54,800	10,500
8	5,760	8,800	18,700	11,500	23	7,080	32,000	50,300	10,200
9	5,760	9,060	16,600	10,900	24	5,760	34,100	48,800	10,200
10	5,760	11,900	18,700	10,500	25	5,560	30,600	47,400	10,200
11	5,980	11,200	23,600	9,620	26	4,560	28,600	47,400	12,200
12	6,410	9,920	26,600	9,060	27	6,630	28,600	42,900	11,900
13	6,860	9,920	27,300	9,340	28	10,900	32,000	42,200	11,500
14	8,040	9,620	26,000	8,800	29	11,500	33,400	39,200	10,200
15	8,800	9,340	24,800	8,540	30	11,500	31,300	37,700	9,060
16	10,200	9,060	25,400	9,060	31	.....	27,900	.....	8,800
17	11,500	9,340	24,200	8,800	1910.				
18	10,900	10,500	24,800	7,550	1	4,560	26,000	30,600	9,060
19	10,900	12,200	23,600	7,320	2	4,560	23,000	33,400	8,800
20	11,500	14,800	18,700	7,320	3	4,950	21,300	33,400	8,540
21	11,900	17,100	16,200	6,190	4	5,560	18,100	34,100	7,790
22	12,200	15,700	17,600	6,630	5	4,950	18,700	32,700	7,550
23	12,900	14,800	20,200	6,630	6	4,560	18,700	29,900	8,540
24	13,300	14,000	20,800	5,560	7	4,560	18,100	27,300	7,550
25	11,500	14,800	20,200	5,150	8	4,560	18,100	26,000	7,320
26	10,200	13,600	19,700	5,150	9	4,560	21,300	24,200	7,080
27	8,800	14,000	20,200	4,560	10	5,760	24,800	22,400	6,860
28	7,790	13,600	18,700	4,560	11	5,760	27,900	20,800	6,860
29	7,320	12,600	18,700	4,560	12	7,080	28,600	20,200	6,630
30	6,860	11,900	14,800	7,320	13	9,060	29,200	20,200	6,410
31	.....	11,500	.....	4,560	14	10,500	27,300	18,700	6,190
1909.					15	11,500	26,600	18,700	5,760
1	4,560	9,620	23,600	37,700	16	9,060	24,200	17,600	5,760
2	4,560	6,630	21,300	35,600	17	8,040	21,300	17,100	5,760
3	4,560	7,790	21,900	34,100	18	8,040	18,700	15,700	5,560
4	4,560	7,790	26,600	34,900	19	9,620	18,100	14,800	5,560
5	4,560	11,500	36,300	34,900	20	11,200	17,600	14,000	5,560
6	4,560	15,700	45,100	36,300	21	14,000	17,600	12,900	5,560
7	4,560	18,700	52,500	33,400	22	14,400	16,600	12,600	5,350
8	4,560	21,300	56,200	31,300	23	14,400	16,200	12,200	5,150
9	4,560	23,600	63,600	26,000	24	14,000	15,700	11,500	5,150
10	4,560	21,300	59,900	23,000	25	15,700	15,700	10,500	5,150
11	4,560	24,800	52,500	20,800	26	18,700	16,200	9,620	4,760
12	4,560	26,000	48,800	20,800	27	20,800	17,600	9,060	4,560
13	4,560	25,400	48,800	17,100	28	22,400	18,700	10,200	5,150
14	4,560	21,300	50,300	16,200	29	24,800	22,400	10,200	5,150
15	4,560	20,800	47,400	14,000	30	26,600	27,300	9,060	5,560
					31	.....	32,700	.....	6,410

Daily discharge, in second-feet, of Grand River near Fruita, Colo., for 1908–1913—Con.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1911.							
1	14,200	27,600	15,000	7,200	3,010	8,930	4,470
2	14,200	28,200	14,600	6,740	3,010	8,930	4,260
3	14,200	28,900	17,400	6,300	2,880	8,670	4,110
4	14,200	30,300	21,000	5,870	3,300	8,410	3,940
5	15,800	31,700	22,100	5,450	3,300	8,670	3,770
6	17,400	33,800	21,000	5,050	3,300	11,400	3,610
7	20,000	35,900	23,900	4,660	3,150	13,800	3,450
8	23,900	35,900	21,000	4,290	3,150	11,700	3,300
9	25,100	36,700	18,400	3,940	3,150	11,000	3,150
10	31,000	38,800	15,500	3,770	2,880	9,200	3,010
11	29,600	35,900	13,800	3,610	2,750	7,910	3,010
12	23,900	31,700	12,400	3,940	2,750	7,200	3,010
13	21,000	31,000	12,000	4,660	2,750	6,740	3,010
14	21,600	32,400	11,400	4,660	2,750	6,300	3,150
15	21,600	31,700	12,800	4,290	2,750	6,300	3,300
16	23,900	31,700	12,400	3,940	3,010	6,080	3,450
17	25,100	30,300	12,000	3,610	3,300	5,870	3,610
18	25,100	28,900	11,000	3,300	3,300	5,660	3.770
19	26,300	29,600	11,000	3,300	3,150	5,450	3,610
20	26,900	28,200	11,700	3,300	2,750	5,250	3,610
21	23,900	29,600	11,700	3,010	2,630	5,050	3,610
22	26,300	30,300	11,000	3,450	2,630	4,850	3,610
23	18,900	28,900	13,800	4,660	2,750	4,850	3,450
24	20,000	26,900	15,000	5,250	3,150	4,850	3,300
25	21,600	23,900	12,400	5,450	3,300	4,660	3,150
26	24,500	21,600	11,700	5,050	3,610	4,660	3,010
27	26,300	18,900	10,700	4,660	3,940	4,660	2,880
28	25,100	17,400	10,400	4,290	5,050	4,850	2,880
29	25,100	16,900	9,770	3,940	6,300	5,050	2,880
30	25,100	15,900	8,670	3,610	8,160	4,850	2,880
31	26,300	.....	8,160	3,150	.....	4,660	.....

Daily discharge, in second-feet, of Grand River, near Fruita, Colo., for 1908–1913—Continued.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1912.										
1	2,750	4,290	8,160	50,700	38,800	16,400	4,290	3,940	4,290	3,150
2	2,750	3,770	11,400	47,000	35,200	16,400	4,660	3,940	4,290	3,150
3	2,750	4,110	12,800	49,200	31,700	15,000	4,110	3,770	3,940	3,300
4	2,750	5,050	12,800	52,900	28,200	13,100	3,940	3,770	3,940	3,010
5	3,010	6,520	11,700	56,600	25,100	11,000	3,610	4,470	4,110	2,750
6	3,300	6,740	10,400	58,100	22,700	10,700	3,610	4,290	3,940	.....
7	3,450	6,520	10,400	58,100	21,600	9,770	3,610	4,290	3,940	.....
8	3,300	6,520	12,400	55,900	22,700	8,670	3,770	4,470	3,940	.....
9	3,150	7,200	15,500	56,600	23,300	8,160	3,300	4,470	3,940	.....
10	3,010	7,910	17,400	58,100	22,700	7,200	3,010	4,660	3,940	.....
11	2,880	8,410	17,900	53,600	22,700	7,200	3,300	4,660	4,290	.....
12	2,880	6,970	19,400	49,900	22,700	6,740	3,610	4,850	4,290	.....
13	2,880	6,520	18,400	44,800	21,600	6,300	3,450	4,760	4,110	.....
14	2,880	5,870	15,900	41,800	22,100	5,870	3,610	4,560	3,940	.....
15	2,750	5,050	14,600	38,800	23,300	5,870	3,300	4,380	3,940	.....
16	2,750	5,050	15,500	37,400	22,700	6,970	3,940	4,380	3,610	.....
17	2,630	4,850	20,000	33,100	21,600	8,160	4,290	4,380	3,610	.....
18	2,630	5,450	25,100	32,400	19,400	7,430	4,290	4,380	3,450	.....
19	2,750	4,660	31,700	28,200	18,900	6,520	4,470	4,290	3,450	.....
20	6,740	4,850	37,400	26,300	17,400	5,870	4,470	4,200	3,300	.....
21	5,050	5,250	43,300	25,100	17,900	5,450	4,470	4,200	3,300	.....
22	3,940	4,660	47,700	26,900	17,400	5,250	4,470	4,290	3,150	.....
23	3,770	4,110	48,500	30,300	16,400	5,050	4,470	4,200	3,010	.....
24	3,940	3,940	49,200	34,500	19,400	4,660	4,290	4,110	3,300	.....
25	3,300	4,470	50,700	37,400	16,400	3,940	4,110	4,110	3,300	.....
26	3,300	6,080	52,200	40,300	16,400	3,940	4,290	3,940	3,010	.....
27	3,770	5,870	53,600	41,100	16,900	3,940	4,290	4,110	3,010	.....
28	3,300	5,870	50,700	40,300	16,400	4,660	4,290	4,470	2,880	.....
29	3,610	5,870	47,700	39,600	16,900	4,290	4,290	4,760	2,880	.....
30	3,940	7,430	48,500	38,800	15,900	3,610	4,290	4,850	2,750	.....
31	3,940	.....	50,700	.....	15,900	4,660	.....	4,560	.....	.....
1913.										
1	.....	7,200	16,600	26,000	10,500	4,110	2,370	4,020	3,220	2,750
2	.....	8,410	17,600	26,000	9,340	3,610	2,370	4,020	3,220	2,750
3	.....	9,200	16,400	24,800	8,800	3,380	2,320	4,200	3,380	2,750
4	.....	8,930	15,000	23,300	8,280	3,080	2,520	4,470	3,380	2,820
5	.....	6,970	14,000	21,900	7,670	3,080	2,520	4,470	3,300	2,880
6	.....	7,320	15,000	20,200	7,430	2,940	2,470	4,560	3,150	3,010
7	.....	7,200	17,600	18,900	7,080	2,750	2,880	4,660	3,150	2,750
8	.....	8,160	19,400	17,400	6,520	2,520	3,180	4,560	3,010	2,820
9	.....	7,430	19,200	15,900	6,300	2,630	3,480	4,380	3,080	2,690
10	.....	6,410	18,900	16,600	6,080	2,690	3,780	4,290	3,080	2,580
11	.....	5,050	20,200	17,600	6,190	2,370	4,080	4,290	2,940	2,420
12	4,200	5,050	22,700	20,000	6,300	2,420	4,380	4,290	2,880	2,370
13	3,940	5,760	24,500	19,700	6,190	2,580	4,200	4,110	3,450	2,230
14	3,300	7,670	24,200	16,400	5,450	2,880	3,860	4,110	3,860	.....
15	2,880	9,340	21,300	15,000	4,850	2,940	3,860	4,200	3,770	.....
16	2,880	11,900	17,600	15,700	4,760	2,750	3,770	4,110	3,450	.....
17	2,820	14,200	15,500	16,600	5,250	2,580	3,770	4,110	3,220	.....
18	3,150	15,200	15,200	16,900	5,870	2,370	3,860	3,860	3,380	.....
19	2,940	15,500	16,600	17,400	6,630	2,280	3,770	3,690	3,150	.....
20	3,220	16,400	17,900	18,100	7,790	2,140	3,530	3,530	3,220	.....
21	3,300	16,600	16,400	17,600	8,280	2,100	3,300	3,450	3,300	.....
22	2,940	16,200	14,000	16,400	7,430	2,320	3,300	3,450	3,380	.....
23	2,880	14,200	13,500	15,200	7,670	2,630	4,950	3,450	3,220	.....
24	3,010	12,900	15,500	14,600	8,160	2,520	4,950	3,450	3,010	.....
25	2,630	11,200	18,400	14,000	8,670	2,630	4,760	3,450	2,690	.....
26	2,750	9,480	21,300	12,900	8,410	2,690	4,470	3,450	2,690	.....
27	2,690	8,670	24,500	12,400	7,670	2,320	4,470	3,300	3,080	.....
28	2,630	10,700	27,300	12,200	6,410	2,370	4,470	3,150	3,220	.....
29	2,630	13,100	25,700	11,900	5,660	2,370	4,110	3,150	3,080	.....
30	3,690	16,200	26,300	12,200	4,760	2,100	4,290	3,150	2,940	.....
31	5,350	.....	26,900	.....	4,470	2,420	.....	3,150	.....	.....

NOTE.—Discharge determined from a curve well defined between 2,000 and 60,000 second-feet. Discharge interpolated Sept. 8–11, 1913.

Monthly discharge of Grand River near Fruita, Colo., for 1908–1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1908.					
April	13,300	4,560	8,130	484,000	B.
May	17,100	6,630	10,900	670,000	B.
June	27,300	13,600	20,100	1,200,000	B.
July	14,000	4,560	8,350	513,000	B.
The period				2,870,000	
1909.					
April	12,600	4,560	6,530	389,000	B.
May	34,100	6,630	23,200	1,430,000	B.
June	63,600	21,300	45,500	2,710,000	B.
July	37,700	8,800	19,100	1,170,000	A.
The period				5,700,000	
1910.					
April	26,600	4,560	10,800	643,000	A.
May	32,700	15,700	21,400	1,320,000	A.
June	34,100	9,060	19,300	1,150,000	A.
July	9,060	4,560	6,360	391,000	B.
The period				3,500,000	
1911.					
May	31,000	14,200	22,500	1,380,000	A.
June	38,800	15,900	29,000	1,730,000	A.
July	23,900	8,160	14,000	861,000	A.
August	7,200	3,010	4,460	274,000	A.
September	8,160	2,630	3,400	202,000	A.
October	13,800	4,660	6,980	429,000	A.
November	4,470	2,880	3,410	203,000	A.
The period				5,080,000	
1912.					
March	6,740	2,630	3,350	206,000	A.
April	8,410	3,770	5,660	337,000	A.
May	53,600	8,160	28,400	1,750,000	A.
June	58,100	25,100	42,800	2,550,000	A.
July	38,800	15,900	21,600	1,330,000	A.
August	16,400	3,610	7,510	462,000	A.
September	4,660	3,010	4,000	238,000	A.
October	4,850	3,770	4,340	267,000	A.
November	4,290	2,750	3,630	216,000	A.
The period				7,360,000	
1913.					
March 12–31	5,350	2,630	3,190	126,000	A.
April	16,600	5,050	10,400	619,000	A.
May	27,300	13,500	19,200	1,180,000	B.
June	26,000	11,900	17,800	1,060,000	B.
July	10,500	4,470	6,930	426,000	A.
August	4,110	2,100	2,660	164,000	A.
September	4,950	2,320	3,670	218,000	A.
October	4,660	3,150	3,890	239,000	A.
Novembr	3,860	2,690	3,200	190,000	A.
Dec. 1–13	3,010	2,230	2,680	69,100	B.
The period				4,290,000	

GRAND LAKE OUTLET AT GRAND LAKE, COLO.

Location.—In sec. 6, T. 3 N., R. 75 W., at the footbridge at the outlet of Grand Lake, 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 September 29, 1913, when the station was discontinued.

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

Gage.—Vertical staff.

Control.—The one measurement made during 1913 showed a slight change in channel since 1912.

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.

Diversion.—No water diverted below the former station on the North Inlet. There are court decrees for diversions above that point.

Accuracy.—Prior to the last part of September, 1913, when stones were dumped into channel below gage, conditions were favorable for accurate results, and estimates are good.

The following discharge measurement was made by R. H. Fletcher:
July 31, 1913: Gage height, 2.18 feet; discharge, 98 second-feet.

Daily gage height, in feet, of Grand Lake outlet at Grand Lake, Colo., for 1913.

[Miss Jenny Young, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Day.	Apr.	May.	June.	July.	Aug.	Sept.
1....	1.15	2.22	4.00	2.65	2.16	1.79	16....	1.52	2.75	2.90	2.26	1.90	2.10
2....	1.15	2.28	3.55	2.60	2.10	1.82	17....	1.62	2.55	2.88	2.32	1.94	2.22
3....	1.25	2.30	3.45	2.50	2.09	1.80	18....	1.74	2.40	3.20	2.42	1.89	2.19
4....	1.22	2.20	3.35	2.48	2.02	1.81	19....	1.82	2.32	3.30	2.46	1.85	2.22
5....	1.32	2.22	3.30	2.44	2.00	1.89	20....	1.90	2.30	3.15	2.50	1.80	2.20
6....	1.30	2.22	3.25	2.34	2.02	1.86	21....	2.00	2.38	3.10	2.55	1.82	2.19
7....	1.32	2.32	3.15	2.22	2.02	1.80	22....	2.02	2.30	2.92	2.55	1.80	2.14
8....	1.42	2.42	3.10	2.32	2.00	1.80	23....	2.10	2.40	2.98	2.89	1.80	2.12
9....	1.44	2.52	3.00	2.40	1.96	1.84	24....	2.00	2.56	2.95	3.20	1.78	2.10
10....	1.42	2.64	3.05	2.46	1.98	1.86	25....	2.00	2.95	2.88	3.05	1.80	2.20
11....	1.40	2.70	3.20	2.32	1.99	1.88	26....	1.92	3.30	2.80	2.89	1.80	2.20
12....	1.44	2.74	3.15	2.30	2.00	1.98	27....	1.90	3.60	2.88	2.66	1.79	2.20
13....	1.40	2.76	2.95	2.33	2.00	1.94	28....	1.92	3.70	2.80	2.55	1.79	2.20
14....	1.40	2.76	2.85	2.30	2.00	1.86	29....	2.02	3.80	2.82	2.45	1.80	2.20
15....	1.48	2.68	2.90	2.32	1.95	1.90	30....	2.10	3.90	2.70	2.25	1.76	.....
							31....	.....	4.00	.....	2.19	1.80	.....

NOTE.—Sept. 16 to 30, discharge relation affected by rock dumped in the channel below the gage. As station is so near the outlet, gage heights represent water level in Grand Lake.

Daily discharge, in second-feet, of Grand Lake outlet at Grand Lake, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Day.	Apr.	May.	June.	July.	Aug.	Sept.
1	5	107	880	228	95	39	16	14	262	316	116	53	.....
2	5	121	612	211	85	43	17	22	196	309	130	59	.....
3	6	125	560	180	83	40	18	33	150	440	156	52	.....
4	6	103	510	174	71	41	19	43	130	485	169	46	.....
5	7	107	485	161	68	52	20	53	125	418	180	40	.....
6	7	107	462	135	71	48	21	68	145	395	196	43	.....
7	7	130	418	107	71	40	22	71	125	324	196	40	.....
8	10	156	395	130	68	40	23	85	150	347	312	40	.....
9	11	186	355	150	62	45	24	68	199	336	440	38	.....
10	10	224	375	169	65	48	25	68	336	309	375	40	.....
11	9	244	440	130	66	50	26	56	485	279	312	40	.....
12	11	258	418	125	68	65	27	53	640	309	231	39	.....
13	9	265	336	132	68	59	28	56	695	279	196	39	.....
14	9	265	298	125	68	48	29	71	755	286	164	40	.....
15	12	237	316	130	60	53	30	85	815	244	114	36	.....
							31	.....	880	.....	101	40	.....

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

Monthly discharge of Grand Lake outlet at Grand Lake, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April	85	5	32.3	1,920	B.
May	880	107	281	17,300	B.
June	880	244	398	23,700	B.
July	440	101	183	11,300	B.
August	95	36	56.6	3,480	B.
September 1–15	65	39	47.4	1,410	C.
The period	.....	.....	.....	59,100	

FRASER RIVER NEAR ARROW, COLO.

Location.—In sec. 3, T. 2 S., R. 75 W., one-fourth mile from Idlewild ranger station, in the Arapahoe National Forest; 2 miles from Arrow. Nearest tributary, Cooper Creek, which enters a short distance below.

Records available.—September 23, 1910, to December 31, 1913.

Drainage area.—Twenty-eight square miles (measured on special maps and is a revision of the area given for 1911).

Gage.—Vertical staff.

Control.—Shifting during high water.

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

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

Diversions.—There is a court decree for the diversion of 53 second-feet across the divide from the headwaters above the station. During 1913 a total of 1,120 acre-feet was diverted. There are court decrees for diversions of 74 second-feet for irrigation and 61 second-feet for placer and power below the station.

Accuracy.—Owing to the high altitude of the drainage basin (9,000 to 12,000 feet), it is probable that at certain seasons alternate melting and freezing cause diurnal fluctuations; the mean daily gage height as determined by one or two readings may be considerably in error; estimates of discharge are only fair.

Discharge measurements of Fraser River near Arrow, Colo., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 13	R. H. Fletcher	1.65	85	Oct. 1	Robert Follansbee	1.17	32
July 3	do	1.42	66	2	do	1.11	28
Aug. 1	do	1.20	37				

Daily gage height, in feet, of Fraser River near Arrow, Colo., for 1913.

[C. W. Euler, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		1.05	2.20	1.50	1.30	1.12	1.22	0.95	1.5
2		1.25	2.40	1.50	1.28	1.10	1.15	.95	
3		1.25	2.10	1.50	1.25	1.08	1.15	1.08	
4		1.25	2.20	1.40	1.30	1.15	1.25	1.05	1.05
5		1.20	1.85	1.40	1.25	1.20		1.08	
6		1.25	1.85	1.40	1.22	1.15	1.12	1.10	
7		1.35	1.80	1.38	1.20	1.25	1.10	1.00	
8		1.35	1.80	1.38	1.20	1.35	1.10	1.08	2.3
9		1.45	1.70	1.42	1.15	1.28	1.10	1.08	
10		1.40	1.70	1.42	1.15	1.22	1.15	1.05	
11		1.45	1.90	1.48	1.15	1.25	1.20	1.05	2.3
12		1.55	1.75	1.35	1.15	1.25	1.22	.95	
13		1.58	1.70	1.35	1.20	1.15	1.15	.98	
14		1.55	1.70	1.35	1.15		1.08	1.02	
15		1.40		1.35	1.12	1.25	1.05	.95	2.0
16		1.40	1.70	1.35	1.12	1.30	1.05		
17		1.50	1.65	1.48			1.05	.90	
18		1.50	1.65	1.45	1.10	1.28	1.05		2.0
19		1.55	1.70	1.40		1.25	1.05		
20		1.55	1.70	1.35	1.10	1.20	1.05	.90	
21		1.45	1.70	1.45	1.10	1.15	.95		
22		1.40	1.65	1.40	1.08	1.15	.98		1.7
23		1.50	1.65		1.08	1.18	.95		
24	1.05	1.60	1.70	1.45	1.15	1.15	.98	1.7	
25	1.10		1.60	1.46	1.08	1.15	1.25		1.5
26	.95	1.92	1.55	1.45	1.05	1.10	1.05		
27		1.90	1.60	1.42	1.05	1.10	1.10	.90	
28	1.10	1.85	1.60	1.35	1.08	1.10	1.15		
29	1.10	2.00	1.50	1.35	1.05	1.10	1.32		1.3
30	1.10	2.25	1.50	1.35	1.05	1.12	1.35		
31		2.20		1.32	1.08				

NOTE.—Discharge relation affected by ice Nov. 24 and Dec. 1–31.

Daily discharge, in second-feet, of Fraser River near Arrow, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	18	230	79	50	30	40	16
2	.....	36	298	79	48	28	33	16
3	.....	36	210	79	44	26	33	26
4	.....	36	238	64	50	33	44	24
5	.....	31	148	64	44	38	37	26
6	.....	36	148	64	40	33	30	28
7	.....	46	136	61	38	44	28	20
8	.....	46	136	61	38	57	28	26
9	.....	58	115	67	33	48	28	26
10	.....	52	115	67	33	40	33	24
11	.....	58	159	76	33	44	38	24
12	.....	71	126	57	33	44	40	16
13	.....	75	115	57	38	33	33	19
14	.....	71	115	57	33	38	26	22
15	.....	52	115	57	30	44	24	16
16	.....	52	115	57	30	50	24	14
17	.....	64	106	76	29	49	24	13
18	.....	64	106	72	28	48	24	13
19	.....	71	115	64	28	44	24	13
20	.....	71	115	57	28	38	24	13
21	.....	58	115	72	28	33	16	13
22	.....	52	106	64	26	33	19	13
23	.....	64	106	68	26	36	16	13
24	18	78	115	72	33	33	19	13
25	22	107	96	72	26	33	44	13
26	10	136	88	72	24	28	24	13
27	16	131	96	67	24	28	28	13
28	22	121	96	57	26	28	33	13
29	22	154	79	57	24	28	53	13
30	22	230	79	57	24	30	57	13
31	.....	228	.....	53	26	.....	36	.....

NOTE.—Discharge determined as follows: Apr. 24 to May 29, from a poorly defined rating curve; May 30 to June 1, by the indirect method for shifting channels; June 2 to Nov. 23, and Nov. 25–30, from a curve fairly well defined below 80 second-feet but uncertain above; Nov. 24, estimated on account of ice; for days for which gage heights are missing, estimated. No estimates made for December on account of unknown ice effect.

Monthly discharge of Fraser River near Arrow, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April 24–30	22	10	18.8	261	C.
May	230	18	81.0	4,980	D.
June	298	79	131	7,800	D.
July	79	53	65.4	4,020	C.
August	50	24	32.7	2,010	C.
September	57	26	37.3	2,220	C.
October	57	16	31.0	1,910	B.
November	28	13	17.5	1,040	C.
The period	.....	.....	.....	24,200	

WILLIAMS FORK NEAR SCHOLL, COLO.

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

Records available.—September 22, 1910, to June 30, 1912; April 27 to December 31, 1913.

Drainage area.—141 square miles (measured on Forest atlas).

Gage.—Vertical staff; read daily, morning and evening.

Control.—Apparently permanent, 1910 to 1913.

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

Winter flow.—Discharge relation slightly affected by ice.

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, but this diversion has not been made.

Accuracy.—Owing to the high altitude of the station (about 7,900 feet) it is probable that at certain seasons there is considerable diurnal fluctuation; mean daily stage as determined from morning and evening readings may be somewhat in error; estimates are rated as fair or probably good; rating curve good.

Discharge measurements of Williams Fork near Scholl, Colo., for 1913.

Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 12	R. H. Fletcher	2.40	393
July 2	do	2.20	310
Oct. 8	Robert Follansbee	1.36	74

Daily gage height, in feet, of Williams Fork near Scholl, Colo., for 1913.

[J. B. Hull, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		1.9	3.05	2.25	1.6	1.45	1.55	1.35	1.2
2		1.85	2.95	2.15	1.6	1.45	1.55	1.3	1.25
3		1.8	2.9	2.15	1.6	1.45	1.5	1.3	1.2
4		1.8	2.8	2.1	1.6	1.7	1.5	1.35	.....
5		1.8	2.8	2.05	1.6	1.6	1.4	1.3	.....
6		1.95	2.75	2.05	1.6	1.6	1.5	1.3	.....
7		1.95	2.6	2.0	1.5	1.6	1.5	1.3	.....
8		2.05	2.55	2.0	1.5	1.6	1.45	1.3	.....
9		2.05	2.5	2.0	1.5	1.55	1.4	1.3	.....
10		2.1	2.6	2.0	1.55	1.5	.....	1.25	.....
11		2.2	2.9	1.95	1.6	1.5	1.6	1.3	.....
12		2.35	2.65	1.9	1.65	1.5	1.4	1.35	.....
13		2.3	2.55	1.8	1.55	1.4	1.5	1.3	1.3
14		2.2	2.55	1.85	1.5	1.45	1.5	1.3	1.25
15		2.1	2.6	1.9	1.5	1.7	1.45	1.3	1.25
16		2.1	2.6	1.9	1.45	1.65	1.4	1.15	1.2
17		2.15	2.6	2.0	1.4	1.55	1.35	1.35	1.2
18		2.25	2.7	2.0	1.4	1.45	1.35	1.3	1.2
19		2.25	2.8	1.95	1.4	1.4	1.4	1.3	1.2
20		2.2	2.7	1.9	1.45	1.4	1.35	1.3	1.1
21		2.1	2.6	1.95	1.45	1.4	1.35	1.25	1.15
22		2.15	2.6	1.85	1.4	1.4	1.4	1.15	1.15
23		2.35	2.55	2.0	1.45	1.4	1.4	1.15	1.2
24		2.45	2.55	2.0	1.45	1.4	1.4	1.35	1.2
25		2.55	2.45	1.85	1.4	1.45	1.4	1.45	1.2
26		2.65	2.4	1.8	1.45	1.5	1.25	1.25	1.2
27	1.6	2.7	2.4	1.8	1.45	1.5	1.3	1.15	1.2
28	1.8	2.7	2.4	1.7	1.45	1.4	1.4	1.2	1.2
29	1.8	2.9	2.35	1.7	1.5	1.4	1.2	1.15	1.2
30	1.95	3.05	2.25	1.7	1.4	1.4	1.2	1.35	1.15
31	.....	3.1	.....	1.65	1.5	.....	1.35	.....	1.2

Daily discharge, in second-feet, of Williams Fork near Scholl, Colo., for 1910–1913.

Day.	Sept.	Oct.	Nov.	Day.	Sept.	Oct.	Nov.	Day.	Sept.	Oct.	Nov.
1910.				1910.				1910.			
1	.....	68	68	11	.....	61	68	21	.....	76	54
2	.....	76	61	12	.....	61	68	22	92	76	48
3	.....	76	61	13	.....	61	54	23	94	76	48
4	.....	68	68	14	.....	61	61	24	96	76	54
5	.....	61	68	15	.....	61	68	25	98	76	48
6	.....	68	68	16	.....	61	68	26	100	76	48
7	.....	61	68	17	.....	92	61	27	102	68	48
8	.....	61	68	18	.....	76	54	28	102	68	48
9	.....	61	76	19	.....	76	61	29	84	68	37
10	.....	61	68	20	.....	68	54	30	84	76	37
								31	.....	68	.....

Daily discharge, in second-feet, of Williams Fork near Scholl, Colo., for 1910–1913—Continued.

Day.	Jan	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1911.												
1	.....	42	37	42	148	740	370	160	111	92	84	37
2	.....	42	37	42	111	770	532	160	111	84	76	37
3	.....	42	37	54	123	800	478	135	111	76	76	37
4	.....	48	42	54	148	770	450	135	111	76	68	37
5	.....	48	42	54	175	800	770	135	111	102	76	37
6	.....	42	42	54	280	832	560	135	111	135	68	37
7	.....	42	42	54	345	832	450	135	111	123	76	37
8	.....	42	48	48	345	832	478	135	111	102	68	37
9	.....	42	42	.....	370	800	422	135	92	92	76	37
10	.....	42	42	.....	395	770	370	160	92	92	84	37
11	.....	42	42	.....	322	710	345	160	92	92	61	37
12	.....	42	42	.....	280	770	345	135	92	92	54	37
13	.....	48	42	.....	280	865	345	135	92	92	61	37
14	.....	42	42	.....	300	800	322	135	92	76	61	37
15	48	42	42	.....	450	770	300	135	102	92	76	37
16	37	37	42	.....	422	800	300	135	92	111	68	37
17	42	42	42	.....	422	832	300	111	92	102	68	37
18	48	42	42	.....	478	680	300	111	92	92	68	37
19	48	37	42	.....	505	680	260	111	76	92	68	37
20	48	37	48	.....	395	710	260	135	76	84	68	48
21	48	37	48	.....	370	650	280	135	76	76	54	48
22	48	37	42	.....	370	650	260	148	76	84	54	48
23	48	37	42	123	370	620	260	160	76	76	54	48
24	48	37	48	111	422	560	260	148	76	111	54	48
25	48	37	42	111	422	560	225	135	76	84	48	48
26	48	37	42	123	422	505	225	135	76	92	54	37
27	48	37	61	135	478	505	225	135	76	111	48	37
28	48	37	48	135	478	450	190	135	76	111	48	37
29	54	.....	42	148	560	450	190	123	84	84	42	37
30	42	.....	42	175	620	395	190	111	102	84	37	37
31	42	.....	48	.....	620	.....	190	111	.....	84	.....	37
1912.												
1	37	42	48	48	84	710	1,060	.....	.....	.....	.....	.....
2	37	37	48	48	92	865	1,090	.....	.....	.....	.....	.....
3	37	37	48	42	102	995	1,120	.....	.....	.....	.....	.....
4	37	42	48	42	111	1,090	1,060	.....	.....	.....	.....	.....
5	37	42	37	42	111	1,190	1,120	.....	.....	.....	.....	.....
6	37	48	37	42	111	1,290	1,120	.....	.....	.....	.....	.....
7	37	48	42	54	123	1,260	.....	.....	.....	.....	.....	.....
8	37	48	42	54	148	1,350	.....	.....	.....	.....	.....	.....
9	37	48	42	54	160	1,350	.....	.....	.....	.....	.....	.....
10	37	48	42	61	190	1,290	.....	.....	.....	.....	.....	.....
11	37	42	37	48	135	1,120	.....	.....	.....	.....	.....	.....
12	37	42	37	48	123	1,160	.....	.....	.....	.....	.....	.....
13	37	42	37	48	111	1,030	.....	.....	.....	.....	.....	.....
14	37	37	37	48	102	1,060	.....	.....	.....	.....	.....	.....
15	37	37	37	48	92	1,060	.....	.....	.....	.....	.....	.....
16	37	37	37	48	92	1,030	.....	.....	.....	.....	.....	.....
17	37	37	37	48	111	995	.....	.....	.....	.....	.....	.....
18	37	37	37	48	260	930	.....	.....	.....	.....	.....	.....
19	42	42	37	48	422	898	.....	.....	.....	.....	.....	.....
20	42	42	37	48	560	865	.....	.....	.....	.....	.....	.....
21	42	42	42	48	532	865	.....	.....	.....	.....	.....	.....
22	42	42	48	42	478	898	.....	.....	.....	.....	.....	.....
23	42	48	48	42	532	1,060	.....	.....	.....	.....	.....	.....
24	42	48	48	42	620	1,090	.....	.....	.....	.....	.....	.....
25	42	48	54	48	680	1,230	.....	.....	.....	.....	.....	.....
26	42	48	54	48	680	1,190	.....	.....	.....	.....	.....	.....
27	42	48	48	48	590	1,160	.....	.....	.....	.....	.....	.....
28	42	48	48	48	590	1,060	.....	.....	.....	.....	.....	.....
29	42	48	54	48	650	1,190	.....	.....	.....	.....	.....	.....
30	42	.....	54	54	770	1,160	.....	.....	.....	.....	.....	.....
31	42	.....	48	.....	898	.....	.....	.....	.....	.....	.....	.....

Daily discharge, in second-feet, of Williams Fork near Scholl, Colo., for 1910–1913—Con.

	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1913.									
1	.....	190	770	322	111	84	102	68	48
2	.....	175	710	280	111	84	102	61	54
3	.....	160	680	280	111	84	92	61	48
4	.....	160	620	260	111	135	92	68	48
5	.....	160	620	242	111	111	76	61	48
6	.....	208	590	242	111	111	92	61	50
7	.....	208	505	225	92	111	92	61	50
8	.....	242	478	225	92	111	84	61	55
9	.....	242	450	225	92	102	76	61	55
10	.....	260	505	225	102	92	92	54	55
11	.....	300	680	208	111	92	111	61	60
12	.....	370	532	190	123	92	76	68	60
13	.....	345	478	160	102	76	92	61	61
14	.....	300	478	175	92	84	92	61	54
15	.....	260	505	190	92	135	84	61	54
16	.....	260	505	190	84	123	76	42	48
17	.....	280	505	225	76	102	68	68	48
18	.....	322	560	225	76	84	68	61	48
19	.....	322	620	208	76	76	76	61	48
20	.....	300	560	190	84	76	68	61	37
21	.....	260	505	208	84	76	68	54	42
22	.....	280	505	175	76	76	76	42	42
23	.....	370	478	225	84	76	76	42	48
24	.....	422	478	225	84	76	76	68	48
25	.....	478	422	175	76	84	76	84	48
26	.....	532	395	160	84	92	54	54	48
27	111	560	395	160	84	92	61	42	48
28	160	560	395	135	84	76	76	48	48
29	160	680	370	135	92	76	48	42	48
30	208	770	322	135	76	76	48	68	42
31	.....	800	.....	123	92	.....	68	.....	48

NOTE.—Discharge determined from a rating curve well defined above 30 second-feet. Discharge estimated Sept. 23–26, Oct. 23–25, 1910, and Oct. 10, 1913. No discharge given for Dec., 1910, as gage heights are probably in error, indicating a flow much lower than for Williams Fork, near Sulphur Springs, and much lower than records for subsequent years at this station. Discharge Dec. 4–12, 1913, estimated by comparison with Williams Fork near Sulphur Springs.

Monthly discharge of Williams Fork near Scholl, Colo., for 1910–1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1910.					
September 22–30	102	84	94.7	1,690	B.
October	92	61	69.1	4,250	B.
November	76	37	58.7	3,490	B.
1911.					
January 15–31	54	37	46.6	1,570	C.
February	48	37	40.7	2,260	B.
March	61	37	43.3	2,660	B.
May	620	111	369	22,700	D.
June	865	395	697	41,500	D.
July	770	190	337	20,700	D.
August	160	111	136	8,360	C.
September	111	76	92.1	5,480	B.
October	135	76	93.4	5,740	B.
November	84	37	63.3	3,770	B.
December	48	37	39.1	2,400	C.
1912.					
January	42	37	39.1	2,400	B.
February	48	37	43.3	2,490	B.
March	54	37	43.5	2,670	B.
April	61	42	47.8	2,840	B.
May	898	84	331	20,400	D.
June	1,350	710	1,080	64,300	D.
July 1–6	1,120	1,060	1,100	13,100	D.
The period				108,000	
1913.					
April 27–30	208	111	160	1,270	B.
May	800	160	348	21,400	B.
June	770	322	521	31,000	C.
July	322	123	205	12,600	B.
August	123	76	89.5	5,500	B.
September	135	76	92.2	5,490	B.
October	111	48	78.6	4,830	B.
November	84	42	58.9	3,500	B.
December	61	42	49.6	3,050	C.
The period				88,600	

WILLIAMS FORK NEAR SULPHUR SPRINGS, COLO.

Location.—About sec. 36, T. 1 N., R. 79 W., at highway bridge at Field's ranch, 4 miles above the mouth of the river, and about 7 miles southwest of Sulphur Springs. Nearest tributary, Battle Creek, entering from the west 2 miles below station.

Records available.—July 25, 1904, to December 31, 1913.

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

Gage.—Vertical staff.

Control.—Practically permanent during 1913.

Discharge measurements.—Made from bridge or by wading.

Winter flow.—The main channel is kept open by springs, but ice forms along the banks, and slush ice frequently forms. The morning readings are usually affected by backwater from ice, but the afternoon readings are practically unaffected. Gage heights for the winter of 1913 were taken in the afternoon.

Diversions.—There are court decrees for the diversion of 558 second-feet from Williams Fork between the station near Scholl and that near Sulphur Springs. There are also two storage decrees for 80,700 acre-feet and 1,420 acre-feet, respectively, from Williams Fork.

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

Discharge measurements of Williams Fork near Sulphur Springs, Colo., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-feet.*			*Feet.*	*Sec.-feet.*
Feb. 26	C. L. Chatfield	.....	45	July 2	R. H. Fletcher	3.80	273
May 12	R. H. Fletcher	4.07	413	Oct. 8	Robert Follansbee	3.19	90

Daily gage height, in feet, of Williams Fork near Sulphur Springs, Colo., for 1913.

[F. A. Field, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	3.79	4.55	3.98	3.26	3.16	3.37	3.14	2.99
2	.....	3.74	4.60	3.92	3.28	3.12	3.35	3.10	2.96
3	.....	3.66	4.45	3.88	3.26	3.25	3.30	3.12	2.94
4	.....	3.60	4.50	3.86	3.28	3.22	3.35	3.10	2.96
5	.....	3.68	4.35	3.82	3.24	3.18	3.32	3.06	2.96
6	.....	3.73	4.35	3.72	3.22	3.32	3.31	3.06	2.96
7	.....	3.80	4.30	3.66	3.20	3.43	3.26	3.10	3.02
8	.....	3.85	4.25	3.62	3.18	3.25	3.21	3.00	3.04
9	.....	3.82	4.20	3.60	3.20	3.28	3.23	3.08	3.01
10	.....	3.88	4.25	3.58	3.25	3.31	3.25	3.06	3.01
11	3.20	4.00	4.40	3.55	3.18	3.20	3.14	3.10	3.08
12	3.13	4.10	4.30	3.52	3.35	3.16	3.24	3.12	3.30
13	3.18	4.00	4.20	3.50	3.22	3.15	3.22	3.15	3.80
14	3.21	3.99	4.25	3.54	3.19	3.11	3.29	3.15	3.57
15	3.45	3.86	4.20	3.55	3.18	3.40	3.30	3.11	3.30
16	3.50	3.94	4.20	3.51	3.18	3.34	3.22	2.90	3.18
17	3.58	3.88	4.20	3.66	3.10	3.22	3.18	3.11	3.18
18	3.64	3.94	4.25	3.63	3.12	3.20	3.16	3.07	3.10
19	3.66	3.96	4.35	3.62	3.11	3.15	3.12	3.08	3.04
20	3.64	3.92	4.25	3.66	3.11	3.11	3.20	3.07	4.82
21	3.66	3.85	4.25	3.63	3.16	3.12	3.19	3.08	4.20
22	3.57	3.78	4.20	3.52	3.14	3.10	3.21	3.02	4.60
23	3.46	3.98	4.20	3.54	3.12	3.22	3.14	2.75	3.95
24	3.30	4.00	4.15	3.76	3.11	3.32	3.14	2.90	4.10
25	3.38	4.10	4.10	3.63	3.12	3.19	3.20	3.12	3.75
26	3.39	4.25	4.10	3.64	3.12	3.15	3.05	3.09	3.11
27	3.37	4.35	4.05	3.60	3.11	3.11	3.02	2.96	3.11
28	3.56	4.35	4.05	3.53	3.24	3.21	3.12	2.98	4.15
29	3.56	4.45	4.10	3.44	3.14	3.21	2.98	2.97	3.65
30	3.73	4.55	3.99	3.38	3.11	3.22	3.10	2.92	3.60
31	.....	4.50	.....	3.29	.....	.....	3.19	.....	3.20

NOTE.—Discharge relation affected by ice Dec. 11-31.

Daily discharge, in second-feet, of Williams Fork near Sulphur Springs, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	271	795	364	102	83	127	80	59
2	.....	250	850	332	106	76	122	73	56
3	.....	218	690	313	102	100	110	76	53
4	.....	195	740	303	106	94	122	73	56
5	.....	225	600	284	98	87	115	68	56
6	.....	246	600	241	94	115	112	68	56
7	.....	275	560	218	90	142	102	73	63
8	.....	298	525	203	87	100	92	60	65
9	.....	284	490	195	90	106	96	70	61
10	.....	313	525	188	100	112	100	68	61
11	90	374	640	178	87	90	80	73	.....
12	78	430	560	169	122	83	98	76	.....
13	87	374	490	162	94	82	94	82	.....
14	92	369	525	175	88	75	108	82	.....
15	148	303	490	178	87	134	110	75	.....
16	162	343	490	165	87	120	94	49	.....
17	188	313	490	218	73	94	87	75	.....
18	210	343	525	206	76	90	83	69	
19	218	353	600	203	75	82	76	70	
20	210	333	525	218	75	75	90	69	.....
21	218	298	525	206	83	76	88	70	.....
22	185	267	490	169	80	73	92	63	.....
23	151	364	490	175	76	94	80	36	.....
24	110	374	460	258	75	115	80	49	.....
25	129	430	430	206	76	88	90	76	.....
26	132	525	430	210	76	82	66	72	.....
27	127	600	402	195	75	75	63	56	.....
28	182	600	402	172	98	92	76	58	.....
29	182	690	430	145	80	92	58	57	.....
30	246	795	369	129	75	94	73	51	.....
31	.....	740	.....	108	79	.....	88	.....	.....

NOTE.—Discharge determined from a well-defined rating curve. Dec. 11–31, no estimates made on account of unknown ice effect.

Monthly discharge of Williams Fork near Sulphur Springs, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April 11–30	246	78	157	6,230	B.
May	795	195	380	23,400	B.
June	850	369	538	32,000	B.
July	364	108	209	12,900	B.
August	122	73	87.5	5,380	A.
September	142	73	94.0	5,590	A.
October	127	58	92.6	5,690	A.
November	82	36	67.2	4,000	A.
December 1–10	65	53	58.6	1,160	B.
The period	.....	.....	.....	96,400	

BLUE RIVER AT DILLON, COLO.

Location.—In sec. 18, T. 5 S., R. 77 W., at the cemetery bridge on the outskirts of Dillon, on the edge of the Leadville National Forest. Nearest tributaries, Snake River, which enters a short distance below the station, and Tenmile Creek, which also enters below.

Records available.—October 15, 1910, to November 30, 1913.

Drainage area.—110 square miles (measured on Forest atlas).

Gage.—Vertical staff.

Control.—Practically permanent.

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

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

Diversions.—There are court decrees for the diversion of 2.3 second-feet for irrigation from Blue River above the station and 63 second-feet below, exclusive of a decree for 350 second-feet for the Green Mountain canal. In addition there are placer decrees for diversions totaling 118 second-feet from the Blue near Breckenridge, which, however, are returned to Swan River, entering above Dillon. There is an unadjudicated diversion from the headwaters of the Blue, across Boreas Pass to Tarryall Creek. This diversion was very small during 1913.

Accuracy.—Owing to the high altitude of this station (about 8,800 feet) there is liable to be considerable diurnal fluctuation at certain seasons of the year due to the alternate melting and freezing, and the mean daily gage height based on one gage reading may be considerably in error. For this reason the estimates are only fair.

Discharge measurements of Blue River at Dillon, Colo., for 1913.

Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 27	R. H. Fletcher	1.80	70
June 23	do	2.80	385
Oct. 15	Robert Follansbee	1.78	64

Daily gage height, in feet, of Blue River at Dillon, Colo., for 1913.

[Ira Blundell, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1		2.35					1.9	1.68
2		2.4			2.0	1.8	1.9	
3		2.3	2.95	2.5		1.85	1.9	1.7
4			2.9			1.85	1.9	
5			2.9	2.45		1.9		1.65
6		2.5			2.0		1.88	
7			2.85	2.4				1.7
8		2.45			1.9	2.4	1.85	1.7
9			2.9	2.38	1.9	2.35	1.85	
10		2.35		2.35		2.3		
11			2.95	2.35		2.3	1.85	1.68
12			3.0		2.1			1.65
13			3.05		2.05	2.2	1.8	1.65
14			3.0	2.35	1.98			1.62
15					1.9		1.78	1.65
16			3.05	2.3	1.9	2.1		
17			3.1			2.0	1.78	1.62
18			3.15	2.35	1.9		1.75	
19			2.8	2.4	1.9			1.6
20		2.5			1.9	1.95	1.75	1.6
21	2.1		2.85	2.45			1.75	1.6
22	2.1	2.4		2.45	1.85	1.95	1.72	
23	1.9	2.6	2.8		1.85	1.95	1.7	
24	1.8	2.7		2.4		1.95		
25			2.8	2.3			1.7	
26	1.85	2.95		2.25	1.8	1.92		
27	1.8	2.95	2.75		1.85	1.92	1.7	
28	1.9	2.95	2.7	2.15	1.8			
29	2.15			2.1			1.7	
30	2.4	3.0	2.65			1.9	1.7	
31								

Daily discharge, in second-feet, of Blue River at Dillon, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	208	467	305	110	70	86	56
2	.....	225	462	285	106	70	86	57
3	.....	191	458	265	106	78	86	58
4	.....	215	435	255	106	78	86	56
5	.....	240	435	245	106	86	84	53
6	.....	265	424	235	106	132	83	56
7	.....	255	412	225	96	179	80	58
8	.....	245	424	222	86	225	78	58
9	.....	226	435	218	86	208	78	57
10	.....	208	446	208	101	191	78	57
11	.....	.....	458	208	116	191	78	56
12	.....	.....	480	208	131	176	74	53
13	.....	.....	502	208	118	161	70	53
14	.....	.....	480	208	102	151	69	50
15	.....	.....	491	200	86	141	68	53
16	.....	.....	502	191	86	131	68	52
17	.....	.....	525	200	86	106	68	50
18	.....	.....	548	208	86	102	64	49
19	.....	.....	390	225	86	99	64	48
20	.....	265	401	235	86	96	64	48
21	131	245	412	245	82	96	64	48
22	131	225	401	245	78	96	60	.....
23	86	305	390	235	78	96	58	.....
24	70	345	390	225	76	96	58	.....
25	74	402	390	191	73	93	58	.....
26	78	458	379	176	70	90	58	.....
27	70	458	368	161	78	90	58	.....
28	86	458	345	146	70	88	58	.....
29	146	469	335	131	70	87	58	.....
30	225	480	325	120	70	86	58	.....
31	.....	473	.....	113	70	.....	57	.....

NOTE.—Discharge determined from a well-defined rating curve. Discharge estimated for days when the gage was not read, except May 11–19.

Monthly discharge of Blue River at Dillon, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
June	548	325	430	25,600	C.
July	305	113	211	13,000	C.
August	131	70	90.5	5,560	B.
September	225	70	120	7,140	B.
October	86	57	69.6	4,280	B.
November 1–21	58	48	53.6	2,230	B.
The period	.....	.....	.....	57,800	

TENMILE CREEK AT DILLON, COLO.

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

Records available.—October 15, 1910, to November 21, 1913.

Drainage area.—113 squre miles (measured on Forest atlas).

Gage.—Vertical staff; read once daily.

Control.—Practically permanent.

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

Winter flow.—Ice causes backwater during winter; observations discontinued.

Diversions.—There are court decrees for the diversion of 11 second-feet from Tenmile Creek above station.

Accuracy.—Owing to the high altitude of this station (8,800 feet) there is liable to be considerable diurnal fluctuation at certain seasons of the year, 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 estimates are rated as fair only.

Discharge measurements of Tenmile Creek at Dillon, Colo., for 1913.

Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 26	R. H. Fletcher	1.95	63
June 23	do	2.80	362
Oct. 15	Robert Follansbee	1.85	53

Daily gage height, in feet, of Tenmile Creek at Dillon, Colo., for 1913.

[Ira Blundell, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1		2.45					1.85	1.72
2		2.55			2.0	1.9	1.85	
3		2.4	3.4	2.5		1.9	1.85	1.75
4			3.5			1.9	1.85	
5			3.4	2.4		1.95		1.72
6		2.85			1.95		1.85	
7			3.2	2.35				1.72
8		2.6			1.9	2.25	1.82	1.75
9			3.3	2.3	1.9	2.1	1.82	
10		2.55		2.3		2.0		
11			3.2	2.25		1.9	1.82	1.73
12			3.0		2.1			1.72
13			3.1		2.05	1.9	1.85	1.7
14			3.1	2.2				1.7
15					1.9		1.85	1.72
16			3.2	2.25	1.9	1.9		
17			3.2			1.9	1.85	1.72
18			3.5	2.35	1.88		1.85	
19			3.95	2.3	1.88			1.72
20		2.75			1.85	1.88	1.82	1.72
21	2.5		3.05	2.35			1.82	1.72
22	2.5	2.6		2.32	1.8	1.9	1.8	
23	2.1	3.0			1.8	1.9	1.8	
24	2.0	3.65		2.3		1.9		
25			2.85	2.25			1.78	
26	1.95	4.5		2.2	1.8	1.9		
27		4.2	2.8		1.85	1.85	1.75	
28	2.1	4.0	2.7	2.1	1.9			
29	2.4			2.1			1.75	
30	2.5	3.9	2.7			1.85	1.75	
31								

Daily discharge, in second-feet, of Tenmile Creek at Dillon, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	194	715	265	74	54	48	34
2	.....	230	672	239	69	54	48	36
3	.....	177	610	212	67	54	48	37
4	.....	235	660	194	65	54	48	36
5	.....	294	610	177	63	61	48	34
6	.....	353	560	168	61	70	48	34
7	.....	301	510	160	57	115	46	34
8	.....	249	535	152	54	129	44	37
9	.....	240	560	144	54	89	44	36
10	.....	230	535	144	66	69	44	35
11	.....	238	510	129	78	54	44	35
12	.....	246	420	125	89	54	46	34
13	.....	254	465	120	79	54	48	32
14	.....	262	465	115	66	54	48	32
15	.....	270	488	122	54	54	48	34
16	.....	278	510	129	54	54	48	34
17	.....	286	510	144	53	54	48	34
18	.....	294	660	160	52	53	48	34
19	.....	302	398	144	52	53	46	34
20	.....	301	420	152	48	52	44	34
21	212	280	442	160	45	53	44	34
22	212	249	420	151	42	54	42	.....
23	89	420	398	148	42	54	42	.....
24	69	735	375	144	42	54	41	.....
25	65	948	353	129	42	54	40	.....
26	61	1,160	342	115	42	54	38	.....
27	75	1,010	331	102	48	48	37	.....
28	89	910	289	89	54	48	37	.....
29	177	885	289	89	54	48	37	.....
30	212	860	289	84	54	48	37	.....
31	.....	777	.....	79	54	.....	36	.....

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

Monthly discharge of Tenmile Creek at Dillon, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April 21–30	212	61	126	2,500	D.
May	1,160	177	435	26,700	D.
June	715	289	478	28,400	D.
July	265	79	145	8,920	C.
August	89	42	57.2	3,520	C.
September	129	48	60.0	3,570	C.
October	48	36	44.0	2,700	C.
November 1–21	37	32	34.5	1,440	C.
The period	.....	.....	.....	77,800	

SNAKE RIVER AT DILLON, COLO.

Location.—In sec. 18, T. 5 S., R. 77 W., at a highway bridge, 200 yards above the mouth of the river at Dillon, Colo. Nearest tributary, a small stream that enters from the north 1 mile above the station.

Records available.—October 15, 1910, to December 29, 1913.

Drainage area.—92 square miles (measured on Forest atlas).

Gage.—Vertical staff. On April 26, 1913, the gage was reset, at the same datum, 2 feet downstream in a more protected place, where the water does not pile up at high stages.

Control.—Practically permanent.

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

Winter flow.—Ice gorges cause backwater of varying amount.

Diversions.—The Summit County Power Co. has an adjudicated decree for a diversion of 160 second-feet from Snake above Dillon into Straight Creek. Water is usually diverted from April to November. There is also an irrigation decree for 4.5 second-feet above Dillon.

Accuracy.—Owing to the high altitude of this station (8,800 feet) there is liable to be considerable diurnal fluctuation at certain seasons of the year, due to the alternate melting and freezing; mean daily gage height based on one gage reading may be considerably in error; estimates only fair.

Discharge measurements of Snake River at Dillon, Colo., for 1913.

Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 27	R. H. Fletcher	0.85	21
June 23	do	1.70	224
Oct. 15	Robert Follansbee	.85	22

Daily gage height, in feet, of Snake River at Dillon, Colo., for 1913.

[I. W. Blundell, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		1.25					0.9	0.78	
2		1.2			1.2	1.0	.9		
3		1.0	1.9	1.55		1.0	.9	.78	
4			1.85			1.0	.88		
5			1.85	1.45		.95		.85	
6		1.5			1.15		.88		
7			1.7	1.4				.7	
8		1.4			1.2	1.1	.85	.75	
9			1.7	1.35	1.2	1.0	.85		
10		1.35		1.3		1.0			
11			1.9	1.35		1.0	.85	.7	
12			2.0		1.3			.7	
13			2.05		1.2	1.0	.85	.68	2.0
14			2.0	1.3	1.1			.68	
15					1.05		.85	.7	1.85
16			2.0	1.45	1.0	.95			
17			2.0			.95	.85	.7	
18			2.05	1.6	1.0		.84		
19			1.75	1.65	1.0			.7	
20		1.5			1.0	.95	.84	1.0	1.6
21	1.45		1.8	1.65			.83	1.0	
22	1.45	1.4		1.7	.95	.95	.83		2.0
23	.95	1.6	1.7		1.0	.95	.83		
24	.85	1.85		1.6		.95			
25			1.65	1.55			.82		
26	.85	2.05		1.5	1.0	.9			1.8
27		2.0	1.6		1.05	.9	.82		
28	.95	1.9	1.5	1.35	1.0				
29	1.05			1.3			.82		2.15
30	1.2	1.9	1.6			.9	.8		
31									

NOTE.—Water was turned out of Summit County power canal above the station on Nov. 20. Discharge relation affected by ice during December.

Daily discharge, in second-feet, of Snake River at Dillon, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	82	300	180	76	35	25	16
2	.....	70	300	174	70	35	25	16
3	.....	35	300	169	68	35	25	16
4	.....	74	280	152	65	35	23	18
5	.....	113	280	136	62	30	23	21
6	.....	152	251	128	60	37	23	16
7	.....	136	222	121	65	44	22	11
8	.....	121	222	114	70	50	21	14
9	.....	114	222	108	70	35	21	13
10	.....	108	261	94	78	35	21	12
11	.....	.....	300	108	86	35	21	11
12	.....	.....	342	103	94	35	21	11
13	.....	.....	364	98	70	35	21	10
14	.....	.....	342	94	50	33	21	10
15	.....	.....	342	115	42	31	21	11
16	.....	.....	342	136	35	30	21	11
17	.....	.....	342	161	35	30	21	11
18	.....	.....	364	186	35	30	20	11
19	.....	.....	241	204	35	30	20	11
20	.....	152	250	204	35	30	20	35
21	136	136	260	204	32	30	19	35
22	136	121	241	222	30	30	19	.....
23	30	186	222	204	35	30	19	.....
24	21	280	213	186	35	30	19	.....
25	21	322	204	169	35	28	19	.....
26	21	364	195	152	35	25	19	.....
27	25	342	186	130	42	25	19	.....
28	30	300	152	108	35	25	19	.....
29	42	300	169	94	35	25	19	.....
30	70	300	186	88	35	25	17	.....
31	.....	300	.....	82	35	.....	17	.....

NOTE.—Discharge determined from a well-defined rating curve, except as follows: For days for which gage heights are missing, except May 11–19, estimated. Summit County Power Co. diverted water above station during greater part of the season prior to Nov. 20. No estimates made for December on account of unknown ice effect.

Monthly discharge of Snake River at Dillon, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
June	364	152	263	15,600	C.
July	222	82	143	8,790	C.
August	94	30	51.1	3,140	B.
September	50	25	32.1	1,910	B.
October	25	17	20.1	1,240	B.
November 1–21	35	10	15.2	634	B.
The period	.....	.....	.....	31,300	

EAGLE RIVER AT RED CLIFF, COLO.

Location.—In sec. 29, T. 6 S., R. 80 W., in the Holy Cross National Forest, in the town of Red Cliff. Nearest tributary Turkey Creek, which enters 100 yards below the station. Homestake Creek enters 1 mile below.

Records available.—January 8, 1911, to December 31, 1913.

Drainage area.—74 square miles (measured on topographic sheet).

Gage.—Chain gage; read twice daily.

Control.—Practically permanent during 1913.

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 station.

Diversions.—There are court decrees for the diversion of 6 second-feet from Eagle River above station, and also a decree for diversion to the Arkansas basin of 18.5 second-feet from Piney Creek, a tributary.

Accuracy.—Owing to the high altitude of the station (8,600 feet) it is possible that at certain seasons alternate melting and freezing cause diurnal fluctuations of stage; mean daily stage as determined from two readings per day may be somewhat in error; estimates are only good.

Discharge measurements of Eagle River at Red Cliff, Colo., for 1913.

[Made by R. H. Fletcher.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
Apr. 28	1.70	90
June 30	1.63	85
Sept. 7	.95	28

Daily gage height, in feet, of Eagle River at Red Cliff, Colo., for 1913.

[R. T. Sobey, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	2.10	2.50	1.50	1.00	.80	1.00	.75	.70
2	.....	1.95	2.45	1.50	1.00	.80	1.10	.....	.....
3	.....	1.75	2.65	1.45	1.00	.85	1.00	.80	.45
4	.....	2.10	2.45	.....	1.00	.85	1.00	.80	.....
5	.....	1.98	2.40	1.35	.90	.85	.....	.72	.....
6	.....	2.10	2.25	.....	.98	.92	.90	.75	.70
7	.....	2.15	2.05	1.35	.90	.....	.40	.75	.80
8	1.10	2.10	2.05	1.30	.90	1.05	.32	.75	.....
9	.95	2.20	2.05	1.30	.90	.95	.30	.....	.70
10	.80	2.25	2.10	1.38	.95	.95	.45	.75	.70
11	.80	2.20	2.10	1.32	.90	.88	.50	.75	.....
12	1.00	2.40	2.12	1.25	1.00	.85	.80	.75	.70
13	1.20	2.55	2.05	1.25	.98	.85	.85	.75	.....
14	1.52	2.40	2.10	1.25	.95	.....	.85	.75	.....
15	1.75	2.05	2.10	1.25	.90	1.00	.85	.72	.60
16	1.80	2.00	2.10	1.30	.90	.90	.80	.....	.....
17	1.75	2.10	2.05	1.30	.....	.90	.80	.70	.60
18	1.78	2.10	2.10	1.38	.85	.85	.78	.70	.65
19	1.85	2.10	2.10	1.35	.85	.85	.80	.70	.60
20	1.80	2.35	2.20	.....	.90	.85	.80	.....	.60
21	1.88	2.18	2.12	1.35	1.00	.....	.85	.70	.60
22	1.80	2.20	1.90	1.30	1.00	.90	.85	.70	.60
23	1.70	2.15	2.00	1.35	.85	.92	.85	.....	.....
24	1.50	2.22	1.88	1.60	.....	.90	.85	.....	.....
25	1.48	2.70	1.90	.....	.85	.85	.85	.70	.....
26	1.40	2.60	1.65	.....	.85	.88	.....	.70	.....
27	1.55	2.70	1.65	1.30	.85	.85	.80	.....	.60
28	1.68	2.65	1.60	1.22	.85	.85	.80	.70	.60
29	1.88	2.60	1.60	1.20	.85	.85	.65	.70	.60
30	2.10	2.62	1.60	1.10	.80	.....	.80	.....	.....
31	.....	2.50	.....	1.05	.....	.....	.80	.....	.....

NOTE.—Water diverted into Pando ice pond Oct. 7–11.

Daily discharge, in second-feet, of Eagle River at Red Cliff, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	180	310	68	31	18	31	15	12
2	.....	142	292	68	31	18	38	17	7
3	.....	98	370	64	31	21	31	18	4
4	.....	180	292	60	31	21	31	18	6
5	.....	150	275	56	24	21	28	13	9
6	.....	180	225	56	30	25	24	15	12
7	.....	195	168	56	24	30	4	15	18
8	38	180	168	52	24	34	3	15	15
9	28	210	168	52	24	28	3	15	12
10	18	225	180	58	28	28	4	15	12
11	18	210	180	54	24	23	5	15	12
12	31	275	186	48	31	21	18	15	12
13	45	330	168	48	30	21	21	15	10
14	70	275	180	48	28	26	21	15	9
15	98	168	180	48	24	31	21	13	7
16	106	155	180	52	24	24	18	13	7
17	98	180	168	52	22	24	18	12	7
18	103	180	180	58	21	21	17	12	9
19	118	180	180	56	21	21	18	12	7
20	106	258	210	56	24	21	18	12	7
21	125	204	186	56	31	22	21	12	7
22	106	210	130	52	31	24	21	12	7
23	90	195	155	56	21	25	21	12	7
24	68	216	125	78	21	24	21	12	7
25	66	390	130	60	21	21	21	12	7
26	60	350	84	56	21	23	20	12	7
27	73	390	84	52	21	21	18	12	7
28	88	370	78	46	21	21	18	12	7
29	103	350	78	45	21	21	10	12	7
30	180	358	78	38	18	21	18	12	7
31	.....	310	.....	34	18	.....	18	.....	7

NOTE.—Discharge determined from a well-defined rating curve; for days for which gage heights are missing, discharge interpolated. Low discharge Oct. 7–11 due to filling of Pando ice pond above the station.

Monthly discharge of Eagle River at Red Cliff, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April 8–30	180	18	79.8	3,640	B.
May	390	98	235	14,400	C.
June	370	78	180	10,700	B.
July	78	34	54.3	3,340	B.
August	31	18	24.9	1,530	A.
September	34	18	23.3	1,390	A.
October	38	3	18.7	1,150	A.
November	18	12	13.7	815	B.
December	18	4	8.74	537	B.
The period	.....	.....	.....	37,500	

EAGLE RIVER AT EAGLE, COLO.

Location.—At the highway bridge at Eagle. Nearest tributary, Brush Creek, enters three-fourths mile below station.

Records available.—January 17, 1911, to December 31, 1913. March 12, 1905, to February 10, 1907, a station was maintained a short distance below the mouth of Brush Creek.

Drainage area.—630 square miles (measured on Forest atlas).

Gage.—Vertical staff; referred to the same datum as the Weather Bureau gage near by.

Control.—Slightly shifting.

Discharge measurements.—Made from highway bridge; during low water by wading.

Winter flow.—Ice causes backwater during the winter.

Diversions.—Between Eagle and the station at Redcliff there are court decrees for the diversion of 380 second-feet from Eagle River, of which 300 second-feet is for power. Below Eagle there are decrees for 22 second-feet from Eagle River.

Accuracy.—Estimates only fair as gage heights reported by engineer do not agree closely with those by the observer.

Discharge measurements of Eagle River at Eagle, Colo., for 1913.

[Made by R. H. Fletcher.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
Apr. 30	1.70	967
June 28	2.00	1,120
Sept. 6	.62	258

Daily gage height, in feet, of Eagle River at Eagle, Colo., for 1913.

[S. D. Ackley, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	2.0	4.0	.....	1.1	0.7	0.9	.....	0.3
2	.....	2.0	3.7	1.8	1.0	.6	.8	0.7	.....
3	.....	2.0	3.4	.....	1.0	.6	.7	.....	.....
4	.....	1.6	3.2	.....	.....	.5	.8	.....	.....
5	.....	1.7	3.2	1.7	.8	.5	.9	.7	.....
6	.....	2.1	3.1	.....	.....	.5	.9	.6	.4
7	.....	2.3	2.9	1.8	.....	.6	.9	.....	.....
8	0.65	2.2	2.8	1.8	.....	.7	.9	.6	.....
9	.5	2.3	2.9	.....	.....	.8	.9	.....	.....
10	.5	2.4	3.0	1.8	.....	.8	.8	.....	.....
11	.5	2.5	3.3	1.7	.75	.8	.7	.6	1.4
12	.55	2.7	2.9	.....	.....	.8	.8	.5	.....
13	.6	2.8	2.6	.....	.....	.8	.8	.....	.....
14	.75	2.9	2.5	1.6	.....	.8	.7	.65	.....
15	1.05	2.5	2.9	1.4	.....	.9	.7	.5	.....
16	1.05	2.2	3.0	.....	.....	.7	.8	.5	.....
17	1.55	2.2	2.9	.....	.....	.8	.7	.5	.7
18	1.65	2.3	3.0	.....	.....	.8	.7	.5	.....
19	1.4	2.7	3.1	.....	.....	.8	.8	.5	.....
20	.....	2.5	2.9	.....	1.0	.8	.8	.5	.....
21	1.6	2.4	2.8	1.72	.9	.7	.9	.....	.....
22	1.5	2.2	2.5	.....	.8	.7	.8	.4	.....
23	1.2	2.7	2.7	2.4	.7	.8	.8	.4	.....
24	1.1	3.0	2.5	2.4	.7	.7	.7	.4	1.2
25	.9	3.4	2.5	2.4	.6	.7	.8	.4	.....
26	.65	3.7	2.4	2.0	.6	.7	.7	.4	.....
27	1.2	4.0	2.4	2.0	.6	.8	.7	.....	.....
28	1.15	3.8	2.3	.....	.7	.9	.7	.....	.....
29	1.45	3.9	2.1	.....	.7	.9	.7	.4	1.0
30	1.8	4.1	2.0	1.1	.7	.9	.7	.....	.....
31	.....	4.0	.....	.....	.7	.....	.7	.....	.....

NOTE.—Gage heights for May and June obtained from United States Weather Bureau records. Discharge relation affected by ice Dec. 11-31.

Daily discharge, in second-feet, of Eagle River at Eagle, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1,180	3,410	1,090	490	295	385	295	125
2	.....	1,180	3,020	1,000	435	251	340	295	.....
3	.....	1,180	2,650	975	435	251	295	295	.....
4	.....	840	2,410	950	390	208	340	295	.....
5	.....	920	2,410	920	340	208	385	295	.....
6	.....	1,270	2,300	960	337	208	385	251	166
7	.....	1,460	2,070	1,000	333	251	385	251	.....
8	273	1,360	1,960	1,000	329	295	385	251	.....
9	208	1,460	2,070	1,000	325	340	385	251	.....
10	208	1,550	2,180	1,000	321	340	340	251	.....
11	208	1,650	2,530	920	318	340	295	251	.....
12	230	1,860	2,070	895	330	340	340	208	.....
13	251	1,960	1,750	870	340	340	340	240	.....
14	318	2,070	1,650	840	350	340	295	273	.....
15	463	1,650	2,070	685	360	385	295	208	.....
16	463	1,360	2,180	700	365	295	340	208	.....
17	800	1,360	2,070	720	365	340	295	208	.....
18	880	1,460	2,180	740	380	340	295	208	.....
19	685	1,860	2,300	770	390	340	340	208	.....
20	760	1,650	2,070	850	435	340	340	208	.....
21	840	1,550	1,960	937	385	295	385	187	.....
22	760	1,360	1,650	1,240	340	295	340	166	.....
23	550	1,360	1,360	1,550	295	340	340	166	.....
24	490	2,180	1,650	1,550	295	295	295	166	.....
25	385	2,650	1,650	1,550	251	295	340	166	.....
26	273	3,020	1,550	1,180	251	295	295	166	.....
27	550	3,410	1,550	1,180	251	340	295	166	.....
28	520	3,150	1,460	950	295	385	295	166	.....
29	723	3,280	1,270	720	295	385	295	166	.....
30	1,000	3,550	1,180	490	295	385	295	146	.....
31	.....	3,410	.....	490	295	.....	295	.....	.....

NOTE.—Discharge determined from a fairly well-defined rating curve; April 8 to Nov. 30, for days for which gage heights are missing discharge estimated by comparison with flow of Eagle River at Red Cliff. Dec. 11–31 no estimate made on account of unknown effect of ice.

Monthly discharge of Eagle River at Eagle, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April 8–30	1,000	208	515	23,500	C.
May	3,550	840	1,890	116,000	C.
June	3,410	1,180	2,040	121,000	C.
July	1,550	490	959	59,000	C.
August	490	251	342	21,000	C.
September	385	208	312	18,600	C.
October	385	295	330	20,300	C.
November	295	146	220	13,100	C.
The period	.....	.....	.....	392,000	

TURKEY CREEK AT RED CLIFF, COLO.

Location.—In sec. 19, T. 6 S., R. 80 W., at highway bridge in Red Cliff, 800 feet above the mouth of the creek.

Records available.—June 30 to December 31, 1913.

Drainage area.—27 square miles (measured from Forest atlas).

Gage.—Vertical staff; read once daily.

Control.—Data insufficient to determine.

Discharge measurements.—Made from single-span bridge or by wading.

Winter flow.—Ice causes little if any backwater during the winter.

Diversions.—There is a court decree for a diversion of 5.5 second-feet from Turkey Creek.

Accuracy.—Owing to the high altitude of the station (8,600 feet) it is probable that at certain seasons there is diurnal fluctuation of stage, due to alternate melting and freezing; mean daily gage height, based on one reading, may be considerably in error; estimates only fair.

Discharge measurements of Turkey Creek at Red Cliff, Colo., for 1913.

[Made by R. H. Fletcher.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
June 30	1.73	59
September 7	1.18	13

Daily gage height, in feet, and discharge, in second-feet, of Turkey Creek at Red Cliff, Colo., for 1913.

[Sobey and Friend, observers.]

Day.	July.		Aug.		September.		October.		November.		December.	
	Gage height	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	1.70	55	1.30	19	.....	13	1.15	14	1.00	9	.....	.....
2	1.70	55	1.30	19	1.10	12	1.10	12	.....	8	.....	.....
3	1.70	55	1.25	17	1.10	12	1.10	12	.95	8	0.90	7
4	1.65	49	1.25	17	1.10	12	1.10	12	.80	5	.....	.....
5	1.62	45	1.25	17	1.10	12	1.10	12	.80	5	.....	.....
6	.....	44	1.25	17	1.10	12	1.10	12	.85	6	.90	7
7	1.60	43	1.22	16	.....	13	.90	7	1.00	9	.....	.....
8	1.52	35	1.25	17	1.15	14	1.05	10	1.15	14	.....	.....
9	1.52	35	1.20	15	1.10	12	1.05	10	.....	13	.90	7
10	1.52	35	.....	15	1.10	12	1.05	10	1.10	12	.....	.....
11	1.48	31	1.20	15	1.10	12	1.05	10	1.00	9	.....	.....
12	1.48	31	1.22	16	1.10	12	.....	10	.95	8	.90	7
13	1.45	29	1.22	16	1.08	11	1.05	10	.95	8	.....	.....
14	1.45	29	1.20	15	.....	11	1.05	10	.95	8	.....	.....
15	1.45	29	1.15	14	1.10	12	1.00	9	.95	8	.....	.....
16	1.48	31	1.10	12	1.10	12	.95	8	.....	8	.....	.....
17	1.48	31	.....	13	1.10	12	1.05	10	.95	8	.90	7
18	1.45	29	1.15	14	1.05	10	1.05	10	.....	8	.....	.....
19	1.42	27	1.15	14	1.05	10	.....	10	1.00	9	.....	.....
20	1.40	25	1.15	14	1.08	11	1.00	9	.....	8	.90	7
21	1.40	25	1.15	14	1.05	10	.95	8	.....	8	.....	.....
22	1.40	25	1.15	14	1.08	11	.....	10	.....	8	.90	7
23	1.38	24	1.12	13	1.08	11	1.10	12	.....	8	.....	.....
24	1.40	25	.....	13	1.10	12	1.10	12	.....	8	.....	.....
25	1.35	22	1.15	14	1.08	11	1.05	10	.....	7	.....	.....
26	.....	22	.....	14	1.08	11	.....	10	.90	7	.....	.....
27	1.35	22	1.15	14	1.08	11	1.00	9	.....	7	.90	7
28	1.35	22	1,15	14	1.10	12	1.00	9	.....	8	.....	.....
29	.....	20	1.15	14	1.10	12	1.00	9	.95	8	.90	7
30	1.30	19	1.15	14	1.10	12	1.00	9	.....	7	.....	.....
31	1.30	19	.....	13	.....	.....	1.05	10	.....	.....	.....	.....

NOTE.—Discharge determined from a well-defined rating curve based on three additional measurements made in 1914. July 1 to Nov. 30, discharge estimated for days for which gage heights are missing.

Monthly discharge of Turkey Creek at Red Cliff, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
July	55	19	31.9	1,960	C.
August	19	12	14.9	916	B.
September	14	10	11.7	696	B.
October	14	7	10.2	627	B.
November	14	5	8.2	488	B.
December	.....	.....	[a] 7.0	430	C.
The period	.....	.....	.....	5,120	

[a] Estimated.

HOMESTAKE CREEK AT RED CLIFF, COLO.

Location.—In sec. 30, T. 6 S., R. 80 W., one-fourth mile above mouth of the creek, just above the cascades, and three-fourths mile from Red Cliff. Below all tributaries.

Records available.—January 8, 1911, to December 31, 1913.

Drainage area.—64 square miles (measured on topographic sheet).

Gage.—Vertical staff; read once daily.

Control.—Practically permanent.

Discharge measurements.—Made by wading.

Winter flow.—Ice causes backwater during the winter.

Diversions.—There are court decrees for the diversion of 1.2 second-feet from a tributary of Homestake Creek.

Accuracy.—Owing to the high altitude of the station (8,600 feet) it is possible that during certain seasons alternate melting and freezing cause diurnal fluctuation of stage; mean daily gage height as determined from one reading may be considerably in error; many discharges interpolated; estimates only fair.

Discharge measurements of Homestake Creek at Red Cliff, Colo., for 1913.

[Made by R. H. Fletcher.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
Apr. 28	1.55	103
June 29	1.95	176
Sept. 7	1.15	55

Daily gage height, in feet, of Homestake Creek at Red Cliff, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		2.20			0.90	0.80			
2		2.20	2.70		.95	.75	1.15	0.75	0.50
3		2.20	2.70	1.80			1.10		
4		2.20	2.80	1.80			1.10	.78	
5		2.20		1.70	.80				.70
6		2.30	2.70			.80			
7		2.50		1.65			.80		
8		2.40		1.65	.80	1.10		.65	
9	0.70	2.30	2.60	1.60					.70
10	.80	2.40	2.60						
11		2.70		1.60	.95				
12	1.20	2.70	2.60	1.40	1.35	.90		.70	.60
13		2.80	2.25	1.40		.85	.90		
14	1.60		2.10	1.40	1.05		.85		
15		2.10		1.40	.90			.75	
16	1.60	1.90	2.50		.85			.35	
17	1.60	2.15	2.65	2.30		.90		.65	1.00
18			2.60			.80			
19	2.00	2.20	2.45	2.00				.70	1.00
20		2.30			.90		.80		
21	1.90		2.50		.80		.80	.70	
22		1.90			.80	.80		.70	.9
23	1.30	2.40			.75	.85	.75		
24	1.40	2.70	2.40	2.15			.78		
25	1.20		2.20	1.85	.70				
26	1.10	2.80		1.55	.70	.80		.90	
27		3.40	2.40		.80	.80			.7
28	1.55	2.95	2.10	1.30			.85		
29	1.80	3.00						.70	
30	2.05	3.25	1.95			.80	1.00		
31		3.00		1.00			.85		

NOTE.—Discharge relation affected by ice Nov. 18 to Dec. 31.

Daily discharge, in second-feet, of Homestake Creek at Red Cliff, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	230	450	155	34	26	30	23
2	.....	230	395	155	38	23	56	23
3	.....	230	395	148	35	23	51	24
4	.....	230	430	148	35	23	51	25
5	.....	230	420	131	26	24	46	22
6	.....	260	395	127	26	26	40	20
7	.....	325	385	123	26	30	26	18
8	.....	290	375	123	26	51	27	17
9	20	260	360	115	28	45	28	17
10	26	290	360	125	30	40	30	17
11	45	395	360	115	38	40	31	17
12	61	395	360	86	79	34	33	17
13	80	430	245	86	55	30	34	16
14	115	375	205	86	46	34	30	15
15	115	205	265	86	34	40	30	14
16	115	166	325	.....	30	36	30	8
17	115	217	378	260	30	34	28	10
18	125	220	360	.....	30	26	28	12
19	185	230	308	185	30	26	26	13
20	175	260	315	.....	34	26	26	13
21	166	180	325	.....	26	26	26	14
22	125	166	290	.....	26	26	24	14
23	73	290	300	.....	23	30	23	14
24	86	395	290	217	22	28	25	14
25	61	470	230	157	20	27	25	14
26	51	430	260	108	20	26	25	14
27	80	670	290	90	26	26	25	14
28	108	490	205	73	26	26	25	14
29	148	510	190	62	26	26	25	14
30	195	610	176	52	26	26	25	14
31	.....	510	.....	42	26	.....	25	.....

NOTE.—Discharge determined as follows: Below 600 second-feet from a well-defined rating curve; for days for which gage heights are missing, except July 16–23, estimated by comparison with records of Eagle River at Red Cliff; Nov. 18–30 estimated on account of ice. No estimates made for December on account unknown effect of ice.

Monthly discharge of Homestake Creek at Red Cliff, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April 9–30	195	20	103	4,490	C.
May	670	166	329	20,200	C.
June	450	176	321	19,100	C.
August	79	20	31.5	1,940	B.
September	51	23	30.1	1,790	B.
October	56	23	30.8	1,890	B.
November	25	8	16.0	952	C.

GORE CREEK NEAR MINTURN, COLO.

Location.—In sec. 22, T. 5 S., R. 81 W., 200 feet above the mouth of the creek and 1 mile northwest of Minturn. No tributary below the station. Nearest tributary, Willow Creek, which enters 2 miles above.

Records available.—July 15, 1911, to November 17, 1913.

Drainage area.—96 square miles (measured on Forest atlas).

Gage.—Vertical staff, installed April 29, 1913, and referred to datum of original inclined gage.

Control.—High-water readings affected by backwater from Eagle River.

Discharge measurements.—Made from railroad bridge near by, or by wading.
Winter flow.—Ice causes backwater during winter.
Diversions.—There are court decrees for diversion of 5.7 second-feet of water from Gore Creek and 2.5 second-feet from a tributary entering above.
Accuracy.—Original gage was placed in such a position that during high water especially the stage could not be read within one or two tenths; gage heights for 1911 and 1912 and for 1913 prior to April 29, fair or approximate.

Owing to the backwater from Eagle River and to the uncertainty in th gage heights as read from the inclined gage, no estimates of discharge have been made.

Discharge measurements of Gore Creek near Minturn, Colo., for 1913.

[Made by R. H. Fletcher.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
Apr. 29	2.22	128
June 29	2.58	288
Sept. 6	1.81	52

NOTE.—Gage heights refer to gage installed Apr. 29, 1913.

Daily gage height, in feet, of Gore Creek near Minturn, Colo., for 1913.

[G. W. Gustafson, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1		2.45	3.35	4.0	1.9			1.75
2					1.9	1.75	1.9	
3		2.40		2.5				
4				2.5		1.75	1.9	1.72
5		2.47		2.5	1.85			
6			3.10		1.85	1.8	1.77	
7			2.95					1.7
8	1.83			2.25		1.8		1.7
9	1.83	2.65	3.00	2.2	1.83		1.77	
10		2.70						1.75
11	1.88	2.85	2.95	2.15				1.72
12	2.0	3.00		2.1		1.83		
13		3.07	2.75		1.85	1.8		1.7
14		2.90	2.70				1.85	
15	2.22	2.70			1.8	1.9		
16		2.60			1.8			
17	2.32	2.67		2.15				1.7
18	2.34		2.80	2.15	1.8			
19			2.80	2.15	1.8	1.8		
20					1.8		1.78	
21		2.70	2.85					
22	2.38	2.90		2.1	1.75	1.77		
23		3.00	2.77		1.7	1.8	1.8	
24	2.26	3.10						
25	2.17		2.60	2.1	1.75		1.8	
26	2.17	3.40		2.1	1.73	1.75		
27			2.60		1.73	1.77		
28	2.28		2.50					
29	2.40			2.0				
30	2.57			1.98				
31		3.52		1.96				

NOTE.—Prior to Apr. 29 gage heights may be as much as 0.2 foot too high.

BEAVER CREEK AT AVON, COLO.

Location.—In sec. 12, T. 5 S., R. 82 W., on highway bridge 300 feet above mouth of creek at Avon. Nearest tributary, a small stream that enters from the west 1½ miles above; no tributary below.

Records available.—February 25, 1911, to December 2, 1913.

Drainage area.—15 square miles (measured on Forest atlas).

Gage.—Vertical staff.

Control.—Shifting.

Discharge measurements.—Made by wading; during flood stage, from bridge.

Winter flow.—Ice causes backwater at intervals during winter.

Diversions.—There are court decrees for the diversion of 12 second-feet from Beaver Creek above station.

Accuracy.—Owing to shifting channel and insufficient discharge measurements no estimate of discharge has been made. Base data fairly reliable.

Discharge measurements of Beaver Creek at Avon, Colo., for 1913.

[Made by R. H. Fletcher.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
Apr. 29	0.58	10.3
Sept. 6	.48	7.2

Daily gage height, in feet, of Beaver Creek at Avon, Colo., for 1913.

[I. T. Starbuck, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	0.65	1.00	0.50	0.20	0.05	0.50	0.32	0.30
2	.....	.65	1.00	.50	.20	.10	.40	.35	.30
3	.....	.65	1.00	.....	.30	.10	.40	.35	.....
4	.....	.65	1.00	.38	.30	.15	.40	.....	.....
5	.....	.65	1.00	.....	.30	.15	.40	.35	.....
6	.....	.65	.90	.....	.30	.33	.40	.40	.....
7	.....	.75	.90	.....	.05	.40	.40	.40	.....
8	.....	.75	.88	.30	.02	.35	.40	.35	.....
9	.....	.75	.85	.20	.00	.....	.40	.....	.....
10	.32	.75	.90	.40	.00	.....	.40	.35	.....
11	.37	.70	.95	.40	.00	.....	.40	.35	.....
12	.32	.78	.90	.20	.05	.....	.....	.40	.....
13	.37	.80	.80	.20	.20	.35	.....	.40	.....
14	.28	.78	.82	.38	.10	.35	.....	.40	.....
15	.52	.75	.85	.58	.....	.50	.40	.40	.....
16	.37	.75	.90	.55	.05	.45	.40	.40	.....
17	.45	.70	.85	.60	.....	.45	.40	.....	.....
18	.52	.70	.88	.60	.10	.40	.40	.....	.....
19	.47	.80	.85	.62	.10	.40	.40	.....	.....
20	.47	.75	.85	.....	.12	.35	.40	.....	.....
21	.55	.70	.85	.60	.20	.30	.35	.....	.....
22	.52	.....	.80	.....	.25	.40	.35	.35	.....
23	.52	.....	.82	.60	.20	.40	.35	.35	.....
24	.47	.85	.92	.60	.....	.40	.35	.....	.....
25	.47	.....	.82	.60	.20	.40	.35	.35	.....
26	.47	1.00	.80	.60	.20	.40	.35	.35	.....
27	.47	.95	.78	.....	.20	.40	.35	.....	.....
28	.57	1.00	.72	.....	.10	.40	.30	.35	.....
29	.61	1.20	.70	.50	.08	.40	.20	.30	.....
30	.62	1.00	.55	.50	.00	.40	.35	.30	.....
31	.....	1.05	.....	.20	.00	.....	.32	.....	.....

BRUSH CREEK AT EAGLE, COLO.

Location.—In sec. 6, T. 5 S., R. 84 W., 300 yards above mouth and three-fourths mile west of Eagle. Nearest tributary, a small stream that enters from the south one-half mile above station; no tributary below.

Records available.—January 18, 1911, to November 28, 1913.

Drainage area.—146 square miles (measured on Forest atlas).

Gage.—Vertical staff; on April 30, 1913, the gage was moved 21 feet downstream and datum lowered 1 foot.

Control.—Shifting.

Discharge measurements.—Made from footbridge or by wading.

Winter flow.—Ice causes backwater during winter.

Diversions.—There are court decrees for the diversion above the station of 115 second-feet from Brush Creek and 27 second-feet from tributaries.

Owing to shifting channel and insufficient measurements no estimates for 1913 have been made; base data only are available.

Discharge measurements of Brush Creek at Eagle, Colo., for 1913.

[Made by R. H. Fletcher.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
Apr. 23	1.20	70
June 28	1.10	38
Sept. 6	1.20	57

Daily gage height, in feet, of Brush Creek at Eagle, Colo., for 1913.

[S. D. Ackley, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1		1.3		0.8	1.12			1.3
2		1.3			.98			
3					.85			
4					.70			
5				.4	.65		1.4	1.3
6				.4	.65			
7		1.3			.58		1.4	
8		1.4		.4	.55			
9					.50			
10		1.3	1.5	.3	.45			1.3
11		1.4			.48			1.3
12					.75		1.3	
13				.3	1.15			
14				.6	1.05		1.3	1.4
15		1.4			.9			
16				.6				1.2
17							1.3	1.1
18		1.4		2.0				1.1
19							1.3	1.1
20			1.6					
21			1.6	1.4				
22				1.6			1.3	1.1
23				1.6				1.1
24				1.65	.7			
25			1.4	1.5				
26			1.3	1.5			1.3	1.1
27								
28			1.1					1.1
29		1.5						
30	1.2			1.4				
31				1.28				

NOTE.—Fluctuation in stage during July and August due chiefly to opening and closing of irrigation ditches above station.

NO NAME CREEK NEAR GLENWOOD SPRINGS, COLO.

Location.—In sec. 5, T. 5 S., R. 88 W., 1½ miles above the mouth of the creek, 4 miles from Glenwood Springs. Nearest tributary is a small stream that enters some distance below station.

Records available.—January 5, 1911, to December 31, 1913.

Drainage area.—Not measured.

Gage.—Vertical staff.

Control.—Shifting.

Discharge measurements.—Made by wading or from footbridge.

Winter flow.—Discharge relation slightly affected by ice.

Diversions.—None above station, but the records do not represent the natural run-off, 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 headworks of the canal of the Glenwood Light & Water Co., which has a decree for 12 second-feet.

Accuracy.—Owing to the shifting channel and insufficient discharge measurements, no estimtes of discharge have been made. Base data reliable.

Discharge measurements of No Name Creek near Glenwood Springs, Colo., for 1913.

[Made by R. H. Fletcher.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
May 2	2.30	37
Sept. 5	2.20	25

Daily gage height, in feet, of No Name Creek near Glenwood Springs, Colo., for 1913.

[A. N. Thome, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	2.1	2.1	2.2	2.3	3.0	2.2	2.3	2.2	2.2	2.16	2.15
2	.....	2.1	2.1	2.2	2.3	3.0	2.2	2.3	2.2	2.2	2.17	2.10
3	.....	2.2	2.1	2.2	2.3	2.9	2.2	2.3	2.2	2.2	2.18	2.12
4	.....	2.1	2.1	2.2	2.3	2.8	2.1	2.3	2.2	2.2	2.15	2.15
5	2.2	2.1	2.1	2.2	2.3	2.8	2.1	2.3	2.2	2.2	2.15	2.12
6	2.3	2.1	2.1	2.2	2.4	2.7	2.1	2.3	2.2	2.2	2.12	2.15
7	2.3	2.2	2.1	2.2	2.5	2.7	2.1	2.2	2.2	2.2	2.18	2.12
8	2.2	2.2	2.1	2.2	2.6	2.7	2.1	2.2	2.2	2.2	2.15	2.10
9	2.2	2.2	2.1	2.2	2.6	2.6	2.1	2.2	2.2	2.2	2.15	2.10
10	2.2	2.2	2.1	2.2	2.7	2.6	2.1	2.2	2.2	2.2	2.12	2.00
11	2.2	2.1	2.1	2.1	2.8	2.6	2.1	2.2	2.2	2.2	2.12	2.12
12	2.2	2.2	2.1	2.1	2.9	2.6	2.1	2.3	2.2	2.2	2.15	2.12
13	2.2	2.1	2.1	2.2	2.9	2.6	2.1	2.2	2.2	2.2	2.20	2.10
14	2.2	2.1	2.1	2.2	2.9	2.5	2.1	2.2	2.2	2.2	2.20	2.10
15	2.2	2.1	2.1	2.3	2.8	2.5	2.1	2.2	2.2	2.2	2.10	2.15
16	2.1	2.1	2.2	2.3	2.7	2.5	2.1	2.2	2.2	2.2	2.12	2.15
17	1.9	2.2	2.1	2.3	2.7	2.5	2.3	2.2	2.2	2.2	2.18	2.12
18	2.2	2.1	2.1	2.3	2.7	2.4	2.3	2.2	2.2	2.2	2.19	2.10
19	2.2	2.1	2.1	2.2	2.8	2.4	2.3	2.2	2.2	2.2	2.18	2.10
20	2.2	2.1	2.1	2.2	2.7	2.4	2.3	2.2	2.2	2.2	2.18	2.12
21	2.6	2.1	2.1	2.2	2.7	2.3	2.3	2.2	2.2	2.2	2.18	2.10
22	2.3	2.2	2.1	2.2	2.8	2.3	2.3	2.2	2.2	2.2	2.10	2.20
23	2.1	2.1	2.1	2.2	2.8	2.3	2.3	2.2	2.2	2.2	2.15	2.15
24	2.1	2.1	2.1	2.2	2.8	2.4	2.4	2.2	2.2	2.2	2.18	2.10
25	2.2	2.1	2.1	2.2	3.1	2.3	2.3	2.2	2.2	2.2	2.19	2.12
26	2.1	2.1	2.1	2.1	3.2	2.3	2.3	2.2	2.2	2.2	2.18	2.10
27	2.1	2.0	2.1	2.1	3.2	2.3	2.3	2.2	2.2	2.1	2.18	2.10
28	2.1	2.4	2.1	2.2	3.2	2.2	2.3	2.2	2.2	2.2	2.15	2.11
29	2.1	.....	2.1	2.2	3.1	2.2	2.3	2.2	2.2	2.11	2.00	2.12
30	2.1	.....	2.1	2.3	3.2	2.2	2.3	2.2	2.2	2.15	2.20	2.10
31	2.1	.....	2.1	.....	3.2	.....	.....	2.2	.....	2.12	.....	2.12

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, about 4 miles from Glenwood Springs.
Records available.—January 5, 1911, to December 31, 1913.
Gage.—Vertical staff; read to tenths.
Control.—Practically permanent.
Discharge measuremnts.—Made from top of flume.
Accuracy.—Conditions favorable for accurate results, but estimates are only rated as fair chiefly because gage was usually read only to tenths.
Cooperation.—Gage-height record furnished by the Glenwood Light & Water Co.

Discharge measurements of Glenwood Light & Water Co.'s flume near Glenwood Springs, Colo., for 1913.

[Made by R. H. Fletcher.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
May 2	1.20	14.2	May 4	1.30	17.4
4	1.00	10.8	Sept. 5	1.31	19.8
4	1.40	19.1			

Daily gage height, in feet, of Glenwood Light & Water Co.'s flume near Glenood Springs, Colo., for 1913.

[A. N Thome, observer]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1.1	1.1	1.1	1.2	1.2	1.3	1.3	1.2	.....	1.2	1.1
2	.....	1.1	1.1	1.1	1.2	1.2	1.3	1.3	1.2	.....	1.2	1.1
3	.....	1.1	1.1	1.1	1.2	1.2	1.3	1.3	1.2	.....	1.2	1.1
4	.....	1.2	1.1	1.1	1.2	1.2	1.3	1.3	1.2	.....	1.1	1.1
5	1.1	1.1	1.1	1.1	1.2	1.2	1.3	1.3	1.2	1.2	1.1	1.1
6	1.2	1.1	1.1	1.1	1.2	1.2	.....	1.3	1.2	1.2	1.1	1.1
7	1.2	1.1	1.1	1.1	1.1	1.2	.....	1.2	1.2	1.2	1.1	1.1
8	1.1	1.1	1.1	1.1	1.2	1.2	.....	1.2	1.2	1.2	1.1	1.1
9	1.1	1.1	1.1	1.1	1.2	1.2	.....	1.2	1.2	1.2	1.1	1.1
10	1.1	1.1	1.1	1.1	1.2	1.2	.....	1.2	1.2	1.2	1.1	1.0
11	1.1	1.1	1.1	1.1	1.2	1.2	.....	1.2	.....	1.2	1.1	1.2
12	1.1	1.1	1.1	1.1	1.2	1.2	.....	1.2	1.2	1.2	1.1	1.1
13	1.1	1.1	1.1	1.1	1.2	1.2	1.1	1.2	1.2	1.2	1.12	1.1
14	1.1	1.1	1.1	1.1	1.2	1.2	1.1	1.2	1.2	1.2	1.15	1.0
15	1.1	1.1	1.1	1.1	1.2	1.2	1.1	1.2	1.2	1.2	1.15	1.2
16	1.1	1.1	1.1	1.2	1.2	1.2	1.1	1.2	1.2	1.2	1.5	1.1
17	.7	1.1	1.0	1.2	1.2	1.2	1.3	1.2	1.2	1.2	1.1	1.1
18	1.1	1.1	1.0	1.2	1.2	1.2	1.3	1.2	1.2	1.2	1.1	1.1
19	1.1	1.1	1.0	1.1	1.2	1.2	1.3	1.2	1.2	1.2	1.1	1.1
20	1.1	1.1	1.1	1.1	1.2	1.2	1.3	1.2	1.2	1.3	1.1	1.2
21	1.3	1.1	1.0	1.1	1.2	1.2	1.3	1.2	.....	1.3	1.1	1.1
22	1.2	1.2	1.1	1.1	1.2	1.2	1.3	1.2	.....	1.3	1.15	1.2
23	1.1	1.1	.....	1.1	1.2	1.2	1.3	1.2	.....	1.3	1.1	1.1
24	1.1	1.1	.....	1.1	1.2	1.2	1.3	1.2	.....	1.2	1.1	1.2
25	1.1	1.1	.....	1.1	1.2	1.2	1.3	1.2	.....	1.2	1.1	1.1
26	1.1	1.1	.....	1.1	1.2	1.2	1.3	1.2	.....	1.2	1.1	1.1
27	1.1	1.0	.....	1.1	1.2	1.2	1.2	1.2	.....	1.2	1.1	1.1
28	1.1	1.2	.....	1.1	1.2	1.2	1.2	1.2	.....	1.25	1.1	1.1
29	1.1	.....	.....	1.1	1.2	1.2	1.3	1.2	.....	1.08	1.0	1.1
30	1.1	.....	.....	1.1	1.2	1.3	1.3	1.2	.....	1.5	1.1	1.1
31	1.1	.....	.....	.....	1.2	.....	1.3	1.2	.....	1.25	.....	1.1

Daily discharge, in second-feet, of Glenwood Light & Water Co.'s flume near Glenwood Springs, Colo., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	13	13	13	15	15	17	17	15	.....	15	13
2	.....	13	13	13	15	15	17	17	15	.....	15	13
3	.....	13	13	13	15	15	17	17	15	.....	15	13
4	.....	15	13	13	15	15	17	17	15	.....	13	13
5	13	13	13	13	15	15	17	17	15	15	13	13
6	15	13	13	13	15	15	.....	17	15	15	13	13
7	15	13	13	13	13	15	.....	15	15	15	13	13
8	13	13	13	13	15	15	.....	15	15	15	13	13
9	13	13	13	13	15	15	.....	15	15	15	13	13
10	13	13	13	13	15	15	.....	15	15	15	13	11
11	13	13	13	13	15	15	.....	15	.....	15	13	15
12	13	13	13	13	15	15	.....	15	15	15	13	13
13	13	13	13	13	15	15	13	15	15	15	13	13
14	13	13	13	13	15	15	13	15	15	15	14	11
15	13	13	13	13	15	15	13	15	15	15	14	15
16	13	13	13	15	15	15	13	15	15	15	21	13
17	6	13	11	15	15	15	17	15	15	15	13	13
18	13	13	11	15	15	15	17	15	15	15	13	13
19	13	13	11	13	15	15	17	15	15	15	13	13
20	13	13	13	13	15	15	17	15	15	17	13	15
21	17	13	11	13	15	15	17	15	.....	17	13	13
22	15	15	13	13	15	15	17	15	.....	17	14	15
23	13	13	.....	13	15	15	17	15	.....	17	13	13
24	13	13	.....	13	15	15	17	15	.....	15	13	15
25	13	13	.....	13	15	15	17	15	.....	15	13	13
26	13	13	.....	13	15	15	17	15	.....	15	13	13
27	13	11	.....	13	15	15	15	15	.....	15	13	13
28	13	15	.....	13	15	15	15	15	.....	16	13	13
29	13	.....	.....	13	15	15	17	15	.....	13	11	13
30	13	.....	.....	13	15	17	17	15	.....	21	13	13
31	13	.....	.....	.....	15	.....	17	15	.....	16	.....	13

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

Monthly discharge of Glenwood Light & Water Co.'s flume near Glenwood Springs, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January 5–31	17	6	13.1	702	B.
February	15	11	13.1	728	B.
March 1–22	13	11	12.6	550	B.
April	15	13	13.2	786	B.
May	15	13	14.9	916	B.
June	17	15	15.1	898	B.
August	17	15	15.4	947	C.
October 5–31	21	13	15.5	830	C.
November	21	11	13.5	803	C.
December	15	11	13.2	812	C.

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, 1913.

Drainage area.—109 square miles (measured on topographic sheet).

Gage.—Vertical staff; read once daily.

Control.—Very rough and slightly shifting.

Discharge measurements.—Made by wading; during high water from near-by bridge.

Winter flow.—Ice causes backwater during winter.

Diversions.—Salvation ditch, which has a decree for 58 second-feet, diverts water above the station from the middle of May to the middle of September.

Accuracy.—Owing to the high altitude of the station (7,900 feet) it is probable that at certain seasons alternate melting and freezing cause diurnal fluctuation; mean daily stage, as determined from one reading, made generally in the morning, may be somewhat in error; estimates fair.

Discharge measurements of Roaring Fork at Aspen, Colo., for 1913.

Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 6	R. H. Fletcher	1.40	228
June 27	....do	2.25	489
Oct. 19	Robert Follansbee	.42	52

Daily gage height, in feet, of Roaring Fork at Aspen, Colo., for 1913.

[H. O. Halleck, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		1.00		1.90	0.80	0.40		0.50	0.40
2		1.00	3.6	2.1	.75	.40			
3							0.80	.50	.65
4			3.3		.70	.40		.50	
5		1.60		1.80	.70	.45		.45	
6		1.40	3.0	1.80		.45	.70	.45	.50
7			2.7	1.70			.75	.40	
8			2.7		.50	1.00	.45	.30	.95
9	0.30			1.70	.50	1.10	.60		
10		1.80	2.8		.70		.60	.40	
11	.80		2.9	1.60	.90	1.00	.55	.30	
12	.90	2.4	2.7	1.40					
13		2.3	2.3				.70	.35	
14		2.3	2.4	1.30	.55		.70	.40	
15		2.4		1.30		.90	.70	.30	
16			2.7		.60	.85	.50		
17						.80	.55	.35	
18		2.0		1.30	.40	.80	.45		
19				1.25	.30		.42		
20			2.7		.35				
21		1.80	3.0	1.20					
22		1.90		1.35		.85		.30	
23	.80	2.3				.85	.50		
24	.80	2.4	2.8	1.30			.50		1.64
25	.70	2.9		1.30	.40	.80	.45	.65	
26	.70	3.0		1.15	.40				
27			2.8			.75			1.45
28	.90	3.1	2.6	1.10		.80	.50	.35	
28	1.00	3.5		1.00		.80	.50	.40	
30	1.10	3.6	2.0						1.25
31		2.9		.80			.55		

NOTE.—Discharge relation affected by ice during December.

Daily discharge, in second-feet, of Roaring Fork at Aspen, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	142	770	365	109	55	109	67
2	.....	142	885	423	102	55	109	67
3	.....	180	840	394	98	55	109	67
4	.....	226	780	365	94	55	104	67
5	.....	280	735	336	94	61	99	61
6	.....	226	690	336	85	61	94	61
7	.....	252	600	308	76	102	102	55
8	.....	280	600	308	67	142	61	45
9	45	308	615	308	67	160	80	50
10	.....	336	630	294	94	156	80	55
11	109	423	660	280	125	142	74	45
12	125	510	600	226	100	138	84	48
13	.....	481	481	214	80	134	94	50
14	.....	481	510	202	74	130	94	55
15	.....	510	555	202	77	125	94	45
16	.....	472	600	202	80	117	67	48
17	.....	433	600	202	65	109	74	50
18	.....	394	600	202	55	109	61	49
19	.....	375	600	191	45	111	57	48
20	.....	355	600	186	50	113	59	47
21	.....	336	690	180	51	115	61	46
22	.....	365	670	214	52	117	64	45
23	109	481	650	208	53	117	67	45
24	109	510	630	202	54	113	67	46
25	94	660	630	202	55	109	61	47
26	94	690	630	170	55	105	63	48
27	109	705	630	165	55	102	65	49
28	125	720	570	160	55	109	67	50
29	142	850	482	142	55	109	67	55
30	160	885	394	126	55	109	70	55
31	.....	660	.....	109	55	.....	74	.....

NOTE.—Discharge determined from a rating curve fairly well defined above 50 second-feet. Apr. 23 to Nov. 30 discharge estimated by comparison with record of nearby stations for days for which gage heights are missing. No estimate made for December on account of unknown effect of ice.

Monthly discharge of Roaring Fork at Aspen, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
May	885	142	441	27,100	C.
June	885	394	631	37,500	C.
July	423	109	239	14,700	C.
August	125	45	72.0	4,430	B.
September	160	55	108	6,430	B.
October	109	57	78.4	4,820	B.
November	67	45	52.2	3,110	B.
The period	.....	.....	.....	98,100	

ROARING FORK BELOW ASPEN, COLO.

Location.—In sec. 1, T. 10 S., R. 85 W., 2 miles below Aspen, at the first highway bridge. Nearest tributary above is Castle Creek; nearest below, Maroon Creek.

Records available.—October 18 to December 31, 1913.

Drainage area.—223 square miles (measured on topographic sheet).

Gage.—Vertical staff.

Control.—Not determined; data insufficient.

Discharge measurements.—Made from two-span bridge.

Winter flow.—Ice causes little if any backwater during winter.

Diversions.—Between this station and the one at Aspen there are a number of small diversions, some of which return the water to the river above the Aspen station. The Roaring Fork Light & Power Co. diverts water from Maroon Creek into Castle Creek and thence into Roaring Fork above the station.

Estimates withheld on account of lack of data.

The following discharge measurement was made by Robert Follansbee:

October 18, 1913: Gage height, 0.36 foot; discharge, 152 second-feet.

Daily gage height, in feet, of Roaring Fork below Aspen, Colo., for 1913.

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1	.....	.....	0.5	11	.....	0.3	0.45	21	.....	.....	.....
2	.....	.....	.....	12	.....	.....	.35	22	.....	0.35	0.3
3	.....	0.45	.7	13	.....	.35	.4	23	.....	.....	.....
4	.....	.45	.....	14	.....	.....	.....	24	0.4	.....	.....
5	.....	.....	.....	15	.....	.35	.....	25	.4	.....	.....
6	.....	.....	.45	16	.....	.....	.4	26	.....	.....	.35
7	.....	.3	.....	17	.....	.4	.....	27	.4	.....	.3
8	.....	.25	.....	18	.....	.....	.....	28	.....	.4	.....
9	.....	.....	.....	19	.....	.....	.35	29	.....	.45	.....
10	.....	.....	.....	20	.....	.....	.....	30	.4	.....	.3
								31	.....	.....	.....

ROARING FORK AT GLENWOOD SPRINGS, COLO.

Loction.—On bridge 500 feet above mouth of the river in Glenwood Springs. Nearest tributary of importance enters about 3 miles above station.

Records available.—April 6, 1906, to September 30, 1909; September 21, 1910, to December 31, 1913.

Drainage area.—1,450 square miles (measured on Nell's map of Colorado, 1903).

Gage.—Chain gage.

Control.—Rough but apparently permanent. At extremely high water in Grand River backwater may affect the gage heights. Measurements made at stages as high as 5.7 feet on Roaring Fork and 9.2 feet on the Grand have shown no backwater, but a measurement at 7.45 feet on Roaring Fork and one at 12.0 feet on Grand River show approximately 0.8 foot backwater.

Discharge measurements.—Made from highway bridge.

Winter flow.—Stream rarely frozen over, but slush and anchor ice frequently form. Discharge measurements made during the winter sometimes indicate presence of backwater.

Diversions.—There are court decrees for the diversion of 164 second-feet from Roaring Fork between Glenwood Springs and lower Aspen stations.

Accuracy.—Conditions favorable for accurate results; estimates reliable.

Discharge measurements of Roaring Fork at Glenwood Springs, Colo., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 22	R. H. Fletcher	[a] 1.52	422	Sept. 4	R. H. Fletcher	1.60	667
May 3	do	2.75	1,960	Oct. 16	Robert Follansbee	1.74	756
June 26	do	3.50	3,130				

[a] Discharge relation affected by ice.

Daily gage height, in feet, of Roaring Fork at Glenwood Springs, Colo., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.25	.....	1.10	1.80	3.3	.....	.....	2.00	.....	1.65	1.50	1.40
2	.....	.....	.....	1.70	3.3	4.8	.....	1.90	1.60	1.70	.....	1.45
3	.....	.....	1.10	1.60	2.85	4.8	.....	.....	1.55	1.70	1.55	1.25
4	.....	.....	1.10	1.50	.....	4.9	.....	1.90	1.50	.....	1.50	1.30
5	.....	.....	1.15	1.60	2.9	5.0	.....	1.80	1.60	.....	1.50	1.40
6	.....	.....	1.20	.....	3.5	4.5	.....	1.70	.....	1.80	1.45	1.40
7	.....	.....	1.10	1.75	3.6	4.4	.....	1.75	.....	1.75	1.50	.....
8	.....	.....	1.20	1.60	3.5	.....	.....	1.75	1.80	1.80	1.55	1.35
9	.....	.....	.....	1.40	3.4	4.3	.....	.....	2.20	1.70	.....	1.35
10	.....	1.5	1.15	1.35	.....	.....	.....	.....	2.00	1.75	1.40	1.30
11	.....	1.55	1.15	1.45	.....	4.3	3.2	1.90	1.95	1.65	1.50	1.20
12	.....	1.30	1.15	1.50	4.2	4.3	.....	2.00	1.95	.....	1.50	1.15
13	.....	1.30	1.20	.....	4.5	3.8	.....	2.00	1.80	1.80	1.50	1.15
14	.....	1.30	1.05	1.80	4.1	3.6	.....	1.80	.....	1.70	1.50	.....
15	.....	1.20	.95	1.90	3.5	.....	2.60	1.80	1.90	1.65	1.50	1.30
16	.....	.....	.....	2.25	3.8	.....	2.70	1.70	1.80	1.65	.....	1.30
17	.....	.....	1.05	2.45	.....	.....	.....	.....	1.80	1.70	1.50	1.30
18	.....	.....	1.15	2.55	.....	4.3	2.70	1.70	1.70	1.65	1.55	1.25
19	.....	.....	1.15	2.50	3.7	4.4	3.0	1.60	1.70	.....	1.50	1.30
20	.....	1.10	1.10	2.60	3.4	4.5	.....	1.60	1.70	1.50	1.55	1.25
21	.....	1.10	1.05	2.55	3.2	.....	2.70	1.55	.....	1.50	1.55	.....
22	1.50	1.00	1.05	2.65	3.0	.....	2.70	1.60	1.85	.....	1.45	1.00
23	.....	.....	.....	2.55	.....	.....	2.80	1.60	1.90	1.60	.....	1.30
24	.....	1.00	1.00	.....	4.1	4.2	3.2	.....	1.80	1.50	.....	1.20
25	.....	1.20	1.10	2.30	.....	3.7	2.75	1.60	1.70	1.50	1.50	.....
26	.....	1.10	1.00	2.25	4.8	3.8	2.45	1.60	1.75	.....	1.50	.....
27	.....	1.20	1.00	.....	5.2	4.1	.....	1.50	1.70	1.50	.....	1.30
28	.....	.....	1.15	2.50	4.8	.....	2.25	1.50	.....	1.50	1.45	.....
29	.....	.....	1.20	2.65	5.1	.....	2.25	1.60	1.70	1.40	1.40	1.30
30	.....	.....	.....	3.20	5.4	.....	2.10	1.60	1.65	1.45	.....	1.20
31	.....	.....	.....	.....	4.7	.....	2.00	.....	.....	1.45	.....	1.30

NOTE.—Discharge relation affected by ice Jan. 1 to Feb. 15 and Dec. 1–31.

Daily discharge, in second-feet, of Roaring Fork at Glenwood Springs, Colo., for 1913.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	410	820	2,710	5,720	.....	990	680	715	620	535
2	.....	410	750	2,710	5,840	.....	900	680	750	635	560
3	.....	410	680	1,960	5,840	.....	900	650	750	650	460
4	.....	410	620	2,000	6,070	.....	900	620	770	620	485
5	.....	435	680	2,040	6,300	.....	820	680	800	620	535
6	.....	460	730	3,080	5,150	.....	750	727	820	590	535
7	.....	410	785	3,270	4,920	.....	785	774	785	620	522
8	.....	460	680	3,080	4,810	.....	785	820	820	650	510
9	.....	448	560	2,890	4,700	.....	823	1,180	750	605	510
10	.....	435	535	3,420	4,700	.....	861	990	785	560	485
11	.....	435	590	3,950	4,700	2,530	900	945	715	620	435
12	.....	435	620	4,480	4,700	2,360	990	945	790	620	410
13	.....	460	720	5,150	3,650	2,200	990	820	820	620	410
14	.....	390	820	4,260	3,270	1,650	820	860	750	620	448
15	.....	350	900	3,080	3,280	1,620	820	900	715	620	485
16	.....	370	1,230	3,650	3,500	1,750	750	820	715	620	485
17	.....	390	1,440	3,580	4,700	1,750	750	820	750	620	485
18	.....	435	1,560	3,520	4,700	1,750	750	750	715	650	460
19	.....	435	1,500	3,460	4,920	2,200	680	750	668	620	485
20	410	410	1,620	2,890	5,150	1,980	680	750	620	650	460
21	410	390	1,560	2,530	4,980	1,750	650	800	620	650	370
22	370	390	1,680	2,200	4,820	1,750	680	860	650	590	350
23	370	380	1,560	3,230	4,650	1,890	680	900	680	600	485
24	370	370	1,320	4,260	4,480	2,530	680	820	620	610	435
25	460	410	1,280	5,050	3,460	1,820	680	750	620	620	450
26	410	370	1,230	5,840	3,650	1,440	680	785	620	620	465
27	460	370	1,360	6,780	4,260	1,340	620	750	620	605	485
28	435	435	1,500	5,840	4,250	1,230	620	750	620	590	485
29	.....	460	1,680	6,540	4,100	1,230	680	750	560	560	485
30	.....	560	2,530	7,270	3,900	1,080	680	715	590	560	435
31	.....	680	.....	5,610	.....	990	680	.....	590	.....	485

NOTE.—Discharge determined as follows: Feb. 20 to June 30 and July 11 to Nov. 30 from a well-defined rating curve; Jan. 1 to Feb. 19 no estimate made on account of ice; Dec. 1–31, estimated on account of ice; Feb. 20 to Nov. 30, for days for which gage heights are missing, except July 1–10, estimated by comparison with the flow at near-by stations.

Monthly discharge of Roaring Fork at Glenwood Springs, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
February 20–28	460	370	411	7,350	C.
March	680	350	426	26,200	B.
April	2,530	535	1,120	66,600	B.
May	7,270	1,960	3,880	239,000	B.
June	6,300	3,280	4,640	276,000	C.
July 11–31	2,530	990	1,750	72,800	B.
August	990	620	773	47,500	B.
September	1,180	620	801	47,700	B.
October	820	590	702	43,200	B.
November	650	560	614	36,500	B.
December	560	350	472	29,000	C.

HUNTER CREEK AT ASPEN, COLO.

Location.—In sec. 7, T. 10 S., R. 84 W., at railroad bridge in Aspen, about 500 feet above the mouth. No tributary within several miles of the mouth.

Records available.—February 17, 1911, to October 16, 1913.

Drainage area.—42 square miles (measured on topographic sheet).

Gage.—Vertical staff.

Control.—Shifting after high water.

Discharge measurements.—Made by wading.

Winter flow.—Ice causes backwater during winter; observations discontinued.

Diversions.—At times the RoaringFork Light & Power Co. diverts water above the station. There is a court decree for a diversion of 15 second-feet above station.

Accuracy.—The mean daily stage, as determined from one reading, may be somewhat in error on account of diurnal fluctuation owing to the high altitude of the station.

Estimates withheld on account of shifting of channel and lack of discharge measurements.

Discharge measurements of Hunter Creek at Aspen, Colo., for 1913.

[Made by R. H. Fletcher.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
May 6	2.15	194
June 26	1.63	70

Daily gage height, in feet, of Hunter Creek at Aspen, Colo., for 1913.

[H. O. Halleck, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1		1.7		1.65		0.7	
2		1.7	2.3	1.5	0.65	.75	
3			2.3				1.2
4					.6	.7	
5			2.3	1.45	.6	.7	
6		2.1	2.2		.3	.75	1.1
7				1.4			1.15
8						1.2	
9				1.5		1.2	1.15
10		2.7	2.3				1.15
11			2.35	1.3	.7	1.0	1.1
12		2.8	2.2	1.2			
13		2.5	2.0	1.1			1.2
14			2.0	1.1	−.1		1.25
15		2.0		1.15		1.3	1.2
16			2.2		.4	1.3	1.2
17						1.25	
18				1.2	.3	1.2	
19			2.2	1.15	.3		
20		2.1			.3		
21			2.0	1.2			
22		1.8		1.25		1.3	
23	1.5	2.3	1.9			1.35	
24	1.5	2.5		1.3			
25	1.4		1.75	1.3	.7	1.2	
26	1.3	2.8		1.1	.7		
27			1.6			1.1	
28	1.8	2.8	1.6	1.1		1.1	
29	1.7	2.8		1.0		1.15	
30	1.7	2.5	1.6				
31		2.5		.7			

NOTE.—Fluctuation in stage during July and August due chiefly to variable use of water for irrigation above station.

CASTLE CREEK NEAR ASPEN, COLO.

Location.—In sec. 35, T. 10 S., R. 85 W., at highway bridge 4½ miles above Aspen, in the Sopris National Forest. No inflow below except spring run-off from small gulches; nearest tributary above is Conundrum Creek, which enters about 1 mile upstream.

Records available.—February 16, 1911, to December 31, 1913.

Drainage area.—72 square miles (measured on topographic sheets).

Gage.—Vertical staff; read once daily. On February 29, 1912, the gage was moved to the opposite side of the creek and the datum lowered 1 foot, but the difference in gage readings varies.

Control.—Somewhat shifting, especially during high water.

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

Winter flow.—Ice causes some backwater at station.

Diversions.—No water diverted above station except possibly for a small amount of meadow irrigation; there are court decrees for the diversion of 160 second-feet below station.

Accuracy.—Owing to the high altitude of the station (8,300 feet) it is probable that at certain seasons alternate melting and freezing cause diurnal fluctuation; mean daily gage height as determined by one reading may be considerably in error; gage heights also meager.

Estimates withheld on account of uncertainty of data.

Discharge measurements of Castle Creek near Aspen, Colo., for 1913.

Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 7	R. H. Fletcher	1.35	99
June 27	do.	2.20	283
Oct. 19	Robert Follansbee	1.07	49

Daily gage height, in feet, of Castle Creek near Aspen, Colo., for 1913.

[H. O. Halleck, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1								1.00	
2		0.90		2.10	1.60				1.00
3		1.20		2.00		1.30		1.00	
4		1.20					1.10		
5					1.50			1.00	
6				2.25		1.35			.95
7		1.35	2.20	2.00			1.15		
8					1.45			1.00	
9	0.40					1.60			.95
10			2.00		1.50		1.10		1.00
11			2.10						
12		1.80		1.90					
13					1.40			1.00	
14			1.80						
15		1.60		1.80			1.00		
16							1.00		
17								1.00	1.00
18				1.80					
19			1.80						1.00
20		1.50			1.35	1.40			
21			2.10						
22		1.40		1.75		1.45		.95	
23			2.30				.90		1.50
24	1.00						.85		
25	1.00	2.00		1.70	1.30			1.00	
26	1.00	2.30							.95
27			2.10			1.20			
28	1.00	2.20					1.00	.90	
29	1.00	2.30		1.60					
30	.90	2.30							1.00
21									

NOTE.—Discharge relation affected by ice Dec. 20 to 31.

MAROON CREEK NEAR ASPEN, COLO.

Location.—In sec. 22, T. 10 S., R. 85 W., just above the Roaring Fork Light & Power Co.'s headgate, and 5 miles above Aspen, in the Sopris National Forest. Nearest tributary, Willow Creek, which enters just below the station.

Records available.—January 1, 1911, to December 31, 1913.

Drainage area.—42 square miles (measured on topographic sheet).

Gage.—Vertical staff; read once daily.

Control.—Practically permanent during 1913.

Discharge measurements.—Made by wading.

Winter flow.—Discharge measurements indicate that ice does not cause backwater at station.

Diversions.—One or two small diversions above station; the Roaring Fork Light & Power Co. diverts water just below.

Accuracy.—Owing to the high altitude of station (8,300 feet), it is probable that at certain seasons melting and freezing cause diurnal fluctuations; mean daily gage height as determined from one reading may be considerably in error; gage heights few; estimates only fair.

Discharge measurements of Maroon Creek near Aspen, Colo., for 1913.

Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 7	R. H. Fletcher	0.95	46
June 27	....do	1.80	238
Oct. 19	Robert Follansbee	.90	37

Daily gage height, in feet, of Maroon Creek near Aspen, Colo., for 1913.

[H. O. Halleck, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		0.90		1.50	1.40			0.75	
2		.90							
3								.75	0.70
4					1.30	1.10	0.80		
5									
6							.80		
7		.95	1.80	1.70				.75	
8									
9					1.20				
10				1.60		1.50	.80	.75	
11			1.70		1.25				.70
12	0.70							.80	
13									
14		1.30		1.60					
15									
16					1.20			.80	.80
17		1.20		1.55		.95	.80		
18						.90	.80		
19					1.20				
20			1.80						.75
21		1.80	1.90	1.60			.80		
22									
23			1.80			.90			.80
24	.90	1.50		1.60				.75	
25	.90				1.15	.95	.80		
26	.90		1.65			.85		.70	.80
27							.75		
28	.90	1.70		1.45					
29	.90	1.70							
30	.90		1.60			.85			.80
31									

Daily discharge, in second-feet, of Maroon Creek near Aspen, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	39	.....	149	124	66	34	28	25
2	.....	39	.....	158	116	65	33	28	25
3	.....	40	.....	167	108	64	32	28	25
4	.....	41	.....	176	101	64	31	28	25
5	.....	42	.....	185	97	65	31	28	25
6	.....	43	.....	194	93	80	31	28	25
7	.....	45	233	204	89	100	31	28	25
8	.....	53	.....	194	85	135	31	28	25
9	.....	61	.....	185	81	145	31	28	25
10	.....	69	.....	176	86	149	31	28	25
11	.....	77	204	176	91	140	31	30	25
12	25	85	.....	176	89	135	31	31	26
13	.....	93	.....	176	87	120	31	31	27
14	.....	101	.....	176	85	100	31	31	28
15	.....	95	.....	170	83	70	31	31	30
16	.....	88	.....	166	81	50	31	31	31
17	.....	81	.....	162	81	45	31	31	30
18	.....	119	.....	165	81	39	31	31	29
19	.....	157	.....	168	81	39	31	30	28
20	.....	195	233	172	79	39	31	30	28
21	.....	233	263	176	78	39	31	29	29
22	.....	204	248	176	76	39	31	29	30
23	.....	176	233	176	75	39	31	28	31
24	39	149	215	176	73	42	31	28	31
25	39	165	200	166	72	45	31	26	31
26	39	181	190	156	72	35	30	25	31
27	39	192	186	146	71	35	28	25	31
28	39	204	182	136	70	35	28	25	31
29	39	204	179	133	69	35	28	25	31
30	39	204	176	130	68	35	28	25	31
31	.....	204	.....	127	67	.....	28	.....	31

NOTE.—Discharge determined from a well-defined rating curve. Discharge estimated for days for which gage heights are missing except Apr. 13–23 and June 1–19.

Monthly discharge of Maroon Creek near Aspen, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
May	233	39	119	7,320	D.
July	204	127	168	10,300	C.
August	124	67	84.2	5,180	C.
September	149	35	69.6	4,140	C.
October	34	28	30.7	1,890	B.
November	31	25	28.4	1,690	B.
December	31	25	28.1	1,730	C.

SNOWMASS CREEK AT SNOWMASS, COLO.

Location.—In sec. 27, T. 8 S., R. 86 W., on private bridge at Stewart's ranch, one-half mile from Snowmass. No tributaries below station.

Records available.—February 21, 1911, to December 5, 1913.

Drainage area.—89 square miles (measured on topographic sheet and Forest atlas).

Gage.—Vertical staff.

Control.—Practically permanent.

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

Winter flow.—Ice causes backwater during part of the winter; observations discontinued.

Diversions.—There are court decrees for the diversion of 29 second-feet from the main stream above the station and 7 second-feet below, and also for the diversion of 73 second-feet from tributaries entering above.

Accuracy.—Estimates good.

Discharge measurements of Snowmass Creek near Snowmass, Colo., for 1913.

[Made by R. H. Fletcher.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
May 7	0.60	84
June 27	1.20	264

Daily gage height, in feet, of Snowmass Creek at Snowmass, Colo., for 1913.

[Geo. Hutchins, observer.]

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1			1.05		0.6			
2	0.6	1.1						
3							0.4	
4				0.7				
5								
6	.65					0.45		
7	.6		.9					
8					.5			0.6
9		1.1						
10							.4	
11				.8				
12	.9							
13						.45		
14			.8					
15								
16								
17		1.15					.4	
18				.7	.5			
19	.9							
20								
21			.8			.4		
22								
23					.5			
24								
25		1.0		.6				
26	1.0							
27		1.2				.4		
28			.8					
29								
30					.5			
31								

NOTE.—Discharge relation probably affected by ice during December.

Daily discharge, in second-feet, of Snowmass Creek at Snowmass, Colo., for 1913.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1			204		90		
2	90	221					
3							60
4				109			
5							
6	100					67	
7	90		157				
8					74		
9		221					
10							60
11				131			
12	157						
13						67	
14			131				
15							
16							
17		240					60
18				109	74		
19	157						
20							
21			131			.60	
22							
23					74		
24							
25		187		90			
26	187						
27		260				60	
28			131				
29							
30					74		
31							

NOTE.—Discharge determined from a well-defined rating curve. No estimates for days on which gage was not read. No estimate made for December on account of unknown effect of ice.

FRYING PAN CREEK AT NORRIE, COLO.

Location.—In sec. 28, T. 8 S., R. 83 W., at the highway bridge in Norrie, in the Sopris National Forest. North Fork enters 1 mile below.

Records available.—February 18, 1911, to December 31, 1913.

Drainage area.—92 square miles (measured on topographic sheet).

Gage.—Vertical staff; read once daily.

Control.—Practically permanent during 1913.

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

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

Diversions.—None above the station.

Accuracy.—Because of the high altitude of the station (8,400 feet) alternate melting and freezing cause diurnal fluctuation at certain seasons; mean daily stage as determined from one reading may be considerably in error. Results fair.

Discharge measurements of Frying Pan Creek at Norrie, Colo., for 1913.

Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 8	R. H. Fletcher	3.80	223
Oct. 17	Robert Follansbee	2.56	35

Daily gage height, in feet, of Frying Pan Creek at Norrie, Colo., for 1913.

[Ben I. Beaty, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1				3.50		2.70			
2		3.50	4.40		2.60				
3				3.40	2.60		2.60		3.10
4						2.70	2.60	2.60	
5		3.70	4.10	3.20					3.2
6			4.00			2.70	2.60	2.60	
7				3.10	2.60	2.80	2.60		3.30
8		3.80	3.90			2.80		2.60	
9								2.60	
10		3.90		3.10	2.80		2.60		
11						2.80		2.60	
12				3.00	2.70				3.7
13				3.00				2.60	
14		4.20	3.70		2.60	2.70	2.70		
15							2.60		
16	3.60	3.60		3.10	2.60			2.60	
17			4.10		2.60	2.70	2.56	2.50	
18	3.10			3.10				2.50	
19	3.60	4.30				2.60			2.90
20	3.60			3.00	2.70			2.50	
21			3.90			2.60			
22		4.10		2.90				2.50	3.00
23	3.20		3.80		2.70			2.50	
24		4.30			2.70	2.60		2.50	
25	2.90			2.90			2.50	2.50	
26		4.30	3.70						
27				2.80	2.70	2.60		2.50	3.10
28		5.0	3.50						
29	3.20	4.40			2.70	2.60	2.60	2.50	
30			3.50						
31		5.1		2.60					3.20

NOTE.—Discharge relation affected by ice during December.

Daily discharge, in second-feet, of Frying Pan Creek at Norrie, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	148	600	167	42	51	42	42
2	.....	167	435	158	42	51	42	42
3	.....	181	395	148	42	51	42	42
4	.....	196	360	131	42	51	42	42
5	.....	211	325	115	42	51	42	42
6	.....	219	292	108	42	51	42	42
7	.....	228	278	100	42	61	42	42
8	.....	236	263	100	42	61	42	42
9	.....	240	260	100	50	61	42	42
10	.....	263	260	100	61	61	42	42
11	.....	320	255	93	56	61	44	42
12	.....	360	250	86	51	57	46	42
13	.....	360	230	86	46	54	48	42
14	.....	360	211	86	42	51	51	42
15	.....	292	210	86	42	51	42	42
16	188	188	270	100	42	51	40	42
17	144	180	325	100	42	51	39	34
18	100	250	312	100	45	46	39	34
19	188	395	300	93	48	42	38	34
20	188	350	270	86	51	42	38	34
21	163	325	263	80	51	42	37	34
22	139	325	250	73	51	42	36	34
23	115	340	236	73	51	42	35	34
24	94	395	228	80	51	42	34	34
25	73	395	220	73	51	42	34	34
26	86	395	211	67	51	42	36	34
27	100	550	189	61	51	42	38	34
28	110	710	167	56	51	42	40	34
29	115	435	167	51	51	42	42	34
30	131	600	167	46	51	42	42	34
31	.....	760	.....	42	51	.....	42	.....

NOTE.—Discharge determined from a fairly well defined rating curve. Discharge estimated for days for which gage heights are missing by comparison with records of Frying Pan Creek at Thomasville. No estimate made for December on account of the effect of ice.

Monthly discharge of Frying Pan Creek at Norrie, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April 16-30	188	73	129	3,840	C.
May	760	148	335	20,600	D.
June	600	167	273	16,200	D.
July	167	42	91.8	5,640	C.
August	61	42	47.5	2,920	C.
September	61	42	49.2	2,930	C.
October	51	34	40.7	2,500	C.
November	42	34	38.3	2,280	C.
The period	.....	.....	.....	56,900	

FRYING PAN CREEK AT THOMASVILLE, COLO.

Location.—In sec. 12, T. 8 S., R. 84 W., at private bridge three-fourths mile below Thomasville, in the Sopris National Forest. Nearest tributary, Jakeman Creek, which enters 100 yards above.

Records available.—January 2, 1911, to December 31, 1913.

Drainage area.—190 square miles (measured on Forest atlas).

Gage.—Vertical staff; read once daily.

Control.—Practically permanent.

Discharge measurements.—Made from bridge or by wading.

Winter flow.—Discharge measurements show that ice causes backwater at intervals during the winter.

Diversions.—No court decrees for diversion of water above the station.

Accuracy.—Because of the high altitude of the station (8,000 feet) it is probable that at certain seasons alternate melting and freezing cause diurnal fluctuation; mean daily gage height based on one reading per day may be considerably in error; estimates only fair or possibly good.

Discharge measurements of Frying Pan Creek at Thomasville, Colo., for 1913.

Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 8	R. H. Fletcher	2.20	581
Oct. 17	Robert Follansbee	.65	65

Daily gage height, in feet, of Frying Pan Creek at Thomasville, Colo., for 1913.

[E. T. Wehrly, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1				1.7					
2			2.7	1.6	1.0	0.8			
3			2.6	1.6		.8	0.9	0.65	
4			2.6			.8	.9		0.6
5			2.7	1.6	1.0		.8		.45
6			2.6	1.4					.5
7		2.2	2.7		.9	.8		.65	.55
8		2.25		1.4			.9	.35	
9		2.1	2.7		.9				.5
10		2.2	2.7					.75	
11		2.6	2.7		.9	.8	1.0	.35	
12		2.8	2.7	1.4				.35	
13		2.8	2.4	1.3		.8			2.3
14		2.8		1.3	.9	.8	.9		
15		2.6	2.3	1.4			.8	.40	1.85
16		2.2	2.5	1.7		.8	.7	.5	
17		2.1	2.4	1.8	.8		.65		.55
18			2.4	1.7					.55
19		2.5	2.5	1.7	.9		.7	.55	.45
20			2.3			.8			
21		2.1	2.3					.55	
22		2.1	2.1	1.5		.9	.7	.45	
23		2.3		1.6	.8				1.6
24		2.6	2.1	2.1		.8			
25	1.2		2.0	1.6		.8	.7	.6	
26	1.4	2.7	2.0		.8		.65	.6	
27	1.5	4.1		1.6		.8	.7	.6	.4
28		3.4	2.0	1.3					
29		2.8	2.0		.8	.8			
30			1.7				.7	.5	.4
31		2.6		1.1					

NOTE.—Discharge relation affected by ice Dec. 13–15, and 23.

Daily discharge, in second-feet, of Frying Pan Creek at Thomasville, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	377	860	320	124	86	94	70	.....
2	.....	410	895	280	117	86	98	68	.....
3	.....	443	825	280	117	86	101	66	.....
4	.....	476	825	280	117	86	101	66	60
5	.....	509	895	280	117	86	86	66	48
6	.....	542	825	210	109	86	91	66	51
7	.....	575	895	210	101	86	96	66	56
8	.....	605	895	210	101	86	101	42	.....
9	.....	520	895	210	101	86	106	66	51
10	.....	575	895	210	101	86	111	79	.....
11	.....	825	895	210	101	86	117	42	.....
12	.....	965	895	210	101	86	111	42	.....
13	.....	965	695	180	101	86	106	43	.....
14	.....	965	665	180	101	86	101	44	.....
15	.....	825	635	210	96	86	86	44	.....
16	.....	575	760	320	91	86	72	51	.....
17	.....	520	695	365	86	86	66	52	56
18	.....	640	695	320	94	86	69	54	56
19	.....	760	760	320	101	86	72	56	48
20	.....	640	635	295	98	86	72	56	.....
21	.....	520	635	270	94	94	72	56	.....
22	.....	520	520	245	90	101	72	48	.....
23	.....	635	520	280	86	94	72	52	.....
24	.....	825	520	520	86	86	72	56	.....
25	155	860	465	280	86	86	72	60	.....
26	210	895	465	280	86	86	66	60	.....
27	245	1,960	465	280	86	86	72	60	44
28	278	1,410	465	180	86	86	72	57	.....
29	311	965	465	165	86	86	72	54	.....
30	344	895	320	150	86	90	72	51	44
31	.....	825	.....	135	86	.....	71	.....	.....

NOTE.—Discharge determined from a well-defined rating curve. For days when gage was not read discharge was estimated by comparison with the flow at Norrie, Colo., except for December. Information furnished by the observer indicates that the flow from January to March was about 50 or 60 second-feet. No estimate made December 13–15 and 23 on account of ice.

Monthly discharge of Frying Pan Creek at Thomasville, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April 25–30	344	155	257	3,060	C.
May	1,960	377	743	45,700	C.
June	895	320	696	41,400	C.
July	520	135	254	15,600	C.
August	124	86	97.8	6,010	B.
September	101	86	87.2	5,190	B.
October	117	66	85.2	5,240	B.
November	79	42	56.4	3,360	B.
The period	.....	.....	.....	126,000	

NORTH FORK OF FRYING PAN CREEK NEAR NORRIE, COLO.

Location.—In sec. 21, T. 8 S., R. 85 W., at highway bridge about 1 mile from Norrie, in the Sopris National Forest. No tributaries below station.

Records available.—February 18, 1911, to November 30, 1913.

Drainage area.—42 square miles (measured on topographic sheets).

Gage.—Vertical staff; read irregularly.

Control.—Practically permanent.

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

Winter flow.—Ice probably causes backwater during winter; observations discontinued.

Diversions.—None above station.

Accuracy.—Estimates rated only fair becuase of irregular reading of gage and error in mean daily stage as determined from one reading.

Discharge measurements of North Fork of Frying Pan Creek near Norrie, Colo., for 1913.

Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 8	R. H. Fletcher	1.55	175
Oct. 17	Robert Follansbee	.32	11

Daily gage height, in feet, of North Fork of Frying Pan Creek near Norrie, Colo., for 1913.

[B. I. Beatty, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1		1.3						
2						0.3	0.5	0.3
3		1.3	2.0	1.1			.6	
4						.3	.6	.3
5		1.3			0.3			.3
6		1.6					.6	
7		1.6	1.75	1.0				
8		1.5						
9								
10						.5	.6	
11			1.95	.9			.6	
12				.8				
13		1.9		.8				
14		1.7			.4			.3
15	1.1	1.5			.4		.5	.3
16	.9		1.6			.3		
17				1.6			.4	
18								
19			1.5	1.3				
20	1.3					.3		
21			1.5		.4			.3
22				1.0	.3			
23	1.3	1.6	1.5					
24						.4		
25		2.1		.9		.4	.5	
26		1.9	1.4			.4		
27	1.2			.7	.3	.4		
28							.5	
29				.6			.5	
30		2.2						
31		2.1						

Daily discharge, in second-feet, of North Fork of Frying Pan Creek near Norrie, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	120	296	96	18	10	16	13
2	.....	120	288	90	16	10	18	10
3	.....	120	280	84	14	10	26	10
4	.....	120	265	80	12	10	26	10
5	.....	120	250	76	10	10	26	10
6	.....	185	235	72	10	12	26	10
7	.....	185	220	69	11	14	26	10
8	.....	163	236	66	11	16	26	10
9	.....	165	252	63	11	18	26	10
10	.....	170	260	60	12	18	26	10
11	.....	200	268	56	12	17	26	10
12	.....	240	260	45	12	16	24	10
13	.....	255	220	45	13	15	22	10
14	.....	208	210	50	13	14	20	10
15	84	163	200	60	13	12	18	10
16	56	165	185	150	13	10	16	10
17	60	185	176	185	13	10	13	10
18	70	210	170	150	13	10	14	10
19	95	300	163	120	13	10	16	10
20	120	225	163	101	13	10	16	10
21	120	190	163	84	13	11	16	10
22	120	185	163	69	10	12	17	10
23	120	185	163	75	10	12	17	10
24	115	240	156	80	10	13	18	10
25	110	305	149	56	10	13	18	10
26	105	255	141	46	10	13	18	10
27	101	500	140	35	10	13	18	10
28	105	550	135	30	10	14	18	10
29	110	425	130	26	10	14	18	10
30	115	335	105	23	10	15	17	10
31	.....	305	.....	20	10	.....	16	.....

NOTE.—Discharge determined from a well-defined rating curve. For days when gage was not read the discharge was estimated by comparison with the flow of Frying Pan Creek at Norrie and Thomasville. Information furnished by observer indicates that the flow from January to March was about 7 second-feet.

Monthly discharge of North Fork of Frying Pan Creek near Norrie, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April 15-30	120	56	100	3,170	C.
May	550	120	229	14,100	D.
June	296	105	201	12,000	D.
July	185	20	73.0	4,490	C.
August	18	10	11.8	726	C.
September	18	10	12.7	756	C.
October	26	13	19.9	1,220	C.
November	13	10	10.1	601	C.
The period	.....	.....	.....	37,100	

CRYSTAL RIVER AT MARBLE, COLO.

Location.—In sec. 26, T. 11 S., R. 88 W., at the electric railway bridge of the Colorado-Yule Marble Co., one-half mile west of Marble. Nearest tributary, Carbonate Creek, which enters at Marble.

Records available.—November 1, 1910, to December 31, 1913.

Drainage area.—77 square miles (measured on Forest atlas).

Gage.—A vertical hook gage graduated to hundredths of a foot; read morning and evening.

Control.—Slightly shifting at long intervals.

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

Winter flow.—Discharge relation little if at all affected by ice.

Diversions.—Court decrees for diversion of 114 second-feet below station; none for diversions above.

Accuracy.—Because of the high altitude of the station (8,000 feet) it is probable that at certain seasons alternate melting and freezing cause diurnal fluctuation, and the mean daily stage based on morning and evening readings may be somewhat in error; estimates only good.

Cooperation.—Field data furnished by the Colorado-Yule Marble Co.

Discharge measurements of Crystal River at Marble, Colo., for 1913.

[Made by H. V. Knouse.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
May 14	3.68	467
May 29	4.73	1,050

Daily gage height, in feet, of Crystal River at Marble, Colo., for 1913.

[Homer V. Knouse and F. V. Mueller, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.87	1.81	1.84	2.00	3.00	4.7	3.90	2.70	2.35	2.05	2.00	1.96
2	1.88	1.81	.....	2.00	2.80	4.7	3.90	2.90	2.35	2.10	1.96	1.82
3	1.88	1.73	1.80	2.00	2.80	4.8	3.75	2.80	2.35	2.15	1.98	1.88
4	1.88	1.80	1.80	2.05	2.80	4.6	3.70	2.75	2.35	2.20	1.99	1.91
5	1.80	1.80	1.81	1.96	3.05	4.50	3.65	2.70	2.35	2.15	1.91	1.90
6	1.78	1.80	1.81	1.96	3.40	4.40	3.60	2.70	2.30	2.15	1.98	1.87
7	1.80	1.80	1.80	1.95	3.40	4.40	3.65	2.60	2.35	2.15	1.99	1.86
8	1.88	1.80	1.81	1.91	3.50	4.20	3.65	2.60	2.30	2.15	1.82	1.95
9	1.87	1.81	1.80	1.91	3.45	4.25	3.60	2.60	2.70	2.10	1.90	1.84
10	1.88	1.80	1.82	1.89	3.60	4.15	3.80	2.55	2.55	2.10	1.94	1.84
11	1.88	1.80	1.83	1.89	3.80	4.00	3.55	2.60	2.35	2.15	1.96	1.80
12	1.86	1.78	1.83	1.95	4.10	3.75	3.35	2.80	2.35	2.15	1.91	1.86
13	1.85	1.80	1.82	2.10	4.00	3.60	3.30	2.65	2.30	2.20	2.00	1.80
14	1.84	1.78	1.75	2.30	3.80	3.70	3.35	2.60	2.25	2.15	2.00	1.76
15	1.85	1.80	1.80	2.40	3.45	3.90	3.30	2.55	2.30	2.20	1.97	1.92
16	1.79	1.79	1.78	2.50	3.35	4.30	3.20	2.45	2.20	2.10	1.82	1.89
17	1.81	1.81	1.84	2.60	3.40	4.45	3.20	2.50	2.20	2.15	2.05	1.86
18	1.92	1.80	1.76	2.60	3.50	4.6	3.25	2.45	2.20	2.10	2.00	1.91
19	1.86	1.82	1.77	2.60	3.70	4.6	3.30	2.50	2.15	2.10	1.99	1.91
20	1.83	1.82	1.76	2.65	3.45	4.6	3.20	2.45	2.05	2.05	2.00	1.77
21	1.85	1.80	1.75	2.75	3.25	4.50	3.20	2.50	2.10	2.10	2.00	1.71
22	1.86	1.80	1.73	2.80	3.35	4.20	3.05	2.45	2.25	2.10	1.98	1.75
23	1.86	1.79	.....	2.60	3.75	4.35	3.15	2.45	2.20	2.05	1.72	1.77
24	1.82	1.80	1.79	2.45	4.05	4.10	3.30	2.40	2.15	2.05	1.80	1.83
25	1.84	1.84	1.69	2.35	4.30	3.90	3.05	2.40	2.10	2.05	1.95	1.88
26	1.83	1.62	1.72	2.35	4.6	4.00	2.90	2.35	2.15	2.05	1.98	1.90
27	1.79	1.80	1.72	2.40	4.6	4.25	2.80	2.35	2.10	2.05	1.98	1.90
28	1.81	1.80	1.76	2.55	4.45	4.30	2.70	2.40	2.10	2.05	1.98	1.85
29	1.81	.....	1.79	2.70	4.9	4.10	2.70	2.35	2.15	1.94	1.94	1.84
30	1.81	.....	1.78	2.90	4.9	3.90	2.70	2.35	2.10	2.00	1.94	1.90
31	1.81	.....	1.98	.....	4.7	.....	2.70	2.35	.....	2.00	.....	1.85

Daily discharge, in second-feet, of Crystal River at Marble, Colo., for 1913.

Day.	Jan.	Feb.	Mar.	Arp.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	34	30	32	44	213	1,040	575	146	84	48	44	41
2	35	30	30	44	167	1,040	575	189	84	53	41	30
3	35	25	29	44	167	1,100	500	167	84	58	42	35
4	35	29	29	48	167	975	475	156	84	64	43	37
5	29	29	30	41	226	915	452	146	84	58	37	36
6	28	29	30	41	345	855	430	146	77	58	42	34
7	29	29	29	40	345	855	452	127	84	58	43	33
8	35	29	30	37	385	740	452	127	77	58	30	40
9	34	30	29	37	365	768	430	127	146	53	36	32
10	35	29	30	35	430	712	525	118	118	53	39	32
11	35	29	31	35	525	630	408	127	84	58	41	29
12	33	28	31	40	685	500	325	167	84	58	37	33
13	32	29	30	53	630	430	305	136	77	64	44	29
14	32	28	26	77	525	475	325	127	70	58	44	27
15	32	29	29	92	365	575	305	118	77	64	42	38
16	28	28	28	109	325	795	270	100	64	53	30	35
17	30	30	32	127	345	885	270	109	64	58	48	33
18	38	29	27	127	385	975	288	100	64	53	44	37
19	33	30	27	127	475	975	305	109	58	53	43	37
20	31	30	27	136	365	975	270	100	48	48	44	27
21	32	29	26	156	288	915	270	109	53	53	44	24
22	33	29	25	167	325	740	226	100	70	53	42	26
23	33	28	26	127	500	825	255	100	64	48	24	27
24	30	29	28	100	658	685	305	92	58	48	29	31
25	32	32	22	84	795	575	226	92	53	48	40	35
26	31	20	24	84	975	630	189	84	58	48	42	36
27	28	29	24	92	975	768	167	84	53	48	42	36
28	30	29	27	118	885	795	146	92	53	48	42	32
29	30	.....	28	146	1,160	685	146	84	58	39	39	32
30	30	.....	28	189	1,160	575	146	84	53	44	39	36
31	30	.....	42	.....	1,040	.....	146	84	.....	44	.....	32

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

Monthly discharge of Crystal River at Marble, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	38	28	32.0	1,970	B.
February	32	20	28.7	1,590	B.
March	42	22	28.6	1,760	B.
April	189	35	86.6	5,150	B.
May	1,160	167	522	32,100	C.
June	1,100	430	780	46,400	C.
July	575	146	328	20,200	B.
August	189	84	118	7,260	B.
September	146	48	72.8	4,330	B.
October	64	39	53.2	3,270	B.
November	48	24	39.9	2,370	B.
December	41	24	33.0	2,030	B.
The year	1,160	20	177	128,000	

MIDDLE ELK CREEK NEAR NEW CASTLE, COLO.

Location.—In sec. 22, T. 5 S., R. 91 W., 2 miles above East Elk Creek and about 4 miles northwest of New Castle; about 900 feet below the mouth of West Elk Creek, which carries very little water except possibly during the spring.

Records available.—January 19, 1911, to December 31, 1913.

Drainage area.—122 square miles (measured on Forest atlas).

Gage.—Vertical staff. September 23, 1911, to September 3, 1913, a vertical staff located opposite mouth of West Elk Creek. No known relation between the two gage datums.

Control.—Somewhat shifting.

Discharge measurements.—Made from a near-by bridge or by wading below the mouth of West Elk Creek.

Winter flow.—Discharge relation little affected by ice.

Diversions.—There are court decrees for the diversion of 51 second-feet above present station and 27 second-feet from the main stream below.

Estimates withheld on account of shifting channel and lack of discharge measurements.

Discharge measurements of Middle Elk Creek near New Castle, Colo., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 3	R. H. Fletcher	1.80	130	Sept. 3	R. H. Fletcher	[a]1.50	16
June 25	do	1.62	102	Oct. 20	Robert Follansbee	[a]1.58	19
Sept. 2	do	1.00	16				

[a] Refers to datum of gage installed Sept. 3, 1913.

Daily gage height, in feet, of Middle Elk Creek near New Castle, Colo., for 1913.

[J. M. James and R. K. Potter, observers.]

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1					2.4	1.5	1.0				
2						1.4			1.6	1.5	
3				1.8						1.6	1.5
4			1.2		2.3			1.5			
5										1.5	
6					2.2			1.5		1.5	
7		1.1									
8						1.3		1.5		1.5	1.5
9						1.2					
10				2.6		1.2				1.5	
11											
12							1.0			1.5	
13		.95		2.9				1.5	1.6		
14					1.8	1.1	1.0				
15		.92				1.2	1.0			1.5	
16			1.2	2.4	2.1	1.2		1.5	1.6		
17						1.2				1.5	
18					1.8				1.6		
19		.8	1.5		1.7		1.0	1.5			
20				2.6	1.6		1.0			1.5	
21											
22		1.4	1.55		1.6		1.0				
23			1.4	2.6			1.0		1.6		
24	0.9									1,5	
25	.9									1.5	
26				2.5				1.6	1.6	1.5	
27			1.6				1.0				
28			1.55								
29		1.4							1.6		
30				2.6					1.6		1.4
31		1.35		2.5					1.5		1.4

NOTE.—Subsequent to September 3 gage heights refer to datum of gage installed on that date.

EAST ELK CREEK NEAR NEW CASTLE, COLO.

Location.—On line between secs. 24 and 25, T. 5 S., R. 91 W., at highway bridge 2½ miles northwest of New Castle. No tributaries below station.
Records available.—January 19, 1911, to December 31, 1913.
Drainage area.—60 square miles (measured on Forest atlas).
Gage.—Vertical staff.
Control.—Practically permanent during 1913.
Discharge measurements.—Made from bridge or by wading.
Winter flow.—Ice causes backwater at intervals during winter.
Diversions.—There are court decrees for the diversion of 44 second-feet from East Elk Creek above the station.
Accuracy.—Estimates good.

Discharge measurements of East Elk Creek near New Castle, Colo., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 3	R. H. Fletcher	1.28	28	Sept. 3	R. H. Fletcher	0.62	3.7
June 25	do	1.48	53	Oct. 20	Robert Follansbee	.90	9.5

Daily gage height, in feet, of East Elk Creek near New Castle, Colo., for 1913.

[J. M. James and R. K. Potter, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1						2.4	1.3	0.5				
2	1.7						1.3	.5		0.8	0.8	
3					1.3				0.6		.8	0.8
4				0.8		2.2			.6			
5	.8										.8	
6						2.0					.8	
7			0.75									
8	.8						.9		.6		.8	.8
9							.9					
10					1.85		.9				.8	
11												
12								.5			.8	
13			.8		1.95				.6	.9		
14						1.7	.8	.5				
15			1.0				.8	.5			.8	
16				1.1	1.5	2.1	.8		.5	.9		
17							.8				.8	
18						1.6				.9		
19			.9	1.25		1.6		.5	.5			
20					1.5	1.5		.5		.9	.8	
21												
22			.8	1.3		1.4		.5				
23				1.1	1.8			.5		.8		
24		0.8									.8	
25		.75				1.5					.8	
26					2.15				.8	.8	.8	
27				1.3				.5				
28				1.3								
29			.85							.8		
30					2.3					.8		2.0
31			.9		2.3					.8		2.0

NOTE.—Ice present during greater part of January, February, and December.

Daily discharge, in second-feet, of East Elk Creek near New Castle, Colo., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1						335	31	3				
2							31	3		7	7	
3					31				4		7	7
4				7		250			4			
5	7										7	
6						175					7	
7			6									
8	7						10		4		7	7
9							10					
10					132		10				7	
11												
12								3			7	
13			7		160				4	10		
14						95	7	3				
15			13				7	3			7	
16				17	55	210	7		3	10		
17							7				7	
18						73				10		
19			10	27		73		3	3			
20					55	55		3		10	7	
21												
22			7	31		42		3				
23				17	119			3		7		
24		7									7	
25		6				55					7	
26					230				7	7	7	
27				31				3				
28				31								
29			8							7		
30					290					7		
31			10		290					7		

NOTE.—Discharge determined from a rating curve well defined below 500 second-feet. No estimates for days on which gage was not read. Jan. 2 and Dec. 30 and 31 no estimates made on account of unknown effect of ice.

TAYLOR RIVER AT ALMONT, COLO.

Location.—In sec. 22, T. 51 N., R. 1 E., at highway bridge in Almont, 100 yards above the junction of Taylor and East rivers.

Records available.—July 27, 1910, to December 31, 1913.

Drainage area.—413 square miles (measured on Forest atlas).

Gage.—Vertical staff; read morning and evening.

Control.—Practically permanent.

Discharge measurements.—Made from highway bridge.

Winter flow.—Ice causes backwater; observations discontinued.

Diversions.—No court decrees for diversions from Taylor River.

Accuracy.—Because of the high altitude of the station (8,000 feet) it is probable that at certain seasons alternate melting and freezing cause diurnal fluctuation of stage, and the mean daily gage height based on two readings may be somewhat in error; estimates for such periods fair only.

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

Discharge measurements of Taylor River at Almont, Colo., for 1913.

[Made by E. H. Swett.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
July 12	2.35	407
September 10	2.00	235

Daily gage height, in feet, of Taylor River at Almont, Colo., for 1913.

[H. M. Haydon, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.4	2.05	1.95	1.8	2.25	3.1	2.6	1.4	1.7	2.0	2.0	2.0
2	2.4	2.1	1.95	1.85	2.25	3.15	2.52	1.4	1.7	2.0	2.0	2.0
3	2.4	2.1	1.95	2.1	2.25	3.1	2.5	1.4	1.8	2.0	2.0	2.1
4	2.4	2.1	1.95	1.9	2.25	3.05	2.5	1.3	1.8	2.0	2.0	2.1
5	2.4	2.1	1.95	1.8	2.25	3.02	2.48	1.3	1.8	2.0	2.0	2.1
6	2.35	2.1	1.95	1.95	2.6	3.0	2.48	1.2	1.85	2.0	2.0	2.1
7	2.35	2.1	1.95	1.9	2.7	3.0	2.42	1.2	1.85	2.0	2.0	2.1
8	2.35	2.1	1.75	1.75	2.75	3.0	2.42	1.25	1.9	2.0	2.0	2.1
9	2.3	2.2	1.75	1.85	2.5	3.05	2.42	1.2	1.9	2.0	2.0	2.1
10	2.3	2.2	1.8	1.8	2.75	3.35	2.45	1.2	1.9	2.0	2.0	2.15
11	2.3	2.2	1.8	1.8	2.85	3.45	2.4	1.2	2.0	2.0	2.0	2.15
12	2.3	2.2	1.8	1.9	2.85	3.35	2.38	1.2	2.0	2.0	2.0	2.15
13	2.3	2.2	1.8	1.9	2.95	3.25	2.32	1.3	2.0	2.0	1.95	2.15
14	2.3	2.2	1.8	1.95	2.9	3.0	2.28	1.4	2.0	2.0	1.95	2.15
15	2.3	2.2	1.6	2.0	2.7	2.95	2.22	1.4	2.0	2.0	2.0	2.15
16	2.3	2.2	1.6	2.1	2.75	2.92	2.12	1.5	2.0	2.0	2.0	2.2
17	2.3	2.2	1.6	2.0	2.85	2.98	2.05	1.5	2.0	2.0	2.0	2.2
18	2.3	2.2	1.6	2.15	2.75	3.0	1.95	1.5	2.0	2.0	2.0	2.2
19	2.25	2.08	1.6	2.2	2.7	2.98	1.78	1.55	1.9	2.0	2.0	2.2
20	2.1	2.0	1.6	2.1	2.6	3.0	1.6	1.6	1.9	2.0	2.0	2.2
21	2.1	2.0	1.6	2.1	2.62	3.0	1.5	1.6	2.0	2.0	2.0	2.2
22	2.1	2.0	1.6	2.1	2.72	3.0	1.45	1.55	2.0	2.0	2.0	2.2
23	2.1	2.0	1.6	2.0	2.72	2.98	1.4	1.5	2.0	2.0	2.0	2.2
24	2.1	2.0	1.7	2.05	2.85	2.95	1.5	1.5	2.0	2.0	2.0	2.2
25	2.1	2.0	1.75	2.05	3.05	2.8	1.6	1.5	2.0	2.0	2.0	2.2
26	2.1	2.0	1.75	2.0	3.3	2.8	1.55	1.55	2.0	2.0	2.0	2.2
27	2.05	1.98	1.75	2.1	3.45	2.75	1.55	1.6	2.0	2.0	2.0	2.2
28	2.05	1.95	1.7	2.2	3.55	2.75	1.5	1.6	2.0	2.0	2.0	2.2
29	2.05	.....	1.7	2.35	3.55	2.75	1.5	1.65	2.0	2.0	2.0	2.2
30	2.05	.....	1.8	2.35	3.45	2.62	1.5	1.7	2.0	2.0	2.0	2.2
31	2.05	.....	1.8	.....	3.4	.....	1.4	1.7	.....	2.0	.....	2.2

NOTE.—Ice present Jan. 1 to Mar. 7, and about Dec. 3-31.

Daily discharge, in second-feet, of Taylor River at Almont, Colo., for 1913.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	160	360	1,080	590	74	132	235	235
2	.....	178	360	1,140	534	74	132	235	235
3	.....	280	360	1,080	520	74	160	235	235
4	.....	195	360	1,020	520	61	160	235	235
5	.....	160	360	992	506	61	160	235	235
6	.....	215	590	970	506	50	178	235	235
7	.....	195	670	970	464	50	178	235	235
8	146	146	715	970	464	56	195	235	235
9	146	178	520	1,020	464	50	195	235	235
10	160	160	715	1,380	485	50	195	235	235
11	160	160	810	1,500	450	50	235	235	235
12	160	195	810	1,380	438	50	235	235	235
13	160	195	915	1,250	402	61	235	235	215
14	160	215	860	970	378	74	235	235	215
15	110	235	670	915	342	74	235	235	235
16	110	280	715	882	290	91	235	235	235
17	110	235	810	948	258	91	235	235	235
18	110	305	715	970	215	91	235	235	235
19	110	330	670	948	154	100	195	235	235
20	110	280	590	970	110	110	195	235	235
21	110	280	606	970	91	110	235	235	235
22	110	280	688	970	82	100	235	235	235
23	110	235	688	948	74	91	235	235	235
24	132	258	810	915	91	91	235	235	235
25	146	258	1,020	760	110	91	235	235	235
26	146	235	1,310	760	100	100	235	235	235
27	146	280	1,500	715	100	110	235	235	235
28	132	330	1,640	715	91	110	235	235	235
29	132	420	1,640	715	91	121	235	235	235
30	160	420	1,500	606	91	132	235	235	235
31	160	.....	1,440	.....	74	132	.....	235	.....

NOTE.—Discharge determined from a well-defined rating curve. Jan. 1 to Mar. 7 and Dec. 1-31 no estimate made on account of unknown effect of ice.

Monthly discharge of Taylor River at Almont, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
March 8-31	160	110	135	6,430
April	420	146	243	14,500
May	1,640	360	820	50,400
June	1,500	606	981	58,400
July	590	74	293	18,000
August	132	50	83.2	5,120
September	235	132	210	12,500
October	235	235	235	14,400
November	235	215	234	13,900
The period	.....	.....	.....	194,000

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, 1913.

Drainage area.—1,010 square miles [1] (measured on Hayden's atlas).

Gage.—Chain gage.

Control.—Shifting at long intervals.

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

Winter flow.—Ice causes backwater during winter.

Diversions.—There are court decrees for the diversion of 274 second-feet from Gunnison River between this station and the forks at Almont.

Accuracy.—Owing to slightly shifting channel during 1913, estimates only good.

Discharge measurements of Gunnison River near Gunnison, Colo., for 1913.

Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 11	Robert Follansbee	2.26	2,580
July 19	R. H. Fletcher	.90	873
Aug. 27	R. H. Fletcher	.45	446

Daily gage height, in feet, of Gunnison River near Gunnison, Colo., for 1913.

[Irene Chinery, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		1.75	2.3	1.4	0.55	0.40	0.50	0.30	0.20
2		1.5	2.3	1.35	.55	.30	.30	.30	.20
3		1.5	2.2	1.2	.45	.40	.40	.40	.25
4		1.3	2.05	1.05	.50	.40	.40	.30	.20
5		1.35	2.05	1.1	.50	.40	.40	.30	.25
6		1.7	2.0	1.05	.45	.40	.35	.20	.00
7		2.1	1.8	1.0	.40	.30	.30	.30	.30
8		2.1	1.75	1.0	.30	.40	.40	.30	.20
9		1.7	1.7	.90	.40	.45	.40	.30	.10
10		2.0	2.35	.95	.40	.50	.40	.30	.25
11		2.05	2.4	.90	.55	.50	.35	.20	.20
12		2.15	2.35	.90	.65	.30	.40	.30	.20
13		2.25	2.2	.90	.50	.40	.40	.20	.30
14		1.9	1.8	.80	.50	.40	.40	.30	.20
15		1.5	1.95	.90	.50	.40	.40	.30	.20
16		1.4	2.0	.90	.50	.50	.40	.10	.20
17		1.5	2.05	.90	.45	.30	.30	.20	.20
18		1.5	2.15	.90	.35	.40	.35	.30	.20
19		1.6	2.2	.80	.40	.40	.40	.30	.30
20		1.45	2.0	1.0	.40	.45	.40	.30	.20
21		1.35	1.9	1.1	.50	.30	.35	.10	.20
22		1.55	1.75	1.4	.50	.20	.40	.30	.20
23		1.6	1.8	1.2	.30	.35	.45	.30	.20
24		2.05	1.65	.90	.40	.40	.40	.20	.30
25		2.2	1.75	.90	.40	.40	.35	.25	.30
26		2.4	1.8	.85	.40	.40	.40	.20	.15
27	1.2	2.55	1.7	.80	.40	.30	.30	.30	.30
28	1.4	2.3	1.65	.70	.30	.45	.35	.20	.20
29	1.65	2.15	1.5	.55	.40	.40	.30	.30	.30
30	1.65	2.35	1.5	.60	.40	.40	.35	.20	.30
31		2.45		.60	.40		.40		.20

NOTE.—Ice present during the greater part of December.

[1] Formerly reported as 963 square miles.

Daily discharge, in second-feet, of Gunnison River near Gunnison, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	1,940	2,780	1,460	522	405	480	340
2	.....	1,600	2,780	1,400	522	340	340	340
3	.....	1,600	2,620	1,210	442	405	405	405
4	.....	1,340	2,380	1,030	480	405	405	340
5	.....	1,400	2,380	1,090	480	405	405	340
6	.....	1,870	2,310	1,030	442	405	372	285
7	.....	2,460	2,020	975	405	340	340	340
8	.....	2,460	1,940	975	340	405	405	340
9	.....	1,870	1,870	865	405	442	405	340
10	.....	2,310	2,860	920	405	480	405	340
11	.....	2,380	2,940	865	522	480	372	285
12	.....	2,540	2,860	865	612	340	405	340
13	.....	2,700	2,620	865	480	405	405	285
14	.....	2,160	2,020	760	480	405	405	340
15	.....	1,600	2,240	865	480	405	405	340
16	.....	1,460	2,310	865	480	480	405	240
17	.....	1,600	2,380	865	442	340	340	285
18	.....	1,600	2,540	865	372	405	372	340
19	.....	1,730	2,620	760	405	405	405	340
20	.....	1,530	2,310	975	405	442	405	340
21	.....	1,400	2,160	1,090	480	340	372	240
22	.....	1,660	1,940	1,460	480	285	405	340
23	.....	1,730	2,020	1,210	340	372	442	340
24	.....	2,380	1,800	865	405	405	405	285
25	.....	2,620	1,940	865	405	405	372	312
26	.....	2,940	2,020	812	405	405	405	285
27	1,210	3,180	1,870	760	405	340	340	340
28	1,460	2,780	1,800	660	340	442	372	285
29	1,800	2,540	1,600	522	405	405	340	340
30	1,800	2,860	1,600	565	405	405	372	285
31	.....	3,020	.....	565	405	.....	405	.....

NOTE.—Discharge determined from a well-defined rating curve. No estimate made for December on account of unknown effect of ice.

Monthly discharge of Gunnison River near Gunnison, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
May	3,180	1,340	2,110	130,000	B.
June	2,940	1,600	2,250	134,000	B.
July	1,460	522	932	57,300	B.
August	612	340	439	27,000	B.
September	480	285	398	23,700	B.
October	480	340	391	24,000	B.
November	405	240	320	19,000	B.
The period	.....	.....	.....	415,000	

EAST RIVER AT ALMONT, COLO.

Location.—At highway bridge at Almont, 200 feet above the junction of East and Taylor rivers.

Records available.—July 27, 1910, to December 31, 1913. From April 15 to October 8, 1905, a station was maintained at this point, the gage being referred to a different datum.

Drainage area.—295 square miles (measured on Forest atlas).

Gage.—Vertical staff; read twice daily.

Control.—Slightly shifting at intervals.

Discharge measurements.—Made from bridge.

Winter flow.—Ice causes backwater in varying amounts, but no measurements were made during winter.

Diversions.—There are court decrees for the diversion of 78 second-feet from East River above station.

Accuracy.—Owing to the high altitude of station (8,000 feet) it is probable that at certain seasons alternate melting and freezing cause diurnal fluctuation of stage; mean daily gage height based on morning and evening readings may be somewhat in error; estimates for such periods good only.

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

Discharge measurements of East River at Almont, Colo., for 1913.

[Made by E. H. Swett.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
July 12	1.75	380
Sept. 10	1.25	150

Daily gage height, in feet, of East River at Almont, Colo., for 1913.

[H. M. Hayden, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.3	1.0	0.9	0.85	2.20	3.00	2.00	0.60	0.7	1.2	1.0	1.0
2	1.3	.95	.9	.8	2.08	2.78	1.98	.60	.7	1.2	1.0	1.0
3	1.3	.95	.9	1.0	2.12	2.72	1.98	.60	.8	1.2	1.0	1.05
4	1.3	1.0	.9	1.12	2.10	2.70	1.98	.50	.8	1.2	1.0	1.05
5	1.3	1.0	.9	1.2	2.25	2.72	1.92	.50	.8	1.2	1.0	1.05
6	1.25	1.0	.9	1.3	2.45	2.68	1.95	.40	.8	1.2	1.0	1.05
7	1.25	1.0	.9	1.25	2.60	2.65	1.92	.40	.8	1.2	1.0	1.05
8	1.2	1.0	.82	1.2	2.50	2.78	1.92	.40	.9	1.2	1.0	1.05
9	1.2	1.1	.8	1.1	2.45	2.85	1.92	.40	1.0	1.2	1.0	1.05
10	1.15	1.1	.8	1.1	2.58	2.92	1.88	.40	1.1	1.2	1.0	1.15
11	1.15	1.1	.8	1.15	2.72	2.95	1.88	.40	1.2	1.2	1.0	1.15
12	1.1	1.1	.8	1.25	2.82	2.80	1.88	.40	1.2	1.2	1.0	1.2
13	1.1	1.1	.8	1.9	2.85	2.72	1.82	.30	1.2	1.2	1.0	1.2
14	1.1	1.1	.8	2.0	2.85	2.70	1.70	.35	1.15	1.2	1.0	1.2
15	1.1	1.1	.7	1.95	2.40	2.72	1.55	.40	1.2	1.2	1.0	1.2
16	1.1	1.1	.7	2.1	2.50	2.68	1.45	.40	1.2	1.2	1.0	1.3
17	1.1	1.1	.7	2.0	2.45	2.62	1.25	.40	1.2	1.2	1.0	1.3
18	1.1	1.1	.7	2.05	2.75	2.68	1.05	.40	1.2	1.2	1.0	1.3
19	1.1	.95	.7	2.1	2.72	2.62	.90	.40	1.1	1.2	1.0	1.3
20	1.0	.8	.7	2.15	2.75	2.58	.90	.40	1.1	1.2	1.0	1.3
21	1.0	.8	.7	2.12	2.65	2.50	.90	.50	1.1	1.2	1.0	1.3
22	1.0	.8	.7	2.05	2.60	2.50	.85	.50	1.1	1.2	1.0	1.3
23	1.0	.8	.7	2.08	2.72	2.42	.80	.40	1.1	1.2	1.0	1.3
24	1.0	.8	.82	2.00	2.80	2.35	.90	.40	1.1	1.2	1.0	1.3
25	1.0	.8	.85	2.08	2.92	2.32	.85	.40	1.1	1.2	1.0	1.3
26	1.0	.8	.85	2.08	2.92	2.20	.85	.50	1.05	1.2	1.0	1.3
27	1.0	.85	.85	2.05	2.85	2.10	.85	.50	1.1	1.2	1.0	1.3
28	1.0	.9	.82	2.05	2.80	2.10	.80	.50	1.1	1.2	1.0	1.3
29	1.0	.....	.8	2.08	2.88	2.00	.75	.55	1.1	1.1	1.0	1.3
30	1.0	.....	.8	2.20	2.92	2.00	.70	.60	1.12	1.0	1.0	1.3
31	1.0	.....	.85	.....	2.82	.....	.65	.70	.....	1.0	.....	1.2

NOTE.—Ice present Jan. 1 to about Mar. 7, and about Dec. 3–31.

Daily discharge, in second-feet, of East River at Almont, Colo., for 1913.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	62	710	1,520	550	32	45	140	90
2	.....	55	614	1,280	534	32	45	140	90
3	.....	90	646	1,220	534	32	55	140	90
4	.....	120	630	1,200	534	26	55	140	90
5	.....	140	755	1,220	486	26	55	140	90
6	.....	170	950	1,180	510	22	55	140	90
7	.....	155	1,100	1,150	486	22	55	140	90
8	58	140	1,000	1,280	486	22	70	140	90
9	55	115	950	1,360	486	22	90	140	90
10	55	115	1,080	1,430	456	22	115	140	90
11	55	128	1,220	1,460	456	22	140	140	90
12	55	155	1,320	1,300	456	22	140	140	90
13	55	470	1,360	1,220	414	19	140	140	90
14	55	550	1,360	1,200	340	20	128	140	90
15	45	510	900	1,220	268	22	140	140	90
16	45	630	1,000	1,180	225	22	140	140	90
17	45	550	950	1,120	155	22	140	140	90
18	45	590	1,250	1,180	102	22	140	140	90
19	45	630	1,220	1,120	70	22	115	140	90
20	45	670	1,250	1,080	70	22	115	140	90
21	45	646	1,150	1,000	70	26	115	140	90
22	45	590	1,100	1,000	62	26	115	140	90
23	45	614	1,220	920	55	22	115	140	90
24	58	550	1,300	850	70	22	115	140	90
25	62	614	1,430	820	62	22	115	140	90
26	62	614	1,430	710	62	26	102	140	90
27	62	590	1,360	630	62	26	115	140	90
28	58	590	1,300	630	55	26	115	140	90
29	55	614	1,390	550	50	29	115	115	90
30	55	710	1,430	550	45	32	120	90	90
31	62	.....	1,320	.....	36	45	.....	90	.....

NOTE.—Discharge determined from a fairly well defined rating curve. No estimates made Jan. 1 to Mar. 7 or Dec. 1-31, on account of unknown effect of ice.

Monthly discharge of East River at Almont, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
March 8-31	62	45	52.1	2,480
April	710	55	406	24,200
May	1,430	614	1,120	68,900
June	1,520	550	1,090	64,900
July	550	36	266	16,400
August	45	19	25.0	1,540
September	140	45	104	6,190
October	140	90	136	8,360
November	90	90	90.0	5,360
The period	.....	.....	.....	198,000

CEMENT CREEK NEAR CRESTED BUTTE, COLO.

Location.—In sec. 22, T. 14 S., R. 85 W., at Ahren's ranch, about 7 miles southeast of Crested Butte. No tributaries below station.

Records available.—November 23, 1910, to November 29, 1913.

Drainage area.—32 square miles (measured on Forest atlas).

Gage.—Vertical staff; read once daily.

Channel.—Practically permanent during 1913.

Discharge measurements.—Made by wading, except during high water, when a footbridge is used.

Winter flow.—Ice causes little or no backwater at station, owing to hot springs above.

Diversions.—There are court decrees for the diversion of 8.5 second-feet from Cement Creek.

Accuracy.—Owing to the high altitude of the station (8,700 feet) it is probable that at certain seasons alternate melting and freezing cause diurnal fluctuations of stage; mean daily gage height based on one reading may be considerably in error; estimate only fair.

Discharge measurements of Cement Creek near Crested Butte, Colo., for 1913.

Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 10	Robert Follansbee	1.00	77
July 18	R. H. Fletcher	.75	34

Daily gage height, in feet, of Cement Creek near Crested Butte, Colo., for 1913.

[P. L. Snodgrass, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1					0.67	0.95	1.0		0.6		
2	0.38					.6		0.78	.65	0.62	0.4
3	.38				.72	1.0	1.0				
4					.72	1.4		.60		.6	.45
5	.33				.72	1.3	1.0	.65	.62		
6	.33				.75			.6		.5	.45
7					.82	1.2	.9	.65	.55		
8					.77	1.3	1.0			.55	.4
9	.33	0.28			.87	1.2	.8		.5		
10		.28			1.00			.65		.55	.4
11	.38						.8	.65		.5	
12	.33				1.30	1.2	.85		.62	.5	.35
13		.28			1.10	1.2		.75			
14	.28	.28				1.2			.6	.5	.4
15		.28			1.10	1.3					.35
16	.28				1.15	1.3			.5	.45	.35
17					1.10	1.3			.55		
18	.33					1.3	.75		.5	.5	.4
19					1.20	1.3		.5			
20					1.10	1.2	.9	.6	.5	.45	.35
21					1.10	1.3	.8				.35
22					1.20					.5	.35
23					1.10	1.2	1.0		.5		.35
24					1.30	1.2					
25					1.20	1.3			.5	.45	
26					1.20						.3
27				0.59		1.2	.7	.6	.5	.4	.35
28				.59	1.30	1.2	.73	.65	.5		.3
29				.59	1.50					.45	.3
30				.57	1.30		.75	.75	.5		
31					1.30					.4	

Daily discharge, in second-feet, of Cement Creek near Crested Butte, Colo., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	.....	.....	.....	29	67	76	39	23	22	11
2	10	.....	.....	.....	31	23	76	40	27	25	11
3	10	.....	.....	.....	33	76	76	32	26	24	12
4	.....	.....	.....	.....	33	165	76	23	25	23	14
5	8	.....	.....	.....	33	140	76	27	25	20	14
6	8	.....	.....	.....	36	129	67	23	22	16	14
7	.....	.....	.....	.....	45	118	58	27	20	18	12
8	.....	.....	.....	.....	39	140	86	27	18	20	11
9	8	6	.....	.....	53	118	42	27	16	20	11
10	.....	6	.....	.....	76	118	42	27	18	20	11
11	10	.....	.....	.....	108	118	42	27	22	16	10
12	8	.....	.....	.....	140	118	50	32	25	16	9
13	.....	6	.....	.....	96	118	48	36	24	16	10
14	6	6	.....	.....	96	118	46	34	23	16	11
15	.....	6	.....	.....	96	140	44	26	20	15	9
16	6	.....	.....	.....	107	140	42	24	16	14	9
17	.....	.....	.....	.....	96	140	39	22	20	15	10
18	8	.....	.....	.....	107	140	36	19	16	16	11
19	.....	.....	.....	.....	118	140	47	16	16	15	10
20	.....	.....	.....	.....	96	118	58	23	16	14	9
21	.....	.....	.....	.....	96	140	42	23	16	15	9
22	.....	.....	.....	.....	118	129	59	23	16	16	9
23	.....	.....	.....	.....	96	118	76	23	16	15	9
24	.....	.....	.....	.....	140	118	65	23	16	14	9
25	.....	.....	.....	.....	118	140	54	23	16	14	8
26	.....	.....	.....	.....	118	129	43	23	16	12	7
27	.....	.....	.....	22	129	118	31	23	16	11	9
28	.....	.....	.....	22	140	118	34	27	16	12	7
29	.....	.....	.....	22	190	104	35	32	16	14	7
30	.....	.....	.....	21	140	90	36	36	16	12	7
31	.....	.....	.....	.....	140	.....	38	30	.....	11	.....

NOTE.—Discharge determined from a rating curve well defined between 18 and 100 second-feet and estimated from May to November for days when gage was not read. During February and March observer's notes indicate that discharge averaged between 6 and 10 second-feet.

Monthly discharge of Cement Creek near Crested Butte, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	[a] 8.0	492	D.
February	.....	.....	[a] 6.0	333	D.
May	190	29	93.3	5,740	D.
June	165	23	120	7,140	D.
July	86	31	52.9	3,250	C.
August	40	16	27.0	1,660	C.
September	27	16	19.3	1,150	C.
October	25	11	16.0	984	C.
November	14	7	10.0	595	C.

[a] Estimated.

QUARTZ CREEK NEAR PITKIN, COLO.

Location.—In sec. 8, T. 50 N., R. 4 E., on highway bridge 1 mile southwest of Pitkin, Colo. Nearest tributay enters 2 miles below station.

Records available.—December 12, 1910, to December 16, 1913.

Drainage area.—53 squre miles (measured on Forest atlas).

Gage.—Vertical staff; read once daily.

Control.—Somewhat shifting.

Discharge measurements.—Made by wading.

Winter flow.—Ice causes but little backwater at station.

Diversions.—None above station. There are court decrees for the diversion of 30 second-feet below the station.

Accuracy.—Because of the high altitude of the station (9,100 feet) it is possible that at certain seasons alternate melting and freezing cause diurnal fluctuation of stage, and the mean daily stage as determined from one reading may be considerably in error. For this reason and the fact that the base data are limited, estimates are only fair.

Discharge measurements of Quartz Creek near Pitkin, Colo., for 1913.

Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 8	Robert Follansbee	1.08	66
July 17	R. H. Fletcher	.97	52

Daily gage height, in feet, of Quartz Creek near Pitkin, Colo., for 1913.

[J. L. Glendenning, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1				1.25		0.93			
2					1.1				
3					1.08				
4				1.1				0.85	
5						.95	0.84	.78	
6			1.35						
7								.8	
8		1.08			1.0		.85		0.8
9			1.45			.95			
10			1.5						.8
11					1.0	.93			
12		1.35							
13							.9	.80	
14			1.6						
15		1.1						.76	
16	0.88		1.55						.76
17				.97			.92		
18		1.35		1.0					
19	.82								
20						.9		.79	
21		1.1	1.45			.9			
22					1.0			.77	
23	.68						.93		
24				1.3					
25			1.35	1.25			.85	.85	
26			1.3						
27		1.5		1.17					
28					1.0	.92	.89		
29		1.8						.75	
30			1.25					.8	
31							.87		

NOTE.—Slight effect from ice Dec. 8–10.

Daily discharge, in second-feet, of Quartz Creek near Pitkin, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1				90		49			
2					67				
3					65				
4				67				42	
5						50	41	37	
6			110						
7								38	
8		65			55		42		36
9			136			50			
10			149						36
11					55	49			
12		110							
13							46	38	
14			183						
15		67						35	
16	44		166						35
17				52			48		
18		110		55					
19	40								
20						46		37	
21		67	136			46			
22					55			36	
23	30						49		
24				99					
25			110	90			42	42	
26			99						
27		149		77					
28					55	48	45		
29		267						34	
30			90					38	
31							44		

NOTE.—For days when the gage was read discharge was determined from a rating curve not well defined. Discharge Dec. 8 and 10 estimated on account of ice. No estimates for days on which gage was not read.

SAPINERO CREEK[1] AT SAPINERO, COLO.

Location.—In sec. 28, T. 49 N., R. 4 W., at highway bridge one-half mile northeast, of Sapinero. No tributaries below station.

Records available.—March 17, 1911, to December 15, 1913.

Drainage area.—84 square miles (measured on Forest atlas).

Gage.—Chain gage installed July 22, 1913, 250 feet upstream from vertical staff, and referred to a different datum; read once daily. Beginning July 22 all gage heights refer to chain gage.

Control.—Shifting after high water at original section; not determined for new section because of insufficient data.

Discharge measurements.—Made from bridge or by wading.

Winter flow.—Ice causes backwater; observations discontinued.

Diversions.—Sufficient water to irrigate approximately 300 acres is diverted above station.

Accuracy.—Because of high altitude of station (7,250 feet) it is probable that at certain seasons alternate melting and freezing cause diurnal fluctuations of stage; mean daily gage height based on one reading may be considerably in error; daily estimates only fair.

[1] Known locally as Soap Creek.

Discharge measurements of Sapinero Creek at Sapinero, Colo., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 15	Robert Follansbee...	[a] 1.57	199	Aug. 29	R. H. Fletcher.....	3.03	9.4
July 22	R. H. Fletcher.....	3.24	25	Oct. 24	Robert Follansbee...	3.08	15

[a] Refers to datum of staff gage.

Daily gage height, in feet, of Sapinero Creek at Sapinero, Colo., for 1913.

[C. W. Taft, observer.]

Day.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1							
2							3.1
3						3.15	
4							3.1
5		0.7			3.1		
6					3.0	3.1	
7		.7	3.1	3.1			
8				3.1			3.2
9					3.1		3.2
10	1.4						
11	1.4						3.25
12		.5	3.15				
13						3.2	
14							
15							3.25
16	1.2					3.1	
17	1.3						
18			3.0	3.1			
19	1.2		3.0	3.1		3.1	
20	1.1		3.05	3.0			
21	1.2						
22	1.1	3.25		3.1			
23	1.1	3.25	3.05				
24				3.1			
25	1.0			3.2		3.1	
26							
27	1.0	3.15		3.1		3.1	
28							
29				3.2			
30					3.1		
31							

NOTE.—Beginning July 22 gage heights refer to gage 250 feet upstream from original location. Ice present Dec. 8–31.

Daily discharge, in second-feet, of Sapinero Creek at Sapinero, Colo., for 1913.

Day.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1							
2							16
3						20	
4							16
5		45			16		
6					8	16	
7		45	16	16			
8				16			
9					16		
10	164						
11	164						
12		30	20				
13						24	
14							
15							
16	126					16	
17	144						
18			8	16			
19	126		8	16		16	
20	108			8			
21	126						
22	108	30		16			
23	108	30	12				
24				16			
25	90			24		16	
26							
27	90	20		16		16	
28							
29				24			
30					16		
31							

NOTE.—Discharge determined as follows: Prior to July 21 from a rating curve not well defined; after that date from a fairly well defined rating curve. No estimates for days when gage was not read. Dec. 8, 9, 11 and 15 no estimate made on account of unknown ice effect.

UNCOMPAHGRE RIVER AT OURAY, COLO.

Location.—In sec. 31, T. 44 N., R. 7 W., near highway bridge one-half mile south of Ouray. Nearest tributary, Canyon Creek, which enters 150 feet below; nearest tributary above is Bear Creek.

Record available.—January 25, 1911, to December 31, 1913. 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 furnished through the courtesy of Wheeler & Whinnerah.

Drainage area.—44 square miles (measured on topographic sheet).

Gage.—Vertical staff.

Control.—Shifting.

Discharge measurements.—High-water measurements made from bridge across the Uncompahgre below Canyon Creek and flow of latter subtracted. Low-water measurements made by wading near the gage.

Winter flow.—Discharge relation little if at all affected by ice, as channel is kept open by warm springs.

Diversions.—The Ouray Light & Power Co. diverts approximately 8 second-feet of water 2 miles above station and returns it to the river a short distance below. No other diversions above station.

Accuracy.—Owing to the high altitude of the station (7,900 feet) alternate melting and freezing cause diurnal fluctuation of stage at certain seasons, and the mean daily stage as determined from the mean of one reading at 8 a. m. and the maximum stage for the 24-hour period may be considerably in error. For this reason and the fact that the channel shifts, the estimates are only fair.

Discharge measurements of Uncompahgre River at Ouray, Colo., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 12	Robert Follansbee...	2.25	253	Sept. 1	R. H. Fletcher.....	.68	22
July 20	R. H. Fletcher.....	1.00	56	Oct. 22	Robert Follansbee...	.56	17
Aug. 31	.....do.....	.78	26				

Daily gage height, in feet, of Uncompahgre River at Ouray, Colo., for 1913.

[T. J. Watkins, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	−0.25	.....	0.4	.....	2.8	1.65	0.7	0.75	0.65	0.4	0.3
2	.....	−.25	.....	.4	1.1	2.85	1.65	.65	.72	.65	.35	.25
3	−0.2	−.3	.....	.3	1.1	2.8	1.65	.65	.7	.75	.4	.3
4	−.15	−.3	.....	.2	1.3	2.6	1.55	.65	.7	.75	.4	.35
5	−.15	−.3	.....	.3	1.4	2.55	1.55	.62	1.12	.75	.35	.1
6	−.3	−.3	−0.2	.3	1.5	2.35	1.55	.62	1.15	.7	.35	.1
7	−.3	−.3	−.2	.3	1.7	2.25	1.45	.62	1.15	.7	.3	.1
8	−.3	−.3	−.2	.3	1.7	2.25	1.35	.6	1.15	.7	.3	.1
9	−.3	−.3	−.2	.2	1.8	2.1	1.35	.58	1.7	.7	.3	.0
10	−.2	−.3	−.2	.2	1.8	2.0	1.3	.58	1.3	.9	.25	.0
11	−.2	−.3	−.2	.1	1.8	1.9	1.2	.68	1.12	.75	.3	.0
12	−.2	−.25	−.2	.1	2.6	2.05	1.2	.68	1.02	.75	.3	.0
13	−.2	−.25	−.2	.4	2.55	1.9	1.2	.6	1.02	.6	.3	.0
14	.....	−.25	−.2	.6	2.2	1.8	1.2	.55	.85	.6	.2	.1
15	.....	−.25	−.2	.8	1.85	1.85	1.15	.55	.7	.6	.1	.15
16	−.35	−.25	−.1	1.0	2.0	2.25	1.4	.55	.65	.6	.1	.2
17	−.35	−.25	−.1	1.1	2.25	2.4	1.3	.55	.65	.6	.2	.1
18	−.3	−.25	−.15	1.0	2.4	2.5	1.2	.55	.65	.9	.25	.1
19	−.3	−.25	−.15	1.1	2.5	2.25	1.2	.55	.6	.9	.25	.1
20	−.3	−.25	−.15	1.1	2.25	2.2	.....	.55	.6	.85	.3	.0
21	−.3	−.25	−.15	1.2	2.0	2.15	.....	.55	.6	.6	.25	.0
22	−.3	−.25	−.2	1.2	2.05	2.05	1.2	.55	.65	.55	.2	.1
23	−.3	.....	−.2	.....	2.5	2.05	1.2	.65	.65	.55	.0	.2
24	−.3	.....	−.15	.....	2.7	1.98	1.15	.9	.65	.5	.2	.2
25	−.3	.....	−.2	.....	2.8	1.98	1.05	.75	.6	.5	.2	.3
26	−.25	.....	−.3	.....	2.9	1.95	.95	.55	.65	.5	.2	.3
27	−.25	.....	−.3	.....	3.2	1.95	.9	.55	.65	.5	.25	.3
28	−.2	.....	−.3	.....	2.85	1.95	.8	.65	.65	.5	.2	.3
29	−.2	.....	−.3	.....	2.9	1.85	.8	.65	.65	.45	.1	.35
30	−.25	.....	−.2	.....	2.8	1.75	.7	.95	.65	.4	.2	.4
31	−.25	.....	+.15	.....	2.75	.....	.7	.9	.....	.4	.....	.4

NOTE.—Pipe line of electric light company closed Oct. 18–20.

Daily discharge, in second-feet, of Uncompahgre River at Ouray, Colo., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.0	2.5	3.0	16	50	350	120	30	24	20	12	9
2	3.0	2.5	3.0	16	50	365	120	26	23	20	10	8
3	3.0	2.0	3.0	13	50	350	120	26	22	24	12	9
4	3.5	2.0	3.0	10	66	285	108	26	22	24	12	8
5	3.5	2.0	3.0	13	76	272	108	24	51	24	10	4.5
6	2.0	2.0	3.0	13	86	216	108	24	54	22	10	4.5
7	2.0	2.0	3.0	13	110	206	97	24	54	22	9	4.5
8	2.0	2.0	3.0	13	110	206	86	22	54	22	9	4.5
9	2.0	2.0	3.0	10	124	178	86	20	115	22	9	3.0
10	3.0	2.0	3.0	10	124	161	81	20	74	32	8	3.0
11	3.0	2.0	3.0	8	124	145	72	26	51	24	9	3.0
12	3.0	2.5	3.0	8	275	169	72	26	42	24	9	3.0
13	3.0	2.5	3.0	16	262	145	72	22	42	18	9	3.0
14	2.0	2.5	3.0	25	189	130	72	18	30	18	6	4.5
15	2.0	2.5	3.0	37	131	137	68	18	22	18	4.5	4.0
16	1.5	2.5	4.5	53	155	211	91	18	20	18	4.5	6
17	1.5	2.5	4.5	62	199	243	81	18	20	18	6	4.5
18	2.0	2.5	3.5	53	230	270	72	18	20	32	8	4.5
19	2.0	2.5	3.5	62	250	211	72	18	18	32	8	4.5
20	2.0	2.5	3.5	62	199	202	56	18	18	30	9	3.0
21	2.0	2.5	3.5	70	154	192	64	18	18	18	8	3.0
22	2.0	2.5	3.0	70	162	174	72	18	20	16	6	4.5
23	2.0	2.5	3.0	68	250	174	72	23	20	16	3	6
24	2.0	2.5	3.5	66	305	163	68	37	20	15	6	6
25	2.0	2.5	3.0	63	335	163	60	25	18	15	6	9
26	2.5	2.5	2.0	61	370	157	53	17	20	15	6	9
27	2.5	2.5	2.0	59	492	157	49	17	20	15	8	9
28	3.0	2.5	2.0	57	350	157	42	22	20	15	6	9
29	3.0	.....	2.0	55	370	142	42	22	20	14	4.5	10
30	2.5	.....	3.0	52	335	127	32	38	20	12	6	12
31	2.5	.....	9.0	.....	319	.....	32	31	.....	12	.....	12

NOTE.—Discharge determined by the indirect method for shifting channels; discharge interpolated for days for which gage heights are missing.

Monthly discharge of Uncompahgre River at Ouray, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	3.5	1.5	2.42	149	C.
February	2.5	2.0	2.34	130	C.
March	9.0	2.0	3.24	199	C.
April	70	8.0	37.8	2,250	C.
May	492	50	203	12,500	C.
June	365	127	202	12,000	C.
July	120	32	75.7	4,650	C.
August	38	17	22.9	1,410	C.
September	115	18	32.4	1,930	C.
October	32	12	20.2	1,240	C.
November	12	3.0	7.78	463	C.
December	12	3.0	6.05	372	C.
The year	492	1.5	51.5	37,300	

UNCOMPAHGRE RIVER BELOW OURAY, COLO.

Location.—At lowest bridge in Ouray, one-third mile below railroad station. Below all tributaries in Ouray.

Records available.—May 12 to December 31, 1913.

Drainage area.—76 square miles (measured on topographic sheets).

Gage.—Vertical staff; read once daily.

Control.—Practically permanent during 1913.

Discharge measurements.—Made from bridge or by wading.

Winter flow.—Ice causes little if any backwater; warm springs keep river open.

Diversions.—All diversions returned to river above station except one of 5.2 second-feet from Oak Creek.

Accuracy.—Owing to the high altitude of station (7,700 feet) alternate melting and freezing cause diurnal fluctuation of stage at certain seasons; mean daily gage height based on the mean of one reading at 8 a. m. and the maximum stage for the 24-hour period, may be somewhat in error; estimates only fair, except during low water when they are considered good.

Discharge measurements of Uncompahgre River below Ouray, Colo., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 12	Robert Follansbee...	3.50	518	Sept. 1	R. H. Fletcher.....	2.35	86
July 20	R. H. Fletcher.....	2.75	166	Oct. 22	Robert Follansbee....	2.10	58
Aug. 31	.....do.....	2.43	109				

Daily gage height, in feet, of Uncompahgre River below Ouray, Colo., for 1913.

[T. J. Watkins, observer.]

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	4.05	3.40	2.38	2.58	2.18	1.90	1.80
2	.....	4.00	3.40	2.32	2.42	2.18	1.90	1.55
3	.....	3.95	3.35	2.32	2.35	2.20	1.90	1.78
4	.....	3.90	3.25	2.28	2.38	2.20	1.90	1.81
5	.....	3.90	3.25	2.28	2.90	2.20	1.80	1.75
6	.....	3.80	3.25	2.28	2.85	2.18	1.80	1.79
7	.....	3.70	3.15	2.30	2.80	2.18	1.78	1.79
8	.....	3.60	3.00	2.28	2.85	2.18	1.78	1.78
9	.....	3.55	3.00	2.28	3.10	2.18	1.80	1.75
10	.....	3.35	3.00	2.28	2.85	2.25	1.78	1.75
11	.....	3.30	2.94	2.32	2.70	2.20	1.80	1.75
12	3.88	3.50	2.94	2.32	2.62	2.20	1.85	1.75
13	3.75	3.30	2.92	2.32	2.55	2.15	1.85	1.74
14	3.42	3.15	2.92	2.32	2.45	2.12	1.80	1.76
15	2.94	3.35	2.83	2.3	2.25	2.10	1.78	1.79
16	3.17	3.65	3.15	2.25	2.22	2.10	1.75	1.81
17	3.50	3.75	3.10	2.25	2.22	2.05	1.80	1.78
18	4.28	4.00	3.00	2.22	2.22	2.05	1.85	1.70
19	3.75	3.85	3.10	2.22	2.22	2.05	1.85	1.70
20	3.40	3.75	.....	2.25	2.18	2.00	1.80	1.65
21	3.20	3.60	.....	2.28	2.12	1.90	1.70	1.65
22	3.25	3.40	3.05	2.28	2.22	1.90	1.60	1.68
23	3.50	3.40	3.10	2.28	2.18	1.98	1.65	1.70
24	3.90	3.55	2.90	2.70	2.18	1.98	1.75	1.70
25	4.00	3.55	2.85	2.40	2.12	2.00	1.75	1.73
26	4.10	3.60	2.75	2.30	2.18	1.98	1.68	1.73
27	4.30	3.60	2.75	2.30	2.18	1.95	1.75	1.73
28	4.00	3.60	2.68	2.30	2.18	1.98	1.70	1.73
29	4.05	3.50	2.60	2.30	2.18	1.95	1.72	1.73
30	4.00	3.45	2.55	2.68	2.18	1.90	1.75	1.76
31	4.00	.....	2.45	2.70	.....	1.91	.....	1.76

Daily discharge, in second-feet, of Uncompahgre River below Ouray, Colo., for 1913.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	845	435	92	128	67	42	34
2	.....	810	435	84	98	67	42	17
3	.....	778	408	84	88	69	42	33
4	.....	745	355	79	92	69	42	35
5	.....	745	355	79	210	69	34	30
6	.....	680	355	79	195	67	34	33
7	.....	615	308	81	180	67	33	33
8	.....	555	245	79	195	67	33	33
9	.....	525	245	79	285	67	34	30
10	.....	408	245	79	195	75	33	30
11	.....	380	224	84	155	69	34	30
12	732	495	224	84	137	69	38	30
13	648	380	217	84	122	64	38	30
14	447	308	217	84	104	61	34	31
15	224	408	189	81	75	59	33	33
16	316	585	308	75	71	59	30	35
17	495	648	285	75	71	54	34	33
18	1,010	810	245	71	71	54	38	27
19	648	712	285	71	71	54	38	27
20	435	648	275	75	67	50	34	24
21	330	555	275	79	61	42	27	24
22	355	435	265	79	71	42	20	26
23	495	435	285	79	67	48	24	27
24	745	525	210	155	67	48	30	27
25	810	525	195	95	61	50	30	29
26	880	555	168	81	67	48	26	29
27	1,020	555	168	81	67	46	30	29
28	810	555	150	81	67	48	27	29
29	845	495	132	81	67	46	28	29
30	810	465	122	150	67	42	30	31
31	810	.....	104	155	.....	43	.....	31

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

Monthly discharge of Uncompahgre River below Ouray, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
May 12–31	1,020	224	643	25,500	C.
June	845	308	573	34,100	C.
July	435	104	256	15,700	C.
August	155	71	87.6	5,390	B.
September	285	61	109	6,490	B.
October	75	42	57.4	3,530	B.
November	42	20	33.1	1,970	B.
December	35	17	29.6	1,820	B.
The period	.....	.....	.....	94,500	

UNCOMPAHGRE RIVER AT MONTROSE, COLO.

Location.—At highway bridge one-fourth mile west of Montrose. Nearest tributary of importance, Happy Canyon Creek, enters about 2 miles below.

Records available.—April 22, 1903, to December 16, 1913.

Drainage area.—565 square miles.

Gage.—Vertical staff.

Control.—Fairly permanent during 1913.

Discharge measurements.—Made from bridge.

Winter flow.—Although ice forms along the banks during winter, river is not frozen over. Observations, however, are discontinued.

Diversions.—Uncompahgre River is so overappropriated that the United States Reclamation Service has constructed a tunnel and canal to divert 1,300 second-feet from Gunnison River into the Uncompahgre above Uncompahgre.

Accuracy.—Conditions favorable for accurate results.

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

Discharge measurements of Uncompahgre River at Montrose, Colo., for 1913.

[Made by E. H. Swett.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Apr. 29	2.69	60	July 10	3.22	165
May 5	3.18	145	July 30	2.45	28
May 27	4.28	586	Aug. 16	2.77	68
June 4	3.29	168	Oct. 23	2.10	7.6
June 21	3.70	310			

Daily gage height, in feet, of Uncompahgre River at Montrose, Colo., for 1913.

[Alfred Reeves, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	2.45	3.75	2.38	2.82	2.45	3.20	2.42	2.85
2	.....	2.60	3.85	3.22	2.78	2.55	3.02	2.60	2.79
3	.....	2.40	3.60	3.42	2.92	2.35	3.09	2.52	2.80
4	.....	3.35	3.64	3.35	2.75	2.65	3.18	2.65	2.76
5	.....	2.65	3.55	3.25	2.60	2.60	3.15	2.75	2.88
6	.....	2.35	3.42	3.80	2.45	2.40	3.05	2.85	2.88
7	.....	2.40	3.62	3.32	2.55	2.50	3.08	3.00	2.78
8	.....	2.70	3.32	3.22	2.52	2.65	2.85	3.15	2.78
9	.....	2.65	3.48	3.08	2.45	2.80	2.60	3.40	2.68
10	.....	3.05	3.40	3.08	2.85	2.88	2.50	3.45	2.75
11	.....	3.12	3.20	3.08	2.65	2.90	2.15	3.38	2.90
12	.....	2.55	3.28	2.50	3.00	3.05	2.05	3.50	2.71
13	.....	3.00	3.12	2.49	2.60	3.10	2.22	3.55	2.69
14	.....	2.88	3.05	2.56	2.70	3.10	2.25	3.48	2.64
15	.....	3.20	3.47	2.68	2.52	3.20	2.15	3.65	2.55
16	.....	3.15	3.25	2.72	2.48	3.05	2.05	2.80	2.62
17	.....	3.25	3.14	3.16	2.35	2.80	2.10	3.05	.....
18	.....	3.40	3.85	3.92	2.30	2.60	2.10	3.05	.....
19	.....	3.00	3.68	3.88	1.70	2.52	2.10	3.00	.....
20	3.70	2.70	3.55	3.48	1.50	2.50	2.25	2.95	.....
21	3.60	3.20	3.51	3.05	1.80	3.38	2.18	2.92	.....
22	3.38	3.40	3.82	3.45	1.95	3.35	2.30	2.88	.....
23	2.50	3.80	3.32	3.48	2.08	3.28	2.25	2.90	.....
24	2.35	3.68	3.56	3.30	2.55	3.10	2.08	2.89	.....
25	2.40	3.35	3.50	3.48	2.50	3.04	2.22	2.90	.....
26	2.12	3.55	3.60	3.55	2.50	3.05	2.22	2.88	.....
27	2.05	4.10	3.44	3.40	2.58	3.02	2.28	2.90	.....
28	2.55	3.15	3.55	3.25	2.65	3.00	2.32	3.00	.....
29	2.45	3.32	4.18	2.40	2.65	3.12	2.20	2.92	.....
30	3.25	3.40	3.08	2.35	2.60	3.25	2.18	2.80	.....
31	.....	3.60	.....	2.15	2.68	.....	2.25	.....	.....

Daily discharge, in second-feet, of Uncompahgre River at Montrose, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	31	328	26	74	31	148	29	79
2	.....	45	372	153	68	40	109	45	70
3	.....	27	267	207	91	24	123	37	71
4	.....	187	283	187	64	51	143	51	65
5	.....	51	250	160	45	45	136	64	84
6	.....	24	207	349	31	27	115	79	84
7	.....	27	275	179	40	35	121	105	68
8	.....	57	179	153	37	51	79	136	68
9	.....	51	226	121	31	71	45	201	55
10	.....	115	201	121	79	84	35	216	64
11	.....	130	148	121	51	87	12	195	87
12	.....	40	168	35	105	115	7	232	58
13	.....	105	130	34	45	125	15	250	56
14	.....	84	115	41	57	125	17	226	50
15	.....	148	223	55	37	148	12	286	40
16	.....	136	160	60	33	115	7	71	47
17	.....	160	134	139	24	71	9	115	.....
18	.....	201	372	405	20	45	9	115	.....
19	.....	105	298	386	1	37	9	105	.....
20	306	57	250	226	.....	35	17	96	.....
21	267	148	236	115	2	195	13	91	.....
22	195	201	358	216	4	187	20	84	.....
23	35	349	179	226	8	168	17	87	.....
24	24	298	253	173	40	125	8	85	.....
25	27	187	232	226	35	113	15	87	.....
26	10	250	267	250	35	115	15	84	.....
27	7	495	213	201	43	109	19	87	.....
28	40	136	250	160	51	105	21	105	.....
29	31	179	535	27	51	130	14	91	.....
30	160	201	121	24	45	160	13	71	.....
31	.....	267	.....	12	55	.....	17	.....	.....

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

Monthly discharge of Uncompahgre River at Montrose, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April 20-30	306	7	100	2,180
May	495	24	145	8,920
June	535	115	241	14,300
July	405	12	154	9,470
August	105	0	42.0	2,580
September	195	24	92.3	5,490
October	148	7	43.2	2,660
November	286	29	118	7,020
December 1-16	87	40	65.4	2,080
The period	.....	.....	.....	54,700

UNCOMPAHGRE RIVER NEAR DELTA, COLO.

Location.—At highway bridge on line between Rs. 95 and 96 W., 2 miles south of Delta. No tributaries below station and none for several miles above.

Records available.—April 29, 1903, to December 18, 1913.

Drainage area.—1,130 square miles.

Gage.—Vertical staff. Original gage located at a highway bridge one-fourth mile above Denver & Rio Grande Railroad bridge; moved to latter bridge November 17, 1903; replaced by an inclined gage, installed near bridge, April 21, 1904, which was used until November, 1906, when a staff gage was placed at present site April 16, 1910, a new gage was installed at slightly different datum. No determined relation between gages at the various sites.

Control.—Fairly permanent during 1913.

Discharge measurements.—Made from bridge.

Winter flow.—Although ice forms along banks and slush ice frequently occurs, the discharge relation is probably not materially affected thereby; observations, however, are discontinued during winter.

Diversions.—Ditches above station divert the normal flow during irrigation season; records represent largely return seepage water.

Accuracy.—Conditions during 1913 favorable for accurate results.

Discharge measurements of Uncompahgre River near Delta, Colo., for 1913.

[Made by E. H. Swett.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
May 24	1.96	418	July 24	1.48	200
29	1.60	273	Aug. 20	.65	33
June 30	1.10	108	Oct. 21	1.10	108

Daily gage height, in feet, of Uncomphgre River near Delta, Colo., for 1913.

[Mrs. W. J. Lance, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1.45	1.4	0.85	0.75	0.65	1.75	1.2	1.35
2	.....	1.35	1.45	.65	.7	.8	1.75	1.2	1.4
3	.....	1.45	1.25	.75	.7	.8	1.7	1.25	1.3
4	.....	1.2	1.05	.7	.8	1.0	1.75	1.3	1.4
5	.....	1.0	1.05	.8	.75	1.05	1.75	1.3	1.4
6	.....	1.1	.85	1.15	.7	1.25	1.8	1.2	1.4
7	.....	1.05	.85	.85	.7	1.0	1.7	1.15	1.35
8	.....	1.05	1.1	.7	.5	1.3	1.7	1.2	1.45
9	.....	1.0	1.15	.7	.6	1.8	1.7	1.2	1.35
10	.....	1.1	1.1	.8	.7	1.65	1.5	1.2	1.3
11	.....	1.25	1.3	.8	.7	1.25	1.4	1.2	1.3
12	.....	1.3	1.2	.75	.7	1.1	1.2	1.3	1.3
13	.....	1.25	1.15	.7	.75	1.35	1.1	1.25	1.35
14	.....	1.1	1.05	.7	.75	1.4	1.2	1.25	1.35
15	1.5	.85	1.25	.75	.7	1.5	1.2	1.2	1.35
16	2.0	.85	1.25	.9	.7	1.45	1.2	1.2	1.35
17	2.35	.8	1.0	.95	.7	1.25	1.2	1.2	1.4
18	1.95	1.05	1.35	1.1	.7	1.2	1.2	1.3	1.5
19	2.3	1.05	1.45	1.15	.7	1.2	1.1	1.3	.....
20	2.15	1.0	1.4	2.05	.65	1.15	1.1	1.3	.....
21	2.25	.9	1.3	1.55	.75	1.0	1.1	1.3	.....
22	1.9	.8	1.4	1.35	.8	1.3	1.1	1.3	.....
23	1.75	1.05	1.45	1.6	.7	2.35	1.05	1.3	.....
24	1.1	1.65	1.3	1.5	.8	1.8	1.1	1.3	.....
25	.9	1.15	1.2	1.2	.7	1.7	1.15	1.3	.....
26	.9	1.05	1.15	1.05	.75	1.75	1.1	*1.3	.....
27	.95	1.0	1.3	1.0	.7	1.8	1.1	1.3	.....
28	1.25	1.25	1.15	1.1	.85	1.8	1.2	1.4	.....
29	1.35	1.25	1.45	.95	.8	1.9	1.2	1.5	.....
30	1.5	1.3	1.15	.8	.7	1.8	1.2	1.45	.....
31	.....	1.05	.....	.8	.6	.....	1.3	.....	.....

Daily discharge, in second-feet, of Uncompahgre River near Delta, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	205	190	68	52	37	305	137	176
2	.....	176	205	37	44	60	305	137	190
3	.....	205	150	52	44	60	285	150	162
4	.....	137	105	44	60	95	305	162	190
5	.....	95	105	60	52	105	305	162	190
6	.....	115	68	126	44	150	325	137	190
7	.....	105	68	68	44	95	285	126	176
8	.....	105	115	44	18	162	285	137	205
9	.....	95	126	44	30	325	285	137	176
10	.....	115	115	60	44	268	220	137	162
11	.....	150	162	60	44	150	190	137	162
12	.....	162	137	52	44	115	137	162	162
13	.....	150	126	44	52	176	115	150	176
14	.....	115	105	44	52	190	137	150	176
15	220	68	150	52	44	220	137	137	176
16	420	68	150	77	44	205	137	137	176
17	620	60	95	86	44	150	137	137	190
18	395	105	176	115	44	137	137	162	220
19	590	105	205	126	44	137	115	162	.....
20	502	95	190	448	37	126	115	162	.....
21	560	77	162	235	52	95	115	162	.....
22	370	60	190	176	60	162	115	162	.....
23	305	105	205	250	44	620	105	162	.....
24	115	268	162	220	60	325	115	162	.....
25	77	126	137	137	44	285	126	162	.....
26	77	105	126	105	52	305	115	162	.....
27	86	190	162	95	44	325	115	162	.....
28	150	150	126	115	68	325	137	190	.....
29	176	150	205	86	60	370	137	220	.....
30	220	162	126	60	44	325	137	205	.....
31	.....	105	.....	60	30	.....	162	.....	.....

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

Monthly discharge of Uncompahgre River near Delta, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April	620	77	305	9,680
May	268	60	127	7,810
June	205	68	145	8,630
July	448	37	105	6,460
August	68	18	46.4	2,850
September	620	37	203	12,100
October	325	105	182	11,200
November	220	126	156	9,280
December 1–18	220	162	181	6,460
The period	.....	.....	.....	74,400

CANYON CREEK AT OURAY, COLO.

Location.—In sec. 31, T. 44 N., R. 7 W., at Ouray, 200 feet above the mouth, in the Uncompahgre National Forest. Nearest tributary, a small stream that enters from the east some distance above.

Records available.—January 25,.1911, to December 31, 1913.

Drainage area.—26 square miles (measured on topographic sheets).

Gage.—Vertical staff. August 31, 1913, a new staff gage was installed 115 feet upstream and referred to a different datum. All readings subsequent to that date are referred to the new gage.

Control.—Shifting after high water at the old section. Data insufficient to determine for the new section.

Discharge measurements.—Made from near-by footbridge or by wading.

Winter flow.—Practicaly no backwater from ice; channel kept open by hot springs.

Diversions.—None above station.

Accuracy.—Because of the high altitude of the station (7,900 feet) alternate melting and freezing cause diurnal fluctuation of stage; mean daily stage, as determined from the mean of one reading at 8 a. m. and the maximum stage for the 24-hour period, may be considerably in error; in general, estimates of discharge are only fair, except during low water when they are considered good.

Discharge measurements of Canyon Creek at Ouray, Colo., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 12	Robert Follansbee...	1.20	118	Sept. 1	R. H. Fletcher.....	[a] 3.02	37
July 20	R. H. Fletcher.....	1.00	115	Oct. 22	Robert Follansbee...	[a] 2.65	18
Aug. 31	.....do.....	[a] 3.15	47				

[a] Refers to datum of gage installed Aug. 31, 1913.

Daily gage height, in feet, of Canyon Creek at Ouray, Colo., for 1913.

[T. J. Watkins, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	−0.35	.....	0.0	.....	2.05	1.4	0.48	3.25	2.75	2.58	2.55
2	.....	− .35	.....	.0	0.3	2.1	1.4	.45	3.12	2.75	2.58	2.4
3	−0.4	− .35	.....	− .1	.3	2.1	1.4	.45	3.05	2.75	2.58	2.45
4	− .4	− .35	.....	− .2	.6	2.05	1.25	.45	3.10	2.75	2.58	2.5
5	− .4	− .35	.....	− .2	.6	2.05	1.15	.42	3.30	2.75	2.58	2.45
6	− .45	− .35	−0.35	− .15	.6	1.9	1.15	.42	3.32	2.75	2.58	2.5
7	− .45	− .35	− .35	− .15	.8	1.8	1.0	.42	3.32	2.75	2.6	2.5
8	− .45	− .35	− .35	− .15	.8	1.8	1.0	.42	3.32	2.75	2.6	2.5
9	− .45	− .35	− .3	− .1	.8	1.7	.92	.42	3.60	2.75	2.6	2.5
10	− .4	− .35	− .3	− .1	.8	1.6	.85	.42	3.28	2.85	2.5	2.5
11	− .4	− .32	− .25	− .15	.8	1.3	.85	.42	3.28	2.7	2.5	2.5
12	− .4	− .32	− .25	− .15	1.5	1.3	.85	.42	3.20	2.7	2.55	2.5
13	− .4	− .3	− .3	− .1	1.45	1.05	.95	.42	3.10	2.7	2.55	2.45
14	.....	− .3	− .3	+ .15	1.2	1.05	.95	.42	3.10	2.7	2.5	2.5
15	.....	− .3	− .35	.15	.95	1.8	.85	.42	2.90	2.7	2.5	2.5
16	− .45	− .3	− .35	.2	1.02	1.8	1.0	.35	2.9	2.7	2.5	2.5
17	− .45	− .3	− .35	.4	1.35	1.9	1.0	.34	2.85	2.7	2.5	2.5
18	− .4	− .3	− .3	.3	1.45	2.05	1.0	.28	2.85	2.7	2.5	2.5
19	− .4	− .3	− .3	.3	1.55	2.0	1.0	.28	2.75	2.7	2.55	2.5
20	− .4	− .3	− .3	.3	1.25	1.8	1.0	.35	2.75	2.7	2.55	2.4
21	− .4	− .3	− .3	.4	1.0	1.65	.....	.35	2.75	2.7	2.5	2.4
22	− .4	− .3	− .35	.4	1.0	1.55	1.05	.35	2.8	2.65	2.5	2.4
23	− .4	.....	− .35	.....	1.4	1.55	1.15	.35	2.75	2.65	2.6	2.4
24	− .4	.....	− .35	.....	1.65	1.58	.95	.60	2.75	2.62	2.55	2.4
25	− .4	.....	− .35	.....	1.75	1.6	.85	.55	2.75	2.68	2.5	2.4
26	− .4	.....	− .4	.....	1.85	1.6	.75	.45	2.75	2.7	2.45	2.4
27	− .35	.....	− .4	.....	2.35	1.65	.68	.45	2.75	2.62	2.55	2.4
28	− .35	.....	− .3	.....	2.0	1.65	.6	.42	2.75	2.7	2.5	2.4
29	− .35	.....	− .3	.....	2.15	1.55	.6	.42	2.75	2.6	2.45	2.4
30	− .35	.....	− .25	.....	2.05	1.5	.5	.70	2.75	2.6	2.5	2.4
31	− .35	.....	− .15	.....	2.05	.....	.48	.95	.....	2.58	.....	2.4

NOTE.—Gage heights Sept. 1 to Dec. 31 refer to gage installed Aug. 31.

Daily discharge, in second-feet, of Canyon Creek at Ouray, Colo., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	5	6	6	17	32	289	175	38	56	22	13	12
2	5	6	6	17	32	298	175	35	45	22	13	6
3	5	6	6	13	32	298	175	35	40	22	13	8
4	5	6	6	10	59	289	150	35	43	22	13	10
5	5	6	6	10	59	289	134	32	60	22	13	8
6	4	6	6	12	59	262	134	32	63	22	13	10
7	4	6	6	12	83	244	110	32	63	22	14	10
8	4	6	6	12	83	244	110	32	63	22	14	10
9	4	6	7	13	83	226	97	32	115	22	14	10
10	5	6	7	13	83	209	86	32	58	27	10	10
11	5	7	8	12	83	158	86	32	58	19	10	10
12	5	7	8	12	192	158	86	32	51	19	12	10
13	5	7	7	13	184	118	102	32	43	19	12	8
14	5	7	7	24	143	118	102	32	43	19	10	10
15	4	7	6	24	104	244	86	32	30	19	10	10
16	4	7	6	26	115	244	110	26	30	19	10	10
17	4	7	6	40	167	262	110	25	27	19	10	10
18	5	7	7	32	184	289	110	21	27	19	10	10
19	5	7	7	32	200	280	110	21	22	19	12	10
20	5	7	7	32	151	244	110	26	22	19	12	6
21	5	7	7	40	112	218	114	26	22	19	10	6
22	5	7	6	40	112	200	118	26	24	16	10	6
23	5	7	6	40	175	200	134	26	22	16	14	6
24	5	7	6	39	218	206	102	52	22	15	12	6
25	5	7	6	38	235	209	86	46	22	18	10	6
26	5	7	5	37	253	209	72	35	22	19	8	6
27	6	7	5	36	346	218	62	35	22	15	12	6
28	6	7	7	35	280	218	52	32	22	19	10	6
29	6	.....	7	34	308	200	52	32	22	14	8	6
30	6	.....	8	33	289	192	40	65	22	14	10	6
31	6	.....	12	.....	289	.....	38	102	.....	13	.....	6

NOTE.—Discharge determined as follows: Jan. 1 to May 27, from a rating curve not well defined; May 28 to Aug. 31 from a well-defined curve; Sept. 1 to Dec. 31 from a well-defined curve referred to the new gage. Discharge interpolated for days for which gage heights are missing.

Monthly discharge of Canyon Creek at Ouray, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	6	4	4.9	301	B.
February	7	6	6.6	366	B.
March	12	5	6.6	406	B.
April	40	10	24.9	1,480	C.
May	346	32	153	9,410	C.
June	298	118	228	13,600	C.
July	175	38	104	6,400	C.
August	102	21	35.2	2,160	B.
September	115	22	39.4	2,340	B.
October	27	13	19.1	1,170	B.
November	14	8	11.4	678	B.
December	12	6	8.2	504	B.
The year	346	4	53.6	38,800	

FREMONT RIVER BASIN.

MUDDY CREEK NEAR EMERY, UTAH.

Location.—In the NE. ¼ NE. ¼ sec. 21, T. 21 S., R. 6 E., at Jacobsen's ranch, about 1 mile above boundary line of Manti Forest Reserve.

Records available.—May 1 to July 31, 1909; July 23, 1910, to December 31, 1913.

Drainage area.—89 square miles (revised).

Gage.—Inclined staff. Temporary gage, located 50 feet downstream and at different datum, used November 24 to December 31, 1913.

Control.—Shifting.

Discharge measurements.—Made from cable or by wading.

Winter flow.—Ice affects discharge relation for long periods during December, January, and February.

Diversions.—Station is above headgates of the Emery, Independence Co., and Lower canals, and is near a proposed reservoir site; records indicate the natural flow of stream at station and amount of water available for storage.

Accuracy.—Records only fair, owing to shifting of stream bed.

Discharge measurements of Muddy Creek near Emery, Utah, for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 8	W. R. King	1.82	25.2	Aug. 24	Lynn Crandall	2.02	37.4
May 6	do	2.62	133	Nov. 22	C. L. Batchelder	[a] 1.53	.7
June 7	do	2.78	142				

[a] New gage installed Nov. 22 read 2.18 feet.

Daily gage height, in feet, of Muddy Creek near Emery, Utah, for 1913.

[Louis Jacobsen, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1				2.08	2.08	3.0	2.4	2.1	1.9	1.9		
2	1.78		1.98			3.0	2.4			1.9	1.9	
3		1.83			2.28	2.95	2.35	2.1	1.9			
4				1.98	2.33	2.95	2.35	2.05		1.9	1.9	2.9
5			1.98			2.85	2.35	2.05	1.85			
6	1.78				2.6	2.8	2.35	2.05			1.9	
7		1.88	1.98	1.83	2.25	2.8	2.35	2.05	1.85	1.9		2.9
8	1.78		1.98	1.82	2.65	2.8	4.1	2.05	1.85	1.9	1.9	
9				2.33	3.0	2.8		4.0				
10		1.83			3.5	2.8	2.35	2.0	1.85	1.9	1.9	2.9
11	1.78		1.93	2.28	3.0	2.75	2.3	2.0				
12					3.0	2.75	2.3	2.0	1.9	1.9	1.9	
13				2.08	2.9	2.7	2.25	2.0				2.9
14		1.83	1.93	2.33	3.25	2.75		2.0	1.8	1.9	1.9	
15	1.78		1.98		3.25	2.7	2.25	2.0		1.9		2.9
16				2.23	3.4	2.7		2.0	1.8	1.9	1.9	
17		1.88	1.98		3.25	2.7	2.25	2.0				2.9
18	1.78			2.38	3.25	2.7	2.25	2.0	1.75	1.9	1.9	
19				2.33	3.25	2.7		2.0				
20	1.78	1.88	1.73	2.08	3.0	2.7	2.25		1.75	1.9		2.9
21				2.08	2.9	2.7		2.0				
22			1.73	2.08	2.9	2.6	2.9		1.8	1.9	1.53	
23		1.93	1.73	2.33	2.9	2.55	2.25			1.9		
24	1.78			2.2	3.0	2.55		1.98	1.8	1.9	2.7	2.9
25				2.2	2.9	2.5	2.2					
26			1.78	2.33	2.95	2.5	2.2	1.95	1.9	1.9	2.7	
27	1.83	1.93		2.08	3.0	2.5						
28			1.78	2.08	3.1	2.45	2.1	1.95		1.9		2.9
29				2.08	3.0	2.45					2.7	
30					3.0	2.45	2.1	1.95		1.9		
31	1.83											2.9

NOTE.—Gage heights beginning Nov. 24 refer to a new gage at different datum. Discharge relation affected by ice Jan. 1 to Mar. 17 and Nov. 24 to Dec. 31.

Daily discharge, in second-feet, of Muddy Creek near Emery, Utah, for 1913.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	44	44	185	84	46	32	23	10
2	.....	40	55	185	84	46	32	23	10
3	.....	38	67	175	77	46	32	22	10
4	.....	37	74	175	77	42	30	22	10
5	.....	34	95	156	77	42	29	21	10
6	.....	31	113	147	77	42	29	20	10
7	.....	28	63	147	77	42	29	19	10
8	.....	27	122	147	446	42	29	18	10
9	.....	74	185	147	80	420	29	17	10
10	.....	70	294	147	77	38	29	16	10
11	.....	67	185	138	70	38	30	15	10
12	.....	56	185	138	70	38	32	14	10
13	.....	44	165	130	63	38	30	13	10
14	.....	74	236	138	63	38	26	12	10
15	.....	67	236	130	63	38	26	11	10
16	.....	60	270	130	63	38	26	10	10
17	.....	70	236	130	63	38	25	10	10
18	14	81	236	130	63	38	24	10	10
19	18	74	236	130	63	38	24	10	10
20	23	44	185	130	63	38	24	10	9
21	23	44	165	130	63	38	25	10	7
22	23	44	165	113	165	38	26	10	.7
23	23	74	165	106	63	37	26	10	.....
24	24	56	185	106	60	37	26	10	.....
25	25	56	165	98	56	36	26	10	.....
26	25	74	175	98	56	35	26	10	.....
27	25	44	185	98	51	35	25	10	.....
28	25	44	205	91	46	35	25	10	.....
29	28	44	185	91	46	35	24	10	.....
30	35	44	185	91	46	35	24	10	.....
31	40	.....	185	.....	46	35	.....	10	.....

NOTE.—Discharge determined from two fairly well-defined rating curves and by the indirect method for shifting channels. Mar. 18 to Nov. 22 discharge estimated for days of missing gage heights.

Monthly discharge of Muddy Creek near Emery, Utah, for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	[a] 7.0	430	D.
February	.....	.....	[a] 8.0	444	D.
March	40	.....	[a] 16.8	1,030	C.
April	81	27	52.8	3,140	B
May	294	44	169	10,400	B.
June	185	91	132	7,860	A.
July	446	46	80.6	4,960	B.
August	420	35	51.0	3,140	B.
September	32	24	27.3	1,620	C.
October	23	10	13.7	842	D.
November	10	.7	[a] 9.3	553	D.
December	.....	.....	[a] 8.0	492	D.
The year	446	.7	48.3	34,900	

[a] Estimated.

MUDDY CREEK (LOWER STATION) NEAR EMERY, UTAH.

Location.—In the NE. ¼ sec. 35, T. 21 S., R. 6 E., 800 feet above the county bridge, about 2½ miles north of Emery.

Records available.—June 6, 1911, to December 31, 1912; discharge measurements in 1913.

Drainage area.—114 square miles.

Gage.—Inclined staff gage with vertical low-water extension at bridge until May 7, 1913, when a new gage at different datum was installed at the present site.

Control.—Sand and gravel; shifting.

Discharge measurements.—Made from the bridge at high water or by wading at other stages.

Winter flow.—Ice affects the discharge relation for periods during the winter.

Diversions.—Several small ditches divert water below station.

Gage-height record for 1913 withheld because of probable inaccuracies.

Discharge measurements of Muddy Creek (lower station) near Emery, Utah, for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 8	W. R. King	2.80	15.7	June 7	W. R. King	1.08	41.6
May 7	do	1.08	45.9	Aug. 25	Lynn Crandall	.15	.7
8	do	.91	30.8	Nov. 22	Batchelder and Bennett	.7	2.0

NOTE.—Beginning May 7, gage heights refer to new gage at different datum

ESCALANTE RIVER BASIN.

ESCALANTE CREEK AT ESCALANTE, UTAH.

Location.—In sec. 9, T. 35 S., R. 3 E., just below the mouth of Winslow or Pine Creek and about 2 miles below Escalante.

Records available.—August 5, 1909, to April 30, 1913.

Drainage area.—315 square miles.

Gage.—Vertical staff.

Contol.—Shifting.

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

Winter flow.—Ice affects the discharge relation for periods during the winter.

Diversions.—All of the low-water flow is used for irrigation above station, and the records at this point indicate unappropriated and waste waters.

Estimates withheld on account of lack of measurements.

Daily gage height, in feet, of Escalante Creek at Escalante, Utah, for 1913.

[D. C. Shurtz, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	Day.	Jan.	Feb.	Mar.	Apr.
1	2.5			3.0	16	2.6	3.8		
2	2.65	2.6	2.8		17			2.6	1.8
3				2.8	18	2.6	4.0		
4	2.5	2.8	3.6		19			2.8	2.95
5				2.95	20	2.3	3.9		2.85
6	2.0	2.7	2.9		21			2.9	2.0
7				2.6	22	2.4	2.95		
8	2.2	2.9	3.8		23			2.7	2.1
9				2.8	24	2.55	2.9		2.15
10	2.30	2.8			25			2.85	
11			2.9	2.75	26	2.3	3.8		
12	2.6	3.0			27			2.65	2.25
13			2.7	2.0	28	2.5	3.95		
14	2.6	3.2			29			2.8	2.6
15			2.95	2.1	30	2.4			2.45
					31				

SAN JUAN RIVER BASIN.

SAN JUAN RIVER AT PAGOSA SPRINGS, COLO.

Location.—In sec. 13, T. 35 N., R. 2 W., at Pagosa Springs. Nearest tributary is a stream that enters from the north a mile below.

Records available.—January 24, 1911, to June 30, 1912; April 24 to November 29, 1913.

Drainage area.—287 square miles (measured on Forest atlas).

Gage.—Vertical staff; read once daily; installed November 23, 1911, to replace gage originally located at a highway bridge above Pagosa Springs, which was moved one-half mile downstream March 7, 1911, and washed out by a flood October 5, 1911. Relation of gage datums unknown.

Control.—Practically permanent.

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

Winter flow.—Ice causes backwater during winter; observations discontinued.

Diversions.—There are court decrees for the diversion of 20 second-feet above the station and 175 second-feet from tributaries entering above.

Accuracy.—Owing to the high altitude of the station (7,100 feet) it is probable that at certain seasons alternate melting and freezing cause considerable diurnal fluctuation; mean daily gage height based on one reading may be somewhat in error; estimates rated as fair or possibly good.

Discharge measurements of San Juan River at Pagosa Springs, Colo., for 1913.

[Made by Frank O'Brien.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
May 15	3.93	929
July 15	1.80	174
Nov. 6	1.40	103

Daily gage height, in feet, of San Juan River at Pagosa Springs, Colo., for 1913.

[R. W. Smith, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	4.1	.....	3.0	1.5	1.3	1.8	1.3
2	.....	3.9	5.2	2.9	1.4	1.3	1.9	.....
3	.....	3.4	5.2	2.8	.....	1.2	2.8	1.5
4	.....	.....	5.1	2.7	1.4	1.4	2.9	1.4
5	.....	3.4	5.0	2.5	1.3	1.5	.....	1.4
6	.....	3.7	4.7	.....	1.3	1.5	2.4	1.4
7	.....	4.0	4.4	2.5	1.3	.....	2.2	1.4
8	.....	4.1	.....	2.4	1.3	.....	2.1	1.4
9	.....	3.9	4.25	2.5	1.3	2.2	2.0	.....
10	.....	4.2	4.4	2.5	.....	1.8	1.9	1.4
11	.....	.....	4.7	2.4	1.3	1.6	1.9	1.4
12	.....	4.8	4.25	2.3	1.5	1.7	.....	1.4
13	.....	4.9	4.0	.....	2.4	1.6	1.9	1.4
14	.....	4.4	3.9	2.0	1.8	.....	1.9	1.6
15	.....	4.0	.....	2.0	1.6	1.4	1.9	1.55
16	.....	4.0	4.2	2.0	1.4	1.4	1.8	.....
17	.....	4.3	3.9	2.0	.....	1.4	1.8	1.45
18	.....	.....	3.9	1.9	1.5	1.3	1.7	1.45
19	.....	4.7	4.2	1.8	1.5	1.2	.....	1.5
20	.....	4.3	4.0	.....	1.4	1.2	1.6	1.7
21	.....	4.3	3.8	2.1	1.4	.....	1.6	1.6
22	.....	4.2	.....	2.1	2.0	1.3	1.6	1.5
23	.....	4.8	3.6	2.1	1.6	2.0	1.6	.....
24	2.8	5.2	3.6	1.9	.....	1.8	1.6	1.5
25	2.7	.....	3.4	1.8	1.5	1.8	1.6	1.6
26	2.8	5.1	3.4	1.7	1.5	1.6	.....	1.4
27	.....	5.5	3.3	.....	1.4	1.6	1.5	1.4
28	3.7	5.4	3.5	1.7	1.3	.....	1.5	1.4
29	4.0	5.4	.....	1.6	1.3	1.7	1.4	1.15
30	4.0	5.3	3.2	1.6	1.3	1.7	1.3	.....
31	.....	5.1	.....	1.5	.....	.....	1.3	.....

Daily discharge, in second-feet, of San Juan River at Pagosa Springs, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	965	1,510	495	120	96	166	96
2	.....	875	1,540	455	107	96	185	108
3	.....	655	1,540	420	107	87	420	120
4	.....	655	1,480	385	107	107	455	107
5	.....	655	1,420	325	96	120	376	107
6	.....	785	1,260	325	96	120	298	107
7	.....	920	1,110	325	96	250	248	107
8	.....	965	1,080	298	96	225	226	107
9	.....	875	1,040	325	96	248	205	107
10	.....	1,010	1,110	325	96	166	185	107
11	.....	1,160	1,260	298	96	134	185	107
12	.....	1,310	1,040	272	120	149	185	107
13	.....	1,360	920	238	298	134	185	107
14	.....	1,110	875	205	166	120	185	134
15	.....	920	942	205	134	107	185	127
16	.....	920	1,010	205	107	107	166	120
17	.....	1,060	875	205	114	107	166	114
18	.....	1,160	875	185	120	96	149	114
19	.....	1,260	1,010	166	120	87	142	120
20	.....	1,060	920	196	107	87	134	149
21	.....	1,060	830	226	107	92	134	134
22	.....	1,010	785	226	205	96	134	120
23	.....	1,310	740	226	134	205	134	120
24	420	1,540	740	185	127	166	134	120
25	385	1,510	655	166	120	166	134	134
26	420	1,480	655	149	120	134	127	107
27	600	1,720	615	149	107	134	120	107
28	785	1,660	695	149	96	142	120	107
29	920	1,660	635	134	96	149	107	84
30	920	1,600	575	134	96	149	96	84
31	.....	1,480	.....	120	96	.....	96	.....

NOTE.—Discharge determined from a well-defined rating curve. Discharge estimated for days for which gage heights are missing.

Monthly discharge of San Juan River at Pagosa Springs, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April 24-30	920	385	636	8,830	B.
May	1,720	655	1,150	70,700	C.
June	1,540	575	991	59,000	C.
July	495	120	249	15,300	C.
August	298	96	119	7,320	B.
September	250	87	136	8,090	B.
October	455	96	187	11,500	B.
November	149	84	113	6,720	B.
The period	.....	.....	.....	187,000	

SAN JUAN RIVER AT ARBOLES, COLO.

Location.—Near center of T. 33 N., R. 5 W., at Arboles, about one-fourth mile above mouth of Piedra River.

Records available.—June 19, 1895, to Sept. 30, 1899; August 21, 1910, to December 31, 1913.

Drainage area.—1,390 square miles.

Gage.—Chain gage.

Control.—Permanent at low and medium stages but likely to shift during high stages.

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

Winter flow.—Discharge relation affected by ice during winter.

Diversions.—There are court decrees for the diversion of 13 second-feet between Arboles and the station at Pagosa Springs and 39 second-feet from intervening tributaries.

Flood discharges.—Two severe floods have occurred on the San Juan since records have been maintained, one September 6, 1909, and another and larger one October 1, 1911, when the river rose 17 feet, with a maximum discharge of about 40,000 second-feet.

Accuracy.—Estimates good.

Discharge measurements of San Juan River at Arboles, Colo., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 23	C. J. Emerson	[a] 1.43	98.4	Aug. 2	Frank O'Brien	0.42	169
Feb. 17	Frank O'Brien	[a] 1.57	112	30	do	.49	189
Apr. 1	do	2.22	1,150	Oct. 1	do	.67	244
25	do	1.73	799	Nov. 6	do	.35	160
May 13	do	3.54	2,400	14	do	.60	185
June 10	do	2.86	1,840	Dec. 18	C. J. Emerson	[a] .59	194
July 16	do	.82	284				

[a] Discharge relation affected by ice.

Daily gage height, in feet, of San Juan River at Arboles, Colo., for 1913.

[Anna Nossaman, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.20	.....	.....	2.59	2.68	4.10	1.98	0.38	0.18	0.55	0.32	0.42
2	1.20	.....	.....	2.62	2.75	3.40	1.53	.42	.25	.60	.35	.48
3	1.10	.....	.....	2.54	2.35	3.20	1.33	.41	.20	1.88	.42	.42
4	1.10	.....	.....	1.86	3.20	3.42	1.35	.29	.12	2.35	.68	.58
5	1.00	.....	.....	1.94	2.70	3.10	1.22	.28	.35	1.42	.52	.55
6	1.00	.....	.....	3.76	2.68	3.15	1.27	.28	1.40	1.30	.45	.48
7	1.10	.....	.....	3.74	2.95	3.15	1.18	.28	.58	1.18	.40	.25
8	1.15	.....	.....	2.86	1.90	3.09	1.10	.24	.18	1.05	.40	.00
9	1.20	.....	.....	2.14	2.30	2.80	1.08	.22	.62	.95	.42	.20
10	1.20	.....	.....	2.38	2.85	2.80	1.25	.28	.55	.92	.40	.20
11	1.30	.....	1.90	2.48	2.85	2.92	1.15	.32	.62	.85	.45	.30
12	1.30	.....	1.98	2.78	3.24	2.82	.83	1.02	.75	.78	.35	.20
13	1.30	.....	1.79	3.03	3.44	2.72	.72	1.02	.32	.68	.40	.....
14	1.30	.....	1.56	3.12	2.85	2.72	.74	.30	.55	.78	.75	.....
15	1.30	.....	1.49	3.02	2.55	2.65	.69	.30	.40	.75	.62	.....
16	1.30	.....	1.39	3.28	2.65	2.78	.88	.30	.38	.60	.58	.....
17	1.30	1.57	1.34	2.70	2.72	2.76	1.20	.48	.25	.65	.55	.....
18	1.30	1.53	1.32	2.70	2.92	2.22	1.25	.40	.20	.62	.62	.50
19	1.25	.....	1.25	2.55	3.09	.....	1.08	.55	.15	.50	.62	.....
20	1.25	.....	1.18	2.75	2.35	.....	1.22	.48	.18	.45	1.00	.....
21	1.25	.....	.72	3.28	2.88	.....	1.35	.48	.18	.55	.88	.....
22	1.25	.....	.42	2.62	2.69	.....	1.00	.40	.15	.50	.92	.....
23	1.25	.....	.79	2.56	2.76	.....	1.00	.52	1.05	.55	.68	.....
24	1.25	.....	.39	1.98	2.95	.....	1.00	.48	.90	.45	.65	.....
25	1.25	.....	.36	1.82	3.25	.....	1.02	.48	.85	.50	.62	.....
26	1.25	.....	.46	1.75	3.45	.....	.88	.55	.90	.50	.58	.....
27	1.25	.....	.32	2.00	4.40	.....	.62	.45	.75	.40	.68	.....
28	1.25	.....	.28	2.70	3.70	3.30	.54	.22	.60	.30	.68	.....
29	1.20	.....	.65	4.24	3.90	2.55	.58	.22	.60	.30	.65	.....
30	1.20	.....	1.78	3.98	3.95	2.00	.62	.22	.60	.35	.32	.....
31	.....	.....	2.10	.....	4.12	.....	.45	.30	.....	.38	.....	.....

NOTE.—Discharge relation affected by ice Jan. 1 to Mar. 21 and Dec. 7–31. Average thickness of ice in January, 1.8 feet; February, 1 foot.

Daily discharge, in second-feet, of San Juan River at Arboles, Colo., for 1913.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	120	1,510	1,590	2,960	984	159	116	204	146	169
2	120	1,540	1,660	2,260	651	169	130	219	152	185
3	130	1,470	1,300	2,060	532	167	120	904	169	169
4	130	888	2,060	2,280	542	139	105	1,300	245	213
5	130	952	1,610	1,970	471	137	152	582	196	204
6	130	2,620	1,590	2,020	498	137	570	515	177	185
7	140	2,600	1,840	2,020	450	137	213	450	164	130
8	140	1,750	920	1,960	410	128	116	388	164	120
9	140	1,110	1,250	1,700	401	124	225	344	164	120
10	180	1,320	1,740	1,700	488	137	205	332	155	120
11	240	1,410	1,740	1,810	435	146	225	305	162	140
12	280	1,680	2,100	1,720	297	374	268	279	135	120
13	220	1,910	2,300	1,630	258	374	146	245	141	120
14	160	1,990	1,740	1,630	265	141	205	279	229	130
15	140	1,900	1,480	1,560	248	141	164	268	190	130
16	160	2,140	1,560	1,680	316	141	159	219	180	160
17	200	1,610	1,630	1,660	460	185	130	235	172	180
18	180	1,610	1,810	1,180	488	164	120	225	190	194
19	180	1,480	1,960	1,130	401	204	110	190	190	160
20	220	1,660	1,300	1,080	471	185	116	177	365	140
21	258	2,140	1,770	1,080	542	185	116	204	316	140
22	169	1,540	1,600	980	365	164	110	190	332	140
23	282	1,480	1,660	930	365	196	388	204	245	140
24	162	984	1,840	880	365	185	324	177	235	130
25	155	856	2,110	830	374	185	305	190	225	130
26	180	805	2,310	780	316	204	324	190	213	130
27	146	1,000	3,260	730	225	177	268	164	245	130
28	137	1,610	2,560	2,160	202	124	219	141	245	130
29	235	3,100	2,760	1,480	213	124	219	141	235	130
30	826	2,840	2,810	1,000	225	124	219	152	146	130
31	1,080	.....	2,980	.....	177	141	.....	159	.....	130

NOTE.—Discharge determined as follows: Mar. 1–21 and Dec. 7–31 estimated on account of ice; Mar. 22 to Nov. 8 and Nov. 20 to Dec. 6, from a well-defined rating curve; Nov. 9–19 by the indirect method for shifting channels. June 19–28 discharge estimated.

Monthly discharge of San Juan River at Arboles, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	[a] 100	6,150	D.
February	.....	.....	[a] 115	6,390	D.
March	1,080	120	225	13,800	C.
April	3,100	805	1,650	98,200	A.
May	3,260	920	1,900	117,000	A.
June	2,960	730	1,560	92,800	B.
July	984	177	401	24,700	A.
August	374	124	171	10,500	A.
September	570	105	203	12,100	A.
October	1,300	141	309	19,000	A.
November	365	135	204	12,100	B.
December	213	120	147	9,040	D.
The year	3,260	.....	582	422,000	

[a] Estimated on account of ice.

SAN JUAN RIVER AT FARMINGTON, N. MEX.

Location.—In sec. 17, T. 29 N., R. 13 W., one-half mile southwest of Farmington, at an old bridge site near Bentley's ferry, 1,500 feet below confluence of San Juan and Animas rivers. Station originally located (June 19, 1904) at suspension bridge near Methodist Indian school, 3 miles south of Farmington and about 2 miles below mouth of Animas River. Station was moved (May 11, 1906) to new suspension bridge about 1½ miles above. September 19, 1912, re-established at present location.

Records available.—June 19, 1904, to Sept. 22, 1906; September 19, 1912, to December 31, 1913.

Drainage area.—Not measured.

Gage.—Vertical staff. Wire gage 1904 to May 10, 1906; chain gage, May 11 to September 22, 1906.

Control.—Shifting.

Discharge measurements.—Made by wading or from cable.

Winter flow.—Discharge relation slightly affected by ice.

Diversions.—Considerable water is diverted for irrigation above station.

Accuracy.—On account of shifting of stream bed, estimates are only fair or possibly good for certain periods.

Discharge measurements of San Juan River at Farmington, N. Mex., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 21	C. J. Emerson	[a] 0.88	434	July 23	Frank O'Brien	1.65	1,670
Feb. 26	Frank O'Brien	.88	514	Aug. 18	do	.45	417
Mar. 22	do	1.28	774	Sept. 3	do	.89	686
Apr. 29	do	3.20	4,700	Oct. 6	do	2.11	2,400
May 29	do	3.50	8,940	Nov. 12	do	1.10	822
June 24	do	2.42	4,590	Dec. 13	C. J. Emerson	[a] .70	545

[a] Discharge relation slightly affected by ice.

Daily gage height, in feet, of San Juan River at Farmington, N. Mex., for 1913.

[G. E. Bentley, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.99	1.04	0.74	2.65	3.60	3.65	2.42	0.75	0.82	1.25	0.90	1.22
2	1.00	1.00	.66	2.84	3.58	3.70	2.22	.55	.82	1.55	.95	1.15
3	.90	.81	.90	2.89	3.42	3.50	2.08	.48	.88	2.90	1.02	1.18
4	.88	.71	.82	2.55	3.25	3.32	1.72	.58	.88	3.60	1.20	1.20
5	1.01	.79	.80	2.60	3.00	3.10	1.62	.48	1.10	2.38	1.18	1.20
6	.79	.87	.79	3.10	3.12	2.92	1.70	.48	1.25	2.15	1.15	1.10
7	.41	.98	.99	3.48	3.55	2.80	1.70	.45	1.85	1.95	1.10	1.02
8	.24	1.06	.98	3.10	3.68	2.62	1.48	.38	1.60	1.72	1.10	.90
9	.62	1.01	1.08	3.30	3.59	2.62	1.52	.32	2.75	1.65	1.05	.90
10	.92	.96	1.15	2.90	3.52	2.48	1.60	.32	2.55	1.52	1.00	.85
11	.98	.91	1.22	2.70	3.85	2.85	1.65	.30	2.35	1.50	1.05	.80
12	.93	.81	1.40	2.85	4.25	3.00	1.55	1.50	2.08	1.48	1.08	.72
13	1.00	.76	1.15	2.90	4.35	2.78	1.42	1.50	1.80	1.50	1.12	.72
14	.95	.69	1.00	3.35	3.75	2.42	1.35	1.25	1.70	1.50	1.22	.80
15	1.16	.70	.92	3.65	3.35	2.65	1.30	.95	1.52	1.45	1.28	.78
16	1.24	.74	1.05	3.62	3.25	2.88	1.25	.70	1.45	1.35	1.22	.98
17	1.34	.74	1.10	3.70	3.45	2.92	1.45	.48	1.35	1.22	1.19	1.08
18	1.15	.78	1.08	3.58	3.55	2.90	1.32	.42	1.22	1.05	1.18	1.10
19	1.19	.85	1.08	3.68	3.68	3.02	1.35	.38	1.10	1.00	1.20	1.02
20	1.00	.82	1.15	3.58	3.58	3.00	1.45	.45	1.02	1.02	1.22	.75
21	.85	.76	1.20	3.42	3.40	2.75	1.60	.58	.92	1.02	1.28	.70
22	.92	.68	1.22	3.48	3.30	2.60	1.75	.62	.90	1.12	1.18	.80
23	.95	.74	1.28	3.12	3.55	2.52	1.70	1.00	1.40	1.08	1.20	.....
24	.90	.58	1.22	3.30	3.80	2.45	1.82	1.25	1.55	1.00	1.25	.....
25	.90	.80	1.12	3.02	3.78	2.35	1.65	1.12	2.10	.95	1.30	.....
26	.85	.88	.96	2.82	3.85	2.20	1.45	1.25	1.85	.92	1.30	1.20
27	.85	.95	.95	2.72	4.00	2.18	1.30	1.05	1.50	.95	1.20	.....
28	.80	.70	.95	3.05	3.86	2.12	1.18	.85	1.30	.95	1.22	.....
29	.80	.....	1.05	3.38	3.75	2.22	1.10	.78	1.35	1.00	1.25	1.15
30	.75	.....	1.80	3.50	3.75	2.40	1.00	.75	1.32	1.02	1.22	.....
31	.90	.....	2.45	.....	3.62	.....	.88	.88	.....	.88	.....	.....

NOTE.—Discharge relation slightly affected by ice Jan. 1–31 and Dec. 10–31.

Daily discharge, in second-feet, of San Juan River at Farmington, N. Mex., for 1913.

[G. E. Bentley, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	500	588	434	3,030	6,370	9,620	4,340	580	628	1,020	688	992
2	500	560	394	3,560	6,290	9,860	3,680	464	628	1,380	730	918
3	500	453	512	3,700	5,870	8,920	3,240	429	673	4,650	791	949
4	450	407	464	2,760	5,230	8,110	2,300	479	673	7,350	970	970
5	500	443	453	2,890	4,520	7,140	2,060	429	866	3,060	949	970
6	400	484	448	4,350	4,940	6,400	2,210	429	1,020	2,490	918	866
7	300	548	554	5,710	6,770	5,930	2,190	416	1,860	2,050	866	791
8	200	602	548	4,350	7,310	5,260	1,750	385	1,450	1,640	866	688
9	350	567	616	5,050	7,140	5,260	1,800	361	4,150	1,530	819	688
10	450	536	670	3,730	6,850	4,770	1,930	361	3,540	1,340	772	650
11	500	506	726	3,170	8,480	6,120	2,000	353	2,980	1,310	819	613
12	450	453	880	3,590	10,400	6,730	1,800	1,310	2,330	1,290	847	560
13	500	430	670	3,730	11,100	5,860	1,570	1,310	1,770	1,310	887	560
14	450	398	560	5,230	8,250	4,580	1,440	1,020	1,610	1,310	992	613
15	550	402	512	6,370	6,770	5,380	1,360	730	1,340	1,250	1,060	600
16	650	420	595	6,250	6,370	6,240	1,260	547	1,250	1,140	992	650
17	750	420	630	6,570	7,390	6,400	1,540	429	1,140	992	960	650
18	550	439	616	6,090	7,810	6,320	1,310	402	992	819	949	700
19	600	479	616	6,490	8,610	6,810	1,320	385	866	772	970	625
20	500	464	670	6,090	8,160	6,730	1,440	416	791	791	992	580
21	420	439	710	5,490	7,600	5,740	1,650	479	705	791	1,060	550
22	450	402	726	5,710	7,180	5,190	1,870	501	688	887	949	610
23	450	434	774	4,420	8,480	4,910	1,750	772	1,190	847	970	610
24	450	366	726	5,050	9,600	4,680	1,930	1,020	1,380	772	1,020	610
25	450	469	646	4,090	9,750	4,310	1,600	887	2,370	730	1,080	605
26	400	512	536	3,510	10,100	3,810	1,260	1,020	1,860	705	1,080	600
27	400	554	530	3,230	11,100	3,720	1,100	819	1,310	730	970	600
28	400	416	530	4,190	10,400	3,500	949	650	1,080	730	992	600
29	400	.....	595	5,340	10,100	3,780	866	600	1,140	772	1,020	600
30	425	.....	1,310	5,790	10,100	4,310	772	580	1,100	791	992	600
31	500	.....	2,510	.....	9,480	.....	673	673	.....	673	.....	600

NOTE.—Discharge determined from three fairly well-defined rating curves and by the indirect method for shifting channels. Discharge estimated on account of ice Jan. 1–31 and Dec. 10–31.

Monthly discharge of San Juan River at Farmington, N. Mex., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	750	200	464	28,500	D.
February	602	366	471	26,200	C.
March	2,510	394	683	42,000	C.
April	6,570	2,760	4,650	277,000	C.
May	11,100	4,520	8,020	493,000	C.
June	9,860	3,500	5,880	350,000	C.
July	4,340	673	1,770	109,000	C.
August	1,310	353	621	38,200	B.
September	4,150	628	1,450	86,300	B.
October	7,350	673	1,480	91,000	B.
November	1,080	688	932	55,500	B.
December	992	600	684	42,100	C.
The year	11,100	200	2,260	1,640,000	

NAVAJO RIVER AT EDITH, COLO.

Location.—Near the southwestern corner of T. 33 N., R. 1 E., at the highway bridge on road from Lumberton to Edith, one-fourth mile east of Edith, a short distance north of the New Mexico-Colorado State line, and 6 miles northeast of Lumberton, N. Mex.; about 5 miles below the confluence of Navajo and Little Navajo rivers. A small tributary from the north enters about one-fourth mile below the station.

Records available.—September 21, 1912, to December 31, 1913.
Drainage area.—Not measured.
Gage.—Vertical staff.
Control.—Permanent at low stages, but liable to shift at high stages.
Discharge measurements.—Made by wading or from bridge.
Winter flow.—Discharge relation affected by ice.
Diversions.—Considerable water is diverted for irrigation above station.
Accuracy.—Estimates good except for winter.

Discharge measurements of Navajo River at Edith, Colo., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 24	C. J. Emerson	[a] 2.92	34.5	July 14	Frank O'Brien	1.90	73.0
Feb. 18	Frank O'Brien	[a] 2.61	25.9	Aug. 3	do	1.70	47.6
Mar. 14	do	[a] 1.48	27.9	29	do	1.64	37.8
Apr. 3	do	[a] 3.62	134	Sept. 30	do	1.70	44.9
24	do	2.66	255	Nov. 4	do	1.70	44.2
May 16	do	2.78	287	15	do	1.71	48.6
June 11	do	2.75	288	Dec. 19	C. J. Emerson	[a] 2.25	41.2

[a] Discharge relation affected by ice.

Daily gage height, in feet, of Navajo River at Edith, Colo., for 1913.

[G. H. Young, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.60	3.06	.....	4.05	2.91	2.96	2.28	1.71	1.58	1.70	1.65	1.70
2	2.60	3.06	.....	4.10	2.85	3.02	2.21	1.71	1.58	1.69	1.65	1.70
3	2.60	3.06	.....	3.65	2.69	2.90	2.18	1.68	1.58	2.40	1.69	1.70
4	2.60	3.06	.....	3.55	2.65	2.91	2.21	1.66	1.60	2.40	1.72	1.70
5	2.60	3.06	.....	3.05	2.68	2.86	2.11	1.68	1.85	2.25	1.70	1.70
6	2.60	3.06	.....	3.10	2.75	2.80	2.05	1.68	1.68	1.98	1.68	1.70
7	2.60	3.06	.....	2.65	2.91	2.76	1.98	1.66	1.62	1.95	1.68	1.70
8	2.60	3.06	.....	2.55	2.88	2.76	1.96	1.64	1.62	1.89	1.68	1.70
9	2.60	3.06	.....	2.35	2.90	2.76	1.92	1.62	1.72	1.86	1.68	1.70
10	2.60	3.06	.....	2.60	2.92	2.71	2.05	1.61	1.65	1.84	1.68	1.90
11	2.60	3.06	.....	2.90	2.94	2.78	2.00	1.60	1.64	1.80	1.68	2.30
12	2.60	3.06	.....	2.86	2.95	2.70	1.94	1.66	1.72	1.79	1.68	2.20
13	2.60	3.06	.....	2.95	2.99	2.52	1.90	2.15	1.66	1.80	1.70	2.00
14	2.60	3.06	1.48	3.14	2.95	2.59	1.86	1.76	1.64	1.78	1.70	2.00
15	2.70	3.06	2.01	3.20	2.91	2.70	1.85	1.71	1.62	1.78	1.70	2.00
16	2.72	3.06	2.03	3.19	2.88	2.60	1.84	1.68	1.60	1.78	1.70	2.30
17	2.80	3.06	2.05	3.10	2.85	2.52	1.82	1.68	1.58	1.78	1.70	2.20
18	2.85	2.62	2.10	3.00	2.88	2.60	1.81	1.76	1.58	1.75	1.70	2.25
19	2.90	.....	2.15	2.90	2.90	2.70	1.81	1.75	1.58	1.73	1.70	2.25
20	2.90	.....	1.95	2.90	2.82	2.61	1.86	1.72	1.58	1.70	1.70	2.30
21	3.10	.....	2.00	2.90	2.78	2.52	1.92	1.74	1.58	1.70	1.75	2.30
22	3.11	.....	2.10	2.81	2.76	2.46	1.98	1.82	1.69	1.70	1.74	2.30
23	2.90	.....	1.90	2.74	2.89	2.46	2.08	1.78	1.72	1.70	1.72	2.30
24	2.90	.....	1.90	2.58	2.96	2.48	2.12	1.72	1.72	1.70	1.70	2.30
25	2.90	.....	1.90	2.45	2.91	2.42	2.03	1.68	1.78	1.68	1.76	2.40
26	2.90	2.02	2.00	2.54	3.02	2.40	1.98	1.64	1.75	1.68	1.75	2.40
27	3.02	.....	1.70	2.59	3.12	2.35	1.92	1.64	1.72	1.67	1.72	2.50
28	3.04	.....	2.00	2.71	3.09	2.32	1.86	1.62	1.70	1.65	1.72	2.50
29	3.05	.....	3.20	2.80	3.02	2.59	1.78	1.61	1.75	1.65	1.70	2.60
30	3.05	.....	3.60	2.85	3.01	2.36	1.75	1.62	1.76	1.65	1.70	2.60
31	3.05	.....	3.90	.....	3.01	.....	1.74	1.63	.....	1.65	.....	2.60

NOTE.—Discharge relation affected by ice Jan. 1 to Apr. 6 and Dec. 10–31. Average thickness of ice in January, 1.3 feet; in February and March, 1.1 feet.

Daily discharge, in second-feet, of Navajo River at Edith, Colo., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	160	331	348	152	46	32	45	40	45
2	140	313	368	135	46	32	44	40	45
3	135	265	328	129	43	32	184	44	45
4	130	253	331	135	41	34	184	48	45
5	150	262	316	114	43	66	145	45	45
6	200	283	298	102	43	43	87	43	45
7	253	331	286	87	41	36	82	43	45
8	224	322	286	84	38	36	72	43	45
9	170	328	286	77	36	48	67	43	45
10	238	335	271	102	35	40	64	43	45
11	328	341	292	91	34	38	58	43	40
12	316	344	268	80	41	48	57	43	40
13	344	358	216	73	122	41	58	45	40
14	407	344	235	67	53	38	55	45	40
15	427	331	268	66	46	36	55	45	40
16	424	322	238	66	43	34	55	45	40
17	394	313	216	61	43	32	55	45	40
18	361	322	238	60	53	32	52	45	40
19	328	328	268	60	52	32	49	45	40
20	328	304	241	67	48	32	45	45	40
21	328	292	216	77	50	32	45	52	40
22	301	286	200	87	61	44	45	50	40
23	280	325	200	108	55	48	45	48	40
24	233	348	206	116	48	48	45	45	40
25	198	331	189	97	43	55	43	53	40
26	222	368	184	87	38	52	43	52	40
27	235	401	170	77	38	48	42	48	40
28	271	391	162	67	36	45	40	48	40
29	298	368	235	55	35	52	40	45	40
30	313	364	173	52	36	53	40	45	40
31	.....	364	.....	50	37	.....	40	.....	40

NOTE.—Discharge determined from a well-defined rating curve. Discharge estimated Apr. 1–6 and Dec. 10–31 on account of ice.

Monthly discharge of Navajo River at Edith, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	[a] 35.0	2,150	D.
February	.....	.....	[a] 30.0	1,670	D.
March	.....	.....	[a] 60.0	3,690	D.
April	427	130	271	16,100	B.
May	401	253	328	20,200	A.
June	368	162	251	14,900	A.
July	152	50	86.5	5,320	A.
August	122	34	45.9	2,820	A.
September	66	32	41.3	2,460	A.
October	184	40	63.9	3,930	A.
November	53	40	45.5	2,710	A.
December	45	40	41.6	2,560	C.
The year	427	.....	108	78,500	

[a] Estimated on account of ice.

PIEDRA RIVER AT ARBOLES, COLO.

Location.—In sec. 16, T. 33 N., R. 5 W., at railroad bridge at Arboles, 1 mile above junction with San Juan River. No tributaries below station.

Records available.—June 19, 1895, to September 30, 1899; August 21, 1910, to December 31, 1913.

Drainage area.—650 square miles.

Gage.—Chain gage.

Control.—Practically permanent except during high water.

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

Diversions.—There are a number of small diversions for irrigation above station.

Accuracy.—Estimates good.

Discharge measurements of Piedra River at Arboles, Colo., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 24	C. J. Emerson	a 2.81	37.8	June 10	Frank O'Brien	4.13	806
Feb. 18	Frank O'Brien	a 2.80	75.9	July 16	do	2.05	124
Mar. 12	do	1.88	102	Aug. 2	do	1.69	70.1
Apr. 1	do	3.43	492	Nov. 14	do	2.20	135
26	do	3.80	677	Dec. 18	C. J. Emerson	a 1.90	100
May 13	do	5.16	1,380				

a Discharge relation affected by ice.

Daily gage height, in feet, of Piedra River at Arboles, Colo., for 1913.

[Myrtle Nossaman, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1				3.40	4.55	5.18	2.86	1.75	2.00	2.25	1.85	2.12
2				3.82	4.65	5.15	2.70	1.78	1.90	2.18	1.95	2.12
3				3.95	4.10	5.15	2.28	1.69	1.92	2.65	2.08	1.90
4				3.52	4.25	4.55	2.06	1.66	1.92	3.52	2.10	2.20
5				3.85	4.35	4.60	2.03	1.72	2.02	3.12	2.05	2.00
6				5.08	4.45	4.20	2.48	1.74	2.35	2.88	2.05	2.05
7				5.26	4.60	4.35	2.40	1.68	2.28	2.75	2.02	1.80
8				4.69	4.54	4.55	2.29	1.58	2.25	2.62	2.00	1.78
9				4.36	4.62	4.02	2.27	1.68	3.10	2.68	2.00	1.98
10				3.64	4.70	4.14	2.49	1.64	2.50	2.58	1.95	1.88
11				4.05	5.00	5.10	2.32	1.70	2.52	1.95	1.90	1.72
12			1.88	5.55	5.15	4.82	1.92	.....	2.78	2.48	1.95	1.88
13			1.73	5.82	5.35	4.85	1.91	.....	2.22	2.62	1.95	1.85
14			1.72	5.35	4.75	4.79	1.79	.....	2.28	2.52	2.20	1.85
15			1.65	5.15	4.70	4.59	2.09	2.05	2.22	2.48	2.10	1.85
16			1.67	5.20	4.54	4.36	2.06	2.08	2.18	2.42	2.12	1.88
17			1.80	5.15	4.62	4.32	2.05	2.82	2.15	2.40	2.02	1.85
18		2.80	1.70	5.15	4.85	4.18	1.98	1.78	2.10	2.30	2.00	2.05
19			1.74	5.08	4.96	4.25	2.02	1.90	2.05	2.55	2.15	2.25
20			1.70	4.00	4.65	4.32	2.00	2.10	2.08	2.25	2.18	2.10
21			1.72	4.85	4.62	3.85	1.95	2.00	1.90	2.10	2.15	2.85
22			1.66	4.60	4.68	3.79	2.40	2.02	1.95	2.10	2.22	.....
23			1.86	3.62	4.70	3.50	2.40	1.92	2.30	2.12	2.28	.....
24	2.81		1.74	4.15	4.80	3.65	2.35	2.18	2.40	2.10	2.15	3.10
25			1.78	3.62	4.88	3.22	2.02	2.10	2.15	2.05	2.12	.....
26			1.76	3.78	5.00	3.32	1.94	2.10	2.20	2.05	2.18	.....
27			1.72	3.80	5.20	3.12	1.88	1.88	2.05	1.95	2.12	3.45
28			1.70	3.92	5.15	3.05	1.75	1.88	2.10	1.90	2.12	.....
29			1.79	4.95	5.12	3.10	1.88	1.92	2.10	1.88	2.08	.....
30			3.15	4.20	5.20	3.03	1.85	1.80	2.10	1.90	2.05	.....
31			3.59	.....	5.42	.....	1.75	2.12	.....	1.90	.....	2.95

NOTE.—Discharge relation affected by ice Jan. 1 to Mar. 23 and Dec. 18-31.

Daily discharge, in second-feet, of Piedra River at Arboles, Colo., for 1913.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	80	504	1,050	1,410	307	76	104	141	90	129
2	80	681	1,100	1,390	257	78	92	130	102	129
3	80	740	812	1,390	160	71	94	223	117	100
4	80	552	886	1,050	124	68	94	520	120	141
5	80	694	938	1,080	120	73	106	370	114	112
6	80	1,350	992	860	202	75	155	287	114	120
7	80	1,460	1,080	938	184	70	143	249	110	90
8	80	1,130	1,040	1,050	162	62	138	216	108	88
9	80	943	1,090	774	159	70	356	230	108	111
10	80	602	1,130	831	204	67	184	206	102	99
11	90	788	1,300	1,360	168	71	188	100	96	83
12	102	1,630	1,390	1,200	106	80	252	184	102	100
13	85	1,790	1,510	1,220	105	90	133	216	102	97
14	84	1,510	1,160	1,180	91	100	143	193	135	97
15	78	1,390	1,130	1,070	129	108	133	184	120	97
16	79	1,420	1,040	944	124	111	127	172	124	102
17	92	1,390	1,090	922	123	257	123	168	111	98
18	82	1,390	1,220	850	112	78	116	150	109	100
19	86	1,350	1,280	886	116	90	110	199	129	100
20	82	764	1,100	922	112	114	114	141	133	100
21	84	1,220	1,090	694	105	102	92	119	130	100
22	78	1,080	1,120	668	174	104	98	119	141	90
23	99	593	1,130	544	174	92	146	122	151	90
24	86	836	1,190	606	162	124	164	119	130	90
25	90	593	1,230	435	110	114	123	112	126	90
26	88	663	1,300	472	99	114	130	112	136	80
27	84	672	1,420	399	91	88	110	100	127	80
28	82	726	1,390	374	78	88	116	94	127	80
29	91	1,270	1,370	392	90	92	116	92	122	80
30	410	860	1,420	367	86	80	116	94	117	70
31	580	.....	1,550	.....	77	116	.....	94	.....	70

NOTE.—Discharge determined as follows: Mar. 1–23 and Dec. 18–31, estimated on account of ice; Mar. 24 to July 17, from a well-defined rating curve; July 18 to Dec. 17, by the indirect method for shifting channels; Aug. 12–14, interpolated.

Monthly discharge of Piedra River at Arboles, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	[a] 40.0	2,460	D.
February	.....	.....	[a] 70.0	3,890	D.
March	580	78	111	6,820	C.
April	1,790	504	1,020	60,700	A.
May	1,550	812	1,180	72,600	A.
June	1,410	367	876	52,100	A.
July	307	77	139	8,550	B.
August	257	62	94.3	5,800	B.
September	356	92	137	8,150	B.
October	520	92	176	10,800	B.
November	151	90	119	7,080	B.
December	141	70	97.2	5,980	C.
The year	1,790	.....	338	245,000	

[a] Estimated on account of ice.

LOS PINOS RIVER NEAR IGNACIO, COLO.

Location.—About sec. 8, T. 33 N., R. 7 W., at highway bridge near Ignacio Indian Agency, 1 mile north of Ignacio. Nearest tributary, a small stream that enters from the west 2 miles below.

Records available.—April 22, 1899, to October 31, 1903; September 1, 1910, to November 30, 1912; March 10 to December 31, 1913.

Drainage area.—450 square miles.

Gage.—Chain gage.

Control.—Shifting.

Discharge measurements.—Made from bridge or by wading.

Winter flow.—Discharge relation slightly affected by ice.

Diversion.—There are a number of diversions above the station for irrigation.

Accuracy.—Records only fair on account of shifting channel.

Discharge measurements of Los Pinos River near Ignacio, Colo., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 27	C. E. Turner	[a] 2.00	58	July 19	Frank O'Brien	0.52	20.2
Feb. 11	do	[a] 2.00	77	Sept. 26	do	.68	24.8
Mar. 10	Frank O'Brien	1.22	93.6	Oct. 15	do	1.95	212
Apr. 9	do	2.12	428	Nov. 14	do	1.71	159
May 6	do	3.31	1,080	Dec. 17	C. J. Emerson	1.50	133
June 9	do	3.04	753				

[a] Discharge relation affected by ice.

Daily gage height, in feet, of Los Pinos River near Ignacio, Colo., for 1913.

[Stephen Abbot, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		2.54	3.28	3.73	2.28	0.11	0.74	1.18	1.53	1.46
2		2.56	3.12	3.73	2.12	.10	.72	1.32	1.51	1.43
3		2.31	2.86	3.61	1.92	.08	.80	2.08	1.68	1.46
4		2.03	2.79	3.49	1.76	.08	.80	2.82	1.65	1.50
5		2.36	2.85	3.42	1.66	.08	.82	2.46	1.52	1.52
6		2.86	3.26	3.15	1.71	.07	1.61	2.43	1.49	1.54
7		2.80	3.36	3.12	1.51	.04	1.75	2.22	1.44	1.54
8		2.42	3.40	3.07	1.39	.04	2.06	2.12	1.42	1.55
9		2.20	3.27	3.02	1.14	.04	3.30	2.06	1.38	1.58
10	1.23	2.16	3.50	2.95	1.24	.04	2.94	2.06	1.36	1.52
11	1.26	2.24	3.81	3.59	1.27	.04	2.56	1.99	1.36	1.51
12	1.22	2.50	3.93	3.36	1.04	.05	2.34	1.92	1.37	1.49
13	1.00	2.75	3.98	3.11	.90	.16	2.09	1.95	1.46	1.44
14	.96	2.90	3.72	3.18	.77	1.56	1.90	2.00	1.71	1.43
15	.91	3.06	3.50	3.30	.67	.58	1.74	1.95	1.61	1.48
16	.92	3.18	3.41	3.38	.70	.41	1.59	1.89	1.57	1.59
17	1.00	3.35	3.62	3.24	1.16	.46	1.48	1.84	1.51	1.52
18	1.14	3.36	3.74	3.57	.52	.50	1.37	1.66	1.50	1.49
19	1.12	3.20	3.79	3.56	.55	.55	1.38	1.56	1.54	1.42
20	1.18	3.08	3.46	3.29	.62	.43	1.10	1.52	1.61	1.32
21	1.20	3.12	3.45	3.10	.77	.40	.99	1.46	1.61	1.25
22	1.21	2.99	3.41	2.93	1.26	1.34	1.10	1.42	1.62	1.28
23	1.15	2.82	3.83	2.92	1.88	1.04	1.48	1.44	1.47	1.38
24	1.09	2.74	3.93	2.88	1.17	.80	1.42	1.43	1.55	1.35
25	1.00	2.54	3.81	2.75	.88	.85	1.29	1.57	1.72	1.33
26	.92	2.50	3.93	2.68	.56	.59	1.36	1.69	1.61	1.52
27	.86	2.66	4.03	2.62	.39	.51	1.22	1.61	1.52	1.55
28	1.04	2.95	3.78	2.62	.36	.51	1.21	1.58	1.49	1.44
29	1.43	3.02	3.76	2.87	.27	.50	1.16	1.54	1.45	1.41
30	1.78	3.22	3.81	2.54	.20	.56	1.16	1.53	1.41	1.45
31	2.22	.....	3.55	.....	.15	.64	.....	1.52	.....	1.48

NOTE.—Discharge relation slightly affected by ice Dec. 19–31.

Daily discharge, in second-feet, of Los Pinos River near Ignacio, Colo., for 1913.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	458	1,030	1,230	420	1.0	30	71	124	119
2	.....	477	972	1,210	366	.9	28	90	120	114
3	.....	411	876	1,130	304	.7	35	246	152	119
4	.....	341	856	1,060	256	.7	35	458	146	126
5	.....	452	888	1,010	225	.7	37	349	122	129
6	.....	631	1,060	880	233	.5	148	338	117	135
7	.....	624	1,110	848	180	.2	178	279	109	135
8	.....	509	1,140	808	150	.2	253	253	106	136
9	.....	452	1,090	768	103	.2	635	238	100	142
10	95	452	1,200	720	116	.2	512	238	96	131
11	100	484	1,360	976	117	.1	390	220	96	131
12	93	576	1,420	884	79	.2	327	204	98	127
13	64	672	1,470	784	59	1.6	259	211	112	119
14	59	740	1,340	812	43	146	211	223	158	117
15	53	812	1,240	860	31	20	173	211	138	126
16	54	868	1,200	892	34	3.8	140	196	133	150
17	64	944	1,290	836	87	11	120	184	122	136
18	82	956	1,350	968	19	14	103	146	120	131
19	79	900	1,380	964	22	17	104	127	127	119
20	87	860	1,220	856	27	9.6	65	120	140	103
21	90	884	1,220	780	40	8.0	51	111	142	92
22	92	840	1,200	704	101	104	64	104	144	90
23	83	780	1,400	692	228	63	119	108	117	90
24	75	756	1,440	668	87	37	109	106	131	90
25	64	684	1,380	614	51	42	89	129	164	90
26	54	676	1,440	583	21	18	98	152	144	85
27	48	748	1,500	556	9.6	13	77	136	127	85
28	69	872	1,340	549	8.4	13	76	131	122	85
29	135	908	1,310	628	5.1	12	70	124	116	85
30	220	996	1,310	509	3.0	16	70	122	109	85
31	349	.....	1,170	.....	2.0	22	.....	120	.....	85

NOTE.—Discharge determined by the indirect method for shifting channels. Discharge estimated on account of ice Dec. 19–31.

Monthly discharge of Los Pinos River near Ignacio, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
March 10–31	349	48	95.9	4,180	C.
April	996	341	692	41,200	C.
May	1,500	856	1,230	75,600	C.
June	1,230	509	826	49,200	C.
July	420	2.0	111	6,820	C.
August	146	.1	18.8	1,160	C.
September	635	28	154	9,160	C.
October	458	71	185	11,400	C.
November	164	96	125	7,440	C.
December	150	85	113	6,950	C.
The period	1,500	.1	362	213,000	

ANIMAS RIVER AT DURANGO, COLO.

Location.—In the SW. ¼ SW. ¼ sec. 20, T. 35 N., R. 9 W., at the footbridge at the foot of Fourteenth Street in Durango, opposite power plant of San Juan Water & Power Co. Junction Creek enters about three-fourths mile above station and Lightner Creek about three-fourths mile below.

Records available.—June 20, 1901, to December 31, 1905; January 1, 1910, to December 31, 1913.

Drainage area.—694 square miles (measured on Hayden's atlas).

Gage.—Vertical staff. Automatic gage previous to March 24, 1913.

Control.—Liable to shift during high water.

Discharge measurements.—Made from bridge and from cable.

Winter flow.—Little if any backwater from ice.

Diversions.—Water is diverted above station for irrigation.

Floods.—The most severe flood in many years occurred the first week in October, 1911, when the river reached a maximum stage of 13.6 feet.

Accuracy.—Estimates of discharge for 1913 good.

Discharge measurements of Animas River at Durango, Colo., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 28	C. E. Turner	1.10	180	June 6	Frank O'Brien	3.44	2,090
Feb. 24	Frank O'Brien	1.10	184	July 5	do	2.52	1,060
Mar. 20	do	1.10	207	Aug. 16	do	1.47	340
Apr. 19	do	2.34	927	Oct. 14	do	1.78	533
May 10	do	3.34	2,020	Dec. 16	C. J. Emerson	1.17	235

Daily gage height, in feet, of Animas River at Durango, Colo., for 1913.

[P. V. Sheridan, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1.10	0.85	1.88	2.75	4.02	2.64	1.56	1.72	1.60	1.40	1.30
2	.....	1.10	.80	1.75	2.65	4.10	2.62	1.55	1.75	1.65	1.40	1.30
3	.....	1.10	.90	1.65	2.40	3.92	2.58	1.56	1.68	1.95	1.42	1.30
4	.....	1.10	1.00	1.58	2.35	3.74	2.42	1.55	1.61	2.18	1.44	1.30
5	.....	1.10	1.10	1.64	2.52	3.74	2.52	1.55	1.61	2.15	1.40	1.29
6	.....	1.10	1.10	1.78	2.86	3.38	2.32	1.54	1.75	2.04	1.40	1.25
7	.....	1.10	1.10	1.90	3.12	3.32	2.26	1.51	1.95	1.95	1.39	1.20
8	.....	1.10	1.15	1.75	3.14	3.32	2.20	1.50	2.12	1.90	1.35	1.20
9	.....	1.05	1.15	1.60	2.92	3.02	2.12	1.51	2.70	1.84	1.35	1.20
10	.....	1.05	1.15	1.52	3.32	3.14	2.18	1.50	2.61	1.80	1.35	1.20
11	.....	1.05	1.15	1.52	3.78	3.42	2.25	1.50	2.34	1.76	1.35	1.20
12	.....	1.05	1.15	1.68	3.86	3.30	2.12	1.56	2.18	1.75	1.35	1.20
13	.....	1.05	1.10	2.00	3.92	3.06	2.06	1.52	2.06	1.75	1.39	1.20
14	.....	1.05	1.00	2.42	3.44	3.10	1.92	1.50	1.98	1.70	1.40	1.20
15	.....	1.05	1.00	2.72	3.20	3.46	1.90	1.46	1.92	1.70	1.40	1.20
16	.....	1.05	1.00	2.62	3.34	3.68	1.99	1.45	1.84	1.70	1.40	1.16
17	.....	1.05	1.00	2.72	3.44	3.72	2.15	1.45	1.75	1.70	1.36	1.15
18	.....	1.05	1.10	2.50	3.62	3.86	2.16	1.41	1.61	1.69	1.31	1.19
19	.....	1.00	1.12	2.35	3.66	3.72	2.06	1.40	1.61	1.62	1.30	1.16
20	.....	1.00	1.15	2.42	3.32	3.78	2.18	1.40	1.61	1.60	1.32	1.12
21	.....	1.00	1.10	2.45	3.10	3.52	2.22	1.48	1.55	1.59	1.30	.....
22	.....	1.00	1.13	2.40	3.30	3.35	2.25	1.61	1.52	1.55	1.30	.....
23	.....	.95	1.10	2.30	3.80	3.20	2.37	1.58	1.70	1.55	1.30	1.10
24	.....	1.00	1.00	2.10	3.95	3.14	2.30	1.61	1.58	1.51	1.30	.....
25	.....	.85	1.00	1.90	3.92	3.08	2.15	1.76	1.50	1.50	1.30	.....
26	.....	.95	.95	1.92	4.34	3.00	1.98	1.68	1.50	1.46	1.30	.....
27	.....	.85	1.02	2.10	4.48	3.00	1.88	1.60	1.50	1.42	1.30	1.05
28	1.10	.90	1.12	2.32	4.28	3.00	1.78	1.56	1.51	1.40	1.30	.....
29	.....	.....	1.15	2.60	4.14	3.06	1.70	1.56	1.58	1.40	1.30	.....
30	.....	.....	1.30	2.78	4.22	2.82	1.64	1.65	1.60	1.40	1.30	1.00
31	.....	.....	1.52	.....	4.00	.....	1.60	1.70	.....	1.40	.....	.....

NOTE.—Discharge relation slightly affected by ice Dec. 20–31.

Daily discharge, in second-feet, of Animas River at Durango, Colo., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	180	106	630	1,310	2,920	1,210	398	493	420	315	265
2	.....	180	94	538	1,220	3,050	1,190	392	512	450	315	265
3	.....	180	119	468	1,000	2,760	1,150	398	468	652	325	265
4	.....	180	152	426	960	2,490	1,020	392	426	825	335	265
5	.....	180	188	462	1,100	2,490	1,100	392	426	802	315	265
6	.....	180	188	552	1,420	2,000	936	387	512	720	315	247
7	.....	180	192	630	1,690	1,920	888	370	652	652	310	247
8	.....	180	212	526	1,710	1,920	840	365	780	615	290	247
9	.....	162	212	432	1,480	1,580	780	370	1,260	573	290	247
10	.....	162	216	387	1,920	1,710	825	365	1,180	545	290	247
11	.....	162	216	381	2,550	2,050	880	365	952	519	290	247
12	.....	162	216	474	2,670	1,900	780	398	825	512	290	247
13	.....	162	200	698	2,760	1,630	735	376	735	512	310	247
14	.....	162	162	1,020	2,070	1,670	630	365	675	480	315	247
15	.....	162	162	1,280	1,780	2,100	615	345	630	480	315	247
16	.....	162	166	1,190	1,950	2,400	682	340	573	480	315	229
17	.....	162	166	1,280	2,070	2,460	802	340	512	480	295	224
18	.....	162	204	1,080	2,320	2,670	810	320	426	474	270	242
19	.....	145	216	960	2,370	2,460	735	315	426	432	265	229
20	.....	145	229	1,020	1,920	2,550	825	315	426	420	275	212
21	.....	145	208	1,040	1,670	2,180	856	355	392	414	265	208
22	.....	145	216	1,000	1,900	1,960	880	426	376	392	265	204
23	.....	130	204	920	2,580	1,780	976	409	480	392	265	200
24	.....	145	166	765	2,810	1,710	920	426	409	370	265	195
25	.....	104	166	615	2,760	1,650	802	519	365	365	265	190
26	.....	130	145	630	3,460	1,560	675	468	365	345	265	185
27	.....	104	170	765	3,700	1,560	601	420	365	325	265	180
28	180	116	208	936	3,360	1,560	532	398	370	315	265	175
29	.....	.....	220	1,170	3,120	1,630	480	398	409	315	265	170
30	.....	.....	285	1,340	3,250	1,380	444	450	420	315	265	162
31	.....	.....	398	.....	2,890	.....	420	480	.....	315	.....	160

NOTE.—Discharge determined from a well-defined rating curve Feb. 1–28 and Apr. 15 to Dec. 4; by the indirect method for shifting channels Mar. 1 to Apr. 14 and Dec. 5–19; estimated on account of ice Dec. 20–31.

Monthly discharge of Animas River at Durango, Colo., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	[a] 150	9,220	D.
February	180	104	162	9,000	A.
March	398	94	194	11,900	B.
April	1,340	381	787	46,800	B.
May	3,700	960	2,190	135,000	A.
June	3,050	1,380	2,060	123,000	A.
July	1,210	420	807	49,600	A.
August	519	315	389	23,900	A.
September	1,260	365	561	33,400	A.
October	825	315	481	29,600	A.
November	335	265	290	17,300	A.
December	265	160	225	13,800	C.
The year	3,700	94	692	503,000	

[a] Estimated.

ANIMAS RIVER AT AZTEC, N. MEX.

Location.—In sec. 9, T. 30 N., R. 11 W., about one-half mile west of Aztec, 200 feet upstream from suspension bridge on main wagon road to Farmington and La Plata; 20 miles above mouth of river and below all important tributaries.

Records available.—June 21 to December 14, 1904; June 8, 1907, to December 31, 1913.

Gage.—Chain gage installed May 31, 1913. From June 21, 1904, to September 13, 1908, gage about one-half mile downstream was used; datum unchanged from September 14, 1908, to December 31, 1913.

Control.—Shifts during high water.

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

Winter flow.—Ice causes slight backwater during winter.

Diversions.—Considerable water taken out above and blow station for irrigation. The Aztec Light & Power Co. diverts water just above station; amount of diversion measured. (See p. 193.)

Accuracy.—Estimates for first part of 1913 good; for last part only fair.

Discharge measurements of Animas River at Aztec, N. Mex., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 20	C. J. Emerson	[a] 3.46	301	July 22	Frank O'Brien	[b] 4.70	769
Feb. 25	Frank O'Brien	3.30	200	Aug. 19	do	[b] 3.87	107
Mar. 27	do	3.26	185	Sept. 4	do	[b] 4.22	286
Apr. 30	do	4.70	1,390	Oct. 7	do	[b] 4.18	702
May 30	do	6.67	4,190	Nov. 12	do	3.53	265
June 25	do	5.10	1,830	Dec. 15	C. J. Emerson	3.42	196

[a] Discharge relation affected by ice.
[b] Discharge relation affected by backwater from temporary diversion dam.

Daily gage height, in feet, of Animas River at Aztec, N. Mex., for 1913.

[W. G. Black, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.3	3.5	3.3	4.5	5.1	6.7	4.8	3.95	4.3	3.75	3.55	3.55
2	3.3	3.3	3.3	4.5	4.8	6.85	4.75	3.85	4.3	3.9	3.55	3.6
3	3.3	3.3	3.3	4.2	4.6	6.8	4.55	3.9	4.3	4.4	3.65	3.6
4	3.4	3.3	3.3	4.1	4.4	6.2	4.5	3.85	4.25	4.55	3.75	3.55
5	3.5	3.3	3.4	4.2	4.3	6.1	4.2	3.85	4.35	4.35	3.65	3.55
6	3.5	3.3	3.3	4.4	4.9	6.2	4.15	3.8	4.45	4.25	3.6	3.55
7	3.5	3.3	3.3	4.4	5.2	6.1	4.05	3.75	4.75	4.2	3.6	3.55
8	4.5	3.4	3.3	4.3	5.4	5.9	4.15	3.7	4.8	4.15	3.65	3.55
9	3.5	3.4	3.4	4.2	5.0	5.4	4.1	4.0	4.8	4.1	3.65	3.5
10	3.5	3.4	3.5	3.8	5.5	5.3	4.05	3.95	4.95	4.0	3.65	3.5
11	3.5	3.4	3.6	3.8	6.1	5.8	4.05	3.95	4.6	3.95	3.6	3.5
12	3.5	3.4	3.5	3.9	6.3	5.6	3.95	3.9	4.5	3.9	3.55	3.5
13	3.7	3.4	3.5	4.3	6.4	5.55	4.0	4.25	4.25	3.9	3.6	3.5
14	3.7	3.4	3.4	4.7	5.8	5.4	4.0	4.1	4.15	3.9	3.8	3.5
15	3.3	3.4	3.4	4.8	5.4	5.8	4.05	4.05	4.05	3.9	3.75	3.5
16	3.3	3.4	3.4	5.0	5.2	6.2	4.25	3.95	3.95	3.85	3.65	3.5
17	3.3	3.4	3.3	5.2	5.4	6.25	4.15	3.9	3.9	3.8	3.6	3.4
18	3.3	3.4	3.4	4.8	5.8	6.5	4.3	3.85	3.8	3.8	3.55	3.4
19	3.4	3.4	3.4	4.6	6.2	6.2	4.45	3.85	3.75	3.75	3.55	3.4
20	3.6	3.3	3.5	4.6	5.8	6.2	4.55	3.85	3.7	3.75	3.6	.....
21	3.4	3.3	3.5	4.7	6.0	6.05	5.5	3.85	3.65	3.75	3.6	.....
22	3.4	3.3	3.5	4.6	5.6	5.6	4.7	4.3	3.6	3.75	3.55	4.2
23	3.4	3.2	3.5	4.5	6.2	5.45	4.95	4.2	3.75	3.7	3.55	4.25
24	3.4	3.3	3.5	4.2	6.4	5.45	4.8	4.25	3.8	3.7	3.55	4.6
25	3.3	3.3	3.2	4.2	6.2	5.2	4.6	4.5	3.85	3.65	3.65	4.65
26	3.3	3.3	3.2	4.0	6.5	5.15	4.45	4.5	3.8	3.6	3.6	4.6
27	3.4	3.3	3.3	3.9	6.6	5.3	4.45	4.35	3.75	3.6	3.55	4.6
28	3.4	3.3	3.3	4.2	.....	5.1	4.25	4.1	3.8	3.6	3.55	4.2
29	3.4	.....	3.5	4.6	.....	5.05	4.25	4.3	3.8	3.6	3.55	4.2
30	3.4	.....	3.7	5.2	6.7	4.95	3.95	4.25	3.7	3.55	3.55	4.4
31	3.4	.....	4.2	.....	6.3	.....	3.95	4.25	.....	3.55	.....	4.2

NOTE.—Discharge relation affected by ice Jan. 1 to Feb. 5 and Dec. 20-31; average thickness of ice in January, 0.75 foot. Discharge relation affected by backwater from temporary diversion dam July 21 to about Nov. 1.

Daily discharge, in second-feet, of Animas River at Aztec, N. Mex., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	160	330	205	1,190	1,840	4,240	1,500	178	330	365	265	265
2	160	205	205	1,190	1,500	4,500	1,440	128	330	475	265	298
3	160	205	205	900	1,290	4,410	1,240	150	330	900	330	298
4	180	205	205	810	1,090	3,410	1,190	128	298	1,040	400	265
5	220	205	265	900	995	3,250	900	128	365	855	330	265
6	220	205	205	1,090	1,610	3,410	855	95	515	765	298	265
7	220	205	205	1,090	1,960	3,250	765	75	765	720	298	265
8	220	265	205	995	2,220	2,950	855	60	810	678	330	265
9	220	265	265	900	1,720	2,220	810	178	810	635	330	235
10	220	265	330	555	2,360	2,090	765	150	948	555	330	235
11	220	265	400	555	3,250	2,800	765	150	720	515	298	235
12	220	265	330	635	3,570	2,500	678	128	635	475	265	235
13	260	265	330	995	3,730	2,430	720	330	438	475	298	235
14	260	265	265	1,390	2,800	2,220	720	235	365	475	438	235
15	205	265	265	1,500	2,220	2,800	765	205	298	475	400	235
16	205	265	265	1,720	1,960	3,410	948	150	298	438	330	235
17	205	265	205	1,960	2,220	3,490	855	128	265	400	298	178
18	205	265	265	1,500	2,800	3,900	995	105	205	400	265	178
19	265	265	265	1,290	3,410	3,410	1,140	105	178	365	265	178
20	300	205	330	1,290	2,800	3,410	1,240	105	150	365	298	180
21	265	205	330	1,390	3,100	3,180	1,560	95	178	365	298	180
22	265	205	330	1,290	2,500	2,500	765	330	150	365	265	180
23	265	150	330	1,190	3,410	2,290	995	265	235	330	265	180
24	265	205	330	900	3,730	2,290	855	298	265	330	265	200
25	205	205	150	900	3,410	1,960	678	475	298	298	330	200
26	205	205	150	720	3,900	1,900	515	475	330	298	298	200
27	265	205	205	635	4,070	2,090	515	365	298	298	265	200
28	265	205	205	900	5,000	1,840	365	205	330	298	265	200
29	265	.....	330	1,290	4,000	1,780	365	330	330	298	265	200
30	265	.....	475	1,960	4,240	1,660	178	298	265	265	265	200
31	265	.....	900	.....	3,570	.....	178	298	.....	265	.....	200

NOTE.—Discharge determined as follows: Jan. 1 to Feb. 5 and Dec. 20–31, estimated on account of ice; Feb. 6 to July 20, from a well-defined rating curve; July 21 to Dec. 19, by the indirect method for shifting channels. Discharge interpolated for days for which gage heights are missing.

Monthly discharge of Animas River at Aztec, N. Mex., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	300	160	230	14,100	C.
February	330	150	233	12,900	C.
March	900	150	289	17,800	B.
April	1,960	555	1,120	66,600	B.
May	5,000	995	2,780	171,000	B.
June	4,500	1,660	2,850	170,000	B.
July	1,560	178	842	51,800	B.
August	475	60	205	12,600	C.
September	948	150	391	23,300	C.
October	1,040	265	477	29,300	C.
November	438	265	304	18,100	C.
December	298	178	223	13,700	C.
The year	5,000	60	830	601,000	

AZTEC LIGHT & POWER CO.'S CANAL AT AZTEC, N. MEX.

The Aztec Light & Power Co.'s canal diverts water from the Animas River just above the gaging station. (See p. 192.)

Discharge measurements of Aztec Light & Power Co.'s canal for 1913.

Date.	Made by—	Discharge.	Date.	Made by—	Discharge.
		Sec.-ft.			*Sec.-ft.*
Feb. 25	Frank O'Brien	42.8	Aug. 19	Frank O'Brien	72.9
Mar. 27	do	41.2	Sept. 4	do	84.6
Apr. 30	do	60.1	Oct. 7	do	84.0
May 30	do	67.8	Nov. 12	do	64.5
June 25	do	50.1	Dec. 15	C. J. Emerson	60.5
July 22	do	88.0			

ANIMAS RIVER AT FARMINGTON, N. MEX.

Location.—In sec. 15, T. 29 N., R. 13 W., about three-fourths mile east of Farmington; one-fourth mile above the confluence of Animas and San Juan rivers.
Records available.—September 17, 1912, to December 31, 1913.
Drainage area.—Not measured.
Gage.—Automatic recording.
Control.—Practically permanent.
Discharge measuremnts.—Made by wading or from car and cable.
Winter flow.—Ice causes backwater during winter.
Diversions.—Considerable water is taken from the stream above station.
Accuracy.—Estimates good.

Discharge measurements of Animas River at Farmington, N. Mex., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 21	C. J. Emerson	[a]1.40	205	July 23	F. O'Brien	2.24	840
Feb. 26	F. O'Brien	1.38	265	Aug. 18	do	.80	89.7
Mar. 22	do	1.57	360	Sept. 3	do	1.46	292
Apr. 29	do	2.40	976	Oct. 6	do	2.30	894
May 29	do	3.88	3,230	Nov. 11	do	1.50	317
June 24	do	3.00	1,690	Dec. 13	C. J. Emerson	[a]1.52	355

[a] Discharge relation affected by ice.

Daily gage height, in feet, of Animas River at Farmington, N. Mex., for 1913.

[Mrs. G. H. Bergen, observer.]

Date.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.27	1.85	1.33	2.22	2.78	3.96	2.64	1.54	1.45	1.80	1.59	1.63
2	1.24	1.82	1.34	2.35	2.79	4.02	2.49	1.38	1.49	1.94	1.55	1.63
3	1.17	1.88	1.36	2.30	2.62	3.93	2.39	1.36	1.49	3.36	1.66	1.62
4	1.17	1.82	1.42	2.02	2.41	3.63	2.31	1.30	1.54	3.07	1.96	1.67
5	1.21	1.70	1.42	1.96	2.32	3.51	2.23	1.24	1.66	2.36	1.66	1.68
6	1.30	1.85	1.41	2.13	2.57	3.27	2.18	1.17	1.66	2.34	1.62	1.66
7	1.38	1.83	1.46	2.28	2.93	3.16	2.16	1.05	1.86	2.23	1.61	1.53
8	1.46	1.75	1.35	2.13	3.09	3.15	2.10	1.00	2.08	2.13	1.61	1.52
9	1.54	1.73	1.32	1.95	2.98	3.07	2.05	.95	2.82	2.05	1.57	1.52
10	1.60	1.70	1.34	1.85	2.82	2.88	2.14	.83	2.82	2.05	1.54	1.51
11	1.70	1.67	1.43	1.80	3.16	3.24	2.12	.80	2.55	2.00	1.54	1.49
12	1.71	1.65	1.46	1.83	3.88	3.26	2.01	.75	2.46	2.01	1.55	1.40
13	1.72	1.65	1.42	2.01	3.91	3.16	2.00	.79	2.37	2.03	1.57	1.33
14	1.61	1.60	1.36	2.36	3.80	2.95	1.91	.94	2.21	2.00	1.75	1.36
15	1.57	1.50	1.40	2.76	3.34	3.21	1.86	.88	2.14	2.00	1.65	1.41
16	1.58	1.55	1.35	2.87	3.22	3.48	1.84	.84	2.03	1.99	1.57	1.50
17	1.68	1.60	1.32	2.94	3.29	3.60	1.90	.73	1.96	1.97	1.54	1.50
18	1.78	1.60	1.38	2.98	3.46	3.72	1.93	.73	1.84	1.80	1.54	1.52
19	1.82	1.55	1.40	2.82	3.62	3.70	2.00	.71	1.79	1.82	1.57	1.50
20	1.83	1.50	1.48	2.68	3.54	3.61	2.17	.68	1.73	1.81	1.59	1.40
21	1.70	1.45	1.46	2.71	3.22	3.49	2.21	.68	1.74	1.79	1.62	1.23
22	1.73	1.35	1.55	2.62	3.17	3.30	2.33	.76	1.69	1.78	1.56	1.23
23	1.73	1.30	1.45	2.58	3.55	3.16	2.23	1.06	1.77	1.74	1.55	1.26
24	1.90	1.30	1.43	2.35	3.96	3.04	2.35	1.27	1.93	1.73	1.52	1.29
25	1.95	1.35	1.48	2.05	3.82	2.99	2.20	1.59	1.89	1.70	1.65	1.34
26	1.85	1.38	1.38	2.05	4.01	2.84	2.10	1.70	1.88	1.69	1.64	1.38
27	1.80	1.40	1.35	2.07	4.25	2.83	2.02	1.69	1.86	1.67	1.61	1.40
28	1.85	1.35	1.35	2.26	4.16	2.82	1.89	1.43	1.85	1.61	1.59	1.40
29	1.83	.....	1.50	2.50	3.92	2.96	1.78	1.40	1.81	1.60	1.61	1.40
30	1.90	.....	1.75	2.70	3.96	2.82	1.70	1.44	1.80	1.60	1.63	1.40
31	1.90	.....	2.12	.....	3.92	.....	1.64	1.45	.....	1.60	.....	1.40

NOTE.—Discharge relation affected by ice Jan. 1–Feb. 3, Dec. 11–15 and 20–31. Average thickness of ice in January, 0.4 foot.

Daily discharge, in second-feet, of Animas River at Farmington, N. Mex., for 1912–13.

[G. H. Bergen, observer.]

Day.	Sept.	Oct.	Nov.	Dec.	Day.	Sept.	Oct.	Nov.	Dec.
1912.					16		372	366	225
1		276	445	336	17	331	377	361	200
2		276	416	316	18	336	388	356	200
3		284	416	312	19	326	399	351	200
4		280	410	302	20	316	394	336	200
5		280	410	294	21	316	388	326	230
6		382	416	300	22	307	382	326	200
7		445	399	295	23	307	377	336	180
8		433	394	280	24	307	372	331	180
9		421	377	270	25	298	366	326	195
10		427	361	270	26	289	366	316	200
11		421	366	260	27	284	377	331	220
12		372	366	250	28	289	451	341	180
13		372	361	240	29	280	514	321	170
14		372	351	240	30	280	534	321	180
15		366	361	230	31		507		190

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1913.												
1	219	421	242	808	1,410	3,360	1,240	336	294	481	361	382
2	208	433	246	930	1,430	3,480	1,070	263	312	576	341	382
3	183	500	254	880	1,210	3,310	970	255	312	2,300	399	377
4	183	494	280	636	990	2,760	890	230	536	1,820	591	404
5	197	421	280	590	900	2,560	817	208	399	940	399	410
6	230	514	276	727	1,160	2,150	772	183	399	920	377	399
7	263	501	298	862	1,620	1,970	754	146	521	817	372	331
8	276	451	250	727	1,860	1,950	700	131	684	727	372	326
9	289	439	238	584	1,690	1,820	660	118	1,470	660	351	326
10	294	421	246	514	1,470	1,550	736	91	1,470	660	336	321
11	316	404	284	481	1,970	2,100	718	85	1,140	620	336	312
12	322	394	298	501	3,210	2,130	628	76	1,040	628	341	294
13	326	394	280	628	3,270	1,970	620	83	950	644	351	263
14	276	366	254	940	3,070	1,650	554	116	799	620	451	276
15	259	316	271	1,390	2,270	2,050	521	102	736	620	394	298
16	263	341	250	1,540	2,060	2,510	507	93	644	613	351	316
17	307	366	238	1,640	2,180	2,710	547	72	592	598	336	316
18	356	366	263	1,690	2,470	2,930	569	72	507	481	336	326
19	377	341	271	1,470	2,750	2,890	620	69	475	494	351	315
20	382	316	307	1,290	2,610	2,730	763	64	439	488	361	271
21	316	294	298	1,320	2,060	2,520	799	64	445	475	377	204
22	331	250	341	1,210	1,980	2,200	910	78	417	469	346	204
23	331	230	294	1,170	2,620	1,970	817	148	463	445	341	215
24	421	230	284	930	3,360	1,780	930	219	569	439	326	226
25	451	250	307	660	3,110	1,710	790	361	540	421	394	246
26	394	263	263	660	3,460	1,500	700	421	534	417	388	263
27	366	271	250	676	3,940	1,480	636	416	521	404	372	271
28	394	250	250	844	3,760	1,470	540	284	514	372	361	271
29	282	.....	316	1,080	3,290	1,660	469	271	488	366	372	271
30	421	.....	451	1,310	3,360	1,470	421	289	481	366	382	271
31	421	.....	718	.....	3,290	.....	388	294	.....	366	.....	271

NOTE.—Discharge determined from a well-defined rating curve. Discharge estimated on account of ice Dec. 6, 1912, to Feb. 3, 1913; and Dec. 11–15 and 20–31, 1913.

Monthly discharge of Animas River at Farmington, N. Mex., for 1912–13.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1912.					
September 17–30	336	280	305	8,470	A.
October	534	276	386	23,700	A.
November	445	316	363	21,600	A.
December	336	170	237	14,600	C.
The period				68,400	
1913.					
January	451	183	311	19,100	C.
February	514	230	366	20,300	B.
March	718	238	293	18,000	A.
April	1,690	481	956	56,900	A.
May	3,940	900	2,380	146,000	A.
June	3,480	1,470	2,210	132,000	A.
July	1,240	388	711	43,700	A.
August	421	64	182	11,200	A.
September	1,470	294	623	37,100	A.
October	2,300	366	653	40,200	A.
November	591	326	372	22,100	A.
December	410	204	302	18,600	C.
The year	3,940	64	781	565,000	

HERMOSA CREEK NEAR HERMOSA, COLO.

Location.—In sec. 34, T. 37 N., R. 9 W., 1½ miles above Hermosa post office, which is at the mouth of the stream, in the San Juan National Forest. Nearest tributary, Buck Creek, enters 200 yards above; no tributaries below.

Record available.—November 28, 1911, to June 30, 1912; April 11 to December 31, 1913.

Drainage area.—172 square miles (measured on topographic sheets).

Gage.—Vertical staff; read once daily.

Control.—Somewhat shifting during high water.

Discharge measurements.—Made from bridge 1 mile below station or by wading.

Winter flow.—So far as known ice causes little or no backwater at station.

Diversions.—None above station.

Accuracy.—Owing to the high altitude of the drainage basin it is probable that at certain seasons alternate melting and freezing cause considerable diurnal fluctuation; mean daily stages based on one gage height may be considerably in error; estimates only fair.

Discharge measurements of Hermosa Creek near Hermosa, Colo., for 1913.

[Made by Frank O'Brien.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
May 12	3.50	524	Sept. 7	1.95	52
June 4	2.95	238	Nov. 7	1.75	34

Daily gage height, in feet, of Hermosa Creek near Hermosa, Colo., for 1913.

[Ralph R. Shaw, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1						1.9			1.79
2						1.93	2.15	1.77	
3			3.0		1.85			1.8	
4			2.95		1.84				
5			2.9		1.83	1.86	2.3		
6			2.8		1.80	2.18	2.17		
7		3.15	2.75			2.23	2.0	1.75	
8		3.25	2.78			2.35			
9		3.25	2.79	2.09		2.4			
10		3.35	2.8	2.1					1.75
11	2.35	3.45	3.15	2.07					
12	2.35	3.5		2.08					
13	2.85	3.45				2.0			
14						1.94			
15									
16	2.95								
17	2.95				1.75				1.75
18	3.25	3.35							
19	2.95	3.3			1.73		1.75		
20		3.3		2.2	1.76				
21		3.3			1.8	1.91			
22	2.95	3.15			1.86				
23	2.9	3.25	2.55		1.9			1.8	
24	2.85				1.92				
25	2.75						1.7	1.75	
26	2.85						1.65	1.78	
27	3.05					1.92			
28	3.1					1.9	1.75		
29	3.2	3.25				1.89	1.77	1.75	
30	3.45	3.25		1.9	1.85	1.9	1.76	1.77	
31		3.25		1.9	1.87				1.7

NOTE.—Discharge relation affected slightly if at all by ice during December.

Daily discharge, in second-feet, of Hermosa Creek near Hermosa, Colo., for 1913.

Day.	Apr.	May	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1						46			36
2						49	76	35	
3			265		42				
4			249		41			37	
5			233		40	42	97		
6			204		37	79	78		
7		322	191			86	57	33	
8		367	199			106			
9		367	201	68		114			
10		418	204	69					33
11	106	475	322	65					
12	106	505		67					
13	218	475				57			
14						50			
15									
16	249								
17	249				33				33
18	367	418							
19	249	391			31		33		
20		391		82	34				
21		391			37	47			
22	249	322			42				
23	233	367	144		46			37	
24	218				48				
25	191						29	33	
26	218						26	35	
27	283					48			
28	301					46	33		
29	343	367				45	35	33	
30	475	367		46	42	46	34	35	
31		367		46	43				29

NOTE.—Discharge determined from a rating curve fairly well defined between 25 and 1,500 second-feet.

LA PLATA RIVER NEAR LA PLATA, N. MEX.

Location.—In sec. 14, T. 31 N., R. 13 W., at William's ranch house, 1 mile south of La Plata; 15 miles above the mouth of the river and below all tributaries.

Records available.—May 25, 1905, to July 21, 1911; September 15, 1912, to December 31, 1913, when station was discontinued.

Drainage area.—About 340 square miles.

Gage.—Chain gage; referred to datum of old gage used prior to July 21, 1911, attached to highway bridge 300 feet below present site. There is 1.2 feet fall between the two points and all gage heights since September 15, 1912, have been corrected by this amount.

Control.—Shifting.

Discharge measurements.—Made by wading.

Winter flow.—Discharge relation slightly affected by ice during the winter.

Diversions.—Nearly all the normal flow is diverted for irrigation above station.

Estimates of discharge withheld on account of shifting channel and lack of data.

Discharge measurements of La Plata River near La Plata, N. Mex., for 1913.

[Made by Frank O'Brien.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
Apr. 30	2.36	84.8
May 30	1.00	a.5

a Estimated.

Daily gage height, in feet, of La Plata River near La Plata, N. Mex., for 1913.

[Frank Williams, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.3	1.6	1.0	4.1	2.35	1.0	.....	.....	.....	1.1	1.5	1.6
2	1.3	1.7	1.1	3.1	2.2	1.0	.....	.....	1.0	1.1	2.5	1.6
3	1.3	1.7	1.1	2.7	2.2	1.0	.....	.....	1.1	1.7	2.4	1.6
4	1.2	1.5	1.1	1.5	2.15	1.0	.....	.....	1.1	2.45	1.8	1.6
5	1.1	1.45	1.1	1.2	1.9	1.0	.....	.....	1.1	1.5	1.7	1.6
6	1.2	1.2	1.2	2.4	1.95	1.0	.....	.....	1.7	1.4	1.65	1.6
7	1.2	1.1	1.2	2.4	1.8	1.0	.....	.....	1.25	1.6	1.65	1.6
8	1.2	1.1	1.1	2.3	1.9	1.0	.....	.....	1.25	1.6	1.65	1.6
9	1.3	1.0	1.3	2.3	1.95	.95	.....	.....	2.7	1.6	1.65	1.6
10	1.2	1.15	1.3	2.2	1.8	.95	.....	.....	1.1	1.6	1.65	1.6
11	1.4	1.15	1.3	2.3	2.0	.95	.....	.....	1.1	1.6	1.6	1.6
12	1.4	1.25	1.7	2.2	1.9	.95	.....	2.35	1.1	1.65	1.6	1.6
13	1.4	1.25	1.7	2.3	2.05	.95	.....	1.95	1.1	1.65	1.6	1.6
14	1.4	1.15	1.6	2.3	1.95	.95	.....	2.0	1.1	1.65	1.8	1.6
15	1.3	1.25	1.5	2.25	1.45	.95	.....	1.2	1.1	1.65	1.6	1.6
16	1.4	1.25	1.6	2.35	1.35	.95	.....	.....	1.1	1.65	1.6	1.6
17	1.45	1.3	1.65	2.3	1.25	.95	.....	.....	1.1	1.65	1.6	1.6
18	1.45	1.2	1.4	2.5	1.3	.95	2.5	.....	1.1	1.65	1.6	1.6
19	1.45	1.0	1.5	2.5	1.3	.....	1.0	.....	1.1	1.65	1.65	1.6
20	1.35	1.3	1.5	2.2	1.2	.....	1.0	.....	1.1	1.65	1.65	1.6
21	1.45	1.3	1.5	2.3	1.1	.....	1.0	.....	1.1	1.65	1.6	1.6
22	1.45	1.2	1.4	2.15	.95	.....	1.0	.....	1.1	1.5	1.6	1.6
23	1.45	1.3	1.3	2.3	1.05	.....	1.0	.....	1.1	1.5	1.6	1.6
24	1.45	1.3	1.3	2.3	1.05	.....	1.0	.....	1.2	1.5	1.6	1.6
25	1.4	1.2	1.35	2.2	.95	.....	1.0	.....	1.2	1.5	1.6	1.6
26	1.5	1.3	1.3	2.3	1.05	.....	1.0	.....	1.1	1.5	1.6	1.6
27	1.5	1.2	1.4	2.2	.95	.....	.....	.....	1.1	1.5	1.6	1.6
28	1.5	1.2	1.4	2.35	1.2	.....	.....	.....	1.1	1.5	1.6	1.6
29	1.5	.....	1.5	2.35	1.05	.....	.....	.....	1.1	1.5	1.6	1.6
30	1.45	.....	1.6	2.3	.....	.....	.....	.....	1.1	1.5	1.6	1.6
31	1.55	.....	1.7	.....	1.0	.....	.....	.....	.....	1.5	.....	1.6

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

LITTLE COLORADO RIVER BASIN.

ZUNI RIVER AT BLACK ROCK, N. MEX.

Location.—At reservoir of Zuni Indian Reservation at Black Rock. Rio de Los Nutrias, nearest important tributary, enters from the north about 4 miles above.

Records available.—Yearly flow, July 1, 1903, to June 30, 1905; July 1, 1908, to June 30, 1910. Monthly flow, October 1, 1910, to December 31, 1913. The reservoir was completed in 1908, and since July 1 of that year the record shows the inflow into reservoir.

Drainage area.—Approximately 660 square miles.

Method of collecting data.—From July 1, 1903, to June 30, 1905, the records were obtained by the ordinary methods of stream gaging. Beginning July 1, 1908, a gage in the reservoir was used and the inflow was determined from a capacity curve for the reservoir, the amount of water released from the reservoir during the periods of inflow being taken into consideration.

Floods.—During the greater part of the year stream is dry below point where it leaves the mountains, but is subject to sudden floods of considerable volume and generally of short duration. An account of the flood of September 6, 1909, which damaged the reservoir, is given in Water-Supply Paper 269, pages 206 to 210.

Diversion.—There is a reservoir at Ramah, about 18 miles above the station, capacity given as 4,240 acre-feet, which is used to irrigate about 1,150 acres in T. 11 N., R. 16 W. There are other small ponds or reservoirs in the drainage area.

Cooperation.—Entire record furnished by Office of Indian Affairs through H. F. Robinson, superintendent of irrigation, Albuquerque, N. Mex.

Yearly run-off of Zuni River at Black Rock, N. Mex., for the years ending June 30, 1904, 1905, 1909, 1910.

Month.	Run-off (total in acre-feet).	Month.	Run-off (total in acre-feet).
1903–4	14,000	1908–9	12,700
1904–5	91,600	1909–10	11,200

NOTE.—The run-off for 1905 to 1908 was estimated by engineers of the Office of Indian Affairs as follows: 1905–6, 2,500 acre-feet; 1906–7, 3,000 acre-feet; 1907–8, 5,600 acre-feet.

Monthly run-off of Zuni River at Black Rock, N. Mex., for 1910–1913.

Month.	Run-off (total in acre-feet).	Month.	Run-off (total in acre-feet.
1910.		1912.	
October	0	May	0
November	0	June	0
December	0	July	1,800
		August	1,100
The period	0	September	0
1911.		October	380
January	1,340	November	0
February	1,200	December	0
March	5,200		
April	0	The year	4,030
May	0	1913.	
June	0	January	0
July	8,820	February	90
August	1,665	March	1,380
September	760	April	1,470
October	1,340	May	0
November	50	June	0
December	0	July	1,380
		August	300
The year	20,400	September	3,480
1912.		October	2,200
January	0	November	120
February	0	December	50
March	350		
April	400	The year	10,500

NOTE.—Entire record furnished by the Office of Indian Affairs and shows the flow into the Zuni reservoir beginning July 1, 1908.

VIRGIN RIVER BASIN.

VIRGIN RIVER AT VIRGIN, UTAH.

Location.—In sec. 23, T. 41 S., R. 12 W., 600 feet below mouth of North Creek; one-half mile east of Virgin.

Records available.—April 18, 1909, to December 31, 1913.

Drainge area.—1,010 square miles.

Gage.—Inclined staff.

Control.—Shifting.

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

Floods.—The highest flood for which records have been obtained at this point occurred October 27, 1912; discharge, 12,000 second-feet. A flood in August, 1909, for which no accurate data were obtained, probably equaled or exceeded that of October 27, 1912.

Winter flow.—Ice occasionally forms to a slight extent during winter.

Diversions.—No large diversions above station, but there are a number of small ditches. Records show very closely the total run-off of the Virgin River drainage above station.

Accuracy.—Records fair, except during extremely high water.

Discharge measurements of Virgin River at Virgin, Utah, for 1913.

Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 12	Leonard Tanner	3.10	347
May 14	....do	2.90	212
July 31	Lynn Crandall	2.33	84.1

Daily gage height, in feet, of Virgin River at Virgin, Utah, for 1913.

[Niles Earl, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.5	2.65	2.6	3.8	.....	2.75	2.62	2.32	3.4	2.70	2.65	2.90
2	2.52	.....	.....	.....	3.10	2.75	.....	5.5	.....	.....	.....	2.80
3	.....	2.6	2.7	.....	3.00	.....	2.60	2.53	2.65	.....	3.40	2.82
4	2.52	.....	2.75	2.95	.....	2.70	2.60	.....	2.6	2.68	2.60	2.80
5	.....	2.55	.....	3.1	3.00	2.67	2.60	.....	.....	2.70	2.65	2.82
6	2.45	.....	2.8	.....	.....	.....	2.58	.....	3.1	.....	.....	2.75
7	.....	2.6	.....	3.45	2.95	2.68	2.60	2.80	2.7	2.70	2.75	2.80
8	2.55	.....	2.8	3.3	2.95	2.65	.....	.....	3.0	2.70	2.65	.....
9	.....	2.83	.....	.....	2.95	2.67	2.60	2.60	2.7	.....	2.70	2.85
10	2.7	.....	3.25	.....	.....	.....	2.55	2.60	.....	.....	2.73	2.80
11	2.7	.....	3.0	3.0	2.95	.....	.....	2.50	.....	2.75	.....	2.80
12	2.7	2.6	3.2	3.1	2.92	2.75	2.55	.....	2.6	2.75	3.10	2.80
13	.....	.....	.....	3.45	2.90	2.78	2.60	.....	2.6	.....	.....	2.80
14	2.75	2.6	2.7	3.5	2.90	2.60	.....	2.40	2.65	2.65	2.85	2.80
15	.....	.....	.....	3.2	.....	2.62	2.60	2.40	2.7	2.72	2.80	2.80
16	2.75	2.75	2.6	.....	2.85	2.65	2.55	.....	.....	2.70	2.80	2.82
17	.....	2.75	2.7	.....	2.85	2.65	.....	2.40	2.6	.....	2.85	2.80
18	2.6	.....	.....	3.2	2.85	.....	.....	2.42	2.6	2.70	.....	2.85
19	.....	2.6	2.85	3.1	2.82	.....	2.83	.....	.....	2.70	2.80	2.80
20	2.65	.....	.....	3.35	.....	.....	2.61	.....	2.55	.....	2.85	2.82
21	2.6	.....	2.65	3.4	.....	2.60	.....	2.40	2.55	.....	2.90	.....
22	2.65	2.6	.....	.....	2.80	2.60	3.5	2.50	2.6	2.60	2.83	2.80
23	.....	2.6	.....	.....	.....	2.62	.....	.....	.....	2.60	.....	2.83
24	2.6	.....	2.7	2.85	2.80	2.60	2.50	2.60	.....	.....	.....	.....
25	.....	2.8	.....	.....	2.77	2.60	2.50	.....	.....	.....	2.90	2.80
26	2.6	.....	.....	3.0	2.80	.....	2.47	2.65	2.75	2.65	2.90	2.80
27	.....	2.75	2.7	3.1	.....	.....	.....	.....	.....	2.75	2.85	2.82
28	2.6	2.57	.....	3.1	2.75	2.60	2.38	2.50	2.65	.....	.....	2.78
29	2.62	.....	.....	.....	.....	2.63	2.35	.....	.....	2.65	2.85	2.80
30	2.6	.....	3.4	3.0	.....	2.62	2.38	.....	2.7	.....	.....	2.80
31	.....	.....	3.6	.....	2.75	.....	2.33	2.75	.....	.....	.....	2.80

Daily discharge, in second-feet, of Virgin River at Virgin, Utah, for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	120	150	140	880	300	171	144	84	500	144	135	198
2	124	145	150	600	330	171	142	2,940	318	143	135	166
3	124	140	160	400	270	166	140	113	135	142	500	172
4	124	135	171	244	270	160	140	126	126	140	126	166
5	117	130	176	330	270	154	140	139	213	144	135	172
6	110	135	182	450	257	156	136	152	300	144	145	155
7	120	140	182	572	244	156	140	166	144	144	155	166
8	130	166	182	460	244	150	140	146	244	144	135	174
9	145	193	305	390	244	154	140	126	144	148	144	182
10	160	180	428	330	244	160	130	126	138	152	151	166
11	160	160	270	270	244	166	130	108	132	155	226	166
12	160	140	395	330	228	171	130	102	126	155	300	166
13	166	140	278	572	218	177	140	97	126	145	241	166
14	171	140	160	610	218	140	140	92	135	135	182	166
15	171	156	150	395	209	144	140	92	144	148	166	166
16	171	171	140	395	200	150	130	92	135	144	166	172
17	156	171	160	395	200	150	140	92	126	144	182	166
18	140	156	180	395	200	147	140	95	126	144	174	182
19	145	140	200	330	189	145	193	92	122	144	166	166
20	150	140	175	498	186	142	142	92	117	138	182	172
21	140	140	150	535	184	140	150	92	117	132	198	169
22	150	140	153	400	182	140	610	108	126	126	176	166
23	145	140	156	300	182	144	130	117	133	126	183	176
24	140	161	160	200	182	140	120	126	140	129	190	171
25	140	182	160	235	175	140	120	130	148	132	198	166
26	140	176	160	270	182	140	114	135	155	135	198	166
27	140	171	160	330	176	140	105	122	145	155	182	172
28	140	134	160	330	171	140	96	108	135	145	182	162
29	144	.....	348	300	171	146	90	124	138	135	182	166
30	140	.....	535	270	171	144	96	140	144	135	190	166
31	145	.....	690	.....	171	.....	86	155	.....	135	.....	166

NOTE.—Discharge determined from two fairly well defined rating curves. Discharge interpolated for days for which gage heights are missing.

Monthly discharge of Virgin River at Virgin, Utah, for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	171	110	143	8,790	B.
February	193	130	153	8,500	B.
March	690	140	226	13,900	B.
April	880	200	401	23,900	B.
May	330	171	216	13,300	B.
June	171	140	151	8,990	B.
July	610	86	146	8,980	B.
August	2,940	84	207	12,700	B.
September	500	117	164	9,760	B.
October	155	126	141	8,670	B.
November	500	126	188	11,200	B.
December	198	155	169	10,400	B.
The year	2,940	84	192	139,000	

ZION CREEK NEAR SPRINGDALE, UTAH.

Location.—In the SW. ¼ sec. 32, T. 42 S., R. 10 W., 1½ miles below Springdale; 1 mile above confluence with Virgin River.

Records avilable.—May 13 to December 31, 1913.

Drainage area.—330 square miles.

Gage.—Vertical staff; read once daily.

Control.—Sand and rocks. During the greater part of the year the stream bed is a mass of moving sand, although a fairly permanent riffle exists just below the gage and is not apt to change except during sudden floods.

Discharge measurements.—Made by wading.

Diversions.—Station is below all diversions and wasteways; records show the tributary inflow into Virgin River.

Accuracy.—Records rather poor owing to infrequent measurements and the fact that one gage reading a day is apt to give results that do not represent the mean daily discharge.

Discharge measurements of Zion Creek near Springdale, Utah, for 1913.

Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 13	Leonard Tanner	1.64	162
July 31	Lynn Crandall	1.13	40.6

Daily gage height, in feet, of Zion Creek near Springdale, Utah, for 1913.

[Annie Gifford, observer.]

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1.35	1.1	1.1	2.1	1.1	1.1	1.1
2	.....	1.3	1.1	2.75	2.0	1.1	1.7	1.1
3	.....	1.3	1.1	1.25	1.3	1.1	1.2	1.05
4	.....	1.3	1.05	1.5	1.2	1.05	1.2	1.05
5	.....	1.25	1.05	1.25	1.15	1.0	1.15	1.05
6	.....	1.25	1.0	1.15	2.1	1.0	1.15	1.15
7	.....	1.25	1.0	1.1	2.1	1.0	1.15	1.15
8	.....	1.25	2.35	1.15	1.2	1.0	1.2	1.15
9	.....	1.25	1.1	1.2	1.15	1.05	1.2	1.1
10	.....	1.3	1.1	1.2	1.65	1.05	1.2	1.1
11	.....	1.4	1.1	1.2	1.15	1.0	1.95	1.1
12	.....	1.4	1.0	1.2	1.15	1.0	2.85	1.1
13	1.65	1.3	1.0	1.0	1.1	1.0	3.45	1.15
14	1.78	1.3	1.0	1.0	1.25	1.0	1.5	1.15
15	1.6	1.25	1.0	1.0	1.1	1.0	1.2	1.15
16	1.6	1.2	1.0	.95	1.05	1.0	1.2	1.15
17	1.6	1.25	1.0	.95	1.05	1.0	1.15	1.15
18	1.6	1.25	1.2	.95	1.05	1.0	1.2	1.3
19	1.6	1.25	1.2	.9	1.05	1.0	1.3	1.1
20	1.5	1.2	1.15	.95	1.0	1.0	1.4	1.1
21	1.45	1.2	1.15	.95	1.0	1.05	1.4	1.1
22	1.4	1.15	1.5	1.15	2.25	1.1	1.2	1.1
23	1.45	1.15	1.4	1.15	1.2	1.1	1.1	1.1
24	1.4	1.1	1.3	1.8	1.15	1.1	1.1	1.1
25	1.4	1.1	1.25	2.1	1.1	1.1	1.5	1.1
26	1.4	1.1	1.25	1.1	1.1	1.1	1.4	1.1
27	1.4	1.15	1.25	.95	1.1	1.1	1.3	1.1
28	1.4	1.15	1.3	1.65	1.1	1.1	1.1	1.1
29	1.4	1.15	1.2	1.2	1.05	1.1	1.1	1.15
30	1.4	1.1	1.15	1.2	1.05	1.1	1.1	1.15
31	1.35	.....	1.15	1.0	.....	1.1	.....	1.2

Daily discharge, in second-feet, of Zion Creek near Springdale, Utah, for 1913.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	88	34	34	358	57	57	57
2	.....	75	34	578	319	57	216	57
3	.....	75	34	92	105	57	80	47
4	.....	75	27	158	80	47	80	47
5	.....	64	27	92	68	38	68	47
6	.....	64	20	68	358	38	68	68
7	.....	64	20	57	358	38	68	68
8	.....	64	410	68	80	38	80	68
9	.....	64	34	80	68	47	80	57
10	.....	75	34	80	201	47	80	57
11	.....	100	34	80	68	38	300	57
12	.....	100	20	80	68	38	675	57
13	166	75	20	38	57	38	952	68
14	204	75	20	38	92	38	158	68
15	152	64	20	38	57	38	80	68
16	152	52	20	30	47	38	80	68
17	152	64	20	30	47	38	68	68
18	152	64	52	30	47	38	80	105
19	152	64	52	23	47	38	105	57
20	125	52	43	30	38	38	130	57
21	112	52	43	30	38	47	130	57
22	100	43	125	68	438	57	80	57
23	112	43	100	68	80	57	57	57
24	100	34	75	249	68	57	57	57
25	100	34	64	358	57	57	158	57
26	100	34	64	57	57	57	130	57
27	100	43	64	30	57	57	105	57
28	100	43	75	201	57	57	57	57
29	100	43	52	80	47	57	57	68
30	100	34	43	80	47	57	57	68
31	88	.....	43	38	.....	57	.....	80

NOTE.—Discharge determined as follows: May 13 to Aug. 2, from a fairly well defined rating curve; Aug. 3 to Dec. 31, from a poorly defined rating curve.

Monthly discharge of Zion Creek near Springdale, Utah, for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
May 13–31	204	88	125	4,710	B.
June	100	34	60.7	3,610	B.
July	410	20	55.6	3,420	B.
August	578	23	96.2	5,920	C.
September	358	38	117	6,960	C.
October	57	38	47.1	2,900	C.
November	952	57	146	8,690	B.
December	105	47	61.9	3,810	B.
The period	.....	.....	.....	40,000	

SANTA CLARA CREEK NEAR CENTRAL, UTAH.

Location.—In sec. 14, T. 39 S., R. 16 W., about 1 mile southeast of Central post office, at R. H. Hunt's ranch, 6 miles below Pine Valley. Hunts Spring, which has a fairly constant discharge of about 3 second-feet, enters just below the station.

Record available.—April 21, 1909, to December 31, 1913.

Drainage area.—84 square miles.

Gage.—Vertical staff.

Control.—Shifting during flood stages.

Discharge measurements.—Made by wading or from a footbridge.

Winter flow.—Ice does not form to any great extent.

Diversions.—The Central canal, which has a maximum capacity of about 11 second-feet, diverts water about a mile above the station.

Accuracy.—Records good except for periods when channel shifts.

Discharge measurements of Santa Clara Creek near Central, Utah, for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-feet.*			*Feet.*	*Sec.-feet.*
Apr. 10	Leonard Tanner	3.03	19.8	May 19	Leonard Tanner	3.12	24.0
14	do	3.07	21.9	Aug. 3	Lynn Crandall	2.83	8.0
May 9	do	3.10	24.0				

Daily gage height, in feet, of Santa Clara Creek at Central, Utah, for 1913.

[Royal H. Hunt, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	3.0	3.42	3.1	3.05	2.85	2.85	2.9	2.85	2.85	.....
2	.....	.....	2.95	3.55	3.0	3.05	2.85	2.85	2.9	2.85	2.85	.....
3	.....	.....	2.95	3.48	3.0	3.05	2.8	2.85	2.9	2.85	2.85	2.9
4	.....	2.9	2.9	3.3	3.0	3.0	2.8	2.85	2.9	2.85	2.85	2.9
5	2.95	2.9	3.0	3.1	3.05	3.0	2.8	2.85	2.9	2.85	.....	2.9
6	2.95	2.9	3.0	3.1	3.05	3.0	2.8	2.85	2.9	2.85	2.85	2.9
7	2.95	2.9	3.4	3.0	3.1	3.0	2.8	2.85	2.9	2.9	2.85	2.9
8	.....	.....	3.6	3.0	3.15	3.0	2.8	2.85	2.9	2.9	2.85	2.9
9	.....	.....	3.9	3.0	3.1	3.0	2.8	2.85	2.9	2.9	.....	.....
10	.....	.....	4.0	3.03	3.1	3.0	2.8	2.85	2.9	2.9	2.85	2.85
11	.....	.....	3.58	2.95	3.2	3.0	2.8	2.8	.....	2.9	2.85	2.85
12	.....	.....	3.0	3.0	3.2	2.95	2.8	2.8	.....	2.9	2.9	.....
13	.....	.....	2.9	3.0	3.2	2.95	2.8	2.8	.....	2.9	3.1	2.85
14	2.95	.....	2.9	3.05	3.2	2.95	2.8	2.8	.....	2.9	2.95	.....
15	2.95	2.9	3.0	3.05	3.2	2.95	2.8	2.8	2.85	2.9	2.95	2.85
16	.....	2.9	2.9	3.0	3.1	2.95	2.8	2.8	2.85	2.9	2.95	2.85
17	.....	.....	.....	3.0	3.1	2.95	2.8	2.8	2.85	2.9	2.95	.....
18	.....	2.9	.....	3.1	3.1	2.95	2.85	2.8	2.85	2.9	.....	2.85
19	2.95	2.9	2.85	3.1	3.1	2.95	2.85	2.8	2.85	2.9	.....	2.85
20	2.95	2.9	2.9	3.1	3.1	2.85	2.9	2.8	2.85	2.9	2.95	2.85
21	2.95	2.9	2.9	3.1	3.1	2.85	2.9	2.8	2.85	2.85	2.95	2.85
22	2.95	2.9	2.85	3.1	3.1	2.85	2.9	2.8	2.85	2.85	2.9	2.85
23	2.95	2.9	2.9	3.1	3.1	2.85	3.9	2.8	2.85	2.85	2.9	.....
24	.....	2.9	2.9	3.1	3.1	2.85	2.9	2.98	2.85	2.85	2.9	2.85
25	.....	2.9	2.9	3.1	3.1	2.85	2.85	2.9	2.85	2.85	2.9	.....
26	.....	.....	2.9	3.15	3.1	2.85	2.85	2.85	2.85	2.85	2.9	2.85
27	.....	2.95	2.9	3.35	3.1	2.9	2.85	2.85	2.85	.....	2.9	2.85
28	.....	3.0	2.9	3.32	3.1	2.9	2.85	2.85	2.85	2.85	2.9	.....
29	.....	.....	3.0	3.2	3.1	2.85	2.85	3.2	2.85	2.85	2.9	2.85
30	.....	.....	3.45	3.15	3.1	2.85	2.85	2.9	2.85	2.85	.....	.....
31	.....	.....	3.45	.....	3.05	.....	2.85	2.9	.....	2.85	.....	2.85

Daily discharge, in second-feet, of Santa Clara Creek at Central, Utah, for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	11	10	14	52	24	20	8	8	10	7.5	7.5	10
2	11	10	11	67	17	20	8	8	10	7.5	7.5	10
3	11	9	11	59	17	20	5	8	10	7.5	7.5	10
4	11	8	8	40	17	17	5	8	10	7.5	7.5	10
5	11	8	14	24	20	17	5	8	10	7.5	7.5	10
6	11	8	14	24	20	17	5	8	10	7.5	7.5	10
7	11	8	45	17	24	17	5	8	10	10	7.5	10
8	11	8	70	17	28	17	5	8	10	10	7.5	10
9	11	8	113	17	24	17	5	8	10	10	7.5	8.5
10	11	8	133	19	24	17	5	8	10	10	7.5	7.5
11	11	8	71	14	31	17	5	5	10	10	7.5	7.5
12	11	8	17	17	31	14	5	5	9	10	10	7.5
13	11	8	10	17	31	14	5	5	8	10	24	7.5
14	11	8	10	21	31	14	5	5	8	10	14	7.5
15	11	8	17	21	31	14	5	5	7.5	10	14	7.5
16	11	8	10	17	24	14	5	5	7.5	10	14	7.5
17	11	8	9	17	24	14	5	5	7.5	10	14	7.5
18	11	8	9	24	24	14	8	5	7.5	10	14	7.5
19	11	8	8	24	24	14	8	5	7.5	10	14	7.5
20	11	8	10	24	24	8	10	5	7.5	10	14	7.5
21	11	8	10	24	24	8	10	5	7.5	7.5	14	7.5
22	11	8	8	24	24	8	10	5	7.5	7.5	10	7.5
23	11	8	10	24	24	8	10	5	7.5	7.5	10	7.5
24	11	8	10	24	24	8	10	16	7.5	7.5	10	7.5
25	11	8	10	24	24	8	8	10	7.5	7.5	10	7.5
26	11	8	10	28	24	8	8	8	7.5	7.5	10	7.5
27	11	11	10	45	24	10	8	8	7.5	7.5	10	7.5
28	11	14	10	42	24	10	8	8	7.5	7.5	10	7.5
29	11	.....	17	31	24	8	8	31	7.5	7.5	10	7.5
30	11	.....	56	28	24	8	8	10	7.5	7.5	10	7.5
31	11	.....	56	.....	20	.....	8	10	.....	7.5	.....	7.5

NOTE.—Discharge determined from two fairly well-defined rating curves. Discharge interpolated for days for which gage heights are missing.

Monthly discharge of Santa Clara Creek near Central, Utah, for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	11	11	11.0	676	C.
February	14	8	8.5	472	C.
March	133	8	26.2	1,610	B.
April	67	17	27.5	1,640	A.
May	31	17	24.2	1,490	A.
June	20	8	13.3	791	A.
July	10	5	6.9	424	B.
August	31	5	7.9	486	B.
September	10	7.5	8.5	506	A.
October	10	7.5	8.6	529	A.
November	24	7.5	10.6	631	A.
December	10	7.5	8.2	504	B.
The year	133	5	13.5	9,760	

SANTA CLARA CREEK NEAR ST. GEORGE, UTAH.

Location.—In sec. 27, T. 42 S., R. 16 W., about 2 miles west of St. George, and 3 miles above mouth of creek.

Records available.—April 16, 1909, to January 31, 1913, when station was discontinued.

Drainage area.—540 square miles.

Gage.—Inclined staff.

Control.—Shifting sand.

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

Winter flow.—Ice does not usually affect the discharge relation.

Diversions.—The Bloomington and Sego canals divert water from Santa Clara Creek below station. With exception of these canals records indicate amount of unutilized water flowing from Santa Clara Creek into Virgin River.

Accuracy.—Records poor owing to shifting of the stream bed and questionable gage heights.

Discharge measurements of Santa Clara Creek near St. George, Utah, for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 11	Leonard Tanner.....	4.81	16.8	May 16	Leonard Tanner.....	4.95	9.4
14	.....do.....	4.88	11.9	Aug. 2	Lynn Crandall.....	4.86	3.4
May 10	.....do.....	4.90	6.7				

Daily gage height, in feet, and discharge, in second-feet, of Santa Clara Creek near St. George, Utah, for 1913.

[A. W. Burgess, observer.]

Day.	January.		Day.	January.		Day.	January.	
	Gage height.	Discharge.		Gage height.	Discharge.		Gage height.	Discharge.
1	.....	37	11	5.0	25	21	5.0	25
2	4.80	37	12	.....	25	22	.....	25
3	.....	39	13	5.0	25	23	5.0	25
4	4.9	41	14	.....	22	24	.....	25
5	.....	41	15	4.9	20	25	5.0	25
6	4.9	41	16	.....	22	26	.....	25
7	.....	41	17	5.0	25	27	5.0	25
8	6.0	90	18	.....	25	28	.....	25
9	.....	25	19	5.0	25	29	5.0	25
10	.....	25	20	.....	25	30	.....	25
						31	5.0	25

NOTE.—Discharge only approximate owing to tendency of channel to shift. Mean discharge for month, 31 second-feet; total run-off, 1,910 acre-feet.

MUDDY RIVER NEAR MOAPA, NEV.

Location.—About three-fourths mile below the Home ranch, 6 miles above Moapa, and a short distance below the springs that form the source of the stream.

Records available.—July 1 to December 31, 1913.

Drainage area.—1,080 square miles, including drainage tributary to Arrow Canyon which may discharge water only once in several years.

Gage.—Stevens automatic and outside staff gage in pool above weir.

Control.—A 10-foot Cippoletti weir.

Discharge measurements.—Made from foot plank below the weir. Current-meter measurements check the weir formula very closely.

Diversions.—Several ranches are irrigated by water diverted above the station.

Accuracy.—Records excellent.

Cooperation.—Field data furnished by the Muddy Valley Irrigation District through Leonard Tanner, engineer.

Discharge measurements of Muddy River near Moapa, Nev., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 22	Leonard Tanner.....	1.79	46.3	Aug. 6	Tanner and Crandall.	1.17	41.6
July 5	.....do.....	1.22	45.4	Oct. 13	Leonard Tanner.....	1.29	47.3
31	.....do.....	1.21	44.4	25	.....do.....	1.21	48.4

NOTE.—At time of measurement, on May 22, the weir control had a 5-foot crest which was changed to 10 feet in June.

Daily gage height, in feet, and discharge, in second-feet, of Muddy River near Moapa, Nev., for 1913.

[Leonard Tanner, observer.]

Day.	July.		Aug.		Sept.		Oct.		Nov.		Dec.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	.....	.....	1.24	46.2	1.28	48.3	1.25	45.6	1.28	48.3	1.29	48.9
2	.....	.....	1.26	47.2	1.26	47.7	1.25	45.6	1.29	48.9	1.29	48.9
3	.....	.....	1.25	46.7	1.26	47.2	1.27	46.7	1.29	48.9	1.30	49.4
4	.....	.....	1.25	46.7	1.26	47.2	1.26	46.2	1.29	48.9	1.30	49.4
5	1.22	45.1	1.25	46.7	1.27	47.8	1.25	45.6	1.29	48.9	1.30	49.4
6	.....	.....	1.20	44.7	1.26	47.2	1.27	46.7	1.29	48.9	1.30	49.4
7	.....	.....	1.19	45.5	1.26	47.2	1.29	47.8	1.28	48.3	1.30	49.4
8	.....	.....	1.17	42.4	.....	47.2	1.30	48.3	1.28	48.3	1.30	49.4
9	.....	.....	1.16	41.8	1.26	47.2	1.28	47.2	1.29	48.9	1.30	49.4
10	.....	.....	1.17	42.4	1.26	47.2	1.28	47.2	1.29	48.9	1.30	49.4
11	.....	.....	1.23	45.6	1.26	47.2	1.29	47.8	1.29	48.9	1.30	49.4
12	.....	.....	1.25	46.7	1.27	47.8	1.29	47.8	1.28	48.3	1.31	50
13	.....	.....	1.25	46.7	1.27	47.8	1.29	47.8	1.28	48.3	1.31	50
14	.....	.....	1.22	45.1	1.28	48.3	1.28	48.3	1.29	48.9	1.31	50
15	.....	.....	1.18	42.9	1.28	48.3	1.28	48.3	1.29	48.9	1.30	49.4
16	.....	.....	1.20	44	1.27	47.8	1.27	47.8	1.29	48.9	1.31	50
17	.....	.....	1.21	44.5	1.22	45.1	1.28	48.3	1.29	48.9	1.31	50
18	.....	.....	1.22	45.1	1.21	44.5	1.27	47.8	1.29	48.9	1.30	49.4
19	.....	.....	1.23	45.6	1.22	45.1	1.27	47.8	1.30	49.4	1.31	50
20	.....	.....	1.24	46.2	1.22	45.1	1.27	47.8	1.31	50	1.31	50
21	1.22	45.1	1.24	46.2	1.23	45.6	1.27	47.8	1.30	49.4	1.30	49.4
22	1.23	45.6	1.18	42.9	1.23	45.6	1.27	47.8	1.29	48.9	1.31	50
23	1.24	46.2	1.13	40.2	1.23	45.6	1.27	47.8	1.29	48.9	1.30	49.4
24	1.24	46.2	1.15	41.3	1.28	47.2	1.28	48.3	1.29	48.9	1.31	50
25	1.20	44	1.24	46.2	1.27	46.7	1.28	48.3	1.30	49.4	1.31	50
26	1.18	42.9	1.28	48.3	1.25	45.6	1.28	48.3	1.30	49.4	1.31	50
27	1.17	42.4	1.27	47.8	1.26	46.2	1.28	48.3	1.29	48.9	1.30	49.4
28	1.18	42.9	1.27	47.8	1.26	46.2	1.28	48.3	1.29	48.9	.....	50
29	1.18	42.9	1.25	46.7	1.26	46.2	1.27	47.8	1.30	49.4	.....	50
30	1.20	44	1.26	47.2	1.25	45.6	1.28	48.3	1.30	49.4	.....	50
31	1.20	44	1.34	51.8	.....	.....	1.28	48.3	.....	.....	.....	50

NOTE.—Discharge relation slightly affected by moss in channel Sept. 24 to Oct. 13. Discharge determined from a well-defined rating curve except Dec. 28-31 when it was estimated.

Monthly discharge of Muddy River near Moapa, Nev., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
July	.....	.....	[a] 44.7	2,750	B
August	51.8	40.2	45.4	2,790	A
September	48.3	44.5	46.7	2,780	A
October	48.3	45.6	47.6	2,930	A
November	50	48.3	48.9	2,910	A
December	50	48.9	49.7	3,060	A
The period	.....	.....	.....	17,200	

[a] Estimated.

NOTE.—A flood of one hour's duration and with a discharge of approximately 85 second-feet occurred Aug. 31.

MUDDY RIVER NEAR LOGAN, NEV.[1]

Location.—In the "Narrows," about 7 miles below Moapa, 2½ miles above Logan, and about 2½ miles below the mouth of the Meadow Valley Wash.

Records available.—July 1 to December 31, 1913. Intermittent records have also been obtained at this station and at a point 1½ miles above from January 1, 1904, to October 31, 1910.

Drainage area.—3,740 square miles.

Gage.—Vertical staff in stilling well.

Control.—Rectangular wooden rating flume with free drop at downstream end.

Discharge measurements.—Made from plank across flume.

Diversions.—Above all diversions in the lower Muddy Valley in the vicinity of Logan.

Accuracy.—Records excellent.

Cooperation.—Field data furnished by Muddy Valley Irrigation District through Leonard Tanner, engineer.

Discharge measurements of Muddy River near Logan, Nev., for 1913.

[Made by Leonard Tanner.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
June 4	1.12	36.3	Aug. 2	1.20	40.8
June 12	1.12	37.0	Nov. 13	1.28	48.2
June 27	1.08	33.2	Nov. 13	1.28	49.2
July 12	1.00	29.4			

[1] Formerly known as "near Moapa, Nev."

Daily gage height, in feet, and discharge, in second-feet, of Muddy River near Logan, Nev., for 1913.

[W. W. Muir, observer.]

Day.	July.		Aug.		Sept.		Oct.		Nov.		Dec.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	.....	33	1.08	33.8	.....	45	1.19	41.3	.....	.....	1.32	51
2	.....	33	1.08	33.8	.....	40	1.20	42	.....	.....	1.31	50
3	1.06	32.6	1.09	34.4	.....	38	1.20	42	.....	.....	1.32	51
4	1.07	33.2	1.10	35	.....	38	1.20	42	.....	.....	1.32	51
5	1.06	32.6	1.09	34.4	.....	38	1.14	37.8	.....	.....	1.32	51
6	1.06	32.6	1.10	35	.....	38	1.15	38.5	.....	.....	1.33	52
7	1.07	33.2	1.08	33.8	1.18	40.6	1.14	37.8	.....	.....	1.32	51
8	1.07	33.2	1.04	31.4	1.22	43.5	1.23	44.2	.....	.....	1.32	51
9	1.06	32.6	1.05	32	1.19	41.3	1.22	43.5	.....	.....	1.30	50
10	1.06	32.6	1.09	34.4	1.20	42	1.15	38.5	.....	.....	1.30	50
11	1.02	30.2	1.08	33.8	1.14	37.8	1.15	38.5	.....	.....	1.31	50
12	1.00	29	1.14	37.8	1.14	37.8	1.16	39.2	.....	.....	1.28	48
13	.....	30	.....	35	1.17	39.9	1.21	42.8	1.28	48	1.28	48
14	.....	30	.....	34	1.23	44.2	1.15	38.5	.....	.....	1.27	47
15	.....	30	1.08	33.8	1.2	42	1.22	43.5	.....	.....	1.34	53
16	1.01	29.6	1.08	33.8	1.19	41.3	1.2	42	.....	.....	1.30	50
17	1.10	35	1.07	33.2	1.16	39.2	1.23	44.2	.....	.....	1.28	48
18	1.10	35	1.12	36.4	1.19	41.3	1.24	45	.....	.....	1.33	52
19	1.11	35.7	1.06	32.6	1.17	39.9	1.25	45.8	.....	.....	1.33	52
20	1.12	36.4	1.08	33.8	1.16	39.2	1.20	42	.....	.....	1.33	52
21	.....	37	1.01	29.6	1.13	37.1	1.22	43.5	.....	.....	1.32	51
22	.....	37	1.03	30.8	1.12	36.4	1.20	42	.....	.....	1.34	53
23	.....	37	1.06	32.6	1.11	35.7	1.25	45.8	1.28	48	1.32	51
24	.....	37	1.07	33.2	1.13	37.1	1.26	46.5	1.28	48	1.32	51
25	.....	37	1.08	33.8	1.14	37.8	1.26	46.5	1.29	49	1.32	51
26	1.14	37.8	1.11	35.7	1.15	38.5	.....	.....	1.30	50	1.31	50
27	1.11	35.7	1.10	35	1.19	41.3	.....	.....	1.28	48	1.31	50
28	.....	35.7	1.12	36.4	1.19	41.3	.....	.....	1.28	48	1.32	51
29	1.11	35.7	1.08	33.8	1.20	42	.....	.....	1.28	48	1.32	51
30	1.10	35	1.09	34.4	1.16	39.2	.....	.....	1.30	50	1.31	50
31	1.11	35.7	.....	35	.....	.....	.....	.....	.....	.....	1.34	53

NOTE.—Discharge determined from a well-defined rating curve. Discharge estimated for days for which gage heights are missing except Oct. 26 to Nov. 22.

Monthly discharge of Muddy River near Logan, Nev., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
July	37.8	29	33.9	2,080	A.
August	37.8	29.6	34.0	2,090	A.
September	45	35.7	39.8	2,370	A.
October	.....	37.8	[a]42.9	2,640	A.
November	.....	.....	[a]48.2	2,870	B.
December	53	47	50.6	3,110	A.
The period	.....	.....	.....	15,200	

[a] Monthly mean estimated.

MUDDY RIVER NEAR ST. THOMAS, NEV.

Location.—About 1½ miles below St. Thomas post office and about 1 mile above mouth of stream.

Records available.—May 23 to December 31, 1913.

Drainage area.—3,980 square miles.

Gage.—Vertical staff.

Control.—Firm clay, with occasional falls or rapids.

Discharge measurements.—Made by wading.

Diversions.—Below all diversions; records indicate the waste water flowing into the Virgin River.

Accuracy.—Records only fair, on account of the small discharge.

Cooperation.—Discharge measurements furnished by the Muddy Valley Irrigation District through Leonard Tanner, engineer.

Discharge measurements of Muddy River near St. Thomas, Nev., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 23	Leonard Tanner	1.49	3.0	Aug. 5	Lynn Crandall	1.15	a0.3
June 21	do	1.10	a.02	Nov. 12	Leonard Tanner	2.62	17.4

a Estimated.

Daily gage height, in feet, of Muddy River near St. Thomas, Nev., for 1913.

[Frank B. Murphy, observer.]

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		1.0	1.12	1.1	1.4	1.25	2.2	2.55
2		1.0	1.2	1.1	1.45	1.2	2.3	2.6
3		1.1	1.12	1.35	1.85	1.2	2.8	2.8
4		1.21	1.13	1.25	2.15	1.25	2.6	2.6
5		1.1	1.12	1.2	2.0	1.22	2.6	2.8
6		1.11	1.1	1.1	1.45	1.2	2.55	2.85
7		1.12	1.11	1.1	1.45	1.25	2.6	2.6
8		1.1	1.1	1.2	2.15	1.2	2.65	2.75
9		1.13	1.1	1.35	1.45	1.3	2.6	2.7
10		1.24	1.12	1.35	1.4	1.25	2.75	2.85
11		1.15	1.16	1.1	1.35	1.3	2.4	2.6
12		1.10	1.1	1.1	1.3	1.2	2.55	2.75
13		1.11	1.15	1.2	1.35	1.35	2.8	2.8
14		1.12	1.12	1.8	1.3	1.42	2.65	2.8
15		1.14	1.14	1.65	1.4	1.6	2.4	2.75
16		1.12	1.12	1.65	1.25	1.9	2.65	2.8
17		1.10	1.1	1.6	1.15	1.7	1.7	2.5
18		1.1	1.12	1.2	1.25	1.85	1.6	2.6
19		1.1	1.12	1.1	1.2	1.6	1.6	2.5
20		1.2	1.1	1.1	1.25	1.2	2.0	2.5
21		1.16	1.16	1.1	1.15	1.4	1.9	2.55
22		1.11	1.25	1.2	1.20	1.7	2.0	2.8
23	1.5	1.1	1.24	1.15	1.22	1.4	1.8	2.82
24	1.49	1.11	1.2	1.1	1.2	1.25	2.4	2.75
25	1.3	1.1	1.15	1.15	1.25	1.6	2.4	2.9
26	1.2	1.24	1.3	1.2	1.15	1.85	2.6	2.85
27	1.35	1.35	1.2	1.15	1.2	1.8	2.4	2.8
28	1.3	1.1	1.15	1.15	1.3	2.1	2.6	2.9
29	1.35	1.1	1.3	1.15	1.25	2.4	2.6	2.85
30	1.15	1.1	1.25	1.1	1.15	2.2	2.55	2.8
31	1.10		1.1	1.25		2.2		2.9

Daily discharge, in second-feet, of Muddy River near St. Thomas, Nev., for 1913.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		0	0.2	0.02	2.3	1.1	11	16
2		0	.7	.02	2.8	.7	13	17
3		.02	.2	1.9	6.9	.7	20	20
4		.8	.2	1.1	11	1.1	17	17
5		.02	.2	.7	8.7	.9	17	20
6		.1	.02	.02	2.8	.7	16	21
7		.2	.1	.02	2.8	1.1	17	17
8		.02	.02	.7	11	.7	18	20
9		.2	.02	1.9	2.8	1.5	17	19
10		1.0	.2	1.9	2.3	1.1	20	21
11		.4	.4	.02	1.9	1.5	14	17
12		.02	.02	.02	1.5	.7	16	20
13		.1	.4	.7	1.9	1.9	20	20
14		.2	.2	6.3	1.5	2.5	18	20
15		.3	.3	4.7	2.3	4.2	14	20
16		.2	.2	4.7	1.1	7.5	18	20
17		.02	.02	4.2	.4	5.2	5.2	16
18		.02	.2	.7	1.1	6.9	4.2	17
19		.02	.2	.02	.7	4.2	4.2	16
20		.7	.02	.02	1.1	.7	8.7	16
21		.4	.4	.02	.4	2.3	7.5	16
22		.1	1.1	.7	.7	5.2	8.7	20
23	3.2	.02	1.0	.4	.9	2.3	6.3	21
24	3.1	.1	.7	.02	.7	1.1	14	20
25	1.5	.02	.4	.4	1.1	4.2	14	22
26	.7	1.0	1.5	.7	.4	6.9	17	21
27	1.9	1.9	.7	.4	.7	6.3	14	20
28	1.5	.02	.4	.4	1.5	10	17	22
29	1.9	.02	1.5	.4	1.1	14	17	21
30	.4	.02	1.1	.02	.4	11	16	20
31	.02		.02	1.1		11		22

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

Monthly discharge of Muddy River near St. Thomas, Nev., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
May 23–31	3.2	0.02	1.58	28.2	D.
June	1.9	.00	.26	15.5	D.
July	1.5	.02	.41	25.2	D.
August	6.3	.02	1.10	67.6	D.
September	11	.4	2.49	147	C.
October	14	.7	3.85	238	C.
November	20	4.2	14.0	833	B.
December	22	16	19.2	1,180	B.
The period				2,530	

WILLIAMS RIVER BASIN.

WILLIAMS RIVER[1] 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, 1913.

Drainage area.—Not measured.

Gage.—Staff in four sections. The two low-water sections are on right bank a short distance above cable. Upper sections are bolted to cliffs on left bank just above cable.

Control.—Shifting sand.

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

[1] Called Bill Williams River in previous reports.

Diversions.—Ranch diverts water for irrigating a few acres about 1 mile above station. Desert claim of about 500 acres about 20 miles above station has been partly irrigated, principally from flood water; other small ranches above station pump water from river sands.

Accuracy.—Estimates of discharge are approximate.

Discharge measurements of Williams River near Swansea, Ariz., for 1912–13.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
1912.		*Feet.*	*Sec.-ft.*	1913.		*Feet.*	*Sec.-ft.*
Feb. 28	C. C. Jacob	3.18	17	Mar. 15	W. Richins	3.90	164.
Sept. 11	do	3.30	16	16	do	4.00	173
Dec. 20	W. Richins	3.40	17.7	May 7	do	3.65	18.3
1913.				July 7	do	3.65	17.3
Mar. 13	W. Richins	4.00	226	Sept. 20	Gray and Jacob	3.65	16.7

Daily gage height, in feet, of Williams River near Swansea, Ariz., for 1913.

[L. G. Martinez, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.4	3.2	3.8	3.7	3.7	3.7	3.7	3.55	3.6	3.65	3.3	3.3
2	3.4	3.2	3.8	3.7	3.65	3.7	3.65	3.55	4.0	3.65	3.3	3.3
3	3.4	3.15	3.8	3.7	3.7	3.7	3.65	3.55	3.7	3.65	3.25	3.3
4	3.4	3.15	3.8	3.7	3.7	3.7	3.7	3.55	3.6	3.7	3.25	3.3
5	3.4	3.15	4.0	3.7	3.65	3.7	3.7	3.55	3.6	3.7	3.25	3.3
6	3.4	3.15	4.2	3.7	3.7	3.7	3.65	3.6	3.6	3.65	3.25	3.3
7	3.4	3.15	4.75	3.7	3.7	3.7	3.65	3.55	3.6	3.65	3.25	3.3
8	3.4	3.15	4.3	3.7	3.65	3.7	3.65	3.55	3.6	3.65	3.25	3.3
9	3.4	3.15	4.5	3.7	3.7	3.7	3.65	3.55	3.6	3.65	3.25	3.3
10	3.4	3.3	4.2	3.7	3.7	3.7	3.65	3.55	3.6	3.65	3.25	3.3
11	3.4	3.5	4.1	3.7	3.7	3.7	3.65	3.55	3.6	3.65	3.25	3.3
12	3.4	3.4	4.0	3.7	3.7	3.7	3.7	3.6	3.6	3.65	3.35	3.3
13	3.4	3.3	4.0	3.7	3.7	3.7	3.65	3.6	3.6	3.6	3.35	3.3
14	3.4	3.25	3.9	3.7	3.7	3.7	3.65	3.6	3.6	3.6	3.4	3.3
15	3.4	3.25	3.9	3.7	3.7	3.7	3.65	3.55	3.6	3.6	3.3	3.3
16	3.35	3.25	4.0	3.7	3.7	3.65	3.65	3.6	3.65	3.6	3.3	3.25
17	3.35	3.2	3.9	3.7	3.7	3.65	3.65	3.55	3.65	3.6	3.3	3.25
18	3.35	3.2	3.8	3.7	3.7	3.65	3.65	3.55	3.65	3.6	3.4	3.25
19	3.35	3.2	3.8	3.7	3.7	3.65	3.65	3.55	3.65	3.55	3.35	3.25
20	3.3	3.2	3.8	3.7	3.7	3.65	3.65	3.55	3.65	3.5	3.35	3.2
21	3.3	3.2	3.75	3.7	3.7	3.65	3.7	3.55	3.65	3.45	3.35	3.2
22	3.3	3.3	3.7	3.7	3.7	3.65	3.9	3.55	3.7	3.45	3.35	3.2
23	3.25	3.3	3.7	3.7	3.7	3.65	3.7	3.55	3.65	3.4	3.35	3.2
24	3.25	3.3	3.7	3.7	3.7	3.65	3.65	3.55	3.65	3.4	3.4	3.2
25	3.2	3.3	3.7	3.7	3.7	3.7	3.6	3.55	3.65	3.4	3.45	3.2
26	3.2	4.6	3.7	3.7	3.7	3.7	3.6	3.55	3.65	3.4	3.4	3.2
27	3.2	4.3	3.7	3.7	3.7	3.7	3.6	3.55	3.65	3.4	3.35	3.2
28	3.2	4.1	3.7	3.7	3.7	3.7	3.6	3.55	3.65	3.35	3.35	3.2
29	3.2	.....	3.7	3.7	3.65	3.7	3.6	3.55	3.65	3.3	3.35	3.2
30	3.2	.....	3.7	3.7	3.7	3.7	3.55	3.55	3.65	3.3	3.35	3.2
31	3.2	.....	3.7	.....	3.7	.....	3.55	3.55	.....	3.3	.....	3.2

Monthly discharge of Williams River near Swansea, Ariz., for 1913.

Month.	Discharge in second-feet (mean).	Run-off (total in acre-feet).	Month.	Discharge in second-feet (mean).	Run-off (total in acre-feet).
January	17.5	1,080	August	16.5	1,010
February	93.5	5,190	September	22.5	1,340
March	205	12,600	October	17.5	1,080
April	26.5	1,580	November	16.0	952
May	19.5	1,200	December	16.0	984
June	17.5	1,040			
July	21.5	1,320	The year	40.6	29,400

NOTE.—Discharge determined by the indirect method for shifting channels and is only approximate. Springs above the station keep the low-water flow at about 16 second-feet.

GILA RIVER BASIN.

GILA RIVER NEAR SILVER CITY, N. MEX.

Location.—In the northwestern corner of T. 13 S., R. 13 W., 1¼ miles below the X S X ranch house, 2½ miles below Lyon's hunting lodge, 45 miles northeast of Silver City; 1000 feet below the confluence of East and West forks of Gila River.
Records available.—June 20, 1912, to December 31, 1913.
Drainage area.—Not measured.
Gage.—Bristol automatic recording.
Control.—Liable to shift during high stages.
Discharge measurements.—Made by wading or from car and cable.
Winter flow.—Practically no backwater from ice.
Diversions.—None above station.
Accuracy.—Estimates good.

Discharge measurements of Gila River near Silver City, N. Mex., for 1913.

[Made by E. L. Redding.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Jan. 12	2.00	45.7	Aug. 25	2.17	70.6
Apr. 5	3.70	405	Do	2.52	115
May 4	2.67	154	Sept. 19	1.81	45.5
June 9	2.12	67.7	Nov. 10	1.90	46.8
July 22	2.07	46.5	Dec. 8	2.05	67.8
Aug. 24	2.25	79.3			

Daily gage height, in feet, of Gila River near Silver City, N. Mex., for 1913.

[Geo. Seay, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.05	2.15	2.1	3.55	2.85	2.1	1.6	1.6	1.7	1.65	1.9	2.35
2	1.95	2.15	2.1	3.7	2.8	2.2	1.55	1.65	1.65	1.9	1.9	2.3
3	2.0	2.1	2.1	3.55	2.7	2.15	1.65	1.65	1.65	2.45	1.8	2.2
4	2.1	2.1	2.1	3.4	2.5	2.15	1.6	1.7	1.6	2.15	1.75	2.15
5	2.0	2.1	2.2	3.45	2.4	2.05	1.7	1.65	1.7	2.1	1.75	2.2
6	1.95	2.2	2.3	3.6	2.25	2.1	1.65	1.7	1.8	1.95	1.75	2.1
7	1.9	2.35	2.4	3.6	2.4	2.1	1.65	1.7	2.0	1.9	1.8	2.0
8	1.9	2.4	2.5	3.65	2.45	2.1	1.6	1.85	2.05	1.9	1.8	2.05
9	1.9	2.3	2.6	3.5	2.6	2.05	1.65	1.85	2.1	1.9	1.8	2.1
10	2.0	2.35	2.6	3.5	2.6	2.05	1.7	1.9	2.1	1.9	1.8	2.05
11	2.1	2.35	2.65	3.3	.5	2.0	1.75	1.9	2.2	1.9	1.8	2.05
12	2.1	2.3	2.6	3.25	2.4	2.1	1.7	2.1	2.1	1.85	1.8	2.05
13	2.0	2.25	2.55	3.2	2.45	2.05	1.7	2.35	2.0	1.85	1.8	2.05
14	2.05	2.25	2.5	3.15	2.45	2.0	1.8	2.7	2.0	1.9	1.85	2.0
15	2.1	2.2	2.4	3.15	2.5	1.9	1.8	2.3	2.0	1.9	1.85	2.05
16	2.15	2.1	2.35	3.15	2.4	1.9	1.7	2.1	1.95	1.9	2.1	2.1
17	2.2	2.1	2.3	3.25	2.5	1.85	1.85	2.0	1.9	1.95	2.5	2.1
18	2.15	2.1	2.4	3.3	2.35	1.85	1.75	2.0	1.9	1.95	2.6	2.1
19	2.15	2.05	2.5	3.35	2.25	1.75	1.95	1.9	1.9	2.0	2.35	2.15
20	2.1	2.05	2.65	3.15	2.2	1.8	1.85	1.9	1.9	2.0	2.5	2.15
21	2.1	2.0	2.7	3.1	2.25	1.75	1.75	1.85	1.9	2.0	2.75	2.2
22	2.15	2.05	2.75	3.05	2.2	1.7	1.7	2.05	1.85	1.95	2.5	1.95
23	2.2	2.1	2.95	3.15	2.2	1.8	1.75	2.05	2.1	1.9	2.3	2.0
24	2.15	2.1	2.85	2.9	2.25	1.8	1.6	2.05	2.55	1.95	2.6	2.0
25	2.15	2.1	2.7	2.95	2.3	1.75	1.65	2.1	2.05	1.9	3.3	2.0
26	2.15	2.05	2.6	2.85	2.2	1.65	1.6	2.15	1.95	1.85	2.85	2.05
27	2.1	2.15	2.6	2.75	2.3	1.65	1.65	2.0	1.95	1.85	2.65	2.1
28	2.1	2.15	2.7	2.65	2.3	1.6	1.5	2.0	1.85	1.85	2.55	2.0
29	2.1	.....	2.95	2.65	2.3	1.65	1.7	1.9	1.7	1.85	2.55	1.95
30	2.15	.....	3.3	2.75	2.2	1.55	1.7	1.9	1.65	1.85	2.45	2.05
31	2.15	.....	3.35	.....	2.25	.....	1.6	1.7	.....	1.95	.....	2.05

Daily discharge, in second-feet, of Gila River near Silver City, N. Mex., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	48	53	50	322	194	66	28	28	42	40	49	95
2	42	53	50	400	181	74	27	30	40	52	49	90
3	45	50	50	322	156	70	30	30	40	99	44	80
4	50	50	50	258	126	70	28	32	37	70	41	76
5	45	50	56	278	110	62	32	30	42	66	40	80
6	42	56	63	373	87	66	30	32	47	56	40	72
7	40	66	70	373	104	66	30	32	59	52	42	64
8	40	70	78	400	104	66	28	38	62	52	42	68
9	40	63	87	322	126	62	30	40	66	52	42	72
10	45	66	87	373	118	62	32	45	66	52	42	67
11	50	66	92	258	104	59	34	48	74	52	42	67
12	50	63	87	241	87	66	32	63	66	50	42	67
13	45	60	82	224	92	62	32	87	59	50	42	66
14	48	60	78	224	87	60	36	138	59	52	44	62
15	50	56	70	224	92	53	36	83	59	52	44	66
16	53	50	66	224	78	53	32	66	56	52	59	69
17	56	50	63	258	87	48	38	59	52	56	95	69
18	53	50	70	298	70	48	34	59	52	56	111	69
19	53	48	78	322	63	42	42	52	52	59	84	72
20	50	48	92	241	74	42	38	52	52	59	103	72
21	50	45	98	224	78	40	34	50	52	59	148	77
22	53	48	104	224	74	38	32	62	50	55	108	57
23	56	50	136	258	74	40	34	62	66	52	87	60
24	53	50	118	181	78	40	28	62	112	54	131	60
25	53	50	98	194	83	38	30	66	62	51	353	60
26	53	48	87	181	74	34	28	70	56	48	186	63
27	50	53	87	156	83	32	30	59	56	48	142	67
28	50	53	98	136	83	30	26	59	50	48	124	59
29	50	.....	136	136	83	32	32	52	42	48	124	56
30	53	.....	224	168	74	28	32	52	40	47	108	62
31	53	.....	241	.....	78	.....	28	42	.....	52	.....	62

NOTE.—Discharge determined by the indirect method for shifting channels.

Monthly discharge of Gila River near Silver City, N. Mex., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	56	40	49.0	3,010	B.
February	70	45	54.5	3,030	B.
March	241	50	91.8	5,640	B.
April	400	136	260	15,500	B.
May	194	63	96.8	5,950	C.
June	74	28	51.6	3,070	C.
July	42	26	31.7	1,950	B.
August	138	28	54.2	3,330	B.
September	112	37	55.6	3,310	B.
October	99	40	54.5	3,350	B.
November	353	40	86.9	5,170	C.
December	95	56	68.6	4,220	C.
The year	400	26	79.4	57,500	

GILA RIVER NEAR REDROCK, N. MEX.

Location.—Near the eastern edge of T. 18 S., R. 18 W., 4 miles northeast of Redrock post office, and about 40 miles west of Silver City; one-fourth mile above the mouth of the box canyon near Connor's ranch. Mangos Draw, the first large tributary upstream from the station, joins the Gila about 12 miles above.

Records available.—May 14, 1909, to December 31, 1913.

Drainage area.—3,500 square miles (approximate).

Gage.—Automatic recording. Records from May 14, 1908, to July 16, 1909, are from a gage one-eighth mile downstream from the present gage. The datum of the gage has remained constant since July 16, 1909.

Control.—Shifting.

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

Winter flow.—Ice has practically no effect on discharge relation.

Diversions.—Many diversions for irrigation are made above station.

Accuracy.—Estimates good.

Discharge measurements of Gila River near Redrock, N. Mex., for 1913.

[Made by E. L. Redding.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Jan. 18	0.96	80	Sept. 3	1.40	54.3
Mar. 16	2.00	278	Sept. 24	2.30	369
Apr. 10	2.65	469	Sept. 26	1.90	165
May 14	2.10	167	Nov. 16	1.90	109
June 18	1.41	62.1	Nov. 17	2.85	384
July 29	1.05	23.9	Dec. 12	2.35	136

Daily gage height, in feet, of Gila River near Redrock, N. Mex., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	0.96	1.00	2.72	2.24	1.82	1.00	1.67	.....	1.70	1.88	2.58
2	.....	.....	.....	2.92	2.24	1.84	.97	1.43	.....	3.22	1.87	2.52
3	.....	.....	.....	2.99	2.25	1.80	.97	1.32	1.40	2.83	1.86	2.49
4	.....	.....	.....	2.87	2.28	1.79	.95	1.30	1.50	2.69	1.84	2.48
5	.....	.....	.....	2.80	2.23	1.73	.97	1.29	1.91	2.57	1.84	2.44
6	.....	.....	.....	2.87	2.20	1.73	.98	1.26	1.78	2.40	1.82	2.40
7	.....	.....	.....	2.98	2.14	1.70	.97	1.22	2.02	2.24	1.80	2.40
8	.....	1.01	2.06	2.96	2.09	1.69	.95	1.17	2.01	2.20	1.79	2.39
9	.....	.....	1.98	2.81	2.07	1.69	1.10	1.18	2.07	2.15	1.79	2.35
10	.....	.....	2.10	2.65	2.06	1.65	.98	1.17	1.87	2.12	1.78	2.36
11	.....	.....	2.20	2.58	2.09	1.61	.99	1.52	2.07	2.06	1.76	2.35
12	.....	.....	2.30	2.53	2.12	1.59	1.00	1.70	2.00	2.02	1.77	2.35
13	.....	.....	2.40	2.50	2.12	1.52	.99	2.77	1.92	2.00	1.73	2.32
14	.....	.....	2.20	2.50	2.15	1.47	1.00	.....	1.63	1.99	1.74	2.30
15	.....	1.00	2.10	2.48	2.12	1.43	.98	.....	1.55	1.98	1.74	2.31
16	.....	.....	1.96	2.46	2.11	1.42	1.67	.....	1.49	1.95	1.96	2.37
17	0.96	.....	1.93	2.47	2.06	1.38	1.62	.....	1.42	1.93	3.05	2.39
18	.96	.....	1.94	2.48	2.02	1.39	1.29	.....	1.38	1.93	2.58	2.40
19	.....	.....	1.99	2.51	2.02	1.32	1.21	.....	1.33	1.95	2.34	2.40
20	.....	.....	2.03	2.56	1.97	1.30	1.18	.....	1.30	1.94	2.91	2.40
21	.....	.....	2.04	2.53	1.92	1.35	1.19	.....	1.29	1.95	2.92	2.49
22	.....	1.00	2.09	2.50	1.87	1.30	1.79	.....	1.22	1.95	2.65	2.50
23	.....	.....	2.15	2.58	1.89	1.37	1.61	.....	3.22	1.93	2.45	2.47
24	.....	.....	2.26	2.53	1.88	1.30	1.38	.....	2.64	1.92	3.28	2.44
25	.96	.....	2.20	2.47	1.90	1.28	1.24	.....	1.99	1.93	3.64	2.41
26	.....	.....	2.14	2.40	1.94	1.22	1.22	.....	1.86	1.92	3.29	2.41
27	.....	.....	2.04	2.32	1.96	1.20	1.13	.....	1.78	1.92	2.95	2.42
28	.....	.....	2.00	2.28	1.98	1.17	1.10	.....	1.71	1.92	2.81	2.42
29	.....	.....	2.01	2.22	1.93	1.09	1.06	.....	1.66	1.90	2.72	2.42
30	.....	.....	2.16	2.21	1.93	1.06	1.16	.....	1.60	1.91	2.61	2.42
31	.....	.....	2.47	.....	1.89	.....	1.25	.....	.....	1.90	.....	2.42

NOTE.—Maximum gage height of Aug. 13 approximately 10.4 feet and of Oct. 2, 9.35 feet.

Daily discharge, in second-feet, of Gila River near Redrock, N. Mex., for 1913.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	90	492	193	116	21	94	60	141	106	268
2	120	557	193	120	19	63	60	663	106	240
3	150	578	197	113	19	50	59	526	103	221
4	180	538	202	112	18	48	83	480	101	207
5	210	517	191	103	19	47	134	423	101	188
6	240	538	186	102	20	44	113	350	97	169
7	270	574	175	99	19	40	161	287	94	160
8	299	566	164	97	18	35	152	253	94	148
9	278.	520	159	97	32	36	161	223	93	138
10	309	469	158	91	20	35	125	195	63	139
11	336	447	164	85	20	81	164	158	89	138
12	364	422	170	83	21	105	150	130	90	134
13	393	400	170	73	20	481	134	125	84	129
14	336	383	175	67	21	350	88	124	86	126
15	309	363	170	62	20	260	78	121	86	127
16	272	344	168	61	109	200	70	117	124	136
17	266	334	158	57	88	150	62	114	460	140
18	269	322	150	58	47	120	57	115	333	142
19	280	318	150	50	39	100	51	117	265	142
20	290	318	141	48	36	90	48	116	445	140
21	292	295	132	54	37	220	47	117	428	157
22	306	276	125	48	226	180	40	118	356	159
23	322	282	127	56	181	120	655	115	295	153
24	352	261	126	48	117	180	469	113	561	145
25	335	246	128	46	82	300	245	114	665	140
26	319	230	136	40	66	220	166	113	550	140
27	294	212	139	38	45	140	144	113	428	142
28	283	203	143	35	33	120	132	113	372	140
29	286	190	134	28	25	100	123	111	334	140
30	326	188	134	25	35	90	115	111	292	140
31	414	.....	126	.....	44	70	.....	111	.....	140

NOTE.—Discharge determined from two fairly well defined rating curves and by the indirect method for shifting channels. Discharge estimated Mar. 2–7 and Aug. 14 to Sept. 2.

Monthly discharge of Gila River near Redrock, N. Mex., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	a 80	4,920	D.
February	.....	.....	a 85	4,720	D.
March	414	90	289	17,800	B.
April	578	188	379	22,600	B.
May	202	125	158	9,720	B.
June	120	25	70.4	4,190	B.
July	226	18	48.9	3,010	B.
August	418	35	134	8,240	C.
September	665	40	138	8,210	B.
October	663	111	194	11,900	B.
November	665	84	244	14,500	B.
December	268	126	156	9,590	B.
The year	665	18	165	119,000	

a Estimated.

GILA RIVER AT GUTHRIE, ARIZ.

Location.—In sec. 3, T. 6 S., R. 30 E., about 500 feet above Arizona & New Mexico Railroad bridge at Guthrie, and about 8 miles above junction with San Francisco River.

Records available.—November 6, 1910, to December 31, 1913.

Drainage area.—Not measured.

Gage.—Inclined staff bolted to conglomerate rock on right bank about 500 feet above bridge.

Control.—Shifting sand.

Discharge measurements.—Made from car and cable 50 feet below gage, or by wading.

Diversions.—About 7,000 acres of land are irrigated from this stream above the station.

Accuracy.—Estimates of discharge fair.

Discharge measurements of Gila River at Guthrie, Ariz., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 13	C. C. Jacob	5.55	99.0	June 22	C. C. Jacob	5.80	21.7
Feb. 11	W. Richins	5.70	129	July 25	W. Richins	6.15	47.8
27	C. C. Jacob	5.91	135	Aug. 7	C. C. Jacob	6.88	326
Mar. 24	....do	7.25	351	Sept. 14	Gray and Jacob	6.43	165
Apr. 20	....do	6.71	231	Nov. 9	C. C. Jacob	5.66	78.5
May 17	W. Richins	6.05	76.8				

Daily gage height, in feet, of Gila River at Guthrie, Ariz., for 1913.

[J. W. Beck, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.45	5.55	6.00	7.68	6.48	6.10	5.90	5.95	5.85	6.20	5.65	6.60
2	5.45	5.50	6.00	7.92	6.45	6.10	5.85	5.92	5.82	7.10	5.70	6.60
3	5.45	5.50	6.00	8.00	6.40	6.10	5.80	5.90	5.75	8.65	5.70	6.55
4	5.45	5.45	6.00	7.82	6.38	6.05	5.80	5.85	5.65	7.40	5.70	6.50
5	5.45	5.45	6.10	7.72	6.35	6.05	5.80	5.82	5.58	6.80	5.70	6.45
6	5.40	5.50	6.10	7.65	6.30	6.05	5.80	5.80	6.48	6.70	5.65	6.40
7	5.40	5.60	6.30	7.60	6.30	6.00	5.80	6.40	7.20	6.70	5.65	6.40
8	5.40	5.65	6.40	7.52	6.25	6.00	5.80	5.85	6.62	6.60	5.65	6.40
9	5.40	5.70	6.60	7.42	6.20	6.00	5.80	6.40	6.28	6.50	5.65	6.35
10	5.40	5.75	6.70	7.35	6.15	6.00	5.80	6.00	6.15	6.45	5.65	6.35
11	5.45	5.70	6.90	7.22	6.10	6.00	5.75	5.92	6.70	6.45	5.60	6.35
12	5.45	5.70	7.05	7.12	6.08	6.00	5.75	6.70	6.65	6.40	5.60	6.30
13	5.50	5.70	7.15	7.05	6.02	6.00	5.75	6.20	6.58	6.30	5.60	6.30
14	5.55	5.70	7.20	7.02	6.00	5.98	5.75	6.08	6.50	6.25	5.60	6.25
15	5.50	5.75	7.20	6.95	6.00	5.95	6.25	5.98	6.45	6.20	5.60	6.25
16	5.50	5.75	7.10	6.90	6.00	5.95	6.40	5.95	6.42	6.20	5.60	6.25
17	5.50	5.75	7.10	6.82	6.05	5.92	6.22	5.92	6.42	6.15	6.25	6.30
18	5.50	5.70	7.00	6.78	6.05	5.88	6.15	5.90	6.40	6.10	6.60	6.30
19	5.50	5.70	7.00	6.70	6.05	5.85	6.00	5.92	6.40	6.05	6.55	6.25
20	5.50	5.70	6.55	6.70	6.05	5.82	5.95	6.00	6.40	6.00	6.60	6.25
21	5.45	5.65	7.00	6.62	6.10	5.80	5.90	5.98	6.40	5.95	6.40	6.25
22	5.45	5.65	7.10	6.65	6.10	5.80	6.25	5.88	7.30	.....	7.00	6.25
23	5.60	5.70	7.15	6.62	6.10	5.80	6.25	5.82	6.50	5.70	7.10	6.25
24	5.60	5.70	7.20	6.60	6.10	5.88	6.15	5.75	6.45	5.70	7.05	6.40
25	5.60	5.70	7.40	6.60	6.10	5.90	6.15	5.70	6.45	5.65	7.00	6.40
26	5.60	5.70	7.40	6.58	6.10	5.98	6.12	6.60	6.40	5.65	6.90	6.35
27	5.60	5.90	7.30	6.55	6.10	6.00	6.10	6.35	6.35	5.60	6.70	6.35
28	5.55	5.95	7.30	6.55	6.10	5.98	6.05	6.12	6.35	5.60	6.75	6.35
29	5.55	.....	7.25	6.50	6.10	5.95	6.02	5.98	6.30	5.60	6.60	6.30
30	5.55	.....	7.20	6.50	6.10	5.92	6.00	5.95	6.30	5.55	6.60	6.30
31	5.55	.....	7.20	.....	6.10	.....	5.98	5.90	.....	5.55	.....	6.30

NOTE.—Discharge relation affected by backwater from temporary dam below the station, Mar. 6 to high water of September.

Daily discharge, in second-feet, of Gila River at Guthrie, Ariz., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	82	100	158	805	153	61	29	32	50	132	79	383
2	82	90	158	953	145	61	26	30	47	632	88	383
3	82	90	158	1,000	132	61	23	29	40	1,750	88	352
4	82	82	158	891	128	56	23	26	32	941	88	321
5	82	82	158	829	121	56	23	24	28	569	88	294
6	73	90	158	786	110	50	23	23	181	507	77	266
7	73	109	187	755	110	45	23	132	569	507	77	266
8	73	120	187	705	110	45	23	45	230	445	77	266
9	73	130	266	643	100	45	23	132	128	383	77	244
10	73	142	266	600	91	45	23	61	100	352	77	244
11	82	130	321	519	82	40	20	52	266	352	69	244
12	82	130	352	457	79	40	20	221	244	321	69	221
13	90	130	352	414	70	40	20	91	214	266	69	221
14	100	130	321	395	68	38	20	71	187	244	69	204
15	90	142	321	352	68	36	61	59	172	221	69	204
16	90	142	266	321	68	32	82	56	164	221	68	187
17	90	142	266	277	74	30	58	52	164	204	221	204
18	90	130	221	257	74	28	50	50	158	187	414	204
19	90	130	221	221	74	26	36	52	158	172	383	187
20	90	130	221	221	74	24	32	61	158	158	414	187
21	82	120	221	194	74	23	29	59	158	145	294	187
22	82	120	266	204	74	23	61	48	693	118	662	187
23	109	130	294	194	74	23	61	42	221	91	724	187
24	109	130	321	187	74	28	50	36	204	91	693	244
25	109	130	445	187	74	29	50	32	204	82	662	244
26	109	130	445	181	68	34	47	204	187	81	600	221
27	109	132	383	172	68	36	45	132	172	73	476	221
28	100	145	383	172	68	34	40	86	172	73	507	221
29	100	.....	352	158	68	32	38	65	158	73	414	204
30	100	.....	321	158	68	30	36	61	158	66	414	204
31	100	.....	321	.....	68	.....	34	56	.....	66	.....	204

NOTE.—Discharge determined by the indirect method for shifting channels; discharge interpolated Oct. 22.

Monthly discharge of Gila River at Guthrie, Ariz., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	109	73	89.6	5,510	C.
February	145	82	122	6,780	C.
March	445	158	273	16,800	C.
April	1,000	158	440	26,200	C.
May	153	68	87.4	5,370	C.
June	61	23	38.4	2,280	C.
July	82	20	36.4	2,240	C.
August	221	23	68.4	4,210	C.
September	693	28	187	11,100	C.
October	1,750	66	307	18,900	C.
November	724	68	270	16,100	C.
December	383	187	239	14,700	C.
The year	1,750	20	180	130,000	

GILA RIVER AT KELVIN, ARIZ.

Location.—About one-half mile below the mouth of Mineral Creek, 1 mile below Kelvin,[1] and 25 miles above Florence.

Records available.—January 26, 1911, to December 31, 1913.

Drainage area.—Not measured.

[1] Ray Junction on Arizona & Eastern Railroad.

Gage.—Inclined staff gage installed July 31, 1913, on left bank 50 feet above original inclined staff, which was fastened to basalt ledge on right bank opposite observer's home. Original gage was destroyed by the flood of March 8, 1911, and replaced by painting the section directly on the rock about 10 feet downstream. November 23, 1911, an inclined staff for low water was fastened to the rock at the same location as first gage and on September 20, 1912, an auxiliary vertical staff for low water was installed on left bank opposite gage.

Control.—Sand; somewhat shifting.

Discharge measurements.—Made from public car and cable about three-fourths mile above gage or by wading.

Diversions.—Approximately 25,000 acres of land are irrigated from this stream above this station and below the station at Guthrie.

Accuracy.—Estimates fair.

Discharge measurements of Gila River at Kelvin, Ariz., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 12	C. C. Jacob	4.30	811	July 30	C. C. Jacob	3.57	91
Apr. 15	W. Richins	4.30	347	Aug. 29	do	3.50	62.9
May 21	C. C. Jacob	3.34	391	Sept. 22	Gray and Jacob	3.48	42.2
June 3	W. Richins	3.10	18.4	Oct. 31	C. C. Jacob	3.40	40.8
17	C. C. Jacob	2.93	2.6	Nov. 25	do	4.56	534
July 14	do	3.15	25.2				

Daily gage height, in feet, of Gila River at Kelvin, Ariz., for 1913.

[H. Measom, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.0	3.9	5.05	3.9	3.85	3.15	.....	3.55	3.4	3.6	3.4	5.0
2	4.0	3.8	4.8	3.8	3.8	3.1	.....	3.85	3.7	3.6	3.4	4.95
3	4.0	3.8	4.7	3.9	3.7	3.1	.....	3.7	4.15	3.5	3.5	4.8
4	4.0	3.8	4.7	4.2	3.7	3.1	.....	3.5	3.95	4.85	3.5	4.75
5	3.95	3.8	4.55	4.7	3.7	3.1	.....	3.45	4.0	5.45	3.5	4.6
6	3.9	3.8	4.4	4.75	3.65	3.1	.....	3.3	3.9	5.0	3.5	4.45
7	3.8	4.0	4.25	4.45	3.6	3.1	.....	3.9	4.1	4.55	3.5	4.4
8	3.8	4.6	4.1	4.3	3.6	3.1	.....	4.65	4.5	4.4	3.5	4.4
9	3.8	4.3	4.0	4.3	3.55	3.0	.....	5.25	4.5	4.25	3.5	4.4
10	3.9	4.2	4.05	4.3	3.5	3.0	.....	4.2	4.4	4.15	3.5	4.4
11	4.1	4.4	4.3	4.2	3.5	2.95	.....	4.3	4.4	3.9	3.5	4.4
12	4.3	4.6	4.3	4.2	3.5	2.95	2.95	4.35	4.65	3.8	3.5	4.4
13	4.25	4.45	4.4	4.25	3.5	2.95	3.0	4.8	4.5	3.7	3.5	4.35
14	4.3	4.3	4.5	4.3	3.45	2.95	3.0	5.0	4.5	3.65	3.5	4.35
15	4.2	4.3	4.6	4.3	3.45	2.95	3.1	4.9	4.15	3.6	3.6	4.35
16	4.1	4.3	4.6	4.3	3.4	2.9	3.0	4.9	3.9	3.5	3.6	4.4
17	4.1	4.2	4.5	4.2	3.4	2.9	3.1	4.8	3.8	3.45	3.7	4.4
18	4.1	4.1	4.4	4.1	3.35	2.9	4.4	4.75	3.7	3.45	4.85	4.4
19	4.1	4.1	4.3	4.0	3.35	3.55	5.3	4.3	3.4	3.4	5.3	4.4
20	4.0	4.1	4.2	4.0	3.35	3.35	5.25	3.9	3.3	3.45	5.1	4.4
21	4.0	4.05	4.1	4.0	3.35	3.25	4.95	3.9	3.3	3.5	4.9	4.4
22	4.1	4.1	4.1	4.1	3.3	3.2	4.8	3.85	3.45	3.5	4.8	4.4
23	4.1	4.3	4.1	4.0	3.25	3.15	4.5	3.7	3.6	3.5	4.8	4.4
24	4.0	4.4	4.05	3.95	3.25	3.1	4.15	3.45	3.4	3.5	4.8	4.4
25	4.0	5.4	4.1	4.1	3.25	3.0	4.0	4.25	3.4	3.45	4.8	4.4
26	4.0	5.6	4.2	4.05	3.25	3.0	3.85	3.4	3.65	3.45	5.2	4.4
27	3.9	5.7	4.3	4.0	3.25	2.95	3.65	3.5	3.9	3.45	5.7	4.4
28	3.9	5.25	4.25	4.6	3.2	2.85	3.5	3.5	3.9	3.45	5.65	4.3
29	3.9	.....	4.1	3.95	3.2	.....	3.4	3.5	3.9	3.4	5.5	4.3
30	3.9	.....	4.0	3.95	3.2	.....	3.5	3.45	3.75	3.4	5.0	4.3
31	3.9	.....	4.0	.....	3.15	.....	3.4	3.5	.....	3.4	.....	4.3

NOTE.—Stream dry June 29 to July 11.

Daily discharge, in second-feet, of Gila River at Kelvin, Ariz., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	212	179	1,870	179	164	24	0	88	42	65	42	870
2	212	148	1,430	148	148	18	0	164	98	65	42	820
3	212	148	1,290	179	121	18	0	121	227	47	59	681
4	212	148	1,290	291	121	18	0	78	160	726	59	642
5	196	148	1,100	602	121	18	0	68	173	1,440	59	529
6	179	148	910	642	110	18	0	42	143	870	59	429
7	148	212	762	429	98	18	0	179	202	494	59	398
8	148	529	630	342	98	18	0	566	381	398	59	398
9	148	370	560	342	88	9	0	1,160	381	316	59	398
10	179	291	595	342	78	9	0	291	322	270	59	398
11	249	398	810	291	78	6	0	342	322	164	59	398
12	342	529	810	291	78	6	6	370	467	134	59	398
13	316	429	910	316	78	6	9	681	370	110	59	370
14	342	342	1,030	342	68	6	9	870	370	98	59	370
15	291	342	1,160	342	68	6	24	770	212	88	78	370
16	249	342	1,160	342	57	2	9	770	132	68	78	370
17	249	291	970	291	56	2	18	681	107	59	98	370
18	249	249	810	249	45	2	398	642	86	59	726	370
19	249	249	672	212	44	88	1,230	342	33	50	1,300	370
20	212	249	560	212	42	50	1,160	179	21	59	1,040	370
21	212	230	455	212	41	36	820	176	21	59	820	370
22	249	249	425	249	34	29	681	157	38	59	726	370
23	249	342	398	212	29	24	460	114	63	59	726	370
24	212	398	345	196	30	18	270	61	32	59	726	370
25	212	2,680	345	249	32	9	212	291	32	50	726	370
26	212	3,190	370	230	33	9	164	49	72	50	1,160	370
27	179	3,450	398	212	34	6	110	65	129	50	1,900	370
28	179	2,310	345	529	29	1	78	63	129	50	1,820	316
29	179	.....	255	196	29	0	59	63	129	42	1,600	316
30	179	.....	212	196	29	0	78	52	94	42	925	316
31	179	.....	212	.....	24	.....	59	44	.....	42	.....	316

NOTE.—Discharge determined by the indirect method for shifting channels.

Monthly discharge of Gila River at Kelvin, Ariz., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	342	148	220	13,500	C.
February	3,450	148	664	36,900	C.
March	1,870	212	745	45,800	C.
April	642	148	296	17,600	B.
May	164	24	67.9	4,180	B.
June	88	0	15.8	940	B.
July	1,230	0	189	11,600	B.
August	1,160	42	308	18,900	B.
September	467	21	166	9,880	C.
October	1,440	42	198	12,200	C.
November	1,900	42	508	30,200	C.
December	870	316	425	26,100	C.
The year	3,450	0	315	228,000	

GILA RIVER NEAR SENTINEL, ARIZ.

Location.—In sec. 10, T. 5 S., R. 9 W., 1 mile below the diversion dam of the Southwestern Fruit & Irrigation Co., about 10 miles north of Sentinel.

Records available.—July 1, 1913, to December 31, 1913.

Drainage area.—Not measured.

Gage.—Vertical staff in two sections, on left bank.

Control.—Shifting sand.

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

Diversions.—Water is diverted for irrigation above the station; record shows approximately the amount of water flowing from the Gila drainage into the Colorado.

Estimates withheld on account of lack of discharge measurements.

Discharge measurements of Gila River near Sentinel, Ariz., for 1913.

Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 4	C. C. Jacob	.....	86
Sept. 23	Gray and Jacob	.....	0

Daily gage height, in feet, of Gila River near Sentinel, Ariz., for 1913.

[H. E. Jones, observer.]

Day.	July.	Aug.	Nov.	Dec.	Day.	July.	Aug.	Nov.	Dec.
1	4.8	4.8	.....	6.5	16	4.8	.....	.....	5.6
2	4.8	4.8	.....	6.45	17	5.2	.....	.....	5.6
3	4.8	4.8	.....	5.95	18	4.85	.....	.....	5.6
4	4.8	4.8	.....	5.8	19	4.8	.....	.....	5.6
5	4.8	4.8	.....	5.55	20	4.8	.....	.....	5.6
6	4.8	4.8	.....	5.7	21	4.8	.....	.....	5.6
7	4.8	6.4	.....	5.7	22	4.8	.....	.....	5.75
8	4.8	.....	.....	5.75	23	4.8	.....	6.35	5.8
9	4.8	.....	.....	5.8	24	4.8	.....	6.45	5.8
10	4.8	.....	.....	5.8	25	4.8	.....	5.3	5.8
11	4.8	.....	.....	5.8	26	4.8	.....	5.35	5.8
12	4.8	.....	.....	5.8	27	4.8	.....	5.45	5.8
13	4.8	.....	.....	5.7	28	4.8	.....	5.4	5.8
14	4.8	.....	.....	5.65	29	4.8	.....	5.55	5.8
15	4.8	.....	.....	5.55	30	4.8	.....	6.1	5.75
					31	4.8	6.05	.....	5.7

NOTE.—From June 1 to Dec. 31 stream was dry on days for which gage heights are missing.

SAN FRANCISCO RIVER NEAR ALMA, N. MEX.

Location.—In sec. 4, T. 11 S., R. 20 W., 1½ miles south of Alma, 5 miles northwest of Glenwood, and about 90 miles northwest of Silver City; at the mouth of the box canyon 4½ miles above the mouth of Whitewater Creek, and about 1½ miles below the mouth of Mineral Creek.

Records available.—August 11, 1912, to December 31, 1913, October 18, 1904, to December 31, 1907, and January 1, 1909, to August 12, 1911, at a point 1 mile above the present station.

Drainage area.—Not measured.

Gage.—Vertical staff; no relation to gages used at the station about 1 mile upstream.

Control.—Shifting.

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

Winter flow.—Ice has practically no effect on discharge relation.

Diversions.—Some water is diverted for irrigation above the station.

Accuracy.—Estimates poor, owing to the shifting bed.

Discharge measurements of San Francisco River near Alma, N. Mex., for 1913.

[Made by E. L. Redding.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Jan. 25	0.98	14.3	July 26	0.75	4.1
Mar. 18	1.18	36.4	Aug. 30	1.00	13.9
Apr. 14	1.35	46.2	Sept. 22	.89	9.9
Apr. 15	1.22	48.0	Nov. 14	1.00	16.5
May 10	.82	8.9	Dec. 15	1.20	31.5
June 15	.....	.0			

Daily gage height, in feet, of San Francisco River near Alma, N. Mex., for 1913.

[Mrs. G. G. Graham, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.0	1.0	1.1	2.1	1 0	.....	.....	0.75	1.0	0.9	1.05	1.2
2	1.0	1.0	1.1	1.7	1.0	.....	.....	.....	1.0	2.0	1.05	1.2
3	1.0	1.0	1.1	1.5	1.0	.....	.....	.....	1.0	1.8	1.1	1.1
4	1.0	1.0	1.1	1.6	1.0	.....	.....	.....	1.4	1.7	1.05	1.1
5	1.0	1.0	1.1	1.6	1.0	.....	.....	.....	1.15	1.6	1.05	1.15
6	1.0	1.0	1.15	1.6	1.0	.....	.....	.....	1.4	1.25	1.05	1.2
7	1.0	1.3	1.15	1.6	.9	.....	.....	3.9	1.2	1.1	1.05	1.15
8	1.1	1.2	1.15	1.6	.9	.....	.....	2.9	2.3	1.1	1.0	1.2
9	1.0	1.4	1.2	1.5	.9	.....	.....	1.3	1.3	1.0	1.0	1.2
10	1.0	1.2	1.2	1.6	.9	.....	0.8	1.2	1.2	1.0	1.0	1.15
11	1.0	1.2	1.4	1.6	.9	.....	.....	1.05	1.1	1.0	1.0	1.15
12	1.0	1.2	1.4	1.5	.9	.....	.....	3.8	1.0	1.0	1.1	1.1
13	1.1	1.2	1.4	1.5	.9	.....	.....	1.4	1.0	1.0	1.0	1.1
14	1.2	1.1	1.4	1.4	.8	.....	.....	2.2	1.0	1.0	1.0	1.1
15	1.2	1.0	1.4	1.4	.8	.....	.....	1 5	1 0	1.0	1.0	1.2
16	1.0	1.0	1.3	1.5	.75	.....	.....	1.1	1.0	1.0	1.5	1.2
17	1.05	1.1	1.2	1.4	.7	.....	.....	1.0	1.0	1.0	1.3	1.15
18	1.1	1.1	1.2	1.4	.6	.....	1.15	1.0	1.0	1.0	1.1	1.15
19	1.0	1.1	1.4	1.4	.....	.....	1.0	1.0	1.0	1.0	1.1	1.15
20	1.0	1.1	1.45	1.4	.....	.....	1.0	1.0	1.0	1.0	1.5	1.15
21	1.1	1.1	1.5	1.4	.....	.....	1.0	1.05	.8	1.0	1.3	1.15
22	1.1	1.1	1.5	1.3	.....	.....	1.5	1.0	.9	1.0	1.2	1.1
23	1.1	1.1	1.6	1.2	.....	.....	1.4	1.15	1.1	1.0	1.2	1.1
24	1.0	1.15	1.6	1.15	.....	.....	1.05	1.0	1.05	1.0	1.45	1.05
25	1.0	1.1	1.4	1.1	.....	.....	1.0	2.0	1.15	1.05	1.6	1.05
26	1 05	1.2	1.4	1.1	.....	.....	.75	1.15	1.0	1.05	1.4	1.0
27	1.05	1.2	1.4	1.05	.....	.....	.....	1.0	1.0	1.0	1.2	1.0
28	1.0	1.1	1.4	1.05	.....	.....	.....	1.05	1.0	1.05	1.2	1.05
29	1.0	.....	1.3	1.0	.....	.....	.....	1.0	1.0	1.05	1.2	1.05
30	1.0	.....	1.7	1.0	.....	.....	1.2	1.1	.8	1.05	1.2	1.05
31	1.0	.....	1.85	.....	.....	.....	1.0	1.1	.....	1.05	.....	1.05

NOTE.—Discharge relation slightly affected by ice Jan. 1–12. Flood on Aug. 7 reached a maximum gage height of approximately 8.0 feet. Stream dry on days of no gage height.

Daily discharge, in second-feet, of San Francisco River near Alma, N. Mex., for 1912–13.

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1912.						1912.					
1		38	105	15	19	16	15	19	28	15	15
2		29	25	15	22	17	19	22	28	15	15
3		21	29	15	36	18	19	19	24	15	15
4		17	121	15	22	19	15	19	24	15	15
5		17	66	15	22	20	19	19	20	15	15
6		284	38	15	15	21	20	18	20	15	15
7		210	118	15	15	22	63	18	16	15	15
8		22	43	15	22	23	20	12	16	15	15
9		22	38	15	22	24	20	12	23	15	15
10		22	25	15	22	25	20	9.2	16	15	15
11	12	19	28	15	15	26	64	7.1	16	15	15
12	21	19	28	15	15	27	132	3.6	16	15	19
13	127	19	37	15	15	28	64	3.6	70	15	22
14	15	22	28	15	19	29	48	134	23	15	19
15	18	19	28	15	15	30	42	18	16	22	16
						31	229		16		16

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1913.												
1	16	16	27	151	22		0.0	4.2	14	10	20	32
2	16	16	27	94	22		.0	.0	14	130	20	32
3	16	16	28	67	22		.0	.0	14	102	23	23
4	16	16	28	80	22		.0	.0	48	89	20	23
5	16	16	28	80	21		.0	.0	24	76	20	28
6	16	16	32	80	21		.0	.0	49	36	20	32
7	16	42	32	79	14		.0	415	29	23	20	28
8	16	33	32	79	14		.0	265	170	23	16	32
9	16	53	37	66	13		.0	41	38	16	16	32
10	16	33	37	79	13		5.8	32	29	16	16	28
11	16	33	59	77	13		.0	20	22	16	16	28
12	16	33	59	64	13		.0	400	15	16	23	23
13	23	34	59	64	13		.0	51	15	16	16	23
14	32	25	59	52	7.9		.0	158	15	16	16	23
15	32	17	60	68	7.9		.0	62	15	16	16	32
16	16	17	49	81	5.8		.0	22	15	16	63	31
17	20	25	38	68	4.2		.0	15	15	16	41	27
18	23	25	38	67	1.6		28	15	15	16	23	27
19	16	26	60	67	.0		16	15	15	16	23	27
20	16	26	66	67	.0		16	15	15	16	63	27
21	23	26	72	66	.0		16	18	5.8	16	41	26
22	23	26	71	54	.0		63	15	10	16	32	22
23	23	26	84	43	.0		52	25	23	16	32	22
24	16	30	84	37	.0		20	14	20	16	58	18
25	16	27	59	33	.0		16	126	28	20	76	18
26	20	36	58	33	.0		4.2	25	16	20	52	14
27	20	36	58	28	.0		.0	14	16	16	32	14
28	16	27	58	28	.0		.0	17	16	20	32	17
29	16		46	23	.0		.0	14	16	20	32	17
30	16		94	22	.0		32	20	5.8	20	32	17
31	16		114		.0		16	20		20		17

NOTE.—Discharge determined from a poorly defined rating curve and by the indirect method for shifting channels. There was no flow during June, 1913.

Monthly discharge of San Francisco River near Alma, N. Mex., for 1912–13.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1912.					
August 11–31	229	12	47.7	1,990	D.
September	284	3.6	37.1	2,210	D.
October	121	16	36.4	2,240	D.
November	22	15	15.2	904	D.
December	36	15	17.8	1,090	D.
The period				8,430	
1913.					
January	32	16	18.5	1,140	D.
February	53	16	26.9	1,490	D.
March	114	27	53.3	3,280	D.
April	151	22	63.2	3,760	D.
May	22	0	8.08	497	D.
June	0	0	.00	0	
July	63	0	9.19	565	D.
August	415	0	59.3	3,650	D.
September	170	5.8	24.8	1,480	D.
October	130	10	28.4	1,750	D.
November	76	16	30.3	1,800	D.
December	32	14	24.5	1,510	D.
The year	415	0	28.9	20,900	

SAN FRANCISCO RIVER AT CLIFTON, ARIZ.

Location.—In sec. 19, T. 4 S., R. 30 E., at railroad bridge at Clifton, Ariz., 1¾ miles below diversion dam of the Arizona Copper Co., and 5 miles above junction with Gila River.

Records available.—October 24, 1910, to January 14, 1911; January 24 to March 31, 1912; August 5, 1912, to December 31, 1913.

Drainage area.—Not measured.

Gage.—Until August 5, 1913, chain gage installed October 1, 1912, was read at highway bridge one-fourth mile above station; August 6 to December 31, vertical staff gage on railroad bridge; October 24, 1910, to September 30, 1912, a vertical staff gage was used at the highway bridge. Gage on railroad bridge referred to different datum from that of gages on highway bridge.

Control.—Sand and gravel; shifting at new location; badly shifting at old location.

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

Diversions.—Water diverted for irrigation above the station.

Accuracy.—Estimates January to August, poor; September to December, good.

Discharge measurement of San Francisco River at Clifton, Ariz., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 12	C. C. Jacob	3.46	51	Apr. 19	C. C. Jacob	4.09	248
Feb. 10	W. Richins	3.71	103	May 17	W. Richins	3.36	112
12	do	3.71	120	June 21	C. C. Jacob	2.97	37.3
25	C. C. Jacob	3.47	109	July 25	W. Richins	3.31	67.1
26	do	4.51	417	Aug. 7	C. C. Jacob	4.49	28.8
26	do	4.21	241	Sept. 13	Gray and Jacob	4.90	97.8
Mar. 23	do	3.61	202	Nov. 8	C. C. Jacob	4.67	57.0

NOTE.—Gage height prior to Aug. 7 refer to old gage at highway bridge.

Daily gage height, in feet, of San Francisco River at Clifton, Ariz., for 1913.

[W. C. Bond, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	3.5	3.8	4.4	3.7	3.35	2.7	.....	4.5	4.9	4.6	4.8
2	.....	3.6	3.7	4.4	3.7	3.35	2.7	.....	4.7	4.9	4.65	4.8
3	.....	3.4	3.7	4.4	3.7	3.35	2.6	.....	4.6	4.9	4.65	4.8
4	.....	3.5	3.8	4.3	3.7	3.35	2.7	.....	4.7	4.9	4.6	4.8
5	.....	3.45	3.8	4.2	3.7	3.3	2.7	.....	4.9	4.9	4.65	4.8
6	.....	3.5	3.9	.....	3.6	3.25	2.6	4.5	4.9	4.9	4.65	4.8
7	.....	3.6	4.1	.....	3.6	3.25	2.6	4.5	5.0	4.8	4.7	4.8
8	.....	3.8	4.3	.....	3.6	3.2	4.7	5.6	4.8	4.8	4.7	4.8
9	.....	4.3	4.3	.....	3.5	3.2	4.2	4.25	5.3	4.8	4.7	4.8
10	.....	3.7	4.4	.....	3.4	3.3	3.1	4.7	.....	4.8	4.7	4.9
11	.....	4.05	4.4	.....	3.4	3.35	2.7	4.7	.....	4.85	4.7	4.9
12	3.45	3.7	4.4	.....	3.4	3.4	2.7	4.2	.....	4.9	4.7	4.9
13	3.45	3.55	4.2	.....	3.4	.....	2.7	6.0	4.9	4.8	4.7	4.9
14	3.45	3.55	4.1	.....	3.4	.....	2.7	5.6	4.9	4.55	4.75	4.95
15	3.45	3.5	4.0	.....	3.4	.....	2.7	4.8	4.9	4.65	4.75	4.95
16	3.45	3.5	4.0	.....	3.4	.....	3.5	.....	4.9	4.7	4.75	5.00
17	3.45	3.6	3.95	.....	3.35	.....	2.85	4 7	4.85	4.55	4.7	4.85
18	3.45	3.5	3.9	.....	3.35	.....	2.75	4.7	4.9	4.55	4.75	4.85
19	3.45	3.6	3.7	4.1	3.35	.....	2.85	4.5	4.9	4.55	4.75	4.9
20	3.4	3.5	3.7	.....	3.35	2.95	2.85	5.0	4.85	4.55	4.75	4.95
21	3.4	3.5	3.7	.....	3.35	2.95	2.75	4.7	4.85	4.55	4.85	4.95
22	3.4	3.5	3.6	.....	3.35	2.95	.....	4.5	4.85	4.5	4.95	4.95
23	3.4	3.5	3.6	.....	3.35	2.95	.....	4.8	4.9	4.5	5.0	4.9
24	3.3	.....	3.6	.....	3.35	2.95	3.4	4.6	5.0	4.5	6.0	4.9
25	3.3	3.45	.....	.....	3.35	2.95	3.3	4.5	5.0	4.5	6.15	4.9
26	3.35	4.2	3.7	.....	3.35	2.95	3.5	4.5	5.0	4.7	6.15	4.95
27	3.3	.....	3.7	.....	3.35	2.95	3.4	4.7	4.9	4.7	5.5	4.95
28	3.35	.....	3.6	.....	3.35	2.95	3.35	5.0	4.8	4.7	5.0	4.95
29	3.35	.....	3.7	.....	3.4	2.95	3.3	4.9	4.8	4.7	4.85	4.95
30	.....	.....	3.7	3.7	3.35	2.95	3.3	4.9	4.8	4.7	4.75	.....
31	.....	.....	.....	.....	3.35	.....	3.5	4.7	.....	4.7	.....	.....

NOTE.—Chain gage at highway bridge read Jan. 1 to July 31; staff gage at railroad bridge, referred to new datum, read Aug. 6 to Dec. 31.

Daily discharge, in second-feet, of San Francisco River at Clifton, Ariz., for 1913.

Day.	Jan.	Feb.	Mar.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	100	58	130	174	112	8	54	30	99	42	75
2	100	76	99	174	112	8	50	57	99	50	75
3	100	42	99	174	112	5	45	42	99	50	75
4	100	58	130	174	112	8	40	57	99	42	75
5	80	50	130	174	99	8	35	99	99	50	75
6	80	58	174	174	88	5	30	99	99	50	75
7	80	76	310	174	88	5	29	131	75	57	75
8	70	130	470	174	76	1,170	555	75	75	57	75
9	70	470	470	130	76	685	9	315	75	57	75
10	70	100	550	130	99	50	57	260	75	57	99
11	60	275	550	130	112	6	57	210	87	57	99
12	50	120	550	130	130	6	6	150	99	57	99
13	50	76	470	130	120	6	925	99	75	57	99
14	50	76	390	130	108	6	555	99	36	66	115
15	50	76	350	130	96	6	75	99	50	66	115
16	50	76	350	130	84	130	67	99	57	66	131
17	50	99	350	112	72	16	57	87	36	57	87
18	50	88	310	112	60	8	57	99	36	66	87
19	50	114	240	112	48	16	30	99	36	66	99
20	42	88	240	112	37	16	131	87	36	66	115
21	42	99	240	112	37	6	57	87	36	87	115
22	42	99	202	112	37	33	30	87	30	115	115
23	42	99	202	112	37	60	75	99	30	131	99
24	30	114	202	112	37	88	42	131	30	925	99
25	30	105	218	112	37	67	30	131	30	1,080	99
26	36	241	235	112	37	58	30	131	57	1,080	115
27	30	205	230	112	37	42	57	99	57	475	115
28	36	168	195	112	37	36	131	75	57	131	115
29	36	.....	225	130	37	30	99	75	57	87	115
30	43	.....	220	112	37	30	99	75	57	66	115
31	50	.....	220	112	.....	58	57	.....	57	.....	115

NOTE.—Daily discharge determined as follows: Jan. 1 to Aug. 5 by the indirect method for shifting channels; Aug. 6 to Dec. 31 from a fairly well-defined rating curve. Estimates were not made for April because of lack of data. Discharge interpolated for days for which gage heights are missing.

Monthly discharge of San Francisco River at Clifton, Ariz., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	100	30	57.1	3,510	D.
February	470	42	119	6,610	C.
March	550	99	282	17,300	D.
May	174	112	133	8,180	D.
June	130	37	73.7	4,390	D.
July	1,170	5	86.3	5,310	D.
August	925	6	115	7,070	D.
September	315	30	109	6,490	B.
October	99	30	62.6	3,850	B.
November	1,080	42	177	10,500	C.
December	131	75	98.0	6,030	B.

WHITEWATER CREEK NEAR MOGOLLON, N. MEX.

Location.—In sec. 4, T. 11 S., R. 19 W., 3 miles south of Mogollon, 90 miles northwest of Silver City, at the Socorro Mines Co.'s power plant, 500 feet below the confluence of the South and North forks of Whitewater Creek.

Records available.—May 30, 1911, to December 31, 1913.

Drainage area.—34 square miles.

Gage.—Vertical staff.

Control.—Permanent at low stages but liable to shift at high stages.

Discharge measurements.—Made by wading or from a footbridge.

Winter flow.—Discharge relation not affected by backwater from ice.

Diversions.—None above station.

Accuracy.—Estimates for 1912, fair; for 1913, good.

Discharge measurements of Whitewater Creek near Mogollon, N. Mex., for 1913.

[Made by E. L. Redding.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-feet.*		*Feet.*	*Sec.-feet.*
Jan. 25	1.43	3.0	July 26	1.30	2.5
Mar. 19	1.90	24.1	Aug. 31	1.32	3.2
Apr. 14	2.06	32.3	Sept. 22	1.35	3.4
May 10	2.13	39.7	Nov. 13	1.39	2.7
June 15	1.42	6.1	Dec. 15	1.40	6.6

Daily gage height, in feet, of Whitewater Creek near Mogollon, N. Mex., for 1913.

[H. J. Evans, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.45	1.45	1.45	2.38	2.37	1.67	1.31	1.36	1.31	1.33	1.40	1.55
2	1.45	1.45	1.45	2.38	2.27	1.67	1.31	1.36	1.32	1.47	1.40	1.47
3	1.45	1.45	1.45	2.38	2.07	1.67	1.31	1.31	1.30	1.63	1.40	1.47
4	1.45	1.45	1.45	2.18	1.92	1.62	1.31	1.31	1.31	1.67	1.39	1.45
5	1.45	1.45	1.45	2.08	1.87	1.57	1.31	1.31	1.35	1.53	1.39	1.45
6	1.45	1.45	1.50	2.08	1.92	1.57	1.31	.....	1.39	1.45	1.38	1.45
7	1.45	1.45	1.90	2.28	2.07	1.57	1.31	.....	1.60	1.45	1.38	1.40
8	1.45	1.45	1.90	2.28	2.22	1.57	1.31	.....	1.63	1.40	1.38	1.35
9	1.45	1.45	1.95	2.28	2.12	1.52	1.31	1.46	1.53	1.40	1.37	1.37
10	1.45	1.45	2.00	2.28	2.12	1.47	1.31	1.35	1.51	1.40	1.37	1.35
11	1.45	1.45	2.00	1.98	2.17	1.47	1.31	1.35	1.50	1.40	1.38	1.35
12	1.45	1.45	2.00	1.98	2.17	1.47	1.31	1.50	1.49	1.37	1.39	1.35
13	1.45	1.50	2.00	1.98	2.22	1.47	1.31	1.45	1.45	1.35	1.39	1.35
14	1.45	1.45	2.00	1.97	2.17	1.47	1.31	1.40	1.37	1.35	1.40	1.35
15	1.45	1.45	1.95	1.97	2.02	1.47	1.31	1.35	1.37	1.35	1.43	1.43
16	1.45	1.45	1.90	1.97	1.92	1.45	1.31	1.35	1.37	1.35	1.63	1.45
17	1.45	1.45	1.90	1.97	1.92	1.42	1.31	1.35	1.34	1.35	2.20	1.43
18	1.45	1.45	1.90	1.97	1.97	1.42	1.31	1.35	1.33	1.35	1.73	1.40
19	1.45	1.50	1.90	1.97	1.97	1.39	1.31	1.35	1.33	1.35	1.55	1.40
20	1.45	1.50	1.90	1.97	1.97	1.37	1.31	1.35	1.33	1.35	2.25	1.40
21	1.45	1.45	1.90	1.97	1.92	1.42	1.31	1.40	1.33	1.35	1.83	1.40
22	1.45	1.45	1.90	2.07	1.92	1.45	.....	1.40	1.33	1.35	1.75	1.33
23	1.45	1.45	1.90	2.07	1.97	1.39	.....	1.35	1.35	1.35	1.75	1.30
24	1.45	1.45	1.80	2.07	2.17	1.42	.....	1.35	1.35	1.35	2.30	1.35
25	1.45	1.45	1.80	2.07	2.12	1.37	.....	1.45	1.33	1.35	2.33	1.30
26	1.45	1.45	1.80	1.97	2.02	1.37	1.30	1.35	1.35	1.35	1.97	1.33
27	1.45	1.45	1.80	1.97	2.02	1.36	1.26	1.35	1.33	1.35	1.75	1.33
28	1.45	1.45	1.75	2.07	1.92	1.36	1.26	1.35	1.33	1.35	1.67	1.30
29	1.45	.....	1.75	2.22	1.87	1.36	1.28	1.35	1.33	1.35	1.60	1.35
30	1.45	.....	1.75	2.37	1.82	1.34	1.44	1.35	1.33	1.35	1.57	1.35
31	1.45	.....	2.28	.....	1.72	.....	1.36	1.33	.....	1.39	.....	1.35

Daily discharge, in second-feet, of Whitewater Creek near Mogollon, N. Mex., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.4	3.4	3.4	52	53	16	2.9	4.1	2.9	2.9	3.4	12
2	3.4	3.4	3.4	52	46	16	2.9	4.1	3.2	6.5	3.4	8.7
3	3.4	3.4	3.4	52	34	16	2.9	2.9	2.7	12	3.4	8.7
4	3.4	3.4	3.4	39	27	14	2.9	2.9	2.9	14	3.2	8.0
5	3.4	3.4	3.4	33	24	12	2.9	2.9	3.8	8.4	3.2	8.0
6	3.4	3.4	6.5	33	27	11	2.9	3.8	4.8	5.6	2.7	8.0
7	3.4	3.4	22	45	35	11	2.9	4.8	12	5.6	2.7	6.5
8	3.4	3.4	22	45	45	11	2.9	5.8	13	4.3	2.7	5.0
9	3.4	3.4	24	45	39	9.4	2.9	6.8	9.0	4.3	2.5	5.6
10	3.4	3.4	26	45	39	7.7	2.9	3.8	8.4	4.3	2.5	5.0
11	3.4	3.4	29	28	42	7.7	2.9	3.8	7.7	4.3	2.5	5.0
12	3.4	3.4	29	28	42	7.7	2.9	8.0	7.4	3.6	2.7	5.0
13	3.4	4.5	29	28	45	7.7	2.9	6.5	6.2	3.2	2.7	5.0
14	3.4	3.4	29	28	42	7.7	2.9	5.0	4.1	3.2	2.9	5.0
15	3.4	3.4	26	28	33	7.7	2.9	3.8	4.1	3.2	3.6	7.4
16	3.4	3.4	24	28	27	6.8	2.7	3.8	4.1	2.9	13	8.0
17	3.4	3.4	24	28	27	5.9	2.7	3.8	3.4	2.9	40	7.4
18	3.4	3.4	24	28	30	5.9	2.7	3.8	3.2	2.9	17	6.5
19	3.4	4.5	24	28	30	5.0	2.7	3.8	3.2	2.9	9.8	6.5
20	3.4	4.5	24	28	30	4.5	2.7	3.8	3.2	2.9	44	6.5
21	3.4	3.4	24	28	27	5.9	2.7	5.0	2.9	2.7	23	6.5
22	3.4	3.4	24	33	27	6.8	2.6	5.0	2.9	2.7	20	4.5
23	3.4	3.4	24	33	30	5.0	2.6	3.8	3.4	2.7	20	3.8
24	3.4	3.4	20	33	41	5.9	2.6	3.8	3.4	2.7	50	5.0
25	3.4	3.4	20	33	38	4.5	2.5	6.5	2.9	2.7	52	3.8
26	3.4	3.4	20	28	32	4.3	2.5	3.8	3.4	2.5	30	4.5
27	3.4	3.4	20	28	32	4.1	2.0	3.8	2.9	2.5	20	4.5
28	3.4	3.4	18	34	26	4.1	2.0	3.8	2.9	2.5	16	3.8
29	3.4	.....	18	43	24	4.1	2.2	3.8	2.9	2.5	14	5.0
30	3.4	.....	18	53	22	3.6	5.9	3.8	2.9	2.5	12	5.0
31	3.4	.....	45	.....	18	.....	3.8	3.4	.....	3.4	.....	5.0

NOTE.—Discharge determined by indirect method for shifting channels; interpolated for days for which gage heights are missing.

Monthly discharge of Whitewater Creek near Mogollon, N. Mex., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1913.					
January	3.4	3.4	3.40	209	B.
February	4.5	3.4	3.52	195	B.
March	45	3.4	20.3	1,250	B.
April	53	28	35.6	2,120	B.
May	53	18	33.4	2,050	B.
June	16	3.6	7.97	474	B.
July	5.9	2.0	2.85	175	B.
August	8.0	2.9	4.34	267	B.
September	13	2.7	4.66	277	B.
October	14	2.5	4.17	256	B.
November	52	2.5	14.2	845	B.
December	12	3.8	6.10	375	B.
The year	53	2.0	11.7	8,490	

SAN PEDRO RIVER NEAR FAIRBANK, ARIZ.

Location.—About 1½ miles southeast of Fairbank, opposite Boquillas Land & Cattle Co.'s ranch house, 3 miles below Charleston mill.

Records available.—September 28, 1912, to December 31, 1913.

Drainage area.—Not measured.

Gage.—Vertical staff on right bank. From January 27, 1904, to August 31, 1906, and October 18, 1910, to November 26, 1911, records were collected one-third mile below Charleston. The present gage datum bears no relation to those previously used.

Control.—Sand and gravel; shifting.

Discharge measurements.—Made by wading and from bridge.

Diversions.—Some water is used for irrigation above Charleston. Water is also diverted at the dam, 1 mile above the station, for irrigation on Boquillas ranch.

Accuracy.—Estimates September 28, 1912, to June 30, 1913, good; for last half of 1913, fair.

Discharge measurements of San Pedro River near Fairbank, Ariz., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 14	C. C. Jacob	3.76	13.0	June 23	C. C. Jacob	3.53	1.2
Feb. 15	W. Richins	3.95	22.5	July 28	W. Richins	3.80	16.2
19	C. C. Jacob	3.82	13.0	Aug. 20	C. C. Jacob	5.30	300
Mar. 20	do	3.76	8.7	Sept. 16	Gray and Jacob	3.80	10.1
May 19	W. Richins	3.70	7.5	Nov. 11	C. C. Jacob	3.55	11.9

Daily gage height, in feet, of San Pedro River near Fairbank, Ariz., for 1913.

[J. W. Stanley, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.70	3.76	4.20	3.60	3.60	3.58	3.54	4.50	5.00	3.55	3.40	3.40
2	3.70	3.76	4.15	3.60	3.60	3.58	3.54	4.00	5.20	3.55	3.45	3.40
3	3.70	3.70	4.00	3.58	3.60	3.58	3.54	3.80	5.80	3.55	3.45	3.30
4	3.68	3.74	4.00	3.58	3.64	3.58	3.54	4.00	4.00	3.55	3.50	3.30
5	3.68	3.72	3.96	3.60	3.64	3.58	3.54	3.86	4.50	3.52	3.50	3.30
6	3.70	3.80	3.92	3.58	3.60	3.58	3.54	6.60	6.10	3.52	3.50	3.30
7	3.70	4.10	3.92	3.58	3.60	3.58	3.54	6.50	6.70	3.50	3.50	3.25
8	3.68	3.90	3.90	3.58	3.60	3.58	3.54	4.60	4.60	3.50	3.50	3.25
9	3.70	4.10	3.86	3.58	3.60	3.58	4.10	4.10	4.25	3.50	3.50	3.25
10	3.70	4.40	3.86	3.58	3.60	3.58	3.70	4.00	4.00	3.50	3.50	3.25
11	3.70	4.40	3.86	3.58	3.60	3.58	3.60	5.85	3.98	3.50	3.50	3.25
12	3.70	4.04	3.80	3.58	3.60	3.58	3.56	4.40	3.90	3.50	3.55	3.25
13	3.74	4.00	3.80	3.58	3.60	3.58	4.43	4.40	3.90	3.50	3.55	3.25
14	3.78	4.00	3.80	3.58	3.60	3.58	3.98	4.20	3.90	3.50	3.56	3.25
15	3.74	3.95	3.80	3.58	3.60	3.58	4.08	6.00	3.80	3.50	3.56	.....
16	3.76	3.95	3.80	3.58	3.58	3.58	4.45	4.45	3.80	3.50	3.80	.....
17	3.78	3.94	3.80	3.58	3.58	3.58	4.08	4.20	3.80	3.45	7.00	.....
18	3.74	3.94	3.78	3.58	3.58	3.79	4.30	4.00	3.78	3.45	4.50	.....
19	3.76	3.94	3.78	3.58	3.70	3.70	5.00	4.50	3.78	3.40	4.00	.....
20	3.78	3.86	3.77	3.58	3.60	3.62	6.00	4.70	3.76	3.40	3.80	.....
21	3.78	3.86	3.70	3.58	3.58	3.60	4.20	4.30	3.76	3.40	3.65	.....
22	3.80	3.86	3.70	3.60	3.58	3.58	4.45	4.00	3.75	3.45	3.60	.....
23	3.80	3.86	3.60	3.60	3.60	3.56	4.45	3.96	3.72	3.45	3.60	.....
24	3.78	3.86	3.60	3.58	3.60	3.56	4.00	3.90	3.70	3.45	3.60	.....
25	3.80	3.86	3.60	3.58	3.60	3.56	3.88	3.95	3.70	3.45	3.60	.....
26	3.80	5.00	3.60	3.58	3.60	3.54	3.86	5.00	3.70	3.40	3.70	.....
27	3.80	4.48	3.58	3.60	.....	3.54	3.86	4.00	3.70	3.40	3.55	.....
28	3.80	4.20	3.58	3.60	.....	3.54	3.78	3.90	3.66	3.40	3.50	.....
29	3.80	.....	3.58	3.60	.....	3.54	3.78	3.80	3.64	3.40	3.45	.....
30	3.78	.....	3.58	3.60	3.58	3.54	3.78	3.80	3.60	3.40	3.40	.....
31	3.80	.....	3.58	.....	3.58	.....	4.10	3.80	.....	3.40	.....	.....

Daily discharge, in second-feet, of San Pedro River near Fairbank, Ariz., for 1912–13.

Day.	Sept.	Oct.	Nov.	Dec.	Day.	Sept.	Oct.	Nov.	Dec.
1912.					1912.				
1	.....	66	11	11	16	.....	13	13	7.1
2	.....	69	11	11	17	.....	11	13	5.9
3	.....	49	11	9.8	18	.....	9.8	13	7.5
4	.....	24	11	9.8	19	.....	9.8	13	5.9
5	.....	24	11	9.8	20	.....	9.8	14	5.5
6	.....	21	12	9.3	21	.....	9.8	14	5.5
7	.....	18	12	9.3	22	.....	9.3	13	5.5
8	.....	16	12	9.8	23	.....	9.3	14	6.3
9	.....	14	12	10	24	.....	9.3	14	6.7
10	.....	14	11	11	25	.....	9.3	14	8.8
11	.....	14	11	11	26	.....	11	16	8.8
12	.....	14	11	11	27	.....	11	14	7.5
13	.....	14	12	11	28	16	11	18	5.1
14	.....	14	12	10	29	15	11	16	8.4
15	.....	12	12	8.8	30	28	11	13	12
					31	.....	11	.....	12

Daily discharge, in second-feet, of San Pedro River near Fairbank, Ariz., for 1912–1913— Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1913.												
1	9.3	10	48	3.2	3.5	2.9	1.7	105	211	3.5	5.5	12
2	9.3	10	42	3.2	3.5	2.9	1.7	33	270	3.5	7.5	12
3	9.3	7.5	26	2.6	3.5	2.9	1.7	16	474	3.5	7.5	7.5
4	8.4	9.3	26	2.6	5.1	2.9	1.7	33	26	3.5	9.8	7.5
5	8.4	8.4	23	3.2	5.1	2.9	1.7	20	92	4.3	9.8	7.5
6	9.8	12	19	2.9	3.5	2.9	1.7	846	594	4.3	9.8	7.5
7	9.8	36	19	2.9	3.5	2.9	1.7	803	846	3.5	9.8	7.5
8	8.8	18	17	2.9	3.5	2.9	1.7	133	111	3.5	9.8	7.5
9	9.8	36	15	2.9	3.5	2.9	36	48	55	3.5	9.8	7.5
10	9.8	76	15	2.9	3.5	2.9	7.5	36	26	3.5	9.8	7.5
11	9.8	76	14	2.9	3.5	2.9	3.5	514	24	3.5	9.8	7.5
12	9.8	30	11	2.9	3.5	2.9	2.3	84	18	3.5	12	7.5
13	12	26	11	2.9	3.5	2.9	84	84	18	3.5	12	7.5
14	14	26	11	2.9	3.5	2.9	26	55	18	3.5	13	7.5
15	12	22	11	2.9	3.5	2.9	36	574	12	3.5	13	.....
16	13	22	11	2.9	2.9	2.9	87	84	9.8	3.5	31	.....
17	13	21	11	2.9	2.9	2.9	36	48	9.8	3.5	1,120	.....
18	11	21	9.6	2.9	2.9	12	65	26	8.8	3.5	158	.....
19	12	21	9.6	2.9	7.5	7.5	239	92	8.8	2.0	62	.....
20	13	16	9.3	2.9	3.5	4.3	594	133	8.0	2.0	36	.....
21	13	16	6.3	2.9	2.9	3.5	62	62	8.0	2.0	22	.....
22	14	16	6.3	3.5	2.9	2.9	102	26	7.5	3.5	18	.....
23	13	16	2.6	3.5	3.5	2.3	96	23	6.3	3.5	18	.....
24	12	16	2.6	2.9	3.5	2.3	33	18	5.5	3.5	18	.....
25	13	16	2.6	2.9	3.5	2.3	22	22	5.5	3.5	18	.....
26	13	211	2.9	2.9	3.5	1.7	20	211	5.5	3.5	31	.....
27	13	89	2.3	3.5	3.3	1.7	20	26	5.5	3.5	18	.....
28	13	48	2.3	3.5	3.1	1.7	15	18	5.9	3.5	15	.....
29	12	.....	2.3	3.5	2.9	1.7	15	12	5.1	3.5	12	.....
30	11	.....	2.3	3.5	2.9	1.7	15	12	3.5	3.5	12	.....
31	12	.....	2.3	.....	2.9	.....	44	12	.....	3.5	.....	.....

NOTE.—Discharge determined from a fairly well defined rating curve and by the indirect method for shifting channels. Discharge interpolated for days for which gage heights are missing.

Monthly discharge of San Pedro River near Fairbank, Ariz., for 1912–13.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1912.					
September 28–30	28	15	19.7	117	B.
October	69	9.3	17.7	1,090	B.
November	18	11	12.8	762	B.
December	12	5.1	8.75	538	B.
The period	.....	.....	.....	2,510	
1913.					
January	14	8.4	11.3	695	B.
February	211	7.5	33.3	1,850	B.
March	48	2.3	12.7	781	B.
April	3.5	2.6	3.03	180	B.
May	7.5	2.9	3.56	219	B.
June	12	1.7	3.16	188	B.
July	594	1.7	54.0	3,320	C.
August	846	12	136	8,360	D.
September	846	3.5	96.6	5,750	D.
October	4.3	2.0	3.41	210	C.
November	1,120	5.5	57.9	3,450	C.
December	.....	.....	[a] 8.0	492	D.
The year	1,120	1.7	35.2	25,500	

[a] Estimated.

SANTA CRUZ RIVER NEAR NOGALES, ARIZ.

Location.—Just below proposed dam site on Yerba Buena ranch, one-half mile above city pumping plant, and about 7 miles northeast of Nogales.

Records available.—March 22, 1907, to December 31, 1913 (incomplete).

Drainage area.—Not measured.

Gage.—Richard Frères (Paris, France) self-recording water-stage register installed January 18, 1912, on left bank, about one-fourth mile below intake of small irrigation ditch; previous to that date an inclined staff, 500 feet below intake of irrigation ditch and at a different datum.

Control.—Shifting sand.

Diversions.—About 140 acres of land are irrigated from this stream above the station. A small irrigation ditch also diverts water a short distance above the gage.

Accuracy.—Estimates fair.

Discharge measurements of Santa Cruz River near Nogales, Ariz., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 26	C. C. Jacob	1.64	4.8	July 29	W. Richins		0.0
Feb. 16	W. Richins	1.77	15.6	Aug. 19	do	1.35	.6
19	C. C. Jacob	1.77	11.0	Sept. 17	Gray and Jacob		.0
Mar. 19	do	1.92	11.0	Nov. 20	C. C. Jacob	1.84	40.7
Apr. 23	do	1.77	.5				

Daily gage height, in feet, of Santa Cruz River near Nogales, Ariz., for 1913.

[H. Dewhurst, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		1.64	2.10	1.90	1.74				1.45			1.31
2		1.64	2.06	1.90	1.71				1.54			1.31
3		1.67	2.04	1.90	1.67				1.58			1.31
4		1.71	2.04	1.90	1.64				1.58			1.31
5		1.67	2.04	1.90					1.54			1.31
6		1.67	2.00	1.90	1.64			1.74	1.51			1.31
7		1.71	2.00	1.87	1.64	1.61		1.67				1.31
8		1.74	2.00	1.87	1.64	1.61		1.64				1.31
9		1.77	2.00	1.84				1.31				1.31
10			2.00	1.84				1.31				1.31
11			2.00	1.84				1.31				1.44
12			2.00	1.84				1.31				1.57
13			2.00	1.84				1.31				1.57
14			1.97	1.80				1.31				1.57
15			1.94	1.80				1.31				1.57
16		1.77	1.94	1.77		1.64		1.31				1.57
17			1.94	1.77		1.74	1.77	1.31				1.57
18			1.94	1.77			2.30	1.31				1.57
19		1.77	1.94	1.77			1.84	1.38				1.57
20		1.77	1.90	1.77			1.74	1.44			1.71	1.61
21		1.77	1.94	1.77			1.71	1.44			1.74	1.61
22		1.74	1.94	1.77			1.71	1.51			1.64	1.57
23		1.71	1.94	1.77			1.67	1.41			1.58	1.57
24		1.71	1.90	1.77				1.54			1.51	1.57
25		1.97	1.90	1.77	1.77			1.51			1.44	1.57
26	1.64	2.50	1.87	1.77	1.80			1.64			1.38	1.57
27	1.64	2.14	1.87	1.74				1.41			1.31	1.57
28	1.64	2.16	1.87	1.74							1.31	1.57
29	1.64		1.87	1.74	1.87						1.31	1.57
30	1.64		1.87	1.74	1.54						1.31	1.57
31	1.64		1.89					1.38				1.57

Daily discharge, in second-feet, of Santa Cruz River near Nogales, Ariz., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		4.8	33	10	1.5			27	3.2			0.2
2		4.8	28	10	1.0			19	8.3			.2
3		4.8	25	10	.5			16	11			.2
4		9.4	25	10	.1			.2	11			.2
5		8.2	25	10				.2	2.0			.2
6		8.2	20	10	.1			.2	1.0			.2
7		9.4	20	8.0	.1	4.0		.2				.2
8		12	20	8.0	.1	4.0		.2				.2
9		14	20	6.1				.2				.2
10		14	20	6.1				.2				.2
11		14	20	6.1				.2				2.8
12		15	20	6.1				.2				10
13		15	20	6.1				.2				9.7
14		15	17	3.5				1.0				9.0
15		16	14	3.5				2.8				8.3
16		16	14	2.7		.1		2.8				7.6
17		15	14	2.5		2.3	2.9	6.2				6.9
18		13	14	2.3			80	1.5				6.2
19		11	14	2.1			6.1	8.3				5.5
20		11	10	1.9			2.3	6.2			23	7.6
21		11	14	1.7			1.7	16			27	6.9
22		8.5	14	1.5			1.7	1.5			16	4.4
23		8.2	14	.5			.5				11	4.1
24		8.2	10	.5							6.2	3.8
25		32.0	10	1.0	15						2.8	3.4
26	4.8	174	8	1.5	17						.8	3.0
27	4.8	40.0	8	1.0							.2	2.7
28	4.8	43.0	8	1.0							.2	2.4
29	4.8		8	1.2	25						.2	2.0
30	4.8		8	1.2	2.0						.2	1.8
31	4.8		9.4					.6				1.6

NOTE.—Discharge determined by the indirect method for shifting channels. No flow on days for which no discharge is given.

Monthly discharge of Santa Cruz River near Nogales, Ariz., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	4.8	0.0	0.93	57	C.
February	174	4.8	19.8	1,100	C.
March	33	8.0	16.3	1,000	B.
April	10	.5	4.54	270	B.
May	25	.0	2.01	124	C.
June	4.0	.0	.35	20	D.
July	80	.0	3.07	189	C.
August	27	.0	3.58	220	C.
September	11	.0	1.22	73	C.
October	.0	.0	.00	00	
November	27	.0	2.92	174	B.
December	10	.2	3.60	221	C.
The year	174	.0	4.77	3,450	

SANTA CRUZ RIVER AT TUCSON, ARIZ.

Location.—In sec. 13, T. 14 S., R. 13 E., at Congress Street Bridge in Tucson.
Records available.—October 15, 1905, to December 31, 1913 (incomplete).
Drainage area.—Not measured.
Gage.—Staff on right bank installed July 7, 1913. Original gage was painted on bridge pier on left bank; during 1911 and up to September 30, 1912, gage heights were observed from a temporary staff or by measuring to the water surface from a reference point on the bridge; October 1, 1912, to July 7, 1913, a chain gage installed on the bridge was used. Original datum was maintained until November 22, 1913, when it was lowered 2 feet.
Control.—Sand; shifting.
Discharge measurements.—Made from bridge or by wading.
Accuracy.—Estimates poor.

Discharge measurements of Santa Cruz River at Tucson, Ariz., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 24	C. C. Jacob	0.31	12	Apr. 22	C. C. Jacob	−0.09	0.21
Feb. 18	do	.37	14	July 30	W. Richins		.00
Mar. 4	do	.11	7.1	Sept. 18	Gray and Jacob	−1.00	.00
16	do	−.15	.14	Nov. 22	C. C. Jacob	[a].95	.00
28	do	−.14	.10				

[a] Referred to a datum 2 feet lower than that previously used.

Daily gage height, in feet, of Santa Cruz River at Tucson, Ariz., for 1913.

[J. C. Kenny, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	Aug.	Sept.	Nov.	Dec.
1	0.34	0.09	0.03					1.18
2	.36	.28	.03			0.60		1.20
3	.31	.25	.01					1.20
4	.33	.25	.11					1.25
5	.38	.27	−.07					1.20
6	.39	.29	−.05		0.20			
7	.39	.27	−.11		1.80			
8	.38	.27	−.11					
9	.38	.27	−.12					
10	.40	.29	−.10					
11	.41	.27	−.11					
12	.44	.29	−.11					
13	.44	.27	−.12					
14	.49	.27	−.09					
15	.49	.27	−.11					
16	.43	.25	−.14					
17	.44	.21	−.13					
18	.39	.31	−.13					
19	.29	.37	−.12					
20	.29	.33	−.09					
21	.29	.33	−.07					
22	.24	.34	−.07	−0.12				
23	.37	.29	−.03					
24	.28	.23	−.05				1.15	
25	.33	.25	−.03		.90		1.15	
26	.30	.24	−.05				1.15	
27	.25	.69	−.07				1.15	
28	.28	.33	−.07				1.15	
29	.27		−.11				1.15	
30	.27						1.15	
31	.25							

NOTE.—Gage heights beginning Nov. 22 refer to a datum 2 feet lower than that previously used.

Daily discharge, in second-feet, of Santa Cruz River at Tucson, Ariz., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	Aug.	Sept.	Nov.	Dec.
1	11	6.7	5.5					1.5
2	11	11	5.5			34		1.8
3	10	11	5.1					1.8
4	11	11	7.1					2.5
5	12	11	2.8					1.8
6	13	11	2.8		3.2			
7	13	11	1.7		60			
8	13	11	1.5					
9	13	11	1.2					
10	13	12	1.2					
11	14	11	.9					
12	15	12	.7					
13	15	11	.6					
14	16	11	.6					
15	16	11	.4					
16	15	11	.2					
17	16	9.5	.2					
18	14	12	.2					
19	11	14	.2					
20	11	13	.4					
21	12	13	.4					
22	10	13	.4	0.2				
23	14	12	.7					
24	11	10	.6				13	
25	13	11	.7		34		13	
26	12	10	.5				13	
27	11	26	.4				13	
28	11	13	.4				13	
29	11		.2				13	
30	11						13	
31	11							

NOTE.—Discharge determined by the indirect method for shifting channels. No flow on days for which no discharge is given.

Monthly discharge of Santa Cruz River at Tucson, Ariz., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	16	10	12.6	775	C.
February	26	6.7	11.8	655	C.
March	7.1	.0	1.39	85	C.
April	.2	.0	.01	0	
May	.0	.0	.00	0	
June	.0	.0	.00	0	
July	.0	.0	.00	0	
August	60	.0	3.14	193	D.
September	34	.0	1.13	67	D.
October	.0	.0	.00	0	
November	1.3	.0	.30	18	D.
December	2.5	.0	.30	18	D.
The year	60	.0	2.50	1,810	

RILLITO CREEK NEAR TUCSON, ARIZ.

Location.—In sec. 23, T. 13 S., R. 13 E., at highway bridge on Oracle road, about 4 miles north of Tucson.

Records available.—1909 to 1913 (fragmentary).

Drainage area.—Not measured.

Gage.—Richard Fréres (Paris, France) self-recording water-stage register installed on right abutment of the bridge.

Discharge measurements.—Made from bridge or by wading.
Control.—Channel wide and shallow; shifting sand.

Stream dry throughout the year except for small flow in February, March, and September, data for which are incomplete.

Discharge measurements of Rillito Creek near Tucson, Ariz., for 1913.

Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Mar. 4	C. C. Jacob	3.68	11.0
15	do	3.56	.7
Sept. 18	Gray and Jacob		.0

SALT RIVER AT ROOSEVELT, ARIZ.

Location.—At Roosevelt dam, in the Salt River canyon, just below the mouth of Tonto Creek, at Roosevelt, about 78 miles northeast of Phoenix.
Records available.—February 7, 1901, to December 9, 1907; January 1, 1912, to December 31, 1913.
Drainage area.—5,756 square miles (furnished by United States Reclamation Service).
Cooperation.—Complete estimates furnished by United States Reclamation Service.

Monthly discharge of Salt River at Roosevelt, Ariz., for 1913.

Month	Discharge in second-feet			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January	300	219	273	16,840
February	2,940	248	560	31,039
March	3,369	383	1,346	82,820
April	3,760	983	1,857	110,670
May	921	365	590	36,382
June	365	176	226	13,570
July	558	139	230	14,182
August	575	188	271	16,720
September	494	218	367	21,985
October	316	182	228	14,143
November	670	177	385	22,956
December	541	356	447	27,595
The year	3,760	139	565	408,902

WHITE RIVER AT FORT APACHE, ARIZ.

Location.—At highway bridge on Fort Apache Military Reserve, just below junction of North and East forks, at Fort Apache, Ariz.
Records available.—October 22, 1912, to December 31, 1913.
Drainage area.—Not measured.
Gage.—Vertical staff fastened to downstream end of left abutment of bridge.
Control.—Sand and gravel; fairly permanent.
Discharge measurements.—Made from bridge or by wading.
Cooperation.—Gage-height record furnished by United States Army.

Estimates withheld on account of lack of discharge measurements.

Discharge measurements of White River at Fort Apache, Ariz., for 1913.

[Made by C. C. Jacob.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
May 13	5.35	337
October 18	4.79	[a] 75.5
December 15	4.83	[a] 78.4

[a] Sum of discharge of North and East forks.

Daily gage height, in feet, of White River at Fort Apache Ariz., for 1913.

[M. J. Velasques, observer.]

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	4.65	5.7	5.55	5.0	4.65	4.65	4.75	4.75	4.75	4.95
2	.....	4.8	5.8	5.5	4.95	4.65	4.65	4.75	4.75	4.75	4.95
3	.....	4.8	5.75	5.5	4.95	4.65	4.65	4.75	5.0	4.75	4.95
4	.....	4.8	5.75	5.4	4.95	4.65	4.65	4.75	5.0	4.75	4.95
5	.....	4.9	5.8	5.3	4.95	4.65	4.65	.....	4.85	4.75	4.95
6	.....	4.9	5.95	5.3	4.95	4.65	4.65	.....	4.85	4.75	4.9
7	.....	5.0	6.0	5.3	4.95	4.65	4.75	.....	4.85	4.75	4.85
8	.....	5.0	5.95	5.4	4.95	4.65	4.75	5.0	4.85	4.75	4.85
9	.....	5.1	5.7	5.35	4.9	4.65	4.75	5.0	4.85	4.75	4.85
10	4.7	5.1	5.7	5.35	4.85	4.65	4.75	5.0	4.85	4.75	.....
11	4.7	5.1	5.7	5.35	4.85	4.65	4.85	5.0	4.85	4.75	.....
12	4.7	5.1	5.7	5.35	4.85	4.65	4.85	.....	4.85	4.75	.....
13	4.7	5.0	5.7	5.3	4.85	4.65	.....	.....	4.85	4.75	.....
14	4.7	4.9	5.9	5.3	4.85	4.65	.....	.....	4.85	4.85	.....
15	4.7	4.8	5.9	5.3	4.85	4.65	.....	4.95	4.85	4.85	.....
16	4.7	4.9	5.9	5.2	4.85	4.65	.....	.....	4.85	4.85	.....
17	4.7	4.9	5.9	5.15	4.85	4.7	.....	.....	4.85	4.85	.....
18	4.7	5.0	5.85	5.15	4.85	4.75	.....	.....	4.85	4.85	.....
19	4.7	5.0	5.85	5.15	4.85	4.85	.....	.....	4.85	4.85	.....
20	4.7	5.0	5.8	5.2	4.85	4.85	.....	4.85	4.85	4.85	.....
21	4.7	5.0	5.7	5.15	4.85	4.85	.....	4.85	4.85	4.85	.....
22	4.7	5.0	5.65	5.15	4.85	4.85	.....	4.85	4.85	4.85	.....
23	4.7	5.1	5.65	5.15	4.85	4.85	.....	4.85	4.85	4.85	4.85
24	4.7	5.1	5.6	5.15	4.85	4.85	.....	4.85	4.75	4.85	4.8
25	4.7	5.0	5.5	5.15	4.75	4.75	4.75	.....	4.75	4.85	4.85
26	4.7	5.9	5.5	5.15	4.75	4.75	4.95	.....	4.75	4.95	4.85
27	4.7	4.9	5.5	5.15	4.75	4.75	4.85	.....	4.75	4.95	4.85
28	4.7	5.1	5.5	5.15	4.75	4.65	4.85	.....	4.75	4.95	4.85
29	.....	5.3	5.55	5.1	4.75	4.65	4.85	.....	4.75	4.95	4.85
30	.....	5.3	5.55	5.1	4.65	4.65	4.85	4.85	4.75	4.95	4.85
31	.....	5.5	.....	5.0	.....	4.65	4.85	.....	4.75	.....	4.85

EAST FORK OF WHITE RIVER AT FORT APACHE, ARIZ.

Location.—On Fort Apache Military Reserve at Fort Apache, about one-half mile above junction with North Fork of White River.

Records available.—November 8, 1912, to December 31, 1913.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to ash tree on left bank opposite officers' quarters.

Discharge measurements.—Made by wading near mouth.

Control.—Bowlders and gravel.

Accuracy.—Estimates good.

Cooperation.—Gage-height record furnished by United States Army.

Discharge measurements of East Fork of White River at Fort Apache, Ariz., for 1913.

Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 12	Jacob and Smith	6.01	74
Oct. 18	C. C. Jacob	5.24	17.7
Dec. 15	do	5.39	22.0

Daily gage height, in feet, of East Fork of White River at Fort Apache, Ariz., for 1913.

[M. J. Velasques, observer.]

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	5.15	6.20	6.10	5.72	5.00	5.00	5.25	5.25	5.25	5.35
2	.....	5.30	6.30	6.10	5.68	5.00	5.00	5.25	5.25	5.25	5.35
3	.....	5.20	6.30	6.10	5.62	4.95	5.00	5.25	5.75	5.25	5.35
4	.....	5.30	6.40	6.00	5.62	4.95	5.00	5.25	5.75	5.25	5.35
5	.....	5.30	6.40	5.90	5.62	4.95	5.00	.....	5.45	5.25	5.35
6	.....	5.50	6.40	5.90	5.62	4.95	5.00	.....	5.45	5.25	5.35
7	.....	5.50	6.40	6.00	5.62	4.95	5.00	.....	5.45	5.25	5.35
8	.....	5.50	6.35	6.00	5.60	4.95	5.00	5.75	5.45	5.25	5.35
9	.....	5.60	6.25	6.00	5.45	4.95	5.00	5.75	5.45	5.25	5.35
10	5.20	5.60	6.20	6.00	5.45	4.95	5.00	5.75	5.45	5.25	.....
11	5.20	5.80	6.15	6.00	5.35	4.95	5.05	5.75	5.35	5.25	.....
12	5.20	5.70	6.15	6.00	5.35	4.95	5.05	.....	5.35	5.25	.....
13	5.20	5.70	6.15	6.00	5.35	4.95	.....	.....	5.35	5.25	.....
14	5.20	5.40	6.15	6.00	5.35	4.95	.....	.....	5.35	5.25	.....
15	5.20	5.30	6.10	6.00	5.25	4.95	.....	5.75	5.35	5.25	5.39
16	5.20	5.30	6.10	5.95	5.25	4.95	.....	.....	5.35	5.25	.....
17	5.20	5.50	6.20	5.95	5.25	5.00	5.25	.....	5.35	5.25	.....
18	5.20	5.60	6.20	5.95	5.25	5.00	5.25	.....	5.35	5.25	.....
19	5.20	5.60	6.20	5.95	5.25	5.25	.....	.....	5.35	5.25	.....
20	5.20	5.60	6.20	5.95	5.25	5.25	.....	5.35	5.35	5.25	.....
21	5.20	5.60	6.10	5.95	5.25	5.35	.....	5.35	5.35	5.25	.....
22	5.20	5.60	6.10	5.95	5.25	5.35	.....	5.35	5.25	5.25	.....
23	5.20	5.60	6.10	5.95	5.25	5.35	.....	5.35	5.25	5.35	5.35
24	5.20	5.60	6.10	5.95	5.25	5.25	.....	5.35	5.25	5.35	5.35
25	5.20	5.60	6.10	5.93	5.15	5.25	5.05	.....	5.25	5.35	5.35
26	5.20	5.40	6.05	5.95	5.15	5.25	5.05	.....	5.25	5.35	5.35
27	5.20	5.50	6.05	5.95	5.15	5.00	5.05	.....	5.25	5.35	5.35
28	5.20	5.50	6.05	5.95	5.15	5.00	5.35	.....	5.25	5.35	5.35
29	.....	5.60	6.10	5.95	5.15	5.00	5.35	.....	5.25	5.35	5.35
30	.....	6.10	6.10	5.90	5.00	5.00	5.35	5.25	5.25	5.35	5.35
31	.....	6.10	.....	5.80	.....	5.00	5.35	.....	5.25	.....	5.35

Daily discharge, in second-feet, of East Fork of White River at Fort Apache, Ariz., for 1912–13.

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1912.			1912.			1912.		
1	.....	16	11	18	13	21	16	11
2	.....	16	12	18	12	22	16	14
3	.....	16	13	18	13	23	16	11
4	.....	16	14	18	11	24	16	12
5	.....	16	15	18	12	25	15	15
6	.....	15	16	18	14	26	15	12
7	.....	10	17	18	12	27	16	11
8	18	16	18	16	11	28	14	9.2
9	18	16	19	16	11	29	15	9.2
10	18	16	20	16	11	30	15	9.2
						31	.....	9.2

Daily discharge, in second-feet, of East Fork of White River at Fort Apache, Ariz., for 1912–1913—Continued.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1913.											
1	.....	14	104	86	44	9.2	9.2	16	16	16	20
2	.....	18	126	86	40	9.2	9.2	16	16	16	20
3	.....	15	126	86	36	8.2	9.2	16	46	16	20
4	.....	18	158	72	36	8.2	9.2	16	46	16	20
5	.....	18	158	60	36	8.2	9.2	24	25	16	20
6	.....	28	158	60	36	8.2	9.2	32	25	16	20
7	.....	28	158	72	36	8.2	9.2	40	25	16	20
8	.....	28	142	72	34	8.2	9.2	46	25	16	20
9	.....	34	115	72	25	8.2	9.2	46	25	16	20
10	15	34	104	72	25	8.2	9.2	46	25	16	20
11	15	50	95	72	20	8.2	11	46	20	16	20
12	15	42	95	72	20	8.2	11	46	20	16	20
13	15	42	95	72	20	8.2	12	46	20	16	22
14	15	22	95	72	20	8.2	13	46	20	16	22
15	15	18	86	72	16	8.2	14	46	20	16	22
16	15	18	86	66	16	8.2	15	40	20	16	22
17	15	28	104	66	16	9.2	16	35	20	16	22
18	15	34	104	66	16	9.2	16	30	20	16	22
19	15	34	104	66	16	16	16	25	20	16	22
20	15	34	104	66	16	16	15	20	20	16	20
21	15	34	86	66	16	20	14	20	20	16	20
22	15	34	86	66	16	20	13	20	16	16	20
23	15	34	86	66	16	20	12	20	16	20	20
24	15	34	86	66	16	16	11	20	16	20	20
25	15	34	86	66	14	16	11	20	16	20	20
26	15	22	79	66	14	16	11	18	16	20	20
27	15	28	79	66	14	9.2	11	18	16	20	20
28	15	28	79	66	14	9.2	20	18	16	20	20
29	.....	34	86	66	14	9.2	20	16	16	20	20
30	.....	86	86	60	9.2	9.2	20	16	16	20	20
31	.....	86	.....	50	.....	9.2	20	.....	16	.....	20

NOTE.—Discharge determined from a rating curve well defined between 10 and 150 second-feet and interpolated for days for which gage heights are missing.

Monthly discharge of East Fork of White River at Fort Apache, Ariz., for 1912–13.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1912.					
November 8–30	18	16	16.6	757	B.
December	14	9.2	12.8	787	B.
The period	.....	.....	.....	1,540	
1913.					
February 10–28	15	15	15.0	565	B.
March	86	14	32.6	2,000	B.
April	158	79	105	6,250	B.
May	86	50	68.8	4,230	B.
June	44	9.2	22.2	1,320	B.
July	20	8.2	10.9	670	B.
August	20	9.2	12.7	781	C.
September	46	16	28.8	1,710	C.
October	46	16	21.1	1,300	B.
November	20	16	17.1	1,020	B.
December	22	20	20.5	1,260	C.
The period	.....	.....	.....	21,100	

Daily discharge, in second-feet, of Black River near Fort Apache, Ariz., for 1912–13.

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1912.						21		109
1		76	11		135	22		105
2		76	12		121	23		101
3		76	13		115	24	63	97
4		86	14		109	25	67	93
5		92	15		86			
						26	67	89
6		97	16		97	27	72	85
7		109	17		97	28	72	81
8		121	18		103	29	72	77
9		121	19		109	30	76	73
10		135	20		109	31		70

Day.	Jan.	Feb.	Mar.	Apr.	May.	Oct.	Nov.	Dec.
1913.								
1	67	67	293	247	293		66	94
2	67	67	319	581	371		66	91
3	67	67	293	781	225		66	88
4	76	76	293	1,050	185		68	88
5	67	76	319	1,460	135		68	86
6	67	67	371	1,360	121		68	86
7	76	86	345	1,430	135		70	85
8	86	269	345	1,460	135		71	78
9	86	293	517	1,390	269		70	80
10	86	319	581	1,320	269		68	83
11	76	247	549	1,090	247		68	83
12	76	76	645	1,090	225		67	80
13	76	76	713	781	225		68	82
14	72	67	815	781			68	86
15	67	67	679	679			69	93
16	67	67	613	713		72	71	93
17	67	67	613	679		72	74	91
18	67	76	487	613		73	78	90
19	67	76	487	549		71	82	93
20	67	67	371	549		70	85	93
21	76	67	319	457		69	93	82
22	76	67	225	427		68	91	86
23	76	76	185	427		68	91	84
24	67	76	151	399		68	91	78
25	67	86	151	345		68	94	89
26	67	679	121	345		67	96	90
27	67	517	121	371		66	100	79
28	76	293	109	269		66	115	83
29	76		109	247		66	110	80
30	86		97	205		66	100	85
31	86		97			66		87

NOTE.—Discharge determined from two well-defined rating curves. Discharge interpolated for days for which gage heights are missing except May 14 to Nov. 15, 1913.

Monthly discharge of Black River near Fort Apache, Ariz., for 1912–13.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1912.					
November 24–30	76	63	69.9	970	B.
December	135	70	98.4	6,050	C.
1913.					
January	86	67	73.1	4,490	B.
February	679	67	148	8,220	B.
March	815	97	336	22,500	B.
April	1,460	205	736	43,800	B.
May 1–13	371	121	218	5,620	B.
October 16–31	73	66	68.5	2,170	B.
November	115	66	79.7	4,740	B.
December	94	78	86.0	5,290	B.

BLACK RIVER NEAR FORT APACHE, ARIZ.

Location.—About three-fourths mile below the bridge on highway from Rice to Fort Apache, about 2 miles above junction with White River, and 18 miles southwest of Fort Apache.

Records available.—November 24, 1912, to December 31, 1913.

Drainage area.—Not measured.

Gage.—Staff gage until October 16, when automatic recording gage was installed three-fourths mile below and at a different datum.

Control.—Bowlders and gravel; practically permanent.

Discharge measurements.—Made by wading below gage; high-water measurements may be made from private cable about 1,000 feet below gage.

Accuracy.—Estimates good.

Discharge measurements of Black River near Fort Apache, Ariz., for 1913.

[Made by C. C. Jacob.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
May 10	6.20	270
October 16	4.00	72
December 14	4.14	84

NOTE.—Gage heights beginning Oct. 16 refer to datum of automatic gage.

Daily gage height, in feet, of Black River near Fort Apache, Ariz., for 1913.

[Mrs. V. R. Duke, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	Oct.	Nov.	Dec.
1	4.9	4.9	6.3	6.1	6.3	.....	3.92	4.23
2	.....	4.9	6.4	7.3	6.6	.....	3.92	4.21
3	4.9	4.9	6.3	7.9	6.0	.....	3.92	4.18
4	5.0	5.0	6.3	8.7	5.8	.....	3.94	4.18
5	4.9	5.0	6.4	9.9	5.5	.....	3.94	4.16
6	4.9	4.9	6.6	9.6	5.4	.....	3.95	4.16
7	5.0	5.1	6.5	9.8	5.5	.....	3.97	4.15
8	5.1	6.2	6.5	9.9	5.5	.....	3.98	4.08
9	5.1	6.3	7.1	9.7	6.2	.....	3.97	4.10
10	5.1	6.4	7.3	9.5	6.2	.....	3.95	4.13
11	5.0	6.1	7.2	8.8	6.1	.....	3.94	4.13
12	.....	5.0	7.5	8.8	6.0	.....	3.93	4.10
13	5.0	5.0	7.7	7.9	6.0	.....	3.94	4.12
14	.....	4.9	8.0	7.9	.....	.....	3.94	4.16
15	4.9	4.9	7.6	7.6	.....	.....	3.96	4.22
16	4.9	4.9	7.4	7.7	.....	4.00	3.98	4.22
17	4.9	4.9	7.4	7.6	.....	.....	4.03	4.21
18	4.9	5.0	7.0	7.4	.....	4.01	4.07	4.20
19	4.9	5.0	7.0	7.2	.....	3.99	4.12	4.22
20	4.9	4.9	6.6	7.2	.....	3.97	4.15	4.22
21	5.0	4.9	6.4	6.9	.....	3.96	4.22	4.12
22	.....	4.9	6.0	6.8	.....	3.95	4.21	4.16
23	5.0	5.0	5.8	6.8	.....	3.94	4.21	4.14
24	4.9	5.0	5.6	6.7	.....	3.94	4.21	4.08
25	.....	5.1	5.6	6.5	.....	3.94	4.23	4.19
26	4.9	7.6	5.4	6.5	.....	3.93	4.25	4.20
27	4.9	7.1	5.4	6.6	.....	3.92	4.28	4.09
28	5.0	6.3	5.3	6.2	.....	3.92	4.37	4.13
29	5.0	.....	5.3	6.1	.....	3.92	4.34	4.10
30	5.1	.....	5.2	5.9	.....	3.92	4.28	4.15
31	5.1	.....	5.2	.....	.....	3.91	.....	4.17

NOTE.—Staff gage read Jan. 1 to May 13; automatic gage at new datum Oct. 16 to Dec. 31.

Daily discharge, in second-feet, of Verde River at Camp Verde, Ariz., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	135	135	190	3,620	72	44	60	60	452	80	82	135
2	135	135	190	2,900	64	44	52	60	604	80	85	135
3	135	135	190	2,600	57	44	52	60	344	170	88	135
4	135	135	232	2,040	57	44	52	52	256	170	90	135
5	135	135	280	1,180	57	44	52	52	198	120	92	135
6	135	135	420	1,080	66	38	135	44	178	105	95	135
7	135	135	625	1,130	57	38	80	44	290	120	98	135
8	135	210	1,040	908	57	38	80	44	534	105	100	135
9	135	420	1,320	555	49	38	70	92	178	105	100	135
10	135	420	1,320	420	49	38	60	152	160	105	102	135
11	135	360	1,470	305	49	38	60	105	120	105	105	135
12	170	305	1,880	255	57	38	60	105	105	92	135	135
13	170	255	1,720	255	49	38	60	135	92	92	135	135
14	170	210	1,720	255	42	44	135	105	92	80	135	135
15	170	170	305	255	49	44	92	80	152	80	135	135
16	170	170	360	255	38	44	105	60	120	80	135	152
17	170	170	520	170	38	44	105	60	92	80	152	152
18	170	135	452	135	44	52	92	70	92	80	152	152
19	170	135	555	135	44	52	80	70	92	80	152	152
20	158	135	555	135	38	52	80	60	92	80	170	152
21	146	135	555	135	38	52	92	70	74	80	190	152
22	135	135	520	135	44	52	105	60	142	80	210	152
23	135	135	485	105	44	70	105	60	111	80	190	152
24	135	135	420	80	38	60	105	70	98	80	190	152
25	135	120	360	80	44	60	92	80	85	80	190	152
26	135	135	360	80	52	70	80	105	85	80	170	135
27	135	190	360	60	44	60	80	80	85	80	170	135
28	135	190	305	60	52	60	70	80	85	92	152	135
29	135	.....	305	80	44	60	70	105	85	92	152	135
30	135	.....	305	80	52	60	60	80	85	92	152	135
31	135	.....	1,470	.....	44	.....	60	80	.....	80	.....	135

NOTE.—Discharge determined as follows: Jan. 1 to Feb. 22, Mar. 6 to Apr. 30, June 6 to Aug. 31, and Oct. 1 to Dec. 31, from a fairly well defined rating curve; remainder of year, by indirect method for shifting channels; for days for which gage heights are missing, interpolated.

Monthly discharge of Verde River at Camp Verde, Ariz., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	170	135	145	8,920	B.
February	420	120	186	10,300	B.
March	1,880	190	671	41,300	B.
April	3,620	60	649	38,600	B.
May	72	38	493	3,030	B.
June	70	38	48.7	2,900	B.
July	135	52	80.0	4,920	B.
August	152	44	76.8	4,720	B.
September	604	74	173	10,300	B.
October	170	80	94.4	5,800	B.
November	210	82	137	8,150	B.
December	152	135	140	8,610	B.
The year	3,620	38	204	148,000	

VERDE RIVER NEAR CAMP VERDE, ARIZ.

Location.—Just below power plant of Arizona Power Co. at Camp Childs, 3 miles above mouth of Fossil Creek, and about 18 miles southeast of Camp Verde.

Records available.—February 26, 1911, to December 31, 1913.

Drainage area.—Not measured.

Gage.—Inclined staff in three section on left bank, about 300 feet below power plant of Arizona Power Co.

Control.—Bed of bowlders and rock; control shifting.

VERDE RIVER AT CAMP VERDE, ARIZ.

Location.—In sec. 30, T. 14 N., R. 5 E., at steel highway bridge just above the town of Camp Verde, and above the mouth of Beaver Creek.

Records available.—December 5, 1912, to December 31, 1913.

Drainage area.—Not measured.

Gage.—Vertical staff painted on east bridge pier.

Control.—Straight channel; banks fairly high and wooded, not liable to overflow; clay and sand bottom; somewhat shifting.

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

Diversions.—Made for irrigation at various points up the valley, much of low-stage flow being diverted.

Accuracy.—Estimates good.

Discharge measurements of Verde River at Camp Verde, Ariz., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 1	W. Richins	3.80	188	June 12	W. Richins	3.15	36.5
Apr. 4	do	5.60	1,620	Aug. 6	do	3.20	43.8
May 4	do	3.20	56	Sept. 9	C. C. Jacob	3.65	179
28	C. C. Jacob	3.18	47.3	Dec. 3	do	3.60	136

Daily gage height, in feet, of Verde River at Camp Verde, Ariz., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.6	3.6	3.8	7.35	.....	3.15	3.3	3.3	4.2	3.4	.....	3.6
2	3.6	3.6	3.8	6.75	.....	3.15	3.25	3.3	4.4	3.4	.....	3.6
3	3.6	3.6	3.8	6.5	3.2	3.15	3.25	3.3	4.0	3.7	.....	3.6
4	3.6	3.6	3.9	6.0	3.2	3.15	3.25	3.25	3.8	3.7	.....	3.6
5	3.6	3.6	4.0	5.15	3.2	3.15	3.25	3.25	3.7	3.55	.....	3.6
6	3.6	3.6	4.2	5.05	3.25	3.15	3.6	3.2	3.65	3.5	.....	3.6
7	3.6	3.6	4.5	5.1	3.2	3.15	3.4	3.2	3.9	3.55	.....	3.6
8	3.6	3.8	5.0	4.85	3.2	3.15	3.4	3.2	4.3	3.5	.....	3.6
9	3.6	4.2	5.3	4.4	3.15	3.15	3.35	3.45	3.65	3.5	.....	3.6
10	3.6	4.2	5.3	4.2	3.15	3.15	3.3	3.65	3.6	3.5	.....	3.6
11	3.6	4.1	5.45	4.0	3.15	3.15	3.3	3.5	3.5	3.5	3.5	3.6
12	3.7	4.0	5.85	3.9	3.2	3.15	3.3	3.5	3.45	3.45	3.6	3.6
13	3.7	3.9	5.7	3.9	3.15	3.15	3.3	3.6	3.4	3.45	3.6	3.6
14	3.7	3.8	5.7	3.9	3.1	3.2	3.6	3.5	3.4	3.4	3.6	3.6
15	3.7	3.7	4.0	3.9	3.15	3.2	3.45	3.4	3.6	3.4	3.6	3.6
16	3.7	3.7	4.1	3.9	3.1	3.2	3.5	3.3	3.5	3.4	3.6	3.65
17	3.7	3.7	4.35	3.7	3.1	3.2	3.5	3.3	3.4	3.4	3.65	3.65
18	3.7	3.6	4.25	3.6	3.15	3.25	3.45	3.35	3.4	3.4	3.65	3.65
19	3.7	3.6	4.4	3.6	3.15	3.25	3.4	3.35	3.4	3.4	3.65	3.65
20	.....	3.6	4.4	3.6	3.1	3.25	3.4	3.3	3.4	3.4	3.7	3.65
21	.....	3.6	4.4	3.6	3.1	3.25	3.45	3.35	3.35	3.4	3.75	3.65
22	3.6	3.6	4.35	3.6	3.15	3.25	3.5	3.3	3.6	3.4	3.8	3.65
23	3.6	3.65	4.3	3.5	3.15	3.35	3.5	3.3	3.5	3.4	3.75	3.65
24	3.6	3.65	4.2	3.4	3.1	3.3	3.5	3.35	3.45	3.4	3.75	3.65
25	3.6	3.6	4.1	3.4	3.15	3.3	3.45	3.4	3.4	3.4	3.75	3.65
26	3.6	3.65	4.1	3.4	3.2	3.35	3.4	3.5	3.4	3.4	3.7	3.6
27	3.6	3.8	4.1	3.3	3.15	3.3	3.4	3.4	3.4	3.4	3.7	3.6
28	3.6	3.8	4.0	3.3	3.2	3.3	3.35	3.4	3.4	3.45	3.65	3.6
29	3.6	.....	4.0	3.4	3.15	3.3	3.35	3.5	3.4	3.45	3.65	3.6
30	3.6	.....	4.0	3.4	3.2	3.3	3.3	3.4	3.4	3.45	3.65	3.6
31	3.6	.....	5.45	.....	3.15	.....	3.3	3.4	.....	3.4	.....	3.6

Discharge measurements.—Made by car and cable 1 mile above gage or by wading.

Artificial control.—Throughout the year a fairly constant flow of approximately 48 second-feet was diverted from Fossil Creek for power and returned to Verde River above the gage.

Accuracy.—Owing to shifting conditions estimates are considered somewhat uncertain.

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

Discharge measuremnts of Verde River near Camp Verde, Ariz., for 1913.

[Made by L. L. Hanson.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Apr. 15	5.9	546	Aug. 16	5.1	166
Apr. 22	5.35	262	Aug. 22	4.9	142
July 4	4.8	118	Aug. 30	5.0	179
July 12	5.0	149	Sept. 5	5.4	299
July 18	5.1	179	Sept. 27	5.1	199
July 25	5.1	187	Oct. 4	5.5	317
Aug. 1	4.9	155	Oct. 11	5.1	221
Aug. 9	4.85	131	Oct. 18	5.1	211
Aug. 12	5.2	225			

NOTE.—Measurements include discharge of tail race of Arizona Power Co.'s plant. This amount was believed to have remained constant at approximately 48 second-feet.

Daily gage height, in feet, of Verde River near Camp Verde, Ariz., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.3	5.2	5.45	10.7	5.1	4.9	4.8	4.9	6.55	5.1	5.1	5.4
2	5.3	5.2	5.45	10.2	5.0	4.9	4.8	4.85	6.0	5.1	5.1	5.4
3	5.3	5.2	5.4	8.2	5.0	4.9	4.8	4.8	5.7	5.15	5.1	5.4
4	5.3	5.2	5.5	7.5	5.0	4.9	4.8	4.85	5.4	5.45	5.2	5.4
5	5.3	5.2	5.7	7.35	5.0	4.85	4.8	4.85	5.4	5.1	5.2	5.4
6	5.3	5.2	6.05	7.4	5.0	4.9	5.0	4.85	5.35	5.1	5.2	5.4
7	5.2	5.2	6.4	7.25	5.0	4.9	4.8	4.8	5.5	5.1	5.15	5.35
8	5.2	5.3	6.9	6.8	4.9	4.85	5.45	4.8	6.0	5.1	5.15	5.35
9	5.35	5.8	7.4	6.3	4.9	4.85	5.0	4.85	5.4	5.1	5.15	5.3
10	5.35	5.8	7.7	6.1	4.9	4.8	5.0	5.0	5.25	5.1	5.2	5.3
11	5.3	5.7	8.2	6.05	4.9	4.8	5.0	5.5	5.2	5.1	5.2	5.3
12	5.3	5.6	8.3	5.95	4.85	4.8	4.95	5.2	5.1	5.1	5.35	5.3
13	5.3	5.5	7.2	5.9	4.85	4.85	4.9	5.2	5.1	5.1	5.4	5.35
14	5.3	5.45	6.8	5.9	4.9	4.9	5.1	5.2	5.1	5.1	5.4	5.3
15	5.3	5.4	6.3	5.9	4.85	4.9	4.9	5.1	5.1	5.1	5.3	5.3
16	5.3	5.4	6.05	5.8	4.85	4.9	5.4	5.1	5.2	5.1	5.3	5.35
17	5.3	5.3	5.85	5.6	4.8	4.9	5.15	5.1	5.15	5.1	5.4	5.4
18	5.3	5.3	6.0	5.5	4.8	4.9	5.1	4.95	5.1	5.1	5.35	5.4
19	5.3	5.4	6.45	5.45	4.9	4.9	5.0	5.0	5.0	5.1	5.4	5.35
20	5.3	5.4	6.4	5.4	4.9	4.9	5.0	4.95	5.0	5.1	5.55	5.35
21	5.3	5.4	6.45	5.4	4.85	4.9	5.05	5.0	5.0	5.1	5.55	5.3
22	5.3	5.55	7.25	5.35	4.9	4.85	5.1	4.9	5.15	5.1	5.6	5.3
23	5.3	5.55	8.3	5.3	4.9	5.0	5.15	4.9	5.15	5.1	5.5	5.3
24	5.3	5.5	7.2	5.3	4.9	5.0	5.1	4.9	5.05	5.1	5.15	5.3
25	5.3	5.65	6.3	5.35	4.9	4.9	5.1	5.0	5.1	5.1	5.15	5.3
26	5.25	6.0	6.0	5.3	4.95	4.9	5.0	5.15	5.1	5.1	5.5	5.3
27	5.2	5.75	5.8	5.2	4.95	4.9	4.9	5.2	5.1	5.1	5.75	5.3
28	5.25	5.55	5.6	5.15	4.95	4.9	4.95	5.1	5.1	5.1	5.6	5.3
29	5.2	.....	6.25	5.1	4.85	4.8	4.9	5.0	5.1	5.1	5.5	5.3
30	5.2	.....	7.8	5.1	4.9	4.8	4.9	5.0	5.1	5.1	5.4	5.3
31	5.2	.....	9.6	.....	4.9	.....	4.9	4.95	.....	5.1	.....	5.3

Daily discharge, in second-feet, of Verde River near Camp Verde, Ariz., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	244	213	298	7,080	186	140	120	156	1,340	200	186	279
2	244	213	298	6,380	163	140	120	142	621	200	186	279
3	244	213	279	3,580	163	140	120	130	414	213	186	279
4	244	213	318	2,600	163	140	120	138	298	318	213	279
5	244	213	414	2,390	163	130	120	136	298	191	213	279
6	244	213	666	2,460	163	140	158	134	279	197	213	279
7	213	213	1,060	2,250	163	140	120	122	318	202	200	262
8	213	244	1,760	1,620	140	130	298	120	621	208	200	262
9	262	473	2,460	930	140	130	158	130	298	213	200	244
10	262	473	2,880	712	140	120	154	165	244	219	213	244
11	244	414	3,580	666	140	120	149	327	228	221	213	244
12	244	363	3,720	582	130	120	138	225	200	221	262	244
13	244	318	2,180	542	130	130	130	219	200	221	279	262
14	244	298	1,620	542	140	140	186	213	200	216	279	244
15	244	279	930	542	130	140	132	174	200	216	244	244
16	244	279	666	473	130	140	265	165	228	216	244	262
17	244	244	508	363	120	140	191	170	213	210	279	279
18	244	244	621	318	120	140	179	140	200	210	262	279
19	244	279	1,130	298	140	140	158	156	174	210	279	262
20	244	279	1,060	279	140	140	158	149	174	205	340	262
21	244	279	1,130	279	130	140	172	163	174	205	340	244
22	244	340	2,250	262	140	130	184	142	213	205	363	244
23	244	340	3,720	244	140	163	200	142	213	200	318	244
24	244	318	2,180	244	140	163	186	145	186	200	200	244
25	244	388	930	262	140	140	186	170	200	200	200	244
26	228	621	621	244	152	140	165	210	200	194	318	244
27	213	444	473	213	152	140	145	228	200	194	444	244
28	228	340	363	200	152	140	158	202	200	194	363	244
29	213	.....	872	186	130	120	149	177	200	189	318	244
30	213	.....	3,020	186	140	120	152	179	200	189	279	244
31	213	.....	5,540	.....	140	.....	154	168	.....	189	.....	244

NOTE.—Discharge determined as follows: Jan. 1 to July 8 and Nov. 1 to Dec. 31, from a well-defined rating curve; July 9 to Oct. 31, by the indirect method for shifting channels.

Monthly discharge of Verde River near Camp Verde, Ariz., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January	262	213	238	14,600
February	621	213	312	17,300
March	5,540	279	1,530	94,100
April	7,080	186	1,230	73,200
May	186	120	144	8,850
June	163	120	137	8,150
July	298	120	162	9,960
August	327	120	169	10,400
September	1,340	174	291	17,300
October	318	189	209	12,900
November	444	186	261	15,500
December	279	244	257	15,800
The year	7,080	120	412	298,000

VERDE RIVER AT M'DOWELL, ARIZ.

Location.—At dam site on Salt River Indian Reservation, about three-fourths mile above junction with Salt River.

Records available.—August 14 to September 30, 1889; April 20, 1897, to November 11, 1899; January 1, 1901, to April 19, 1902; July 23 to 26, 1902; January 1, 1903, to December 31, 1913.

Drainage area.—6,000 square miles (furnished by United States Reclamation Service).

Gage.—Painted directly on granite rocks on right bank.

Control.—Sand; shifting.

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

Diversions.—See Verde River near Camp Verde. Water is also diverted 5 miles above station for use on Indian reservation.

Accuracy.—Since the completion of the Roosevelt dam in March, 1910, records have been obtained indirectly from the computed flow of Salt River above and below mouth of Verde River.

Cooperation.—Complete estimates furnished by United States Reclamation Service.

The following discharge measurement was made by C. C. Jacob:
February 14, 1914: Gage height, 9.75 feet; discharge, 374 second-feet.

Monthly discharge of Verde River at McDowell, Ariz., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January	278	170	229	14,110
February	4,314	179	680	37,850
March	3,791	520	1,800	110,750
April	5,714	257	1,412	83,950
May	288	108	159	9,790
June	157	93	105	6,278
July	322	77	119	7,320
August	564	93	150	9,250
September	1,411	176	354	21,032
October	227	163	191	11,735
November	670	177	353	20,996
December	357	258	380	23,383
The year	5,714	77	494	356,444

BEAVER CREEK AT CAMP VERDE, ARIZ.

Location.—In sec. 30, T. 14 N., R. 5 E., one-fourth mile above junction with Verde River and about 1 mile north of Camp Verde.

Records available.—December 1, 1912, to December 31, 1913.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to willow stump on right bank.

Control.—Sand, clay, and solid rock; somewhat shifting.

Discharge measurements.—Made by wading near gage.

Diversions.—Water is diverted for irrigation at several points above the station.

Accuracy.—Estimates good except during extremely high water, when they are fair.

Discharge measurements of Beaver Creek at Camp Verde, Ariz., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 1	W. Richins	4.00	14.3	June 12	W. Richins	3.95	9.3
Apr. 4	....do	5.25	459	Aug. 6	.....do	3.90	8.9
May 4	.....do	3.90	8.6	Sept. 9	C. C. Jacob	3.90	4.3
28	C. C. Jacob	3.98	9.2	Dec. 3	.....do	4.12	18.8

Daily gage height, in feet, of Beaver Creek at Camp Verde, Ariz., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.0	4.0	4.0	5.4	.....	4.0	3.9	3.9	4.1	4.0	.....	4.1
2	4.0	4.0	4.0	6.1	.....	3.95	3.9	3.9	4.0	4.0	.....	4.1
3	4.0	4.0	4.0	4.9	3.9	4.0	3.9	3.9	4.0	4.15	.....	4.1
4	.....	4.0	4.4	5.2	3.9	4.0	3.9	3.9	3.95	4.05	.....	4.1
5	4.0	4.0	4.4	5.2	3.9	3.95	3.9	3.9	3.9	4.0	.....	4.05
6	4.0	4.0	4.3	5.1	3.95	4.0	3.9	3.9	3.9	4.0	.....	4.1
7	4.0	4.0	4.4	5.1	3.9	3.95	3.95	3.9	3.9	4.0	.....	4.1
8	4.0	4.0	4.3	5.0	3.9	3.95	3.95	3.9	3.95	4.0	.....	4.0
9	4.0	4.0	5.0	5.2	3.9	3.95	3.95	4.5	3.9	4.0	.....	4.0
10	4.0	4.0	5.0	5.0	3.95	3.95	3.95	4.3	3.9	4.0	.....	4.0
11	4.0	4.1	4.8	4.9	3.9	3.95	3.95	4.0	3.9	4.0	4.05	4.0
12	4.0	4.1	4.9	4.5	3.9	3.95	3.95	3.9	3.9	4.0	4.1	4.0
13	.....	4.1	4.3	4.5	3.9	3.95	3.95	3.9	3.9	4.0	4.1	4.0
14	4.0	4.0	4.9	4.5	3.95	3.95	4.0	3.9	3.9	4.0	4.05	4.0
15	4.0	4.0	4.8	4.5	3.95	3.95	3.95	3.9	3.9	4.0	4.0	4.1
16	4.0	4.0	4.5	4.5	3.9	3.95	3.95	3.9	3.9	4.0	4.15	4.1
17	4.0	4.0	4.6	4.3	3.95	3.95	3.95	3.9	3.9	4.0	4.1	4.1
18	4.0	4.0	4.5	4.3	3.95	3.95	3.95	3.9	3.95	4.0	4.25	4.1
19	4.0	4.0	4.6	4.3	3.95	3.95	3.95	3.9	3.9	4.0	4.2	4.1
20	4.0	4.0	4.7	4.3	3.95	3.95	3.95	3.9	3.9	4.0	4.2	4.1
21	4.0	4.0	4.6	4.3	3.95	3.95	3.95	3.9	3.9	4.0	4.3	4.1
22	4.0	4.0	4.9	4.3	3.95	3.95	3.95	3.9	3.95	4.0	4.4	4.1
23	4.0	4.0	4.8	4.2	4.0	3.95	3.95	3.9	3.9	4.0	4.2	4.1
24	4.0	4.0	4.8	4.1	3.95	3.95	3.95	3.9	3.9	4.0	4.25	4.1
25	4.0	4.0	4.5	4.0	4.0	3.95	3.9	3.95	3.9	4.0	4.15	4.1
26	4.0	4.0	4.0	3.7	3.95	3.95	3.9	3.95	3.9	4.0	4.4	4.1
27	4.0	4.0	4.0	3.7	4.0	3.95	3.9	3.9	3.95	4.0	4.3	4.1
28	4.0	4.0	4.0	3.7	3.95	3.95	3.95	3.9	3.95	4.0	4.2	4.1
29	4.0	.....	4.0	3.7	3.95	3.95	3.9	3.95	3.95	4.0	4.2	4.1
30	4.0	.....	4.0	3.7	3.95	3.95	3.9	4.0	4.0	4.0	4.1	4.1
31	4.0	.....	4.9	.....	3.95	.....	3.9	3.95	.....	4.0	.....	4.1

Daily discharge, in second-feet, of Beaver Creek at Camp Verde, Ariz., for 1912–13.

Day.	Dec.	Day.	Dec.	Day.	Dec.
1912.		1912.		1912.	
1	12	11	12	21	12
2	12	12	12	22	12
3	12	13	12	23	12
4	12	14	12	24	12
5	12	15	12	25	12
6	12	16	12	26	12
7	12	17	12	27	12
8	12	18	12	28	12
9	12	19	12	29	12
10	12	20	12	30	12
				31	12

Daily discharge, in second-feet, of Beaver Creek at Camp Verde, Ariz., for 1912–13—Con.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1913.												
1	12	12	14	585	4	12	8	8	16	10	10	16
2	12	12	14	1,410	6	10	8	8	10	10	10	16
3	12	12	14	249	8	12	8	8	10	20	10	16
4	12	12	69	425	8	12	8	8	8	12	10	16
5	12	12	69	425	8	10	8	8	6	10	10	12
6	12	12	48	358	10	12	8	8	4	10	11	16
7	12	12	69	358	8	10	10	8	4	10	11	16
8	12	12	48	300	8	10	10	8	6	10	11	10
9	12	12	300	425	8	10	10	95	4	10	11	10
10	12	12	300	300	10	10	10	48	4	10	11	10
11	12	20	203	249	8	10	10	12	4	10	12	10
12	12	20	249	95	8	10	10	8	4	10	16	10
13	12	20	48	95	8	10	10	8	4	10	16	10
14	12	14	249	95	10	10	12	8	4	10	12	10
15	12	14	203	95	10	10	10	8	4	10	10	16
16	12	14	95	95	8	10	10	8	4	10	20	16
17	12	14	126	48	10	10	10	8	4	10	16	16
18	12	14	95	48	10	10	10	8	6	10	32	16
19	12	14	126	48	10	10	10	8	4	10	26	16
20	12	14	162	48	10	10	10	8	4	10	26	16
21	12	14	126	48	10	10	10	8	4	10	40	16
22	12	14	249	48	10	10	10	8	6	10	58	16
23	12	14	203	32	12	10	10	8	4	10	26	16
24	12	14	203	20	10	10	10	8	4	10	32	16
25	12	14	95	12	12	10	8	10	4	10	20	16
26	12	14	12	1.5	10	10	8	10	6	10	58	16
27	12	14	12	1.5	12	10	8	8	8	10	40	16
28	12	14	12	1.5	10	10	10	8	8	10	26	16
29	12	.....	12	1.5	10	10	8	10	8	10	26	16
30	12	.....	12	1.5	10	10	8	12	10	10	16	16
31	12	.....	249	.....	10	.....	8	10	.....	10	.....	16

NOTE.—Daily discharge determined as follows: Dec. 1, 1912, to Feb. 13, 1913, and Mar. 4 to Aug. 31, 1913, from a well-defined rating curve; Feb. 14 to Mar. 3, and Sept. 1 to Dec. 31, 1913, by the indirect method for shifting channels; for days for which gage heights are missing, interpolated.

Monthly discharge of Beaver Creek at Camp Verde, Ariz., for 1912–13.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1912.					
December	12	12	12.0	738	B.
1913.					
January	12	12	12.0	738	B.
February	20	12	13.9	772	B.
March	300	12	119	7,320	B.
April	1,410	1.5	197	11,700	C.
May	12	4.0	9.23	568	B.
June	12	10	10.3	613	B.
July	12	8.0	9.29	571	B.
August	95	8.0	12.6	775	B.
September	16	4.0	5.87	349	B.
October	20	10	10.4	640	B.
November	58	10	21.1	1,260	B.
December	16	10	14.5	892	B.
The year	1,410	1.5	36.2	26,200	

AGUA FRIA RIVER NEAR GLENDALE, ARIZ.

Location.—In sec. 28, T. 6 N., R. 1 E., at old diversion dam of the Beardsley irrigation project at Camp Dyer, 4 miles below mouth of Castle Creek, and 22 miles northwest of Glendale.

Records available.—November 10, 1910, to December 31, 1913.

Drainage area.—Not measured.

Gage.—Staff gage until August 28, 1913, when automatic recording gage, referred to original datum, was installed. The diversion dam failed during the flood of

1895, when a portion of the masonry near each end was washed out. At low and medium stages the entire stream flows through the larger opening, which is near the right bank. The gage for each channel is painted on upstream face of dam at right of opening. September 18, 1912, a vertical staff gage for low water was installed on upstream face of dam at the left of the right opening. Gage readings for 1913 are reported 20 feet lower than read to avoid the use of large gage heights.

Control.—Sand; shifting.

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

Accuracy.—Full reliance can not be placed on the gage heights recorded previous to August 28, 1913, because of an incompetent gage reader. After that date the gage-height record was obtained by means of an automatic gage.

Cooperation.—Prior to August 28, 1913, gage-height record was furnished by the Beardsley Irrigation Co., through Mr. A. L. Harris, engineer.

Estimates withheld on account of extreme shifting and lack of high-water measurements.

Discharge measurements of Agua Fria River near Glendale, Ariz., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 2	C. C. Jacob	3.45	3.6	Aug. 15	W. Richins	2.30	2.9
Feb. 15	do	3.55	7.6	27	C. C. Jacob	2.31	4.7
Apr. 18	W. Richins	2.65	10.6	Sept. 25	Gray and Jacob	2.33	2.6
May 27	do	2.35	3.0	Oct. 2	C. C. Jacob	2.32	2.6
June 30	C. C. Jacob	2.55	1.7	28	do	2.35	2.7
July 19	W. Richins	2.40	4.1	Nov. 28	do	2.80	5.7
Aug. 12	do	2.45	6.5	Dec. 30	do	2.84	3.7

Daily gage height, in feet, of Agua Fria River near Glendale, Ariz., for 1913.

[R. Jones, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.5	3.5	5.0	3.5	2.6	2.35	2.4	2.4	2.55	.....	2.40	2.80
2	3.5	3.5	5.0	3.5	2.55	2.35	2.4	2.5	2.35	2.33	2.40	2.81
3	3.5	3.5	5.0	3.5	2.55	2.35	2.4	2.6	2.35	3.53	2.40	2.86
4	3.5	3.5	5.5	3.5	2.55	2.4	2.4	2.4	2.85	3.55	2.40	2.89
5	3.5	3.5	5.5	3.5	2.55	2.4	2.4	2.4	2.55	2.50	2.40	2.89
6	3.5	3.5	6.0	3.5	2.55	2.4	2.4	2.35	2.35	2.46	2.40	2.85
7	3.5	3.5	6.0	3.5	2.55	2.4	2.4	2.3	2.35	2.45	2.40	2.83
8	3.5	3.6	5.0	3.5	2.55	2.4	2.4	2.4	2.35	2.42	2.40	2.81
9	3.5	3.6	5.0	3.5	2.5	2.4	2.4	2.4	2.35	2.38	2.40	2.80
10	3.5	3.6	5.0	3.5	2.5	2.4	2.4	2.3	2.35	2.36	2.40	2.82
11	3.5	3.6	4.6	.....	2.5	2.4	2.3	2.3	2.35	2.36	2.47	2.89
12	3.5	3.5	4.6	.....	2.5	2.4	2.4	2.3	2.35	2.35	2.63	2.89
13	3.5	3.5	4.6	.....	2.5	2.45	2.4	2.4	2.35	2.37	3.17	2.87
14	3.5	3.5	4.5	.....	2.45	2.45	2.4	2.35	2.35	2.37	3.40	2.86
15	3.5	3.5	4.4	.....	2.45	2.45	2.4	2.3	2.35	2.37	3.02	2.83
16	3.5	3.5	4.4	.....	2.45	2.45	2.45	2.3	2.35	2.37	2.98	2.83
17	3.5	3.5	4.5	.....	2.45	2.45	2.4	2.3	2.3	2.35	2.90	2.86
18	3.5	3.5	3.5	2.65	2.45	2.45	2.3	2.3	2.35	2.35	2.78	2.88
19	3.5	3.5	3.5	2.65	2.45	2.45	2.4	2.3	2.35	2.33	3.17	2.89
20	3.5	3.5	3.5	2.65	2.4	2.45	2.4	2.3	3.35	2.33	3.96	2.89
21	3.5	3.5	3.5	2.65	2.4	2.45	2.6	2.3	2.3	2.33	3.80	2.89
22	3.5	7.5	3.5	2.65	2.4	2.5	2.4	2.4	2.55	2.33	3.70	2.89
23	3.5	5.0	3.5	2.65	2.4	2.5	2.6	2.25	2.45	2.33	3.50	2.90
24	3.5	3.6	3.5	2.65	2.4	2.5	2.4	2.4	2.35	2.33	3.35	2.90
25	3.5	4.3	3.5	2.65	2.4	2.5	2.4	2.65	2.33	2.32	3.05	2.89
26	3.5	7.5	3.5	2.6	2.35	2.5	2.4	2.45	.....	2.31	2.82	2.88
27	3.5	5.0	3.5	2.6	2.35	2.5	2.4	2.4	.....	2.32	2.80	2.87
28	3.5	5.0	3.5	2.6	2.35	2.5	2.4	2.3	.....	2.33	2.80	2.87
29	3.5	.....	3.5	2.6	2.35	2.5	2.4	2.25	.....	2.38	2.80	2.86
30	3.5	.....	3.5	2.6	2.35	2.55	2.4	2.45	.....	2.39	2.80	2.85
31	3.5	.....	3.5	.....	2.35	.....	2.4	2.6	.....	2.40	.....	2.85

NOTE.—20 feet has been deducted from all gage readings for 1913; staff gage read Jan. 1 to Aug. 27; automatic gages Aug. 28 to Dec. 31. Maximum gage height Nov. 13, 5.95 feet; maximum gage height Nov. 19, 6.1 feet.

FOSSIL CREEK NEAR CAMP VERDE, ARIZ.

Location.—Just below the flume intake of the Arizona Power Co., 5 miles above the confluence with Verde River, and 20 miles southeast of Camp Verde.
Records available.—March 16 to December 31, 1913.
Drainage area.—Not measured.
Gage.—Vertical staff.
Discharge measurements.—Made by wading.
Cooperation.—Data furnished by the United States Forest Service through Mr. Leonard Lundgren, district engineer.

Estimates of discharge withheld on account of lack of measurements.
The following discharge measurement was made by J. W. Wadsworth:
November 22, 1913: Gage height, 3.22 feet; discharge, 49.2 second-feet.

Daily gage height, in feet, of Fossil Creek near Camp Verde, Ariz., for 1913.

[J. W. Wadsworth, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	3.70	3.00	3.00	3.00	3.00	3.05	.....	3.10	3.01
2	.....	3.60	3.00	3.00	3.00	3.00	3.05	.....	3.01	3.01
3	.....	3.45	3.00	3.00	3.00	3.00	3.05	.....	3.01	3.01
4	.....	3.30	3.00	3.00	3.00	3.00	3.05	.....	3.01	3.01
5	.....	3.35	3.00	3.00	3.00	3.00	3.05	3.15	3.01	3.01
6	.....	3.35	3.00	3.00	3.00	3.00	3.05	3.15	3.01	3.01
7	.....	3.30	3.00	3.00	3.00	3.00	3.05	3.15	3.01	3.02
8	.....	3.20	3.00	3.00	3.00	3.00	3.05	3.15	3.01	3.01
9	.....	3.10	3.00	3.00	3.00	3.00	3.05	3.15	3.01	3.01
10	.....	3.10	3.00	3.00	3.00	3.00	3.05	3.15	3.01	3.01
11	.....	3.10	3.00	3.00	3.00	3.00	3.05	3.15	3.01	3.01
12	.....	3.10	3.00	3.00	3.00	3.00	3.05	3.15	3.01	3.01
13	.....	3.10	3.00	3.00	3.00	3.00	3.05	3.10	3.01	3.01
14	.....	3.10	3.00	3.00	3.00	3.00	3.05	3.10	3.01	3.01
15	.....	3.10	3.00	3.00	3.00	3.00	3.05	3.10	3.01	3.01
16	3.10	3.10	3.00	3.00	3.00	3.00	3.05	3.10	3.00	3.30
17	3.40	3.10	3.00	3.00	3.00	3.00	3.05	3.10	3.01	3.50
18	3.40	3.10	3.00	3.00	3.00	3.00	3.05	3.10	3.01	3.20
19	3.40	3.10	3.00	3.00	3.00	3.00	3.05	3.10	3.15	3.20
20	3.35	3.00	3.00	3.00	3.00	3.00	3.05	3.01	3.20	3.20
21	3.40	3.00	3.00	3.00	3.00	3.00	3.05	3.01	3.22	3.10
22	3.60	3.10	3.00	3.00	3.00	3.00	3.05	3.01	3.12	3.10
23	3.60	3.10	3.00	3.00	3.00	3.00	3.05	3.01	3.10	3.10
24	3.30	3.10	3.00	3.00	3.00	3.00	3.05	3.01	3.15	3.10
25	3.15	3.10	3.00	3.00	3.00	3.05	3.05	3.01	3.22	3.10
26	3.10	3.10	3.00	3.00	3.00	3.05	3.05	3.01	3.17	3.10
27	3.10	3.10	3.00	3.00	3.00	3.05	3.05	3.10	3.10	3.10
28	3.10	3.10	3.00	3.00	3.00	3.05	.....	3.10	3.10	3.01
29	3.50	3.10	3.00	3.00	3.00	3.05	.....	3.10	3.01	3.01
30	3.55	3.00	3.00	3.00	3.00	3.05	.....	3.10	3.01	3.01
31	3.70	.....	3.00	.....	3.00	3.05	.....	3.10	.....	3.01

HASSAYAMPA RIVER AT WALNUT GROVE, ARIZ.

Location.—In sec. 33, T. 11 N., R. 3 W., at road crossing opposite Moore's ranch, one-fourth mile below Walnut Grove, and about 25 miles above Wickenburg.
Records available.—November 21, 1912, to December 31, 1913.
Drainage area.—Not measured.
Gage.—Vertical staff on right bank.
Control.—Sand and gravel; somewhat shifting.
Discharge measurements.—Made by wading or from car and cable.
Diversions.—Nearly the entire low-water flow is diverted for irrigation above the station.
Accuracy.—Estimates poor.

Discharge measurements of Hassayampa River at Walnut Grove, Ariz., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 6	W. Richins	5.45	16.7	Aug. 8	W. Richins	4.80	0.3
Apr. 2	do	5.15	34.2	Sept. 6	C. C. Jacob	4.82	1.4
May 6	do	4.60	1.3	19	Gray and Jacob	4.76	*a* .1
27	C. C. Jacob	4.55	*a*.1	Dec. 5	C. C. Jacob	4.62	1.6

a Estimated.

Daily gage height, in feet, of Hassayampa River at Walnut Grove, Ariz., for 1913.

[Mrs. A. A. Moore, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.8	4.8	4.8	5.0	4.55	.....	.....	4.7	5.75	4.7	4.5	4.5
2	4.8	4.8	4.8	5.05	4.5	.....	.....	4.7	5.6	4.7	4.5	4.5
3	4.8	4.8	5.0	5.1	4.5	.....	.....	4.8	5.15	4.95	4.5	4.5
4	4.75	4.8	5.1	5.1	4.55	.....	.....	4.8	7.6	4.65	4.5	4.5
5	4.7	4.8	5.4	5.1	4.6	.....	.....	4.7	5.0	4.7	4.55	4.6
6	4.7	4.8	5.4	5 1	4.55	.....	.....	4.8	4.95	4.65	4.55	4.5
7	4.7	4.8	5.4	5.05	4.6	.....	.....	4.8	4.85	4.7	4.55	4.5
8	4.8	4.85	5.35	5.0	4.55	.....	.....	4.8	4.85	4.65	4.5	4.5
9	4.8	4.8	5.05	5.0	4.6	.....	.....	5.15	4.8	4.65	4.5	4.5
10	4.8	4.8	5.2	4.9	4.6	.....	.....	4.8	4.8	4.6	4.5	4.5
11	4.8	4.8	5.2	4 9	4.55	.....	.....	4.8	4.8	4.6	4.6	4.5
12	4.8	4.8	5.2	4.9	4.6	.....	.....	4.8	4.7	4.6	4 6	4.5
13	4.8	4.8	5.1	4.9	4.55	.....	.....	4.8	4.7	4.6	4.6	4.5
14	4.8	4.8	5.1	4.9	4.55	.....	.....	4.75	4.7	4.6	4.6	4.5
15	4.8	4.8	5.05	5.0	4.55	.....	.....	4.8	4.7	4.6	4.6	4.6
16	4.8	4.8	5.0	5.05	4.55	.....	.....	4.8	4.7	4.6	4.6	4.6
17	4.8	4.8	5.0	5.0	4.6	.....	5.35	.....	4.7	4.6	4.5	4.5
18	4.8	4.8	4.95	5.0	4.5	.....	4.7	.....	4.75	4.6	4.5	4.5
19	4.8	4.8	4.95	4.9	4.45	.....	4.9	.....	4.7	4.55	5.0	4.5
20	4.8	4.8	4.95	4.9	4.5	.....	4.8	4.8	4.7	4.5	4.7	4.5
21	4.8	4.8	5.0	4.8	4.4	.....	4.8	.....	4.7	4.5	4.7	4.5
22	4.8	4.85	4.95	4 85	4.4	.....	4.7	4.85	4.7	4.5	4.7	4.5
23	4.8	4.85	5.0	4.9	4.45	.....	4.7	.....	4.6	4.5	4.75	4 5
24	4 8	5.0	4.95	4.8	4.45	.....	4.7	.....	4.6	4.5	4.8	4.5
25	4.8	5.55	4.95	4.8	4.6	.....	4.7	4.8	4.6	4.5	4.8	4.5
26	4.8	4.9	5.0	4.7	4.6	.....	4.8	4.8	4.6	4.5	4.8	4.5
27	4.8	5.1	4.95	4.75	4.55	.....	4.7	4.8	4.65	4.5	4.6	4.5
28	4.8	4.9	4.95	4.7	4.45	.....	4.8	5.15	4.65	4.5	4.6	4.5
29	4.8	.....	4.9	4.6	4.6	.....	4.7	4.8	4.65	4.5	4.55	4.5
30	4.8	.....	5.05	4.55	.....	.....	4.7	4.8	4.7	4.5	4.5	4.5
31	4.8	.....	5.05	.....	.....	.....	4.8	6.35	.....	4.5	.....	4.5

Daily discharge, in second-feet, of Hassayampa River at Walnut Grove, Ariz., for 1912–13.

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1912.			1912.			1912.		
1	.....	1.0	11	.....	1.0	21	1.0	1.0
2	.....	1.0	12	.....	.9	22	1.2	1.0
3	.....	3.8	13	.....	.9	23	1.2	1.0
4	.....	2 0	14	.....	1.0	24	1.0	1.0
5	.....	.9	15	.....	1.0	25	1.0	1.0
6	.....	1.2	16	.....	1.0	26	1.0	1.0
7	.....	1.0	17	.....	1.0	27	1.0	1.0
8	.....	1.2	18	.....	1.0	28	1.0	1.0
9	.....	1.2	19	.....	1.0	29	1.0	1.0
10	.....	1.0	20	.....	1.0	30	1.0	1.0
						31	.....	1.0

Daily discharge, in second-feet, of Hassayampa River at Walnut Grove, Ariz., for 1912–13—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1913.												
1	1.0	1.0	1.0	26	1.5	.....	.....	0.1	32	0.3	0.2	0.6
2	1.0	1.0	1.0	29	1.0	.....	.....	.1	24	.3	.2	.6
3	1.0	1.0	3.8	29	1.0	.....	.....	.3	4.9	2.9	.2	.6
4	.7	1.0	6.0	29	1.5	.....	.....	.3	235	.3	.2	.6
5	.5	1.0	15	29	2.0	.....	.....	.1	3.8	.6	.3	1.5
6	.5	1.0	15	26	1.0	.....	.....	.3	2.9	.3	.3	.6
7	.5	1.0	19	24	1.5	.....	.....	.3	1.5	.6	.3	.6
8	1.0	1.6	17	22	1.0	.....	.....	.3	1.5	.3	.2	.6
9	1.0	1.0	7.2	22	1.5	.....	.....	4.9	1.2	.3	.2	.6
10	1.0	1.0	11.5	17	1.5	.....	.....	.3	1.1	.2	.2	.6
11	1.0	1.0	15	15	.6	.....	.....	.3	1.0	.2	.6	.6
12	1.0	1.0	15	15	1.0	.....	.....	.3	.5	.2	.6	.6
13	1.0	1.0	11.5	15	.6	.....	.....	.3	.5	.2	.6	.6
14	1.0	1.0	11.5	15	.6	.....	.....	.2	.4	.2	.6	.6
15	1.0	1.0	13	19	.6	.....	.....	.3	.4	.2	.6	1.5
16	1.0	1.0	11.5	19	.6	.....	.....	.3	.3	.2	.6	1.5
17	1.0	1.0	11.5	17	1.0	.....	13	.....	.2	.2	.3	.6
18	1.0	1.0	10	17	.3	.....	.1	.....	.1	.2	.3	.6
19	1.0	1.0	13	13	.1	.....	1.0	.....	.1	.2	8.5	.6
20	1.0	1.0	13	13	.3	.....	.3	.3	.1	.1	2.0	.6
21	1.0	1.0	15	8.5	.1	.....	.3	.4	.1	.1	2.0	.6
22	1.0	1.6	13	10	.1	.....	.1	.6	.1	.1	2.0	.6
23	1.0	1.6	19	11.5	.1	.....	.1	.5	.1	.1	2.9	.6
24	1.0	3.8	17	8.5	.1	.....	.1	.4	.1	.1	3.8	.6
25	1.0	22	17	8.5	.6	.....	.1	.3	.1	.1	3.8	.6
26	1.0	2	19	4.9	.3	.....	.3	.3	.1	.1	3.8	.6
27	1.0	6	22	6.0	.2	.....	.1	.3	.2	.1	1.0	.6
28	1.0	2	22	4.9	.1	.....	.3	4.9	.2	.1	1.0	.6
29	1.0	.....	19	2.9	.3	.....	.1	.3	.2	.1	.6	.6
30	1.0	.....	26	2.0	.....	.....	.1	.3	.3	.1	.3	.6
31	1.0	.....	29	.....	.....	.....	.3	86	.....	.1	.....	.6

NOTE.—Discharge determined by the indirect method for shifting channels. No flow May 30 to July 16 and Aug. 17–19. Discharge interpolated Aug. 21, 23, and 24.

Monthly discharge of Hassayampa River at Walnut Grove, Ariz., for 1912–13.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
1912.				
November 21–30	1.2	1.0	1.04	21
December	3.8	.9	1.13	69
The period	.....	.....	.....	90
1913.				
January	1.0	0.5	0.94	58
February	22	1.0	2.16	120
March	29	1.0	14.2	873
April	29	2.0	16.0	952
May	2.0	.0	.68	42
June	.0	.0	.00	0
July	13	.0	.53	33
August	86	.0	3.33	205
September	235	.1	10.4	619
October	2.9	.1	.29	18
November	8.5	.2	1.27	76
December	1.5	.6	.69	42
The year	235	.0	4.19	3,040

NOTE.—These estimates are only approximate.

WHITEWATER DRAW[1] NEAR DOUGLAS, ARIZ.

Location.—In the SE. ¼ sec. 10, T. 24 S., R. 27 E., at highway bridge just above El Paso & Southwestern Railroad bridge, three-fourths mile above former station at electric railway bridge, and about 1 mile west of Douglas.

Records available.—April, 1911, to March 16, 1912, at electric railway bridge; March 17, 1912, to December 31, 1913, at highway bridge.

Drainage area.—Not measured.

Gage.—Vertical staff painted on bridge pier in center of channel.

Control.—Gravel and silt; fairly permanent except at high stages. During January, 1913, the Calumet & Arizona smelter dumped slag into the river channel 1,200 feet below the gage, which created backwater at the station. The high water of February and March cut a new channel around the slag pile and eliminated backwater for medium and low stages, but it is probable that a new rating is necessary for high stages.

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

Accuracy.—Estimates poor.

Discharge measurements of Whitewater Draw near Douglas, Ariz., for 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 10	R. M. Fox	6.10	68	Sept. 15	Gray and Jacob	4.20	0
July 28	W. Richins	.....	0	Nov. 10	C. C. Jacob	4.20	0

Daily gage height, in feet, of Whitewater Draw near Douglas, Ariz., for 1913.

Day.	Feb.	Mar.	July.	Aug.	Sept.	Nov.	Dec.
1	.....	4.6	.....	5.75	5.3	.....	.....
2	.....	4.55	.....	4.7	4.4	.....	.....
3	.....	4.45	.....	4.65	4.7	.....	.....
4	.....	.....	.....	4.45	4.5	.....	.....
5	.....	.....	.....	4.4	4.3	.....	.....
6	.....	.....	.....	5.0	4.35	.....	.....
7	6.3	.....	.....	6.6	6.4	.....	.....
8	6.8	.....	.....	6.2	4.65	.....	.....
9	6.75	.....	.....	4.9	4.35	.....	.....
10	6.3	.....	.....	4.85	.....	.....	.....
11	4.65	.....	.....	4.4	.....	.....	.....
12	4.9	.....	.....	4.55	.....	.....	.....
13	4.65	.....	.....	5.3	.....	.....	.....
14	4.5	.....	.....	5.1	.....	.....	.....
15	4.4	.....	.....	5.7	.....	.....	.....
16	.....	.....	5.05	4.8	.....	6.8	4.3
17	.....	.....	4.45	4.6	.....	8.6	4.2
18	.....	.....	4.4	4.45	.....	6.0	4.6
19	.....	.....	.....	5.05	.....	5.3	4.45
20	.....	.....	.....	6.0	.....	4.75	4.35
21	.....	.....	.....	4.55	.....	4.5	4.3
22	.....	.....	.....	4.35	.....	4.45	4.2
23	.....	.....	.....	.....	.....	4.35	4.1
24	.....	.....	.....	.....	.....	4.8	.....
25	4.8	.....	.....	.....	.....	4.75	.....
26	5.15	.....	.....	.....	.....	4.5	.....
27	4.65	.....	.....	.....	.....	4.4	.....
28	4.6	.....	.....	.....	.....	4.35	.....
29	.....	.....	.....	.....	.....	.....	.....
30	.....	.....	.....	.....	.....	.....	.....
31	.....	.....	5.7	.....	.....	.....	.....

[1] Formerly called Whitewater River.

Daily discharge, in second-feet, of Whitewater Draw near Douglas, Ariz., for 1913.

Day.	Feb.	Mar.	July.	Aug.	Sept.	Nov.	Dec.
1		3		83	34		
2		2		4	1		
3		1		4	4		
4				2	2		
5				1	1		
6				14	1		
7	98			242	200		
8	190			160	4		
9	180			10	1		
10	98			8			
11	4			1			
12	10			2			
13	4			34			
14	2			20			
15	1			76			
16			17	6		288	1
17			2	3		810	1
18			1	2		124	4
19				17		34	2
20				124		5	1
21				2		2	1
22				1		2	1
23						1	1
24						6	
25	6					5	
26	23					2	
27	4					1	
28	3					1	
29							
30							
31			76				

NOTE.—Discharge determined from several poorly defined rating curves. Stream dry on days for which no data are given.

Monthly discharge of Whitewater Draw near Douglas, Ariz., for 1913.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January	0.0	0.0	0.00	0
February	190	.0	22.2	1,230
March	3.0	.0	.19	12
April	.0	.0	.00	0
May	.0	.0	.00	0
June	.0	.0	.00	0
July	76	.0	3.10	191
August	242	.0	26.3	1,620
September	200	.0	8.27	492
October	.0	.0	.00	0
November	810	.0	42.7	2,540
December	4.0	.0	.39	24
The year	810	.0	8.44	6,200

NOTE.—These estimates are only approximate.

MISCELLANEOUS MEASUREMENTS.

The following table gives the results of discharge measurements made in the Colorado River Basin at points other than the regular gaging stations.

Miscellaneous measurements in Colorado River drainage basin in 1913.

Green River basin.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
May 24	Green River	Colorado River	Ouray, Utah	8.42	12,700

Grand River basin.

May 10	Grand River	Colorado River	State Bridge, Colo.		4,380
Sept. 5	No Name Creek	Grand River	Above Grizzly Creek tunnel, Colo.		6.6
5	Grizzly Creek tunnel	do	West portal of tunnel, Colorado		16.8
June 4	Gunnison River	do	Old gaging station at River Portal, Colo.	3.29	168
7	do	do	do	10.90	4,320
Aug. 7	do	do	do	7.75	1,030
Sept. 26	do	do	do	8.25	980

Gila River basin.

Feb. 28	Gila River	Colorado River	Highway bridge at Duncan, Ariz.		125
Jan. 29	do	do	Highway bridge at Florence, Ariz.		130
Feb. 3	do	do	Opposite Buckeye division near Buckeye, Ariz.		22.6
Jan. 12	East Fork of Gila River.	Gila River	Just above confluence with West Fork, N. Mex.		26.1
Apr. 5	do	do	do		53.6
May 4	do	do	do		34.0
June 9	do	do	do		35.4
July 22	do	do	do		27.1
Aug. 26	do	do	do		33.9
Sept. 19	do	do	do		20.3
Nov. 10	do	do	do		27.5
Dec. 8	do	do	do		26.6
Jan. 12	West Fork of Gila River.	do	Just above confluence with East Fork, N. Mex.		15.2
Apr. 5	do	do	do		350
May 4	do	do	do		119
June 9	do	do	do		31.5
July 22	do	do	do		19.2
Aug. 25	do	do	do		36.0
Sept. 19	do	do	do		23.0
Nov. 10	do	do	do		20.6
Dec. 8	do	do	do		36.5
May 9	Sycamore Creek	do	Highway crossing Casadore Springs, Rice, Ariz.		.3
Mar. 26	San Pedro River	do	Highway bridge at Hereford, Ariz.		2.4
Apr. 18	do	do	One mile above schoolhouse at St. David, Ariz.		2.2
Mar. 20	Sonorita Creek	San Pedro River	Railroad bridge at Patagonia, Ariz.		4.6
Apr. 18	Merrill artesian well	do	St. David, Ariz.		.1
Jan. 24	Santa Cruz River	Gila River	Just above cut-off dam above Tucson, Ariz.	0.34	2.6
Mar. 8	New River	Agua Fria River	Road crossing above Glendale, Ariz.		30.5
Oct. 21	Arizona Power Co.'s flume.	Diverts from Fossil Creek.	Intake, 5 miles above mouth of Fossil Creek, Ariz.		48

Miscellaneous measurements in Colorado River drainage basin in 1911–12 by engineers of the United States Forest Service.

Fremont River basin.[a]

Date.	Stream.	Tributary to—	Locality.	Discharge.
1911.				*Sec.-ft.*
Dec. 8	North Fork of Twin Creek.	Fish Lake	Near Burrville, Utah	0.5
8	South Fork of Twin Creek.	do	do	4.8

Virgin River basin.[a]

1912.				
Mar. 14	Cottonwood Creek	Virgin River	Power plant near St. George, Utah	1.3
13	Santa Clara Creek	do	Four miles above Santa Clara, Utah	39.6
12	do	do	Above mouth of Magotsu Creek, Utah	20.7
14	do	do	Short distance above mouth, Utah	27.0
11	Pine Valley Creek	Santa Clara Creek	25 miles above Pine Valley, Utah	3.7
12	Hunts Spring	do	Central, Utah	3.0
12	Magotsu Creek	do	Mouth near Santa Clara, Utah	12.8
12	Moody Wash	Magotsu Creek	Just above mouth at Biglow ranch, Utah.	6.4

[a] Measurements were furnished through the courtesy of J. P. Martin, district engineer, United States Forest Service.

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