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

WATER-SUPPLY PAPER 310

SURFACE WATER SUPPLY OF THE UNITED STATES

1911

PART X. THE GREAT BASIN

PREPARED UNDER THE DIRECTION OF M. O. LEIGHTON

BY

F. F. HENSHAW, H. D. McGLASHAN, AND
E. A. PORTER

WASHINGTON
GOVERNMENT PRINTING OFFICE
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SURFACE WATER SUPPLY OF THE GREAT BASIN, 1911.

By F. F. Henshaw, H. D. McGlashan, and E. A. Porter.

AUTHORIZATION OF WORK.

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

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

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

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

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

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

The work was begun in 1888 in connection with special studies of water supply for irrigation.

Since the fiscal year ending June 30, 1895, successive sundry civil bills passed by Congress have carried the following item and appropriations:

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

Annual appropriations for the fiscal year ending June 30—

1895	$12,500
1896	20,000
1897 to 1900, inclusive	50,000
1901 to 1902, inclusive	100,000
1903 to 1906, inclusive	200,000
1907	150,000
1908 to 1910, inclusive	100,000
1911 to 1913, inclusive	150,000

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

PUBLICATIONS.

Measurements of stream flow have been made at more than 2,000 points in the United States and also at many points in small areas in Seward Peninsula and the Yukon-Tanana region, Alaska, and in the Hawaiian Islands. During 1911 gaging stations were maintained by the Survey and the cooperating organizations at about 1,500 points in the United States, and many discharge measurements were made at other points. In connection with this work data were also collected in regard to precipitation, evaporation, storage reservoirs, river profiles, and water power in many sections of the country and will be made available in the regular surface water supply papers from time to time. A complete list of the gaging stations maintained by the Survey to and including 1910 and a list of the papers relating to the water supply of the country has been published as Water-Supply Paper 280. An index to the reports containing stream-flow measurements prior to 1904 has been published as Water-Supply Paper 119.

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

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

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

Report.	Character of data.	Year.
10th A, pt. 2	Descriptive information only	
11th A, pt. 2	Monthly discharge	1884, to 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, measurments, 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.

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

The table which follows gives, by years and drainage basins, the numbers of the papers on surface-water supply published from 1899 to 1911. The data for any particular station will be found in the reports covering the years during which the station was maintained. For example, data for Machias River at Whitneyville, Me., 1903 to 1911, are published in Water-Supply Papers 97, 124, 165, 201, 241, 261, 281, and 301, which contain records for the New England streams from 1903 to 1911.

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

	1899 [a]	1900 [b]	1901	1902	1903	1904
North Atlantic coast (St. John River to York River)	35	47, [c] 48	65, 75	82	97	[d] 124, [e] 125, [f] 126
South Atlantic coast and eastern Gulf of Mexico (James River to the Mississippi)	[g] 35, 36	48	65, 75	[g] 82, 83	[g] 97, 98	[f] 126, 127
Ohio River basin	36	48, [h] 49	65, 75	83	98	128
St. Lawrence River and Great Lakes	36	49	65, 75	[i] 82, 83	97	129
Hudson Bay and upper Mississippi River	36	49	[j] 65, 66, 75	[j] 83, 85	[j] 98, 99, 100	[j] 128, 130
Missouri River	[k] 36, 37	49, [l] 50	66, 75	84	99	130, [m] 131
Lower Mississippi River	37	50	[j] 65, 66, 75	[j] 83, 84	[j] 98, 99	[j] 128, 131
Western Gulf of Mexico	37	50	66, 75	84	99	132
Colorado River	[n] 37, 38	50	66, 75	85	100	133
Great Basin	38, [p] 39	51	66, 75	85	100	133, [q] 134
Pacific coast in California	38, [r] 30	51	66, 75	85	100	134
North Pacific coast	38	51	66, 75	85	100	135

	1905	1906	1907–8	1909	1910	1911
North Atlantic coast (St. John River to York River)	[d] 165, [e] 166, [f] 167	[d] 201, [e] 202, [f] 203	241	261	281	301
South Atlantic coast and eastern Gulf of Mexico (James River to the Mississippi)	[f] 167, 168	[f] 283, 204	242	262	282	302
Ohio River basin	169	205	243	263	283	303
St. Lawrence River and Great Lakes	170	206	244	264	284	304
Hudson Bay and upper Mississippi River	171	207	245	265	285	305
Missouri River	172	208	246	266	286	306
Lower Mississippi River	[j] 169, 173	[j] 205, 209	247	267	287	307
Western Gulf of Mexico	174	210	248	268	288	308
Colorado River	175, [o] 177	211	249	269	289	309
Great Basin	176, [q] 177	212, [q] 213	250, [q] 251	270, [q] 271	290	310
Pacific coast in California	177	213	251	271	291	311
North Pacific coast	[s] 177, 178	214	252	272	292	312

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

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 run-off in second-feet per square mile, and (2) those which represent the actual quantity of water, as run-off in depth in inches, and acre-feet. The units used in this series of reports are second-feet, second-feet per square mile, run-off in depth in inches, and acre-feet. They may be defined as follows:

"Second-foot" is an abbreviation for cubic foot per second and is the unit for the rate of discharge of water flowing in a stream 1 foot wide, 1 foot deep, at a rate of 1 foot per second. It is generally used as a fundamental unit from which others are computed by the use of the factors given in the accompanying table of equivalents.

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

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

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

CONVENIENT EQUIVALENTS.

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

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

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

NOTE.—For partial month multiply the values for 1 day by the number of days.

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

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

NOTE.—For partial month multiply values for 1 day by the number of days.

1 second-foot equals 40 California miner's inches (law of March 23, 1901).
1 second-foot equals 38.4 Colorado miner's inches.
1 second-foot equals 40 Arizona miner's inches.
1 second-foot equals 7.48 United States gallons per second; equals 448.8 gallons per minute; equals 646,317 gallons for one day.
1 second-foot for one year covers 1 square mile 1.131 feet or 13.572 inches deep.
1 second-foot for one year equals 31,536,000 cubic feet.
1 second-foot equals about 1 acre-inch per hour.
1 second-foot for one day equals 86,400 cubic feet.
1,000,000,000 (1 United States billion) cubic feet equals 11,570 second-feet for one day.
1,000,000,000 cubic feet equals 414 second-feet for one 28-day month.
1,000,000,000 cubic feet equals 399 second-feet for one 29-day month.
1,000,000,000 cubic feet equals 386 second-feet for one 30-day month.
1,000,000,000 cubic feet equals 373 second-feet for one 31-day month.
100 California miner's inches equals 18.7 United States gallons per second.
100 California miner's inches for one day equals 4.96 acre-feet.
100 Colorado miner's inches equals 2.60 second-feet.
100 Colorado miner's inches equals 19.5 United States gallons per second.
100 Colorado miner's inches for one day equals 5.17 acre-feet.
100 United States gallons per minute equals 0.223 second-foot.
100 United States gallons per minute for one day equals 0.442 acre-foot.
1,000,000 United States gallons per day equals 1.55 second-feet.
1,000,000 United States gallons equals 3.07 acre-feet.
1,000,000 cubic feet equals 22.95 acre-feet.
1 acre-foot equals 325,850 gallons.
1 inch deep on 1 square mile equals 2,323,200 cubic feet.
1 inch deep on 1 square mile equals 0.0737 second-foot per year.
1 foot equals 0.3048 meter.
1 mile equals 1.60935 kilometers.
1 mile equals 5,280 feet.
1 acre equals 0.4047 hectare.
1 acre equals 43,560 square feet.
1 acre equals 209 feet square, nearly.
1 square mile equals 2.59 square kilometers.
1 cubic foot equals 0.0283 cubic meter.
1 cubic foot of water weighs 62.5 pounds.
1 cubic meter per minute equals 0.5886 second-foot.
1 horsepower equals 550 foot-pounds per second.
1 horsepower equals 76.0 kilogram-meters per second.
1 horsepower equals 746 watts.
1 horsepower equals 1 second-foot falling 8.80 feet.
1½ horsepower equal about 1 kilowatt.

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

EXPLANATION OF DATA.

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

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

The table of daily gage heights records the daily fluctuations of the surface of the river as found from the mean of the gage readings taken each day, usually in the morning and in the evening. The gage height given in the table represents the elevation of the surface of the water above the zero of the gage. All gage heights affected by the presence of ice in the streams or by backwater from obstructions are published as recorded, with suitable footnotes. The rating table is not applicable for such periods unless the proper corrections to the gage heights are known and applied. Attention is called to the fact that the zero of the gage is placed at an arbitrary datum and has no relation to zero flow or the bottom of the river. In general the zero is located somewhat below the lowest known flow, so that readings of negative values shall not occur.

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

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

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

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

In the table of monthly discharge the column headed "Maximum" gives the mean flow, as determined from the rating table, for the day

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

The field methods used in the collection of the data presented in this series of reports are described in the introductory sections of Water-Supply Papers 261 to 272, inclusive, "Surface water supply of the United States, 1909."

Plates I and II show the average precipitation and run-off in the United States, as determined from the measurements of stream flow made by the Geological Survey and records of rainfall collected by the Weather Bureau.

Plate III shows typical gaging stations.

Plate IV shows current meters [1] used in the work.

ACCURACY AND RELIABILITY OF FIELD DATA AND COMPARATIVE RESULTS.

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

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

In order to give engineers and others information regarding the probable accuracy of the computed results, footnotes are added to the daily discharge tables, stating the probable accuracy of the rating tables used, and an accuracy column is inserted in the monthly discharge table. For the rating tables "well defined" indicates, in general, that the rating is probably accurate within 5 per cent; "fairly well defined," within 10 per cent; "poorly defined" or "approximate," within 15 to 25 per cent. These notes are very general and are based on the plotting of the individual measurements with reference to the mean rating curve.

The accuracy column in the monthly discharge table does not apply to the maximum or minimum nor to any individual day, but to the monthly mean. It is based on the accuracy of the rating, the

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

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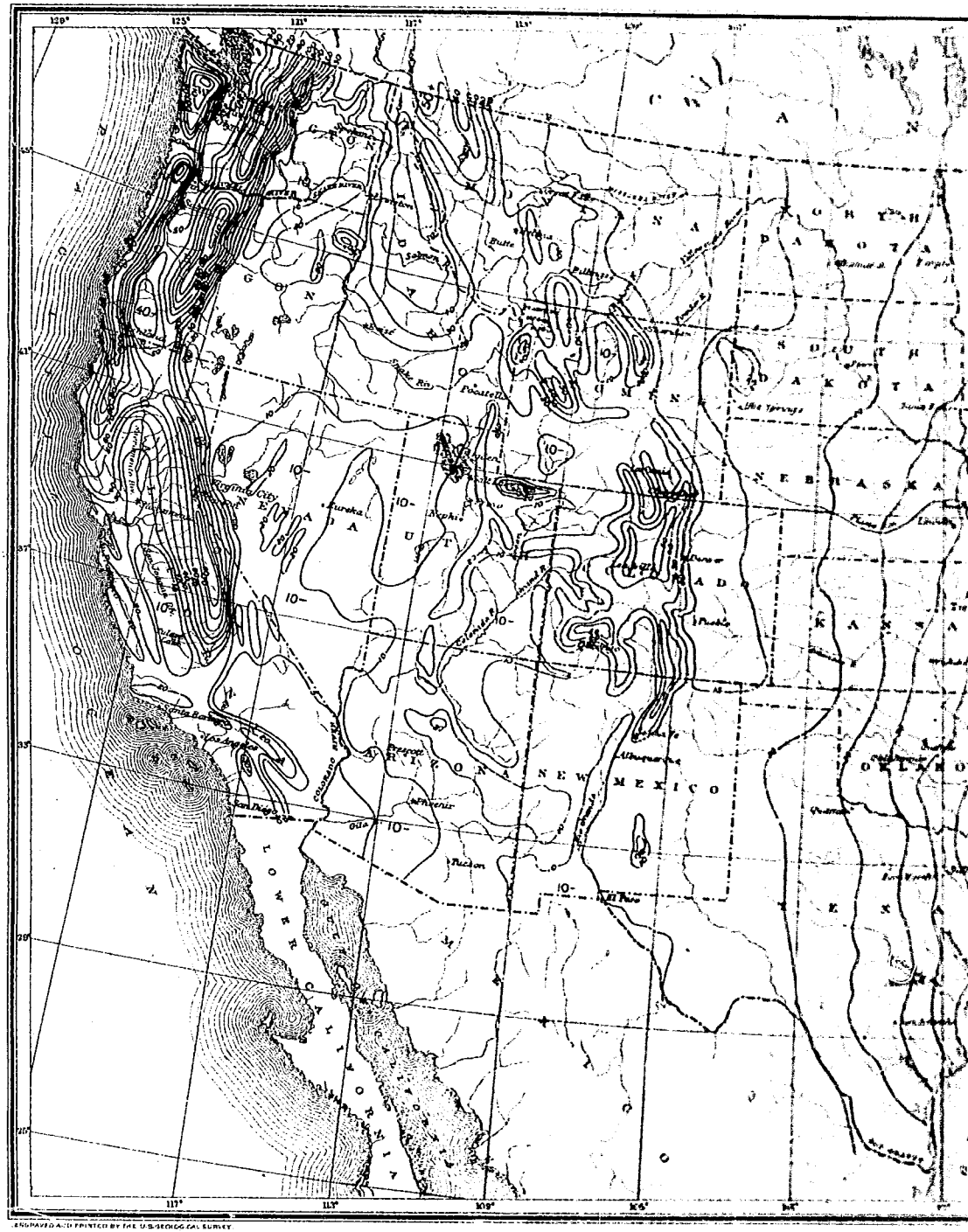

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MAP OF UNITED STATES, SHOWING

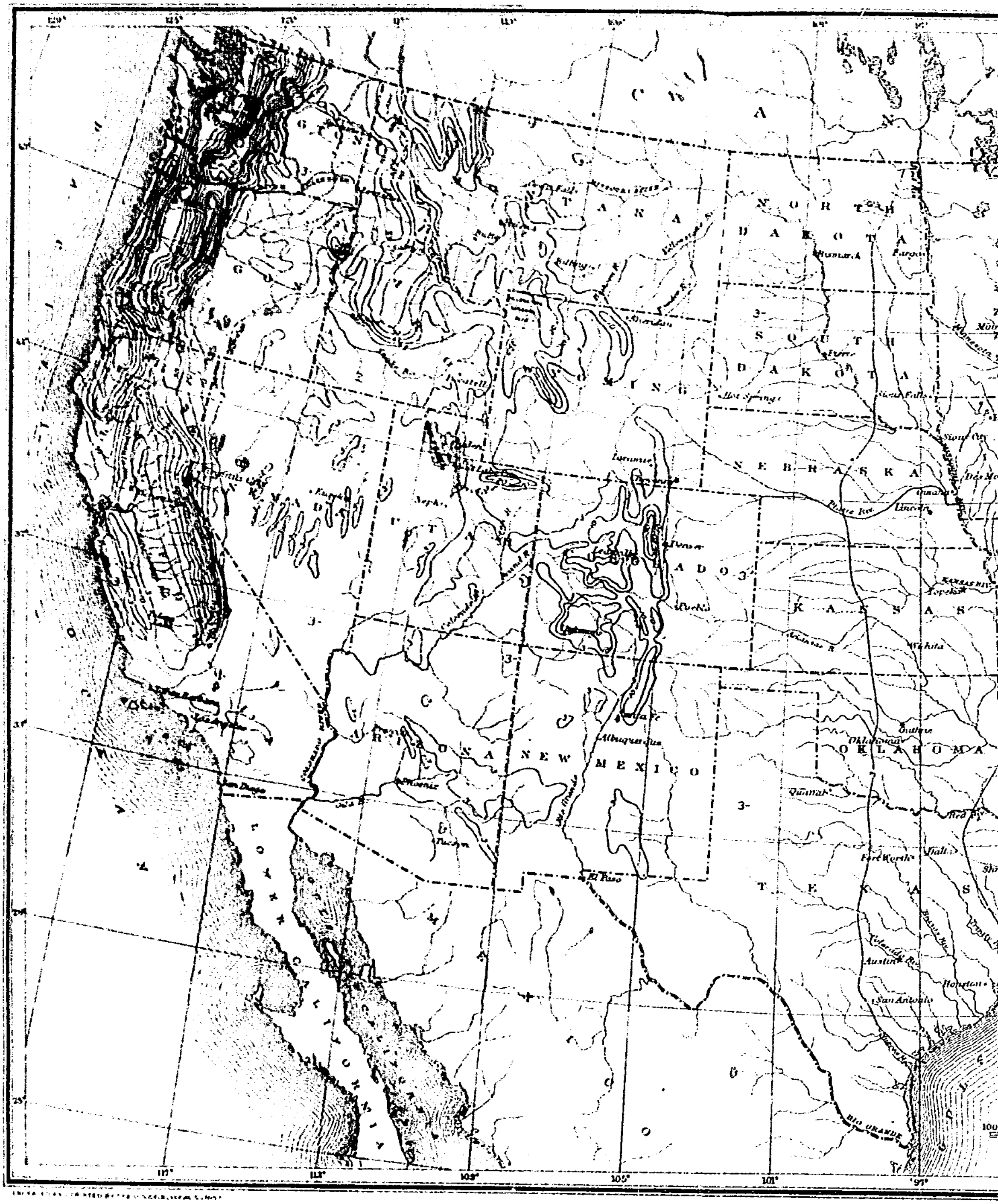
Blue lines and figures indicate average an

WING MEAN ANNUAL PRECIPITATION

erage annual precipitation in depth in inches

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

U. S GEOLOGICAL SURVEY
GEORGE OTIS SMITH, DIRECTOR



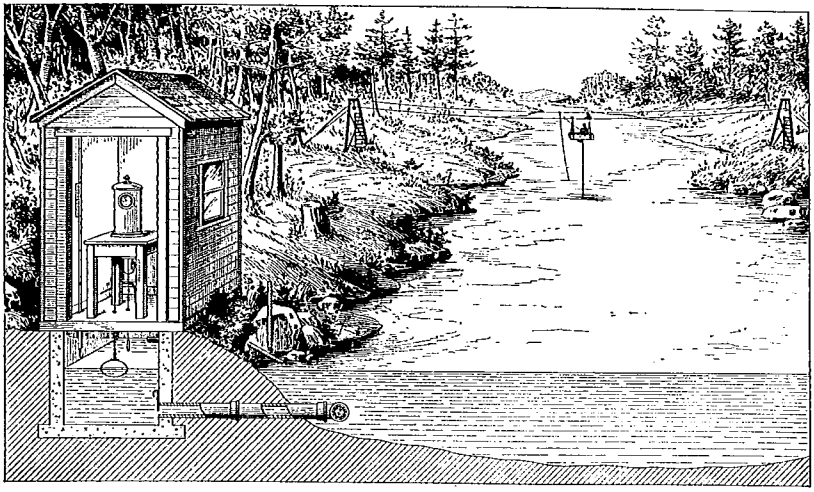
MAP OF UNITED STATES, SHOWING

Blue lines and figures indicate average annu

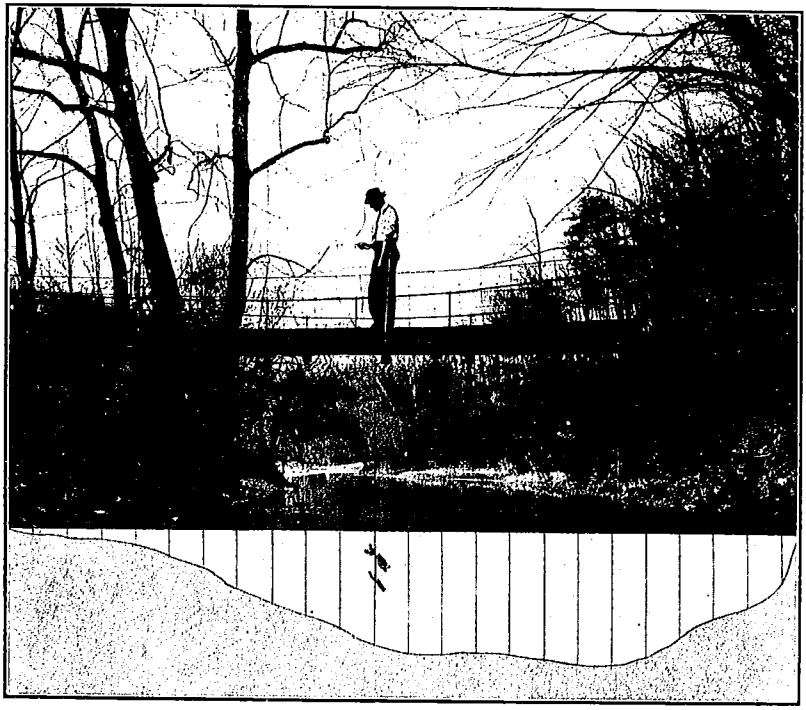
OWING MEAN ANNUAL RUN-OFF

verage annual run-off in depth in inches

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

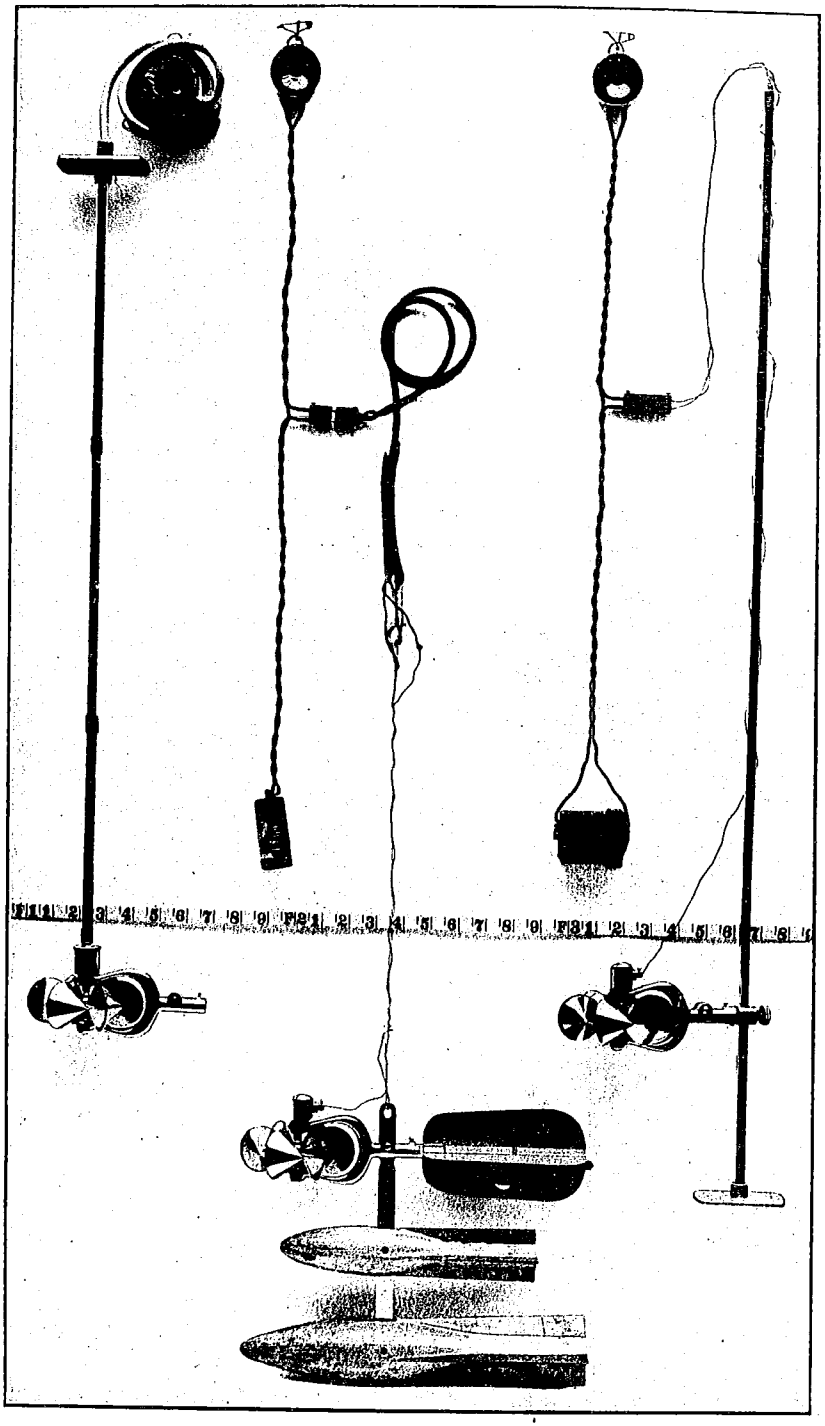


A. CABLE STATION, SHOWING AUTOMATIC GAGE.



B. FOR BRIDGE MEASUREMENT.

TYPICAL GAGING STATIONS.



SMALL PRICE CURRENT METERS.

probable reliability of the observer, and knowledge of local conditions. In this column A indicates that the mean monthly flow is probably accurate within 5 per cent; B, within 10 per cent; C, within 15 per cent; D, within 25 per cent. Special conditions are covered by footnotes.

Even though the monthly means for any station may represent with a high degree of accuracy the quantity of water flowing past the gage, the figures showing discharge per square mile and depth of runoff in inches may be subject to gross errors which result from including in the measured drainage area large noncontributing districts or omitting estimates of water diverted for irrigation or other use, and they should, therefore, be considered as only approximate, particularly for periods of irrigation or of low water. For these errors it is as a rule not feasible to make adequate correction.

In general the base data collected each year by the Survey engineers are published not only to comply with the law but to afford any engineer the means of examining and adjusting to his own needs the results of the computations. The table of monthly discharge is so arranged as to give only a general idea of the flow at the station and should not be used for other than preliminary estimates. The determinations of daily discharge allow more detailed studies of the variation in flow by which the period of deficiency may be determined.

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

COOPERATION AND ACKNOWLEDGMENTS.

CALIFORNIA AND NEVADA.

Assistance has been rendered or records furnished by the following, to whom acknowledgment is due: W. M. Kearney, State engineer of Nevada; the United States Reclamation Service, through D. W. Cole, project engineer; the Office of Experiment Stations, United States Department of Agriculture, through F. L. Peterson, irrigation engineer; the United States Weather Bureau, through H. F. Alps, section director; the United States Forest Service, through W. L. Huber, district engineer; the Stone & Webster Engineering Corporation; the Bureau of the Los Angeles Aqueduct; and P. L. Sherman, jr. This cooperation is separately acknowledged in the station descriptions.

OREGON.

In 1905 the State legislature of Oregon passed an act providing for an annual appropriation of $2,500 for investigation of water resources in the State, and a like amount for the making of topographic maps,

contingent upon an equal allotment by the United States Geological Survey for similar investigations.

In 1911 the legislature passed an act appropriating $20,000 for the purpose of completing the topographic map of the State of Oregon, making more extensive stream measurements and otherwise investigating and determining the water supply of the State. The State engineer represents the State in this cooperation and each year enters into a contract with the Director of the United States Geological Survey.

A statement of the expenditures of both parties under this agreement and the cost of the work is given in Water-Supply Paper 312, which contains the major portion of the results obtained in Oregon.

Special acknowledgment is due to John H. Lewis, State engineer of Oregon.

A number of irrigation companies have cooperated with the Survey in procuring the field data for stations in the Great Basin in Oregon, and some assistance of this character was rendered on practically all these stations during 1911. Acknowledgment is due to the Silver Valley Irrigation Co. for data on the stations on streams entering Harney Valley from the north; the Eastern Oregon Engineering Co., engineers for Wm. Hanley Co., for data on Donner und Blitzen River and its tributaries; Thomas & Walter, on stations near Denio; Warner Lake Irrigation Co., on stations in Warner Valley, and Lakeview Irrigation & Power Co., on stations in Goose Lake valley.

IDAHO.

The work in Idaho has been carried on in cooperation with the State since 1909. The State Land Board provides funds on behalf of the State and the State engineer acts as the agent for the State. In general, contracts were entered into between the Director of the Geological Survey and the State engineer at the beginning of each fiscal year. A statement of the expenditures of both parties and the cost of the work for the year 1911 is given in Water-Supply Paper 312, which contains the major portion of the results obtained in Idaho. Special acknowledgement is due to Mr. A. E. Robinson, State engineer, and to the Telluride Power Co.

UTAH.

The stream-gaging work in Utah during 1911 was carried on by the Geological Survey in cooperation with the State under contracts between the Director of the Survey and the State engineer in the same manner as in other States. Special acknowledgments are due to Mr. Caleb Turner, State engineer, and Mr. G. F. McGonagle, city engineer of Salt Lake City.

DIVISION OF WORK.

The field work in California and Nevada was carried on under the direction of W. B. Clapp and H. D. McGlashan, district engineers, by J. E. Stewart, F. C. Ebert, and James E. Jones, and by G. T. Peekema, a Forest Service hydrographer. The records were compiled and recommendations for estimates made by H. D. McGlashan, district engineer, and R. C. Rice, office engineer. The data were reviewed and computations made under the direction of R. H. Bolster, hydraulic engineer, by E. A. Porter, A. H. Tuttle, H. J. Dean, and M. I. Walters.

The field data in Oregon were collected under the direction of Fred F. Henshaw, district engineer, by R. W. Davenport, John Dubuis, and W. O. Harmon. The records were compiled and recommendations for estimates made under the direction of Fred F. Henshaw, by E. S. Fuller, office engineer. The data were reviewed and computations made under the direction of R. H. Bolster, hydraulic engineer, by E. A. Porter, A. H. Tuttle, and M. I. Walters.

The field data in Idaho were collected under the direction of E. C. La Rue and G. C. Baldwin, district engineers, assisted by O. W. Hartwell, A. B. Purton, Lynn Crandall, J. C. Dort, G. H. Canfield, and H. L. Stoner. The data were reviewed and computations made under the direction of R. H. Bolster, by E. A. Porter, A. H. Tuttle, and M. I. Walters.

The field data in Utah were collected under the direction of E. C. La Rue and G. C. Baldwin, district engineers, by O. W. Hartwell, J. C. Dort, Lynn Crandall, G. H. Canfield, A. B. Purton, and H. L. Stoner.

The computations were made and the completed data prepared for publication under the direction of R. H. Bolster, assisted by E. A. Porter, H. D. Padgett, H. J. Dean, and A. H. Tuttle.

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

GREAT SALT LAKE DRAINAGE BASIN.

BEAR RIVER BASIN.

BEAR RIVER AT DINGLE, IDAHO.

Location.—In sec. 7, T. 14 S., R. 45 E., half a mile southeast of the Dingle railway station and 100 yards south of the railway track, 10 miles above the outlet of Bear Lake.

Records available.—May 9, 1903, to December 31, 1911.

Drainage area.—2,890 square miles.

Gage.—Inclined staff on right bank; datum unchanged since 1903.

Channel.—Bed composed of gravel; shifting; both banks fairly high, and not subject to overflow.

Discharge measurements.—Made from car and cable 30 feet below the gage.

Winter flow.—River is usually frozen over from about December to March, ice reaching a thickness of about 15 inches; ice smooth; anchor or needle ice unknown.

Diversions.—Several canals take water for irrigation above the station. During the spring of 1911 the Telluride Power Co. began to divert water from a point above the station into Mud or North Lake for storage, the water being returned to the river above the Alexander station. A station was established on the power canal in June, 1911 (see p. 19). On June 21, 1911, the Pegleg canal was carrying about 10 second-feet of water, the Dingle canal about 25 second-feet, and the Preston-Montpelier canal about 10 second-feet.

Accuracy.—Open-water records good; fairly accurate estimates of the flow under ice have been made.

Cooperation.—Maintained in cooperation with the State and the Telluride Power Co.

To make the records at Dingle comparable to those obtained previous to the spring of 1911 the water diverted by the Telluride canal must be added to the determined discharge of the river.

Discharge measurements of Bear River at Dingle, Idaho, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Jan. 24[a]	Lynn Crandall	4.04	167
May 13	O. W. Hartwell	6.08	1,510
26	Gilkison & Hughes	5.4	1,140
June 2	G. M. Gilkison	5.08	915
21	H. L. Stoner	6.3	1,730
July 22	do	3.9	340
Aug. 14	do	3.4	177
Oct. 3	do	3.49	207

[a] Ice measurement.

Daily gage height, in feet, of Bear River at Dingle, Idaho, for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.65	5.00	4.10	6.80	5.20	5.40	4.60		3.00	3.50		
2						5.08		3.70			3.50	3.50
3		4.90		7.10		5.00	4.40		3.20	3.49		3.48
4	3.60	5.10	4.25		5.30	5.00	4.40	3.65		3.45	3.45	
5		5.15	4.30	7.10		5.00		3.60	3.10			3.48
6	3.70				5.40		4.40		3.10		3.50	
7		5.30	4.30	6.20		5.00		3.55		3.45		3.52
8	3.70						4.25		3.10	3.45	3.50	
9		5.10		5.70	5.75	5.10	4.15	3.50				3.60
10			4.[illegible]			5.60	4.10	3.70	3.10	3.50	3.50	
11					6.00	5.60	4.00					3.62
12	3.70	4.70	5.10	5.30			3.90		3.25	3.50	3.50	
13					6.08			3.50			3.60	3.70
14		4.55	5.80	5.20	6.15	5.70	4.10	3.40	3.30			
15	3.70	4.55				6.00				3.50		3.70
16			5.60	5.00	6.20		4.00	3.30			3.55	
17	3.80	4.40	5.40			5.90			3.30			3.75
18			5.10		6.10		4.00	3.20			3.55	
19		4.40		4.80		6.10		3.10		3.45	3.60	
20	3.75		4.80		6.10		4.00		3.30		4.10	3.80
21	3.80				6.00	6.30		3.10		3.50		
22			5.20	4.80			3.90		3.30	3.45	3.90	3.72
23	3.90	4.30		4.90	5.90	5.15	3.85	3.10				
24	4.04		5.50						3.30		3.50	3.85
25		4.30			5.30	6.10	3.70	3.00		3.50	5.00	
26	3.85	4.30	7.90	4.90	5.40							
27			8.20		5.80	5.65	3.80	3.00	3.45	3.50	3.40	3.95
28	3.95		8.00	5.10								
29			8.10	5.15	5.80	5.00	3.70	3.00	3.40		3.40	3.90
30			6.80			4.95			3.45	3.50		
31							3.70					3.90

NOTE.—Relation of gage height to discharge affected by ice Jan. 1 to about the middle of March and about Dec. 1 to 31. Gage height Nov. 25 not considered correct.

Daily discharge, in second-feet, of Bear River at Dingle, Idaho, for 1911.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	520	185	2,180	886	1,010	606	268	89	207	207
2	498	200	2,320	905	824	562	268	110	206	207
3	475	215	2,470	925	781	517	260	132	204	200
4	560	230	2,470	944	781	522	252	121	194	194
5	590	245	2,470	977	781	522	236	110	194	200
6	625	245	2,040	1,010	781	522	229	110	194	207
7	660	245	1,610	1,090	781	490	222	110	194	207
8	610	268	1,410	1,160	810	459	214	110	194	207
9	560	291	1,210	1,240	840	420	207	110	200	207
10	503	315	1,120	1,340	1,150	400	268	110	207	207
11	446	347	1,030	1,440	1,150	360	248	127	207	207
12	390	380	944	1,480	1,170	319	228	144	207	207
13	360	412	915	1,510	1,170	364	207	150	207	236
14	330	445	886	1,560	1,220	408	180	155	207	231
15	330	477	831	1,580	1,450	388	168	155	207	227
16	302	510	776	1,610	1,410	367	155	155	204	222
17	275	542	742	1,560	1,370	369	144	155	201	222
18	275	575	708	1,520	1,460	371	132	155	198	222
19	275	607	674	1,520	1,540	373	110	155	194	236
20	268	639	674	1,520	1,630	375	110	155	200	420
21	260	748	674	1,440	1,720	357	110	155	207	380
22	252	857	674	1,400	1,300	340	110	155	194	340
23	245	954	724	1,360	874	322	110	155	198	296
24	245	1,050	724	1,150	1,210	295	100	155	202	252
25	245	2,180	724	944	1,550	268	89	168	207	207
26	245	3,310	724	1,010	1,380	286	89	181	207	194
27	225	3,650	777	1,290	1,210	303	89	194	207	180
28	205	3,430	830	1,290	1,010	286	89	187	207	180
29	.....	3,540	857	1,290	808	268	89	180	207	180
30	.....	2,180	872	1,200	781	268	89	194	207	189
31	.....	2,180	.....	1,110	.....	268	89	.....	207	.....

NOTE.—Daily discharge determined as follows: Feb. 1 to Mar. 10 from ice curve based on measurement made Jan. 24; Mar. 11 to 19, discharge gradually increased to allow for effect of melting of ice; Mar. 20 to 27, indirect method for shifting channels used; Mar. 28 to May 13, from fairly accurate curve; May 14 to July 21, by indirect method for shifting channels; July 22 to Nov. 30, from a well-defined rating curve. Discharge interpolated for days for which gage heights are missing except Nov. 21, which was estimated. Note the effect of diversion of water into Bear Lake inlet canal from May 24 to July 18. The discharge of the canal has not been added to the above values. (See p. 20.)

Monthly discharge of Bear River at Dingle, Idaho, for 1911.

[Drainage area, 2,890 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	.....	.....	183	0.063	0.07	11,300	D
February	.....	.....	385	.133	.14	21,400	C.
March	3,650	.....	1,010	.349	.40	62,100	B.
April	2,470	674	1,170	.405	.45	69,600	A.
May	1,610	886	1,270	.453	.52	78,100	B.
June	1,720	781	1,130	.481	.54	67,200	B.
July	606	268	386	.164	.19	23,700	B.
August	268	89	166	.057	.07	10,200	A.
September	194	80	145	.050	.06	8,630	B.
October	207	194	202	.070	.08	12,400	A.
November	.....	80	229	.079	.09	13,600	A.
December	.....	.....	200	.069	.08	12,300	C.
The year	3,650	.....	540	.198	2.69	391,000	

NOTE.—The determinations of discharge per square mile and run-off depth in inches include the diversion above station into Bear Lake inlet canal. All other columns do not include this diversion, and hence, to determine the available water above the diversion, the discharge in table on page 20 must be added.

Discharge Jan. 1 to 31 and Dec. 1 to 31 estimated, because of ice, from climatologic records, discharge of Bear River at Preston, and measurement Jan. 24, 1911.

BEAR (MUD) LAKE INLET CANAL AT DINGLE, IDAHO.

Location.—About three-fourths of a mile south of Dingle, Idaho, and about 2½ miles below the intake of the canal, in sec. 13, T. 14 S., R. 44 E.

Records available.—June 21 to December 31, 1911.

Gage.—Vertical staff about one-fourth of a mile above the point where the canal crosses the road leading south from Dingle.

Channel.—Shifting; the section narrows at the footplank from which discharge measurements are made to half the width of the canal, the narrow section being about 100 feet long. Both banks are high.

Discharge measurements.—Made from a foot plank 3 feet upstream from a small flume across the ditch about 75 feet below the gage.

Cooperation.—Station maintained in cooperation with the State of Idaho and the Telluride Power Co.

The records at this station will indicate the amount of water diverted by the Telluride Power Co. from Bear River for storage in the branch of Bear Lake known as Mud Lake. The amount of water thus diverted should be added to the discharge of the Bear at Dingle to make the records for that station comparable with those made previous to 1911.

Discharge measurements of Bear Lake inlet canal near Dingle, Idaho, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
May 27	Telluride Power Co.	.....	280
June 21	H. L. Stoner	5.0	339
July 5	Telluride Power Co.	4.40	262
22	H. L. Stoner	2.5	[a] 3

[a] Estimated.

Daily gage height, in feet, and discharge, in second-feet, of Bear Lake inlet canal near Dingle, Idaho, for 1911.

[R. S. Hughes, observer.]

Day.	May.		June.		July.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	.....	.....	4.6	250	4.5	230
2	.....	.....	4.6	250	4.5	230
3	.....	.....	5.2	405	4.5	230
4	.....	.....	5.2	405	4.5	230
5	.....	.....	5.2	405	4.5	230
6	.....	.....	5.2	405	4.4	209
7	.....	.....	5.2	405	4.4	209
8	.....	.....	5.2	405	4.3	189
9	.....	.....	5.2	405	4.2	170
10	.....	.....	4.6	250	4.2	170
11	.....	.....	.0	0	4.2	170
12	.....	.....	.0	0	4.1	152
13	.....	.....	.0	0	3.7	92
14	.....	.....	.0	0	3.2	38
15	.....	.....	.0	0	3.2	38
16	.....	.....	.0	0	3.1	31
17	.....	.....	.0	0	3.1	31
18	.....	.....	5.1	348	3.1	31
19	.....	.....	5.1	348	.....	3
20	.....	.....	5.1	348	.....	3

Daily gage height, in feet, and discharge, in second-feet, of Bear Lake inlet canal near Dingle, Idaho, for 1911—Continued.

Day.	May.		June.		July.	
	Gage height.	Dis. charge.	Gage height.	Dis-charge.	Gage height.	Dis-charge.
21			5.0	340		3
22			4.9	317		3
23			5.1	363		
24	4.1	150	5.0	340		
25	4.1	150	4.9	317		
26	4.8	310	4.9	317		
27	.0	0	4.9	317		
28	.0	0	4.9	317		
29	.0	0	4.9	317		
30	4.1	150	4.6	251		
31	5.2	405				

NOTE.—Gage-height records May 24 to June 20 derived by comparison between United States Geological Survey and Telluride Power Co.'s gages; they are probably liable to some error. Gage heights June 21 to July 18 read from the United States Geological Survey gage. Water turned out of the canal July 18, although, as shown by the discharge measurement July 22, there was some seepage discharge subsequent to July 18. The canal was not in operation in 1911 prior to May 24 or subsequent to July 18.

Daily discharge determined from a rating curve not well defined. Discharge July 19 to 22 estimated. There may also have been a few second-feet discharge subsequent to July 22, but the assumption has been made that the discharge was zero after July 22.

Monthly discharge of Bear Lake inlet canal near Dingle, Idaho, for 1911.

Month.	Discharge in second-feet.			Run-off (in acre-feet).	Accu racy.
	Maximum.	Minimum.	Mean.		
May	405	0	37.6	2,310	C.
June	405	0	261	15,500	B.
July	230	0	86.8	5,340	B.

NOTE.—To determine the total discharge of Bear River above Bear Lake inlet canal add the above determination to the discharge at the Dingle gaging station, p 19.

BEAR RIVER AT ALEXANDER, IDAHO.

Location.—About half a mile upstream from the post office at Alexander, Idaho, in secs. 17 and 18, T. 9 S., R. 41 E., 6 miles above the Telluride Power Co.'s plant near Grace, Idaho, and 4 miles above the intake of the Last Chance canal; it is 30 miles below the point where the outlet of Bear Lake flows into Bear River.

Records available.—March 27 to December 31, 1911.

Drainage area.—Not measured.

Gages.—Gage No. 1 is an inclined staff near the house of C. B. Wilson on the right bank about half a mile from the railroad station at Alexander. Gage No. 2 is about 1,000 feet downstream from gage No. 1 on the right bank and has been read in conjunction with gage No. 1 since November 15, 1911.

Channel.—Stream bed composed of fine gravel and sand; moss grows at the measuring section during the summer and fall and causes backwater at gage No. 1.

Discharge measurements.—Made from a cable and car near gage No. 1.

Winter flow.—Ice present during winter months.

Accuracy.—Records fair.

Cooperation.—Maintained in cooperation with Telluride Power Co. and State of Idaho.

Discharge measurements of Bear River at Alexander, Idaho, for 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Apr. 19	J. C. Dort	4.44	1,410
19	do	4.44	1,380
May 13	O. W. Hartwell	5.06	2,080
27	Telluride Power Co	4.9	2,050
June 8	A. B. Purton	4.61	1,490
22	H. L. Stoner	4.95	1,850
July 21[a]	do	3.75	612
Aug. 15[a]	do	3.70	509
Sept. 12[a]	O. W. Hartwell	3.66	539
Oct. 4[a]	H. L. Stoner	3.90	687
30[a]	Lynn Crandall	3.55	466

[a] Moss in channel.

Daily gage height, in feet, of Bear River at Alexander, Idaho, for 1911.

[Charles B. Wilson, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		7.18	4.75	4.90	4.75	3.75	3.60	3.85	3.60	3.32
2		6.82	4.80	4.85	4.62	3.75	3.60	3.85	3.60	3.30
3		6.55	4.80	4.78	4.50	3.75	3.60	3.85	3.60	3.35
4		6.50	4.80	4.70	4.42	3.75	3.65	3.85	3.60	3.52
5		6.45	4.80	4.65	4.30	3.75	3.65	3.85	3.60	3.55
6		6.40	4.80	4.65	4.25	3.75	3.65	3.85	3.60	3.50
7		6.25	4.85	4.65	4.20	3.75	3.70	3.85	3.60	3.50
8		6.05	4.88	4.65	4.15	3.75	3.70	3.82	3.60	4.38
9		5.85	4.95	4.65	4.15	3.75	3.70	3.80	3.60	4.40
10		5.65	4.95	4.60	4.08	3.75	3.75	3.80	3.60	4.40
11		5.38	5.00	4.65	4.00	3.75	3.75	3.85	3.50	4.45
12		5.15	5.02	4.75	4.00	3.75	3.75	3.85	3.50	4.38
13		4.95	5.08	4.92	4.00	3.75	3.75	3.85	3.50	4.39
14		4.78	5.12	5.02	3.95	3.75	3.75	3.85	3.50	4.39
15		4.72	5.15	5.20	3.95	3.70	3.75	3.90	3.85	4.60
16		4.68	5.20	5.15	3.90	3.70	3.75	3.90	4.20	4.35
17		4.60	5.20	5.10	3.90	3.70	3.75	3.90	4.20	4.40
18		4.60	5.20	5.10	3.85	3.70	3.75	3.90	3.90	4.30
19		4.58	5.20	5.05	3.85	3.65	3.75	3.90	3.30	4.38
20		4.52	5.20	5.00	3.80	3.65	3.75	3.90	3.30	4.90
21		4.60	5.20	4.95	3.75	3.65	3.75	3.90	3.30	4.95
22		4.55	5.20	4.95	3.75	3.65	3.80	3.90	3.10	4.92
23		4.50	5.15	5.00	3.75	3.65	3.80	3.85	3.22	4.90
24		4.50	5.15	4.95	3.75	3.65	3.80	3.85	3.30	4.90
25		4.50	5.20	4.95	3.75	3.65	3.80	3.85	3.30	4.80
26		4.50	5.12	5.00	3.75	3.65	3.80	3.80	3.20	4.80
27	5.00	4.55	4.90	4.95	3.75	3.65	3.80	3.70	3.20	4.85
28	5.00	4.60	4.85	4.90	3.75	3.65	3.80	3.65	3.20	5.90
29	6.15	4.65	4.82	4.90	3.75	3.60	3.85	3.60	3.30	5.90
30	6.75	4.70	4.90	4.82	3.75	3.60	3.85	3.60	3.32	5.92
31	7.25		4.90		3.75	3.60		3.60		5.92

NOTE.—Relation of gage height to discharge affected by growth of moss in channel from about the 1st of July to Nov. 10, and by ice at gage Nov. 15 to Dec. 31. All gage heights referred to gage No. 1.

Daily discharge, in second-feet, of Bear River at Alexander, Idaho, for 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	4,650	1,740	1,860	1,630	596	506	660	506
2	.....	4,200	1,790	1,800	1,480	596	506	660	506
3	.....	3,860	1,790	1,760	1,410	596	506	660	506
4	.....	3,800	1,790	1,650	1,340	596	536	660	506
5	.....	3,730	1,790	1,560	1,270	596	536	660	506
6	.....	3,670	1,790	1,560	1,200	596	536	660	506
7	.....	3,490	1,840	1,550	1,130	596	565	660	506
8	.....	3,250	1,880	1,540	1,060	596	565	640	506
9	.....	3,010	1,960	1,540	980	596	565	627	506
10	.....	2,770	1,960	1,480	900	596	596	627	506
11	.....	2,450	2,010	1,540	830	596	596	660	450
12	.....	2,180	2,030	1,640	830	596	596	660	450
13	.....	1,960	2,100	1,830	830	596	596	660	450
14	.....	1,770	2,110	1,940	760	596	596	660	450
15	.....	1,700	2,150	2,150	760	565	596	692	.....
16	.....	1,660	2,200	2,090	710	565	596	692	.....
17	.....	1,580	2,200	2,040	710	565	596	692	.....
18	.....	1,580	2,200	2,040	670	565	596	692	.....
19	.....	1,550	2,200	1,980	670	536	596	692	.....
20	.....	1,490	2,200	1,920	640	536	596	692	.....
21	.....	1,580	2,200	1,860	596	536	596	692	.....
22	.....	1,520	2,200	1,860	596	536	627	692	.....
23	.....	1,470	2,150	1,920	596	536	627	660	.....
24	.....	1,470	2,150	1,850	596	536	627	660	.....
25	.....	1,470	2,200	1,850	596	536	627	660	.....
26	.....	1,470	2,100	1,900	596	536	627	627	.....
27	2,010	1,520	1,850	1,840	596	536	627	565	.....
28	2,010	1,580	1,800	1,800	596	536	627	536	.....
29	3,370	1,630	1,780	1,800	596	506	660	506	.....
30	4,110	1,630	1,850	1,700	596	506	660	506	.....
31	4,740	.....	1,850	.....	596	506	.....	506	.....

NOTE.—Discharge determined from three rating curves which are only fairly well defined and are applicable as follows: Mar. 27–May 13, June 8 to 22, July 21 to Nov. 14. Discharge May 14, June 7, and June 23 to July 20 computed by indirect method for shifting channels.

Monthly discharge of Bear River at Alexander, Idaho, for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
March 27–31	4,740	2,010	3,250	32,300	B.
April	4,650	1,470	2,320	138,000	B.
May	2,200	1,740	2,000	123,000	B.
June	2,150	1,480	1,800	107,000	B.
July	1,630	596	851	52,300	B.
August	596	506	564	34,700	B.
September	660	506	589	35,000	B.
October	692	506	642	39,500	B.
November	506	.....	442	26,300	D.
December	.....	.....	500	30,700	D.
The period	.....	.....	.....	619,000	

NOTE.—Discharge estimated on account of ice Nov. 15 to Dec. 31. Mean discharge Nov. 15–31, 400 second-feet.

BEAR RIVER NEAR PRESTON, IDAHO.

Location.—In sec. 9, T. 15 S., R. 39 E., 100 yards below Battle Creek bridge, about half a mile above the mouth of Battle Creek, and about 4½ miles northwest of Preston.

Records available.—October 11, 1889, to December 31, 1911.

Drainage area.—4,500 square miles.

Gage.—Inclined staff on right bank at O. M. Seamons's barn. This gage was installed April 3, 1909, to replace the old one 200 feet above, on the left bank. Both gages read the same on this date at 3.3 feet and the datum of new gage has remained unchanged.

Channel.—Bed of stream composed of clay and gravel; fairly permanent except during flood stages; water about 2.5 deep during low stages and does not overflow banks at any stage.

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

Winter flow.—The river seldom freezes over at the station but the relation between gage height and discharge is at times slightly affected by the presence of slush ice.

Diversions.—Several ditches take water for irrigation above the station. The Last Chance canal, which takes out about 4 miles below the Alexander station, was carrying 270 second-feet of water May 25, 1911 (measurement by Telluride Power Co.'s engineer). The West Cache canal, which takes out several miles above the station, had a measured flow of 26 second-feet July 14, 1911, and 5 second-feet August 15, 1911. Water to be used in power development only is diverted by the Telluride Power Co. near Grace, Idaho, at a point about 6 miles below the Alexander station; this water is returned to the river.

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

The records derived from observations at this station show practically the amount of water passing from Idaho into Utah and will be of value in the final adjudication of water rights.

Discharge measurements of Bear River near Preston, Idaho, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Feb. 4	G. H. Canfield	2.85	1,430
May 28	J. C. Dort	3.32	2,210
July 14	do	1.90	589
Aug. 15	Lynn Crandall	1.70	457
26	H. L. Stoner	1.60	396

Daily gage height, in feet, of Bear River near Preston, Idaho, for 1911.

[O. M. Seamons, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.10	4.00	2.20	4.95	3.40	3.22	2.98	1.80	1.80	2.18	2.00	2.29
2	1.65	4.00	2.20	5.02	3.40	3.20	2.90	1.70	1.80	2.20	2.00	2.22
3	1.85	4.28	2.20	4.85	3.40	3.20	2.82	1.70	1.80	2.30	2.00	2.18
4	1.90	2.90	2.28	4.70	3.42	3.20	2.72	1.70	1.75	2.30	2.00	2.15
5	2.25	2.90	2.35	4.60	3.45	3.20	2.62	1.70	1.70	2.30	2.00	2.10
6	2.18	2.80	2.60	4.55	3.50	3.20	2.52	1.70	1.75	2.25	2.00	2.10
7	2.10	2.78	2.50	4.50	3.50	3.25	2.42	1.70	1.80	2.25	2.00	2.10
8	2.05	2.75	3.20	4.45	3.52	3.22	2.32	1.70	1.85	2.25	2.12	2.05
9	2.10	2.65	2.70	4.35	3.58	3.15	2.22	1.72	1.78	2.25	2.10	2.08
10	2.10	2.65	2.75	4.25	3.60	3.02	2.18	1.75	1.75	2.30	2.10	2.08
11	2.10	2.68	2.95	4.05	3.58	2.90	2.08	1.70	1.75	2.30	2.10	2.08
12	2.08	2.68	2.60	3.85	3.55	2.90	1.98	1.70	1.80	2.30	1.90	2.01
13	2.10	2.62	2.45	3.65	3.60	3.00	1.90	1.70	1.85	2.30	1.95	2.10
14	2.10	2.58	2.45	3.45	3.62	3.10	1.90	1.70	1.90	2.30	2.10	2.08
15	2.10	2.52	2.52	3.40	3.68	3.22	1.92	1.70	1.95	2.30	2.25	2.08
16	2.10	2.35	2.72	3.35	3.75	3.28	1.95	3.70	1.95	2.30	2.22	2.10
17	2.10	2.10	2.80	3.30	3.72	3.20	2.00	1.65	1.95	2.25	2.22	2.12
18	2.05	2.35	2.90	3.25	3.70	3.20	1.95	1.65	1.95	2.25	2.25	2.15
19	2.10	2.50	2.95	3.20	3.70	3.20	1.95	1.65	1.95	2.25	2.22	2.00
20	2.08	2.32	3.02	3.15	3.65	3.20	1.90	1.65	1.95	2.25	2.20	2.25

Daily gage height, in feet, of Bear River near Preston, Idaho, for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
21	2.10	2.20	3.15	3.18	3.60	3.10	1.82	1.65	1.98	2.25	2.18	2.22
22	1.85	2.20	3.32	3.20	3.52	3.10	1.80	1.60	2.02	2.25	2.15	2.12
23	1.85	2.22	3.45	3.20	3.50	3.12	1.75	1.60	2.10	2.20	2.10	2.02
24	2.00	2.20	3.55	3.20	3.48	3.20	1.72	1.60	2.02	2.15	2.10	2.08
25	3.00	2.25	3.65	3.15	3.45	3.15	1.70	1.60	2.00	2.05	2.07	2.08
26	3.10	2.30	3.52	3.18	3.45	3.10	1.65	1.65	2.00	2.00	2.20	1.65
27	2.45	2.15	3.50	3.30	3.40	3.10	1.70	1.70	2.00	2.00	2.00	2.20
28	2.20	2.15	3.55	3.32	3.35	3.05	1.70	1.70	2.00	2.00	1.91	2.19
29	2.30	.....	3.75	3.35	3.30	3.05	1.80	1.70	2.00	2.00	1.89	2.25
30	5.15	.....	4.20	3.35	3.28	3.00	1.80	1.70	2.02	2.00	2.11	2.25
31	5.65	.....	4.58	.....	3.25	.....	1.85	1.75	.....	2.00	.....	2.18

Daily discharge, in second-feet, of Bear River near Preston, Idaho, for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	710	4,000	800	4,750	2,310	2,060	1,730	520	520	827	670	930
2	410	4,000	800	4,900	2,310	2,030	1,630	455	520	845	670	864
3	530	3,490	800	4,640	2,310	2,030	1,530	455	520	940	670	827
4	560	1,550	872	4,390	2,340	2,030	1,400	455	488	940	670	800
5	845	1,550	935	4,220	2,380	2,030	1,280	455	455	940	670	755
6	782	1,430	1,200	4,140	2,460	2,030	1,170	455	488	892	670	755
7	710	1,410	1,090	4,050	2,460	2,100	1,060	455	520	892	670	755
8	670	1,370	1,930	3,960	2,490	2,060	960	455	555	892	773	712
9	710	1,260	1,310	3,800	2,580	1,960	864	468	507	892	755	738
10	710	1,260	1,370	3,640	2,610	1,790	827	488	488	940	755	738
11	710	1,290	1,610	3,320	2,580	1,630	738	455	488	940	755	738
12	694	1,290	1,200	3,000	2,540	1,630	654	455	520	940	590	678
13	710	1,220	1,040	2,680	2,610	1,760	590	455	555	940	630	755
14	710	1,180	1,040	2,380	2,640	1,890	590	455	590	940	755	738
15	710	1,110	1,110	2,310	2,730	2,060	606	455	630	940	892	738
16	710	935	1,330	2,240	2,840	2,140	630	455	630	940	864	755
17	710	710	1,430	2,170	2,790	2,030	670	425	630	892	864	773
18	670	935	1,550	2,100	2,760	2,030	630	425	630	892	892	800
19	710	1,090	1,610	2,030	2,760	2,030	630	425	630	892	864	670
20	694	908	1,700	1,960	2,680	2,030	590	425	630	892	845	892
21	710	800	1,860	2,000	2,610	1,890	534	425	654	892	827	864
22	530	800	2,090	2,030	2,490	1,890	520	395	687	892	800	773
23	530	818	2,270	2,030	2,460	1,920	488	395	755	845	755	687
24	630	800	2,410	2,030	2,430	2,030	468	395	687	800	755	738
25	2,920	845	2,550	1,960	2,380	1,960	455	395	670	712	730	738
26	1,800	890	2,370	2,000	2,380	1,890	425	425	670	670	845	792
27	1,040	755	2,340	2,170	2,310	1,890	455	455	670	670	670	845
28	800	755	2,410	2,200	2,240	1,820	455	455	670	670	598	836
29	890	.....	2,700	2,240	2,170	1,820	520	455	670	670	583	892
30	4,990	.....	3,430	2,240	2,140	1,760	520	455	687	670	764	892
31	5,890	.....	4,080	.....	2,100	.....	555	488	.....	670	.....	827

NOTE.—Daily discharge determined from well-defined rating curve applicable as follows: Jan. 1 to Mar. 29 and Apr. 3 to Dec. 31, 1911. Discharge Mar. 30 to Apr. 2 determined by the indirect method for shifting channels. Discharge Dec. 26 interpolated; gage height on that date believed to be in error.

Gage.—Inclined staff on right bank at O. M. Seamons's barn. This gage was installed April 3, 1909, to replace the old one 200 feet above, on the left bank. Both gages read the same on this date at 3.3 feet and the datum of new gage has remained unchanged.

Channel.—Bed of stream composed of clay and gravel; fairly permanent except during flood stages; water about 2.5 deep during low stages and does not overflow banks at any stage.

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

Winter flow.—The river seldom freezes over at the station but the relation between gage height and discharge is at times slightly affected by the presence of slush ice.

Diversions.—Several ditches take water for irrigation above the station. The Last Chance canal, which takes out about 4 miles below the Alexander station, was carrying 270 second-feet of water May 25, 1911 (measurement by Telluride Power Co.'s engineer). The West Cache canal, which takes out several miles above the station, had a measured flow of 26 second-feet July 14, 1911, and 5 second-feet August 15, 1911. Water to be used in power development only is diverted by the Telluride Power Co. near Grace, Idaho, at a point about 6 miles below the Alexander station; this water is returned to the river.

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Discharge measurements of Bear River near Preston, Idaho, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Feb. 4	G. H. Canfield	2.85	1,430
May 28	J. C. Dort	3.32	2,210
July 14	do	1.90	589
Aug. 15	Lynn Crandall	1.70	457
26	H. L. Stoner	1.60	396

Daily gage height, in feet, of Bear River near Preston, Idaho, for 1911.

[O. M. Seamons, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.10	4.60	2.20	4.95	3.40	3.22	2.98	1.80	1.80	2.18	2.00	2.29
2	1.65	4.60	2.20	5.02	3.40	3.20	2.90	1.70	1.80	2.20	2.00	2.22
3	1.85	4.28	2.20	4.85	3.40	3.20	2.82	1.70	1.80	2.30	2.00	2.18
4	1.90	2.90	2.28	4.70	3.42	3.20	2.72	1.70	1.75	2.30	2.00	2.15
5	2.25	2.90	2.35	4.60	3.45	3.20	2.62	1.70	1.70	2.30	2.00	2.10
6	2.18	2.80	2.60	4.55	3.50	3.20	2.52	1.70	1.75	2.25	2.00	2.10
7	2.10	2.78	2.50	4.50	3.50	3.25	2.42	1.70	1.80	2.25	2.00	2.10
8	2.05	2.75	3.20	4.45	3.52	3.22	2.32	1.70	1.85	2.25	2.12	2.05
9	2.10	2.65	2.70	4.35	3.58	3.15	2.22	1.72	1.78	2.25	2.10	2.08
10	2.10	2.65	2.75	4.25	3.60	3.02	2.18	1.75	1.75	2.30	2.10	2.08
11	2.10	2.68	2.95	4.05	3.58	2.90	2.08	1.70	1.75	2.30	2.10	2.08
12	2.08	2.68	2.60	3.85	3.55	2.90	1.98	1.70	1.80	2.30	1.90	2.01
13	2.10	2.62	2.45	3.65	3.60	3.00	1.90	1.70	1.85	2.30	1.95	2.10
14	2.10	2.58	2.45	3.45	3.62	3.10	1.90	1.70	1.90	2.30	2.10	2.08
15	2.10	2.52	2.52	3.40	3.68	3.22	1.92	1.70	1.95	2.30	2.25	2.08
16	2.10	2.35	2.72	3.35	3.75	3.28	1.95	3.70	1.95	2.30	2.22	2.10
17	2.10	2.10	2.80	3.30	3.72	3.20	2.00	1.65	1.95	2.25	2.22	2.12
18	2.05	2.35	2.90	3.25	3.70	3.20	1.95	1.65	1.95	2.25	2.25	2.15
19	2.10	2.50	2.95	3.20	3.70	3.20	1.95	1.65	1.95	2.25	2.22	2.00
20	2.08	2.32	3.02	3.15	3.65	3.20	1.90	1.65	1.95	2.25	2.20	2.25

Daily gage height, in feet, of Bear River near Preston, Idaho, for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
21	2.10	2.20	3.15	3.18	3.60	3.10	1.82	1.65	1.98	2.25	2.18	2.22
22	1.85	2.20	3.32	3.20	3.52	3.10	1.80	1.60	2.02	2.25	2.15	2.12
23	1.85	2.22	3.45	3.20	3.50	3.12	1.75	1.60	2.10	2.20	2.10	2.02
24	2.00	2.20	3.55	3.20	3.48	3.20	1.72	1.60	2.02	2.15	2.10	2.08
25	3.90	2.25	3.65	3.15	3.45	3.15	1.70	1.60	2.00	2.05	2.07	2.08
26	3.10	2.30	3.52	3.18	3.45	3.10	1.65	1.65	2.00	2.00	2.20	1.65
27	2.45	2.15	3.50	3.30	3.40	3.10	1.70	1.70	2.00	2.00	2.00	2.20
28	2.20	2.15	3.55	3.32	3.35	3.05	1.70	1.70	2.00	2.00	1.91	2.19
29	2.30	.....	3.75	3.35	3.30	3.05	1.80	1.70	2.00	2.00	1.89	2.25
30	5.15	.....	4.20	3.35	3.28	3.00	1.80	1.70	2.02	2.00	2.11	2.25
31	5.65	.....	4.58	.....	3.25	.....	1.85	1.75	.....	2.00	.....	2.18

Daily discharge, in second-feet, of Bear River near Preston, Idaho, for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	710	4,000	800	4,750	2,310	2,060	1,730	520	520	827	670	930
2	410	4,000	800	4,900	2,310	2,030	1,630	455	520	845	670	864
3	530	3,490	800	4,640	2,310	2,030	1,530	455	520	940	670	827
4	560	1,550	872	4,390	2,340	2,030	1,400	455	488	940	670	800
5	845	1,550	935	4,220	2,380	2,030	1,280	455	455	940	670	755
6	782	1,430	1,200	4,140	2,460	2,030	1,170	455	488	892	670	755
7	710	1,410	1,090	4,050	2,460	2,100	1,060	455	520	892	670	755
8	670	1,370	1,930	3,960	2,490	2,060	960	455	555	892	773	712
9	710	1,260	1,310	3,800	2,580	1,960	864	468	507	892	755	738
10	710	1,260	1,370	3,640	2,610	1,760	827	488	488	940	755	738
11	710	1,290	1,610	3,320	2,580	1,630	738	455	488	940	755	738
12	694	1,290	1,200	3,000	2,540	1,630	654	455	520	940	590	678
13	710	1,220	1,040	2,680	2,610	1,760	590	455	555	940	630	755
14	710	1,180	1,040	2,380	2,640	1,890	590	455	590	940	755	738
15	710	1,110	1,110	2,310	2,730	2,060	606	455	630	940	892	738
16	710	935	1,330	2,240	2,840	2,140	630	455	630	940	864	755
17	710	710	1,430	2,170	2,790	2,030	670	425	630	892	864	773
18	670	935	1,550	2,100	2,760	2,030	630	425	630	892	893	800
19	710	1,090	1,610	2,030	2,760	2,030	630	425	630	892	864	670
20	694	908	1,700	1,960	2,680	2,030	590	425	630	892	845	892
21	710	800	1,860	2,000	2,610	1,890	534	425	654	892	827	864
22	530	800	2,090	2,030	2,490	1,890	520	395	687	892	800	773
23	530	818	2,270	2,030	2,460	1,920	488	395	755	845	755	687
24	630	800	2,410	2,030	2,430	2,030	468	395	687	800	755	738
25	2,920	845	2,550	1,960	2,380	1,960	455	395	670	712	730	738
26	1,800	890	2,370	2,000	2,380	1,890	425	425	670	670	845	792
27	1,040	755	2,340	2,170	2,310	1,890	455	455	670	670	670	845
28	800	755	2,410	2,200	2,240	1,820	455	455	670	670	598	836
29	890	.....	2,700	2,240	2,170	1,820	520	455	670	670	583	892
30	4,990	.....	3,430	2,240	2,140	1,760	520	455	687	670	764	892
31	5,890	.....	4,080	.....	2,100	.....	555	488	.....	670	.....	827

NOTE.—Daily discharge determined from well-defined rating curve applicable as follows: Jan. 1 to Mar. 29 and Apr. 3 to Dec. 31, 1911. Discharge Mar. 30 to Apr. 2 determined by the indirect method for shifting channels. Discharge Dec. 26 interpolated; gage height on that date believed to be in error.

Monthly discharge of Bear River near Preston, Idaho, for 1911.

[Drainage area, 4,500 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	5,890	410	1,100	0.247	0.28	68,200	A.
February	4,000	710	1,370	.304	.32	76,100	A.
March	4,080	800	1,720	.382	.44	106,000	A.
April	4,900	1,960	2,920	.649	.72	174,000	A.
May	2,840	2,100	2,480	.551	.64	152,000	A.
June	2,140	1,630	1,940	.431	.48	115,000	A.
July	1,730	425	780	.173	.20	48,000	A.
August	520	395	446	.099	.11	27,400	A.
September	755	455	594	.132	.15	35,300	A.
October	940	670	851	.189	.22	52,300	A.
November	892	583	742	.165	.18	44,200	A.
December	930	670	784	.174	.20	48,200	A.
The year	5,890	395	1,310	.291	3.94	947,000	

BEAR RIVER NEAR COLLINSTON, UTAH.

Location.—About one-fourth mile below the power plant of the Utah-Idaho Sugar Co., at the Wheelon railroad siding, about 4 miles north of Collinston, in the NW. ¼ sec. 26, T. 13 N., R. 2 W., Salt Lake base and meridian.

Records available.—July 1, 1889, to December 31, 1911.

Drainage area.—6,000 square miles.

Gage.—The original gage was a vertical iron bar driven into the river bed and supported at the top by timbers projecting from the bank. In February, 1905, an inclined gage of 6 by 6 fir was established near the iron gage and at the same datum.

Channel.—Gravel and sand which shift occasionally during high water.

Discharge measurements.—Made from cable and car.

Winter flow.—Some ice forms along the banks near the station but this does not affect the open-channel rating.

Diversions.—There is a low diversion dam at the upper end of the Bear River canyon about 2 miles above the station, where two canals head, diverting the water out on both sides of the canyon and by the station. Either canal can be used to furnish water to the power plant, below which point the water is carried south and west for irrigation. The left canal carries approximately 100 second-feet; the right canal carries about 550 second-feet below the power plant.

Regulation.—Manipulation of gates at the dam 2 miles above the station may cause variations in flow.

Accuracy.—The measurements made at this station plot very consistently and the discharge record is considered reliable.

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

The records derived from observations at this station show practically the total amount of unappropriated water below all diversions.

Discharge measurements of Bear River near Collinston, Utah, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec-feet.*
Feb. 3	G. H. Canfield	6.54	7,860
July 15	J. C. Dort	1.20	413
Aug. 14	L. Crandall	1.14	363

Daily gage height, in feet, of Bear River near Collinston, Utah, for 1911.

[R. A. Johnston, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.2	6.3	2.4	4.7	4.2	4.1	.....	1.0	1.1	1.9	2.3	1.9
2	2.2	7.0	2.3	4.7	4.1	4.0	2.7	1.0	1.1	1.9	2.2	1.9
3	2.2	6.6	2.3	4.7	4.1	3.9	2.7	1.0	1.1	2.0	2.2	2.0
4	2.2	5.6	2.5	4.9	4.2	3.8	2.5	1.0	1.2	2.0	2.2	2.1
5	2.2	4.6	2.6	5.2	4.2	3.6	2.4	1.0	1.2	2.1	2.2	2.1
6	2.3	4.0	2.9	5.3	4.2	3.6	2.2	1.1	1.3	2.2	2.2	2.2
7	2.3	3.5	3.0	5.4	4.2	3.5	1.9	1.1	1.3	2.3	2.3	2.2
8	2.3	3.0	3.0	5.2	4.2	3.4	1.8	1.1	1.4	2.3	2.3	2.3
9	2.3	2.7	3.4	5.1	4.3	3.3	1.7	1.1	1.4	2.3	2.3	2.3
10	2.4	2.4	3.9	5.0	4.5	3.3	1.7	1.1	1.4	2.3	2.3	2.3
11	2.4	2.4	4.2	4.9	4.6	3.3	1.5	1.1	1.4	2.3	2.3	2.2
12	2.4	2.9	4.1	4.7	4.6	3.3	1.4	1.1	1.4	2.4	2.3	2.2
13	2.4	3.2	4.0	4.4	4.6	3.3	1.2	1.1	1.4	2.4	2.2	2.2
14	2.4	3.0	3.9	4.2	4.6	3.6	1.2	1.15	1.4	2.4	2.2	2.2
15	2.4	2.8	3.7	3.8	4.5	3.7	1.1	1.1	1.4	2.5	2.3	2.2
16	2.4	2.4	3.6	3.7	4.5	3.5	1.1	1.1	1.4	2.4	2.3	2.2
17	2.4	2.2	3.3	3.7	4.4	3.4	1.7	1.1	1.4	2.3	2.3	2.3
18	2.3	2.2	3.3	3.5	4.2	3.6	1.7	1.1	1.4	2.3	2.4	2.2
19	2.4	2.2	3.4	3.5	4.0	3.8	1.7	1.1	1.5	2.3	2.3	2.2
20	2.4	2.3	3.7	3.6	4.0	3.8	1.6	1.1	1.6	2.3	2.3	2.1
21	2.4	2.4	3.7	3.6	4.1	3.6	1.5	1.1	1.7	2.3	2.3	2.2
22	2.3	2.4	3.8	3.5	4.0	3.4	1.4	1.1	1.8	2.3	2.3	2.2
23	2.2	2.5	3.9	3.5	4.1	3.3	1.4	1.1	1.8	2.3	2.3	2.3
24	1.9	2.5	4.0	3.5	4.2	3.2	1.3	1.1	1.9	2.3	2.2	2.1
25	2.4	2.5	4.1	3.6	4.1	3.2	1.2	1.1	1.9	2.3	2.2	2.1
26	4.2	2.5	4.1	3.7	4.0	3.1	1.0	1.1	1.9	2.3	2.2	2.2
27	4.7	2.5	4.2	3.8	4.6	3.1	1.0	1.1	1.9	2.3	2.2	2.2
28	3.6	2.5	4.1	4.0	4.6	3.0	1.0	1.1	1.9	2.3	2.2	2.2
29	3.0	.....	4.1	4.2	4.1	3.0	1.0	1.1	1.9	2.3	2.1	2.2
30	3.9	.....	4.2	4.3	4.1	3.0	1.0	1.1	1.9	2.2	2.0	2.2
31	5.0	.....	4.4	.....	4.0	.....	1.0	1.1	.....	2.2	.....	2.2

NOTE.—Observer records water just a little over gage Feb. 2, 1911. Gage heights estimated (no record) July 28 to Sept. 7, with the exception of Aug. 14.

Daily discharge, in second-feet, of Bear River near Collinston, Utah, for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,250	7,300	1,500	4,620	3,830	3,680	2,020	275	340	995	1,390	995
2	1,250	8,800	1,390	4,620	3,680	3,530	1,840	275	340	995	1,290	995
3	1,250	8,000	1,390	4,620	3,680	3,380	1,840	275	340	1,090	1,290	1,090
4	1,250	6,110	1,610	4,940	3,830	3,240	1,610	275	410	1,090	1,290	1,190
5	1,250	4,460	1,720	5,430	3,830	2,960	1,500	275	410	1,190	1,290	1,190
6	1,350	3,530	2,080	5,600	3,830	2,960	1,290	340	485	1,290	1,290	1,290
7	1,350	2,830	2,200	5,770	3,830	2,830	995	340	485	1,390	1,390	1,290
8	1,350	2,200	2,200	5,430	3,830	2,700	905	340	565	1,390	1,390	1,390
9	1,350	1,840	2,700	5,260	3,980	2,570	815	340	565	1,390	1,390	1,390
10	1,450	1,500	3,380	5,100	4,300	2,570	815	340	565	1,390	1,390	1,390
11	1,450	1,500	3,830	4,940	4,460	2,570	645	340	565	1,390	1,390	1,290
12	1,450	2,080	3,680	4,620	4,460	2,570	565	340	565	1,500	1,390	1,290
13	1,450	2,440	3,530	4,140	4,460	2,570	410	340	565	1,500	1,290	1,290
14	1,450	2,200	3,380	3,830	4,460	2,960	410	375	565	1,500	1,290	1,290
15	1,450	1,960	3,100	3,240	4,300	3,100	340	340	565	1,610	1,390	1,290
16	1,450	1,500	2,960	3,100	4,300	2,830	340	340	565	1,500	1,390	1,290
17	1,450	1,290	2,570	3,100	4,140	2,700	815	340	565	1,390	1,390	1,390
18	1,350	1,290	2,570	2,830	3,830	2,960	815	340	565	1,390	1,500	1,290
19	1,450	1,290	2,700	2,830	3,530	3,240	815	340	645	1,390	1,390	1,290
20	1,450	1,390	3,100	2,960	3,530	3,240	730	340	730	1,390	1,390	1,190
21	1,450	1,500	3,100	2,960	3,680	2,960	645	340	815	1,390	1,390	1,290
22	1,350	1,500	3,240	2,830	3,530	2,700	565	340	905	1,390	1,390	2,190
23	1,250	1,610	3,380	2,830	3,680	2,570	565	340	905	1,390	1,390	1,390
24	960	1,610	3,530	2,830	3,830	2,440	485	340	995	1,390	1,290	1,190
25	1,450	1,610	3,680	2,960	3,680	2,440	410	340	995	1,300	1,290	1,190
26	3,750	1,610	3,680	3,100	3,530	2,320	275	340	995	1,300	1,290	1,290
27	4,510	1,610	3,830	3,240	4,460	2,320	275	340	995	1,390	1,290	1,290
28	2,890	1,610	3,680	3,530	4,460	2,200	275	340	995	1,390	1,290	1,290
29	2,120	.....	3,680	3,830	3,680	2,200	275	340	995	1,390	1,190	1,290
30	3,300	.....	3,830	3,980	3,680	2,200	275	340	995	1,290	1,090	1,290
31	5,010	.....	4,140	.....	3,530	.....	275	340	.....	1,290	.....	1,290

NOTE.—Discharge determined from two rating curves fairly well defined, one applicable Mar. 19, 1910, to Feb. 2, 1911, the other Feb. 3 to Dec. 31, 1911. Discharge interpolated July 1, 1911.

Monthly discharge of Bear River near Collinston, Utah, for 1911.

[Drainage area, 6,000 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	5,010	960	1,790	0.298	0.34	110,000	B.
February	8,800	1,290	2,720	.453	.47	151,000	A.
March	4,140	1,390	2,950	.492	.57	181,000	A.
April	5,770	2,830	3,970	.662	.74	236,000	A.
May	4,460	3,530	3,930	.655	.76	242,000	A.
June	3,680	2,200	2,780	.463	.52	165,000	A.
July	2,020	275	769	.128	.15	47,300	B.
August	375	275	331	.055	.06	20,400	C.
September	995	340	666	.111	.12	39,600	B.
October	1,610	995	1,350	.225	.26	83,000	A.
November	1,500	1,090	1,340	.223	.25	79,700	A.
December	1,390	995	1,260	.210	.24	77,500	B.
The year	8,800	275	1,980	.330	4.48	1,430,000	

GEORGETOWN CREEK NEAR GEORGETOWN, IDAHO.

Location.—In sec. 4, T. 11 S., R. 44 E., 50 feet below the power plant of the Bear Lake Power Co., 3 miles northeast of Georgetown, Idaho, which is 1 mile from Georgetown station on the Oregon Short Line Railroad.

Records available.—October 20, 1911, to December 31, 1911.

Drainage area.—22 square miles.

Gage.—Staff, nailed to alder stumps on right bank.

Channel.—In general rocky and clean, but lower end of gage rests on a deposit of sand which might shift slightly.

Discharge measurements.—Made by wading at all except extremely high stages.

Winter flow.—Probably not affected by freezing, as water is warm.

Diversion.—Water is probably diverted above the station at certain times of the year.

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

The following discharge measurement was made by J. P. Martin:

October 23, 1911: Gage height, 0.99 foot; discharge, 27.4 second-feet.

Daily gage height, in feet, of Georgetown Creek near Georgetown, Idaho, for 1911.

Oct 23	0.99
Nov. 27	1.02
Dec. 5	1.00
13	1.00
23	1.00
30	.98

LOGAN RIVER NEAR LOGAN, UTAH.

Location.—Two miles east of Logan, Utah, 50 feet below highway bridge at mouth of canyon, and about 800 feet below Telluride Power Co.'s plant, in the center of the NW. ¼, sec. 36, T. 12 N., R. 1 E., Salt Lake base and meridian.

Records available.—June 1, 1896, to July 18, 1903; April 13, 1904, to December 31, 1911.

Drainage area.—218 square miles.

Gage.—Sloping staff gage on right bank.

Channel.—More or less shifting, especially during high water.

Discharge measurements.—Made from car and cable.

Winter flow.—No ice forms at this station.

Diversion.—The Logan, Hyde Park, and Smithfield canal diverts water above the Telluride Power Co.'s plant. This canal carries about 100 second-feet during the irrigation season.

Accuracy.—Fair.

Cooperation.—Maintained in cooperation with Telluride Power Co.

The following discharge measurement was made by G. M. Gilkison, engineer for the Telluride Power Co.:

October 7, 1911: Gage height, 2 feet; discharge, 168 second-feet.

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

[Telluride Power Co., observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	2.5	1.85	2.45	2.8	3.65	2.95	2.2	2.0	2.05	1.95	1.8
2	.....	2.55	1.85	2.5	2.85	3.75	2.9	2.2	2.0	2.05	1.95	1.8
3	.....	2.2	1.85	2.6	2.85	3.7	2.9	2.2	2.0	2.05	1.95	1.8
4	.....	2.2	1.9	2.6	2.95	3.8	2.85	2.2	2.0	2.05	1.95	1.8
5	.....	2.15	1.85	2.6	3.05	3.9	2.85	2.2	2.0	2.05	2.0	1.8
6	.....	2.1	1.85	2.5	3.1	3.8	2.85	2.2	2.0	2.0	1.95	1.8
7	.....	2.1	1.85	2.5	3.35	3.8	2.85	2.2	2.0	2.05	1.95	1.8
8	.....	1.9	1.9	2.5	3.35	3.8	2.8	2.15	1.95	2.0	1.95	1.8
9	.....	1.95	1.95	2.45	3.45	3.8	2.75	2.15	1.95	2.0	1.95	1.8
10	.....	2.0	1.9	2.4	3.45	3.7	2.7	2.1	1.95	2.0	1.95	1.8
11	.....	2.0	1.9	2.4	3.25	3.6	2.65	2.1	1.95	2.0	1.85	1.8
12	.....	2.0	1.95	2.4	3.1	3.65	2.6	2.1	1.95	2.0	1.85	1.8
13	.....	2.0	1.95	2.35	3.1	3.7	2.6	2.05	1.95	2.0	1.85	1.8
14	.....	2.0	1.95	2.35	3.2	3.75	2.6	2.05	1.95	2.0	1.9	1.8
15	.....	1.9	1.95	2.35	3.35	3.75	2.55	2.05	1.95	2.0	1.95	1.8
16	.....	1.85	1.95	2.35	3.35	3.7	2.5	2.05	1.95	2.0	1.95	1.8
17	.....	1.8	2.0	2.35	3.35	3.6	2.5	2.05	1.95	2.0	1.95	1.8
18	.....	1.8	2.0	2.35	3.45	3.55	2.5	2.05	1.95	2.0	1.95	1.8
19	.....	1.9	2.0	2.35	3.45	3.5	2.45	2.05	1.95	2.0	1.9	1.8
20	.....	1.9	2.05	2.3	3.5	3.5	2.45	2.05	1.95	2.0	1.95	1.82
21	.....	1.85	2.1	2.3	3.5	3.5	2.4	2.05	1.95	2.0	1.95	1.82
22	.....	1.85	2.2	2.3	3.5	3.5	2.4	2.05	1.95	2.0	1.95	1.8
23	.....	1.85	2.2	2.3	3.6	3.45	2.4	2.05	1.95	2.0	1.85	1.82
24	1.9	1.85	2.15	2.35	3.6	3.4	2.35	2.05	1.95	2.0	1.9	1.8
25	2.05	1.85	2.2	2.35	3.6	3.3	2.35	2.0	2.05	2.0	1.9	1.8
26	1.95	1.85	2.2	2.5	3.45	3.25	2.3	2.0	2.0	2.0	1.9	1.81
27	1.9	1.85	2.15	2.85	3.35	3.1	2.3	2.0	1.95	2.0	1.85	1.82
28	1.8	1.9	2.15	2.85	3.35	3.05	2.25	2.0	1.95	1.95	1.85	1.83
29	1.9	.....	2.15	2.8	3.4	3.0	2.25	2.0	1.95	1.95	1.85	1.81
30	2.3	.....	2.25	2.8	3.4	3.0	2.25	2.0	2.0	1.95	1.8	1.8
31	2.05	.....	2.4	.....	3.5	.....	2.2	2.0	.....	1.95	.....	1.8

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

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	385	108	356	585	1,280	720	246	168	186	152	105
2	.....	418	108	385	622	1,360	680	246	168	186	152	105
3	.....	230	108	450	622	1,320	680	246	168	186	152	105
4	.....	230	122	450	700	1,410	640	246	168	186	152	105
5	.....	210	108	450	780	1,500	640	246	168	186	168	105
6	.....	190	108	385	820	1,440	640	246	168	168	152	105
7	.....	190	108	385	1,020	1,440	640	246	168	186	152	105
8	.....	122	122	385	1,020	1,440	600	226	152	168	152	105
9	.....	138	138	356	1,110	1,440	560	226	152	168	152	105
10	.....	154	122	327	1,110	1,350	530	205	152	168	152	105

Daily discharge, in second-feet, of Logan River near Logan, Utah, for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
11	.....	154	122	327	940	1,260	500	205	152	168	120	105
12	.....	154	138	327	820	1,300	460	205	152	168	120	105
13	.....	154	138	301	820	1,350	460	186	152	168	120	105
14	.....	154	158	301	900	1,400	460	186	152	168	135	105
15	.....	122	138	301	1,020	1,400	430	186	152	168	152	105
16	.....	108	138	301	1,020	1,350	400	186	152	168	152	105
17	.....	94	154	301	1,020	1,260	400	186	152	168	152	105
18	.....	94	154	301	1,110	1,220	400	186	152	168	152	105
19	.....	122	154	301	1,110	1,170	372	186	152	168	135	105
20	.....	122	172	275	1,150	1,170	372	186	152	168	152	111
21	.....	108	190	275	1,150	1,170	343	186	152	168	152	111
22	.....	108	230	275	1,150	1,170	343	186	152	168	152	105
23	.....	108	230	275	1,240	1,120	343	186	152	168	120	111
24	122	108	210	301	1,240	1,080	318	186	152	168	135	105
25	172	108	230	301	1,240	1,000	318	168	186	168	135	105
26	138	108	230	385	1,110	960	292	168	168	168	135	108
27	122	108	210	622	1,020	840	292	168	152	168	120	111
28	94	122	210	622	1,020	800	269	168	152	152	120	114
29	122	.....	210	585	1,060	760	269	168	152	152	120	108
30	275	.....	252	585	1,060	760	269	168	168	152	105	105
31	700	.....	327	.....	1,150	.....	246	168	.....	152	.....	105

NOTE.—Daily discharge determined from two fairly well defined rating curves applicable Jan. 1 to June 5 and June 6 to Dec. 31.

Monthly discharge of Logan River near Logan, Utah, for 1911.

[Drainage area, 218 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	.....	.....	123	0.514	0.59	7,560	C.
February	418	94	158	.725	.75	8,780	C.
March	327	108	165	.757	.87	10,100	C.
April	622	275	373	1.71	1.91	22,200	C.
May	1,240	585	992	4.55	5.25	61,000	C.
June	1,500	760	1,220	5.60	6.25	72,600	C.
July	720	246	448	2.05	2.36	27,500	B.
August	246	168	200	.917	1.06	12,300	B.
September	186	152	158	.725	.81	9,400	A.
October	186	152	169	.775	.89	10,400	A.
November	168	105	141	.647	.72	8,390	B.
December	114	105	106	.486	.56	6,520	B.
The year	1,500	94	355	1.63	22.03	257,000	

NOTE.—The water diverted past the station by the Logan, Hyde Park, and Smithfield canal is not included in the above totals. Discharge Jan. 1-23 estimated 90 second-feet.

LITTLE MALAD RIVER NEAR MALAD, IDAHO.

Location.—At Schwartz ranch, about three-fourths of a mile below the Kerns & Torey reservoir site, about 2½ miles above the Elkhorn reservoir site, and about 14 miles northwest of Malad, in sec. 36, T. 12 S., R. 34 E.

Records available.—August 2, 1911, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Inclined staff about 175 feet above a 3-foot fall in the river.

Channel.—Clay and hard pan; probably permanent; right bank may overflow at extremely high stages.

Discharge measurements.—Made by wading about 150 feet above the gage.
Winter flow.—Affected by ice.
Accuracy.—Good.
Cooperation.—Station maintained in cooperation with the State of Idaho.

The records at this point will indicate the amount of water available for storage at one of several proposed reservoir sites.

Discharge measurements of Little Malad River near Malad, Idaho, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Aug. 2	G. C. Baldwin	3.00	13.8
Nov. 12	H. L. Stoner	3.00	13.0

Daily gage height, in feet, of Little Malad River near Malad, Idaho, for 1911.

[Nephi W. Lewis, observer.]

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	3.0	.....	3.0	3.0	16	3.0	3.0	3.0	3.05	3.0
2	.....	3.0	3.0	3.0	3.0	17	3.0	.....	3.0	3.05	.....
3	.....	.....	3.0	3.0	.....	18	3.0	3.0	3.0	3.0	3.0
4	.....	3.0	3.0	3.0	3.0	19	3.0	3.0	3.0	.....	3.0
5	.....	3.0	3.0	.....	3.0	20	.....	3.0	3.0	3.0	3.0
6	.....	3.0	3.0	3.0	3.0	21	3.0	3.0	3.0	3.0	3.0
7	3.0	3.0	3.0	3.0	3.0	22	3.0	3.0	.....	3.0	3.0
8	3.0	3.0	.....	3.05	3.0	23	3.0	3.0	3.0	3.0	3.0
9	3.0	3.0	3.0	3.05	3.0	24	3.0	.....	3.0	3.0	.....
10	3.0	.....	3.1	3.1	.....	25	3.0	3.0	3.0	3.0	3.0
11	3.0	3.0	3.0	3.1	3.0	26	3.0	3.0	3.0	.....	3.0
12	3.0	3.0	3.0	.....	3.0	27	.....	3.0	3.0	3.0	3.0
13	.....	3.0	3.0	3.05	3.0	28	3.0	3.0	3.0	3.0	3.1
14	3.0	3.0	3.0	3.1	3.0	29	3.0	3.0	.....	3.0	3.05
15	3.0	3.0	.....	3.05	3.0	30	3.0	3.0	3.0	3.0	3.2
						31	3.0	.....	3.0	.....	.....

NOTE.—Relation of gage height to discharge affected by ice about Dec. 28-31.

Daily discharge, in second-feet, of Little Malad River near Malad, Idaho, for 1911.

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	13	13	13	13	16	13	13	13	16	13
2	.....	13	13	13	13	17	13	13	13	16	13
3	.....	13	13	13	13	18	13	13	13	13	13
4	.....	13	13	13	13	19	13	13	13	13	13
5	.....	13	13	13	13	20	13	13	13	13	13
6	.....	13	13	13	13	21	13	13	13	13	13
7	13	13	13	13	13	22	13	13	13	13	13
8	13	13	13	16	13	23	13	13	13	13	13
9	13	13	13	16	13	24	13	13	13	13	13
10	13	13	18	18	13	25	13	13	13	13	13
11	13	13	13	18	13	26	13	13	13	13	13
12	13	13	13	17	13	27	13	13	13	13	13
13	13	13	13	16	13	28	13	13	13	13	13
14	13	13	13	18	13	29	13	13	13	13	13
15	13	13	13	16	13	30	13	13	13	13	13
						31	13	.....	13	.....	13

NOTE.—Daily discharge determined from a well-defined rating curve based on measurements made during 1911 and 1912. Discharge estimated Dec. 28-31, on account of ice.

Monthly discharge of Little Malad River near Malad, Idaho, for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
August 7-31	13	13	13.0	645	A.
September	13	13	13.0	774	A.
October	18	13	13.2	812	A.
November	18	13	14.2	845	A.
December	13	13	13.0	799	A.

BOXELDER CREEK AT BRIGHAM UTAH.

Location.—At the highway bridge three blocks west and about five blocks north of the courthouse at Brigham, Utah, in the NW. ¼ NW. ¼ sec. 13, T. 9 N., R. 2 W., Salt Lake base and meridian.

Records available.—May 20, 1909, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened on the downstream corner of the right abutment of the bridge. On February 24, 1910, the datum of the gage was lowered 2 feet.

Channel.—Shifting; bed composed of sand.

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

Winter flow.—Ice forms at this station.

Diversions.—During the summer months the entire flow of Boxelder Creek is used for irrigation and no water flows by the station.

Regulation.—Flow affected by artificial control above the station.

Accuracy.—Low because of shifting channel.

Cooperation.—Station maintained in cooperation with the State of Utah.

Discharge measurements of Boxelder Creek at Brigham, Utah, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Feb. 5[a]	G. H. Canfield	4.10	10.7
Mar. 13[a]	do	4.28	16.9
Nov. 4[b]	J. C. Dort	4.20	6.0
Dec. 12[b]	L. Tanner	4.35	14.2

[a] Wading below section. [b] Wading at section.

Daily gage height, in feet, of Boxelder Creek at Brigham, Utah, for 1911.

[Woodruff Nelson, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.4	4.9	4.3	4.8	4.5	.....	.....	.....	.....	4.1	4.2	4.3
2	3.4	5.2	4.4	4.7	4.5	.....	.....	.....	.....	4.2	4.2	4.3
3	3.4	5.0	4.4	4.8	4.5	.....	.....	.....	.....	4.1	4.2	4.3
4	3.4	4.7	4.4	4.8	4.5	.....	.....	.....	.....	4.1	4.2	4.4
5	3.4	4.1	4.4	4.7	4.5	.....	.....	.....	.....	4.1	4.2	4.4
6	3.5	4.2	4.4	4.7	4.6	.....	.....	.....	.....	4.1	4.2	4.4
7	3.5	4.2	4.6	4.6	4.7	.....	.....	.....	.....	4.1	4.3	4.4
8	3.4	4.3	4.6	4.6	4.7	.....	.....	.....	.....	4.1	4.3	4.5
9	3.4	4.4	4.5	4.6	4.6	.....	.....	.....	.....	4.1	4.3	4.5
10	3.3	4.5	4.6	4.6	4.5	.....	.....	.....	.....	4.1	4.3	4.5
11	3.3	4.3	4.7	4.7	4.1	.....	.....	.....	.....	4.1	4.3	4.4
12	3.4	4.3	4.6	4.5	4.1	.....	.....	.....	.....	4.1	4.3	4.4
13	3.4	4.3	4.6	4.5	3.4	.....	.....	.....	.....	4.1	4.3	4.4
14	3.4	4.3	4.5	4.4	3.6	.....	.....	.....	.....	4.1	4.3	4.3
15	3.5	4.3	4.5	4.4	3.7	.....	.....	.....	.....	4.1	4.3	4.3

Daily gage height, in feet, of Boxelder Creek at Brigham, Utah, for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
16	3.5	4.2	4.6	4.4	3.9	.....	.....	.....	.....	4.1	4.4	4.3
17	3.5	4.2	4.6	4.6	3.9	.....	.....	.....	.....	4.1	4.3	4.3
18	3.4	4.2	4.7	4.6	4.0	.....	.....	.....	.....	4.1	4.4	4.3
19	3.4	4.3	4.7	4.6	4.0	.....	.....	.....	.....	4.1	4.3	4.3
20	3.5	4.3	4.7	4.5	4.0	.....	.....	.....	.....	4.1	4.3	4.3
21	3.5	4.2	4.6	4.4	4.0	.....	.....	.....	.....	4.2	4.3	4.2
22	3.5	4.2	4.5	4.4	.....	.....	.....	.....	.....	4.2	4.4	4.2
23	3.5	4.2	4.6	4.5	.....	.....	.....	.....	.....	4.2	4.3	4.2
24	3.6	4.2	4.6	4.6	.....	.....	.....	.....	.....	4.2	4.3	4.3
25	3.6	4.2	4.7	4.6	.....	.....	.....	.....	.....	4.2	4.3	4.3
26	3.9	4.2	4.6	4.6	.....	.....	.....	.....	.....	4.2	4.3	4.3
27	4.0	4.2	4.6	4.7	.....	.....	.....	.....	.....	4.2	4.3	4.3
28	4.5	4.3	4.6	4.9	.....	.....	.....	.....	.....	4.2	4.3	4.3
29	4.5	.....	4.7	4.8	.....	.....	.....	.....	.....	4.2	4.3	4.3
30	4.6	.....	4.8	4.8	.....	.....	.....	.....	.....	4.2	4.3	4.3
31	4.8	.....	4.7	.....	.....	.....	.....	.....	.....	4.2	.....	4.3

NOTE.—Creek dry about May 22 to Sept. 30. Probably no material effect from ice.

Daily discharge, in second-feet, of Boxelder Creek at Brigham, Utah, for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	20	159	18	48	28	.....	.....	.....	.....	5	7	10
2	20	82	23	41	28	.....	.....	.....	.....	7	7	10
3	20	64	23	48	28	.....	.....	.....	.....	5	7	10
4	20	41	23	48	28	.....	.....	.....	.....	5	7	13
5	20	10	23	41	28	.....	.....	.....	.....	5	7	13
6	25	13	23	41	34	.....	.....	.....	.....	5	7	13
7	25	13	34	34	41	.....	.....	.....	.....	5	10	13
8	20	18	34	34	41	.....	.....	.....	.....	5	10	18
9	20	23	28	34	34	.....	.....	.....	.....	5	10	18
10	15	28	34	34	28	.....	.....	.....	.....	5	10	18
11	15	18	41	41	10	.....	.....	.....	.....	5	10	13
12	20	18	34	28	10	.....	.....	.....	.....	5	10	13
13	20	18	34	28	0	.....	.....	.....	.....	5	10	13
14	20	18	28	23	1	.....	.....	.....	.....	5	10	10
15	25	18	28	23	2	.....	.....	.....	.....	5	10	10
16	25	13	34	23	5	.....	.....	.....	.....	5	13	10
17	25	13	34	34	5	.....	.....	.....	.....	5	10	10
18	20	13	41	34	7	.....	.....	.....	.....	5	13	10
19	20	18	41	34	7	.....	.....	.....	.....	5	10	10
20	25	18	41	28	7	.....	.....	.....	.....	5	10	10
21	25	13	34	23	7	.....	.....	.....	.....	7	10	7
22	25	13	28	23	.....	.....	.....	.....	.....	7	13	7
23	25	13	34	28	.....	.....	.....	.....	.....	7	10	7
24	30	13	34	34	.....	.....	.....	.....	.....	7	10	10
25	30	13	41	34	.....	.....	.....	.....	.....	7	10	10
26	54	13	34	34	.....	.....	.....	.....	.....	7	10	10
27	63	13	34	41	.....	.....	.....	.....	.....	7	10	10
28	113	18	34	56	.....	.....	.....	.....	.....	7	10	10
29	113	.....	41	48	.....	.....	.....	.....	.....	7	10	10
30	124	.....	48	48	.....	.....	.....	.....	.....	7	10	10
31	147	.....	41	.....	.....	.....	.....	.....	.....	7	.....	10

NOTE.—Discharge determined from three poorly defined rating curves applicable Jan. 1 to Feb 1, Feb. 2 to May 21, and Oct. 1 to Dec. 31.

Monthly discharge of Boxelder Creek at Brigham, Utah, for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	147	15	37.7	2,320	D.
February	159	10	25.9	1,440	D.
March	48	18	33.0	2,030	D.
April	56	23	35.6	2,120	D.
May	41	0	12.2	750	D.
October	7	5	5.8	360	D.
November	13	7	9.7	580	D.
December	18	7	11.2	689	D.
The year	159	0	14.2	10,300	

NOTE.—Creek dry from May 22 to Sept. 30, 1911.

WEBER RIVER BASIN.

WEBER RIVER NEAR OAKLEY, UTAH.

Location.—Near the mouth of the canyon, 3 miles above Oakley post office, below the South Fork of Weber River, and above Kamas Creek, in the SW. ¼ NE. ¼ sec. 15, T. 1 S., R. 6 E., Salt Lake base and meridian.

Records available.—October 22, 1904, to December 31, 1911.

Drainage area.—163 square miles.

Gage.—An inclined iron rod firmly bolted to a limestone ridge at the left end of the cable; datum unchanged since installation.

Channel.—One channel at all stages; fairly permanent but may shift during extreme high water.

Discharge measurements.—Made from car and cable during medium to high water; and by wading just below the cable during low water.

Winter flow.—The river freezes across at the station and gage heights are also affected by slush and anchor ice; nevertheless fairly reliable estimates of the discharge for the winter period can be made by interpolating between days on which open water is known to have existed, as the winter discharge varies little.

Diversions.—No water is diverted above the station but several canals head just below the station, diverting water for the Kamas prairie region.

Regulation.—None.

Accuracy.—The records for the open-water periods are very good.

Cooperation.—Maintained in cooperation with State of Utah.

Discharge measurements of Weber River near Oakley, Utah, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Mar. 12[a]	G. H. Canfield	3.92	60.0
Aug. 22[a]	J. C. Dort	4.07	87.8

[a] Wading at section.

Daily gage height, in feet, of Weber River near Oakley, Utah, for 1911.

[John Franson, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	4.2	.....	4.2	4.8	6.1	5.3	4.25	.....	4.1	.....	.....
2	.....	.....	4.6	4.25	4.8	6.1	5.3	4.25	3.95	4.25	4.0	5.1
3	.....	.....	.....	4.25	4.9	6.3	5.2	4.2	3.95	4.20	4.0	5.1
4	5.1	.....	.....	4.3	5.1	6.7	5.1	4.2	3.95	4.15	4.0	4.8
5	.....	.....	.....	4.4	5.3	6.8	5.05	4.2	3.95	4.10	4.0	4.4
6	.....	.....	.....	4.3	5.6	7.0	5.0	4.2	3.95	4.10	4.0	4.6
7	.....	.....	3.95	4.3	5.6	6.9	4.95	4.2	3.95	4.05	4.0	4.6
8	.....	.....	.....	4.3	5.8	7.0	4.9	4.15	.....	4.05	.....	.....
9	.....	4.1	.....	4.3	5.7	7.0	4.85	4.1	3.95	4.05	4.05	4.4
10	.....	.....	3.95	4.4	5.7	6.3	4.75	4.1	3.95	4.05	4.2	4.4
11	.....	.....	.....	4.3	5.6	6.5	4.7	4.1	3.95	4.05	4.2	4.5
12	5.4	.....	.....	4.3	5.6	7.0	4.7	.....	3.95	4.05	4.3	4.4
13	.....	.....	.....	4.25	5.7	7.3	4.65	4.05	3.95	4.05	4.3	4.6
14	.....	.....	3.95	4.35	5.7	7.2	4.6	4.05	3.95	4.05	4.2	.....
15	.....	4.3	.....	.....	5.8	7.0	4.6	4.05	3.95	4.05	.....	4.6
16	.....	.....	.....	4.2	5.7	6.8	4.6	4.05	.....	4.05	4.15	4.8
17	.....	.....	3.95	4.2	5.7	6.6	4.6	4.05	3.95	4.05	4.0	4.8
18	4.4	.....	.....	4.25	5.6	6.4	4.55	4.05	3.95	.....	4.0	5.0
19	.....	.....	3.95	4.3	5.5	6.4	4.5	4.05	3.95	4.05	4.0	.....
20	.....	.....	.....	4.35	5.4	6.5	4.5	4.05	3.95	4.0	4.0	5.0
21	.....	.....	.....	4.35	5.3	6.4	4.5	4.05	.....	4.0	4.0	5.3
22	.....	5.1	4.0	4.35	5.4	6.3	4.9	4.05	3.9	4.0	4.1	5.3
23	.....	.....	.....	4.4	5.6	6.2	4.6	4.0	3.9	4.0	4.1	5.7
24	.....	.....	4.05	4.55	5.7	6.1	4.5	4.0	3.95	.....	4.15	5.8
25	4.0	.....	.....	4.7	5.8	5.7	4.5	4.0	3.95	4.0	4.2	5.6
26	.....	.....	4.1	4.8	5.9	5.7	4.5	4.0	3.95	4.0	4.3	5.6
27	.....	.....	.....	4.9	5.7	5.6	4.45	3.95	4.0	4.0	4.3	5.4
28	.....	.....	4.0	4.9	5.5	5.6	4.0	3.95	4.0	4.0	4.5	5.0
29	.....	.....	.....	4.9	5.5	5.5	4.35	3.95	4.0	4.0	4.7	4.9
30	.....	.....	4.05	4.9	5.6	5.4	4.3	3.95	4.1	4.0	5.0	4.7
31	.....	.....	4.1	.....	5.9	.....	4.3	3.95	.....	4.0	.....	4.7

NOTE.—Relation of gage height to discharge probably affected by ice Jan. 1 to about Mar. 6, Nov. 10 to Nov. 16, and Nov. 24 to Dec. 31.

Daily discharge, in second-feet, of Weber River near Oakley, Utah, for 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	120	320	1,090	568	133	64	96	74
2	.....	133	320	1,090	568	133	64	133	74
3	.....	133	364	1,250	514	120	64	120	74
4	.....	146	462	1,600	462	120	64	108	74
5	.....	174	568	1,690	437	120	64	96	74
6	.....	146	747	1,890	412	120	64	96	74
7	64	146	747	1,790	388	120	64	85	74
8	64	146	878	1,890	364	108	64	85	80
9	64	146	811	1,890	342	96	64	85	85
10	64	174	811	1,250	299	96	64	85	.....
11	64	146	747	1,420	278	96	64	85	.....
12	64	146	747	1,890	278	90	64	85	.....
13	64	133	811	2,220	259	85	64	85	.....
14	64	160	811	2,100	240	85	64	85	.....
15	64	140	878	1,890	240	85	64	85	.....
16	64	120	811	1,690	240	85	64	85	.....
17	64	120	811	1,510	240	85	64	85	74
18	64	133	747	1,330	222	85	64	85	74
19	64	146	685	1,330	205	85	64	85	74
20	68	160	625	1,420	205	85	64	74	74

Daily discharge, in second-feet, of Weber River near Oakley, Utah, for 1911—Continued.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
21	71	160	568	1,330	205	85	60	74	74
22	74	160	625	1,250	364	85	55	74	96
23	80	174	747	1,170	240	74	55	74	96
24	85	222	811	1,090	205	74	64	74	.....
25	90	278	878	811	205	74	64	74	.....
26	96	320	948	811	205	74	64	74	.....
27	85	364	811	747	190	64	74	74	.....
28	74	364	685	747	74	64	74	74	.....
29	80	364	685	685	160	64	74	74	.....
30	85	364	747	625	146	64	96	74	.....
31	96	.....	948	.....	146	64	.....	74	.....

NOTE.—Daily discharge determined from a fairly well-defined rating curve. Discharge interpolated for days on which gage heights were not recorded. Discharge affected by ice Jan. 1–Mar. 6, Nov. 10–16, and Nov. 24–Dec. 31, 1911.

Monthly discharge of Weber River near Oakley, Utah, for 1911.

[Drainage area, 163 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January [a]	.....	.....	75	0.460	0.53	4,610	D.
February [a]	.....	.....	85	.521	.54	4,720	D.
March	96	60	70.2	.431	.50	4,320	C.
April	364	120	188	1.15	1.28	11,200	B.
May	948	320	715	4.39	5.06	44,000	B.
June	2,220	625	1,380	8.47	9.45	82,100	B.
July	568	74	287	1.76	2.03	17,600	B.
August	133	64	90.9	.558	.64	5,590	A.
September	96	55	65.3	.401	.45	3,890	A.
October	133	74	85.2	.523	.60	5,240	A.
November	96	74	76.5	.469	.52	4,550	C.
December [a]	.....	.....	75	.460	.53	4,610	D.
The year	2,220	.....	266	1.63	22.13	192,000	

[a] Monthly mean estimated.

NOTE.—Estimated daily discharge Mar. 1 to 6, 60 second-feet; Nov. 10 to 16 and Nov. 24 to Dec. 31, 75 second-feet.

WEBER RIVER AT DEVILS SLIDE,[1] UTAH.

Location.—About 1 mile east of the railroad station at Devils Slide, about three-fourths of a mile upstream from the Union Pacific Railroad bridge. Lost Creek enters one-fourth mile above the station and Chalk Creek about 15 miles above. It is in the center of the SW. ¼ sec. 19, T. 4 N., R. 4 E., Salt Lake base and meridian.

Records available.—February 1, 1905, to December 31, 1911.

Drainage area.—1,090 square miles.

Gage.—Inclined staff gage on right bank of the stream. Datum unchanged since installation.

Channel.—Shifts at various periods.

Discharge measurements.—Made from car and cable.

[1] Formerly called Croydon.

Winter flow.—The river does not freeze over at this station, but a little ice often forms along the banks; open-channel rating will apply throughout the year.

Diversions.—Some water is diverted from Weber River for the Kamas Prairie Valley below.

Accuracy.—Fair.

Cooperation.—Maintained in cooperation with State of Utah.

Discharge measurements of Weber River at Devils Slide, Utah, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Mar. 10	G. H. Canfield	3.04	523
11	do	4.52	1,670
Aug. 23[a]	J. C. Dort	2.09	77

[a] Wading at section.

Daily gage height, in feet, of Weber River at Devils Slide, Utah, for 1911.

[E. F. Crouch, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.4	5.0	2.5	2.95	3.8	3.7	3.2	2.4	2.1	2.3	2.4	2.4
2	2.4	3.2	2.6	3.05	3.6	3.7	3.0	2.4	2.1	2.3	2.4	2.4
3	2.4	3.0	2.8	3.1	3.6	3.7	3.0	2.4	2.1	2.4	2.4	2.4
4	2.4	3.0	2.8	3.1	3.7	3.8	3.0	2.4	2.1	2.4	2.4	2.4
5	2.4	3.0	3.0	3.15	4.0	4.0	2.9	2.4	2.1	2.4	2.4	2.4
6	2.4	2.9	3.0	3.25	4.4	4.1	2.9	2.4	2.1	2.4	2.4	2.4
7	2.4	2.9	3.0	3.2	4.5	4.5	2.8	2.3	2.1	2.4	2.4	2.4
8	2.4	2.8	3.0	3.1	4.5	4.65	2.7	2.3	2.1	2.4	2.4	2.4
9	2.4	2.7	3.0	3.1	4.5	4.65	2.6	2.3	2.1	2.4	2.4	2.4
10	2.4	2.7	3.0	3.1	4.4	4.65	2.6	2.3	2.1	2.4	2.4	2.4
11	2.4	2.7	4.5	3.1	4.4	4.5	2.5	2.3	2.1	2.4	2.4	2.4
12	2.4	2.7	3.3	3.05	4.2	4.6	2.5	2.3	2.1	2.4	2.4	2.4
13	2.4	2.6	3.1	3.05	4.2	4.75	2.4	2.3	2.1	2.4	2.4	2.4
14	2.4	2.6	2.9	3.0	4.2	4.95	2.4	2.3	2.1	2.4	2.4	2.4
15	2.4	2.5	2.9	3.0	4.2	5.0	2.4	2.3	2.1	2.4	2.4	2.4
16	2.4	2.5	2.75	3.05	4.2	4.8	2.4	2.3	2.1	2.4	2.4	2.4
17	2.4	2.5	3.0	3.05	4.2	4.8	2.4	2.3	2.1	2.4	2.4	2.4
18	2.4	2.5	3.0	3.05	4.2	4.65	2.4	2.3	2.1	2.4	2.4	2.4
19	2.4	2.5	3.0	2.95	4.0	4.65	2.4	2.3	2.1	2.4	2.4	2.4
20	2.4	2.5	3.0	2.95	4.0	4.55	2.4	2.3	2.1	2.4	2.4	2.4
21	2.4	2.5	3.1	2.95	4.0	4.45	2.4	2.3	2.1	2.4	2.4	2.4
22	2.4	2.5	3.1	2.95	3.9	4.35	2.4	2.2	2.1	2.4	2.4	2.4
23	2.4	2.5	3.15	3.05	3.9	4.35	2.4	2.1	2.1	2.4	2.4	2.4
24	2.4	2.5	3.45	3.15	3.8	4.25	2.4	2.1	2.1	2.4	2.4	2.4
25	2.8	2.5	3.3	3.15	3.8	4.1	2.4	2.1	2.1	2.4	2.4	2.4
26	2.9	2.5	3.05	3.25	3.8	3.95	2.4	2.1	2.1	2.4	2.4	2.4
27	2.8	2.5	2.95	3.4	3.8	3.85	2.4	2.1	2.1	2.4	2.4	2.4
28	2.8	2.5	2.95	3.65	3.8	3.65	2.4	2.1	2.2	2.4	2.4	2.4
29	2.7	.....	2.95	3.85	3.7	3.35	2.4	2.1	2.2	2.4	2.4	2.4
30	2.9	.....	2.95	3.9	3.6	3.25	2.4	2.1	2.2	2.4	2.4	2.4
31	5.2	.....	2.95	.....	3.6	.....	2.4	2.1	.....	2.4	.....	2.4

Daily discharge, in second-feet, of Weber River at Devils Slide, Utah, for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	190	2,070	265	472	1,010	940	495	157	80	129	157	157
2	190	610	305	528	870	940	395	157	80	129	157	157
3	190	500	395	555	870	940	395	157	80	157	157	157
4	190	500	395	555	940	1,010	395	157	80	157	157	157
5	190	500	500	582	1,170	1,170	350	157	80	157	157	157
6	190	445	500	640	1,510	1,250	350	157	80	157	157	157
7	190	445	500	610	1,600	1,600	305	129	80	157	157	157
8	190	395	500	555	1,600	1,740	263	129	80	157	157	157
9	190	350	500	555	1,600	1,740	224	129	80	157	157	157
10	190	350	500	555	1,510	1,740	224	129	80	157	157	157
11	190	350	1,600	555	1,510	1,600	189	129	80	157	157	157
12	190	350	670	528	1,330	1,690	189	129	80	157	157	157
13	190	305	555	528	1,330	1,820	157	129	80	157	157	157
14	190	305	445	500	1,330	2,020	157	129	80	157	157	157
15	190	265	445	500	1,330	2,070	157	129	80	157	157	157
16	190	265	372	528	1,330	1,700	157	129	80	157	157	157
17	190	265	500	528	1,330	1,700	157	129	80	157	157	157
18	190	265	500	528	1,330	1,560	157	129	80	157	157	157
19	190	265	500	472	1,170	1,560	157	129	80	157	157	157
20	190	265	500	472	1,170	1,480	157	129	80	157	157	157
21	190	265	555	472	1,170	1,380	157	129	80	157	157	157
22	190	265	555	472	1,090	1,300	157	103	80	157	157	157
23	190	265	582	528	1,090	1,300	157	80	80	157	157	157
24	190	265	765	582	1,010	1,220	157	80	80	157	157	157
25	350	265	670	582	1,010	1,100	157	80	80	157	157	157
26	400	265	528	640	1,010	985	157	80	80	157	157	157
27	350	265	472	730	1,010	915	157	80	80	157	157	157
28	350	265	472	905	1,010	775	157	80	103	157	157	157
29	305	.....	472	1,050	940	585	157	80	103	157	157	157
30	400	.....	472	1,090	870	525	157	80	103	157	157	157
31	2,270	.....	472	.....	870	.....	157	80	.....	157	.....	157

NOTE.—Discharge determined from three rating curves, only fairly well defined, applicable Jan. 1 to 31, Feb. 1 to June 15, and June 16 to Dec. 31.

Monthly discharge of Weber River at Devils Slide, Utah, for 1911.

[Drainage area 1090 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	2,270	190	290	0.266	0.31	17,800	C.
February	2,070	265	399	.366	.38	22,200	C.
March	1,600	265	531	.487	.56	32,600	C.
April	1,090	472	593	.544	.61	35,300	C.
May	1,600	870	1,190	1.09	1.26	73,200	C.
June	2,070	525	1,350	1.24	1.38	80,300	C.
July	495	157	218	.200	.23	13,400	C.
August	157	80	119	.109	.13	7,320	C.
September	103	80	82.3	.076	.08	4,900	C.
October	157	129	155	.142	.16	9,530	C.
November	157	157	157	.144	.16	9,340	C.
December	157	157	157	.144	.17	9,650	C.
The year	2,270	80	436	.400	5.43	316,000	

WEBER RIVER NEAR PLAIN CITY, UTAH.

Location.—At the county highway bridge about 6 miles above the mouth of Weber River, on the road from Ogden to Plain City and West Weber, in the SW. ¼ SE. ¼ sec. 5, T. 6 N., R. 2 W., about 6 miles below the mouth of Ogden River, 2 miles below the mouth of Mill Creek, and 1 mile below Fourmile Creek.

Records available.—January 1, 1904, to December 31, 1911.

Drainage area.—2,060 square miles.

Gage.—Vertical staff painted on upstream side of center pier of bridge; datum unchanged.

Channel.—Shifts occasionally during extreme floods.

Discharge measurements.—Made from bridge or by wading.

Winter flow.—Very little ice forms at this station but the river has occasionally frozen over in the later part of December or early part of January.

Diversions.—Practically the entire flow of Weber River is used for irrigation during the summer months and in August the discharge of 4 or 5 second-feet is seepage past the dam, which is about 5 miles above the station.

Artificial control.—The operation of the power plants in Weber Canyon above the city of Ogden probably has no effect in controlling the natural flow of the stream.

Accuracy.—Good.

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

Discharge measurements of Weber River near Plain City, Utah, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 1	G. H. Canfield	17.2	5,670
Mar. 14	do	7.45	1,200
July 31[a]	J. C. Dort	2.37	9.28
Aug. 18[a]	do	2.17	4.80

[a] Wading below station.

Daily gage height, in feet, of Weber River near Plain City, Utah, for 1911.

[W. E. Davies, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.4	17.3	5.3	8.5	10.0	6.8	4.4	2.4	2.2	3.1	4.6	4.6
2	4.8	11.5	5.3	9.0	9.4	7.2	4.0	2.4	2.2	3.3	4.4	4.8
3	5.5	9.8	5.1	9.3	9.4	7.1	3.6	2.4	2.2	3.6	4.5	4.8
4	5.3	8.5	5.4	9.5	9.6	7.2	3.4	2.4	2.2	4.3	4.5	4.5
5	5.4	8.2	5.8	9.3	10.5	7.5	3.0	2.4	2.2	4.3	4.6	4.5
6	5.3	7.8	6.6	10.3	12.0	7.5	2.8	2.4	2.2	4.3	4.6	4.7
7	5.2	7.4	6.8	10.4	12.8	7.8	2.7	2.4	2.2	4.2	4.5	4.5
8	4.8	6.9	7.5	9.2	12.6	7.9	2.7	2.4	2.2	4.2	4.5	4.6
9	4.6	6.5	8.7	9.4	12.7	8.0	2.6	2.4	2.2	4.4	4.7	4.3
10	5.0	6.3	8.3	9.0	12.8	7.9	2.6	2.3	2.2	4.4	4.7	4.6
11	4.9	6.5	11.2	9.2	11.7	7.3	2.5	2.3	2.2	4.5	4.8	4.5
12	4.8	6.6	10.6	9.0	10.6	7.4	2.5	2.3	2.2	4.4	4.6	4.3
13	4.7	6.5	8.5	8.7	10.1	7.7	2.5	2.3	2.3	4.6	4.5	4.1
14	4.7	6.3	7.4	8.4	10.0	8.2	2.5	2.3	2.3	4.6	4.6	4.1
15	4.6	5.9	7.0	8.0	10.0	10.3	2.5	2.3	2.3	4.6	4.6	4.0
16	4.9	5.9	7.4	7.9	10.2	10.9	2.5	2.3	2.3	4.6	4.6	4.3
17	4.7	5.8	7.6	7.8	9.6	10.8	2.4	2.3	2.3	4.6	4.9	4.3
18	5.0	5.6	7.8	7.7	9.1	10.5	2.4	2.2	2.3	4.6	4.8	4.3
19	4.7	5.5	7.9	8.1	8.8	9.8	2.4	2.2	2.3	4.6	4.8	4.5
20	4.9	5.3	7.8	8.0	8.5	9.7	2.4	2.2	2.3	4.5	4.7	4.3
21	4.9	5.3	8.2	8.0	8.3	9.9	2.4	2.2	2.3	4.5	4.8	4.6
22	4.8	5.5	8.4	7.8	7.7	9.6	2.4	2.2	2.3	4.4	4.8	5.7
23	5.5	5.4	8.5	7.6	7.5	8.1	2.4	2.2	2.3	4.4	4.7	5.0
24	5.7	5.2	9.2	7.7	7.5	7.6	2.4	2.2	2.8	4.3	4.5	5.4
25	7.75	5.5	9.6	8.2	7.4	7.1	2.4	2.2	2.8	4.3	4.3	5.8
26	10.4	5.0	8.9	8.6	7.7	6.6	2.4	2.2	2.7	4.4	4.4	5.5
27	7.4	4.9	8.0	9.5	8.5	6.0	2.4	2.2	2.7	4.0	4.5	5.3
28	6.2	5.0	7.8	10.7	8.3	5.3	2.4	2.2	2.7	4.6	4.6	5.3
29	6.0	.....	7.6	11.1	7.7	5.0	2.4	2.2	2.7	4.3	4.5	5.4
30	6.9	.....	7.6	10.9	7.1	4.8	2.4	2.2	2.7	4.5	4.4	5.3
31	16.8	.....	7.9	.....	6.9	.....	2.4	2.2	.....	4.4	.....	5.2

NOTE.—Relation of gage height to discharge affected by ice from about Dec. 16 to 31.

Daily discharge, in second-feet, of Weber River near Plain City, Utah, for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	348	5,900	564	1,580	2,160	986	348	9	5	104	392	392
2	438	2,770	564	1,770	1,920	1,120	266	9	5	136	348	438
3	616	2,080	512	1,880	1,920	1,080	190	9	5	190	370	438
4	564	1,580	590	1,960	2,000	1,120	154	9	5	326	370	370
5	590	1,470	694	1,880	2,360	1,220	88	9	5	326	392	370
6	564	1,330	926	2,280	2,980	1,220	58	9	5	326	392	414
7	538	1,190	986	2,320	3,320	1,330	44	9	5	306	370	370
8	438	1,020	1,220	1,840	3,230	1,360	44	9	5	306	370	392
9	392	896	1,650	1,920	3,270	1,400	32	9	5	348	414	326
10	486	836	1,510	1,770	3,320	1,360	32	7	5	348	414	392
11	462	896	2,640	1,840	2,850	1,150	15	7	5	370	438	370
12	438	926	2,400	1,770	2,400	1,190	15	7	5	348	392	326
13	414	896	1,580	1,660	2,200	1,290	15	7	7	392	370	286
14	414	836	1,190	1,540	2,160	1,470	15	7	7	392	392	286
15	392	722	1,050	1,400	2,160	2,280	15	7	7	392	392	266
16	462	722	1,190	1,360	2,240	2,520	15	7	7	392	392	.....
17	414	694	1,260	1,330	2,000	2,480	9	7	7	392	462	.....
18	486	642	1,330	1,290	1,800	2,360	9	5	7	392	438	.....
19	414	616	1,360	1,440	1,690	2,080	9	5	7	392	438	.....
20	462	564	1,330	1,400	1,580	2,040	9	5	7	370	414	.....
21	462	564	1,470	1,400	1,510	2,120	9	5	7	370	438	.....
22	438	616	1,540	1,330	1,290	2,000	9	5	7	348	38	.....
23	616	590	1,580	1,260	1,220	1,440	9	5	7	348	414	.....
24	668	538	1,840	1,290	1,220	1,260	9	5	58	326	370	.....
25	1,310	616	2,000	1,470	1,190	1,080	9	5	58	326	326	.....
26	2,320	486	1,730	1,620	1,290	926	9	5	44	348	348	.....
27	1,190	462	1,400	1,960	1,580	750	9	5	44	266	370	.....
28	806	486	1,330	2,440	1,510	564	9	5	44	392	392	.....
29	750	.....	1,260	2,600	1,290	486	9	5	44	326	370	.....
30	1,020	.....	1,260	2,520	1,080	438	9	5	44	370	348	.....
31	5,420	.....	1,360	.....	1,020	.....	9	5	.....	348	.....	.....

NOTE.—Discharge determined from a fairly well defined rating curve. Discharge affected by ice Dec. 16–31, 1911.

Monthly discharge of Weber River near Plain City, Utah, for 1911.

[Drainage area, 2,060 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	5,420	348	785	0.381	0.44	48,300	A.
February	5,900	462	1,110	.539	.56	61,600	A.
March	2,640	512	1,330	.646	.74	81,800	A.
April	2,600	1,260	1,740	.845	.94	104,000	A.
May	3,320	1,020	1,990	.966	1.11	122,000	A.
June	2,520	438	1,400	.679	.76	83,300	A.
July	348	9	47.8	.023	.03	2,940	C.
August	9	5	6.7	.0033	.004	412	D.
September	58	5	15.8	.0077	.009	940	C.
October	392	104	333	.162	.19	20,500	A.
November	438	326	392	.190	.21	23,300	A.
December	.....	.....	330	.160	.18	20,300	D.
The year	5,900	5	786	.382	5.17	569,000	

NOTE.—Mean discharge Dec. 16 to 31 estimated on account of ice at 300 second-feet.

OGDEN RIVER NEAR OGDEN, UTAH.

Location.—At the Utah Light & Railway Co.'s dam, 2½ miles above the terminus of the Ogden Canyon Electric Railway and about 8 miles from Ogden post office, in the NW. ¼ SW. ¼ sec. 16, T. 6 N., R. 1 E., Salt Lake base and meridian.

Records available.—January, 1904, to December, 1911.

Drainage area.—Not measured.

Gage.—Hook gage.

Discharge measurements.—The discharge in the river is measured by a weir consisting of eleven 5-foot openings each crested as a separate weir. The water diverted through the power plant is measured by two Venturi meters, each having a 24-inch throat. A waste pipe having a maximum capacity of 2 second-feet is situated at the mouth of the canyon and is taken account of in the company's records.

Accuracy.—The Utah Light & Railway Co. considers the accuracy of these records to be under 2 per cent error.

Cooperation.—Records of daily discharge furnished by the Utah Light & Railway Co.

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

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	66.5	1,440.8	88.8	570.9	795.5	276.8	89.3	53.3	43.6	46.8	66.4	53.8
2	52.6	743.5	84.2	625.3	702.4	270.5	94.2	51.2	47.2	48.7	53.9	52.9
3	47.8	506.9	83.8	669.6	620.8	259.3	84.1	50.4	45.6	66.5	62.3	51
4	58.6	406.8	90.5	665.2	835	245	91.7	46.6	42.5	46.2	67.2	57
5	62.7	356.5	116.1	658.2	987.1	243.5	89.3	50.1	40	58.6	59.6	48.3
6	61.7	291.8	127.9	712.4	1,234.5	218.3	93.7	45.7	48	46	64.7	58.3
7	65.5	236.1	150.3	599.5	1,179.4	182.7	82.2	43	46.5	45.1	64.3	53.7
8	67.1	198	354.7	519.9	1,159.7	195.3	92.5	51.3	50.3	50.2	66.6	58.1
9	63.5	175.1	198.9	504.5	1,222.3	212.3	88.3	44.4	44.8	39.8	66.2	54.2
10	67.9	180.5	297.3	591.8	980.2	193.2	83.6	37.9	45.7	73.2	35.4	48.1
11	66	164.3	545.8	541.3	941.7	169.4	82.2	50.8	51	59	75.8	56
12	67.2	180.7	329.7	520.7	776.7	165.6	70.5	39.9	39.7	52.8	61.4	54.8
13	63.4	171.6	275.9	453.7	812	145	75.1	46.9	52.4	53.9	57.8	60.7
14	66.7	161.1	266.9	434.7	823.3	156.3	78.1	42.8	51.2	53	64.1	57.7
15	64.5	124.5	258.7	416.4	826.7	194.7	68.3	48.7	43	49.6	62	59
16	69.4	115	305.9	395.2	795.7	195	61.5	46.8	46.9	55.8	62.8	62
17	64.5	116.7	329.2	296.3	633.1	183.6	73.7	42.6	47.5	54.6	66.8	53.7
18	67.5	121.9	352	380.9	655.2	172	71.5	46.7	48	59.6	69.2	57.9
19	64.8	105.1	351.7	418.7	812.4	160.1	69.5	49.5	46.8	59.3	67.3	52
20	69.3	103.8	388.6	411.2	525.7	139.9	63.6	47	47	55.6	60.3	54.4
21	69.5	95.6	415.7	383.8	447.4	144.2	59	46.1	51.3	60.8	68.5	57.9
22	63	73.9	495.6	364.7	408.1	138.5	66.6	44.5	50.8	46.5	58.8	49
23	59	100.9	497.2	361.9	409.5	127	52.9	44.8	54.4	57	59.6	59
24	64.5	96.3	661.3	430.1	412.8	121.7	57.5	47.1	49.6	57.4	57.9	55.1
25	296.3	109.8	691.7	502.1	440.8	118	70.7	52.1	47.4	51.1	64.3	54.6
26	166.4	95.6	497.3	647.3	473.7	114.5	61.6	50	50.4	56.3	54.4	49.5
27	130.3	82.8	433.8	764.8	450.7	114.5	54.3	47.9	43.3	56.6	56.6	55.9
28	135.5	86.9	384.1	918.6	389	98.1	60.5	51	44.7	48.6	52.4	62.2
29	165.3	.....	370	962.6	381.1	98.1	56.3	50.2	53.5	61.1	61.1	54
30	1,269.6	.....	399.2	676.2	315.2	84	53.5	47.5	59.9	50.6	62.1	62.9
31	2,444.6	.....	462.1	.....	299.8	.....	53.1	43	.....	60	.....	67

Monthly discharge of Ogden River near Ogden, Utah, for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January	2,440	48	198	12,200
February	1,440	74	237	13,200
March	692	84	332	20,400
April	963	296	547	32,500
May	1,230	300	702	43,200
June	277	84	171	10,200
July	94	53	72.5	4,460
August	53	38	47.1	2,900
September	60	40	47.8	2,840
October	73	40	54.2	3,330
November	85	52	63.3	3,770
December	67	48	55.8	3,430
The year	2,440	38	210	152,000

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

JORDAN RIVER BASIN.

MAPLE CREEK NEAR SPRINGVILLE, UTAH.

Location.—About half a mile above the mouth of Maple Creek canyon, about 4 miles southeast of Springville post office, in the NE. ¼ NW. ¼ sec. 13, T. 8 S., R. 3 E.

Records available.—November 10, 1910, to December 31, 1911.

Drainage area.—Approximately 10.8 square miles.

Gage.—Staff gage inside of flume, installed February 16, 1911, bears no determined relation to original gage installed November 10, 1910.

Channel.—Wooden rectangular flume.

Discharge measurements.—Made by wading at upper end of the flume, or in case of flood, from a board across top of flume.

Winter flow.—Creek freezes over during winter.

Accuracy.—Records good.

Cooperation.—Maintained in cooperation with the United States Weather Bureau.

Discharge measurements of Maple Creek near Springville, Utah, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Feb. 16	A. B. Purton	0.20	0.53
Apr. 1	J. C. Dort	.25	.90
6	G. H. Canfield	.26	1.13
May 5	G. C. Baldwin	.37	1.98
5	do	.37	1.98

NOTE.—All measurements made by wading in various parts of flume.

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

[Lewis Gillilan, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.30	1.48	0.29	0.26	0.36	0.32	0.23	0.22	0.22	0.22	0.21	0.12
2	1.25	1.47	.29	.25	.31	.32	.23	.22	.22	.29	.20	.15
3	1.25	1.45	.29	.25	.32	.32	.22	.22	.22	.24	.20	.15
4	1.40	1.44	.29	.25	.34	.33	.22	.22	.22	.23	.20	.15
5	1.42	1.44	.29	.25	.37	.35	.22	.22	.22	.22	.21	.15
6	1.43	1.44	.29	.26	.41	.35	.22	.22	.22	.22	.20	.15
7	1.43	1.40	.28	.26	.41	.35	.22	.22	.22	.21	.20	.15
8	1.43	1.41	.28	.26	.41	.35	.22	.22	.21	.21	.21	.15
9	1.44	1.41	.29	.28	.42	.39	.22	.22	.21	.20	.21	.13
10	1.44	1.41	.30	.27	.43	.36	.22	.22	.21	.23	.20	.15
11	1.44	1.41	.31	.27	.42	.34	.21	.22	.21	.23	.09	.15
12	1.44	1.42	.30	.27	.40	.30	.21	.22	.22	.22	.12	.17
13	1.44	1.42	.29	.26	.35	.30	.21	.22	.22	.20	.15	.17
14	1.45	1.42	.29	.26	.35	.32	.21	.22	.21	.20	.17	.17
15	1.46	.....	.29	.26	.35	.36	.21	.22	.21	.20	.21	.18
16	1.46	.20	.29	.26	.35	.39	.21	.22	.21	.20	.23	.18
17	1.46	.13	.29	.26	.34	.35	.21	.22	.21	.20	.23	.12
18	1.46	.13	.29	.26	.34	.33	.21	.22	.21	.20	.22	.15
19	1.46	.13	.29	.26	.32	.30	.21	.22	.21	.20	.22	.13
20	1.46	.22	.29	.26	.30	.29	.22	.22	.20	.20	.22	.11
21	1.46	.25	.29	.26	.30	.28	.22	.22	.20	.20	.22	.10
22	1.28	.27	.29	.27	.30	.26	.22	.22	.20	.20	.22	.08
23	1.21	.29	.29	.27	.30	.25	.22	.22	.21	.20	.23	.05
24	1.48	.29	.30	.28	.32	.25	.22	.22	.20	.20	.23	.06
25	1.50	.30	.30	.29	.36	.24	.22	.22	.20	.20	.23	.08
26	1.46	.29	.29	.29	.43	.24	.22	.22	.19	.20	.21	.10
27	1.46	.27	.29	.30	.38	.24	.22	.22	.19	.20	.13	.10
28	1.46	.28	.28	.31	.35	.23	.21	.22	.19	.20	.10	.10
29	1.51	.....	.27	.41	.32	.23	.21	.22	.23	.20	.10	.11
30	1.49	.....	.27	.39	.30	.23	.21	.22	.22	.19	.10	.14
31	1.49	.....	.27	.....	.31	.....	.22	.22	.....	.19	.....	.18

NOTE.—Relation of gage height to discharge affected by ice about Dec. 1 to 31. Gage heights Jan. 1 to Feb. 14 refer to original staff gage. Feb. 15, 1911, the creek was turned into a flume and a new gage was installed next day at an independent datum. No estimates for 1910 and 1911 up to Feb. 15 have been made.

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

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	1.27	1.03	1.89	1.53	0.79	0.71	0.71	0.71	0.63
2	.....	1.27	.95	1.44	1.53	.79	.71	.71	1.27	.55
3	.....	1.27	.95	1.53	1.53	.71	.71	.71	.87	.55
4	.....	1.27	.95	1.71	1.62	.71	.71	.71	.79	.55
5	.....	1.27	.95	1.98	1.80	.71	.71	.71	.71	.63
6	.....	1.27	1.03	2.34	1.80	.71	.71	.71	.71	.55
7	.....	1.19	1.03	2.34	1.80	.71	.71	.71	.63	.55
8	.....	1.19	1.03	2.34	1.80	.71	.71	.63	.63	.63
9	.....	1.27	1.19	2.43	2.16	.71	.71	.63	.55	.63
10	.....	1.35	1.11	2.52	1.89	.71	.71	.63	.79	.55
11	.....	1.44	1.11	2.43	1.71	.63	.71	.63	.79	.02
12	.....	1.35	1.11	2.25	1.35	.63	.71	.71	.71	.09
13	.....	1.27	1.03	1.80	1.35	.63	.71	.71	.55	.22
14	.....	1.27	1.03	1.80	1.53	.63	.71	.63	.55	.33
15	.....	1.27	1.03	1.80	1.89	.63	.71	.63	.55	.63
16	0.55	1.27	1.03	1.80	2.16	.63	.71	.63	.55	.79
17	.13	1.27	1.03	1.71	1.80	.63	.71	.63	.55	.79
18	.13	1.27	1.03	1.71	1.62	.63	.71	.63	.55	.71
19	.13	1.27	1.03	1.53	1.35	.63	.71	.63	.55	.71
20	.71	1.27	1.03	1.35	1.27	.71	.71	.55	.55	.71
21	.95	1.27	1.03	1.35	1.19	.71	.71	.55	.55	.71
22	1.11	1.27	1.11	1.35	1.03	.71	.71	.55	.55	.71
23	1.27	1.27	1.11	1.35	.95	.71	.63	.63	.55	.79
24	1.27	1.35	1.19	1.53	.95	.71	.71	.55	.55	.79
25	1.35	1.35	1.27	1.89	.87	.71	.71	.55	.55	.79
26	1.27	1.27	1.27	2.52	.87	.71	.71	.47	.55	.63
27	1.11	1.27	1.35	2.07	.87	.71	.71	.47	.55	.13
28	1.19	1.19	1.44	1.80	.79	.63	.71	.47	.55	.06
29	.....	1.11	2.34	1.53	.79	.63	.71	.79	.55	.06
30	.....	1.11	2.16	1.35	.79	.63	.71	.71	.47	.06
31	.....	1.11	.....	1.44	.....	.71	.71	.....	.47	.....

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

Monthly discharge of Maple Creek near Springville, Utah, for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
February 16-28	1.35	0.13	0.86	22.2	B.
March	1.44	1.11	1.26	77.5	B.
April	2.34	.95	1.16	69.0	B.
May	2.52	1.35	1.83	113	B.
June	2.16	.79	1.42	84.5	B.
July	.79	.63	.684	42.1	B.
August	.71	.71	.71	43.7	B.
September	.79	.47	.633	37.7	B.
October	1.27	.47	.625	38.4	B.
November	.79	.06	.518	30.8	C.
December	.....	.....	.15	9.22	D.
The period	.....	.....	.....	651	

NOTE.—The mean monthly discharge for December was estimated because of ice.

PROVO RIVER AT FORKS, UTAH.

Location.—At Forks, Utah, 12 miles above Provo, in the NE. ¼ sec. 26, T. 5 S., R. 3 E. It is about 600 feet above the mouth of South Fork of Provo River, about 1 mile below the mouth of North Fork, and about 1½ miles above the Telluride Power Co.'s dam.

Records available.—October 22 to December 31, 1911. Records have been obtained on Provo River since February 1, 1905. The discharge of the South Fork added to that obtained at this station gives the total flow of Provo River.

Drainage area.—600 square miles.

Gage.—Inclined staff on left bank driven into the bed of the stream, and firmly braced.

Channel.—Not liable to shift; bed of stream composed of small gravel. One channel during all stages. Both banks are fairly high and not liable to overflow.

Discharge measurements.—Made from cable and car 10 feet below gage.

Winter flow.—No ice forms at this station.

Cooperation.—Station maintained in cooperation with Telluride Power Co. and State of Utah.

Estimates withheld owing to lack of sufficient measurements.

The following discharge measurement was made by Dort and Gilkison by wading at gage:

October 31, 1911: Gage height, 0.84 feet; discharge, 228 second-feet.

Daily gage height, in feet, of Provo River at Forks, Utah, for 1911.

[Frank Dusenberry, observer.]

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1		0.75	11		0.9	21	1.0	0.7
2		.75	12		.95	22	1.0	.7
3		.75	13		.9	23	1.0	.7
4		.75	14		.85	24	.95	.7
5		.75	15		.85	25	.9	.7
6		.75	16	1.05	.9	26	.95	.7
7		.8	17	1.0	.95	27	.95	.7
8		.85	18	1.0	.95	28	.8	.8
9		.8	19	1.0	.9	29	.7	.8
10		.85	20	1.0	.75	30	.7	.8
						31		.8

PROVO RIVER NEAR PROVO, UTAH.

Location.—About 1 mile above Telluride Power Co.'s dam, one-fourth mile below mouth of the South Fork, and 1¼ miles below the mouth of the North Fork, in the NW. ¼ SW. ¼ sec. 26, T. 5 S., R. 3 E.

Records available.—February 1, 1905, to December 31, 1911, when it was discontinued and new stations were established on the main river and the South Fork to obtain better conditions for measuring. A station was maintained at the mouth of canyon from 1889 to 1906.

Drainage area.—640 square miles.

Gage.—Vertical staff installed June 15, 1909, by the Telluride Power Co., to replace vertical gage which was set July 24, 1908, and washed out June 14, 1909. Datum of gage set June 15, 1909, probably the same as that of the gage installed July 24, 1908, but there is no record to this effect. The gage installed February 1, 1905, was an inclined staff on the left bank.

Channel.—One channel at all stages except at low water, when a bar near the left bank divides the current of the stream.

Discharge measurements.—From car and cable.

Winter flow.—No ice forms at this station.

Diversions.—A little water is diverted in Heber Valley near the head of the river.

Accuracy.—Low because of shifting channel.

Cooperation.—Station maintained in cooperation with Telluride Power Co.

Discharge measurements of Provo River above Telluride Power Co.'s dam near Provo, Utah, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Feb. 20	A. B. Purton	2.35	298
July 19	Dort and Pharis	2.38	275
19	Gilkison and Pharis	2.38	290
Oct. 22	J. C. Dort	2.10	260

Daily gage height, in feet, of Provo River above Telluride Power Co.'s dam near Provo, Utah, for 1911.

[Frank Dusenberry, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.2	4.0	2.3	2.95	3.05	3.8	2.4	2.2	1.85	2.1	2.15	2.1
2	2.15	3.1	2.35	3.05	2.9	3.9	2.35	1.95	1.85	2.4	2.15	2.1
3	2.5	2.9	2.3	3.15	3.0	3.7	2.3	1.95	1.9	2.25	2.2	2.1
4	2.25	2.75	2.3	2.95	2.7	3.85	2.3	1.95	1.9	2.1	2.2	2.1
5	2.4	2.9	2.4	2.9	2.9	4.15	2.4	1.9	1.9	2.1	2.2	2.15
6	2.3	3.0	2.45	3.2	3.05	4.35	2.4	1.95	1.85	2.05	2.2	2.15
7	2.25	2.7	2.5	2.85	3.35	4.5	2.35	1.95	1.85	2.05	2.2	2.2
8	2.25	2.5	2.75	2.9	3.3	4.35	2.35	1.95	1.85	2.15	2.25	2.25
9	2.3	2.6	3.4	2.9	3.4	4.3	2.35	1.9	1.9	2.1	2.25	2.2
10	2.5	2.55	3.65	3.0	3.5	4.3	2.10	1.9	1.9	2.25	2.4	2.25
11	2.2	2.7	3.95	2.95	3.3	4.15	2.15	1.9	1.85	2.2	2.5	2.3
12	2.2	2.6	2.9	2.8	3.4	4.0	2.2	1.9	1.85	2.2	2.35	2.35
13	2.25	2.4	2.75	2.75	3.3	4.2	2.3	1.9	1.9	2.2	2.25	2.25
14	2.25	2.4	2.65	2.7	3.45	4.2	2.3	1.9	1.9	2.2	2.3	2.25
15	2.3	2.3	2.7	2.65	3.6	4.65	2.25	1.9	1.9	2.2	2.4	2.25
16	2.35	2.25	2.75	2.75	3.45	4.25	2.3	1.9	1.9	2.2	2.45	2.3
17	2.25	2.25	2.7	2.65	3.50	4.2	2.4	1.9	1.9	2.15	2.4	2.35
18	2.2	2.1	2.75	2.5	3.5	4.0	2.4	1.9	1.9	2.15	2.4	2.35
19	2.1	2.05	2.4	2.45	3.45	3.8	2.3	1.85	1.9	2.15	2.4	2.3
20	2.2	2.15	2.6	2.45	3.5	3.7	2.3	1.85	1.9	2.15	2.4	2.15
21	2.3	2.3	2.75	2.35	3.4	3.7	2.45	1.8	1.85	2.1	2.4	2.1
22	2.1	2.3	2.7	2.4	3.35	3.6	2.45	1.8	1.85	2.1	2.4	2.1
23	2.35	2.15	2.8	2.45	3.5	3.3	2.35	1.8	1.9	2.1	2.4	2.1
24	2.3	2.3	3.15	2.5	3.5	3.3	2.3	1.85	2.05	2.1	2.35	2.1
25	4.75	2.4	2.95	2.6	3.6	3.15	2.35	1.85	1.95	2.1	2.3	2.1
26	3.0	2.4	2.6	2.75	3.6	3.00	2.3	1.85	1.9	2.1	2.35	2.1
27	2.7	2.2	2.7	2.8	3.6	2.95	2.3	1.85	2.0	2.1	2.35	2.1
28	2.55	2.2	2.65	2.85	3.4	2.7	2.2	1.85	2.0	2.1	2.25	2.2
29	2.8	.....	2.75	2.95	3.25	2.7	2.3	1.85	2.0	2.15	2.05	2.2
30	3.7	.....	2.8	3.0	3.3	2.5	2.35	1.85	2.25	2.15	2.05	2.2
31	5.75	.....	2.85	.....	3.4	.....	2.2	1.85	.....	2.15	.....	2.2

Daily discharge, in second-feet, of Provo River above Telluride Power Co.'s dam near Provo, Utah, for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	300	1,000	270	510	550	900	300	240	172	240	285	270
2	285	570	285	550	490	950	285	172	172	335	285	270
3	410	490	270	595	530	850	270	172	185	318	300	270
4	318	430	270	510	410	925	270	172	185	270	300	270
5	370	490	300	490	490	1,080	300	160	185	270	300	285
6	335	530	318	620	550	1,180	300	172	172	255	300	285
7	318	410	335	470	690	1,250	285	172	172	255	300	300
8	318	335	430	490	670	1,180	285	172	172	285	318	318
9	335	370	710	490	710	1,150	285	160	185	270	318	300
10	410	352	830	530	760	1,150	210	160	185	318	370	318
11	300	410	975	510	670	1,080	225	160	172	300	410	335
12	300	370	490	450	710	1,000	240	160	172	300	352	352
13	318	300	430	430	670	1,100	270	160	185	300	318	318
14	318	300	390	410	735	1,100	270	160	185	300	335	318
15	335	270	410	390	810	1,320	255	160	185	300	370	318

Daily discharge, in second-feet, of Provo River above Telluride Power Co.'s dam near Provo, Utah, for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
16	352	255	430	430	735	1,120	270	160	185	300	390	335
17	318	255	410	390	760	1,100	300	160	185	285	370	352
18	300	210	430	335	760	1,000	300	160	185	285	370	352
19	270	198	300	318	735	900	270	148	185	285	370	335
20	300	225	370	318	760	850	270	148	185	285	370	285
21	335	270	430	285	710	850	318	160	172	270	370	270
22	270	270	410	300	690	810	318	160	172	270	370	270
23	352	225	450	318	760	670	285	160	185	270	370	270
24	335	270	595	385	760	670	270	172	225	270	352	270
25	1,480	300	510	370	810	595	285	172	198	270	335	270
26	615	300	370	430	810	530	270	172	185	270	352	270
27	490	240	410	450	810	510	270	172	210	270	352	270
28	430	240	390	470	710	410	240	172	210	270	318	300
29	530	.....	430	510	645	410	270	172	210	285	255	300
30	950	.....	450	530	670	335	285	172	285	285	255	300
31	1,920	.....	470	.....	710	.....	240	172	.....	285	.....	300

NOTE.—Daily discharge determined from two poorly defined rating curves, one applicable Jan. 1 to 30 and Oct. 3 to Dec. 31; the other Jan. 31 to Aug. 20. Indirect method for shifting channels used Aug. 21 to Oct. 3, 1911.

Monthly discharge of Provo River above Telluride Power Co.'s dam near Provo, Utah, for 1911.

[Drainage area, 640 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	1,920	270	458	0.716	0.83	28,200	D.
February	1,000	198	353	.552	.57	19,600	D.
March	975	270	438	.684	.79	26,900	D.
April	920	285	441	.689	.77	26,200	D.
May	810	410	686	1.07	1.23	42,200	D.
June	1,320	335	899	1.40	1.56	53,500	D.
July	318	210	275	.430	.50	16,900	D.
August	240	148	167	.261	.30	10,300	D.
September	285	172	189	.295	.33	11,200	D.
October	335	240	283	.442	.51	17,400	D.
November	410	255	336	.523	.58	19,900	D.
December	352	270	299	.467	.54	18,400	D.
The year	1,920	148	402	.628	8.51	291,000	

SOUTH FORK OF PROVO RIVER AT FORKS, UTAH.

Location.—At Forks, Utah, 12 miles above Provo, in the NW. ¼ SE. ¼ sec. 26, T. 5 S., R. 3 E., at a point about 150 feet above the confluence of the South Fork with Provo River.

Records available.—Station established October 22, 1911; records begun November 17, 1911. The discharge of the South Fork added to that of Provo River at Forks will give the total flow of Provo River available for diversion at the Telluride Power Co.'s dam.

Drainage area.—30 square miles.

Gage.—Vertical staff driven into the stream bed at the right bank 150 feet above the mouth and 40 feet southeast of the Denver & Rio Grande Railroad tracks.

Channel.—Probably permanent; well-defined control 30 feet below the gage composed of gravel and small bowlders. One channel at all stages. The left bank is liable to overflow in extreme floods.

Discharge measurements.—Made by wading about 30 feet below the gage.
Winter flow.—No ice forms at this station.
Cooperation.—Maintained in cooperation with Telluride Power Co.

The following discharge measurement was made by Dort and Gilkison by wading belo wgage.

October 31, 1911: Gage height, 2.36 feet; discharge, 35.3 second-feet.

Daily gage height, in feet, of South Fork of Provo River at Forks, Utah, for 1911.

[Frank Dusenberry, observer.]

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1		2.25	11		2.35	21	2.35	2.25
2		2.25	12		2.35	22	2.35	2.25
3		2.25	13		2.3	23	2.35	2.25
4		2.25	14		2.3	24	2.35	2.25
5		2.3	15		2.3	25	2.35	2.30
6		2.3	16		2.3	26	2.35	2.30
7		2.3	17	2.35	2.3	27	2.35	2.30
8		2.3	18	2.35	2.3	28	2.35	2.30
9		2.3	19	2.35	2.3	29	2.25	2.30
10		2.35	20	2.35	2.25	30	2.25	2.30
						31		2.30

LITTLE COTTONWOOD CREEK NEAR SALT LAKE CITY, UTAH.

Location.—At the mouth of the canyon, about one-fourth mile below the county bridge, 1½ miles above Armstrong Creek, half a mile below the Flagstaff smelting works, and in the SW. ¼ sec. 2, T. 3 S., R. 1 E.
Records available.—November 11, 1898, to May 20, 1899; August, 1904, to December, 1911.
Drainage area.—27.7 square miles.
Gage.—Hub at level with weir crest; depth of water measured with carpenter's rule.
Discharge measurements.—The flow of the stream is measured by two 15-foot Cippoletti weirs.
Winter flow.—No ice at the weir.
Diversions.—The Despain ditches, one on each side of the stream, divert water about 1½ miles above the weir. These ditches irrigate one small farm. Nearly all the water is used during the irrigating season.
Accuracy.—Records excellent.
Cooperation.—Records of daily discharge furnished by Salt Lake City engineer.

Daily discharge, in second-feet, of Little Cottonwood Creek near Salt Lake City, Utah, for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	9.58	62.87	21.27						7.52	15.94	11.07	7.52
2	9.58	60.17	21.27						7.52	21.27	8.90	6.89
3	11.87	55.02	21.27						7.52	25.17	9.58	6.89
4	10.35	44.96	21.27						6.89	26.13	8.90	5.63
5	10.35	47.41	21.27						6.89	25.17	8.90	5.63
6	10.35	35.7	22.27						6.22	25.17	9.58	5.63
7	11.07	33.48	22.27						6.22	24.13	9.58	4.46
8	11.07	17.60	20.38						5.63	23.19	9.58	5.63
9	11.07	17.60	17.60						5.01	23.19	8.17	5.63
10	11.87	16.76	15.94						5.63	23.19	7.52	5.63
11	11.07	17.60	15.94						6.22	22.27	7.52	5.63
12	11.07	17.60	17.60						6.89	21.27	8.17	5.63
13	11.07	16.76	17.60						8.90	19.41	7.52	4.46
14	10.35	15.94	17.60						8.17	19.41	7.21	5.63
15	10.35	15.94	17.60					21.27	8.17	15.94	6.89	5.63

Daily discharge, in second-feet, of Little Cottonwood Creek near Salt Lake City, Utah, for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
16	11.07	16.76	18.54	.....	.....	.....	.....	19.41	7.52	14.25	6.89	6.22
17	11.07	16.76	18.54	.....	.....	.....	.....	19.41	6.89	13.39	6.89	6.22
18	11.07	17.60	17.60	.....	.....	.....	.....	18.54	6.89	12.62	8.17	5.63
19	10.35	18.54	17.60	.....	.....	.....	.....	17.60	6.89	12.62	9.58	5.63
20	10.35	19.41	17.60	.....	.....	.....	.....	16.76	6.22	12.62	11.07	6.22
21	11.07	19.41	17.60	.....	.....	.....	.....	17.60	6.22	12.62	9.58	5.63
22	11.07	18.54	21.27	.....	.....	.....	.....	19.41	6.22	14.25	9.58	6.22
23	10.35	18.54	23.19	.....	.....	.....	.....	14.25	8.90	14.25	9.58	6.22
24	11.07	17.60	23.19	.....	.....	.....	.....	12.62	9.58	14.25	9.58	5.63
25	11.87	18.54	25.17	.....	.....	.....	.....	14.25	9.58	13.39	10.35	6.22
26	11.87	19.41	26.13	.....	.....	.....	.....	11.07	10.35	13.39	8.90	5.63
27	11.87	19.41	19.41	.....	.....	.....	.....	9.58	12.62	12.62	8.90	5.63
28	12.62	26.13	19.41	.....	.....	.....	.....	8.90	12.62	12.62	8.17	5.63
29	19.41	.....	23.19	.....	.....	.....	.....	8.90	13.39	11.87	8.17	5.63
30	31.31	.....	27.20	.....	.....	.....	.....	8.17	14.25	11.07	8.17	4.46
31	62.87	.....	31.31	.....	.....	.....	.....	7.52	.....	11.87	.....	4.46

NOTE.—No record from Apr. 1 to Aug. 14, as the weir was out of order.

Monthly discharge of Little Cottonwood Creek near Salt Lake City, Utah, for 1911.

[Drainage area, 27.7 square miles.]

Month.	Discharge in second-feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.
January	62.9	9.58	13.6	0.491	0.57	836
February	62.9	15.9	25.8	.931	.97	1,430
March	31.3	15.9	20.6	.744	.86	1,270
August (15-31)	21.3	7.52	14.4	.520	.33	486
September	14.2	5.01	8.05	.291	.32	479
October	26.1	11.1	17.4	.628	.72	1,070
November	11.1	6.89	8.76	.316	.35	521
December	7.52	4.46	5.74	.207	.24	353

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

BIG COTTONWOOD CREEK NEAR SALT LAKE CITY, UTAH.

Location.—At the mouth of the canyon, just below the county bridge, in the SW. ¼ NE. ¼ sec. 25, T. 2 S., R. 1 E.

Records available.—November, 1898, to December, 1911.

Drainage area.—48.5 square miles.

Gage.—Vertical graduated glass tube set on lower side of dam.

Discharge measurements.—Made with two 15-foot Cippoletti weirs.

Winter flow.—No ice forms at the weirs.

Diversions.—The Butler ditch, which takes out water from the left bank about three-fourths of a mile above the weir, is entitled to about 2 second-feet during irrigating season; not included in discharge record. The water is used for irrigation and for municipal supply in Salt Lake City.

Accuracy.—Excellent.

Cooperation.—Records of daily discharge furnished by Salt Lake City engineer.

Daily discharge, in second-feet, of Big Cottonwood Creek near Salt Lake City, Utah, for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	37.87	70.92	41.20	60.42	87.68	264.52	149.70	69.58	37.87	49.31	34.64	26.52
2	37.87	61.70	38.97	66.92	84.80	285.67	154.92	66.92	37.87	50.50	29.47	26.52
3	.....	50.50	38.97	72.27	81.96	285.67	160.19	68.24	36.79	48.12	29.47	26.52
4	.....	49.31	37.87	72.27	101.00	307.36	137.78	64.29	35.71	46.94	29.47	25.55
5	.....	48.12	41.20	73.63	134.43	334.08	132.77	61.70	34.64	45.77	34.64	26.52
6	.....	50.50	40.08	73.63	196.79	350.01	129.46	57.89	38.97	43.46	31.51	26.52
7	.....	41.20	36.79	68.24	200.59	320.63	129.46	57.89	37.87	43.46	28.48	25.55
8	.....	34.64	32.54	64.29	212.12	366.18	129.46	51.71	37.87	40.08	30.49	25.55
9	41.20	34.64	38.97	66.92	223.87	361.53	116.52	52.93	35.71	38.97	31.51	25.55
10	42.33	46.94	45.77	73.63	204.41	272.91	110.23	52.93	34.64	43.46	31.51	26.52
11	38.97	43.46	52.93	79.15	170.90	287.82	104.05	52.93	34.64	44.61	28.48	26.52
12	36.79	43.46	50.50	73.63	151.44	350.01	107.12	50.50	31.51	42.33	30.49	25.55
13	31.51	43.46	44.61	69.58	154.92	387.32	104.05	48.12	35.71	42.33	29.47	25.55
14	41.20	41.20	44.61	68.24	163.74	375.52	104.05	50.50	38.97	35.71	29.47	23.66
15	40.09	38.97	48.12	64.29	161.96	329.58	99.49	49.31	35.71	37.87	28.48	25.55
16	38.97	34.64	48.12	61.70	154.92	289.97	93.52	46.94	35.71	37.87	32.54	25.55
17	40.09	32.54	48.12	64.29	156.67	289.97	96.49	46.94	34.64	36.79	31.51	25.55
18	34.64	33.59	44.61	65.60	169.10	285.67	96.49	45.77	34.64	35.71	31.51	25.55
19	37.87	36.79	48.12	68.24	161.96	289.97	95.00	45.77	34.64	34.64	30.49	23.66
20	36.79	38.97	46.94	70.92	142.85	296.45	81.96	43.46	34.64	34.64	29.47	24.60
21	37.87	40.08	49.31	68.24	136.10	275.03	80.55	43.46	34.64	33.59	30.49	24.60
22	40.09	35.71	51.71	62.99	134.43	268.70	76.37	42.33	34.64	33.59	29.47	23.66
23	33.59	43.46	51.71	52.93	165.52	245.95	76.37	42.33	36.79	34.64	26.52	24.60
24	34.64	38.97	60.42	56.63	196.79	239.86	69.58	42.33	37.87	34.64	28.48	24.60
25	43.46	43.46	60.42	62.75	216.01	214.07	68.24	42.33	36.79	32.54	27.49	23.66
26	40.08	40.08	57.89	68.87	243.91	191.14	72.27	42.33	35.71	32.54	28.48	21.82
27	40.08	32.54	51.71	75.00	216.01	187.41	68.24	40.08	40.08	34.64	27.49	25.55
28	40.08	38.97	51.71	86.24	193.02	185.55	70.92	40.08	37.87	32.54	20.91	24.60
29	37.87	.....	51.71	93.52	189.27	181.85	66.92	38.97	35.71	31.51	22.73	24.60
30	56.63	.....	52.93	90.58	204.41	172.71	66.92	37.87	46.94	29.47	23.66	24.60
31	79.15	.....	59.15	.....	237.84	.....	70.92	37.87	.....	31.51	.....	23.66

NOTE—Discharge on April 25-26 and Aug. 23 interpolated by engineers of the United States Geological Survey.

Monthly discharge of Big Cottonwood Creek near Salt Lake City, Utah, for 1911.

[Drainage area, 48.5 square miles.]

Month.	Discharge in second-feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.
January	79.2	31.5	40.2	0.829	0.96	2,470
February	70.9	32.5	42.5	.877	.91	2,360
March	60.4	32.5	47.3	.975	1.12	2,910
April	93.5	52.9	69.9	1.44	1.61	4,160
May	238	82.0	169	3.49	4.02	10,400
June	387	173	283	5.84	6.52	16,800
July	160	66.9	101	2.08	2.40	6,210
August	69.6	37.9	49.5	1.02	1.18	3,040
September	46.9	31.5	36.5	.753	.84	2,170
October	50.5	29.5	38.4	.792	.91	2,360
November	34.6	20.9	29.3	.604	.67	1,740
December	26.5	21.8	25.1	.518	.60	1,540
The year	366	20.9	77.7	1.60	21.66	56,200

NOTE.—The Butler ditch diverts approximately 2 second-feet during the irrigating season above the weirs, and this amount is not included in the above record. Discharge Jan. 3 to 8 estimated at 38 second-feet. Monthly values computed by engineers of the United States Geological Survey.

MILL CREEK NEAR SALT LAKE CITY, UTAH.

Location.—Near the mouth of canyon, at a weir in the SW. ¼ NW. ¼ sec. 31, T. 1 S., R. 2 E. A weir is also located in the power plant tailrace in the SE. ¼ NE. ¼ sec. 36, T. 1 S., R. 1 E.

Records available.—Fall of 1898 to December, 1911.

Drainage area.—21.3 square miles.

Gage.—Depth of water measured by a carpenter's rule from a hub set level with crest of weir in creek and by a hook gage in tailrace.

Discharge measurements.—There is a 12.5-foot Cippoletti weir in the main stream and a 5-foot rectangular weir in the tailrace of the power plant.

Winter flow.—No ice forms at the weir.

Diversions.—Most of the water is used for irrigation during the summer season.

Accuracy.—Excellent.

Cooperation.—Records of daily discharge furnished by Salt Lake City engineer.

Daily discharge, in second-feet, of Mill Creek near Salt Lake City, Utah, for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	11.33	5.58	7.04	9.03	11.48	36.37	16.67	11.05	7.76	6.64	6.87	5.33
2	11.33	5.58	7.04	8.73	11.48	36.37	15.07	11.05	7.76	6.64	6.34	5.33
3	5.26	5.58	7.04	8.73	11.48	36.37	15.07	11.05	7.76	6.64	6.34	5.11
4	5.26	5.58	7.04	8.73	11.48	40.72	15.07	11.05	7.76	6.64	6.34	5.27
5	5.26	5.26	7.46	8.73	15.74	40.72	15.07	11.05	7.76	6.64	6.34	5.27
6	5.26	3.71	7.46	8.73	15.74	40.72	15.07	11.05	7.76	6.64	6.34	5.27
7	5.26	3.71	7.46	8.73	18.35	40.72	15.07	11.05	7.76	6.64	6.34	5.27
8	5.26	3.71	7.62	8.73	18.35	35.76	14.66	11.05	7.48	7.76	6.34	5.27
9	5.26	3.42	7.62	10.27	18.35	31.21	14.66	11.05	7.48	7.76	6.34	5.27
10	5.26	3.71	7.32	10.27	18.35	31.21	14.66	11.05	6.89	7.76	6.34	5.27
11	5.26	3.71	7.32	10.27	18.35	30.66	14.66	7.76	6.89	7.76	6.34	5.27
12	5.26	3.71	7.62	10.27	18.35	30.66	14.66	7.76	6.89	7.76	6.34	5.27
13	5.26	3.71	7.62	10.27	18.35	30.66	14.66	7.76	6.89	7.76	6.34	5.27
14	5.26	3.71	7.62	10.27	18.35	30.66	12.90	7.76	6.89	7.76	6.34	6.04
15	5.26	3.71	7.34	10.27	22.90	30.66	12.90	7.76	6.89	7.76	6.34	6.64
16	5.26	3.71	7.34	10.27	22.90	28.30	11.04	7.76	6.89	7.17	4.68	6.64
17	5.95	3.71	7.48	10.27	22.90	26.77	11.04	7.76	6.89	7.17	4.68	6.64
18	5.95	3.71	7.48	10.27	22.90	28.30	11.04	7.76	6.89	7.17	4.68	6.64
19	5.95	7.04	7.48	10.27	22.90	28.30	11.04	7.76	6.64	7.17	4.68	6.37
20	5.95	7.04	7.48	10.27	22.90	26.25	11.04	7.48	6.64	7.17	4.68	6.07
21	5.95	7.04	7.48	10.27	22.90	18.51	11.04	7.48	6.64	7.17	4.68	6.34
22	5.26	7.04	7.48	10.27	33.43	18.51	11.04	7.48	6.64	7.17	4.68	6.34
23	5.26	7.04	7.48	10.27	33.43	18.51	11.04	7.48	6.64	7.17	4.68	6.34
24	5.26	7.04	7.48	10.27	33.43	18.51	11.04	7.48	6.64	7.17	4.68	6.04
25	5.26	7.04	7.48	11.48	33.43	18.51	11.04	7.48	6.64	6.45	4.68	5.03
26	3.99	7.04	7.18	11.48	33.43	18.51	11.04	7.48	6.64	6.45	6.34	5.03
27	3.99	7.04	7.18	11.48	33.43	18.51	11.70	7.76	6.64	6.45	5.33	5.03
28	3.99	7.04	7.18	11.48	33.43	18.51	11.70	7.76	6.64	6.45	5.33	5.03
29	3.99	.....	7.18	11.48	33.43	16.67	11.70	7.76	6.64	6.87	5.33	5.32
30	3.99	.....	7.48	11.48	33.43	16.67	11.05	7.76	6.64	6.87	5.33	5.32
31	3.99	.....	9.03	.....	36.76	.....	11.05	7.76	.....	6.87	.....	5.56

NOTE.—The above record represents the total flow in the creek near the mouth of the canyon, including the flow in the creek plus the flow in the tailrace.

Monthly discharge of Mill Creek near Salt Lake City, Utah, for 1911.

[Drainage area, 21.3 square miles.]

Month.	Discharge in second-feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.
January	11.33	3.99	5.52	0.259	0.30	339
February	7.04	3.42	5.21	.245	.26	289
March	9.03	7.04	7.44	.349	.40	457
April	11.48	8.73	10.1	.475	.53	601
May	36.76	11.48	23.3	1.09	1.26	1,430
June	40.72	16.67	28.1	1.32	1.47	1,670
July	16.67	11.04	12.9	.607	.70	793
August	11.05	7.48	8.76	.411	.47	538
September	7.76	6.64	7.03	.330	.37	418
October	7.76	6.45	7.08	.332	.38	435
November	6.87	4.68	5.67	.266	.30	337
December	6.64	5.03	5.69	.267	.31	340
The year	40.72	3.42	10.6	.498	6.75	7,660

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

PARLEYS CREEK NEAR SALT LAKE CITY, UTAH.

Location.—At the mouth of the canyon, just above the intake of the city waterworks, in the northwest corner of the NW. ¼ NW. ¼ sec. 25, T. 1 S., R. 1 E.

Records available.—Fall of 1898 to December, 1911.

Drainage area.—50.1 square miles.

Gage.—Hook.

Discharge measurements.—Two 10-foot Cippoletti weirs are used to determine the flow of the stream.

Winter flow.—No ice forms at the weir.

Diversions.—The city obtains part of its water supply from this creek and any surplus water is used for irrigation during the summer season. The Parleys surplus ditch diverts water from the left bank about 1 mile above the weir.

Accuracy.—Excellent.

Cooperation.—Records of daily discharge furnished by Salt Lake City engineer.

Daily discharge, in second-feet, of Parleys Creek near Salt Lake City, Utah, for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	9.98	22.39	9.98	18.33	33.67	27.46	19.65	12.76	7.92	11.06	7.92	6.48
2	4.31	17.68	10.52	20.33	27.46	27.46	19.65	12.76	7.92	12.76	7.92	6.48
3	8.42	15.15	10.52	21.70	25.25	26.72	19.65	12.76	7.92	10.52	7.92	6.48
4	10.52	15.15	12.76	23.10	28.98	24.52	18.99	12.19	7.43	11.06	7.92	7.43
5	10.52	13.94	12.19	28.22	33.67	25.25	18.33	12.19	7.43	11.06	7.92	8.42
6	10.52	13.35	12.76	24.52	34.47	24.52	18.33	11.62	7.43	11.62	8.42	10.52
7	10.52	8.42	12.76	24.52	37.76	24.52	21.70	10.52	7.43	11.62	8.42	12.76
8	10.52	6.48	13.35	24.52	40.28	24.52	16.40	9.98	7.43	11.62	8.93	11.06
9	12.19	7.43	13.94	25.98	45.50	26.72	15.15	9.98	7.43	11.62	9.45	10.89
10	11.62	11.62	13.94	25.98	42.86	24.52	15.15	9.98	7.43	11.62	8.93	10.72
11	10.52	12.19	17.68	25.98	37.76	23.10	15.15	9.98	7.92	12.19	6.95	10.55
12	10.52	12.76	15.77	27.46	35.29	22.39	14.54	9.98	7.92	12.76	4.31	10.38
13	10.52	12.76	14.54	26.72	32.08	22.39	18.99	9.45	7.92	12.19	9.45	10.21
14	10.52	12.76	15.15	24.52	32.87	22.39	19.65	9.45	7.92	11.06	9.45	10.04
15	10.52	4.31	15.77	24.52	32.87	22.39	18.99	9.45	7.92	10.52	8.93	9.86
16	9.98	5.58	16.40	23.81	32.08	22.39	17.68	8.93	7.43	9.98	8.93	9.68
17	4.72	6.48	17.03	24.52	32.08	22.39	16.40	8.93	7.92	9.45	8.93	9.50
18	5.58	7.43	18.33	23.81	32.08	22.39	15.77	8.93	7.92	8.93	9.45	8.93
19	11.06	8.42	18.33	23.10	32.08	22.16	15.77	8.93	7.92	8.93	9.45	4.60
20	11.06	9.98	18.99	24.52	32.08	21.93	15.15	8.42	7.92	8.42	9.45	4.81
21	9.45	6.48	18.99	24.52	32.08	21.70	15.15	8.42	7.92	8.42	9.45	7.38
22	2.80	9.45	20.33	24.52	33.67	21.70	15.15	8.42	7.92	7.92	8.42	5.22
23	4.31	11.06	21.01	25.98	34.47	21.01	14.54	8.93	7.92	7.92	6.48	8.42
24	12.19	11.62	21.70	28.22	34.47	20.33	14.33	8.93	8.93	8.42	6.07	8.42
25	13.94	12.19	22.39	28.98	35.29	18.99	14.10	8.42	8.93	8.42	6.08	8.42
26	12.76	11.62	21.01	31.29	30.50	18.99	13.88	8.42	8.42	8.93	6.14	6.38
27	12.19	8.42	20.39	32.87	29.74	18.99	13.66	8.42	8.42	8.93	6.20	5.22
28	12.19	8.42	18.99	38.59	28.98	18.33	13.44	8.42	8.42	8.93	6.26	11.74
29	12.19	.....	17.68	44.61	25.98	21.70	13.22	8.42	8.42	8.93	6.33	6.38
30	24.52	.....	17.68	53.70	24.52	17.03	12.99	8.42	10.52	8.42	6.40	6.38
31	25.98	.....	17.03	.....	24.52	.....	12.88	8.42	.....	8.42	.....	6.38

NOTE.—Discharge June 19, 20, July 24-31, Nov. 25-30, and Dec. 9-16, interpolated by engineers of the United States Geological Survey.

Monthly discharge of Parleys Creek near Salt Lake City, Utah, for 1911.

[Drainage area, 50.1 square miles.]

Month.	Discharge in second-feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.
January	26.0	4.31	10.9	0.218	0.25	670
February	22.4	4.31	10.8	.216	.22	600
March	22.4	9.93	16.4	.328	.38	1,010
April	53.7	18.3	27.3	.545	.61	1,620
May	45.5	24.5	32.8	.655	.76	2,020
June	27.5	17.0	22.6	.451	.50	1,340
July	21.7	12.9	16.3	.326	.38	1,000
August	12.8	8.42	9.70	.194	.22	596
September	10.5	7.43	8.01	.160	.18	477
October	12.8	7.92	10.1	.202	.23	621
November	9.45	4.31	7.89	.157	.18	469
December	12.8	4.60	8.39	.167	.19	516
The year	53.7	4.31	15.1	.302	4.10	10,900

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

EMIGRATION CREEK NEAR SALT LAKE CITY, UTAH.

Location.—About half a mile below the mouth of the canyon and below Wagener's brewery, in the SW. ¼ NW. ¼ sec. 11, T. 1 S., R. 1 E. A weir is also located in a pipe line about half a mile east of Wagener's brewery, in a tank house.

Records available.—Fall of 1898 to December, 1911.

Drainage area.—29 square miles.

Gage.—Graduated copper plates used as staff gages in pipe line and creek.

Discharge.—Computed from flow over two Cippoletti weirs 2.5 feet and 5 feet long in creek and a 2-foot rectangular weir in pipe line from spring just inside mouth of canyon.

Diversions.—The city has obtained a small part of its water supply by developing a spring a short distance up the canyon, keeping the water out of the creek by means of a pipe line. This water is included in the total run-off record.

Regulation.—None.

Accuracy.—Excellent.

Cooperation.—Records of daily discharge furnished by Salt Lake City engineer.

Daily discharge, in second-feet, of Emigration Creek near Salt Lake City, Utah, for 1911.

[A. Hawkes, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1					6.81					0.60	0.60	
2			1.72	5.80				1.12				
3	2.40	3.15			5.80	3.15	1.72	.60	0.39	.60		0.50
4				7.83			1.72		.39			.50
5		3.15	2.40					1.12			.60	
6				8.93	4.85	3.15	1.72	.60				.50
7										.60		
8				8.93			1.72	.60	.39			
9	2.40	2.40			4.85					.60	.60	.50
10			4.85	6.81		3.15	1.56	.60	.39	.60	.60	.50
11					3.99			.60	.39		.60	.50
12	2.40	2.40										
13												
14												
15			4.85									

Daily discharge, in second-feet, of City Creek near Salt Lake City, Utah, for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	22.98	27.32	15.46	10.33	7.42	6.97	6.09	5.53
2	.....	22.75	27.08	15.06	10.00	7.42	6.67	6.09	5.53
3	.....	22.54	26.85	14.87	10.00	7.42	6.67	6.09	5.53
4	.....	23.42	27.79	14.68	10.00	7.28	6.52	6.09	5.53
5	.....	24.50	27.79	14.30	10.00	7.42	6.52	6.09	5.53
6	.....	25.58	27.79	13.92	9.82	7.42	6.52	6.09	5.53
7	.....	26.66	27.79	13.92	9.66	7.42	6.52	6.09	5.53
8	.....	27.74	28.03	13.73	9.32	7.28	6.38	6.38	5.53
9	.....	28.82	26.85	13.73	9.32	7.12	6.38	6.38	5.53
10	.....	29.90	25.00	13.54	9.32	7.12	6.97	6.38	5.53
11	.....	30.98	24.77	13.18	9.00	7.12	6.67	5.95	5.53
12	.....	32.07	24.32	12.80	9.00	7.12	6.67	5.81	5.53
13	.....	33.16	23.42	12.62	8.68	7.12	6.52	5.81	5.53
14	.....	31.66	22.75	12.44	8.68	7.12	6.38	5.81	5.53
15	.....	31.42	21.87	12.44	8.68	6.82	6.38	5.81	5.53
16	.....	31.17	21.00	12.32	8.68	6.82	6.38	5.81	5.53
17	.....	32.16	20.36	12.20	8.52	6.82	6.38	5.81	5.53
18	.....	32.91	19.93	12.08	8.36	6.82	6.38	5.81	5.53
19	.....	31.92	19.51	11.96	8.36	6.82	6.38	5.81	5.53
20	.....	29.95	19.09	11.84	8.20	6.82	6.38	5.81	5.26
21	.....	28.51	18.46	11.72	8.20	6.52	6.38	5.95	5.26
22	.....	28.27	18.26	11.60	8.20	6.67	6.38	6.09	5.26
23	.....	28.03	17.84	11.49	8.20	7.28	6.38	6.09	5.26
24	.....	27.32	17.44	11.38	7.89	6.82	6.38	5.81	5.26
25	.....	28.03	17.04	11.02	7.89	6.82	6.38	5.81	5.26
26	.....	29.23	16.44	11.02	7.89	6.67	6.38	5.81	5.26
27	16.44	28.75	16.24	11.02	7.89	6.52	6.09	5.81	5.26
28	17.24	28.51	15.84	10.68	7.89	6.67	6.09	5.81	5.26
29	18.88	28.03	15.65	10.68	7.58	7.12	6.09	5.53	5.26
30	20.58	27.32	15.65	10.33	7.58	7.28	6.09	5.53	5.26
31	.....	28.03	.....	10.33	7.58	.....	6.09	.....	5.26

NOTE.—Discharge May 5 to 12 and July 16 to 23 interpolated by engineers of the United States Geological Survey.

Monthly discharge of City Creek near Salt Lake City, Utah, for 1912.

[Drainage area, 19.2 square miles.]

Month.	Discharge in second-feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.
May	33.2	22.5	28.4	1.48	1.71	1,750
June	28.0	15.6	21.9	1.14	1.27	1,300
July	15.5	10.3	12.5	.653	.75	769
August	10.3	7.58	8.73	.454	.52	537
September	7.42	6.52	7.03	.366	.41	418
October	6.97	6.09	6.43	.334	.39	395
November	6.38	5.53	5.94	.309	.34	353
December	5.53	5.26	5.42	.282	.33	333
The period	.....	.....	.....	.....	.....	5,860

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

SEVIER LAKE BASIN.

SEVIER RIVER NEAR HATCHTOWN, UTAH.

Location.—Just below the Hatchtown reservoir, about 2 miles east of Hatchtown, Utah.

Records available.—June 3 to November 4, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff; datum unchanged.

Channel.—Permanent.

Discharge measurements.—Made from car and cable.

Winter flow.—Conditions unknown.

Diversions.—Water is diverted for the Hatchtown project about 8 miles below the station.

Regulation.—The flow is entirely controlled by the gates in the reservoir.

Accuracy.—Fair.

Cooperation.—Discharge measurements and gage-height records furnished by the State Land Board.

Discharge measurements of Sevier River near Hatchtown, Utah, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
June 3	H. S. Kleinschmidt	3.90	539
4	do	3.90	532
July 30	J. J. Hayes	1.90	133
31	do	2.70	268

Daily gage height, in feet, of Sevier River near Hatchtown, Utah, for 1911.

[J. C. Barnhurst, observer.]

Day.	June.	July.	Aug.	Sept.	Oct.	Nov.	Day.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	3.00	3.30	2.70	1.80	1.60	16	3.90	2.20	2.10	2.69	3.00	.....
2	.....	2.80	3.30	2.70	1.60	1.60	17	3.90	2.20	2.10	2.70	2.99	.....
3	3.90	2.80	3.30	2.70	1.60	1.60	18	3.50	2.20	2.10	2.70	2.98	.....
4	3.90	2.80	3.30	2.70	1.60	1.60	19	3.30	2.20	2.10	2.70	2.97	.....
5	3.50	3.00	3.30	2.70	1.60	1.60	20	3.30	2.20	2.10	1.60	2.96	.....
6	4.10	3.00	3.30	2.70	1.60	.....	21	3.40	2.20	2.10	1.60	2.95	.....
7	4.10	2.20	3.30	2.70	1.60	.....	22	3.30	2.20	2.10	1.60	1.60	.....
8	4.10	2.20	1.80	2.70	2.30	.....	23	2.90	3.40	2.10	1.60	1.60	.....
9	4.20	2.20	1.80	2.70	2.30	.....	24	2.90	3.40	2.10	1.60	1.60	.....
10	4.20	2.20	1.80	2.69	2.30	.....	25	3.60	3.40	2.10	1.60	1.60	.....
11	4.20	2.20	2.10	2.69	2.30	.....	26	3.60	3.40	2.10	1.60	1.60	.....
12	3.50	2.20	2.10	2.69	2.30	.....	27	3.60	3.40	2.10	1.60	1.60	.....
13	3.40	2.20	2.10	2.68	2.30	.....	28	2.90	3.40	2.10	1.80	1.60	.....
14	3.40	2.20	2.10	2.69	2.30	.....	29	2.90	3.40	2.10	1.80	1.60	.....
15	3.40	2.20	2.10	2.69	3.00	.....	30	2.90	3.30	2.70	1.80	1.60	.....
							31	.....	3.30	.....	.....	1.60	.....

Daily discharge, in second-feet, of Sevier River near Hatchtown, Utah, for 1911.

Day.	June.	July.	Aug.	Sept.	Oct.	Nov.	Day.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	331	395	270	120	96	16	536	179	163	268	331	.....
2	.....	290	395	270	96	96	17	536	179	163	270	329	.....
3	536	290	395	270	96	96	18	441	179	163	270	327	.....
4	536	290	395	270	96	96	19	395	179	163	270	325	.....
5	441	331	395	270	96	.....	20	395	179	163	96	323	.....
6	584	331	395	270	96	.....	21	118	179	163	96	320	.....
7	584	179	395	270	96	.....	22	395	179	163	96	96	.....
8	584	179	120	270	196	.....	23	310	418	163	96	96	.....
9	608	179	120	270	196	.....	24	310	418	163	96	96	.....
10	608	179	120	268	196	.....	25	464	418	163	96	96	.....
11	608	179	163	268	196	.....	26	464	418	163	96	96	.....
12	441	179	163	268	196	.....	27	464	418	163	96	96	.....
13	418	179	163	266	196	.....	28	310	418	163	120	96	.....
14	418	179	163	268	196	.....	29	310	418	163	120	96	.....
15	418	179	163	268	331	.....	30	310	395	270	120	96	.....
							31	.....	395	270	.....	96	.....

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

Monthly discharge of Sevier River near Hatchtown, Utah, for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
June 3-30	608	310	459	25,500	B.
July	418	179	272	16,700	B.
August	395	120	218	13,400	C.
September	270	96	208	12,400	C.
October	331	96	171	10,500	C.
November (1-4)	.....	96	96	760	C.
The period	.....	.....	.....	79,300	

SEVIER RIVER NEAR JUNCTION, UTAH.

Location.—At Harris's ranch, about 1,000 feet below the junction of the East and South forks of Sevier River and about 1½ miles east of Junction, Utah.

Records available.—June 1 to September 30, 1911.

Drainage area.—Not measured.

Gage.—Inclined staff gage on right bank; datum unchanged.

Channel.—Shifting.

Discharge measurements.—Made from car and cable.

Winter flow.—No ice forms at this station.

Diversions.—Some water is diverted for the Hatchtown project about 50 miles above, from the South Fork of Sevier River.

Regulation.—The flow is controlled to a large degree by the Otter Creek reservoir on the East Fork and Hatchtown reservoir on the South Fork.

Accuracy.—Good during the period covered by the record.

Cooperation.—Discharge measurements and gage-height records furnished by the State Land Board.

Discharge measurements of Sevier River near Junction, Utah, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
May 24	H. S. Kleinschmidt	1.30	452
29	do	1.55	516
June 23	do	.70	289
23	do	.60	263
24	do	.51	238
July 23	do	1.30	460
29	J. J. Hayes	1.74	612
Aug. 5	do	.70	300
10	do	.64	296
12	do	.70	303
19	do	.80	323
Nov. 27	J. C. Dort	.96	307

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

[Charles Harris, observer.]

Day.	June.		July.		August.		September.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	1.5	515	1.1	396	1.3	474	0.6	277
2	1.4	485	1.3	455	1.1	414	.7	302
3	1.3	455	1.3	455	.8	328	.....	.....
4	1.1	396	1.3	455	.8	328	.....	.....
5	1.1	396	1.3	455	.8	328	.....	.....
6	1.1	396	1.3	455	.7	302	.....	.....
7	1.0	368	1.3	455	.5	253	.....	.....
8	1.0	368	1.2	425	.4	230	.....	.....
9	1.3	455	1.1	396	.6	277	.....	.....
10	1.1	396	1.0	368	.6	277	.....	.....
11	1.2	425	1.0	368	.7	302	.....	.....
12	.9	340	1.0	368	.7	302	.....	.....
13	.8	313	1.0	368	.7	302	.....	.....
14	.9	340	1.0	368	.7	302	.....	.....
15	1.2	425	1.0	368	.7	302	.....	.....
16	.9	340	1.0	368	.7	302	.....	.....
17	1.2	425	1.0	368	.8	328	.....	.....
18	1.2	425	1.0	368	.8	328	.....	.....
19	1.2	425	1.1	396	.8	328	.....	.....
20	1.1	396	1.3	455	.9	356	.....	.....
21	1.1	396	1.4	485	.9	356	.....	.....
22	.9	340	1.4	485	.9	356	.....	.....
23	.7	288	1.4	485	.9	356	.....	.....
24	.7	288	1.5	515	.9	356	.9	356
25	.4	219	1.5	515	.9	356	.9	356
26	.7	288	2.0	696	.9	356	.9	356
27	.5	240	2.0	696	.8	328	.6	277
27	.3	198	1.9	664	.8	328	.8	328
29	.9	340	1.8	632	.8	328	.8	328
30	.9	340	1.7	600	.4	230	2.5	856
31	.....	.....	1.7	600	.4	230	.....	.....

NOTE.—Discharge determined from two well-defined discharge rating curves, one applicable from June 1 to July 25, 1911, the other from July 26 to Sept. 29, 1911.

Monthly discharge of Sevier River near Junction, Utah, for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
June	515	198	367	21,800	A.
July	696	368	467	28,700	A.
August	474	230	321	19,700	A.

SEVIER RIVER AT PIUTE RESERVOIR, NEAR JUNCTION, UTAH.

Location.—About 500 yards below the dam for the Piute reservoir and 10 miles south of Marysvale.

Records available.—May 17 to August 31, 1911.

Drainage area.—Not measured.

Gage.—Inclined gage on right bank; datum unchanged.

Channel.—Probably permanent under the cable but shifting at point of control.

Discharge measurements.—Made from car and cable.

Winter flow.—Considerable mush ice flows in the river during the winter.

Diversions.—Very little water is diverted from the Sevier River near this station.

Regulation.—The flow past the station is controlled absolutely by the gates in the dam.

Accuracy.—Good during the period covered by the record.

Cooperation.—Maintained in cooperation with the State Land Board.

Discharge measurements of Sevier River at Piute reservoir, near Junction, Utah, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
May 18	H. S. Kleinschmidt	3.60	756
22	do	2.95	536
22	do	1.55	135
23	do	2.72	456
29	do	2.78	464
29	do	2.85	501
June 22	do	2.55	383
25	do	2.18	270
July 13	do	2.63	408
23	do	2.82	473
30	J. J. Hayes	2.94	517
Aug. 6	do	2.63	394
13	do	2.62	403
Nov. 27[a]	J. C. Dort	3.14	389

[a] Affected by ice and change in channel.

Daily gage height, in feet, and discharge, in second-feet, of Sevier River at Piute reservoir, near Junction, Utah, for 1911.

Day.	May.		June.		July.		August.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1				470	2.70	432	2.66	418
2				470	2.70	432	2.66	418
3				470	2.60	396	2.60	396
4				470	2.60	396	2.58	389
5				470	2.60	396	2.63	407
6				470	2.70	432	2.63	407
7				470	2.70	432	2.62	403
8			2.80	470	2.80	470	2.72	440
9				460	2.80	470	2.71	436
10				450	2.78	462	2.70	432
11				445	2.77	459	2.67	421
12				435	2.76	455	2.64	410
13				428	2.64	410	2.62	403
14				420	2.70	432	2.62	403
15				412	2.69	428	2.61	400
16				402	2.69	428	2.61	400
17	3.60	790		394	2.69	428	2.61	400
18	3.60	790	2.57	386	2.68	425	2.62	403
19	3.50	750	2.57	386	2.70	432	2.62	403
20	3.50	750		386	2.74	447	2.62	403
21	2.95	530		379	2.81	474	2.62	403
22	2.80	470	2.55	379	2.82	478	2.63	407
23	2.70	432		336	2.82	478	2.63	407
24	2.80	470	2.28	294	2.83	482	2.62	403
25		470	2.18	267	2.87	498	2.62	403
26		470	2.20	272	2.92	518	2.61	400
27		470	2.20	272	2.92	518	2.60	396
28		470	2.20	272	2.94	526	2.59	393
29	2.80	470	2.65	414	2.94	526	2.59	393
30		470	2.65	414	2.94	526	2.58	389
31		470			2.95	530	2.57	386

NOTE.—Discharge determined from a well-defined rating curve. Discharge interpolated for days of missing gage heights.

SEVIER RIVER NEAR MARYSVALE, UTAH.

Location.—At Peter Pitts's ranch, about 6 miles above Marysvale, Utah, 200 yards from the main wagon road, and 3½ miles below the dam for the Piute reservoir, in the SW. ¼ NW. ¼ sec. 23, T. 28 S., R. 3 W. Big Cottonwood Creek enters on the left about three-fourths of a mile above the station.

Records available.—February 18, 1906, to December 31, 1911, when station was discontinued.

Drainage area.—2,560 square miles.

Gage.—Vertical staff; datum unchanged since installation.

Channel.—Somewhat shifting.

Discharge measurements.—Made from car and cable.

Winter flow.—No ice forms at this station.

Diversions.—Very little water is diverted from Sevier River above this station.

Regulation.—The Piute reservoir is situated about 3½ miles above the station, and the total flow of the river is controlled through the gates in the dam.

Accuracy.—Records fair.

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

Discharge measurements of Sevier River near Marysvale, Utah, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Aug. 5	J. C. Dort	3.60	400
Nov. 27[a]	do	2.85	227

[a] Mush ice—river falling rapidly.

Daily gage height, in feet, of Sevier River near Marysvale, Utah, for 1911.

[Martha Pitts, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.7	3.0	.....	3.5	4.2	.....	3.7	3.5	3.4	4.3	3.1	3.0
2	2.7	3.05	2.4	2.6	4.2	.....	3.5	3.5	3.5	4.4	3.1	2.8
3	2.0	3.05	2.4	2.6	.....	4.0	3.5	3.5	3.5	4.4	3.0	.....
4	.....	4.0	2.4	2.6	.....	4.0	3.5	3.5	3.4	4.4	3.0	.....
5	.....	4.0	2.4	2.6	.....	4.0	3.5	3.4	3.5	4.0	3.0	2.9
6	.....	3.05	2.4	2.65	.....	4.0	3.5	3.5	3.5	4.0	3.1	3.1
7	.....	3.0	.....	4.7	.....	4.0	3.6	3.6	3.5	4.0	3.1	3.0
8	.....	3.0	2.4	4.6	.....	3.9	3.8	3.7	3.5	4.1	3.1	2.9
9	.....	3.0	3.3	4.6	.....	3.9	3.7	3.7	3.4	4.1	3.1	2.9
10	.....	.....	4.15	4.6	.....	3.9	3.7	3.6	3.4	4.0	3.1	2.9
11	.....	3.8	4.4	4.6	.....	3.9	3.7	3.6	3.5	4.0	3.1	2.9
12	.....	3.0	5.6	4.6	5.6	3.7	3.6	3.6	3.5	3.9	3.1	2.9
13	.....	3.0	5.7	4.0	.....	3.7	3.7	3.5	3.5	3.8	3.2	2.95
14	.....	2.35	5.7	4.0	.....	3.7	3.7	3.5	3.5	3.8	3.2	2.9
15	.....	2.35	5.6	.....	.....	3.7	3.6	3.5	3.6	3.8	3.2	2.7
16	.....	2.4	4.7	.....	.....	3.5	3.6	3.5	4.1	3.8	3.2	2.5
17	.....	2.9	4.0	.....	.....	3.5	3.6	3.5	3.8	3.8	3.1	2.5
18	.....	2.4	2.8	.....	.....	3.5	3.6	3.5	3.6	3.9	3.1	2.5
19	2.3	2.4	2.8	.....	.....	3.5	3.7	3.5	3.5	3.9	3.1	3.5
20	2.5	2.4	2.8	.....	5.0	3.5	3.7	3.5	3.5	3.9	3.1	3.4
21	2.8	.....	5.7	.....	4.4	3.5	3.7	3.5	3.5	3.9	3.1	3.0
22	2.8	2.4	5.7	.....	4.3	3.5	3.8	3.5	3.5	3.9	3.1	2.8
23	2.8	2.35	5.6	.....	3.9	3.4	3.9	3.5	3.5	3.9	3.1	2.5
24	3.2	2.4	4.35	.....	4.0	3.1	4.0	3.5	3.4	3.8	3.1	2.4
25	3.2	2.4	4.35	.....	4.0	3.1	4.0	3.5	3.4	3.7	3.1	2.7
26	3.2	2.4	4.3	4.2	4.0	3.0	4.0	3.5	3.4	3.6	.....	2.8
27	3.2	2.4	4.2	.....	4.0	3.0	4.0	3.5	3.2	3.6	3.6	2.9
28	3.0	2.4	4.2	.....	3.9	3.0	4.0	3.5	3.1	3.5	3.4	2.9
29	4.0	.....	4.2	.....	4.0	3.5	4.0	3.5	3.3	3.4	3.0	2.9
30	4.0	.....	4.2	.....	.....	3.7	4.0	3.5	3.5	3.3	3.1	.....
31	3.9	.....	3.5	.....	.....	.....	3.8	3.4	.....	3.1	.....	.....

NOTE.—Gates closed on Piute reservoir, about 3½ miles above the station, from Jan. 4 to 18 and Dec. 30 to 31, which caused water to fall below gage.

Daily discharge, in second-feet, of Sevier River near Marysvale, Utah, for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	206	434	159	351	500	480	420	380	360	555	300	280
2	206	445	159	190	500	480	380	380	380	580	300	244
3	108	445	159	190	540	480	380	380	380	580	280	250
4	.....	456	159	190	580	480	380	380	360	580	280	256
5	.....	456	159	190	620	480	380	360	380	480	280	262
6	.....	445	159	198	660	480	380	380	380	480	300	300
7	.....	434	159	620	700	480	400	400	380	480	300	280
8	.....	434	159	595	740	460	440	420	380	505	300	262
9	.....	434	312	595	780	460	420	420	360	505	300	262
10	.....	423	489	595	820	460	420	400	360	480	300	262
11	.....	412	546	595	860	460	420	400	380	480	300	262
12	.....	257	860	595	900	420	400	400	380	460	300	262
13	.....	257	890	456	879	420	420	380	380	440	320	271
14	.....	152	890	456	858	420	420	380	380	440	320	262
15	.....	152	860	460	836	420	400	380	400	440	320	228
16	.....	159	620	463	815	380	400	380	505	440	320	197
17	.....	240	456	467	794	380	400	380	440	440	300	197
18	.....	159	223	471	772	380	400	380	400	460	300	197
19	145	159	223	474	751	380	420	380	380	460	300	380
20	174	159	223	478	730	380	420	380	380	460	300	360
21	223	159	890	482	580	380	420	380	380	460	300	280
22	223	159	890	485	555	380	440	380	380	460	300	244
23	223	152	860	489	460	360	460	380	380	460	300	197
24	203	159	534	493	480	300	480	380	360	440	300	182
25	203	159	534	496	480	300	480	380	360	420	300	228
26	203	159	523	500	480	280	480	380	360	400	350	244
27	203	159	500	500	480	280	480	380	320	400	400	262
28	257	159	500	500	460	280	480	380	300	380	360	262
29	456	.....	500	500	480	380	480	380	340	360	280	262
30	456	.....	500	500	480	420	480	380	380	340	300	.....
31	434	.....	351	.....	480	.....	440	360	.....	300	.....	.....

NOTE.—Daily discharge determined from two fairly well defined rating curves. Gage heights interpolated for days on which gage was not read except Jan. 4 to 18 and Dec. 30 to 31. Relation of gage height to discharge probably not affected by ice during the winter.

Monthly discharge of Sevier River near Marysvale, Utah, for 1911.

[Drainage area, 2,560 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	456	.....	162	0.063	0.07	9,960	D.
February	456	152	278	.109	.11	15,400	B.
March	890	159	466	.182	.21	28,700	B.
April	620	190	452	.177	.20	26,900	B.
May	900	460	647	.253	.29	39,800	B.
June	480	280	405	.158	.18	24,100	A.
July	480	380	426	.167	.19	26,200	B.
August	420	300	384	.150	.17	23,600	A.
September	505	300	377	.147	.16	22,400	B.
October	580	300	457	.179	.21	28,100	B.
November	400	280	307	.120	.13	18,300	B.
December	380	.....	243	.095	.11	14,900	B.
The year	900	.....	385	.150	2.03	278,000	

NOTE.—Discharge Jan. 4 to 18 estimated at 50 second-feet; Dec. 30 to 31 at 50 second-feet.

SEVIER RIVER AT SEVIER, UTAH.

Location.—At the town of Sevier about 100 yards above the railroad bridge on the Y-spur, 50 yards west of the Denver & Rio Grande Railroad main-line track and about 80 yards above the mouth of Clear Creek, in the NE. ¼ SE. ¼ sec. 32, T. 25 S., R. 4 W.

Records available.—May 19 to December 31, 1911.

Drainage area.—2,700 square miles.

Gage.—A vertical staff driven into the stream bed and nailed to an overhanging cottonwood tree.

Channel.—Permanent since station was established.

Discharge measurements.—Made from car and cable.

Winter flow.—Ice does not form at this station.

Diversions.—Very little water is diverted above the station from Sevier River but a number of canals head 2 or 3 miles down stream. These canals irrigate the whole Sevier Valley as far north as Gunnison.

Regulation.—The Piute reservoir, about 27 miles above the station, controls the flow in the river as there is very little inflow between the reservoir and the station.

Accuracy.—Good.

Cooperation.—Maintained in cooperation with the State Land Board.

Discharge measurements of Sevier River at Sevier, Utah, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
May 20	H. S. Kleinschmidt	2.70	816
27	do	2.20	498
28	do	2.25	510
July 6	do	2.00	408
26	J. J. Hayes	2.26	513
Aug. 3	do	2.00	415
9	do	2.10	439
16	do	2.00	401
24	do	2.00	405
Nov. 26	J. C. Dort	1.00	353

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

[O. A. Anderson, observer.]

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		2.4	2.2	2.1	2.0	2.0	1.8	1.75
2		2.4	2.2	2.0	2.0	2.5	1.8	1.75
3		2.4	2.1	2.0	2.0	2.6	1.8	1.7
4		2.4	2.1	2.0	2.0	2.5	1.8	1.7
5		2.4	2.1	2.0	2.0	2.5	1.8	1.7
6		2.5	2.1	2.0	2.0	2.45	1.8	1.7
7		2.5	2.1	2.0	2.0	2.4	1.8	1.7
8		2.5	2.2	2.0	2.0	2.4	1.8	1.7
9		2.5	2.2	2.1	2.0	2.4	1.8	1.65
10		2.5	2.2	2.1	2.0	2.3	1.8	1.65
11		2.5	2.2	2.1	2.0	2.3	1.8	1.6
12		2.5	2.2	2.1	1.9	2.3	1.8	1.6
13		2.4	2.2	2.0	2.0	2.3	1.8	1.55
14		2.4	2.2	2.0	2.0	2.3	1.8	1.55
15		2.4	2.15	2.0	2.0	2.3	1.8	1.55

Daily gage height, in feet, of Sevier River at Sevier, Utah, for 1911—Continued.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
16	.....	2.4	2.1	2.05	2.1	2.3	1.8	1.5
17	.....	2.3	2.1	2.0	2.1	2.25	1.8	1.4
18	.....	2.3	2.1	2.0	2.1	2.15	1.8	1.4
19	2.9	2.3	2.1	2.0	2.05	2.1	1.8	1.4
20	2.7	2.3	2.15	2.0	2.05	2.0	1.8	1.4
21	2.7	2.3	2.4	2.0	2.0	2.0	1.8	1.4
22	2.7	2.3	2.3	2.05	2.0	2.0	1.8	1.4
23	2.6	2.2	2.25	2.1	1.95	2.0	1.8	1.4
24	2.3	2.1	2.25	2.05	1.95	2.0	1.8	1.4
25	2.3	1.9	2.25	2.0	1.9	1.9	1.8	1.4
26	2.3	1.85	2.25	2.0	1.85	1.9	1.8	1.4
27	2.3	1.8	2.25	2.0	1.8	1.8	1.8	1.4
28	2.25	1.8	2.3	2.0	1.8	1.8	1.8	1.4
29	2.3	1.9	2.3	2.0	1.85	1.8	1.8	1.4
30	2.35	2.1	2.3	2.0	1.9	1.8	1.8	1.3
31	2.4	.....	2.25	2.0	.....	1.8	.....	1.2

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

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	615	500	450	400	400	315	295
2	.....	615	500	400	400	680	315	295
3	.....	615	450	400	400	750	315	275
4	.....	615	450	400	400	680	315	275
5	.....	615	450	400	400	680	315	275
6	.....	680	450	400	400	648	315	275
7	.....	680	450	400	400	615	315	275
8	.....	680	500	400	400	615	315	275
9	.....	680	500	450	400	615	315	258
10	.....	680	500	450	400	555	315	258
11	.....	680	500	450	400	555	315	240
12	.....	680	500	450	355	555	315	240
13	.....	615	500	400	400	555	315	225
14	.....	615	500	400	400	555	315	225
15	.....	615	475	400	400	555	315	225
16	.....	615	450	425	450	555	315	210
17	.....	555	450	400	450	528	315	190
18	.....	555	450	400	450	475	315	190
19	965	555	450	400	425	450	315	190
20	820	555	475	400	425	400	315	190
21	820	555	615	400	400	400	315	190
22	820	555	555	425	400	400	315	190
23	750	500	528	450	378	400	315	190
24	555	450	528	425	378	400	315	190
25	555	355	528	400	355	355	315	190
26	555	335	528	400	335	355	315	190
27	555	315	528	400	315	315	315	190
28	528	315	555	400	315	315	315	190
29	555	355	555	400	335	315	315	190
30	585	450	555	400	355	315	315	175
31	615	.....	528	400	.....	315	.....	160

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

Monthly discharge of Sevier River at Sevier, Utah, for 1911.

[Drainage area, 2,700 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
May 19-31	965	528	668	0.247	0.12	17,200	A.
June	680	315	557	.206	.23	33,100	A.
July	615	450	500	.185	.21	30,700	A.
August	450	400	412	.152	.18	25,300	A.
September	450	315	391	.145	.16	23,300	A.
October	750	315	494	.176	.20	30,400	A.
November	315	315	315	.117	.13	18,700	A.
December	295	160	223	.083	.10	13,700	B.
The period						192,000	

SEVIER RIVER NEAR GUNNISON, UTAH.

Location.—At the bridge on the county road leading from Gunnison to West View precinct, about 3 miles west of Gunnison post office, about 60 rods west of the southeast corner of sec. 14, T. 19 S., R. 1 W. San Pitch River flows into the Sevier from the east about half a mile below the station.

Records available.—June 29, 1900, to December 31, 1911.

Drainage area.—3,990 square miles.

Gage.—Vertical staff on right bridge abutment; datum of gage was lowered 1 foot in September, 1910.

Channel.—Somewhat shifting.

Discharge measurements.—Measurements are made from the downstream side of the bridge during high water and by wading at the riffle about 50 yards below the bridge during low water.

Winter flow.—The river freezes from bank to bank for short periods during December and January.

Diversion.—During the irrigation season the greater portion of the stream flow is diverted above the station.

Storage.—There are three storage reservoirs on the headwaters of Sevier River and during certain seasons of the year these reservoirs hold a large portion of the stream flow.

Accuracy.—Records obtained at this station are good.

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

Discharge measurements of Sevier River near Gunnison, Utah, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Aug. 3[a]	J. C. Dort	2.49	82
Nov. 25	do	3.89	504

[a] Wading below gage.

Daily gage height, in feet, of Sevier River near Gunnison, Utah, for 1911.

[Le Roy H. Lund, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.85	4.60	3.50	4.30	1.20	3.35	2.75	2.50	2.55	3.95	4.50	3.90
2	3.85	4.00	3.50	4.00	1.20	3.30	2.15	2.50	2.55	4.00	3.80	3.90
3	4.60	4.30	3.55	3.60	1.20	1.80	2.10	2.50	2.55	4.05	3.70	3.80
4	5.20	4.40	3.60	3.10	1.20	2.00	2.10	2.50	2.55	4.35	3.70	3.70
5	4.75	4.40	3.80	3.10	1.20	2.20	2.15	2.50	2.60	4.35	3.70	3.70
6	4.30	4.60	3.90	3.10	1.20	2.20	2.20	2.50	2.55	4.00	3.70	3.50
7	4.15	4.30	3.80	3.10	1.50	2.20	2.25	2.50	2.65	4.00	3.70	4.30
8	4.20	4.20	3.95	3.10	2.30	2.20	2.30	2.45	2.55	4.00	3.70	4.50
9	4.20	4.20	4.25	2.70	2.70	2.20	2.25	2.45	2.55	4.00	3.70	4.00
10	3.75	3.80	4.25	3.30	2.80	2.15	2.20	2.60	2.55	4.00	3.70	3.90
11	3.55	3.80	3.90	3.35	3.25	2.10	2.20	2.52	2.55	4.15	3.70	3.90
12	3.55	3.80	4.50	3.75	3.85	2.10	2.10	2.45	2.60	4.00	3.70	3.90
13	3.60	3.75	4.25	3.50	3.80	2.10	2.05	2.40	2.60	4.00	3.70	3.80
14	3.75	3.75	4.65	3.50	3.60	2.40	2.08	2.35	2.60	4.00	3.70	3.70
15	3.60	3.80	4.70	3.40	3.70	2.95	2.15	2.25	2.60	4.00	3.70	3.70
16	3.60	3.60	4.75	3.20	3.55	2.75	2.25	2.25	2.60	4.00	3.70	3.60
17	3.40	3.60	5.20	3.20	3.75	2.30	2.30	2.20	2.55	3.95	3.70	3.60
18	3.35	3.60	5.15	2.70	3.55	3.00	2.35	2.20	2.60	3.95	3.70	3.70
19	3.35	3.60	4.70	2.50	3.50	3.00	2.40	2.25	2.70	3.95	3.70	3.95
20	3.35	3.60	5.10	2.50	3.40	3.10	2.40	2.20	2.70	3.90	3.70	3.95
21	3.40	3.60	4.20	2.10	3.40	3.45	2.35	2.20	2.85	3.95	3.85	4.05
22	3.45	3.60	4.70	2.05	3.40	2.90	2.30	2.25	2.85	3.90	3.90	4.15
23	3.50	.....	4.80	2.05	3.30	2.90	2.30	2.30	2.85	4.00	3.90	4.20
24	3.50	3.60	4.80	1.70	3.15	3.10	2.75	2.60	2.85	4.00	3.85	4.20
25	3.50	3.60	4.90	1.50	3.10	3.00	3.00	2.75	2.85	4.00	3.90	4.50
26	3.75	3.50	4.80	1.20	3.10	3.30	2.75	2.85	2.85	3.95	3.90	4.50
27	3.70	3.45	4.85	1.20	3.10	2.90	2.75	2.75	2.85	4.00	3.90	4.70
28	3.60	3.50	4.60	1.20	2.50	2.90	2.60	2.55	2.85	4.00	3.90	5.05
29	4.00	.....	4.45	1.15	2.50	2.80	2.60	2.55	3.00	4.00	3.90	5.05
30	4.20	.....	4.35	1.10	2.40	2.75	2.55	2.60	3.65	4.00	3.85	5.40
31	4.60	.....	4.30	.....	2.40	.....	2.55	2.65	.....	4.00	.....	5.40

NOTE.—Relation of gage height to discharge probably affected by ice Dec. 30 and 31.

Daily discharge, in second-feet, of Sevier River near Gunnison, Utah, for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	552	760	330	630	1	285	130	80	90	490	715	470
2	552	510	330	510	1	270	34	80	90	510	435	470
3	760	630	348	365	1	13	30	80	90	530	400	435
4	1,050	670	365	215	1	23	30	80	90	650	400	400
5	828	670	435	215	1	38	34	80	100	650	400	400
6	630	760	470	215	1	38	38	80	90	510	400	330
7	570	630	435	215	6	38	43	80	110	510	400	630
8	590	590	490	215	48	36	48	71	90	510	400	715
9	590	590	610	120	120	38	43	71	90	510	400	510
10	418	435	610	270	140	34	38	100	90	510	400	470
11	348	435	470	285	255	30	38	84	90	570	400	470
12	348	435	715	418	452	30	30	71	100	510	400	470
13	365	418	610	330	435	30	26	62	100	510	400	435
14	418	418	782	330	365	62	29	55	100	510	400	400
15	365	435	805	300	400	178	34	43	100	510	400	400
16	365	365	828	240	348	130	43	43	100	510	400	365
17	300	365	1,050	240	418	48	48	38	90	490	400	365
18	285	365	1,020	120	348	190	55	38	100	490	400	400
19	285	365	805	80	330	190	62	43	120	490	400	490
20	285	365	1,000	80	300	215	62	38	120	470	400	490
21	300	365	590	30	300	315	55	38	152	490	452	530
22	315	365	805	26	300	165	48	43	152	470	470	570
23	330	365	850	26	270	165	48	48	152	510	470	590
24	330	365	850	10	228	215	130	100	152	510	452	590
25	330	365	900	6	215	190	190	130	152	510	470	715
26	418	330	850	1	215	270	130	152	152	490	470	715
27	400	315	880	1	215	165	130	130	152	510	470	805
28	365	330	760	1	80	165	100	90	152	510	470	975
29	510	.....	692	.5	80	140	100	90	190	510	470	975
30	590	.....	650	.0	62	130	90	100	382	510	452	975
31	760	.....	630	.....	62	.....	90	110	.....	510	.....	975

NOTE.—Daily discharge determined from a rating curve fairly well defined above 70 second-feet. Discharge Dec. 30-31 estimated on account of ice.

Monthly discharge of Sevier River near Gunnison, Utah, for 1911.

[Drainage area, 3,990 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	1,050	285	469	0.118	0.14	28,800	B.
February	760	315	465	.117	.12	25,800	B.
March	1,050	330	676	.169	.19	41,600	B.
April	630	0	183	.046	.05	10,900	B.
May	452	1	194	.049	.06	11,900	B.
June	315	13	128	.032	.04	7,620	B.
July	190	26	64.7	.016	.02	3,980	B.
August	152	38	75.7	.019	.02	4,650	B.
September	382	90	125	.031	.03	7,440	B.
October	650	470	515	.129	.15	31,700	B.
November	715	400	433	.109	.12	25,800	B.
December	975	330	565	.142	.16	34,700	B.
The year	1,050	0	325	.082	1.10	235,000	

SEVIER RIVER NEAR JUAB, UTAH.

Location.—About 1,000 feet downstream from the Sevier Bridge dam, about 14 miles southwest of Juab, Utah, in the NE. ¼ sec. 2, T. 17 S., R. 2 W., Salt Lake base and meridian.

Records available.—September 23 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Inclined gage on right bank; datum unchanged.

Channel.—Probably permanent.

Discharge measurements.—Made from car and cable during medium to high water and by wading at low stages of the river.

Winter flow.—No ice forms at this station.

Diversions.—The entire outflow of the Sevier Bridge reservoir passes the station. There are no diversions near the station.

Regulation.—The flow in the river is absolutely controlled by the gates in the dam just above the station.

Cooperation.—Maintained in cooperation with Delta Land & Water Co., Mellville & Desert Irrigation Co., and State of Utah.

Daily gage height, in feet, of Sevier River near Juab, Utah, for 1911.

[F. M. Fisher, observer.]

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1	3.13	1.62	1.56	11	3.31	1.55	1.72	21	1.75	1.56	3.15
2	3.16	1.62	1.56	12	3.32	1.55	1.72	22	1.75	1.56	3.15
3	3.18	1.62	1.56	13	3.33	1.55	1.72	23	1.75	1.56	3.15
4	3.18	1.62	1.72	14	1.35	1.55	2.72	24	1.62	1.56	3.60
5	3.20	1.55	1.72	15	1.55	1.55	2.72	25	1.62	1.56	3.60
6	3.22	1.55	1.72	16	1.64	1.55	2.72	26	1.62	1.56	3.60
7	3.24	1.55	1.72	17	1.75	1.55	2.72	27	1.62	1.56	3.60
8	3.26	1.55	1.72	18	1.75	1.55	2.72	28	1.62	1.56	4.05
9	3.28	1.55	1.72	19	1.75	1.56	3.15	29	1.62	1.56	4.05
10	3.30	1.55	1.72	20	1.75	1.56	3.15	30	1.62	1.56	4.05
								31	1.62	.....	4.05

BEAVER RIVER AT MINERSVILLE, UTAH.

Location.—About 2 miles below Minersville canal, half a mile northwest of the business district of Minersville and below all tributaries, Indian Creek, North Creek, and South Creek entering 10, 12, and 15 miles respectively, above the station. It is 30 rods east and 60 rods north of the southwest corner of sec. 1, T. 30 S., R. 10 W., Salt Lake base and meridian.

Records available.—April 18, 1909, to December 31, 1911.

Drainage area.—599 square miles.

Gage.—Inclined staff; datum unchanged.

Channel.—Practically permanent.

Discharge measurements.—Made from a footbridge near gage.

Winter flow.—Ice forms at this station.

Diversions.—All of the water is diverted from the creek above the station during the irrigation season.

Regulation.—There is a storage reservoir just above Minersville, where a large part of the flow of the creek is impounded, and only the excess water flows past the station.

Accuracy.—The discharge curve is well defined by the measurements and the record may be considered good.

Cooperation.—Maintained in cooperation with State of Utah.

The following discharge measurement was made by G. C. Baldwin.

May 16, 1911: Gage height, 2.05 feet; discharge, 20.1 second-feet.

Daily gage height, in feet, of Beaver River at Minersville, Utah, for 1911.

[Tom Gillies, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.55	2.55	2.5	2.15						1.65	2.2	2.4
2	2.45	2.55	2.5	2.45							2.2	2.4
3	2.45	2.45	2.5	2.45							2.2	2.4
4	2.45	2.45	2.5	2.5						2.1	2.2	2.4
5	2.45	2.45	2.5	2.5						2.2	2.3	2.5
6	2.45	2.45	2.5	2.5						2.2	2.3	2.5
7	2.45	2.45	2.5	2.5	2.4					2.2	2.3	2.5
8	2.45	2.45	2.6	2.5	2.55					2.1	2.3	2.4
9	2.75	2.45	2.6	2.45	2.55					2.1	2.3	2.4
10	2.1	2.45	2.5	2.45	2.55					2.1	2.3	2.4
11	2.1	2.45	2.5	1.55	2.45					2.05	2.3	2.5
12	2.45	2.45	2.5	1.55	2.35					2.05	2.7	2.4
13	2.45	2.45	2.5	1.55	2.25					2.05	2.5	2.4
14	2.45	2.45	2.5	1.75	2.25					2.1	2.5	2.4
15	2.45	2.45	2.5	1.75	2.1					2.1	2.5	2.4
16	2.45	2.45	2.25		2.05					2.1	2.5	2.4
17	2.45	2.5	2.3							2.1	2.5	2.4
18	2.45	2.5	2.3							2.0	2.5	2.4
19	2.45	2.5	2.3							2.1	2.5	2.4
20	2.45	2.5	2.3							2.1	2.5	2.4
21	2.45	2.5	2.4							2.1	2.5	2.4
22	2.45	2.5	2.4							2.1	2.5	2.4
23	2.45	2.5	2.4							2.0	2.35	2.4
24	2.45	2.5	2.4		1.55					2.2	2.45	2.4
25	2.45	2.5	2.4		2.25					2.2	2.4	2.4
26	2.7	2.5	2.4		2.3					2.2	2.4	2.55
27	2.3	2.5	2.4		2.15					2.2	2.4	2.75
28	2.45	2.5	2.4		1.5					2.2	2.4	2.65
29	2.45		2.1							2.2	2.4	2.6
30	2.45		2.1							2.2	2.4	2.6
31	2.55		2.15							2.2		2.6

Daily discharge, in second-feet, of Beaver River at Minersville, Utah, for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	42	62	57	26	.....	.....	.....	.....	.....	1	30	47
2	52	62	57	52	.....	.....	.....	.....	.....	.....	30	47
3	52	52	57	52	.....	.....	.....	.....	.....	.....	30	47
4	52	52	57	57	.....	.....	.....	.....	.....	23	30	47
5	52	52	57	57	.....	.....	.....	.....	.....	30	38	57
6	52	52	57	57	.....	.....	.....	.....	.....	30	38	57
7	52	52	57	57	47	.....	.....	.....	.....	30	38	57
8	52	52	68	57	62	.....	.....	.....	.....	23	38	47
9	86	52	68	52	62	.....	.....	.....	.....	23	38	47
10	138	52	57	52	62	.....	.....	.....	.....	23	38	47
11	138	52	57	8.5	52	.....	.....	.....	.....	20	38	57
12	52	52	57	8.5	42	.....	.....	.....	.....	20	80	47
13	52	52	57	8.5	34	.....	.....	.....	.....	20	57	47
14	52	52	57	4.0	34	.....	.....	.....	.....	23	57	47
15	52	52	57	4.0	23	.....	.....	.....	.....	23	57	47
16	52	52	34	.....	20	.....	.....	.....	.....	23	57	47
17	52	57	38	.....	.....	.....	.....	.....	.....	23	57	47
18	52	57	38	.....	.....	.....	.....	.....	.....	17	57	47
19	52	57	38	.....	.....	.....	.....	.....	.....	23	57	47
20	52	57	38	.....	.....	.....	.....	.....	.....	23	57	47
21	52	57	47	.....	.....	.....	.....	.....	.....	23	57	47
22	52	57	47	.....	.....	.....	.....	.....	.....	23	57	47
23	52	57	47	.....	.....	.....	.....	.....	.....	17	42	47
24	52	57	47	.....	8.5	.....	.....	.....	.....	30	52	47
25	52	57	47	.....	34	.....	.....	.....	.....	30	47	47
26	80	57	47	.....	38	.....	.....	.....	.....	30	47	47
27	57	57	47	.....	26	.....	.....	.....	.....	30	47	47
28	52	57	47	.....	6	.....	.....	.....	.....	30	47	47
29	52	.....	23	.....	.....	.....	.....	.....	.....	30	47	47
30	52	.....	23	.....	.....	.....	.....	.....	.....	30	47	47
31	52	.....	26	.....	.....	.....	.....	.....	.....	30	.....	47

NOTE.—Discharge determined from a fairly well defined rating curve. Water standing in pools Apr. 16 to May 6 and May 17 to 23. Creek dry May 29 to Sept. 30 and Oct. 2 and 3. Discharge estimated Dec. 26-31 on account of ice.

Monthly discharge of Beaver River at Minersville, Utah, for 1911.

[Drainage area, 549 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	138	42	59.7	0.109	0.13	3,670	C.
February	62	52	54.9	.100	.10	3,050	C.
March	68	23	48.7	.089	.10	2,990	C.
April	57	0	18.4	.034	.04	1,090	C.
May	62	0	17.8	.032	.04	1,090	C.
June	.....	.....	.0	.....	.....	.....	
July	.....	.....	.0	.....	.....	.....	
August	.....	.....	.0	.....	.....	.....	
September	.....	.....	.0	.....	.....	.....	
October	30	0	22.6	.041	.05	1,390	C.
November	80	30	47.1	.086	.10	2,800	C.
December	57	47	48.3	.088	.10	2,970	C.
The year	138	0	26.3	.048	.66	19,000	

NOTE.—Accuracy of estimates rated low because of errors in gage reading caused by displacement of gage.

BEAVER RIVER AT MINERSVILLE, UTAH.

Location.—About 2 miles below Minersville canal, half a mile northwest of the business district of Minersville, and below all tributaries, Indian Creek, North Creek, and South Creek entering 10, 12, and 15 miles, respectively, above the station. It is 80 rods east and 60 rods north of the southwest corner of sec. 1, T. 30 S., R. 10 W., Salt Lake base and meridian.

Records available.—April 13, 1909, to December 31, 1911.

Drainage area.—549 square miles.

Gage.—Inclined staff; datum unchanged.

Channel.—Practically permanent.

Discharge measurements.—Made from a footbridge near gage.

Winter flow.—Ice forms at this station.

Diversions.—All of the water is diverted from the creek above the station during the irrigation season.

Regulations.—There is a storage reservoir just above Minersville, where a large part of the flow of the creek is impounded, and only the excess water flows past the station.

Accuracy.—The discharge curve is well defined by the measurements and the record may be considered good.

Cooperation.—Maintained in cooperation with State of Utah.

The following discharge measurement was made by G. C. Baldwin.
May 16, 1911: Gage height, 2.05 feet; discharge, 20.1 second-feet.

Daily gage height, in feet, of Beaver River at Minersville, Utah, for 1911.

[Tus Gillins, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.35	2.55	2.5	2.15	.....	.....	.....	.....	.....	1.65	2.2	2.4
2	2.45	2.55	2.5	2.45	.....	.....	.....	.....	.....	.....	2.2	2.4
3	2.45	2.45	2.5	2.45	.....	.....	.....	.....	.....	.....	2.2	2.4
4	2.45	2.45	2.5	2.5	.....	.....	.....	.....	.....	2.1	2.2	2.4
5	2.45	2.45	2.5	2.5	.....	.....	.....	.....	.....	2.2	2.3	2.5
6	2.445	2.45	2.5	2.5	.....	.....	.....	.....	.....	2.2	2.3	2.5
7	2.45	2.45	2.5	2.5	2.4	.....	.....	.....	.....	2.2	2.3	2.5
8	2.45	2.45	2.6	2.5	2.55	.....	.....	.....	.....	2.1	2.3	2.4
9	2.75	2.45	2.6	2.45	2.55	.....	.....	.....	.....	2.1	2.3	2.4
10	3.1	2.45	2.5	2.45	2.55	.....	.....	.....	.....	2.1	2.3	2.4
11	3.1	2.45	2.5	1.85	2.45	.....	.....	.....	.....	2.05	2.3	2.5
12	2.45	2.45	2.5	1.85	2.35	.....	.....	.....	.....	2.05	2.7	2.4
13	2.45	2.45	2.5	1.85	2.25	.....	.....	.....	.....	2.05	2.5	2.4
14	2.45	2.45	2.5	1.75	2.25	.....	.....	.....	.....	2.1	2.5	2.4
15	2.45	2.45	2.5	1.75	2.1	.....	.....	.....	.....	2.1	2.5	2.4
16	2.45	2.45	2.25	.....	2.05	.....	.....	.....	.....	2.1	2.5	2.4
17	2.45	2.5	2.3	.....	.....	.....	.....	.....	.....	2.1	2.5	2.4
18	2.45	2.5	2.3	.....	.....	.....	.....	.....	.....	2.0	2.5	2.4
19	2.45	2.5	2.3	.....	.....	.....	.....	.....	.....	2.1	2.5	2.4
20	2.45	2.5	2.3	.....	.....	.....	.....	.....	.....	2.1	2.5	2.4
21	2.45	2.5	2.4	.....	.....	.....	.....	.....	.....	2.1	2.5	2.4
22	2.45	2.5	2.4	.....	.....	.....	.....	.....	.....	2.1	2.5	2.4
23	2.45	2.5	2.4	.....	.....	.....	.....	.....	.....	2.0	2.35	2.4
24	2.45	2.5	2.4	.....	1.85	.....	.....	.....	.....	2.2	2.45	2.4
25	2.45	2.5	2.4	.....	2.25	.....	.....	.....	.....	2.2	2.4	2.4
26	2.7	2.5	2.4	.....	2.3	.....	.....	.....	.....	2.2	2.4	2.55
27	2.5	2.5	2.4	.....	2.15	.....	.....	.....	.....	2.2	2.4	2.75
28	2.45	2.5	2.4	.....	1.8	.....	.....	.....	.....	2.2	2.4	2.65
29	2.45	.....	2.1	.....	.....	.....	.....	.....	.....	2.2	2.4	2.6
30	2.45	.....	2.1	.....	.....	.....	.....	.....	.....	2.2	2.4	2.6
31	2.55	.....	2.15	.....	.....	.....	.....	.....	.....	2.2	.....	2.6

Daily discharge, in second-feet, of Beaver River at Minersville, Utah, for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	42	62	57	26	.....	.....	.....	.....	.....	1	30	47
2	52	62	57	52	.....	.....	.....	.....	.....	.....	30	47
3	52	52	57	52	.....	.....	.....	.....	.....	.....	30	47
4	52	52	57	57	.....	.....	.....	.....	.....	23	30	47
5	52	52	57	57	.....	.....	.....	.....	.....	30	38	57
6	52	52	57	57	.....	.....	.....	.....	.....	30	38	57
7	52	52	57	57	47	.....	.....	.....	.....	30	38	57
8	52	52	68	57	62	.....	.....	.....	.....	23	38	47
9	86	52	68	52	62	.....	.....	.....	.....	23	38	47
10	138	52	57	52	62	.....	.....	.....	.....	23	38	47
11	138	52	57	8.5	52	.....	.....	.....	.....	20	38	57
12	52	52	57	8.5	42	.....	.....	.....	.....	20	80	47
13	52	52	57	8.5	34	.....	.....	.....	.....	20	57	47
14	52	52	57	4.0	34	.....	.....	.....	.....	23	57	47
15	52	52	57	4.0	23	.....	.....	.....	.....	23	57	47
16	52	52	34	.....	20	.....	.....	.....	.....	23	57	47
17	52	57	38	.....	.....	.....	.....	.....	.....	23	57	47
18	52	57	38	.....	.....	.....	.....	.....	.....	17	57	47
19	52	57	38	.....	.....	.....	.....	.....	.....	23	57	47
20	52	57	38	.....	.....	.....	.....	.....	.....	23	57	47
21	52	57	47	.....	.....	.....	.....	.....	.....	23	57	47
22	52	57	47	.....	.....	.....	.....	.....	.....	23	57	47
23	52	57	47	.....	.....	.....	.....	.....	.....	17	42	47
24	52	57	47	.....	8.5	.....	.....	.....	.....	30	52	47
25	52	57	47	.....	34	.....	.....	.....	.....	30	47	47
26	80	57	47	.....	38	.....	.....	.....	.....	30	47	47
27	57	57	47	.....	26	.....	.....	.....	.....	30	47	47
28	52	57	47	.....	6	.....	.....	.....	.....	30	47	47
29	52	.....	23	.....	.....	.....	.....	.....	.....	30	47	47
30	52	.....	23	.....	.....	.....	.....	.....	.....	30	47	47
31	52	.....	26	.....	.....	.....	.....	.....	.....	30	.....	47

NOTE.—Discharge determined from a fairly well defined rating curve. Water standing in pools Apr. 16 to May 6 and May 17 to 23. Creek dry May 29 to Sept. 30 and Oct. 2 and 3. Discharge estimated Dec. 26–31 on account of ice.

Monthly discharge of Beaver River at Minersville, Utah, for 1911.

[Drainage area, 549 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	138	42	59.7	0.109	0.13	3,670	C.
February	62	52	54.9	.100	.10	3,050	C.
March	68	23	48.7	.089	.10	2,990	C.
April	57	0	18.4	.034	.04	1,090	C.
May	62	0	17.8	.032	.04	1,060	C.
June	.....	.....	.0	.....	.....	.....	
July	.....	.....	.0	.....	.....	.....	
August	.....	.....	.0	.....	.....	.....	
September	.....	.....	.0	.....	.....	.....	
October	30	0	22.6	.041	.05	1,390	C.
November	80	30	47.1	.086	.10	2,800	C.
December	57	47	48.3	.088	.10	2,970	C.
The year	138	0	26.3	.048	.66	19,000	

NOTE.—Accuracy of estimates rated low because of errors in gage reading caused by displacement of gage.

THOUSAND SPRINGS CREEK BASIN.

THOUSAND SPRINGS CREEK NEAR TECOMA, NEV.

Location.—In the SE. ¼ sec. 31, T. 43 N., R. 67 E., Mount Diablo base and meridian, about three-fourths of a mile below the junction of Rock Springs and Thousand Springs creeks, one-fourth of a mile below the mouth of the canyon and about 1½ miles from the lower H. D. ranch, which is 30 miles from Tecoma, Nev.

Records available.—November 1, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Inclined gage for low water; vertical staff gage for high water; datum remained unchanged to November 19, 1911. Automatic gage installed November 20, 1911; datum raised 0.03 foot above zero of inclined gage.

Channel.—Liable to shift at high stages.

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

Winter flow.—If there is any flow during the winter the creek will freeze entirely over, sometimes even to the bottom. The creek generally dries up in July and there is no more water until the snow begins to melt in the early spring.

Diversions.—Thousand Springs Creek is used more or less for irrigation but most of this water finds its way back to the main channel. During the summer the creek sinks at a point several miles above the lower H. D. ranch.

Accuracy.—Low, as all measurements were made at low stages.

Discharge measurements of Thousand Springs Creek near Tecoma, Nev., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Mar. 25	J. C. Dort	2.40	72.8
26	do	2.30	65.3
26	do	1.85	49.6
27	do	1.75	31.7
27	do	1.80	41.8
May 2	G. C. Baldwin	1.25	24.1
2	do	1.19	21.9

Daily gage height, in feet, of Thousand Springs Creek near Tecoma, Nev., for 1911.

[Samuel Colston, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.
1	.....	0.7	1.5	1.7	1.2	.....	.....	16	.....	1.0	2.3	1.4	1.5	.....	.....
2	0.5	4.0	1.5	1.7	1.22	0.7	0.4	17	.....	.9	2.0	1.2	1.3	0.5	.....
3	.....	2.8	1.6	1.7	1.2	.6	.....	18	.....	.8	1.8	1.1	1.1	.....	0.1
4	.....	1.6	1.8	1.0	1.1	.6	.4	19	.....	1.1	1.7	1.1	1.0	.6	.....
5	.5	1.5	2.0	2.0	1.1	.6	.....	20	.....	1.3	1.9	.9	1.0	.....	2.3
6	.....	1.5	5.2	1.9	1.0	.5	.3	21	.....	1.0	2.0	1.2	1.0	.5	.3
7	.....	1.0	5.7	1.8	.9	.5	.....	22	.....	1.3	2.2	1.2	1.0	.....	.....
8	.6	1.1	0.4	1.7	1.0	.45	.2	23	0.5	1.3	2.3	.....	.9	.4	.....
9	.....	1.0	6.1	1.8	1.2	.4	.....	24	.....	1.2	2.5	.....	.9	.....	.....
10	.....	.9	4.7	1.7	1.0	.35	.15	25	3.5	1.3	2.4	.8	.8	.3	.1
11	.....	1.0	3.4	1.5	1.0	.35	.....	26	5.2	1.2	2.08	.9	.9	.....	.....
12	.6	.9	2.3	1.5	1.2	.....	.1	27	3.1	1.2	1.78	.9	.9	.3	.05
13	.....	1.2	2.3	1.4	1.2	.4	.....	28	2.4	1.3	1.5	1.0	.9	.....	.....
14	.....	1.1	2.1	1.7	1.7	.....	.....	29	2.0	.....	1.8	1.2	.8	.2	.....
15	.5	1.1	2.2	1.6	1.6	.4	.1	30	5.6	.....	1.8	1.1	.8	.3	.....
								31	8.0	.....	1.9	.....	.8	.....	.....

NOTE.—Creek frozen Jan. 1 to 23, 1911. Creek dry August to December.

Daily discharge, in second-feet, of Thousand Springs Creek near Tecoma, Nev., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.
1	.....	453	31	39	22	10	2.5	16	.....	16	66	28	31	4	.....
2	.....	259	31	39	23	9	3	17	.....	13	51	22	25	5	.....
3	.....	94	35	39	22	7	3	18	.....	11	43	19	19	6	.....
4	.....	35	43	47	19	7	3	19	.....	19	39	19	16	7	.....
5	.....	31	51	51	19	7	2.5	20	.....	25	47	13	16	6	66
6	.....	31	289	47	16	5	2	21	.....	16	51	22	16	5	2
7	.....	16	343	43	13	5	1.5	22	.....	25	61	22	16	4	.....
8	.....	19	776	39	16	4	1	23	.....	25	66	18	13	3	.....
9	.....	16	387	43	22	3	.08	24	70	22	76	15	13	2.5	.....
10	.....	13	239	39	16	2.5	.05	25	140	25	71	11	11	2	.....
11	.....	16	133	31	16	2.5	.....	26	289	22	55	13	13	2	.....
12	.....	13	66	31	22	2.8	.....	27	112	22	42	13	13	2	.....
13	.....	22	66	28	22	3	.....	28	71	25	31	16	13	1.5	.....
14	.....	19	56	39	39	3	.....	29	51	.....	43	22	11	1	.....
15	.....	19	61	35	35	3	.....	30	332	.....	43	19	11	2	.....
								31	608	.....	47	.....	11	.....	.....

NOTE.—Discharge determined from a rating curve fairly well-defined between 15 and 100 second-feet. Probably zero flow Jan. 1 to 23, July 11 to 19, and July 22 to 31. Discharge interpolated on other days when gage was not read.

Monthly discharge of Thousand Springs Creek near Tecoma, Nev., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	608	0	54.0	3,320	D.
February	453	11	47.2	2,620	C.
March	776	31	111	6,820	C.
April	51	11	28.7	1,710	B.
May	39	11	18.4	1,130	C.
June	10	1	4.23	252	D.
July	66	0	2.83	174	D.
August	.....	.....	0	0	
September	.....	.....	0	0	
October	.....	.....	0	0	
November	.....	.....	0	0	
December	.....	.....	0	0	
The year	776	0	22.1	16,000	

SALTON SINK BASIN.

SALTON SEA NEAR SALTON, CAL.

Location.—At a trestle bent across Salt Creek about 2½ miles east of Salton, Cal.

Records available.—November, 1904, to December 31, 1911.

Gage.—A graduated trestle bent; datum of gage 280.3 feet below sea level, Southern Pacific Co.'s datum, or 273.5 feet below sea level as determined from United States Geological Survey bench marks. The gage height records kept by the New Liverpool Salt Co. from November, 1904, to February 26, 1906, show the actual depth of water above the lowest portion of the sink. On February 23, 1906, the Government installed a gage at the same datum as that of the Salt Co. gage about half a mile west of Salton railway station and 3 miles southeast of the old Salton station. This gage was destroyed by waves and the present gage has since been used.

Practically all the water now received from Salton Sea enters through Alamo and New rivers, chiefly through the former. These rivers run through Imperial Valley and are drainage channels for excess and waste waters from the irrigation system and from the power plants.

Daily depth, in feet, of Salton Sea near Salton, Cal., for 1911.

[V. H. Jones, William Kellams, and John Martin, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	58.44	58.23	58.14	58.01	57.61	57.10	56.50	56.23	55.81	55.20	54.57	54.28
2	58.44	58.23	58.14	58.00	57.60	57.08	56.49	56.21	55.82	55.16	54.55	54.27
3	58.43	58.25	58.13	57.99	57.59	57.05	56.47	56.20	55.80	55.12	54.54	54.27
4	58.42	58.30	58.13	57.98	57.57	57.03	56.46	56.19	55.79	55.09	54.52	54.26
5	58.41	58.29	58.12	57.97	57.55	57.00	56.44	56.17	55.78	55.06	54.51	54.26
6	58.40	58.28	58.12	57.96	57.54	56.98	56.43	56.15	55.77	55.03	54.50	54.26
7	58.39	58.26	58.12	57.96	57.53	56.96	56.42	56.14	55.76	54.98	54.49	54.25
8	58.39	58.25	58.11	57.95	57.52	56.95	56.41	56.12	55.74	54.96	54.48	54.24
9	58.38	58.23	58.11	57.94	57.51	56.92	56.40	56.10	55.71	54.95	54.46	54.24
10	58.38	58.23	58.10	57.93	57.51	56.90	56.39	56.08	55.70	54.93	54.44	54.24
11	58.38	58.23	58.10	57.92	57.49	56.89	56.38	56.06	55.66	54.91	54.42	54.24
12	58.37	58.23	58.10	57.90	57.48	56.87	56.37	56.05	55.64	54.90	54.42	54.23
13	58.37	58.23	58.10	57.88	57.47	56.86	56.35	56.03	55.61	54.88	54.41	54.23
14	58.36	58.22	58.09	57.87	57.45	56.85	56.34	56.01	55.68	54.86	54.41	54.23
15	58.34	58.22	58.09	57.85	57.43	56.84	56.33	55.99	55.54	54.84	54.40	54.22
16	58.33	58.22	58.09	57.85	57.40	56.82	56.31	55.97	55.52	54.81	54.34	54.22
17	58.31	58.22	58.08	57.84	57.38	56.80	56.30	55.95	55.51	54.79	54.38	54.21
18	58.30	58.22	58.08	57.83	57.35	56.78	56.29	55.93	55.50	54.77	54.37	54.21
19	58.29	58.21	58.08	57.82	57.33	56.76	56.28	55.91	55.48	54.76	54.36	54.20
20	58.28	58.20	58.07	57.82	57.30	56.75	56.28	55.90	55.47	54.75	54.35	54.19
21	58.26	58.20	58.07	57.81	57.29	56.73	56.30	55.89	55.45	54.74	54.34	53.94
22	58.26	58.19	58.06	57.80	57.27	56.71	56.32	55.88	55.43	54.73	54.33	54.20
23	58.26	58.18	58.06	57.78	57.25	56.69	56.32	55.88	55.40	54.72	54.33	54.17
24	58.25	58.17	58.05	57.75	57.24	56.67	56.32	55.88	55.38	54.71	54.31	54.16
25	58.25	58.17	58.05	57.73	57.22	56.65	56.31	55.88	55.36	54.69	54.30	54.15
26	58.25	58.16	58.05	57.70	57.21	56.62	56.30	55.88	55.32	54.68	54.30	54.15
27	58.24	58.15	58.04	57.67	57.19	56.60	56.29	55.87	55.30	54.66	54.29	54.14
28	58.24	58.15	58.04	57.65	57.17	56.58	56.28	55.86	55.27	54.64	54.29	54.13
29	58.24	.....	58.03	57.63	57.15	56.55	56.27	55.85	55.25	54.63	54.29	54.12
30	58.24	.....	58.03	57.62	57.13	56.52	56.26	55.84	55.22	54.61	54.28	54.11
31	58.23	.....	58.02	.....	57.12	.....	56.24	55.83	.....	54.60	.....	54.10

Fluctuations of surface of Salton Sea near Salton, Cal., for 1904–1911.

Month.	1904		1905		1906		1907	
	Monthly change.	Total rise.	Monthly change.	Total rise.	Monthly change.	Total rise.	Monthly change.	Total rise.
	Feet.	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*
January	.....	.....	1.4	2.2	1.1	23.8	2.8	75.3
February	.....	.....	1.6	3.8	1.8	25.6	.7	76.0
March	.....	.....	.8	4.6	2.7	28.3	−.1	75.9
April	.....	.....	1.2	5.8	5.6	33.9	−.3	75.6
May	.....	.....	1.0	6.8	8.6	42.5	−.5	75.1
June	.....	.....	2.2	9.0	15.4	57.9	−.4	74.7
July	.....	.....	4.4	13.4	8.6	66.5	−.2	74.5
August	.....	.....	2.2	15.6	2.9	69.4	−.3	74.2
September	.....	.....	1.2	16.8	.9	70.3	−.7	73.5
October	.....	.....	1.4	18.2	1.2	71.5	−.4	73.1
November	0.6	.....	1.6	19.8	−.2	71.3	−.5	72.6
December	.2	0.8	2.9	22.7	1.2	72.5	−.3	72.3

Month.	1908		1909		1910		1911	
	Monthly change.	Total rise.	Monthly change.	Total rise.	Monthly change.	Total rise.	Monthly change.	Total rise.
	Feet.	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*
January	0.0	72.3	0.0	67.4	0.0	63.4	−0.22	58.23
February	−.1	72.2	−.15	67.25	−.2	63.2	−.08	58.15
March	−.2	72.0	−.25	67.0	−.25	62.95	−.13	58.02
April	−.4	71.6	−.3	66.7	−.3	62.65	−.40	57.62
May	−.6	71.0	−.4	66.3	−.5	62.15	−.50	57.12
June	−.5	70.5	−.4	65.9	−.65	61.5	−.60	56.52
July	−.5	70.0	−.6	65.3	−.45	61.05	−.28	56.24
August	−.6	69.4	−.05	65.25	−.65	60.4	−.41	55.83
September	−.8	68.6	−.5	64.75	−.7	59.7	−.61	55.22
October	−.7	67.9	−.55	64.2	−.55	59.15	−.62	54.60
November	−.3	67.6	−.55	63.65	−.3	58.85	−.32	54.28
December	−.2	67.4	−.25	63.4	−.4	58.45	−.18	54.10

ALAMO RIVER NEAR BRAWLEY, CAL.

Location.—At highway bridge in sec. 31, T. 13 S., R. 15 E., about 3½ miles east of Brawley.

Records available.—1908 to December 31, 1911. Gage observations were begun on June 24, 1909. This station was discontinued early in January, 1912.

Gage.—Vertical staff on left abutment of bridge.

Channel.—Sand and clay; shifting.

Discharge measurements.—Made from car and cable 100 feet below gage.

Cooperation.—This station is maintained by P. L. Sherman, jr., Los Angeles, Cal.

Estimates have not been prepared for 1911, as no discharge measurements were made during the year.

Daily gage height, in feet, of Alamo River near Brawley, Cal., for 1911.

[Mrs. Flora Helman, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.7	5.1	4.0	4.0	5.3	5.6	.....	6.0	4.8	5.8	6.6	6.2
2	.....	5.3	4.4	5.0	5.4	5.4	5.5	5.6	4.6	5.5	6.5	6.4
3	5.8	5.4	4.2	4.9	5.4	5.5	.....	5.2	4.5	5.7	6.7	6.5
4	5.6	5.8	4.3	4.8	5.4	5.6	.....	5.3	4.8	5.4	6.6	6.8
5	5.4	6.0	4.3	5.0	5.4	5.7	5.6	5.5	4.6	5.5	7.0	6.5
6	5.3	6.2	4.4	5.0	5.3	5.5	5.6	5.3	4.1	5.5	7.1	6.4
7	5.4	6.0	4.2	4.9	5.0	5.4	5.5	5.5	4.9	5.6	7.2	6.5
8	5.3	6.0	4.3	5.1	5.1	5.5	5.9	5.6	4.7	5.2	7.1	6.5
9	5.4	6.3	4.3	5.2	5.0	5.4	6.0	5.5	5.0	5.6	7.0	6.3
10	5.0	6.2	4.3	5.5	4.6	5.7	5.9	5.0	4.8	5.8	6.8	6.5
11	5.5	6.0	4.2	5.3	4.4	5.5	5.8	4.9	4.5	5.8	5.7	6.3
12	5.6	5.7	4.0	4.8	4.0	5.5	6.0	4.7	4.2	5.6	5.5	6.2
13	5.4	5.4	4.0	4.0	4.0	5.4	6.1	4.9	3.9	5.5	5.5	6.3
14	5.4	5.1	4.0	4.1	4.5	5.5	6.2	4.8	4.0	5.3	5.7	6.0
15	5.5	6.0	3.9	3.7	4.8	5.7	6.4	4.9	4.5	6.0	6.1	6.5
16	5.7	4.8	3.7	4.0	4.4	5.8	5.0	4.9	5.0	5.8	6.7	6.4
17	5.5	5.6	3.7	4.1	5.0	5.5	4.5	4.7	4.7	6.0	6.3	6.8
18	5.4	5.5	3.8	4.2	5.5	5.3	4.5	4.4	5.1	5.7	6.3	6.9
19	5.6	5.3	4.0	3.5	5.3	5.4	.....	4.6	4.9	5.8	6.8	6.7
20	5.7	5.1	4.0	3.7	5.2	5.5	6.2	4.7	4.6	5.5	6.4	6.5
21	5.6	5.2	3.9	4.5	5.5	5.4	6.0	4.5	4.8	5.8	6.3	6.3
22	5.5	4.5	3.6	4.4	5.7	5.3	.....	4.4	5.0	6.0	6.5	6.0
23	5.6	4.3	4.0	4.3	5.5	5.1	.....	4.2	5.4	6.1	5.8	5.8
24	5.3	4.2	4.1	4.4	5.6	5.3	.....	4.2	5.0	6.2	5.5	5.7
25	5.2	4.5	4.0	4.6	5.7	4.9	6.8	4.0	5.2	6.0	6.0	6.0
26	5.4	4.3	4.2	4.5	5.6	5.3	6.6	4.2	5.0	5.8	6.1	6.1
27	5.5	4.5	4.4	4.8	5.5	5.5	6.5	4.1	5.0	6.0	6.2	5.8
28	5.5	4.2	4.4	4.5	5.6	5.4	6.5	4.3	5.2	6.1	6.2	5.6
29	5.2	.....	4.1	4.7	5.5	6.0	6.5	4.2	5.5	6.2	5.8	5.5
30	5.5	.....	4.2	5.0	5.5	5.9	6.5	4.4	5.6	6.5	6.0	5.5
31	5.4	.....	4.1	.....	5.4	.....	6.5	4.5	.....	6.1	.....	5.7

OWENS LAKE BASIN.

OWENS RIVER NEAR ROUND VALLEY, CAL.

Location.—At footbridge in sec. 10, T. 6 S., R. 31 E., 700 feet above the mouth of Rock Creek and 2 miles north of Round Valley.

Records available.—August 4, 1903, to December 31, 1911.

Drainage area.—Approximately 450 square miles.

Gage.—Vertical staff on left bank, in use since May 29, 1907. The datum differs from that of the previous gage, which was located 100 feet above the present one.

Channel.—Rock and bowlders; fairly permanent.

Discharge measurements.—Made from car and cable at the gage.

Diversions.—No ditches take out water above the gage, but several divert from the main river and its tributaries below the station.

Accuracy.—Discharge measurements are somewhat scattering and an average rating curve has been used. Results are considered reliable.

Cooperation.—Maintained in cooperation with the city of Los Angeles.

Discharge measurements of Owens River near Round Valley, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Jan. 25	G. T. Peekema	2.15	206
Mar. 12	C. H. Lee	2.20	220
May 5	do	2.45	288
June 26	do	3.40	757
July 7	do	3.82	919
Aug. 3	J. E. Jones	2.92	466
24	do	2.50	342
Sept. 20	do	2.30	232
Oct. 24	do	2.25	250
Nov. 22	do	2.18	223
Dec. 13	do	2.10	201

Daily gage height, in feet, of Owens River near Round Valley, Cal., for 1911.

[L. L. Roberts, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.95	2.60	2.15	2.60	2.53	2.75		3.40	2.50	2.30		
2							3.45				2.25	2.18
3	1.95	2.40	2.10	2.65	2.40	2.85	3.45	3.45	2.40	2.30		
4								2.92	2.40			2.10
5	2.00	2.40	2.15	2.70	2.45	2.90	3.75	3.35		2.33	2.30	
6							3.80		2.35	2.30		2.15
7	1.95	2.35	2.20	2.60	2.40	2.85	3.80	3.40		2.25	2.25	
8					2.40	2.90	3.83		2.35	2.30		2.10
9		2.25	2.60	2.50				3.20			2.25	
10	2.10		2.20		2.40	2.90	3.75		2.30	2.23		2.13
11		2.20		2.30	2.40	2.95		3.23			2.25	
12	2.00		2.20				3.80		2.35	2.30		2.10
13		2.20		2.25	2.45	2.95	3.73	2.90			2.30	2.10
14	2.10		2.23		2.40	3.00			2.35	2.30		2.13
15	2.00	2.25		2.30			4.00	3.00		2.30	2.15	
16			2.15		2.45	3.20	3.93		2.35	2.30		2.10
17	2.10	2.15	2.20	2.35	2.45	3.40		2.85		2.30	2.19	2.10
18			2.15			3.70	3.95	2.90	2.35			
19	2.05	2.20		2.40	2.55	3.77				2.30	2.20	2.13
20			2.25				3.65	2.75	2.30			
21	2.10	2.10		2.45	2.50	3.95				2.30	2.15	2.10
22	2.00		2.30		2.60		3.70	2.80	2.30		2.18	
23		2.10	2.40	2.50		3.80				2.25		2.10
24	2.10		2.40		2.70	3.80	3.55	2.70	2.30		2.10	2.13
25	2.15	2.10		2.55						2.30		
26	2.00	2.15	2.50		2.70	3.60	3.50	2.60	2.30		2.15	
27	2.10			2.53						2.20		2.10
28		2.10	2.50		2.75	3.55	3.50	2.50	2.33		2.20	2.13
29				2.55				2.55		2.25		
30	2.60		2.60	2.50	2.70	3.40	3.53		2.30		2.15	2.10
31			2.55					2.45		2.20		

NOTE.—Relation of gage height to discharge probably not affected by ice during the winter months.

Daily discharge, in second-feet, of Owens River near Round Valley, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	164	355	213	355	328	418	742	730	317	253	233	217
2	164	319	206	365	356	440	755	742	300	253	240	221
3	164	283	200	375	283	462	755	755	283	253	244	210
4	170	283	206	385	292	474	834	494	283	258	248	200
5	176	283	213	395	300	485	912	705	276	262	253	206
6	170	276	220	375	292	474	940	718	268	253	246	213
7	164	268	226	355	283	462	940	736	268	240	240	206
8	176	254	290	336	283	485	956	680	268	253	240	200
9	188	240	355	317	283	485	934	630	260	244	240	204
10	200	233	226	285	283	485	912	638	253	234	240	208
11	188	226	226	253	283	508	1,020	645	260	244	240	204
12	176	226	226	246	292	508	940	565	268	253	246	200
13	188	226	230	240	300	508	902	495	268	253	253	200
14	200	233	234	246	283	530	976	508	268	253	233	208
15	176	240	224	253	292	580	1,050	530	268	253	213	204
16	188	226	213	260	300	630	1,010	496	268	253	218	200
17	200	213	226	268	300	730	1,020	462	268	253	223	200
18	194	220	213	276	318	885	1,020	485	268	253	224	204
19	188	226	226	283	336	924	939	452	260	253	226	208
20	194	213	240	292	326	972	858	418	253	253	220	204
21	200	200	246	300	317	1,020	872	429	253	253	213	200
22	176	200	253	308	355	1,080	885	440	253	246	221	200
23	188	200	283	317	375	940	845	418	253	240	210	200
24	200	200	283	326	395	940	805	395	253	246	200	208
25	213	200	300	336	395	885	792	375	253	253	206	206
26	176	213	317	332	395	830	780	355	253	240	213	204
27	200	206	317	328	406	780	780	336	258	226	220	200
28	240	200	317	332	418	805	780	317	262	233	226	208
29	300	.....	336	336	406	768	788	336	258	240	220	204
30	355	.....	355	317	395	730	795	318	253	233	213	200
31	420	.....	336	.....	406	.....	762	300	.....	226	.....	200

NOTE.—Daily discharge determined from a fairly well-defined curve. Discharge Jan. 28, 29, and 31, June 22 and 27, and July 11 estimated from climatologic reports and records of discharge of adjacent streams. Discharge interpolated for other days on which gage was not read.

Monthly discharge of Owens River near Round Valley, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	420	164	203	12,500	B.
February	355	200	238	13,200	B.
March	355	200	257	15,800	B.
April	395	240	313	18,630	B.
May	418	283	331	20,400	B.
June	1,080	418	674	40,100	A.
July	1,050	742	881	54,200	A.
August	755	300	512	31,500	A.
September	317	253	257	15,300	B.
October	262	226	247	15,200	B.
November	253	200	220	13,600	B.
December	221	200	205	12,600	B.
The year	1,080	164	364	263,000	

OWENS RIVER NEAR TINEMAHA, CAL.

Location.—At Charlies Butte, in sec. 2, T. 11 S., R. 34 E., about 7 miles south of Tinemaha.

Records available.—September 20, 1906, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on left bank.

Channel.—Sand and gravel; shifts slightly.

Discharge measurements.—Made from car and cable at the gage.

Diversions.—On account of irrigation diversions above the station the record does not indicate the total run-off from the drainage area.

Cooperation.—Maintained in cooperation with the city of Los Angeles.

Discharge measurements of Owens River near Tinemaha, Cal., for 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Jan. 27	G. T. Peekema	2.82	495
Feb. 2	C. H. Lee	6.50	1,530
Mar. 11	do	5.79	1,280
15	do	3.00	640
May 4	do	1.05	144
June 10	do	3.04	573
22	do	6.58	1,520
July 9	do	7.01	1,700
Aug. 5	do	3.98	777
25	J. E. Jones	2.11	318
Sept. 22	do	1.43	231
Oct. 26	do	2.64	432
Nov. 24	do	2.88	473
Dec. 14	do	2.78	477

Daily gage height, in feet, of Owens River near Tinemaha, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.50	6.20	2.90	3.30	1.15	2.20	6.00	4.85	1.95	2.50	2.82	2.90
2	2.45	6.55	3.00	3.45	1.18	2.20	6.10	4.60	1.90	2.60	2.85	2.90
3	2.48	5.10	3.20	3.55	1.10	2.10	6.10	4.40	1.80	2.60	2.88	2.90
4	2.50	4.80	3.35	3.80	1.05	2.20	6.15	4.20	1.75	2.60	2.88	2.88
5	2.50	4.55	3.55	4.10	1.05	2.45	6.20	3.98	1.65	2.60	2.86	2.88
6	2.50	4.20	3.40	4.00	1.10	2.70	6.35	3.85	1.60	2.58	2.85	2.88
7	2.50	3.90	3.20	3.98	1.10	2.80	6.50	3.80	1.55	2.55	2.82	2.88
8	2.50	3.60	3.80	4.00	1.10	3.00	6.75	3.70	1.50	2.55	2.85	2.88
9	2.50	3.48	4.90	3.95	1.05	3.00	7.00	3.50	1.48	2.55	2.85	2.88
10	3.10	3.40	5.25	3.90	1.02	3.04	7.15	3.40	1.60	2.50	2.82	2.85
11	3.55	3.30	5.72	3.80	1.00	3.30	7.25	3.35	1.60	2.53	2.80	2.85
12	3.10	3.20	4.65	3.60	1.00	3.50	7.10	3.30	1.60	2.60	2.80	2.80
13	3.05	3.10	4.20	3.30	1.00	3.70	6.88	3.20	1.60	2.60	2.82	2.75
14	2.90	3.10	4.00	3.05	1.10	4.25	6.95	3.15	1.60	2.60	2.85	2.75
15	2.95	3.05	3.90	3.00	1.15	4.50	7.05	3.10	1.60	2.60	2.95	2.78
16	2.90	3.00	3.40	3.00	1.25	4.85	7.25	3.05	1.60	2.58	3.00	2.80
17	2.80	2.98	3.30	2.95	1.35	5.30	7.45	3.00	1.58	2.55	3.00	2.75
18	2.70	3.00	3.20	2.95	1.25	5.50	7.65	2.90	1.55	2.55	2.98	2.70
19	2.68	3.00	3.10	2.75	1.15	5.85	7.80	2.80	1.58	2.55	2.93	2.68
20	2.70	3.00	3.00	2.55	1.10	6.25	7.85	2.80	1.55	2.56	2.90	2.75
21	2.70	3.00	3.00	2.30	1.15	6.50	7.80	2.70	1.48	2.50	2.90	2.70
22	2.75	2.95	2.95	2.10	1.20	6.60	7.70	2.50	1.43	2.50	2.90	2.60
23	2.85	2.95	2.95	2.05	1.25	6.50	7.55	2.40	1.50	2.55	2.88	2.65
24	2.80	2.95	3.00	2.00	1.30	6.38	7.10	2.35	1.60	2.60	2.88	2.65
25	2.85	2.90	2.98	1.90	1.65	6.00	7.00	2.10	1.60	2.65	2.88	2.65
26	2.80	2.85	2.95	1.80	2.00	5.70	6.70	2.05	1.63	2.63	2.90	2.63
27	2.80	2.75	3.00	1.65	1.95	5.50	6.40	2.03	1.65	2.60	2.95	2.68
28	2.80	2.80	3.05	1.55	1.85	5.60	6.10	2.00	1.65	2.70	2.90	2.70
29	3.30	.....	3.10	1.40	1.75	5.70	5.90	2.00	2.00	2.80	2.88	2.72
30	4.10	.....	3.10	1.20	1.40	5.90	5.50	2.00	2.25	2.80	2.88	2.75
31	5.20	.....	3.15	.....	2.00	.....	5.20	1.98	.....	2.80	.....	2.7

Daily discharge, in second-feet, of Owens River near Tinemaha, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	410	1,420	490	585	172	353	1,350	995	306	410	474	490
2	400	1,540	510	622	176	353	1,380	920	296	430	480	490
3	406	1,040	560	648	165	334	1,380	860	278	430	486	490
4	410	980	598	710	158	353	1,400	810	270	430	486	486
5	410	905	648	785	158	400	1,420	755	252	430	482	486
6	410	810	610	760	165	450	1,480	722	244	426	480	486
7	410	735	560	755	165	470	1,520	710	236	420	474	486
8	410	660	710	760	165	510	1,610	685	227	420	480	486
9	410	630	1,010	748	158	510	1,700	635	224	420	480	486
10	535	610	1,120	735	155	520	1,750	610	244	410	474	480
11	648	585	1,260	710	152	585	1,790	598	244	416	470	480
12	535	560	935	660	152	635	1,740	585	244	430	470	470
13	522	535	810	585	152	685	1,660	560	244	430	474	460
14	490	535	760	522	165	822	1,680	548	244	430	480	460
15	500	522	660	510	172	890	1,720	535	244	430	500	466
16	490	510	610	510	186	995	1,790	522	244	426	510	470
17	470	506	585	500	202	1,130	1,860	510	241	420	510	460
18	450	510	560	500	186	1,190	1,930	490	236	420	506	450
19	446	510	535	460	172	1,300	1,980	470	241	420	496	446
20	450	510	510	420	165	1,440	2,000	470	236	422	490	460
21	450	510	510	372	172	1,520	1,980	450	224	410	490	450
22	460	500	500	334	170	1,560	1,940	410	215	410	490	430
23	480	500	500	324	180	1,520	1,880	391	227	420	486	440
24	470	500	510	315	194	1,480	1,740	382	244	430	486	440
25	480	490	506	296	252	1,350	1,700	334	244	440	486	440
26	470	480	500	278	315	1,250	1,600	324	240	436	490	436
27	470	460	510	252	300	1,190	1,490	321	252	430	500	446
28	470	470	522	236	287	1,220	1,380	315	252	450	490	450
29	585	.....	535	210	270	1,250	1,320	315	315	470	486	454
30	785	.....	535	179	210	1,320	1,190	315	362	470	486	460
31	1,100	.....	548	.....	315	.....	1,100	311	.....	470	.....	450

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

Monthly discharge of Owens River near Tinemaha, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	1,100	400	498	30,600	B.
February	1,540	460	661	36,700	A.
March	1,260	490	636	39,100	A.
April	785	179	509	30,300	A.
May	315	152	194	11,900	B.
June	1,560	334	920	54,700	A.
July	2,000	1,100	1,630	100,000	A.
August	995	311	544	33,400	A.
September	362	215	253	15,100	B.
October	470	410	429	26,400	B.
November	510	470	486	28,900	B.
December	490	436	464	28,500	B.
The year	2,000	152	602	436,000	

OWENS RIVER NEAR LONE PINE, CAL.

Location.—At Mount Whitney highway bridge, in sec. 23, T. 15 S., R. 36 E., about 2½ miles northeast of Lone Pine.

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

Drainage area.—Not measured.

Gage.—Vertical staff at bridge.

Channel.—Sandy; fairly permanent.

Discharge measurements.—Made from car and cable about 1,000 feet below the bridge. Measurements prior to 1911 were made from bridge.

Diversions.—Record does not show total run-off from drainage area on account of diversions for irrigation above the station.

Accuracy.—Range of stage well covered but measurements plot a little scattering. Results are reliable.

Cooperation.—Maintained in cooperation with the city of Los Angeles.

Discharge measurements of Owens River near Lone Pine, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Jan. 3	G. T. Peckema	5.75	421
Feb. 2	.....do	8.92	1,080
3	.....do	9.80	1,380
5	.....do	9.28	1,150
5	.....do	9.15	1,100
6	.....do	8.80	1,030
7	.....do	8.48	937
9	.....do	7.78	779
10	.....do	7.48	709
11	.....do	7.27	686
12	.....do	7.07	618
13	.....do	6.98	618
Mar. 20	C. H. Lee	6.63	580
May 15	.....do	4.07	136
June 30	.....do	9.62	1,190
Aug. 28	J. E. Jones	5.02	320
Sept. 25	.....do	4.55	239
Oct. 30	.....do	6.00	478
Nov. 27	.....do	6.44	543
Dec. 17	.....do	6.25	489

Daily gage height, in feet, of Owens River near Lone Pine, Cal., for 1911.

[G. F. Marsh, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.85	7.3	6.3	6.5	4.3	4.0	9.7	9.7	4.85	4.9	6.05	6.4
2	5.85	7.7	6.3	6.55	4.3	5.0	9.8	8.9	4.7	5.5	6.15	6.4
3	5.8	9.1	6.5	6.55	4.2	5.2	9.9	8.6	4.7	5.6	6.15	6.4
4	5.7	9.0	6.8	6.55	4.1	5.3	10.0	8.0	4.6	5.05	6.2	6.4
5	5.7	10.0	6.9	6.85	4.1	5.1	10.1	7.8	4.5	5.7	6.2	6.4
6	5.7	8.8	7.0	7.3	4.0	5.3	10.1	7.5	4.45	5.75	6.25	6.4
7	5.7	8.4	7.0	7.5	4.0	5.4	10.1	7.0	4.45	5.75	6.3	6.4
8	5.75	8.0	7.1	7.7	3.9	5.6	10.15	7.0	4.45	5.75	6.3	6.4
9	5.8	7.9	7.2	7.55	3.9	5.9	10.25	6.6	4.45	5.7	6.3	6.4
10	5.9	7.4	7.5	7.35	3.85	5.95	10.45	6.8	4.4	5.7	6.3	6.4
11	6.1	7.3	7.8	7.2	3.8	6.1	10.05	6.4	4.4	5.7	6.25	6.35
12	6.0	7.2	8.2	7.0	3.8	6.5	10.75	6.0	4.4	5.7	6.25	6.35
13	6.8	7.0	9.0	6.9	3.8	6.7	10.85	5.9	4.4	5.75	6.2	6.35
14	6.55	6.95	8.2	6.8	3.75	7.0	10.7	5.9	4.4	5.8	6.25	6.35
15	6.4	6.6	7.1	6.75	3.8	7.3	10.6	5.9	4.4	5.85	6.3	6.3
16	6.2	6.5	7.5	6.6	3.8	7.5	10.7	5.85	4.4	5.9	6.4	6.3
17	6.2	6.4	7.2	6.3	3.8	8.0	10.8	5.8	4.4	5.9	6.4	6.3
18	6.05	6.3	7.0	6.1	3.85	8.5	10.85	5.8	4.4	5.9	6.45	6.3
19	6.0	6.3	6.9	6.0	3.9	8.8	10.9	5.75	4.4	5.85	6.45	6.25
20	6.0	6.4	6.7	5.9	3.9	9.2	10.95	5.75	4.4	5.85	6.5	6.25
21	6.0	6.5	6.6	5.6	4.0	9.6	11.0	5.6	4.4	5.85	6.45	6.2
22	6.0	6.5	6.5	5.5	4.0	9.95	11.05	5.55	4.4	5.8	6.4	6.2
23	6.0	6.4	6.35	5.3	4.0	10.2	10.65	5.5	4.4	5.85	6.4	6.2
24	6.2	6.4	6.4	5.1	4.05	10.35	10.45	5.4	4.4	5.85	6.4	6.15
25	6.2	6.35	6.4	5.0	4.15	10.3	10.3	5.3	4.45	5.85	6.4	6.15
26	6.2	6.35	6.45	5.0	4.2	10.2	10.2	5.3	4.5	5.9	6.4	6.15
27	6.2	6.3	6.5	4.9	4.2	9.9	10.1	5.25	4.6	5.95	6.4	6.1
28	6.3	6.3	6.4	4.7	4.5	9.7	10.0	5.2	4.65	5.9	6.4	6.1
29	6.5	.....	6.4	4.5	4.6	9.6	9.9	4.95	4.75	5.9	6.4	6.05
30	6.9	.....	6.45	4.4	4.8	9.65	9.95	4.9	4.8	5.95	6.4	6.0
31	7.1	.....	6.5	.....	4.9	.....	9.8	4.9	.....	6.0	.....	6.0

NOTE.—Relation of gage height to discharge probably not greatly affected by ice during the winter months.

Daily discharge, in second feet, of Owens River near Lone Pine, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	402	690	490	530	170	260	1,250	1,280	288	295	470	540
2	402	770	490	540	170	275	1,380	1,080	265	385	490	540
3	395	1,100	530	540	155	305	1,310	1,010	265	400	490	540
4	380	1,310	590	540	140	320	1,340	860	250	408	500	540
5	380	1,340	610	600	140	290	1,370	820	235	415	500	540
6	380	1,020	630	690	125	320	1,370	760	228	422	510	540
7	380	920	630	730	125	335	1,370	660	228	422	520	540
8	388	830	650	770	115	365	1,380	660	228	422	520	540
9	395	810	670	740	115	410	1,420	580	228	415	520	540
10	410	710	730	700	110	420	1,480	620	220	415	520	540
11	450	690	790	670	105	450	1,540	540	220	415	510	530
12	550	670	870	630	105	530	1,560	460	220	415	510	530
13	590	630	1,220	610	105	570	1,600	445	220	422	500	530
14	540	620	870	590	100	630	1,550	445	220	430	510	530
15	510	550	650	580	105	690	1,520	445	220	438	520	520
16	470	530	730	550	105	730	1,550	438	220	445	540	520
17	470	510	670	490	105	830	1,580	430	220	445	540	520
18	440	490	630	450	110	945	1,600	430	220	445	550	520
19	430	490	610	430	115	1,020	1,610	422	220	438	550	510
20	430	510	570	410	115	1,120	1,620	422	220	438	560	510
21	430	530	550	305	125	1,220	1,640	400	220	438	550	500
22	430	530	530	350	125	1,320	1,660	392	220	430	540	500
23	430	510	500	320	125	1,400	1,540	385	220	438	540	500
24	470	510	510	290	132	1,440	1,480	370	220	438	540	490
25	470	500	510	275	148	1,430	1,440	355	228	438	540	490
26	470	500	520	275	155	1,400	1,410	355	235	445	540	490
27	470	490	530	290	155	1,310	1,380	348	250	452	540	480
28	400	490	510	230	200	1,250	1,360	340	258	445	540	480
29	530	.....	510	200	215	1,220	1,340	302	272	445	540	470
30	610	.....	520	185	245	1,240	1,350	295	280	452	540	460
31	650	.....	530	.....	260	.....	1,310	295	.....	460	.....	460

NOTE.—Daily discharge determined from two fairly well-defined rating curves, the first applicable Jan. 1 to July 21; the second July 22 to Dec. 31.

Monthly discharge of Owens River near Lone Pine, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	650	380	459	28,200	B.
February	1,340	490	688	38,200	A.
March	1,220	490	624	38,400	A.
April	770	185	485	28,900	A.
May	260	100	130	8,550	B.
June	1,440	260	802	47,700	A.
July	1,660	1,250	1,460	89,800	A.
August	1,280	295	537	33,000	A.
September	288	220	235	14,000	B.
October	460	295	426	26,200	B.
November	560	470	525	31,200	A.
December	540	460	514	31,600	A.
The year	1,660	100	574	416,000	

OWENS LAKE NEAR OLANCHA, CAL.

Location.—About 1 mile north of Brier and near Olancha, Cal.

Records available.—March, 1908, to December 31, 1911.

Gages.—The original gage was established in March, 1908, near the Smith ranch This gage was submerged early in July, 1911, and a new one was installed, which was washed out in September, 1911. The present gage was installed November 1, 1911. Gage heights represent elevation of surface above mean sea level.

Cooperation.—Records furnished by the city of Los Angeles.

Elevation of water surface of Owens Lake near Olancha, Cal.

		Feet.
1908.		
Mar.	4	3,575.95
	29	3,575.73
Apr.	19	3,575.78
	26	3,575.90
May	28	3,575.60
June	4	3,575.40
1910.		
July	22	3,575.98
Sept.	21	3,574.95
Oct.	28	3,574.71
Dec.	1	3,574.89
1911.		
Jan.	5	3,575.29
Feb.	8	3,576.11
July	12	3,577.35
	28	3,578.03
Nov.	1	3,577.35
	5	3,577.50
Dec.	3	3,577.60

ROCK CREEK NEAR ROUND VALLEY, CAL.

Location.—About 400 feet below highway bridge in sec. 9, T. 6 S., R. 31 E., a short distance above the mouth of Pine Creek, and 2 miles northwest of Round Valley.

Records available.—August 3, 1903, to December 31, 1911.

Drainage area.—Approximately 46 square miles.

Gage.—Vertical staff on left bank. Gage was located at the highway bridge prior to July, 1906.

Channel.—Sand and cobblestone; somewhat shifting.

Discharge measurements.—Made from footbridge at gage.

Diversions.—Irrigation diversions above the station.

Accuracy.—Results are good.

Cooperation.—Maintained in cooperation with the city of Los Angeles.

Discharge measurements of Rock Creek near Round Valley, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Jan. 25	G. T. Peekema	1.50	36
Mar. 12	C. H. Lee	1.33	33
May 6	do	1.28	32
June 24	do	2.79	128
July 7	do	3.19	162
8	do	3.38	164
Aug. 2	J. E. Jones	2.15	86
23	do	1.55	49
Sept. 20	do	1.33	36
Oct. 24	do	1.44	38
Nov. 22	do	1.39	35
Oct. 12	do	1.40	37

Daily gage height, in feet, of Rock Creek near Round Valley, Cal., for 1911.

[L. L. Roberts, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.35	2.10	1.35	1.50	1.30	1.80	.....	2.75	1.65	1.30	.....	.....
2	.....	.....	.....	.....	.....	.....	3.30	2.15	.....	.....	1.50	1.40
3	1.35	1.55	1.30	1.45	1.23	1.95	.....	2.70	1.60	1.25	.....	.....
4	.....	.....	.....	.....	.....	.....	3.25	.....	1.50	.....	.....	1.40
5	1.40	1.50	1.35	1.65	1.25	2.10	3.25	2.63	.....	1.25	1.45	.....
6	.....	.....	.....	.....	1.28	.....	3.20	.....	1.45	1.20	.....	1.40
7	1.30	1.50	1.30	1.70	1.30	2.20	3.18	2.50	.....	1.20	1.45	.....
8	.....	.....	.....	.....	1.35	2.40	3.25	.....	1.45	1.30	.....	1.43
9	.....	1.45	2.80	1.50	.....	.....	.....	2.43	.....	.....	1.50	.....
10	1.45	.....	2.20	.....	1.40	2.50	3.23	.....	1.35	1.35	.....	1.40
11	.....	1.45	.....	1.35	1.45	2.65	.....	2.45	.....	.....	1.45	.....
12	1.45	.....	1.33	.....	.....	.....	3.45	.....	1.35	1.40	.....	1.40
13	.....	1.50	.....	1.30	1.50	2.70	3.40	2.20	.....	.....	1.50	.....
14	1.50	.....	1.35	.....	1.55	3.20	.....	.....	1.30	1.50	.....	1.33
15	1.45	1.50	.....	1.35	.....	.....	3.70	2.25	.....	1.50	1.45	.....
16	.....	.....	1.32	.....	1.65	3.50	3.50	.....	1.35	1.40	.....	1.40
17	1.50	1.45	1.35	1.40	1.60	3.65	.....	2.10	.....	1.40	1.45	1.35
18	.....	.....	1.30	.....	.....	3.70	3.30	2.15	1.30	.....	.....	.....
19	1.45	1.40	.....	1.35	1.75	3.70	.....	.....	.....	1.40	1.40	1.30
20	.....	.....	1.32	.....	.....	.....	3.15	2.00	1.33	.....	.....	.....
21	1.50	1.35	.....	1.40	1.85	3.80	.....	.....	.....	1.45	1.40	1.33
22	1.35	.....	1.25	.....	1.90	.....	3.10	2.50	1.30	.....	1.39	.....
23	.....	1.35	1.30	1.35	.....	3.65	.....	1.55	.....	1.45	.....	1.30
24	1.45	.....	1.35	.....	2.00	3.60	3.00	1.85	1.30	1.44	1.38	1.35
25	1.50	1.30	.....	1.43	.....	.....	.....	.....	.....	1.50	.....	.....
26	1.50	1.35	1.40	.....	1.90	3.40	2.95	1.80	1.30	.....	1.39	.....
27	1.50	.....	.....	1.35	.....	.....	.....	.....	.....	1.45	.....	1.30
28	.....	1.30	1.45	.....	1.85	3.45	2.90	1.73	1.33	.....	1.40	1.35
29	.....	.....	.....	1.40	.....	.....	.....	1.75	.....	1.50	.....	.....
30	3.40	.....	1.50	1.35	1.80	3.40	2.90	.....	1.25	.....	1.40	1.40
31	.....	.....	1.45	.....	.....	.....	.....	1.60	.....	1.45	.....	.....

Daily discharge, in second-feet, of Rock Creek near Round Valley, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	30	76	34	41	31	58	170	126	53	35	40	36
2	30	60	32	40	30	62	166	86	52	34	41	36
3	30	44	31	38	28	67	164	122	50	32	40	36
4	31	42	32	44	28	72	162	120	45	32	39	36
5	32	41	34	49	29	76	162	117	44	32	38	36
6	30	41	32	50	32	80	158	112	42	27	38	36
7	28	41	31	52	31	83	156	108	42	27	38	37
8	30	40	78	46	34	97	162	106	42	31	40	38
9	32	38	125	41	35	100	161	103	40	32	41	37
10	34	38	83	38	36	104	160	104	38	34	40	36
11	34	38	58	34	38	114	190	104	38	35	38	36
12	34	40	32	32	40	116	178	96	38	36	40	36
13	35	41	33	31	41	118	174	87	36	38	41	36
14	36	41	34	32	44	157	186	88	35	41	40	35
15	34	41	33	34	46	169	198	90	36	41	38	36
16	35	40	32	35	49	181	182	85	38	36	38	36
17	36	38	34	36	46	193	174	80	36	36	38	34
18	35	37	31	35	50	197	166	84	35	36	37	32
19	34	36	32	34	55	197	160	79	36	36	36	31
20	35	35	32	35	58	201	154	74	36	37	36	32
21	36	34	30	36	61	205	152	91	36	38	36	32
22	30	34	29	35	64	225	150	108	35	38	36	32
23	32	34	31	34	67	194	146	49	35	38	36	31
24	34	32	34	36	70	190	143	65	35	38	35	34
25	36	31	35	38	67	182	142	64	35	41	36	33
26	36	34	36	36	64	174	140	62	35	40	36	32
27	36	32	37	34	62	170	138	60	36	38	36	31
28	80	31	38	35	61	178	136	58	36	40	36	34
29	125	.....	40	36	60	176	136	59	34	41	36	35
30	166	.....	41	34	58	174	136	54	32	40	36	36
31	121	.....	38	.....	58	.....	131	50	.....	38	.....	36

NOTE.—Daily discharge determined from three fairly well defined curves, the first applicable Jan. 1 to 30; the second, Jan. 31 to June 21 and Oct. 6 to Dec. 31; the third, June 22 to Oct. 5. Discharge Jan. 28 and 29, June 22 and 27, and July 11 estimated from climatologic data and records of discharge of adjacent streams. Discharge interpolated for other days on which gage was not read.

Monthly discharge of Rock Creek near Round Valley, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	166	28	44.7	2,750	B.
February	76	31	39.6	2,200	B.
March	125	29	40.4	2,480	B.
April	52	31	37.7	2,240	B.
May	70	28	47.5	2,920	B.
June	225	58	144	8,570	B.
July	198	131	159	9,780	B.
August	126	50	86.8	5,340	B.
September	53	32	38.7	2,300	B.
October	41	27	36.1	2,220	B.
November	41	35	37.9	2,260	B.
December	38	31	34.6	2,130	B.
The year	225	27	62.4	45,200	

PINE CREEK NEAR ROUND VALLEY, CAL.

Location.—At footbridge 300 feet above highway bridge in sec. 9, T. 6 S., R. 31 E., about 600 feet above the junction with Rock Creek and 2 miles northwest of Round Valley.

Records available.—August 3, 1903, to December 31, 1911.

Drainage area.—Approximately 32 square miles above mouth of canyon.

Gage.—Vertical staff on left bank 300 feet above highway bridge. Prior to May 13, 1908, the gage was located 150 feet below the highway bridge.

Channel.—Lava rock and sand; fairly permanent.

Discharge measurements.—Made from footbridge at gage.

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

Accuracy.—Rating curves are fairly well defined and results are good.

Cooperation.—Maintained in cooperation with the city of Los Angeles.

Discharge measurements of Pine Creek near Round Valley, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Jan. 25	G. T. Peekonna	3.61	5.5
Mar. 12	C. H. Lee	3.68	6.5
May 6	do	3.68	6.4
June 24	do	5.28	145
July 8	do	6.35	297
Aug. 2	J. E. Jones	4.80	92
23	do	4.12	32
Sept. 20	do	3.75	11
Oct. 24	do	3.72	10
Nov. 22	do	3.65	8.0
Dec. 12	do	3.60	7.3

Daily gage height, in feet, of Pine Creek near Round Valley, Cal., for 1911.

[L. L. Roberts, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.60	4.10	3.55	3.50	3.50	3.90	.....	5.10	3.95	4.30	.....	.....
2	.....	.....	.....	.....	.....	.....	6.25	.....	.....	.....	3.70	3.65
3	3.60	3.60	3.60	3.50	3.50	4.10	.....	5.15	3.90	4.00	.....	.....
4	.....	.....	.....	.....	.....	.....	6.20	.....	3.90	.....	.....	3.60
5	3.60	3.60	3.60	3.50	3.45	4.30	6.25	4.90	.....	3.90	3.70	.....
6	.....	.....	.....	.....	.....	.....	6.20	.....	3.85	3.75	.....	3.65
7	3.55	3.60	3.60	3.55	3.50	4.50	6.25	4.85	.....	3.75	3.63	.....
8	.....	.....	.....	.....	3.50	4.70	6.30	.....	3.85	3.70	.....	3.53
9	.....	3.55	4.00	3.50	.....	.....	.....	4.55	.....	.....	3.70	.....
10	3.65	.....	3.80	.....	3.50	4.75	6.15	.....	3.75	3.70	.....	3.60
11	.....	3.55	.....	3.50	3.50	4.80	.....	4.55	.....	.....	3.65	.....
12	3.60	.....	3.68	.....	.....	.....	6.20	.....	3.70	3.65	.....	3.60
13	.....	3.60	.....	3.50	3.55	4.80	6.15	4.30	.....	.....	3.70	.....
14	3.60	.....	3.65	.....	3.60	4.90	.....	.....	3.65	3.63	.....	3.60
15	3.55	3.60	.....	3.50	.....	.....	6.50	4.30	.....	3.70	3.65	.....
16	.....	.....	3.60	.....	3.60	5.40	6.30	.....	3.65	3.65	.....	3.60
17	3.60	3.55	3.65	3.55	3.90	5.80	.....	4.30	.....	3.75	3.65	3.55
18	.....	.....	3.60	.....	.....	6.00	6.25	4.33	3.70	.....	.....	.....
19	3.55	3.60	.....	3.50	4.20	6.40	.....	.....	.....	3.70	3.65	3.60
20	.....	.....	3.63	.....	.....	.....	6.10	4.25	3.75	.....	.....	.....
21	3.60	3.50	.....	3.53	4.25	6.60	.....	.....	.....	3.70	3.65	3.60
22	3.60	.....	3.60	.....	4.30	.....	6.15	4.30	3.65	.....	3.65	.....
23	.....	3.50	3.65	3.50	.....	6.70	.....	.....	.....	3.65	.....	3.60
24	3.60	.....	3.60	.....	4.40	6.60	5.90	4.10	3.55	.....	3.70	3.60
25	.....	3.50	.....	3.50	.....	.....	.....	.....	.....	3.70	.....	.....
26	3.60	3.50	3.65	.....	4.20	6.20	5.90	4.15	3.50	.....	3.65	.....
27	3.65	.....	.....	3.50	.....	.....	.....	.....	.....	3.65	.....	3.53
28	.....	3.50	3.60	.....	4.00	6.25	5.50	4.00	3.55	.....	3.70	3.60
29	.....	.....	.....	3.50	.....	.....	.....	4.10	.....	3.70	.....	.....
30	4.50	.....	3.65	3.50	3.90	6.20	5.50	.....	3.50	.....	3.65	3.55
31	.....	.....	3.60	.....	.....	.....	.....	4.00	.....	3.60	.....	.....

NOTE.—Relation of gage height to discharge probably not affected by ice during the winter months. Accuracy of daily gage records is affected at times by great diurnal fluctuations of stage.

Daily discharge, in second-feet, of Pine Creek near Round Valley, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	5	30	4	3	3	17.2	278	124	20.5	45	8.2	8.2
2	5	18	4	3	3	24	282	127	19	34	9.5	8.2
3	5	5	5	3	3	30	278	130	18	23.5	9.5	7.5
4	5	5	5	3	2.6	38	274	110	18	21	9.5	6.8
5	5	5	5	3	2.3	45	282	102	16.7	18	9.5	7.5
6	5	5	5	3	2.6	54	274	99	15.5	11.2	8.6	8.2
7	4	5	5	4	3	62	282	96	15.5	11.2	7.6	6.8
8	4	5	14	4	3	81	290	81	15.5	9.5	8.6	5.5
9	5	4	23.5	3	3	84	278	66	13.4	9.5	9.5	6.2
10	6.5	4	12	3	3	86	266	66	11.2	9.5	8.8	6.8
11	6	4	9	3	3	91	280	66	10.4	8.8	8.2	6.8
12	5	4	7.4	3	3.5	91	274	56	9.5	8.2	8.8	6.8
13	5	6	7.0	3	4	91	266	45	8.8	7.9	9.5	6.8
14	5	5	6.5	3	5	102	294	45	8.2	7.6	8.8	6.8
15	4	5	5.8	3	5	131	322	45	8.2	9.5	8.2	6.8
16	4	5	5	3	5	160	290	45	8.2	8.2	8.2	6.8
17	5	4	6.5	4	17.2	214	286	45	8.8	11.2	8.2	5.9
18	5	4	5	4	27	244	282	47	9.5	10.4	8.2	6.4
19	4	5	5.4	3	37.5	306	270	44	10.4	9.5	8.2	6.8
20	4	4	5.9	3.3	39	322	259	41	11.2	9.5	8.2	6.8
21	5	3	5.4	3.6	41	330	262	43	9.7	9.5	8.2	6.8
22	5	3	5	3.3	45	370	266	45	8.2	8.8	8.2	6.8
23	5	3	6.5	3	49	356	248	38	7.0	8.2	8.8	6.8
24	5	3	5	3	53	339	229	30	5.9	8.8	9.5	6.8
25	5	3	5.8	3	45	306	229	32	5.4	9.5	8.8	6.4
26	5	3	6.5	3	37.5	274	229	34	5	8.8	8.2	6.0
27	6.5	3	5.8	3	30	260	201	29	5.4	8.2	8.8	5.5
28	25	3	5	3	23.5	282	173	23.5	5.9	8.8	9.5	6.8
29	45	.....	5.8	3	20	278	173	30	5.4	9.5	8.8	6.4
30	62	.....	6.5	3	17.2	274	173	27	5	8.2	8.2	5.9
31	46	.....	5	.....	17.2	.....	148	23.5	.....	6.8	.....	6.0

NOTE.—Daily discharge determined from two fairly well defined curves applicable Jan. 1 to June 23 and June 24 to Dec. 31, 1911. Discharge Jan. 28 and 29, June 22 and 27, and July 11 estimated from climatologic data and records of flow of adjacent streams. Discharge interpolated for other days on which gage was not read.

Monthly discharge of Pine Creek near Round Valley, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	62	4	10.0	615	C.
February	30	3	5.54	308	B.
March	23.5	4	6.72	413	B.
April	4	3	3.17	189	B.
May	53	2.3	17.8	1,090	B.
June	370	17.2	178	10,600	B.
July	322	148	256	15,700	B.
August	130	23.5	59.4	3,650	B.
September	20.5	5	10.6	631	B.
October	45	6.8	12.2	750	B.
November	9.5	7.6	8.69	517	B.
December	8.2	5.5	6.73	414	B.
The year	370	2.3	48.3	34,900	

BISHOP CREEK NEAR BISHOP, CAL.

Location.—At highway bridge on Bishop Road, in sec. 9, T. 7 S., R. 32 E., 2 miles below the mouth of the canyon and 4 miles southeast of Bishop.

Records available.—August 9, 1903, to February 28, 1911; discontinued March 1, 1911.

Drainage area.—Approximately 63 square miles above the mouth of the canyon.

Gage.—Vertical staff at bridge in use since August 31, 1909. The gage used previous to this date was at approximately the same datum.

Channel.—Rocky and fairly permanent.

Discharge measurements—Made from bridge at gage.

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

Accuracy.—Results are good.

Cooperation.—Maintained in cooperation with the city of Los Angeles.

The following discharge measurement was made by G. T. Peekema:
January 24, 1911: Gage height, 1.85 feet; discharge, 67 second-feet.

Daily gage height, in feet, and discharge, in second-feet, of Bishop Creek near Bishop, Cal. for 1911.

[A. F. Kilpatrick, observer.]

Day.	January.		February.		Day.	January.		February.	
	Gage height.	Discharge.	Gage height.	Discharge.		Gage height.	Discharge.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*	*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*
1	1.65	48	1.8	62	16	1.9	73	2.0	85
2	1.85	68	1.95	79	17	1.85	68	2.2	110
3	1.55	39	1.95	79	18	1.85	68	2.4	138
4	1.9	73	2.0	85	19	1.85	68	2.5	154
5	1.6	43	1.8	62	20	1.85	68	2.35	131
6	1.85	68	1.8	62	21	1.7	52	2.5	154
7	1.65	48	1.85	68	22	1.8	62	2.5	154
8	1.75	57	1.8	62	23	1.85	68	2.4	138
9	1.55	39	1.9	73	24	1.95	79	2.2	110
10	1.85	68	2.1	97	25	1.5	35	1.9	73
11	1.15	15	1.9	73	26	1.9	73	1.8	62
12	1.85	68	1.85	68	27	1.85	68	1.9	73
13	2.0	85	1.8	62	28	1.95	79	1.8	62
14	1.85	68	1.75	57	29	2.2	110	.....	.....
15	1.65	48	1.9	73	30	1.9	73	.....	.....
					31	1.95	79	.....	.....

NOTE.—Daily gage heights Jan. 11 and Feb. 19 probably regulated by the power company. Relation of gage height to discharge not affected by ice during cold weather. Discharge determined from a fairly well-defined rating curve.

Monthly discharge of Bishop Creek near Bishop, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	110	15	63.2	3,890	B.
February	154	57	89.5	4,970	B.

BIG PINE CREEK NEAR BIG PINE, CAL.

Location.—At footbridge in sec. 26, T. 9 S., R. 33 E., about 2 miles southwest of Big Pine.

Records available.—December 5, 1903, to December 15, 1905, and January 1, 1907, to February 28, 1911. Discontinued February 28, 1911.

Drainage area.—Approximately 27 square miles above mouth of canyon.

Gage.—Vertical staff on right bank at bridge. Previous to October 29, 1907, the station was about half a mile west of the present site.

Channel.—Gravel and bowlders; somewhat shifting.

Discharge measurements.—Made from footbridge at gage.

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

Accuracy.—Results are good.

Cooperation.—Maintained in cooperation with the city of Los Angeles.

The following discharge measurement was made by G. T. Peekema:
January 24, 1911: Gage height, 2.60 feet; discharge, 16 second-feet.

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

[C. Seglie and E. Smith, observers.]

Day.	January.		February.		Day.	January.		February.	
	Gage height.	Discharge.	Gage height.	Discharge.		Gage height.	Discharge.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*	*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*
1	2.55	14	2.95	32	16	.....	13	.....	15
2	.....	14	.....	28	17	2.5	13	2.6	16
3	2.5	13	2.85	26	18	.....	13	.....	15
4	.....	13	.....	30	19	2.5	13	2.55	14
5	2.5	13	2.8	24	20	.....	14	.....	14
6	.....	13	.....	22	21	2.55	14	2.55	14
7	2.5	13	2.7	20	22	.....	15	.....	15
8	.....	12	.....	19	23	2.6	16	2.6	16
9	2.45	12	2.65	18	24	.....	16	.....	16
10	.....	12	.....	17	25	2.6	16	2.6	16
11	2.45	12	2.6	16	26	.....	16	.....	17
12	.....	12	.....	16	27	2.6	16	2.65	18
13	2.5	13	2.6	16	28	.....	18	.....	18
14	.....	13	.....	15	29	2.75	22	.....	.....
15	2.5	13	2.55	14	30	.....	40	.....	.....
					31	3.0	35	.....	.....

NOTE.—Relation of gage height to discharge probably not affected by ice during January and February. Daily discharge determined from a well-defined rating curve. Discharge Jan. 30 and Feb. 4 estimated from climatologic data and records of flow of adjacent streams. Discharge interpolated for other days on which gage was not read.

Monthly discharge of Big Pine Creek near Big Pine, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	40	12	15.5	953	B.
February	32	14	18.5	1,030	B.

TINEMAHA CREEK NEAR BIG PINE,[1] CAL.

Location.—Near Peterson's ranch house, in sec. 21, T. 10 S., R. 34 E., about 1 mile west of Fish Springs schoolhouse, and 7 miles south of Big Pine.

Records available.—December 7, 1906, to February 28, 1911. Discontinued March 1, 1911.

Drainage area.—Approximately 5.2 square miles above mouth of canyon.

Gage.—Vertical staff on right bank at footbridge.

Channel.—Gravel; shifting.

Discharge measurements.—Made from bridge at gage.

Diversions.—No water diverted above the station.

Accuracy.—Results are fair.

Cooperation.—Maintained in cooperation with the city of Los Angeles.

The following discharge measurement was made by G. T. Peekema:
January 23, 1911: Gage height, 0.71 foot; discharge, 5.1 second-feet.

Daily gage height, in feet, and discharge, in second-feet, of Tinemaha Creek near Big Pine, Cal., for 1911.

[Sherman R. Burdick, observer.]

Day.	January.		February.		Day.	January.		February.	
	Gage height.	Discharge.	Gage height.	Discharge.		Gage height.	Discharge.	Gage height.	Discharge.
1	0.85	8.6	0.9	10	16	0.7	4.6	0.7	4.6
2	.8	7.2	.85	8.6	17	.7	4.6	.8	7.2
3	.78	6.7	.8	7.2	18	.7	4.6	.8	7.2
4	.8	7.2	1.0	14	19	.71	4.9	.8	7.2
5	.8	7.2	.85	8.6	20	.7	4.6	.8	7.2
6	.8	7.2	.82	7.8	21	.7	4.6	.8	7.2
7	.8	7.2	.8	7.2	22	.7	4.6	.8	7.2
8	.8	7.2	.8	7.2	23	.68	4.2	.8	7.2
9	.8	7.2	.78	6.7	24	.71	4.9	.8	7.2
10	.85	8.6	.78	6.7	25	.7	4.6	.8	7.2
11	.8	7.2	.78	6.7	26	.68	4.2	.8	7.2
12	.8	7.2	.78	6.7	27	.68	4.2	.75	5.9
13	.8	7.2	.78	6.7	28	.85	8.6	.8	7.2
14	.75	5.9	.78	6.7	29	1.2	22	.....	.....
15	.7	4.6	.72	5.1	30	1.21	22	.....	.....
					31	1.0	14	.....	.....

NOTE.—Relation of gage height to discharge probably not affected by ice during January and February.

BIRCH CREEK NEAR BIG PINE,[2] CAL.

Location.—Near Peterson's ranch house, in sec. 16, T. 10 S., R. 34 E., about 1 mile west of Fish Springs schoolhouse and 7 miles south of Big Pine.

[1] Station formerly known as Tinemaha Creek near Tinemaha.
[2] Station formerly known as Birch Creek near Tinemaha.

Records available.—June 14 to December 9, 1905, and December 7, 1906, to February 28, 1911. Discontinued March 1, 1911.
Drainage area.—Approximately 7 square miles above mouth of the canyon.
Gage.—Vertical staff on left bank at footbridge.
Channel.—Coarse gravel; shifting.
Diversions.—No water diverted above the station.
Discharge measurements.—Made from bridge at gage.
Accuracy.—Results are fair.
Cooperation.—Maintained in cooperation with the city of Los Angeles.

The following discharge measurement was made by G. T. Peekema.
January 23, 1911: Gage height, 0.31 foot; discharge, 3.4 second-feet.

Daily gage height, in feet, and discharge, in second-feet, of Birch Creek near Big Pine, Cal. for 1911.

[Sherman R. Burdick, observer.]

Day.	January.		February.		Day.	January.		February.	
	Gage height.	Dis-charge.	Gage height.	Dis-charge.		Gage height.	Dis-charge.	Gage height.	Dis-charge.
1	0.32	4.2	0.70	24	16	0.35	5.2	0.45	9.5
2	.31	3.9	.55	15	17	.32	4.2	.40	7.0
3	.30	5.3	.40	7.0	18	.30	3.5	.30	3.5
4	.30	3.5	.41	7.5	19	.30	3.5	.30	3.5
5	.30	3.5	.40	7.0	20	.30	3.5	.30	3.5
6	.30	3.5	.40	7.0	21	.30	3.5	.30	3.5
7	.30	3.5	.35	5.2	22	.32	4.2	.30	3.5
8	.30	3.5	.32	4.2	23	.30	3.5	.30	3.5
9	.30	3.5	.30	3.5	24	.35	5.2	.30	3.5
10	.40	7.0	.30	3.5	25	.38	6.3	.30	3.5
11	.35	5.2	.30	3.5	26	.35	5.2	.30	3.5
12	.32	4.2	.30	3.5	27	.30	3.5	.30	3.5
13	.32	4.2	.30	3.5	28	.35	5.2	.30	3.5
14	.35	5.2	.30	3.5	29	.55	15	.....	.....
15	.35	5.2	.40	7.0	30	1.10	52	.....	.....
					31	.90	38	.....	.....

NOTE.—Relation of gage heights to discharge probably not affected by ice during January and February. Discharge determined from a fairly well-defined curve.

Monthly discharge of Birch Creek near Big Pine, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	52	3.5	7.26	4.46	C.
February	24	3.5	5.71	3.17	C.

TABOOSE CREEK NEAR ABERDEEN,[1] CAL.

Location.—At upper road crossing in sec. 16, T. 11 S., R. 34 E., about 4 miles northwest of Aberdeen.
Records available.—January 1, 1906, to February 28, 1911. Discontinued February 28, 1911.
Drainage area.—Approximately 7 square miles above mouth of canyon.

[1] Formerly known as Tibbetts.

Gage.—Vertical staff on left bank at footbridge. Previous to February 25, 1907, the station was maintained about half a mile west of the lower road crossing, 2 miles northwest of Aberdeen. Previous to March 7, 1910, the datum was 1.00 foot higher.

Channel.—Shifting sand.

Discharge measurements.—Made from bridge at gage.

Diversions.—No water diverted above the gage.

Accuracy.—Results are fair.

Cooperation.—Maintained in cooperation with the city of Los Angeles.

The following discharge measurement was made by G. T. Peekema:
January 23, 1911: Gage height, 0.79 foot; discharge, 3.0 second-feet.

Daily gage height, in feet, and discharge, in second-feet, of Taboose Creek near Aberdeen, Cal., for 1911.

[Ray Bowers, observer.]

Day.	January.		February.		Day.	January.		February.	
	Gage height.	Dis-charge.	Gage height.	Dis-charge.		Gage height.	Dis-charge.	Gage height.	Dis-charge.
	Feet.	*Sec.-ft.*	*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*
1		3		9	16	.8	3		3
2	0.8	3		6	17		3	1.25	3
3		3	0.9	4	18		3		3
4		3		4	19		3		3
5		3		3	20	.8	3	.8	3
6	.8	3	.8	3	21		3		3
7		3		3	22		3		3
8		3		3	23	.8	3		3
9	.8	3		3	24		3	.78	3
10		3	.8	3	25		3		3
11		3		3	26		3		3
12		3		3	27	.8	3	.78	3
13	.8	3	.8	3	28		4		3
14		3		3	29		5		
15		3		3	30	1.05	7		
					31		10		

NOTE.—Relation of gage heights to discharge affected by ice Feb. 16.
Discharge determined from a fairly well-defined rating curve. Discharge Jan. 31 and Feb. 17 estimated from records of flow of adjacent streams. Discharge interpolated for other days on which gage was not read.

Monthly discharge of Taboose Creek near Aberdeen, Cal., for 1911.

[Drainage area, 13.9 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accu-racy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	10	3	3.5	0.252	0.29	215	B.
February	9	3	3.4	.245	.26	189	B.

NOTE.—It has been estimated that about half of the discharge of Taboose Creek at the mouth of the canyon is lost by seepage between the canyon and the gaging station. Hence, discharge per square mile and run-off depth in inches does not apply uniformly to the entire basin.

GOODALE CREEK NEAR ABERDEEN,[1] CAL.

Location.—One-fourth mile west of upper road crossing, in sec. 16, T. 11 S., R. 34 E., about 4 miles west of Aberdeen.

Records available.—January 1, 1906, to February 28, 1911. Discontinued February 28, 1911.

Drainage area.—Approximately 5 square miles above mouth of canyon.

Gage.—Vertical staff on left bank at footbridge. Previous to March 7, 1910, the gage datum was 1.00 foot higher.

Channel.—Sand; somewhat shifting.

Discharge measurements.—Made from bridge at gage.

Diversions.—No water diverted above the gage.

Accuracy.—Results are good.

Cooperation.—Maintained in cooperation with the city of Los Angeles.

The following discharge measurement was made by G. T. Peekema:
January 23, 1911: Gage height, 0.93 foot; discharge, 2.7 second-feet.

Daily gage height, in feet, and discharge, in second-feet, of Goodale Creek near Aberdeen, Cal., for 1911.

[Ray Bowers, observer.]

Day.	January.		February.		Day.	January.		February.	
	Gage height.	Dis-charge.	Gage height.	Dis-charge.		Gage height.	Dis-charge.	Gage height.	Dis-charge.
	Feet.	*Sec.-ft.*	*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*
1		3.1		8.5	16	0.95	3.1		3.0
2	0.95	3.1		5.0	17		3.1	1.25	3.0
3		3.1	0.93	3.5	18		3.1		3.0
4		3.1		3.4	19		3.1		3.0
5		3.1		3.2	20	.95	3.1	.92	2.7
6	.95	3.1	.95	3.1	21		3.1		2.7
7		3.1		3.1	22		3.1		2.7
8		3.1		3.1	23	.95	3.1		2.7
9	.95	3.1		3.1	24		3.1	.92	2.7
10		3.1	.95	3.1	25		3.1		2.7
11		3.1		3.1	26		3.1		2.7
12		3.1		3.1	27	.95	3.1	.92	2.7
13	.95	3.1	.95	3.1	28		4.0		2.7
14		3.1		3.1	29		6.0		
15		3.1		3.0	30	1.15	7.3		
					31		9.0		

NOTE.—Relation of gage heights to discharge probably not affected by ice except Feb. 17, when slush ice was running. Discharge Jan. 31 and Feb. 17 estimated from climatologic data and records of flow of adjacent streams. Discharge interpolated for other days on which gage was not read. Discharge determined from a fairly well-defined rating curve.

Monthly discharge of Goodale Creek near Aberdeen, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	9.0	3.1	3.55	218	B.
February	8.5	2.7	3.24	180	B.

[1] Formerly known as Tibbetts.

OAK CREEK NEAR INDEPENDENCE, CAL.

Location.—Three-fourths of a mile west of Bell's flour mill in sec. 2, T. 13 S., R. 34 E., about 4 miles northwest of Independence.

Records available.—June 18, 1905, to February 28, 1911. Discontinued February 28, 1911.

Drainage area.—Approximately 15.4 square miles above mouth of canyon.

Gage.—Vertical staff on right bank at footbridge. The original gage was located about 1 mile west of Old Fort Independence. On October 1, 1906, the station was moved to Bell's flour mill. This station was discontinued on April 19, 1907, and moved to the present site.

Channel.—Sand and gravel; somewhat shifting.

Discharge measurements.—Made from bridge at gage.

Diversions.—No water diverted above the gage.

Accuracy.—Results good.

Cooperation.—Maintained in cooperation with the city of Los Angeles.

Discharge measurements of Oak Creek near Independence, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Jan. 20	G. T. Peckema	0.59	7.2
Feb. 17	C. H. Lee	.60	8.3

Daily gage height, in feet, and discharge, in second-feet, of Oak Creek near Independence, Cal., for 1911.

[A. N. Bell, observer.]

Day.	January.		February.		Day.	January.		February.	
	Gage height.	Discharge.	Gage height.	Discharge.		Gage height.	Discharge.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*	*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*
1		8.0		15	16	0.58	7.9		12
2	0.58	7.9	0.62	9.7	17		7.5		12
3		7.3		9.2	18	.56	7.1	0.60	8.7
4	.55	6.7	.60	8.7	19		7.5		8.3
5		6.7		9.2	20		7.9	.58	7.9
6		6.7	.62	9.7	21	.59	8.3		7.9
7	.55	6.7		9.2	22		8.3	.58	7.9
8		7.3	.60	8.7	23	.59	8.3		7.9
9		8.0		8.7	24		7.7	.58	7.9
10	.60	8.7		8.7	25	.56	7.1		7.9
11		8.3	.60	8.7	26		7.6		8.0
12	.58	7.9		8.7	27		8.2	.57	8.1
13		7.5	.60	8.7	28	.60	8.7		8.0
14	.56	7.1		8.5	29		10		
15		7.5	.59	8.3	30		16		
					31	.78	20		

NOTE.—Discharge determined from a fairly well defined rating curve. Relation of gage heights to discharge probably not affected by ice during January and February. Discharge Jan. 29 to 30 and Feb. 1, 16, and 17 estimated from climatologic data and records of flow of adjacent streams. Discharge interpolated for other days on which gage was not read.

Monthly discharge of Oak Creek near Independence, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	20	6.7	8.40	516	B.
February	15	7.9	8.76	487	B.

LITTLE PINE CREEK[1] NEAR INDEPENDENCE, CAL.

Location.—Three hundred feet above city waterworks, in sec. 18, T. 13 S., R. 35 E., 1 mile west of Independence.

Records available.—June 15, 1905, to February 28, 1911. Discontinued March 1, 1911.

Drainage area.—Approximately 8.4 square miles above mouth of canyon.

Gage.—Vertical staff on left bank at footbridge. Previous to August 20, 1906, the station was located at the city waterworks.

Channel.—Bowlders and gravel; somewhat shifting.

Discharge measurements.—Made from bridge at gage.

Diversions.—No water diverted above the gage.

Accuracy.—Results are good.

Cooperation.—Maintained in cooperation with the city of Los Angeles.

Discharge measurements of Little Pine Creek near Independence, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Jan. 30	G. T. Peckema	0.26	4.4
Feb. 17	C. H. Lee	.31	6.5

Daily gage height, in feet, and discharge, in second-feet, of Little Pine Creek near Independence, Cal., for 1911.

Day.	January.		February.		Day.	January.		February.	
	Gage height.	Discharge.	Gage height.	Discharge.		Gage height.	Discharge.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*	*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*
1	0.17	2.4	.....	10.0	16	.....	3.1	0.34	7.1
2	.....	2.8	0.36	7.9	17	0.20	2.5	.....	6.3
3	.22	3.1	.....	6.2	18	.....	3.1	.30	5.5
4	.....	2.8	.30	5.5	19	.24	3.7	.....	4.6
5	.20	2.5	.....	4.9	20	.....	4.6	.24	3.7
6	.....	2.5	.26	4.3	21	.30	5.5	.....	3.4
7	.20	2.5	.....	4.2	22	.....	4.6	.22	3.1
8	.....	2.5	.25	4.0	23	.24	3.7	.....	3.1
9	.20	2.5	.....	3.2	24	.....	3.8	.22	3.1
10	.....	2.5	.20	2.5	25	.25	4.0	.....	2.6
11	.20	2.5	.....	3.7	26	.....	3.7	.12	2.1
12	.....	3.1	.28	4.9	27	.23	3.4	.....	3.8
13	.24	3.7	.....	4.3	28	.....	6.0	.30	5.5
14	.....	3.7	.24	3.7	29	.44	11.5	.....	.....
15	.24	3.7	.....	5.4	30	.....	12.0	.....	.....
					31	.48	13.5	.....	.....

NOTE.—Relation of gage height to discharge probably not affected by ice during January and February. Discharge determined from a fairly well defined rating curve. Discharge February 1 estimated from records of flow of adjacent streams. Discharge interpolated for other days on which gage was not read.

[1] This creek is known locally as Independence Creek.

Monthly discharge of Little Pine Creek near Independence, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	13.5	2.4	4.24	261	C.
February	10.0	2.1	4.62	257	C.

LONE PINE CREEK NEAR LONE PINE, CAL.

Location.—500 feet above division boxes on the creek in sec. 29, T. 15 S., R. 36 E., about three-fourths of a mile west of Lone Pine.

Records available.—January 1, 1906, to February 28, 1911. Discontinued March 1, 1911.

Drainage area.—Approximately 12 square miles above mouth of canyon.

Gage.—Vertical staff on left bank above footbridge.

Channel.—Gravel and bowlders; shifts at high stages.

Discharge measurements.—Made from bridge at gage.

Diversions.—No water is diverted above the gage.

Accuracy.—Results are good.

Cooperation.—Maintained in cooperation with the city of Los Angeles.

Discharge measurements of Lone Pine Creek near Lone Pine, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Jan. 6	G. T. Peokema	1.98	4.8
Feb. 6	do	2.09	6.9

Daily gage height, in feet, and discharge, in second-feet, of Lone Pine Creek near Lone Pine, Cal., for 1911.

[S. A. Gallahor, observer.]

Day.	January.		February.		Day.	January.		February.	
	Gage height.	Discharge.	Gage height.	Discharge.		Gage height.	Discharge.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*	*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*
1	.....	5.5	2.2	8.7	16	.....	4.5	2.1	6.8
2	2.0	5.5	.....	10.0	17	1.95	4.5	.....	6.6
3	.....	5.5	.....	10.0	18	.....	4.5	.....	6.4
4	.....	5.5	2.4	14.5	19	.....	4.5	2.05	6.2
5	2.0	5.5	.....	10.0	20	1.95	4.5	.....	6.0
6	.....	5.2	.....	10.0	21	.....	4.5	.....	5.8
7	.....	4.8	2.2	8.7	22	.....	4.5	2.0	5.5
8	1.95	4.5	.....	8.0	23	1.95	4.5	.....	5.2
9	.....	4.5	.....	7.1	24	.....	4.5	.....	4.8
10	.....	4.5	2.05	6.2	25	.....	4.5	1.95	4.5
11	1.95	4.5	.....	6.2	26	1.95	4.5	.....	4.5
12	.....	4.5	.....	6.2	27	.....	4.5	.....	4.5
13	.....	4.5	2.05	6.2	28	.....	7.0	1.95	4.5
14	1.95	4.5	.....	6.4	29	2.3	11.0	.....	.....
15	.....	4.5	.....	6.6	30	.....	16.0	.....	.....
					31	.....	11.0	.....	.....

NOTE.—Relation of gage height to discharge probably not affected by ice during January and February. Discharge determined from a fairly well-defined curve. Discharge Jan. 27, 28, 30, and 31 and Feb. 2, 3, 5, and 6 estimated from climatologic record and records of flow of adjacent streams. Discharge interpolated for other days on which gage was not read.

Monthly discharge of Lone Pine Creek near Lone Pine, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	16.0	4.5	5.56	342	C.
February	14.5	4.5	7.00	389	C.

TUTTLE CREEK NEAR LONE PINE, CAL.

Location.—50 feet below division box and creek in sec. 32, T. 15 S., R. 36 E., about 2 miles southwest of Lone Pine.

Records available.—January 1, 1906, to February 28, 1911. Discontinued March 1, 1911.

Drainage area.—Approximately 7.8 square miles above mouth of canyon.

Gage.—Vertical staff on right bank at footbridge

Channel.—Shifting.

Discharge measurements.—Made from bridge at gage.

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

Accuracy.—Results are fair.

Cooperation.—Maintained in cooperation with the city of Los Angeles.

Discharge measurements of Tuttle Creek near Lone Pine, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Jan. 6	G. T. Peekema	1.30	6.1
Feb. 6	do	1.30	7.4

Daily gage height, in feet, and discharge, in second-feet, of Tuttle Creek near Lone Pine, Cal., for 1911.

[S. A. Gallaher, observer.]

Day.	January.		February.		Day.	January.		February.	
	Gage height.	Discharge.	Gage height.	Discharge.		Gage height.	Discharge.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*	*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*
1		6	1.3	6	16		6	1.4	9
2	1.3	6		7	17	1.3	6		8
3		6		8	18		6		8
4		6	1.4	9	19		6	1.35	8
5	1.3	6		8	20	1.3	6		8
6		6	1.3	7	21		6		8
7		6	1.35	8	22		6	1.35	8
8	1.3	6		8	23	1.3	6		8
9		6		7	24		6		7
10		6	1.3	7	25		6	1.3	7
11	1.3	6		7	26	1.3	6		7
12		6		7	27		7		7
13		6	1.3	7	28		8	1.3	7
14	1.3	6		7	29	1.4	9		
15		6		8	30		9		
					31		8		

NOTE.—Relation of gage heights to discharge probably not affected by ice during January and February. Discharge determined by indirect method for shifting channels. Discharge Jan. 28 and 30 estimated from records of flow of adjacent streams. Discharge interpolated for other days on which gage was not read.

Monthly discharge of Tuttle Creek near Lone Pine, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	9	6	6.4	394	C.
February	9	6	7.5	417	C.

COTTONWOOD CREEK NEAR OLANCHA, CAL.

Location.—100 feet above intake of diversion pipe of the Los Angeles Aqueduct in sec. 21, T. 17 S., R. 36 E., about 10 miles northwest of Olancha.

Records available.—January 1, 1906, to March 31, 1911. Discontinued April 1, 1911.

Drainage area.—Approximately 42 square miles above mouth of canyon.

Gage.—Vertical staff on right bank 500 feet below footbridge. Previous to September 9, 1908, the station was maintained at a point about one-fourth mile above the present location.

Channel.—Sand and gravel; somewhat shifting.

Discharge measurements.—Made from footbridge above gage.

Diversion.—No water diverted above the gage.

Accuracy.—Results good.

Cooperation.—Maintained in cooperation with the city of Los Angeles.

Discharge measurements of Cottonwood Creek near Olancha, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Jan. 4	G. T. Peckema	1.41	12
Feb. 8	do	1.76	21

Daily gage height, in feet, and discharge, in second-feet, of Cottonwood Creek near Olancha, Cal., for 1911.

[Sam Robinson, observer.]

Day.	January.		February.		March.		Day.	January.		February.		March.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.		Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	1.5	13	1.7	18	1.35	10	16	1.5	13	1.4	11	1.6	15
2	1.5	13	1.8	21	1.4	11	17	1.45	12	1.5	13	1.55	14
3	1.4	11	1.8	21	1.4	11	18	1.45	12	1.45	12	1.55	14
4	1.4	11	1.7	18	1.4	11	19	1.4	11	1.45	12	1.55	14
5	1.4	11	1.7	18	1.4	11	20	1.4	11	1.4	11	1.55	14
6	1.4	11	1.85	23	1.45	12	21	1.4	11	1.4	11	1.6	15
7	1.4	11	1.75	20	1.45	12	22	1.4	11	1.4	11	1.6	15
8	1.4	11	1.75	20	1.5	13	23	1.4	11	1.4	11	1.6	15
9	1.4	11	1.65	16	1.6	15	24	1.4	11	1.4	11	1.6	15
10	1.35	10	1.65	16	1.65	16	25	1.5	13	1.4	11	1.6	15
11	1.45	12	1.6	15	1.65	16	26	1.5	13	1.4	11	1.6	15
12	1.5	13	1.5	13	1.65	16	27	1.5	13	1.4	11	1.6	15
13	1.5	13	1.5	13	1.6	15	28	1.5	13	1.4	11	1.6	15
14	1.5	13	1.5	13	1.6	15	29	1.7	18	.....	.....	1.7	18
15	1.5	13	1.45	12	1.6	15	30	1.8	21	.....	.....	1.8	21
							31	1.9	25	.....	.....	1.8	21

NOTE.—Relation of gage height to discharge probably not affected by ice during January and February. Discharge determined from a well-defined curve.

Monthly discharge of Cottonwood Creek near Olancha, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	25	10	12.8	787	B.
February	23	11	14.4	800	B.
March	21	10	14.5	892	B.

MONO LAKE BASIN.

RUSH CREEK NEAR MONO LAKE, CAL.

Location.—At highway bridge one-fourth mile above the mouth of the creek, in the NE. ¼ sec. 13, T. 1 N., R. 26 E., about 8 miles southeast of Mono Lake post office, 3 miles below the mouth of Walker Creek.

Records available.—November 16, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Original gage vertical staff fastened to a cottonwood tree on the right bank just above the bridge. This gage was washed out on June 24, 1911, and a new gage was installed July 6 at an independent datum, as the bench mark was destroyed by the June flood. September 15 the gage was moved and the datum was raised 0.90 foot. All gage heights beginning with July 6 have been reduced to the present datum.

Channel.—Sand and gravel; will shift at high water.

Discharge measurements.—Made from highway bridge.

Winter flow.—Affected by ice.

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

Cooperation.—Gage heights furnished by United States Forest Service.

Estimates are withheld until additional measurements are made.

Discharge measurements of Rush Creek near Mono Lake, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
June 18	J. E. Stewart	[a] 8.45	1,190
July 22	G. T. Pookoma	[b] 4.80	[c] 717

[a] Gage heights referred to original gage and datum.
[b] Gage heights referred to gage installed July 6 and datum established Sept. 15.
[c] Measurements made above Walker, Parker, and several small streams the flow of which has been included to give the total discharge past the gage:

	Second-feet.
Discharge of Rush Creek	641
Discharge of Parker Creek	45
Discharge of Walker Creek	11
Estimated total discharge of other small streams	20
Total discharge past gage	717

Daily gage height, in feet, of Rush Creek near Mono Lake, Cal., for 1911.

[John E. Smith and Fred B. Clark, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1				3.40								
2									2.60	2.38		
3						6.32						
4	2.73	3.68	3.50								2.26	
5								3.70				
6					6.36		5.50			2.31		
7												
8				4.10								
9												
10						6.95						
11	2.82	2.83									2.28	2.08
12							5.35	3.35		2.30		
13					6.30				2.35			
14												
15				5.35					2.38	2.25		
16												2.08
17						7.80						
18		2.91	2.75									
19											2.20	
20					6.12							
21	3.00						5.20	2.95		2.25		
22				5.69								
23												2.12
24												
25		3.40	3.23						2.45			
26												
27					6.74							
28	2.99											
29				6.10			4.10					
30												2.50
31												

NOTE.—Relation of gage heights to discharge probably affected by ice about Jan. 16 to Feb. 10 and Dec. 26 to 31. For information regarding datum of gage, see description.

LEEVINING CREEK NEAR MONO LAKE, CAL.

Location.—In the SE. ¼ SE. ¼ sec. 17, T. 1 N., R. 26 E., in the Mono National Forest, about 3¼ miles above the mouth, 4 miles from Mono Lake post office.

Records available.—November 17, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to cottonwood tree on left bank 250 feet below ranger's camp.

Channel.—Gravel; fairly permanent.

Discharge measurements.—Made by wading near gage.

Diversions.—Less than 100 acre-feet are irrigated from ditch above the gage.

Winter flow.—Affected by ice.

Cooperation.—Gage heights furnished by United States Forest Service.

Estimates are withheld until additional measurements are made.

Discharge measurements of Leevining Creek near Mono Lake, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
June 18[a]	J. E. Stewart	4.55	590
July 21[b]	G. T. Peekema	3.93	323

[a] Made from highway bridge 3 miles below gage.
[b] Made from foot-log in Sylvester meadow 3 miles above gage. Practically no water enters creek or is diverted from creek between point of measurement and gage.

Daily gage height, in feet, of Leevining Creek near Mono Lake, Cal., for 1911.

[William J. Clark and Fred B. Clark, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.10	2.25	2.45	2.35	2.60	2.90	4.10	.....	2.68	2.33	.....	.....
2	2.79	2.37	2.50	2.36	2.60	3.00	4.15	.....	2.65	2.32	2.18	.....
3	2.15	2.41	2.19	2.38	2.62	3.24	4.30	3.30	2.60	2.30	2.19	.....
4	2.25	2.48	2.15	2.37	2.66	3.45	4.30	.....	2.58	2.32	2.19	.....
5	2.21	2.47	2.14	2.35	2.63	3.55	4.50	3.15	.....	2.30	2.19	.....
6	2.08	2.48	2.15	2.38	2.72	3.80	4.70	3.10	.....	2.30	2.19	.....
7	2.08	2.83	2.21	2.39	2.74	3.60	4.75	3.00	.....	2.28	2.17	.....
8	2.07	2.85	2.35	2.41	2.72	3.50	.....	3.05	.....	2.27	2.15	.....
9	2.10	2.35	2.51	2.40	2.71	3.55	.....	3.00	.....	2.25	2.14	.....
10	2.16	2.31	2.52	2.38	2.69	3.85	.....	3.10	.....	2.25	2.17	2.13
11	2.99	2.25	2.20	2.38	2.69	4.00	.....	.....	.....	2.25	2.35	2.13
12	2.85	2.27	2.28	2.35	2.71	4.15	4.25	3.00	2.38	2.25	2.50	2.11
13	3.10	2.34	2.38	2.34	2.74	4.40	4.35	2.90	2.35	2.25	2.20	2.10
14	3.60	2.71	2.29	2.32	2.72	4.30	4.60	2.85	2.35	.....	2.22	2.09
15	2.11	2.71	2.18	2.30	2.70	4.40	4.80	2.80	2.35	2.23	2.20	2.09
16	2.23	2.75	2.13	2.31	2.68	4.70	4.40	2.85	2.35	2.22	2.19	2.08
17	2.94	3.11	2.18	2.31	2.66	4.75	4.40	2.85	2.35	2.20	2.19	2.15
18	3.41	3.31	2.17	2.33	2.63	4.85	4.50	2.80	2.35	2.21	2.18	2.20
19	3.01	2.25	2.19	2.32	2.64	4.90	4.25	2.75	2.35	2.20	2.18	2.30
20	2.35	2.41	2.17	2.35	2.71	4.85	4.20	2.73	.....	2.21	2.18	2.38
21	2.31	2.71	2.16	2.37	2.82	4.80	4.00	2.80	.....	2.20	2.17	2.55
22	2.41	2.16	2.16	2.41	2.90	4.40	.....	2.75	.....	.....	.....	2.77
23	2.26	2.17	2.17	2.42	3.11	4.20	.....	2.70	2.38	2.20	.....	2.75
24	2.28	2.15	2.19	2.50	3.18	3.90	.....	2.70	2.35	2.19	.....	3.00
25	2.23	2.18	2.21	2.54	3.30	3.75	3.40	.....	2.38	2.18	.....	3.00
26	2.25	2.91	2.22	2.57	3.05	4.00	3.40	.....	.....	2.18	.....	3.00
27	2.31	2.21	2.20	2.60	2.98	4.35	3.40	.....	.....	2.19	.....	3.00
28	2.37	2.72	2.21	2.59	3.01	4.65	3.45	.....	.....	2.20	.....	3.00
29	2.32	.....	2.25	2.58	3.03	4.45	3.40	.....	.....	.....	.....	3.00
30	2.45	.....	2.31	2.58	3.00	4.20	3.45	.....	2.35	2.20	.....	3.48
31	2.34	.....	2.30	.....	2.95	.....	3.40	2.65	.....	2.20	.....	3.48

NOTE.—Relation of gage height to discharge probably affected by ice Jan. 1 to about Mar. 15 and about Dec. 15 to 31.

WALKER LAKE BASIN.

EAST WALKER RIVER NEAR BRIDGEPORT, CAL.

Location.—In the SW. ¼ SE. ¼ sec. 34, T. 6 N., R. 25 E., Mount Diablo base and meridian, in the Mono National Forest, about 4¼ miles north of Bridgeport.

Records available.—July 29 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on left bank.

Channel.—Gravel.

Discharge measurements.—No measurements have been made at this station.

Winter flow.—Affected by ice.

Cooperation.—Gage heights furnished by United States Forest Service.

Estimates are withheld until additional data have been secured.

Daily gage height, in feet, of East Walker River near Bridgeport, Cal., for 1911.

[Henry W. Atcheson and C. Wyatt, observers.]

Day.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1			0.79		0.41		16						1.20
2		1.91		0.48		0.88	17						
3							18					0.00	
4					.40		19		1.01				
5							20				0.36		
6		1.90					21						
7				.45			22		.90	0.56			
8		1.11					23						
9						1.12	24				.39		
10				.40			25					.99	
11							26		.88	.52			
12							27						
13		1.09	.51		.45		28				.42		
14				.41			29	2.15	.83				
15							30			.54	.40		
							31						

NOTE.—Low stage of river Nov. 18 caused by closing of irrigation reservoir at Twin Lakes. Relation of gage height to discharge probably affected by ice about Dec. 9 to 31.

EAST WALKER RIVER NEAR MASON, NEV.

Location.—At highway bridge in S. ½ NE. ¼ sec. 26, T. 12 N., R. 25 E., 2½ miles above junction with West Walker River and 7 miles above Mason.

Records available.—November 21, 1910, to December 31, 1911. From 1902 to 1908 a station was maintained at the Ross ranch, a short distance above the present station.

Drainage area.—Not measured.

Gage.—Vertical staff on left bank 100 feet below the bridge.

Channel.—Sand; shifting.

Discharge measurements.—Made from highway bridge.

Winter flow.—Some ice forms along the banks.

Diversions.—About 10,000 acres are irrigated above the station.

Accuracy.—Great changes in conditions of flow occurred during 1911. A temporary diversion dam above the bridge was partly destroyed January 31 and sediment held back by it partly filled in the section at the gage. This sediment was apparently largely scoured out during the high water of June. Estimates are accordingly subject to considerable error.

Discharge measurements of East Walker River near Mason, Nev., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Feb. 18	H. D. McGlashan	4.58	119
Apr. 6	J. E. Stewart	7.65	885
28	D. S. Stuver	6.50	490
June 7	do	7.15	696
15	J. E. Stewart	8.72	1,260
Aug. 3	G. T. Peckema	5.98	500
Oct. 31	J. E. Stewart	4.31	162

Daily gage height, in feet, of East Walker River near Mason, Nev., for 1911.

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

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.60	5.60	4.50	6.60	6.40	5.80	7.80	6.00	3.70	3.80	4.20	3.70
2	3.55	5.70	4.50	6.70	6.30	6.20	7.70	6.00	3.70	3.80	4.20	3.65
3	3.40	5.70	4.50	7.00	6.30	6.20	7.50	5.90	3.70	3.90	4.20	3.70
4	3.40	5.70	4.65	7.40	6.20	6.30	7.50	5.90	3.65	3.90	4.20	3.70
5	3.40	5.60	4.70	7.50	6.40	6.60	7.50	5.80	3.65	4.00	4.20	3.70
6	3.60	5.30	4.65	7.80	6.60	6.80	7.60	5.60	3.60	4.00	4.20	3.60
7	3.60	5.10	4.70	7.50	6.50	7.20	7.70	5.30	3.60	4.00	4.20	3.70
8	3.60	5.00	4.80	7.50	6.40	7.30	7.90	4.90	3.60	4.00	4.20	3.80
9	3.65	4.90	4.40	7.50	6.20	8.20	7.80	4.50	3.60	4.00	4.20	3.80
10	3.90	4.85	4.90	7.50	6.10	8.20	7.80	4.50	3.60	4.00	4.20	3.70
11	3.90	4.85	4.90	7.10	6.10	8.30	7.80	4.50	3.60	4.00	4.10	3.60
12	3.75	4.85	4.90	6.90	6.10	8.40	7.80	4.50	3.60	4.00	4.00	3.60
13	3.85	4.70	4.80	6.70	6.15	8.40	7.80	4.45	3.60	4.00	4.00	3.50
14	3.80	4.70	4.80	6.40	6.20	8.70	8.10	4.40	3.60	4.00	4.00	3.50
15	3.50	4.60	4.90	6.00	6.30	8.80	8.30	4.35	3.60	4.00	4.00	3.40
16	3.50	4.60	5.00	6.00	6.00	9.10	8.50	4.30	3.60	4.00	4.00	3.40
17	3.40	4.58	5.30	6.00	5.90	8.92	8.60	4.30	3.60	4.00	3.85	3.40
18	3.40	4.60	5.00	6.50	6.00	9.10	8.80	4.30	3.55	4.00	3.85	3.30
19	3.55	4.80	5.30	6.50	5.90	9.25	8.70	4.20	3.55	4.00	3.80	3.30
20	3.90	4.80	5.45	6.50	5.90	[a] 9.35	8.50	4.20	3.55	4.00	3.80	3.20
21	3.90	4.70	5.50	6.30	5.90	9.40	8.10	4.10	3.55	4.00	3.80	3.20
22	4.10	4.50	5.80	6.40	5.90	9.30	7.60	4.10	3.60	4.00	3.85	3.20
23	4.00	4.50	6.20	6.40	6.20	9.20	7.30	4.10	3.60	4.00	3.85	3.15
24	4.05	4.50	5.80	6.50	6.30	8.70	7.40	4.05	3.70	4.00	3.70	3.10
25	4.20	4.40	5.80	6.60	6.30	8.10	7.60	4.05	3.70	4.00	3.70	3.10
26	4.30	4.35	5.80	6.50	6.30	7.80	7.40	4.00	3.65	4.00	3.70	3.10
27	4.20	4.35	5.60	6.50	6.20	7.70	7.30	3.90	3.60	4.00	3.70	3.10
28	4.20	4.35	5.80	6.50	6.20	7.60	6.90	3.90	3.65	4.20	3.70	3.05
29	4.20	.....	6.10	6.40	5.90	7.90	6.70	3.90	3.65	4.20	3.70	3.05
30	4.15	.....	5.90	6.40	5.90	7.80	6.55	3.80	3.70	4.20	3.70	3.00
31	5.00	.....	6.40	.....	5.80	.....	6.40	3.80	.....	4.20	.....	3.00

[a] Maximum 9.5 at 11 a. m.

NOTE.—Relation of gage height to discharge probably not much affected by the ice which formed at this station in 1911. Temporary diversion dam above bridge partly washed out Jan. 31.

Daily discharge, in second-feet, of East Walker River near Mason, Nev., for 1910–11.

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1910.			1910.			1910.		
1	.....	73	11	.....	92	21	96	107
2	.....	75	12	.....	108	22	97	102
3	.....	78	13	.....	102	23	97	97
4	.....	82	14	.....	97	24	92	97
5	.....	113	15	.....	92	25	92	118
6	.....	102	16	.....	92	26	87	118
7	.....	102	17	.....	82	27	68	82
8	.....	102	18	.....	82	28	66	68
9	.....	97	19	.....	73	29	68	68
10	.....	92	20	.....	82	30	68	64
						31	.....	68

Daily discharge, in second-feet, of East Walker River near Mason, Nev., for 1910–11—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1911.												
1	64	340	110	525	465	315	1,020	500	90	100	145	90
2	60	350	110	555	440	415	985	500	90	100	145	86
3	48	340	110	645	440	415	925	475	90	110	145	90
4	48	325	125	785	415	440	925	475	86	110	145	90
5	48	295	130	820	465	525	925	450	86	120	145	90
6	64	225	125	925	525	585	955	400	81	120	145	81
7	64	185	130	820	495	715	985	335	81	120	145	90
8	64	170	140	820	465	750	1,040	255	81	120	145	100
9	68	155	100	820	415	1,060	1,020	190	81	120	145	100
10	92	148	155	820	390	1,060	1,020	190	81	120	145	90
11	92	148	155	680	390	1,100	1,020	190	81	120	132	81
12	78	148	155	615	390	1,140	1,020	190	81	120	120	81
13	87	130	140	555	402	1,140	1,020	182	81	120	120	72
14	82	130	140	465	415	1,260	1,100	175	81	120	120	72
15	56	120	155	365	440	1,300	1,160	168	81	120	120	63
16	56	120	170	365	365	1,420	1,240	160	81	120	120	63
17	48	118	215	365	340	1,350	1,270	160	81	120	105	63
18	48	120	170	495	365	1,420	1,340	160	76	120	105	55
19	60	140	215	495	340	1,480	1,300	145	76	120	100	55
20	92	140	245	495	340	1,520	1,240	145	76	120	100	47
21	92	130	255	440	340	1,550	1,100	132	76	120	100	47
22	113	110	315	465	340	1,520	955	132	81	120	105	47
23	102	110	415	465	415	1,480	865	132	81	120	105	43
24	108	110	315	495	440	1,300	895	126	90	120	90	39
25	124	100	315	525	440	1,100	955	126	90	120	90	39
26	136	95	315	495	440	1,020	895	120	86	120	90	39
27	124	95	275	495	415	985	865	110	81	120	90	39
28	124	95	315	495	415	955	745	110	86	145	90	36
29	124	.....	390	465	340	1,040	685	110	86	145	90	36
30	118	.....	340	465	340	1,020	640	100	90	145	90	32
31	225	.....	465	.....	315	.....	600	100	.....	145	.....	32

NOTE.—Daily discharge 1910 to 1911 determined from three rating curves as follows: Nov. 21, 1910 to Jan. 30, 1911, fairly accurate; Feb. 9 to June 20, fairly well defined; June 21 to Dec. 31, not well defined, Discharge Jan. 31 to Feb. 6, 1911, determined by indirect method for shifting channels. No reduction made in discharge for ice effect.

Monthly discharge of East Walker River near Mason, Nev., for 1910–11.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1910.					
November 21-30	97	66	83.1	1,650	B.
December	118	64	90.5	5,560	B.
1911.					
January	225	48	87.4	5,370	C.
February	350	95	168	9,330	C.
March	465	110	216	13,300	B.
April	925	365	574	34,200	A.
May	525	315	405	24,900	A.
June	1,550	315	1,050	62,500	B.
July	1,340	600	991	60,900	B.
August	500	100	218	13,400	B.
September	90	76	83.0	4,940	B.
October	145	100	121	7,440	B.
November	145	90	118	7,020	B.
December	100	32	64.1	3,940	B.
The year	1,550	32	341	247,000	

NOTE.—See description for discussion of accuracy.

WALKER RIVER AT MASON, NEV.

Location.—At the highway bridge at Mason, in the SW. ¼ sec. 33, T. 13 N., R. 25 E., about 4½ miles below the junction of East Walker and West Walker rivers.
Records available.—November 21, 1910, to December 31, 1911.
Drainage area.—Not measured.
Gage.—Vertical staff fastened to second bent from right end of bridge.
Channel.—Shifting sand.
Discharge measurements.—Made from highway bridge.
Winter flow.—Affected by ice.
Diversions.—A large part of the flow of both the East and Walker is used for irrigation.
Accuracy.—Results are good.

Discharge measurements of Walker River at Mason, Nev, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Feb. 19	H. D. McGlashan	4.50	335
Apr. 6	J. E. Stewart	6.20	1,260
29	D. S. Stuver	5.72	1,030
June 7	.....do	7.60	2,410
16	J. E. Stewart	9.00	3,860
Aug. 3	G. T. Peckema	5.66	957
Oct. 31	J. E. Stewart	4.28	274

Daily gage height, in feet, of Walker River at Mason, Nev., for 1911.

[T. T. Kelley, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.00	6.05	4.55	4.90	5.60	6.20	7.55	5.90	3.90	3.70	4.30	4.00
2	4.00	5.90	4.60	5.60	5.70	6.00	7.50	5.80	3.80	3.70	4.30	4.00
3	4.05	5.70	4.60	5.80	5.65	6.10	7.50	5.65	3.80	3.70	4.30	4.10
4	4.05	5.45	4.50	6.00	5.75	6.10	7.50	5.50	3.80	3.80	4.30	4.10
5	4.00	5.40	4.50	6.10	5.80	6.60	7.50	5.25	3.80	3.90	4.30	4.10
6	4.00	4.90	4.60	6.20	6.20	7.20	7.70	5.20	3.70	3.90	4.30	4.20
7	4.05	4.80	4.60	6.20	6.00	7.50	8.00	5.15	3.70	3.90	4.30	4.20
8	4.05	4.80	4.90	6.20	5.90	7.60	8.00	4.85	3.80	3.90	4.30	4.20
9	4.15	4.75	4.90	6.10	5.85	7.50	8.20	4.75	3.80	3.90	4.30	4.20
10	4.35	4.75	5.00	6.20	5.80	7.50	7.90	4.50	3.80	3.90	4.30	4.20
11	4.35	4.60	5.20	6.00	5.70	7.75	7.80	4.50	3.80	3.90	4.30	4.20
12	4.40	4.45	5.20	5.80	5.70	7.90	7.80	4.50	3.80	4.00	4.30	4.20
13	4.35	4.50	5.00	5.50	5.80	8.20	7.80	4.50	3.70	4.00	4.30	4.20
14	4.25	4.55	4.90	5.40	5.80	8.70	8.00	4.30	3.70	4.00	4.30	4.10
15	4.02	4.50	4.90	5.20	5.80	9.20	8.35	4.30	3.70	4.00	4.30	4.10
16	4.02	4.45	4.80	5.00	5.70	9.20	8.50	4.20	3.70	4.00	4.30	4.10
17	4.10	4.40	4.80	5.20	5.50	9.25	8.50	4.20	3.70	4.00	4.30	4.10
18	4.15	4.50	4.90	5.40	5.40	9.38	8.70	4.20	3.70	4.00	4.30	4.00
19	4.30	4.45	4.85	5.40	5.40	9.60	8.80	4.10	3.70	4.00	4.30	4.00
20	4.35	4.45	4.90	5.50	5.40	9.70	8.60	4.10	3.70	4.00	4.30	4.00
21	4.50	4.50	4.90	5.48	5.60	9.50	8.20	4.10	3.70	4.00	4.30	4.00
22	4.70	4.50	4.90	5.35	5.80	9.35	7.75	4.10	3.70	4.00	4.30	4.00
23	4.50	4.60	4.90	5.40	6.00	8.80	7.25	4.10	3.70	4.10	4.30	4.00
24	4.50	4.60	5.00	5.50	6.40	8.60	7.25	4.00	3.60	4.10	4.30	4.00
25	4.55	4.50	5.10	5.80	6.50	8.50	7.45	4.00	3.60	4.10	4.30	4.00
26	4.50	4.50	5.20	5.85	6.50	8.00	7.35	4.00	3.60	4.10	4.30	4.00
27	4.40	4.50	5.20	5.95	6.20	7.50	7.15	4.00	3.70	4.20	4.30	4.00
28	4.45	4.60	5.10	5.90	6.40	7.50	6.55	4.00	3.70	4.20	4.20	4.00
29	4.45	.....	5.20	5.75	6.40	7.85	6.50	4.00	3.70	4.20	4.20	4.00
30	5.45	.....	5.10	5.75	6.50	7.80	6.35	4.00	3.70	4.20	4.00	4.00
31	5.40	.....	4.80	.....	6.40	.....	6.10	4.00	.....	4.20	.....	4.00

NOTE.—Relation of gage heights to discharge probably not much affected by ice during 1911.

Daily discharge, in second-feet, of Walker River at Mason, Nev., for 1910–11.

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1910.			1910.			1910.		
1		230	11		260	21	242	200
2		230	12		260	22	242	200
3		230	13		260	23	245	200
4		245	14		230	24	245	200
5		295	15		200	25	230	215
6		260	16		200	26	245	230
7		260	17		200	27	230	200
8		260	18		200	28	200	200
9		260	19		200	29	200	162
10		260	20		188	30	230	130
						31		150

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1911.												
1	130	1,180	365	515	885	1,280	2,380	1,080	165	120	275	190
2	130	1,080	385	885	945	1,140	2,330	1,010	140	120	275	190
3	140	945	385	1,010	915	1,210	2,330	915	140	120	275	215
4	140	798	345	1,140	978	1,210	2,330	825	140	140	275	215
5	130	770	345	1,210	1,010	1,580	2,330	688	140	165	275	215
6	130	515	385	1,280	1,280	2,060	2,510	660	120	165	275	245
7	140	470	385	1,280	1,140	2,330	2,790	635	120	165	275	245
8	140	470	515	1,280	1,080	2,420	2,790	492	140	165	275	245
9	162	448	515	1,210	1,040	2,330	2,990	448	140	165	275	245
10	215	448	560	1,280	1,010	2,330	2,890	345	140	165	275	245
11	215	385	660	1,140	945	2,560	2,600	345	140	165	275	245
12	230	328	660	1,010	945	2,690	2,600	345	140	190	275	245
13	215	345	560	825	1,010	2,990	2,600	345	120	190	275	245
14	188	365	515	770	1,010	3,520	2,790	275	120	190	275	215
15	134	345	515	660	1,010	4,100	3,140	275	120	190	275	215
16	134	328	470	560	945	4,100	3,300	245	120	190	275	215
17	130	310	470	660	825	4,160	3,300	245	120	190	275	215
18	162	345	515	770	770	4,320	3,520	245	120	190	275	190
19	200	328	492	770	770	4,580	3,690	215	120	190	275	190
20	215	328	515	825	770	4,710	3,410	215	120	190	275	190
21	200	345	515	814	885	4,460	2,990	215	120	190	275	190
22	330	345	515	742	1,010	4,280	2,560	215	120	190	275	190
23	200	385	515	770	1,140	3,630	2,100	215	120	215	275	190
24	200	385	560	825	1,430	3,410	2,100	190	100	215	275	190
25	278	345	610	1,010	1,500	3,300	2,280	190	100	215	275	190
26	200	345	660	1,040	1,500	2,790	2,200	190	100	215	275	190
27	230	345	660	1,110	1,280	2,330	2,020	190	120	245	275	190
28	245	385	610	1,080	1,430	2,330	1,540	190	120	245	245	190
29	245	.....	660	978	1,430	2,640	1,500	190	120	245	245	190
30	672	.....	610	978	1,500	2,600	1,330	190	120	245	190	190
31	645	.....	470	.....	1,430	.....	1,210	190	.....	245	.....	190

NOTE.—Discharge Nov. 21, 1910, to Jan. 31, 1911, determined from a fairly accurate rating curve; Feb. 1 to Dec. 31, 1911, from a rating curve well defined above 250 second-feet. No reduction in discharge made on account of ice.

Monthly discharge of Walker River at Mason, Nev., for 1910–11.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1910.					
November 21-30	245	200	231	4,580	B.
December	295	130	220	13,500	B.
1911.					
January	672	130	225	13,800	B.
February	1,180	310	480	26,700	B.
March	660	345	514	31,600	A.
April	1,280	515	948	56,400	A.
May	1,500	770	1,090	67,000	A.
June	4,710	1,140	2,910	173,000	A.
July	3,630	1,210	2,520	155,000	A.
August	1,080	190	388	23,900	A.
September	165	100	126	7,500	B.
October	245	120	188	11,600	B.
November	275	190	270	16,100	B.
December	245	190	210	12,900	B.
The year	4,710	100	823	596,000	

ROBINSON CREEK NEAR BRIDGEPORT, CAL.

Location.—At the mouth of the canyon in the SW. ¼ NW. ¼ sec. 15, T. 4 N., R. 24 E., 5 miles above the junction with Buckeye Creek, and 5½ miles southwest of Bridgeport.

Records available.—November 18, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to a pine tree on the left bank.

Channel.—Composed of gravel and small bowlders; appears permanent.

Discharge measurements.—Made by wading near gage.

Winter flow.—Affected by ice.

Diversions.—The dam at the outlet of Twin Lakes partly regulates the flow at this station.

Cooperation.—Gage heights furnished by United States Forest Service.

Additional measurements are required before estimates can be made.

Discharge measurements of Robinson Creek near Bridgeport, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
June 17	J. E. Stewart [a]	5.00	578
July 25	G. T. Peckema [a]	4.50	387

[a] Made by wading half a mile above gage.

Daily gage heights, in feet, of Robinson Creek near Bridgeport, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1												
2							4.45		3.45		3.00	
3					3.11			4.20		2.99		2.39
4	2.29					3.78	4.43					
5								4.38			2.95	
6												
7	2.31					3.90	4.50					
8				2.99						2.99		
9					2.90			3.49				
10						4.05				2.95		2.40
11	2.30											
12				3.00		4.20	4.50	3.67				
13					3.45				3.12			
14				2.95						3.04	2.36	
15									3.10			
16					3.35		4.80					2.35
17						5.00						
18	2.55								3.10		2.37	
19				2.98				3.55				
20					3.25		5.00			3.02		
21						5.20			3.10			
22				3.00				3.52				
23					3.45				3.00			2.30
24				3.02		4.70	4.50			2.95		
25											2.35	
26												
27					3.75	4.40		3.51	3.52			
28			2.72							3.01		
29							4.25	3.48				
30			2.80	3.10					3.10			2.00
31					3.70							

NOTE.—Dam at Twin Lakes closed on Nov. 14 and gates closed Nov. 25. Relation of gage height to discharge probably more or less affected by ice during the winter.

BUCKEYE CREEK NEAR BRIDGEPORT, CAL.

Location.—At the mouth of the canyon, in the SE. ¼ NW. ¼ sec. 3, T. 4 N., R. 24 E., in the Mono National Forest, half a mile below Hot Springs, 4½ miles southwest of Bridgeport.

Records available.—November 18, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to large cottonwood tree on left bank about half a mile above the mouth of the canyon.

Channel.—Composed of gravel and bowlders and is rough.

Discharge measurements.—Made by wading or from a foot-log 20 feet above the gage.

Winter flow.—Affected by ice.

Cooperation.—Gage heights furnished by United States Forest Service.

Sufficient measurements have not been made to define a rating curve for this station.

Discharge measurements of Buckeye Creek near Bridgeport, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
June 17	J. E. Stewart *a*	4.45	527
July 25	G. T. Peekema *a*	3.95	238

a Made from foot-log 20 feet above gage.

Daily gage height, in feet, of Buckeye Creek near Bridgeport, Cal., for 1911.

[H. W. Atcheson and Clarence Wyatt, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1							4.40		3.38		3.00	
2					3.31			3.80		3.05		2.80
3						3.75	4.40					
4	2.70										2.95	
5								3.75				
6						4.00	4.45					
7	2.70									3.04		
8				2.00				3.68				
9					3.40							2.85
10						4.10				2.90		
11	2.03											
12				2.93		4.30	4.30	3.60				
13					3.39				3.18			
14										3.00	2.93	
15				2.90		4.20			3.12			
16					3.30		4.35					2.85
17						4.45						
18	2.80								3.11		2.92	
19				3.00				3.50				
20					3.40		4.35			2.90		
21	2.85					4.80			3.10			
22				3.12				3.43				
23					3.80				3.10			2.85
24						4.40	3.95			2.95		
25				3.40							2.85	
26								3.38	3.50			
27					3.55	4.50						
28			2.82							2.97		
29				3.25			4.05	3.40				
30			2.95						3.20			2.80
31					3.50							

NOTE.—Relation of gage height to discharge probably more or less affected by ice during the winter.

SWAGER CREEK NEAR BRIDGEPORT, CAL.

Location.—At highway bridge in the NW. ¼ NW. ¼ sec. 23, T. 5 N., R. 24 E., three-fourths of a mile northwest of Mono ranger station, 4¼ miles northwest of Bridgeport.

Records avaliable.—June 1 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on right bank 20 feet above bridge.

Channel.—Gravel and bowlders.

Discharge measurements.—Made from highway bridge.

Winter flow.—Affected by ice.

Cooperation.—Gage heights furnished by United States Forest Service.

Estimates are withheld until additional measurements are obtained.

Discharge measurements of Swager Creek near Bridgeport, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
June 17[a]	J. E. Stewart	4.02	140
July 25[b]	G. T. Peckema	2.88	31

[a] Measurement made by wading one-fourth of a mile below gage. [b] Made by wading.

Daily gage height, in feet, of Swager Creek near Bridgeport, Cal., for 1911.

[H. W. Atcheson and Clarence Wyatt, observers.]

Day.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.60	3.38		2.52	2.52	2.52		16	4.10	3.20			2.52		2.40
2							2.53	17	4.02						
3		3.26	2.76					18				2.50		2.38	
4						2.50		19	4.05		2.60	2.45	2.52		
5	3.90							20	4.04	3.07					
6		3.30	2.60			2.52		21					2.55		
7		3.15			2.07			22	3.90		2.58				
8	3.90		2.68					23				2.45			2.45
9							2.35	24		2.88			2.55		
10					2.05			25	3.60		2.50	2.52		2.38	
11								26	3.60				2.56		
12	4.00	3.15						27							
13			2.69	2.51		2.38		28					2.52		
14					2.55			29		2.90	2.55				
15								30				2.59			2.35
								31							

NOTE.—No information regarding effect of ice.

CARSON-HUMBOLDT SINK BASIN.

EAST FORK OF CARSON RIVER AT SILVER KING VALLEY, NEAR MARKLEEVILLE, CAL.

Location.—At lower end of Silver King Valley, in the NE. ¼ sec. 2, T. 8 N., R. 21 E., in the Mono National Forest, 300 feet above the mouth of Bagley Creek about 12 miles southeast of Markleeville.

Records available.—Fragmentary records during 1910–11.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to a tamarack tree on left bank near dam site. Previous to March 30, 1911, the gage was located a short distance above the present one. The original datum has not been maintained.

Channel.—Gravel; appears permanent.

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

Winter flow.—Affected by ice.

Cooperation.—Gage heights furnished by United States Forest Service and discharge measurements by Stone & Webster Engineering Corporation.

Estimates are withheld until further data are obtained.

Discharge measurements of East Fork of Carson River at Silver King Valley, near Markleeville, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Mar. 30	L. O. Murphy	[a] 2.45	184
July 29	Peckema and Murphy	[b] 2.60	278

[a] Old gage at damsite read 2.17 feet. [b] Old gage at damsite read 2.50 feet.

Gage height, in feet, of East Fork of Carson River at Silver King Valley near Markleeville, Cal., for 1910–11.

Date.	Gage height.	Date.	Gage height.	Date.	Gage height.
1910.		1911.		1911.	
Nov. 19	1.00	Feb. 18	2.95	May 27	3.35
26	1.00	27	2.70	June 23	3.85
Dec. 5	1.31	Mar. 2	2.65	29	3.20
11	1.21	18	1.50	July 26	3.80
17	1.28	25	2.00	29	2.60
24	1.28	30	2.45	Aug. 14	2.10
31	1.30	Apr. 7	2.50	Sept. 20	1.05
1911.		14	2.40	22	1.85
Jan. 7	1.40	22	2.55	Oct. 31	1.79
28	2.40	29	2.40	Nov. 21	1.70
Feb. 3	3.40	May 13	2.55	Dec. 14	2.20
		20	3.00		

NOTE.—Relation of gage height to discharge probably affected by ice Jan. 1 to about Mar. 15 and Dec. 1 to 31. Gage heights prior to Mar. 30, 1911, refer to the old gage at the damsite. Gage heights Mar. 18 and 25 liable to large error caused by disturbance of gage by ice.

EAST FORK OF CARSON RIVER NEAR MARKLEEVILLE, CAL.

Location.—At Hangman's bridge, in the NE. ¼ sec. 27, T. 10 N., R. 20 E., 2 miles east of Markleeville. Indian Creek enters 100 feet above gage and Markleeville Creek 1¼ miles below.

Records available.—November 13, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff 75 feet below the bridge, bolted to rock on right bank.

Channel.—Composed of gravel and small bowlders; appears permanent.

Discharge measurements.—Made from car and cable at stamp mill 3 miles above station where the Stone & Webster Engineering Corporation maintains a gage. At low and medium stages measurements are made by wading below the gage.

Winter flow.—Affected by ice.

Storage.—Low-water flow is augmented by storage developed on Silver Creek above the station.

Cooperation.—Gage heights furnished by United States Forest Service.

Estimates of discharge withheld pending the verification of the data.

Discharge measurements of East Fork of Carson River near Markleeville, Cal., in 1911.

Date.	Hydrographer.	Gage height.		Discharge at U.S.G.S. gage.
		Stone & Webster gage.	U.S. G. S. gage.	
		Feet.	*Feet.*	*Sec.-ft.*
Apr. 11[a]	J. E. Stewart	.....	4.28	423
June 12[b]	.....do	4.00	7.50	2,020
23[b]	.....do	3.68	6.50	1,640
July 28[b]	G. T. Peckema	2.52	4.85	517
Nov. 7[c]	J. E. Stewart	1.22	2.87	78

[a] Made by wading below U. S. Geol. Survey gage.
[b] Made from Stone & Webster's cable at stamp mill, 3 miles above U. S. Geol. Survey gage.
[c] Made by wading about 200 feet above dam near stamp mill.

Daily gage height, in feet, of East Fork of Carson River at Markleeville, Cal., for 1911.

[C. S. Bauder and John E. Smith, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.30	4.30	3.00	4.90	5.20	5.35	.....	.....	.....	.....	.....	.....
2	2.69	3.85	.....	.....	5.10	6.50	.....	.....	3.25	.....	.....	.....
3	2.75	3.87	2.90	5.25	5.40	.....	6.15	.....	.....	.....	.....	.....
4	2.76	3.55	2.90	5.00	5.55	.....	.....	.....	.....	3.10	2.80	.....
5	2.78	.....	.....	5.10	6.00	6.50	.....	4.10	3.20	.....	.....	.....
6	2.72	3.35	2.90	4.75	5.30	.....	.....	.....	.....	.....	.....	.....
7	2.81	3.12	.....	4.70	5.20	.....	6.15	.....	.....	3.17	2.87	.....
8	2.80	3.20	.....	4.60	5.20	.....	.....	.....	.....	.....	.....	.....
9	2.70	3.10	2.85	4.70	5.45	.....	6.00	.....	3.18	.....	.....	.....
10	2.72	3.30	2.90	4.45	5.40	6.78	.....	.....	.....	.....	2.80	.....
11	2.56	3.15	2.90	4.30	5.55	.....	5.98	.....	.....	3.20	2.40	.....
12	2.40	.....	.....	4.15	5.60	7.50	.....	3.70	.....	.....	.....	.....
13	2.38	3.00	2.90	4.05	5.55	.....	5.98	.....	.....	.....	.....	.....
14	2.70	2.85	2.90	4.00	5.50	.....	.....	.....	.....	.....	.....	2.40
15	.....	3.00	3.00	3.95	5.20	7.10	.....	3.50	.....	.....	.....	.....
16	.....	2.90	3.08	4.00	5.00	.....	5.90	.....	.....	.....	.....	.....
17	2.88	2.80	3.20	4.10	4.95	7.70	6.60	3.58	.....	.....	.....	.....
18	3.02	.....	3.50	4.28	4.95	7.05	6.50	.....	.....	2.90	2.80	.....
19	2.84	3.00	.....	4.70	5.30	.....	5.60	.....	.....	.....	.....	.....
20	.....	3.00	3.55	4.53	5.50	7.02	5.60	.....	3.00	.....	.....	.....
21	3.30	2.70	3.53	4.55	5.95	.....	.....	3.45	.....	2.90	2.85	.....
22	.....	2.85	3.75	5.00	6.00	.....	5.40	.....	3.05	.....	.....	.....
23	2.80	3.00	3.95	5.01	6.42	6.40	.....	.....	.....	.....	.....	3.65
24	3.38	2.95	4.05	5.40	6.55	.....	5.10	.....	.....	.....	.....	.....
25	3.08	2.98	4.08	5.60	6.00	.....	.....	.....	.....	.....	2.75	.....
26	2.90	2.80	4.20	5.95	5.90	6.00	4.60	.....	.....	.....	.....	.....
27	2.90	.....	4.00	5.55	5.80	6.20	.....	3.30	.....	.....	.....	.....
28	.....	3.05	4.15	5.20	.....	.....	4.85	3.35	.....	.....	.....	.....
29	2.90	.....	4.35	5.00	5.90	.....	.....	.....	.....	.....	.....	.....
30	5.50	.....	.....	5.00	.....	6.35	4.50	.....	3.05	2.90	.....	.....
31	5.30	.....	4.80	.....	5.55	.....	.....	3.30	.....	.....	.....	3.75

NOTE.—Relation of gage heights to discharge probably affected by ice Jan. 1 to Feb. 16 and Nov. 18 to Dec. 31.

CARSON RIVER AND BRUNSWICK MILL POWER CANAL NEAR EMPIRE, NEV.

Location.—At highway bridge at Brunswick Mill, in the SE. ¼ sec. 12, T. 15 N., R. 20 E., one-fourth of a mile below diversion dam of Brunswick Mill Power Co., and 2 miles below Empire.

Records available.—June 25 to December 31, 1895, and October 21, 1900, to December 31, 1911.

Drainage area.—988 square miles.

Gage.—A staff gage was installed on the left abutment of the bridge June 7, 1907. Previous to this time gages had been in use at other locations. On February 24, 1911, a staff gage was installed on the left bank a short distance below the tailrace of the Brunswick Mill power canal and about 1,000 feet below the bridge at an independent datum. The entire flow of the river passes this gage.

Channel.—Gravel and bowlders; appears permanent. At the old gage the channel is sandy and somewhat shifting.

Discharge measurements.—Made from car and cable about 50 feet above bridge. The discharge of Brunswick Mill power canal is also measured each time and added to the measured discharge of the river to give the total flow past the gage.

Winter flow.—Usually somewhat affected by ice.

Artificial control.—The Carson Valley, above this station, uses a considerable part of the summer flow for irrigation.

Accuracy.—Records since the installation of the new gage are excellent. On account of the uncertainty in the canal data, previous records are not as reliable.

Cooperation.—Gage heights furnished by United States Reclamation Service.

Records at this station include the return water from irrigation in Carson Valley and show amount of water available for use in Dayton Valley.

Discharge measurements of Carson River and Brunswick Mill power canal near Empire, Nev., in 1911.

Date.	Hydrographer.	Gage height, gage at bridge.	Discharge, river at bridge.	Discharge of Brunswick mill power canal.	Gage height, gage below tailrace.	Total discharge.
		Feet.	*Sec.-feet.*	*Sec.-feet.*	*Feet.*	*Sec.-feet.*
Feb. 24	H. D. McGlashan	4.02	244	159	4.10	403
Apr. 13	J. E. Stewart	5.44	785	150	4.90	935
June 9	do	7.60	3,300	49	7.00	3,350
10	D. S. Stuver	7.58	3,350	52	6.95	3,400
21	J. E. Stewart	8.00	4,380	57	7.60	4,440
July 2	D. S. Stuver	6.70	1,860	40	5.88	1,900
Aug. 1	G. T. Peckema	4.58	372	53	4.18	425
9	D. S. Stuver	3.58	126	83	3.70	209
Nov. 5	J. E. Stewart	3.42	88.3	75.4	3.66	164

Daily gage height, in feet, of Carson River near Empire, Nev., for 1911.

[D. I. Patterson, observer.]

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		4.0	5.5	5.3	6.3	6.2	3.5	3.3	3.4	3.6	3.8
2		4.0	5.6	5.4	6.1	6.2	3.4	3.3	3.4	3.7	3.7
3		4.1	5.7	5.3	5.8	6.1	3.4	3.3	3.5	3.8	3.8
4		4.0	5.7	5.4	6.2	5.8	3.4	3.3	3.6	3.8	3.7
5		4.1	5.8	5.7	6.4	5.8	3.3	3.4	3.6	3.7	3.6
6		4.2	5.7	6.0	6.7	5.8	3.3	3.5	3.7	3.7	3.7
7		4.6	5.7	5.8	7.0	5.9	3.4	3.4	3.7	3.8	3.7
8		5.3	5.5	5.6	7.0	5.9	3.5	3.3	3.7	3.8	3.7
9		5.4	5.4	5.4	7.0	5.8	3.7	3.3	3.6	3.9	3.8
10		5.3	5.3	5.5	6.9	5.7	3.7	3.3	3.7	3.9	3.8
11		5.0	5.2	5.5	7.0	5.7	3.7	3.3	3.7	3.9	3.7
12		4.9	5.1	5.6	7.3	6.0	3.7	3.2	3.7	3.8	3.8
13		4.8	4.8	5.7	7.4	6.0	3.7	3.2	3.6	3.7	3.6
14		4.7	4.7	5.7	7.3	5.9	3.6	3.1	3.6	3.7	3.7
15		4.6	4.5	5.7	7.5	5.9	3.6	3.2	3.6	3.7	3.7
16		4.6	4.6	5.5	7.4	6.0	3.5	3.1	3.6	3.7	3.7
17		4.6	4.6	5.3	7.5	5.9	3.4	3.1	3.6	3.9	3.8
18		4.6	4.7	5.3	7.5	5.8	3.2	3.1	3.7	3.9	3.6
19		4.6	4.8	5.2	7.6	5.9	3.2	3.2	3.7	3.9	3.7
20		4.7	4.9	5.4	7.6	5.8	3.2	3.2	3.6	3.8	3.7

Daily gage height, in feet, of Carson River near Empire, Nev., for 1911—Continued.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
21	.....	4.8	4.9	5.6	7.5	5.4	3.3	3.2	3.6	3.7	3.7
22	.....	5.0	4.9	6.0	7.4	5.1	3.4	3.2	3.6	3.7	3.7
23	.....	5.3	5.1	6.2	7.1	4.6	3.3	3.2	3.6	3.7	3.8
24	3.78	5.1	6.3	6.5	6.9	4.3	3.3	3.2	3.6	3.7	3.8
25	4.1	5.2	5.4	6.8	6.4	4.0	3.3	3.2	3.6	3.8	3.8
26	3.9	5.1	5.7	6.5	6.3	3.9	3.4	3.3	3.7	3.8	3.8
27	4.0	4.9	5.8	6.2	6.2	3.7	3.4	3.3	3.7	3.8	3.9
28	3.9	5.1	5.9	6.2	6.3	3.6	3.3	3.4	3.7	3.9	3.9
29	.....	5.2	6.0	6.1	6.5	3.5	3.2	3.4	3.7	3.8	3.8
30	.....	5.3	5.5	6.3	6.4	3.5	3.2	3.5	3.7	3.8	3.8
31	.....	5.4	.....	6.3	.....	3.5	3.3	.....	3.6	.....	4.5

NOTE.—Relation of gage height to discharge probably not affected by ice except on Dec. 17, when the effect was slight.

Daily discharge, in second-feet, of Carson River near Empire, Nev., for 1911.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	335	1,470	1,270	2,390	2,270	122	69	93	155	236
2	.....	335	1,580	1,370	2,150	2,270	93	69	93	194	194
3	.....	391	1,690	1,270	1,800	2,150	93	69	122	236	236
4	.....	335	1,690	1,370	2,270	1,300	93	69	155	236	194
5	.....	391	1,800	1,690	2,520	1,800	69	93	155	194	155
6	.....	450	1,690	2,030	2,950	1,800	69	122	194	194	194
7	.....	710	1,690	1,800	3,400	1,910	93	93	194	236	194
8	.....	1,270	1,470	1,580	3,400	1,910	122	69	194	236	194
9	.....	1,370	1,370	1,370	3,400	1,800	194	69	155	285	236
10	.....	1,270	1,270	1,470	3,250	1,690	194	69	194	285	236
11	.....	1,020	1,180	1,470	3,400	1,690	194	69	194	285	194
12	.....	940	1,100	1,580	3,800	2,030	194	50	194	236	236
13	.....	860	860	1,690	4,060	2,030	194	50	155	194	155
14	.....	780	780	1,690	3,800	1,910	155	36	155	194	194
15	.....	710	640	1,690	4,250	1,910	155	50	155	194	194
16	.....	710	710	1,470	4,060	2,030	122	36	155	194	194
17	.....	710	710	1,270	4,250	1,910	93	36	155	285	236
18	.....	710	780	1,270	4,250	1,800	50	36	194	285	155
19	.....	710	860	1,180	4,440	1,910	50	50	194	285	194
20	.....	780	940	1,370	4,440	1,800	50	50	155	236	194
21	.....	860	940	1,580	4,250	1,370	69	50	155	194	194
22	.....	1,020	940	2,030	4,060	1,100	93	50	155	194	194
23	.....	1,270	1,100	2,270	3,560	710	69	50	155	194	236
24	228	1,100	1,270	2,060	3,250	512	69	50	155	194	236
25	391	1,180	1,370	3,100	2,520	335	69	50	155	236	236
26	285	1,100	1,690	2,060	2,390	285	93	69	194	236	236
27	335	940	1,800	2,270	2,270	194	93	69	194	236	285
28	285	1,100	1,910	2,270	2,300	155	69	93	194	285	285
29	.....	1,180	2,030	2,150	2,060	122	50	93	194	236	236
30	.....	1,270	1,470	2,390	2,520	122	50	122	194	236	236
31	.....	1,370	.....	2,300	.....	122	69	.....	155	.....	640

NOTE.—Discharge Feb. 29 to Dec. 31 determined from a rating curve well defined above 120 second-feet.

Monthly discharge of Carson River near Empire, Nev., for 1911.

[Drainage area, 988 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	.....	.....	480	0.486	0.56	29,500	C.
February	.....	.....	605	.612	.64	33,600	C.
March	1,370	335	877	.888	1.02	53,900	A.
April	2,030	640	1,290	1.31	1.46	76,800	A.
May	3,100	1,180	1,800	1.82	2.10	111,000	A.
June	4,440	1,800	3,280	3.32	3.70	195,000	A.
July	2,270	122	1,400	1.42	1.64	86,100	A.
August	194	50	103	.104	.12	6,330	B.
September	122	36	65	.066	.07	3,870	B.
October	194	93	166	.168	.19	10,200	A.
November	285	155	229	.232	.26	13,600	A.
December	640	155	227	.230	.27	14,000	A.
The year	4,440	36	875	.886	12.03	634,000	

NOTE.—Discharge Jan. 1 to Feb. 23 estimated by means of gage heights and developed rating curve for the bridge station. To allow for discharge of power canal 102 second-feet was added to the discharge past the bridge for January and 131 second-feet for Feb. 1 to 23.

CARSON RIVER NEAR FORT CHURCHILL, NEV.

Location.—One mile west of Clifton station, on Mound House-Churchill branch of Southern Pacific Railroad, in sec. 5, T. 16 N., R. 23 E., 10 miles below Dayton, about 9 miles west of Fort Churchill.

Records available.—April 13 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Inclined staff on right bank and vertical high-water section 100 feet south.

Channel.—Sand; fairly permanent.

Discharge measurements.—Made at suspension gaging bridge 500 feet above gage.

Winter flow.—Somewhat affected by ice.

Artificial control.—Carson and Dayton valleys are irrigated from this stream.

Accuracy.—Rating curve well defined and results good.

Cooperation.—Gage heights and discharge measurements furnished by United States Reclamation Service.

This station is maintained to show the amount of water available from the Carson drainage basin for storage in the Lahontan reservoir now being constructed by the United States Reclamation Service for the Truckee-Carson project.

Discharge measurements of Carson River near Fort Churchill, Nev., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Apr. 13	D. S. Stuver	5.95	927
26	do	6.85	1,570
June 5	do	8.48	2,910
9	do	9.04	3,530
July 3	do	7.14	1,980
Aug. 7	do	3.99	282
8	do	3.90	248
23	do	3.14	72

Daily gage height, in feet, of Carson River near Fort Churchill, Nev., for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	6.48	7.70	7.68	4.60	3.00	3.25	3.55	3.85
2	.....	6.55	7.35	7.50	4.48	3.10	3.27	3.55	3.80
3	.....	6.50	7.60	7.14	4.40	3.05	3.35	3.58	3.90
4	.....	6.65	8.10	7.20	4.37	3.08	3.50	3.60	3.88
5	.....	6.90	8.48	7.25	4.20	3.00	3.50	3.62	3.85
6	.....	7.48	8.85	7.20	4.22	3.03	3.60	3.63	3.83
7	.....	7.15	9.10	7.15	3.95	3.07	3.62	3.65	3.85
8	.....	6.85	9.05	7.10	3.90	3.15	3.62	3.65	3.85
9	.....	6.80	9.00	7.10	3.85	3.10	3.52	3.65	3.85
10	.....	6.75	8.92	6.88	3.80	3.08	3.55	3.70	3.78
11	.....	6.70	8.97	6.70	3.72	3.03	3.55	3.70	3.73
12	.....	6.80	9.10	6.85	3.70	3.05	3.57	3.75	3.70
13	5.95	7.00	9.40	6.80	3.62	3.00	3.60	3.70	3.60
14	5.80	6.98	9.50	6.90	3.50	2.95	3.52	3.70	3.57
15	5.68	6.98	9.67	6.90	3.42	2.97	3.50	3.78	3.63
16	5.63	6.72	9.67	7.10	3.40	2.97	3.48	3.78	3.70
17	5.62	6.45	9.68	7.78	3.28	2.95	3.50	3.85	3.70
18	5.68	6.45	9.70	7.45	3.12	3.00	3.53	3.87	3.65
19	5.75	6.35	9.80	7.20	3.10	3.20	3.52	3.88	3.63
20	6.05	6.60	9.88	6.90	3.08	3.05	3.53	3.80	3.70
21	5.95	6.85	9.88	6.45	3.10	3.08	3.52	3.82	3.58
22	5.97	7.13	9.65	6.25	3.12	3.07	3.55	3.82	3.55
23	6.02	7.60	9.15	5.78	3.13	3.00	3.57	3.80	3.52
24	6.35	8.05	8.58	5.55	3.05	3.00	3.55	3.75	3.52
25	6.65	8.60	8.00	5.50	3.02	3.05	3.55	3.75	3.80
26	6.85	8.42	7.70	5.20	3.00	3.02	3.50	3.80	3.55
27	7.15	7.72	7.45	5.10	3.05	3.05	3.55	3.88	3.65
28	7.20	7.50	7.70	4.90	3.05	3.12	3.57	3.88	3.50
29	6.92	7.68	8.00	4.97	3.00	3.20	3.58	3.85	4.58
30	6.52	7.75	7.80	4.82	3.00	3.25	3.50	3.83	4.40
31	.....	7.85	.....	4.68	3.02	.....	3.55	.....	3.55

NOTE.—Ice Dec. 29 to 30.

Daily discharge, in second-feet, of Carson River near Fort Churchill, Nev., for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1,330	2,220	2,200	465	50	93	158	236
2	.....	1,370	1,940	2,060	427	66	97	158	222
3	.....	1,340	2,140	1,780	401	58	113	166	250
4	.....	1,440	2,580	1,820	391	63	146	171	244
5	.....	1,610	2,930	1,860	337	50	146	176	236
6	.....	2,040	3,300	1,820	343	55	171	178	230
7	.....	1,780	3,550	1,780	264	61	176	184	236
8	.....	1,680	3,500	1,750	250	74	176	184	236
9	.....	1,540	3,450	1,750	236	66	151	184	236
10	.....	1,500	3,370	1,600	222	63	158	196	217
11	.....	1,470	3,420	1,470	201	55	158	196	204
12	.....	1,540	3,550	1,580	196	58	164	209	196
13	1,020	1,680	3,850	1,540	176	50	171	196	171
14	950	1,670	3,950	1,610	146	43	151	196	164
15	800	1,670	4,140	1,910	128	46	146	217	178
16	865	1,480	4,140	1,750	123	46	141	217	196
17	800	1,310	4,150	2,200	99	43	146	236	196
18	890	1,310	4,170	2,020	69	50	154	242	184
19	920	1,250	4,380	1,820	66	83	151	244	178
20	1,080	1,400	4,470	1,610	63	58	154	222	196
21	1,020	1,580	4,470	1,310	66	63	151	228	166
22	1,040	1,770	4,120	1,190	69	61	158	228	158
23	1,060	2,140	3,400	940	71	50	164	222	151
24	1,250	2,540	3,030	830	58	50	158	209	151
25	1,440	3,050	2,490	810	53	58	158	209	222
26	1,580	2,870	2,220	690	50	53	146	222	158
27	1,780	2,240	2,020	650	58	58	158	244	184
28	1,820	2,060	2,220	570	58	69	164	244	146
29	1,620	2,200	2,490	598	50	83	166	236	150
30	1,350	2,260	2,310	542	50	93	146	230	154
31	.....	2,360	.....	493	53	.....	158	.....	158

NOTE.—Daily discharge determined from a rating curve well defined for all stages. Discharge estimated Dec. 29 to 30.

Monthly discharge of Carson River near Fort Churchill, Nev., for 1911.

Month.	Discharge in second-feet.			Run-off (in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April 13-30	1,820	860	1,190	42,500	A.
May	3,050	1,250	1,790	110,000	A.
June	4,470	1,940	3,270	195,000	A.
July	2,290	493	1,430	87,900	A.
August	465	50	169	10,400	A.
September	93	43	59.2	3,520	B.
October	176	93	151	9,280	A.
November	244	158	207	12,300	A.
December	250	146	193	11,900	A.
The period	.....	.....	.....	483,000	

SILVER CREEK NEAR MARKLEEVILLE, CAL.

Location.—In the SE. ¼ sec. 14, T. 9 N., R. 20 E., in the Mono National Forest, at Silver Creek, an abandoned post office, 10 miles above Markleeville.

Records available.—November 12, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to a juniper tree on the right bank 75 feet below foot-bridge.

Channel.—Gravel and bowlders; fairly permanent.

Discharge measurements.—Made from foot bridge at high stages.

Winter flow.—Affected by ice.

Storage.—Storage has been developed for use in irrigation at the Upper and Lower Kinney lakes and Kinney Meadows.

Accuracy.—Records are considered reliable.

Cooperation.—Gage heights furnished by United States Forest Service.

Discharge measurements of Silver Creek near Markleeville, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Apr. 11[a]	J. E. Stewart	3.72	64
June 23	do	5.06	233
July 30[b]	G. T. Peekoma	4.01	93
Nov. 7[a]	J. E. Stewart	2.77	5.7

[a] Made by wading 50 feet above gage. [b] Made from downstream side of bridge.

Daily gage height, in feet, of Silver Creek near Markleeville, Cal., for 1911.

[H. W. Jones, C. Wyatt, C. S. Bauder, and J. E. Smith, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.80	.....
2	.....	.....	.....	.....	4.20	.....	.....	.....	.....	.....	2.20	.....
3	2.00	5.00	3.00	.....	.....	.....	.....	.....	.....	.....	.....	.....
4	.....	.....	.....	4.20	.....	.....	.....	.....	.....	.....	.....	.....
5	.....	.....	.....	.....	4.50	.....	.....	.....	.....	.....	2.00	.....
6	2.81	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.00	.....
7	.....	3.30	3.00	3.90	.....	.....	.....	.....	.....	.....	.....	.....
8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
9	.....	.....	.....	.....	4.32	.....	.....	.....	.....	.....	.....	.....
10	2.75	3.15	3.00	.....	.....	5.10	.....	.....	.....	.....	.....	.....
11	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.10	.....	.....
12	.....	.....	.....	.....	4.45	.....	.....	.....	.....	.....	.....	.....
13	.....	.....	.....	.....	.....	.....	4.06	.....	.....	.....	.....	.....
14	.....	3.05	2.92	3.50	.....	.....	.....	.....	.....	.....	.....	.....
15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Daily gage height, in feet, of Silver Creek near Markleeville, Cal., for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
16					4.20			3.40				
17	2.80	3.05	3.40					3.40				
18	2.75			3.95								
19					4.35	5.95						
20	4.00											
21		3.00	3.90	3.95								
22												
23					4.95	5.05						
24	3.50	3.00	3.50									
25				4.35								
26					4.55							
27	2.80							3.05				
28		3.00	3.90	4.20			4.00		2.90			
29								3.00	2.90			
30							4.00			2.80		
31	6.00		4.00							3.00		3.00

NOTE.—Probably no very great effect from ice.

Daily discharge, in second-feet, of Silver Creek near Markleeville, Cal., for 1910–11.

Day.	Dec.	Day.	Dec.	Day.	Dec.
1910.		1910.		1910.	
1	14	11	14	21	14
2	14	12	13	22	14
3	14	13	13	23	13
4	14	14	15	24	10
5	14	15	16	25	7
6	14	16	18	26	4
7	14	17	13	27	1
8	14	18	14	28	1
9	15	19	14	29	1
10	15	20	15	30	1
				31	8

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1911.												
1	16	533	19	108	120	180	106	88	14	10	7	
2	16	412	19	124	120	222	114	85	14	10	1	
3	16	292	19	140	137	264	122	81	12	12	1	
4	15	227	19	120	155	306	130	78	12	12	1	
5	14	163	19	108	172	348	125	74	12	12	1	
6	13	98	19	95	158	390	120	71	12	12	1	
7	13	33	19	82	144	373	115	67	12	14		
8	12	30	19	70	130	356	110	64	12	14		
9	12	28	19	80	138	339	105	60	12	16		
10	12	25	19	90	130	322	100	57	12	18		
11	12	24	19	79	146	350	95	53	12	19		
12	12	23	18	68	162	377	98	50	12	18		
13	12	22	17	57	151	405	100	46	11	17		
14	12	21	17	46	141	432	105	43	11	16		
15	12	21	24	56	131	460	110	40	11	14		
16	13	21	32	67	120	504	108	36	11	12		
17	13	21	29	77	128	547	106	36	11	10		
18	12	20	50	88	136	590	104	34	11	10		
19	52	20	61	99	144	633	102	32	11	10		
20	93	19	72	110	178	551	101	30	11	8		
21	56	19	82	88	211	470	100	28	11	8		
22	20	19	70	102	245	388	99	26	11	8		
23	33	19	58	116	278	307	98	24	10	8		
24	46	19	46	130	246	271	96	22	10	8		
25	35	19	55	144	214	235	95	20	10	8		
26	24	19	64	170	182	198	94	18	10	7		
27	13	19	73	145	181	162	93	16	10	7		
28	15	19	82	120	180	126	92	15	10	7		
29	228		86	120	185	90	92	14	10	7		
30	440		90	120	190	98	92	14	10	7		
31	653		93		185		92	14		14		14

NOTE.—Daily discharge determined from two rating curves fairly well defined between 20 and 350 second-feet, applicable Nov. 12, 1910, to June 19, 1911, and June 20 to Dec. 31, 1911. Gage heights Jan. 22 and 28; Apr. 3, 8, 10, 20, and 26; May 8, 10, 28, and 30; June 1, 6, 15, and 29, and July 4, 11, and 15, estimated from records of flow of adjacent streams. Discharge interpolated for other days on which gage was not read.

Monthly discharge of Silver Creek near Markleeville, Cal., for 1910–11.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1910.					
December	18	1	11.7	719	C.
1911.					
January	653	12	62.7	3,860	C.
February	533	19	78.8	4,380	C.
March	93	17	43.2	2,660	B.
April	170	46	101	6,010	B.
May	278	126	166	10,200	B.
June	633	90	343	20,400	B.
July	130	92	104	6,400	C.
August	88	14	43.1	2,650	C.
September	14	10	11.3	672	D.
October	19	7	11.4	701	D.
November	.....	.....	10.0	595	D.
December	.....	.....	8.0	492	D.
The year	653	.....	81.5	59,000	

NOTE.—Discharge for November and December estimated.

MARKLEEVILLE CREEK[1] ABOVE MARKLEEVILLE, CAL.

Location.—At highway bridge above mouth of Pleasant Valley Creek, and three-fourths of a mile above Markleeville.

Records available.—November 7 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on left abutment of bridge.

Channel.—Gravel and small bowlders.

Discharge measurements.—Made from bridge at high water.

Winter flow.—Affected by ice.

Diversions.—Town ditch, which heads above the gage, furnishes water for irrigation and domestic use at Markleeville. In addition a small ditch diverts water for irrigation on Hot Springs ranch.

Cooperation.—Gage heights furnished by United States Forest Service.

The following discharge measurement was made by J. E. Stewart:
November 7, 1911: Gage height, 5.60 feet; discharge, 2.6 second-feet.

Gage height, in feet, of Markleeville Creek above Markleeville, Cal., for 1911.

Nov. 7	5.6
18	5.8
25	6.0
Dec. 12	6.0
15	5.2
24	5.8

NOTE.—Gage heights probably affected by ice Nov. 15 to Dec. 31.

[1] Known locally as Hot Springs Creek.

MARKLEEVILLE CREEK AT MARKLEEVILLE, CAL.

Location.—At the highway bridge at Markleeville, in the SE. ¼ sec. 21, T. 10 N., R. 20 E.

Records available.—November 11, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on left abutment of highway bridge.

Channel.—Composed of gravel and bowlders; banks high and not subject to overflow.

Discharge measurements.—Made from bridge.

Winter flow.—Probably affected by ice at times.

Diversions.—Two ditches divert water from Hot Springs Creek (the union of which with Pleasant Creek forms Markleeville Creek, three-fourths of a mile above the station); the upper ditch, which is small, irrigates the Hot Springs ranch; the lower, known as the Town ditch, was built in the early days to furnish water for domestic use at Markleeville, then a mining camp; later this ditch was rebuilt and extended to irrigate land below the town.

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

Discharge measurements of Markleeville Creek at Markleeville, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Apr. 11[a]	J. E. Stewart	3.50	186
June 22	do	5.05	761
July 30[b]	G. T. Peekema	2.80	65
Nov. 6[c]	J. E. Stewart	1.88	9.4

[a] Made from bridge. No water in town ditch.
[b] Made from bridge. Town ditch measured 8.3 second-feet.
[c] Made by wading about 600 feet below gage. Town ditch measured 4.2 second-feet.

Daily gage height, in feet, of Markleeville Creek at Markleeville, Cal., for 1911.

[H. W. Jones, C. Wyatt, C. S. Bander, and John E. Smith, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.20	3.50	2.50	3.75	4.00	4.20						2.10
2	2.11	3.30			4.00				1.95			
3	2.08	3.28	2.50	4.02	4.10		4.20					
4	2.18	3.05	2.50	3.90	4.40					1.90	1.90	
5	2.02			4.15	4.60	5.10		2.70	1.88			
6	2.02	2.95	2.48	3.85	4.20							
7	2.01	2.90		3.75	4.10		4.05			1.92		
8	1.95	2.80		3.70	4.00							
9	1.99	2.85	2.48	3.80	4.20				2.25			
10	2.30	2.80	2.48	3.65	4.10	5.15						
11	2.20	2.78	2.48	3.50	4.20		3.88				2.00	
12	2.35			3.40	4.35			2.40				2.20
13	2.70	2.68	2.53	3.90	4.30			2.30	2.05			
14	3.00	2.75	2.50	3.30	4.30				1.90			
15		2.75	2.53	3.28	3.95	5.30	3.85		2.40			2.00
16		2.95	2.55	3.30	3.90							
17	3.15	2.80	2.70	3.35	3.80	5.20			2.32			
18	3.00		2.80	3.50	3.70					1.78	1.80	
19	2.80	2.58		3.70	4.05		3.40		2.30			
20		2.56	2.80	3.60	4.20	5.10						
21	3.25	2.60	2.85	3.60	4.30			2.15	2.18			
22	2.65	2.78	2.90	3.95	4.70		3.28	2.00	2.18	1.98		2.20
23	3.00	2.58	3.10	4.00	5.00	4.70						
24	2.65	2.55	3.18	4.05	5.20		3.15					
25	2.50	2.58	3.30	4.20	4.55				1.98		1.95	
26		2.30		4.50	4.45	4.35	2.90	1.98				
27	2.44		3.18	4.35	4.40	4.85	3.01		1.92			
28		2.60	3.28	4.05								
29	2.75		3.40	3.90	4.55				1.92			
30	4.80			3.95		4.30	2.80				1.97	
31	4.20		4.12					1.90		1.92		2.40

NOTE.—Relation of gage heights to discharge probably affected by ice Dec. 16 to 31. Assumed no ice effect during remainder of year. Rise on Sept. 9 due to opening of Tamarack and Sunset reservoirs.

Daily discharge, in second-feet, of Markleeville Creek at Markleeville, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	25	178	44	235	305	372	386	68	13	13	13	20
2	20	140	44	274	305	478	360	66	14	12	12	20
3	19	137	44	312	338	583	372	64	13	12	12	20
4	24	102	44	275	452	689	381	62	12	12	12	22
5	17	95	44	355	540	795	390	60	11	12	12	22
6	17	88	43	262	372	770	351	57	15	13	13	22
7	16	82	43	235	338	780	322	54	20	13	13	22
8	14	70	43	222	305	750	302	50	24	13	14	24
9	16	76	43	248	372	786	281	47	28	12	15	24
10	31	70	43	211	338	822	260	44	26	12	16	24
11	25	68	43	178	372	840	270	40	23	10	16	25
12	34	63	44	158	432	858	250	37	21	10	15	25
13	60	58	46	275	412	877	260	31	18	9	14	22
14	95	65	44	140	412	896	270	30	12	9	13	21
15	102	65	46	137	290	915	262	29	37	9	12	20
16	109	88	48	140	275	888	236	28	34	9	11	.....
17	116	70	60	149	248	860	210	26	32	9	10	.....
18	95	60	70	178	222	838	184	25	32	8.6	9	.....
19	70	50	70	222	322	816	158	24	31	9	9	.....
20	101	49	70	200	372	795	146	23	28	12	10	.....
21	132	52	76	200	412	725	134	22	24	14	10	.....
22	56	68	82	290	585	655	123	16	24	15	11	.....
23	95	50	108	305	740	585	120	16	21	15	12	.....
24	56	48	120	322	680	534	116	16	18	15	13	.....
25	44	50	140	372	518	483	99	15	15	15	14	.....
26	42	31	130	495	474	432	82	15	14	14	14	.....
27	40	42	120	432	452	660	96	15	13	14	14	.....
28	52	52	137	322	485	578	88	14	13	14	14	.....
29	65	.....	158	275	518	495	79	14	13	13	15	.....
30	635	.....	252	290	470	412	70	13	13	13	15	.....
31	372	.....	345	.....	421	.....	70	12	.....	13	.....	.....

NOTE.—Daily discharge determined from a well-defined rating curve. Discharge June 6, 7, and 8, and July 2, 5, 10, 12, and 14 estimated from records of flow of adjacent streams. Discharge interpolated for other days on which gage was not read.

Monthly discharge of Markleeville Creek at Markleeville, Cal., for 1910–11.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1910.					
November 11–30	13	4.9	7.40	294	C.
December	60	9.3	22.5	1,380	C.
1911.					
January	635	14	83.7	5,150	C.
February	178	31	73.8	4,100	C.
March	345	43	85.3	5,240	B.
April	495	137	257	15,300	A.
May	860	222	418	25,700	A.
June	915	372	699	41,600	A.
July	390	70	217	13,300	B.
August	68	12	33.3	2,050	B.
September	37	11	20.4	1,210	B.
October	15	8.6	12.1	744	C.
November	16	9	12.8	762	C.
December	25	.....	18.5	1,140	C.
The year	915		161	116,000	

NOTE.—Flow Dec. 16 to 31 estimated as 15 second-feet.

PLEASANT VALLEY CREEK NEAR MARKLEEVILLE, CAL.

Location.—At footbridge in the NW. ¼ sec. 28, T. 10 N., R. 20 E., 600 feet above junction with Hot Springs Creek, and three-fourths of a mile southwest of Markleeville.

Records available.—November 11, 1910, to November 11, 1911. Discontinued November 12, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to cottonwood tree on the left bank 25 feet above footbridge.

Channel.—Gravel and bowlders with control formed by large bowlders.

Discharge measurements.—Made from footbridge at high stages.

Winter flow.—Affected by ice.

Storage and diversion.—Several small reservoirs used in storing water for irrigation have been developed on the headwaters of this stream. Three irrigation ditches head above the station.

Accuracy.—Record considered reliable.

Cooperation.—Gage heights furnished by United States Forest Service.

Record discontinued after station on Markleeville Creek above Markleeville was established. Flow of this stream may be computed from records on Markleeville Creek above and below mouth of Pleasant Valley Creek.

Discharge measurements of Pleasant Valley Creek at Markleeville, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Apr. 12[a]	J. E. Stewart	3.94	92
June 22[b]	do	5.04	331
July 30[a c]	G. T. Peekema	3.51	40
Nov. 6[a]	J. E. Stewart	2.92	4.8

[a] Wading measurement.
[b] Made at footbridge.
[c] Old gage at footbridge read 2.88 feet. J. Maisterrena's ditch measured 3.9 second-feet. J. E. Mayo's ditch measured 8.0 second-feet.

Daily gage height, in feet, of Pleasant Valley Creek near Markleeville, Cal., for 1911.

[H. W. Jones, C. Wyatt, and C. S. Bauder, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	3.10	4.20	3.40	4.20	4.40	4.55					
2	2.90	4.05			4.40				2.80		
3	3.01	4.04	3.40	4.40	4.45		4.40				
4	3.00	3.90	3.40	4.30	4.95					2.45	2.60
5	3.03			4.30	5.30	5.30		3.40	2.75		
6	3.08	3.75	3.40	4.10	4.60						
7	3.05	3.75		4.12	4.50		4.35			2.50	2.92
8	3.50	3.78		4.10	4.50						
9	3.50	3.75	3.40	4.20	4.55				3.20		
10	3.10	3.65	3.40	4.00	4.50	5.40					
11	3.07	3.65	3.40	4.00	4.60		4.20				2.95
12	2.30			3.95	4.80			3.20			
13		3.65	3.40	3.90	4.60	5.45					
14	2.70	3.60	3.40	3.90	4.60			3.00	2.85		
15		3.53	3.37	3.90	4.40		4.25		3.30		
16		3.65	3.39	3.95	4.20						
17	3.30	3.55	3.41	3.95	4.25	5.50			3.30		
18	3.00		3.45	4.00	4.20					2.90	
19	3.20	3.50		4.28	4.52		4.00		3.28		
20		3.48	3.50	4.00	4.60	5.35					
21	3.30	3.50	3.50	4.05	5.01					2.80	
22		3.50	3.53	4.05	5.40		3.35	3.00	3.15		
23	3.27	3.45	3.70	4.35	5.35						
24	3.43	3.40	3.78	4.55	5.45		3.80				
25	3.30	3.40	3.80	4.80	5.00		3.60		3.00		
26	3.25	3.70		5.00	4.95	4.50		2.98			
27	3.20		3.80	4.70					2.92		
28		3.40	3.85	4.50							
29			3.90	4.20	4.95				2.91		
30				4.20		4.10	3.50				
31			4.12		4.65			2.85		2.75	

NOTE.—Observer reports ice during January and February, but relation of gage heights to discharge was probably little affected by ice during this period. Rise in September caused by opening of Tamarack and Sunset reservoirs.

Daily discharge, in second-feet, of Pleasant Valley Creek near Markleeville, Cal., for 1910–11.

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1910.			1910.			1910.		
1		12	11	6.4	26	21	6.0	16
2		12	12	6.4	22	22	6.4	15
3		20	13	6.8	20	23	6.8	14
4		15	14	7.2	15	24	10	15
5		9.2	15	7.2	16	25	8.8	14
6		14	16	7.2	16	26	7.2	12
7		15	17	6.8	15	27	6.4	14
8		16	18	7.6	14	28	12	11
9		12	19	6.8	15	29	12	10
10		19	20	6.0	15	30	12	10
						31		10

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1911.											
1	15	126	34	126	164	195	128	39	4.5	5.0	3.1
2	6.0	103	34	145	164	255	146	38	4.0	4.0	2.8
3	10	102	34	164	174	315	164	36	4.0	3.0	2.4
4	10	84	34	144	306	375	162	35	3.5	1.2	2.0
5	12	75	34	144	435	435	159	34	3.5	1.3	3.6
6	14	66	34	110	206	450	156	32	8.0	1.4	5.2
7	12	66	34	113	184	435	154	30	12	1.5	6.8
8	42	70	34	110	184	420	147	28	16	1.9	7.1
9	42	66	34	126	195	450	140	26	20	2.3	7.4
10	15	55	34	96	184	480	133	24	17	2.7	7.7
11	14	55	34	96	206	487	126	22	14	3.1	8.0
12	0.5	55	34	90	260	495	128	20	11	3.5	.....
13	1.8	55	34	84	206	502	130	15	8.0	3.9	.....
14	3.0	50	34	84	206	518	132	10	5.0	4.3	.....
15	10	44	32	84	164	534	135	10	26	4.7	.....
16	18	55	33	90	126	550	126	10	26	5.1	.....
17	26	46	35	90	135	525	116	10	26	5.6	.....
18	10	44	38	96	126	502	106	10	26	6.0	.....
19	20	42	40	141	188	480	96	10	25	5.0	.....
20	35	40	42	96	206	458	74	10	22	5.0	.....
21	26	42	42	103	326	413	52	10	20	4.0	.....
22	25	42	44	103	480	368	30	10	18	4.0	.....
23	24	38	60	154	458	322	51	10	15	4.0	.....
24	36	34	70	195	502	276	72	10	12	4.0	.....
25	26	34	72	260	322	230	50	10	10	4.0	.....
26	23	60	72	322	306	184	48	9.2	8.4	4.0	.....
27	20	47	72	232	333	165	46	9.0	6.8	3.5	.....
28	86	34	78	184	360	147	44	8.0	6.6	3.5	.....
29	154	.....	84	126	306	128	43	7.0	6.4	3.5	.....
30	220	.....	98	126	262	110	42	6.0	6.0	3.5	.....
31	173	.....	113	.....	219	.....	40	5.0	.....	3.5	.....

NOTE.—Daily discharge determined from a fairly well defined curve for all stages. Discharge Jan. 30, May 28, and June 6, 8, and 16, 1911, estimated from records of flow of adjacent streams. Discharge interpolated for other days on which gage was not read.

Monthly discharge of Pleasant Valley Creek near Markleeville, Cal., for 1910–11.

Month.	Discharge in second-feet.			Run-off (total in acre-feet.)	Accuracy.
	Maximum.	Minimum.	Mean.		
1910.					
November 11-30	12	6.0	7.80	309	C.
December	26	9.2	14.3	913	C.
1911.					
January	220	0.5	36.4	2,240	C.
February	126	34	55.1	3,200	C.
March	113	32	48.4	1,980	C.
April	322	84	134	7,970	C.
May	502	126	255	15,700	A.
June	550	110	373	22,200	A.
July	154	40	131	8,070	C.
August	39	5.0	17.5	1,080	C.
September	26	4.5	11.0	654	C.
October	6.0	1.2	3.42	210	C.
November 1-11	8.0	2.0	5.10	111	C.
The period				42,800	

WEST FORK OF CARSON RIVER AT WOODFORDS, CAL.

Location.—At Woodfords, above highway bridge in the SE. ¼ sec. 34, T. 11 N., R. 19 E.

Records available.—April, 1890, to March, 1892; October 18, 1900, to December 31, 1911.

Drainage area.—70 square miles.

Gage.—October 18, 1900, to May 18, 1907, gage located at cable. June 8, 1907, to date, gage near highway bridge at Woodfords, one-half mile below site previously used. During portions of 1910 and 1911 gage records secured by the Stone & Webster Engineering Corporation are also available. These were read on a gage one-fourth of a mile above the cable.

Channel.—Composed of fine gravel and bowlders and is rough. The section is fairly permanent.

Discharge measurements.—Made from car and cable half a mile above the lower gage or by wading.

Winter flow.—Affected by ice.

Diversions.—Three irrigation ditches head between the cable and the lower gage. There is no record regarding these diversions. No water is diverted above the upper gage.

Accuracy.—Results January 1 to August 31, 1911, are good. For remainder of the year the data are not so reliable.

Cooperation.—Observations from upper gage furnished by Stone & Webster Engineering Corporation. Gage heights at lower gage furnished by United States Reclamation Service.

Discharge measurements of West Fork of Carson River at Woodfords, Cal., in 1910–11.

Date.	Hydrographer.	Gage heights.		Discharge.
		U. S. R. S. gage at bridge.	Stone & Webster gage above cable.	
		Feet.	*Feet.*	*Sec.-ft.*
1910. Dec. 10	Stone & Webster Engineering Corporation		1.00	49
1911. Mar. 28	Stone & Webster Engineering Corporation		1.50	95
Apr. 10	J. E. Stewart	2.40	1.85	[a] 149
June 9	Stone & Webster Engineering Corporation		4.00	802
22	J. E. Stewart	4.43	3.86	[a] 797
July 20	Stone & Webster Engineering Corporation		2.65	289
28	do		2.15	175
28	G. T. Peckema	2.35	2.10	[a b] 192
Sept. —	Stone & Webster Engineering Corporation		.81	43
Oct. 10	do		.60	26
Nov. 6[c]	J. E. Stewart		.68	30

[a] Made from cable half a mile above bridge. Canal diversions unknown.
[b] Discharge at highway bridge is 192-36=156 second-feet. West Carson ditches were carrying water as follows: Lower, 12.5 second-feet; middle, 13.4 second feet; upper, 9.8 second-feet.
[c] Wading 10 feet below Stone & Webster gage. Canal diversions unknown.

Daily gage height, in feet, of West Fork of Carson River at Woodfords, Cal., for 1911

[O. H. Rieff, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.55	0.95	0.90	2.20	2.70	3.90	3.30	1.90	1.25	1.20	1.10	1.60
2	.55	.90	.90	2.40	2.75	4.10	3.20	1.90	1.25	1.20	.....	1.60
3	.55	.85	.90	2.40	3.10	4.40	3.30	.....	.....	1.20	1.10	1.55
4	.65	1.00	.85	2.35	3.40	4.40	3.40	.....	.....	1.20	1.10	1.50
5	.65	1.00	.80	2.15	3.50	4.50	3.40	.....	1.20	1.20	1.10	1.50
6	.70	1.20	.85	2.05	2.90	4.20	3.40	1.70	1.20	1.15	1.10	1.40
7	.70	1.25	.85	2.00	2.85	4.30	3.30	1.60	1.20	1.10	1.15	1.40
8	.65	1.20	.80	2.05	3.10	4.10	3.30	.....	.....	1.10	1.20	1.40
9	.95	1.20	.80	2.00	3.00	4.30	3.30	1.50	.....	1.10	1.20	1.40
10	.55	1.20	.75	1.80	3.20	4.50	2.90	1.50	1.25	1.10	1.20	1.35
11	.50	1.15	.75	1.75	3.10	4.70	3.00	.....	1.25	1.10	1.20	1.30
12	.45	1.10	.75	.....	3.30	4.40	2.90	.....	1.20	1.10	1.20	1.30
13	.45	1.05	.80	1.70	3.30	4.80	3.00	1.40	.....	1.10	1.20	1.30
14	.50	1.00	.80	1.65	3.00	4.70	3.00	.....	.....	1.10	1.30	1.30
15	.55	1.00	.80	1.60	2.85	4.70	2.90	1.40	1.20	1.10	1.30	1.20
16	.60	1.00	.85	1.60	2.90	4.70	3.00	1.40	1.20	1.10	1.30	1.20
17	.55	1.00	.90	1.75	2.80	4.70	2.90	.....	.....	1.10	1.30	1.20
18	.55	1.00	.90	2.00	3.30	4.50	.....	.....	1.20	1.10	1.35	1.20
19	.50	.95	.95	2.20	3.40	4.50	2.65	1.30	1.20	1.10	1.38	1.20
20	.80	.95	1.00	2.20	3.70	4.50	2.65	1.30	.....	1.10	1.40	1.20
21	.65	.95	1.00	2.20	3.80	4.20	2.58	.....	1.10	1.10	1.40	1.20
22	.65	1.00	1.10	2.50	4.30	4.20	2.50	1.20	1.10	1.10	1.40	1.10
23	.65	.....	1.20	2.70	4.90	3.60	.....	1.20	1.10	1.10	1.45	1.10
24	.70	.....	1.20	2.85	4.20	3.40	.....	.....	1.10	1.10	1.50	1.10
25	.65	.....	1.20	3.00	3.80	3.30	.....	.....	1.10	1.10	1.55	1.10
26	.65	.....	1.25	3.00	3.80	3.40	.....	1.20	.....	1.10	1.58	1.10
27	.65	.....	1.35	2.90	4.00	3.70	2.15	1.20	.....	1.10	1.60	1.10
28	.60	.....	1.50	2.70	3.90	3.90	2.15	.....	1.20	1.10	1.60	1.10
29	1.00	.....	1.60	2.50	4.00	3.60	.....	.....	1.20	1.10	1.60	1.10
30	1.25	.....	1.75	2.60	3.80	3.40	.....	1.00	.....	1.10	1.65	1.10
31	1.10	.....	1.90	.....	3.50	.....	2.05	.....	.....	1.10	.....	1.15

NOTE.—Records Jan. 1 to Aug. 31 are from Stone & Webster's gage, one-fourth mile above the cable. Gage heights Sept. 1 to Dec. 31 refer to gage at highway bridge half a mile below cable. Relation of gage height to discharge probably unaffected by ice.

Daily discharge, in second-feet, of West Fork of Carson River at Woodfords, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	24	48	45	200	318	785	520	148	50	47	41	79
2	24	45	45	240	332	885	482	148	50	47	41	79
3	24	42	45	240	445	1,040	520	140	49	47	41	74
4	30	52	42	230	560	1,040	560	134	48	47	41	70
5	30	52	39	190	600	1,080	560	127	47	47	41	70
6	33	68	42	172	378	935	560	120	47	44	41	62
7	33	72	42	164	362	985	520	106	47	41	44	62
8	30	68	39	172	445	885	520	100	48	41	47	62
9	48	68	39	164	410	985	520	95	49	41	47	62
10	24	68	36	134	482	1,080	378	95	50	41	47	58
11	22	64	36	127	445	1,190	410	92	50	41	47	54
12	20	60	36	124	520	1,040	378	89	47	41	47	54
13	20	56	39	120	520	1,240	410	85	47	41	47	54
14	22	52	39	113	410	1,190	410	85	47	41	54	54
15	24	52	39	106	362	1,190	378	85	47	41	54	47
16	27	52	42	106	378	1,190	410	85	47	41	54	47
17	24	52	45	127	346	1,190	378	82	47	41	54	47
18	24	52	45	164	520	1,080	341	79	47	41	58	47
19	22	48	48	200	560	1,080	304	76	47	41	60	47
20	39	48	52	200	690	1,080	304	76	44	41	62	47

Daily discharge, in second-feet, of West Fork of Carson River at Woodfords, Cal., for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
21	30	48	52	200	735	935	285	72	41	41	62	47
22	30	52	60	264	985	935	264	68	41	41	62	41
23	30	51	68	318	1,300	645	248	68	41	41	66	41
24	33	50	68	362	935	560	234	68	41	41	70	41
25	30	49	68	410	735	520	220	68	41	41	74	41
26	30	48	72	410	735	560	205	68	43	41	77	41
27	30	47	80	378	835	690	190	68	45	41	79	41
28	27	46	95	318	785	785	190	62	47	41	79	41
29	52	.....	106	264	835	645	184	57	47	41	79	41
30	72	.....	127	290	735	560	178	52	47	41	84	41
31	60	.....	148	.....	600	.....	172	51	.....	41	.....	44

NOTE.—Daily discharge Jan. 1 to Aug. 31 determined from a well-defined rating curve referred to the gage one-fourth mile above the cable. Discharge Sept. 1 to Dec. 31 determined from a fairly well defined curve referred to the bridge gage half a mile below the cable. Discharge January to August represents total flow of river. Discharge September to December more or less reduced by diversions above the gage. Discharge interpolated for days on which gage was not read.

Monthly discharge of West Fork of Carson River at Woodfords, Cal., for 1911.

[Drainage area, 70 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	72	20	31	0.443	0.51	1,910	B.
February	72	42	54	.771	.80	3,000	B.
March	148	36	57	.814	.94	3,500	B.
April	410	106	217	3.10	3.46	12,900	A.
May	1,300	346	590	8.43	9.72	36,300	A.
June	1,240	520	934	13.3	14.84	55,600	A.
July	560	172	362	5.17	5.96	22,300	A.
August	148	51	89	1.27	1.46	5,470	A.
September	50	41	46	.657	.73	2,740	B.
October	47	41	42	.600	.69	2,580	B.
November	84	41	57	.814	.91	3,390	B.
December	79	41	53	.757	.87	3,260	B.
The year	1,300	20	211	3.01	40.89	153,000	

HUMBOLDT RIVER AT PALISADE, NEV.

Location.—At highway bridge at Palisade, about 5 miles above mouth of Pine Creek and 100 feet below Southern Pacific Railroad bridge.

Records available.—November 27, 1902, to October 19, 1906, July 26 to December 31, 1911.

Drainage area.—5,010 square miles.

Gage.—Original gage was a vertical staff on right abutment of highway bridge. The high water in 1910 destroyed this bridge. On July 26, 1911, an inclined staff, at an independent datum, was installed on left bank near Southern Pacific Railroad bridge. December 1, 1911, a chain gage was installed at highway bridge with same datum as inclined staff.

Channel.—Sand and gravel; fairly permanent.

Discharge measurements.—Made from car and cable about one-eighth mile above gage.

Winter flow.—Affected by ice.

Cooperation.—Maintained in cooperation with Office of Experiment Stations, United States Department of Agriculture, through F. L. Peterson, irrigation engineer.

No discharge measurements were made in 1911 and estimates are accordingly withheld.

Daily gage height, in feet, of Humboldt River at Palisade, Nev., for 1911.

[Albini Siri, observer.]

Day.	July.	Aug.	Sept.	Oct	Nov.	Dec.	Day.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1.8	1.4	1.5	1.6	1.6	16	.....	1.5	1.4	1.6	1.8	1.8
2	.....	1.7	1.4	1.5	1.6	1.6	17	.....	1.5	1.4	1.6	1.8	1.8
3	.....	1.7	1.4	1.5	1.6	1.6	18	.....	1.5	1.4	1.6	1.8	1.7
4	.....	1.7	1.4	1.5	1.6	1.6	19	.....	1.5	1.4	1.6	1.8	1.9
5	.....	1.6	1.4	1.5	1.6	1.6	20	.....	1.5	1.4	1.6	1.8	1.8
6	.....	1.6	1.4	1.5	1.6	1.6	21	.....	1.5	1.4	1.6	1.7	1.7
7	.....	1.6	1.4	1.5	1.7	1.6	22	.....	1.5	1.4	1.6	1.7	1.7
8	.....	1.6	1.4	1.5	1.7	1.6	23	.....	1.4	1.4	1.6	1.7	1.7
9	.....	1.5	1.4	1.5	1.7	1.6	24	.....	1.4	1.4	1.6	1.7	1.8
10	.....	1.5	1.4	1.5	1.7	1.6	25	.....	1.4	1.4	1.6	1.7	1.7
11	.....	1.5	1.4	1.6	1.8	1.6	26	2.0	1.4	1.4	1.6	1.6	1.7
12	.....	1.5	1.4	1.6	1.8	1.7	27	2.0	1.4	1.4	1.6	1.6	1.8
13	.....	1.5	1.4	1.6	1.8	1.7	28	1.9	1.4	1.4	1.6	1.6	1.7
14	.....	1.5	1.4	1.6	1.8	1.7	29	1.9	1.4	1.4	1.6	1.6	.....
15	.....	1.5	1.4	1.6	1.8	1.7	30	1.8	1.4	1.4	1.6	1.6	.....
							31	1.8	1.4	.....	1.6	.....	.....

NOTE.—Gage heights probably affected by ice Dec. 12 to 31; stream frozen solid Dec. 29 to 31. Gage heights July to November not strictly comparable with those of December on account of change in location of gage.

HUMBOLDT RIVER NEAR GOLCONDA, NEV.

Location.—At highway bridge at extreme lower end of central valley of the Humboldt 1½ miles north of Golconda, and about 12 miles above the mouth of Little Humboldt River.

Records available.—October 24, 1894, to December 31, 1909, and September 8, 1910, to December 31, 1911.

Drainage area.—10,800 square miles.

Gage.—Several gages at various datums and in various locations have been used at this station. November 5, 1910, the present chain gage was installed at the highway bridge.

Channel.—Sand and gravel and somewhat shifting.

Discharge measurements.—Made from highway bridge.

Winter flow.—Affected but little by ice.

Artificial control.—Diversions for irrigation above the station. The Taylor & Sheehan dam, about 2 miles above, and Pinson's dam, 5 miles above, regulate the flow at low stages.

Cooperation.—Maintained in cooperation with W. M. Kearney, State engineer, and Office of Experiment Stations, United States Department of Agriculture, through F. L. Peterson, irrigation engineer.

Estimates are withheld until additional measurements are made.

Discharge measurements of Humboldt River near Golconda, Nev., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
July 20	F. L. Peterson	3.07	79
Aug. 24	do	2.47	35
Nov. 30	F. L. Stewart	1.75	16
Dec. 15	F. L. Peterson	2.00	12

a Made by Office of Experiment Stations, United States Department of Agriculture.
b Made by wading 200 feet above bridge.
c Made by Office of Experiment Stations, United States Department of Agriculture. River open at measuring section, but frozen over above and below.

Daily gage height, in feet, of Humboldt River near Golconda, Nev., for 1911.

[William and Adele Duyck, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.6	4.85	5.3	7.2	5.6	4.2	6.2	2.7	1.6	1.5	1.7	2.0
2	2.6	4.9	5.1	7.2	5.7	4.2	6.1	2.7	1.7	1.6	1.7	2.0
3	2.65	4.95	5.1	7.1	5.5	4.2	6.0	2.6	1.7	1.5	1.8	2.0
4	2.7	5.0	4.9	7.1	5.4	4.2	5.8	2.6	1.5	1.6	1.8	2.0
5	2.7	5.2	4.9	6.9	5.3	4.4	5.8	2.6	1.5	1.7	1.8	2.0
6	2.7	5.2	5.0	6.9	5.3	4.4	5.7	2.5	1.5	1.7	1.8	2.0
7	2.7	5.1	5.0	6.8	4.9	4.4	5.5	2.5	1.4	1.8	1.8	2.0
8	2.8	5.15	5.0	6.8	4.8	4.5	4.4	2.4	1.5	1.7	1.8	2.0
9	2.8	5.2	5.2	6.8	4.9	4.6	4.3	2.4	1.5	1.8	1.8	2.0
10	2.9	5.4	5.2	6.7	4.8	4.6	4.1	2.3	1.5	1.8	1.9	2.0
11	2.9	5.6	.....	6.7	4.8	4.8	4.1	2.3	1.5	1.7	1.9	2.0
12	3.0	5.6	5.3	6.6	4.8	4.9	4.0	2.3	1.5	1.8	1.9	2.0
13	3.0	5.7	5.5	6.6	4.7	4.9	3.9	2.2	1.5	1.7	1.9	2.0
14	3.0	5.8	5.6	6.6	4.5	5.0	3.9	2.1	1.4	1.8	1.9	2.0
15	3.1	5.8	5.7	6.6	4.5	5.1	3.8	2.1	1.5	1.7	1.9	2.0
16	3.1	6.0	5.8	6.7	4.5	5.2	3.8	2.0	1.5	1.6	1.9	2.0
17	3.1	5.9	5.8	6.5	4.4	5.3	3.7	1.9	1.5	1.7	1.8	2.0
18	3.2	5.9	5.9	6.4	4.4	5.3	3.7	1.9	1.4	1.6	1.7	2.0
19	3.2	5.9	6.0	6.3	4.4	5.5	3.6	1.8	1.5	1.7	1.7	2.0
20	3.3	5.9	6.0	6.3	4.4	5.6	3.4	1.6	1.5	1.7	1.8	2.0
21	3.5	5.8	6.0	6.3	4.4	5.7	3.4	1.6	1.4	1.6	1.9	2.2
22	4.0	5.8	6.1	6.3	4.4	5.7	3.1	1.5	1.5	1.7	2.0	2.2
23	4.0	5.75	6.2	6.2	4.3	5.8	3.1	1.3	1.5	1.6	2.0	2.2
24	4.1	5.7	6.3	6.2	4.3	5.8	3.1	1.3	1.5	1.7	2.1	2.2
25	4.1	5.6	6.5	6.1	4.2	5.8	3.0	1.2	1.4	1.7	2.1	2.2
26	4.4	5.5	6.6	6.0	4.2	5.8	3.0	1.0	1.5	1.5	2.1	2.2
27	4.5	5.5	6.7	5.95	4.2	5.9	3.1	1.0	1.5	1.6	2.1	2.2
28	4.6	5.3	6.8	5.9	4.2	6.0	2.8	1.0	1.5	1.6	2.1	2.2
29	4.6	.....	6.9	5.7	4.2	6.0	2.8	1.6	1.6	1.5	2.0	2.2
30	4.7	.....	6.9	5.7	4.2	6.1	2.8	1.7	1.6	1.7	2.0	2.2
31	4.7	.....	7.0	.....	.....	.....	2.8	1.7	.....	1.7	.....	2.2

NOTE.—Gage heights probably affected by ice Jan. 1 to 20 and Dec. 20 to 31.

HUMBOLDT RIVER NEAR OREANA, NEV.

Location.—At highway bridge at head of Lovelock Valley, about 1½ miles southwest of Oreana railroad station, about 25 miles northeast of mouth of river at Humboldt Lake, and 12 miles northeast of Lovelock, the nearest post office.

Records available.—January 27, 1896, to December 31, 1909, and September 7, 1910, to December 31, 1911.

Drainage area.—13,800 square miles.

Gage.—Original gage was located at old Oreana highway bridge. The abutment to which the gage was fastened was undermined and fell May 26, 1897. A temporary staff was used until September 8, 1897, when an inclined staff was installed on left bank, about 1½ miles above original gage at section house. This gage and bench marks were destroyed by high water. On November 29, 1902, a vertical staff, in two sections, was fastened to the piling at the old dam. October 1, 1904, the datum was lowered 2.00 feet. The high water of 1910 destroyed this gage and bench marks. September 7, 1910, this station was reestablished and a temporary vertical staff installed 150 feet above old bridge. On November 9, 1910, a vertical staff was fastened on the center pile of the bridge. On that date the reading was the same as that on the temporary gage.

Channel.—Shifting sand.

Discharge measurements.—Made from bridge at gage.

Winter flow.—Affected by ice.

Diversions.—Water diverted for irrigation above the station.

Accuracy.—Relation between gage height and discharge affected by shifting channel and, during the winter, by ice; records are only fair.

Cooperation.—Maintained in cooperation with W. M. Kearney, State engineer, and Office of Experiment Stations, United States Department of Agriculture, through F. L. Peterson, irrigation engineer.

Estimates are withheld until additional measurements are available.

Discharge measurements of Humboldt River near Oreana, Nev., in 1911.

Date.	Hydrographer.	Gage height.
		Feet.
July 13[a]	F. L. Peterson	4.50
July 19[a]	do	4.00
Aug. 4[a]	do	3.10
Nov. 4	J. E. Stewart	2.41
Dec. 4[a]	F. L. Peterson	2.40

[a] Made by United States Department of Agriculture.

Daily gage height, in feet, of Humboldt River near Oreana, Nev., for 1911.

[J. J. McCarthy, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.2	4.5	4.6	6.0	5.0	3.9	3.6	3.5	2.35	2.0	2.4	2.4
2	3.2	4.55	4.6	6.0	4.85	3.85	3.7	3.35	2.35	2.5	2.4	2.4
3	3.15	4.6	4.55	6.2	4.85	3.8	3.8	3.3	2.35	2.15	2.4	2.4
4	3.15	4.6	4.5	6.2	4.8	3.75	3.9	3.2	2.3	2.15	2.4	2.45
5	3.15	4.65	4.5	6.25	4.75	3.75	4.0	3.15	2.3	2.25	2.45	2.5
6	3.1	4.65	4.5	6.3	4.75	3.7	4.1	3.0	2.25	2.25	2.45	2.5
7	3.0	4.65	4.45	6.4	4.65	3.7	4.15	3.0	2.2	2.25	2.4	2.55
8	3.0	4.7	4.45	6.45	4.65	3.65	4.25	3.0	2.15	2.35	2.5	2.6
9	3.1	4.8	4.45	6.45	4.6	3.65	4.35	3.0	2.1	2.35	2.5	2.65
10	3.15	4.85	4.45	6.45	4.6	3.65	4.45	3.0	2.0	2.35	2.55	2.6
11	3.2	4.9	4.4	6.5	4.5	3.6	4.55	2.9	2.0	2.35	2.65	2.55
12	3.2	4.9	4.4	6.6	4.45	3.55	4.65	2.9	2.0	2.4	2.6	2.55
13	3.25	4.9	4.45	6.65	4.35	3.45	4.75	2.9	2.0	2.4	2.55	2.5
14	3.3	4.95	4.5	6.65	4.25	3.35	4.7	2.85	2.0	2.4	2.55	2.55
15	3.3	4.95	4.55	6.65	4.25	3.35	4.65	2.8	2.0	2.4	2.5	2.55
16	3.3	5.0	4.65	6.65	4.15	3.25	4.6	2.75	2.0	2.4	2.45	2.7
17	3.35	5.1	4.8	6.55	4.15	3.15	4.45	2.7	2.0	2.4	2.45	2.65
18	3.4	5.2	4.85	6.45	4.15	3.1	4.2	2.65	2.0	2.4	2.4	2.65
19	3.45	5.2	4.9	6.4	4.25	3.1	4.0	2.6	2.0	2.4	2.4	2.5
20	3.5	5.1	4.95	6.3	4.35	3.1	4.0	2.6	2.0	2.45	2.35	2.5
21	3.55	5.0	5.0	6.15	4.4	3.1	4.0	2.55	2.0	2.45	2.35	2.6
22	3.55	5.0	5.2	6.05	4.4	3.0	4.0	2.5	2.0	2.45	2.4	2.7
23	3.6	4.95	5.45	6.0	4.35	3.0	3.95	2.5	2.0	2.45	2.4	2.75
24	3.65	4.85	5.5	5.75	4.3	3.0	3.9	2.5	1.95	2.45	2.4	2.75
25	3.7	4.7	5.5	5.7	4.3	3.0	3.85	2.5	1.95	2.45	2.35	2.75
26	3.8	4.7	5.55	5.6	4.25	3.2	3.8	2.5	1.9	2.45	2.35	2.75
27	4.0	4.65	5.6	5.55	4.25	3.3	3.75	2.45	1.9	2.45	2.35	2.8
28	4.3	4.6	5.65	5.35	4.15	3.4	3.7	2.45	1.9	2.45	2.3	2.8
29	4.35	.....	5.75	5.2	4.1	3.45	3.65	2.4	1.85	2.45	2.3	2.8
30	4.35	.....	5.8	5.1	4.1	3.55	3.6	2.4	1.85	2.45	2.35	2.85
31	4.4	.....	5.95	.....	4.0	.....	3.6	2.4	.....	2.45	.....	2.85

NOTE.—Relation of gage height to discharge probably affected by ice Jan. 1 to 29, Feb. 3 to 12, and Nov. 8 to Dec. 31.

NORTH FORK OF HUMBOLDT RIVER NEAR HALLECK, NEV.

Location.—About one-fourth mile above mouth, 2 miles west of Elburz station on Southern Pacific Railroad, and 6 miles west of Halleck.

Records available.—October 10, 1902, to December 31, 1909, and October 1, 1910, to December 31, 1911.

Drainage area.—1,020 square miles.

Gage.—Staff in two sections on left bank installed August 5, 1909, at same datum as original inclined staff.

Channel.—Sand and gravel and somewhat shifting.

Discharge measurements.—Made from car and cable near gage.

Winter flow.—Affected by ice.

Artificial control.—There are several diversions for irrigation above the station.

Cooperation.—Maintained in cooperation with W. M. Kearney, State engineer.

Estimates are withheld until additional measurements can be made.

The following discharge measurement was made by J. E. Stewart by wading 200 feet above gage; ice along banks:

November 2, 1911: Gage height, 2.97 feet; discharge, 9.9 second-feet.

Daily gage height, in feet, of North Fork of Humboldt River near Halleck, Nev., for 1911.

[Frank E. Schroeder, observer.]

Day.	Jan.	Feb.	Mar	Apr	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	.....	.....	.....	.....	3.7	2.8	2.4	2.5	2.9	3.0
2	.....	.....	.....	4.5	.....	.....	3.6	2.8	2.4	2.6	2.9	3.0
3	.....	4.4	.....	5.0	.....	.....	3.6	2.7	2.4	2.6	2.9	3.0
4	.....	4.4	3.8	4.8	.....	3.6	3.6	2.7	2.4	2.6	2.9	3.0
5	.....	4.2	4.0	4.6	.....	3.65	3.6	2.7	2.4	2.6	2.9	3.0
6	.....	4.2	4.0	4.6	.....	3.7	3.5	2.7	2.4	2.6	3.0	3.0
7	.....	4.0	4.2	4.4	.....	3.9	3.5	2.6	2.4	2.6	3.0	3.0
8	.....	3.4	5.0	4.4	.....	3.9	3.4	2.6	2.5	2.6	3.0	3.0
9	.....	3.4	6.0	4.4	.....	3.9	3.3	2.6	2.5	2.6	3.0	3.0
10	.....	3.8	6.0	4.2	.....	4.0	3.2	2.6	2.5	2.6	3.0	3.0
11	.....	4.2	5.0	4.0	.....	4.0	3.2	2.6	2.5	2.6	3.0	3.0
12	.....	3.4	5.8	4.0	.....	4.0	3.2	2.6	2.5	2.6	3.0	3.0
13	.....	3.6	5.4	3.8	.....	4.0	3.1	2.6	2.5	2.6	3.0	3.0
14	.....	3.6	5.0	3.8	.....	4.1	3.0	2.6	2.5	2.6	3.0	3.0
15	.....	3.6	4.6	3.6	.....	4.2	2.9	2.5	2.5	2.7	3.0	3.0
16	.....	3.6	4.4	.....	.....	4.4	2.9	2.5	2.5	2.7	3.0	3.0
17	.....	4.0	4.8	.....	.....	4.5	2.9	2.4	2.5	2.7	3.0	3.0
18	.....	4.0	5.0	.....	.....	4.65	3.0	2.4	2.5	2.8	3.0	3.0
19	.....	4.0	5.0	.....	.....	4.7	3.0	2.4	2.5	2.8	3.0	3.0
20	4.2	.....	5.0	.....	.....	4.7	3.0	2.4	2.5	2.8	3.0	3.0
21	4.4	.....	5.0	.....	.....	4.6	3.0	2.4	2.5	2.8	3.0	3.0
22	4.6	.....	5.0	.....	.....	4.55	3.0	2.4	2.5	2.8	3.0	3.0
23	4.6	.....	5.2	.....	.....	4.5	3.0	2.4	2.5	2.8	3.0	3.0
24	4.6	.....	5.0	.....	.....	4.5	3.0	2.4	2.5	2.8	3.0	3.0
25	4.6	.....	5.0	.....	.....	4.35	2.9	2.4	2.5	2.9	3.0	3.0
26	4.6	.....	4.8	.....	.....	4.1	2.9	2.4	2.5	2.9	3.0	3.0
27	4.6	.....	4.4	.....	.....	4.0	2.9	2.4	2.5	2.9	3.0	3.0
28	4.6	.....	4.4	.....	.....	3.9	2.9	2.4	2.5	2.9	3.0	3.0
29	4.7	.....	4.2	.....	.....	3.8	2.9	2.4	2.5	2.9	3.0	3.0
30	4.7	.....	4.4	.....	.....	3.8	2.9	2.4	2.5	2.9	3.0	3.0
31	4.7	.....	4.4	.....	.....	.....	2.9	2.4	.....	2.9	.....	3.0

NOTE.—Relation of gage heights to discharge probably affected by ice January and February and Nov. 6 to Dec. 31.

SOUTH FORK OF HUMBOLDT RIVER NEAR ELKO, NEV.

Location.—About 12 miles southwest of Elko, below all tributaries, and 6 miles above the mouth.

Records available.—August 29, 1896, to December 31, 1909, and September 9, 1910, to December 31, 1911.

Drainage area.—1,150 square miles.

Gage.—Original gage was an inclined staff on right bank at Cislini's (formerly Mason's) ranch. November 22, 1902, this gage was replaced by a new inclined staff at same location. The original datum was maintained. A new gage, at an independent datum, was installed May 21, 1905, below a dam which was built just below old gage. September 7, 1905, the datum was lowered 1 foot. On February 26, 1907, an inclined staff, at an independent datum, was installed above highway bridge on left bank about 1,000 feet above former gage.

Channel.—Sand. Somewhat shifting.

Discharge measurements.—Made from car and cable just below gage.

Winter flow.—Affected by ice.

Cooperation.—Maintained in cooperation with W. M. Kearney, State engineer.

Estimates are withheld until additional measurements are available.

Discharge measurements of South Fork of Humboldt River near Elko, Nev., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Nov. 1 *a*	J. E. Stewart	1.07	12
1 *b*	do	1.07	11

a Made by wading at gage.
b Made by wading just below ford at Cowling's ranch, about half a mile below gage.

Daily gage height, in feet, of South Fork of Humboldt River near Elko, Nev., for 1911.

[James Cowling, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.0	2.7	2.0	2.1	1.9	2.5	2.05	1.0	.....	0.8	1.1	1.5
2	2.0	2.3	1.95	2.0	1.9	2.8	2.0	1.0	.....	.8	1.1	1.5
3	2.0	1.9	1.95	2.05	1.9	2.9	2.0	1.0	.....	.9	1.15	1.5
4	2.0	1.75	1.8	2.1	1.95	3.0	2.0	1.0	.....	.9	1.15	1.5
5	2.0	1.7	1.7	2.2	2.1	3.15	1.9	1.0	.....	.9	1.1	1.5
6	2.0	1.6	1.6	2.2	2.3	3.45	1.9	.9	.....	.8	1.1	1.5
7	2.0	1.8	1.45	2.15	2.4	3.6	1.8	.9	.....	.8	1.1	1.5
8	2.0	1.8	1.45	2.05	2.5	3.7	1.65	.8	.....	.8	1.1	1.5
9	2.0	1.95	1.65	2.0	2.5	3.7	1.6	.8	.....	.8	1.1	1.5
10	2.1	1.8	1.9	1.95	2.5	3.7	1.55	.7	.....	.8	1.1	1.5
11	2.1	1.8	2.0	1.9	2.4	3.85	1.5	.7	.....	.9	1.3	1.5
12	2.1	1.9	1.85	1.85	2.35	4.3	1.45	.7	.....	.9	1.3	1.5
13	2.1	2.0	1.85	1.85	2.3	4.65	1.4	.7	.....	1.0	1.2	1.5
14	2.1	2.1	1.65	2.05	2.3	4.7	1.4	.7	.....	1.0	1.15	1.5
15	2.1	2.15	1.65	1.95	2.3	4.65	1.3	.6	.....	1.0	1.15	1.5
16	2.1	2.15	1.85	1.9	2.3	4.55	1.3	.6	.....	1.0	1.15	1.5
17	2.1	2.1	1.85	1.85	2.3	4.35	1.2	.6	.....	1.1	1.15	1.5
18	2.1	2.1	1.85	1.85	2.3	4.2	1.2	.6	.....	1.1	1.15	1.5
19	2.1	2.1	1.85	1.8	2.25	4.1	1.2	.6	.....	1.1	1.15	1.5
20	2.55	2.1	1.85	1.75	2.2	4.1	1.1	.6	0.6	1.1	1.15	1.5

Daily gage height, in feet, of South Fork of Humboldt River near Elko, Nev., for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
21	2.85	2.1	1.85	1.75	2.2	4.0	1.15	0.6	0.7	1.1	1.2	1.5
22	2.6	2.1	1.85	1.75	2.2	3.65	1.2	.6	.7	1.1	1.25	1.5
23	2.6	2.1	1.85	1.75	2.3	3.35	1.2	.6	.7	1.1	1.4	1.5
24	2.6	2.1	2.1	1.75	2.3	3.15	1.2	.6	.7	1.1	1.35	1.5
25	5.8	2.1	1.95	1.75	2.4	2.95	1.1	.6	.7	1.1	1.25	1.5
26	4.6	2.1	1.85	1.85	2.5	2.9	1.1	.6	.7	1.1	1.3	1.5
27	4.0	2.1	1.85	1.95	2.6	2.75	1.0	.....	.7	1.1	1.35	1.5
28	3.55	2.1	1.85	2.05	2.55	2.6	1.0	.....	.7	1.1	1.4	1.5
29	3.3	.....	1.85	1.95	2.45	2.45	1.0	.....	.7	1.1	1.5	1.5
30	2.95	.....	1.85	1.9	2.4	2.25	1.0	.....	.8	1.1	1.5	1.5
31	2.6	.....	2.0	.....	2.4	.....	1.0	.....	.....	1.1	.....	1.5

NOTE.—Ice probably affected gage heights Jan. 1 to 29, Feb. 1 to Mar. 3, and Nov. 3 to Dec. 31. Mush ice noted Apr. 14. Aug. 27 to Sept. 10, water standing in pools. Sept. 11 to 13, river dry.

PYRAMID AND WINNEMUCCA LAKES BASIN.

LAKE TAHOE AT TAHOE, CAL.

Location.—Near the outlet of the lake in the SE. ¼ sec. 6, T. 15 N., T. 17 E.
Records available.—1900 to 1911.
Drainage area.—519 square miles (including water surface of lake).
Gage.—Staff; datum, 6,220 feet above sea level.

The following table summarizes the fluctuations of the lake for the past 24 years as far as they have been recorded:

Water-surface fluctuation of Lake Tahoe from 1888 to 1911.

Year.	High water.		Low water.		Extreme range.
	Gage height.	Date.	Gage height.	Date.	
	Feet.		*Feet.*		*Feet.*
1888	4.90	Sept. 8	.....	.....	.....
1889	4.60	Spring	3.05	October	1.55
1890	8.55±	.....	.....	.....	.....
1895	9.02	July 7	7.55	Dec. 17 [a]	1.47
1900	7.00	June 17	5.87	Oct. 17 [b]	1.17
1901	8.43	July 27	6.10	Jan. 1	2.33
1902	9.02	June 22	6.97	Dec. 5	2.05
1903	8.90	July 5	6.80	Jan. 21	2.10
1904	10.40	June 22	7.10	Feb. 5	3.30
1905	8.70	June 18	6.20	Dec. 23	2.50
1906	9.87	July 21	6.16	Jan. 5	3.71
1907	11.26	July 14	7.80	Jan. 19	3.46
1908	8.40	Jan. 1	6.10	Dec. 31	2.28
1909	8.88	July 11	6.10	Jan. 1	2.78
1910	8.48	June 2–11	5.80	Dec. 1–2	2.68
1911	9.21	July 19–21	5.74	Jan. 8–9	3.47

[a] The lake was also low in January. [b] Lower earlier in year, no record.

NOTE.—Records for 1888 to 1890 were reported by W. H. Hall.

Daily gage height, in feet, of Lake Tahoe at Tahoe, Cal., for 1911.

[J. N. Haley, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.80	.....	.....	7.14	7.37	8.10	.....	9.05	8.56	.....	.....	7.29
2	5.80	7.10	.....	7.16	7.40	8.12	9.10	9.05	8.55	.....	.....	7.28
3	5.80	7.10	.....	7.18	.....	8.14	9.10	9.05	8.52	.....	.....	7.27
4	5.79	7.10	7.00	7.18	7.48	8.18	9.10	8.98	8.50	.....	7.48	7.26
5	5.79	7.10	.....	.....	.....	8.22	9.10	8.98	.....	.....	.....	7.26
6	5.78	7.10	.....	7.30	7.60	8.22	9.10	8.95	.....	7.80	.....	7.26
7	5.76	7.10	.....	7.30	7.60	.....	.....	8.95	.....	.....	7.48	.....
8	5.74	7.10	7.15	.....	7.60	8.32	.....	8.93	8.40	.....	.....	.....
9	5.74	7.10	7.32	.....	7.60	8.41	9.15	8.90	.....	.....	.....	7.28
10	5.79	7.11	7.32	.....	7.60	8.45	9.16	8.90	.....	.....	.....	7.27
11	5.90	7.12	7.30	.....	7.65	8.48	9.16	8.90	.....	7.76	.....	7.26
12	.....	7.13	.....	.....	.....	8.54	9.18	8.90	.....	.....	.....	.....
13	.....	.....	.....	.....	.....	8.60	9.18	8.90	.....	.....	.....	7.26
14	.....	.....	.....	.....	.....	8.66	9.18	.....	8.34	.....	.....	7.23
15	6.30	7.14	7.20	7.32	.....	8.70	9.19	.....	8.32	.....	.....	7.22
16	6.30	7.15	7.20	7.32	.....	8.73	9.20	8.80	8.30	.....	.....	7.21
17	6.30	7.15	7.20	7.30	.....	8.78	9.20	8.80	.....	7.70	7.38	.....
18	6.33	7.15	7.20	.....	.....	8.83	9.20	8.78	.....	7.68	7.38	.....
19	.....	.....	7.20	7.30	.....	8.88	9.21	8.76	.....	7.66	7.37	7.18
20	.....	7.14	7.20	7.26	7.73	8.93	9.21	8.75	8.10	7.66	7.37	.....
21	6.45	7.14	7.20	7.26	7.76	.....	9.21	8.73	.....	7.64	7.37	.....
22	6.45	7.13	7.20	7.27	7.80	8.96	9.20	8.72	.....	7.64	7.37	7.15
23	6.45	7.12	7.20	7.28	.....	.....	9.18	8.70	.....	7.64	7.37	7.15
24	.....	7.11	7.20	7.28	.....	8.98	9.15	8.67	.....	7.62	7.37	.....
25	.....	7.10	7.20	7.30	.....	9.00	9.15	8.65	.....	7.60	7.36	7.05
26	6.50	7.10	7.20	7.31	.....	9.00	9.08	8.65	.....	.....	7.35	7.00
27	6.50	.....	7.17	7.31	7.90	.....	9.08	8.64	.....	.....	7.34	.....
28	6.60	.....	7.15	7.31	7.93	9.06	9.08	8.62	7.95	7.57	7.32	.....
29	6.70	.....	7.14	7.33	7.93	.....	9.08	8.60	.....	7.53	7.30	7.00
30	6.84	.....	7.14	7.33	7.97	9.10	9.08	8.58	.....	7.50	7.29	7.00
31	.....	.....	7.14	.....	8.04	.....	9.08	8.58	.....	.....	.....	.....

NOTE.—On days of missing gage heights the observer notes "Lake too rough for accurate reading of gage."

EVAPORATION AT LAKE TAHOE, CAL.

The following tables showing evaporation at Lake Tahoe have been taken from studies made by Edwin Duryea, jr.,[1] of Duryea, Haehl & Gilman, San Francisco, Cal. Table 1 records actual observations, estimated monthly and yearly totals, and the ratios of the evaporation in each month to the yearly total, expressed in percentage. The estimated monthly total was obtained by filling in the gaps of the record. This was done by taking into consideration the records immediately preceding and following and the climatologic conditions during the period. The estimates are believed to be conservative in that they give a greater evaporation than actually occurred.

Table 2 summarizes the data presented in the first and gives a maximum, minimum, and mean value for the period for each month and also percentage values for comparative purposes.

The yearly mean evaporation for the period is found to be 30.59 inches, and Mr. Duryea has assumed a safe yearly evaporation of 36 inches.

A climatologic year beginning with September and ending with August has been used in the tabulation.

[1] See Eng. News, Feb. 29, 1912.

TABLE 1.—*Monthly and yearly evaporation at Lake Tahoe, 1899–1906.*

[As estimated from daily observations of the United States Geological Survey and the United States Reclamation Service.]

Month.	1899–1900.[c]		1900–1901.[c]		1901–2.				1902–3.				1903–4.			
					Observed evaporation.		Estimated monthly total.		Observed evaporation.		Estimated monthly total.		Observed evaporation.		Estimated monthly total.	
	Inches.	Per cent of total for year.	Inches.	Per cent of total for year.	Days.	Inches.	Inches.	Per cent of total for year.	Days.	Inches.	Inches.	Per cent of total for year.	Days.	Inches.	Inches.	Per cent of total for year.
September	.....	....	3.10	11	....	....	4.12	16	24	2.80	3.40	10	25	3.88	4.27	14
October	.....	....	2.15	7	....	....	2.65	10	0	....	[a] 3.09	9	24	2.78	3.33	11
November	.....	....	1.38	5	....	....	2.09	8	0	....	[a] 2.15	6	9	.64	2.53	8
December	.....	....	1.33	5	....	....	1.44	6	4	.25	.85	3	23	1.18	1.44	5
January	.....	....	.84	3	9	0.35	1.02	4	7	.35	.70	2	18	.72	1.17	4
February	.....	....	.70	2	4	.15	.87	4	0	....	.84	3	7	.20	.47	1
March	.....	....	.77	3	0	....	[a] 1.24	5	13	1.15	1.88	6	1	.10	.56	2
April	.....	....	1.25	4	0	....	[a] 1.85	7	15	1.50	2.75	8	21	.94	1.38	4
May	[a b] 2.44	....	2.42	9	5	.30	1.08	4	28	3.05	3.20	10	24	2.70	3.19	10
June	3.80	....	3.35	12	21	1.90	2.45	10	24	3.40	3.90	12	26	3.24	3.80	12
July	4.00	....	[a] 4.42	16	29	3.20	3.40	13	10	1.42	5.62	17	31	4.42	4.42	14
August	5.15	....	6.50	23	26	3.20	3.45	13	29	4.36	4.66	14	25	3.82	4.73	15
The year	.....	....	28.21	100	....	....	25.66	100	....	....	33.04	100	....	.....	31.29	100
Per cent of yearly mean 1900–1901 to 1905–6	.....	....	92		84				108				102			

Month.	1904–5.				1905–6.				1906–7.			
	Observed evaporation.		Estimated monthly totals.		Observed evaporation.		Estimated monthly totals.		Observed evaporation.		Estimated monthly totals.	
	Days.	Inches.	Inches.	Per cent of total for year.	Days.	Inches.	Inches.	Per cent of total for year.	Days.	Inches.	Inches.	Per cent of total for year.
September	21	2.56	3.27	10	26	4.38	4.74	15	25	3.52	3.94	.....
October	15	1.62	2.86	8	29	3.66	3.82	12	29	3.44	3.70	.....
November	16	1.62	2.77	8	17	1.78	2.78	9	5	.42	1.35	.....
December	18	1.06	1.59	5	22	1.58	1.85	6	0	.....	.62	.....
January	20	1.33	1.81	5	10	.50	1.12	4	.....	.....	.....	.....
February	17	.95	1.30	4	3	.18	.98	3	.....	.....	.....	.....
March	12	.98	1.78	5	11	.64	1.20	4	.....	.....	.....	.....
April	22	2.08	2.46	7	14	.83	1.42	4	.....	.....	.....	.....
May	15	1.64	2.50	7	17	1.64	2.26	7	.....	.....	.....	.....
June	23	3.12	3.57	11	13	1.49	2.39	8	.....	.....	.....	.....
July	31	4.76	4.76	14	31	4.30	4.30	14	.....	.....	.....	.....
August	26	4.60	5.27	16	25	3.80	4.55	14	.....	.....	.....	.....
The year	.....	.....	33.94	100	.....	.....	31.41	100	.....	.....	.....	100
Per cent of yearly mean 1900–1901 to 1905–6	111				103							

[a] Filled in by using mean of all Octobers, Novembers, etc.
[b] Observed May 17 to 31, 14 days=1.83 inches.
[c] Value for 1899–1901 taken from Water Supply Paper U. S. Geol. Survey No. 68.

TABLE 2.—*Maximum, minimum, and mean evaporation at Lake Tahoe in each month from September, 1900, to August, 1906.*

Month.	Maximum value for period.			Minimum value for period.			Mean value for period.		Mean of all percentages, 1900–1901 to 1905–6.
	Inches.	Per cent of year.	Per cent of mean value for period.	Inches.	Per cent of year.	Per cent of mean value for period.	Inches.	Per cent of year.	
September	4.74	12	124	3.10	15	81	3.83	13	13
October	3.82	9	124	2.15	10	70	3.09	10	9
November	2.78	7	120	1.35	7	63	2.15	7	7
December	1.85	5	142	.62	3	48	1.30	4	5
January	1.81	4	103	.70	4	63	1.11	4	4
February	1.30	3	151	.47	2	55	.86	3	3
March	1.88	5	152	.50	3	45	1.24	4	4
April	2.75	7	140	1.25	6	68	1.85	6	6
May	3.20	8	131	1.08	5	44	2.44	8	8
June	3.90	10	117	2.30	11	72	3.32	11	11
July	5.02	14	127	3.40	17	77	4.42	14	14
August	6.50	16	133	3.45	17	70	4.90	16	16
The year	40.15	100	132	20.52	100	67	30.51	100	100

Yearly mean for period, 30.50.

TRUCKEE RIVER AT TAHOE, CAL.

Location.—In the NW. ¼ sec. 7, T. 15 N., R. 17 E., a short distance below dam at outlet of Lake Tahoe.

Records available.—July 3, 1895, to February 20, 1896, and June 17, 1900, to December 31, 1911.

Drainage area.—519 square miles.

Gage.—Vertical staff on left bank 200 feet below dam at outlet of Lake Tahoe.

Channel.—Gravel; fairly permanent.

Discharge measurements.—Made from car and cable just above railroad bridge, about one-fourth mile below gage.

Winter flow.—Affected but little by ice.

Artificial control.—Flow regulated by operation of gates in dam at Lake Tahoe.

Accuracy.—Records are considered excellent.

Cooperation.—Gage heights furnished by United States Reclamation Service.

Discharge measurements of Truckee River at Tahoe, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
June 6a	J. E. Stewart	1.32	156
Sept. 27b	F. C. Ebert	2.04	347

a Made by wading about 20 feet below cable. b Made by wading just above railroad bridge.

Daily gage height, in feet, of Truckee River at Tahoe, Cal., for 1911.

[J. U. Haley, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.64	1.73	2.84	2.78	1.25	1.31	3.25	2.00	2.28	2.00	2.07	1.99
2	1.62	1.73	2.80	2.79	1.25	1.31	3.25	1.50	2.28	2.00	2.07	1.99
3	1.70	1.74	2.78	2.80	1.25	1.31	3.25	2.05	2.27	1.98	2.07	1.99
4	1.71	1.50	2.75	2.80	1.27	1.31	3.25	2.05	2.25	1.98	2.07	1.99
5	1.70	2.40	2.74	2.80	1.27	1.31	3.25	2.05	2.25	1.98	2.07	1.99
6	1.73	2.40	2.73	2.90	1.27	1.31	3.25	2.05	2.23	1.98	2.07	1.99
7	1.30	2.40	2.75	2.91	1.28	1.31	3.25	2.05	2.16	1.98	2.07	1.99
8	1.30	2.80	2.87	2.91	1.28	1.31	3.25	2.05	2.10	1 98	2.07	1.98
9	1.60	2.80	2.92	2.91	1.28	1.31	3.25	2.05	2.10	1.98	2.07	1.98
10	1.80	2.80	2.92	2.91	1.28	1.32	3.25	2.05	2.08	2.05	2.07	1.97
11	1.80	2.80	2.92	2.91	1.28	1.32	3.25	2.05	2.08	2.05	2.07	1.97
12	.....	2.81	2.91	2.91	1.28	1.34	3.25	2.15	2.08	2.05	2.07	1.97
13	.....	2.81	2.91	2.92	1.28	1.36	3.26	2.15	2.06	2.05	2.07	1.97
14	.....	2.81	2.90	2.92	1.28	1.37	3.26	2.15	2.04	2.05	2.06	1.96
15	2.10	2.81	2.84	2.92	1.29	1.37	3.27	2.12	2.03	2.05	2.05	1.94
16	2.10	2.82	2.84	2.92	1.29	1.69	3.27	2.10	2.03	2.05	2.05	1.93
17	2.10	2.83	2.83	2.91	1.29	2.35	3.27	2.10	2.02	2.05	2.04	1.94
18	2.11	2.82	2.83	2.91	1.29	2.74	3.27	2.25	2.02	2.05	2.04	1.95
19	2.11	2.82	2.83	2.76	1.29	2.98	3.27	2.32	2.00	2.03	2.04	1.90
20	2.12	2.84	2.83	2.62	1.29	3.00	3.28	2.35	2.00	2.03	2.04	1.90
21	2.15	2.84	2.83	2.62	1.29	3.00	3.28	2.35	2.00	2.03	2.03	1.95
22	2.15	2.84	2.83	2.62	1.30	3.00	3.28	2.35	2.00	2.02	2.02	1.90
23	2.15	2.84	2.83	2.62	1.30	3.22	3.28	2.33	2.00	2.00	2.01	1.88
24	2.15	2.84	2.83	2.62	1.30	3.22	3.27	2.32	2.00	2.00	2.01	2.26
25	1.83	2.84	2.83	2.62	1.30	3.19	3.27	2.32	2.00	2.00	2.00	2.65
26	1.82	2.84	2.83	2.62	1.30	3.18	2.30	2.30	2.00	2.07	2.00	2.65
27	1.82	2.84	2.80	1.25	1.30	3.25	2.30	2.30	2.00	2.07	2.00	2.65
28	1.84	2.84	2.79	1.25	1.30	3.25	2.30	2.30	2.00	2.07	2.00	2.65
29	1.70	.....	2.78	1.25	1.30	3.25	2.15	2.30	2.00	2.07	1.99	2.70
30	1.70	.....	2.78	1.25	1.31	3.25	2.15	2.28	2.00	2.07	1.99	2.70
31	1.70	.....	2.78	.....	1.31	.....	2.15	2.28	.....	2.07	.....	2.70

Daily discharge, in second-feet, of Truckee River at Tahoe, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	241	267	676	651	145	158	848	350	449	350	374	347
2	236	267	659	655	145	158	848	204	449	350	374	347
3	258	270	651	659	145	158	848	367	445	344	374	347
4	261	204	638	659	149	158	848	367	438	344	374	347
5	258	494	634	659	149	158	848	367	438	344	374	347
6	267	494	630	701	149	158	848	367	430	344	374	347
7	156	494	638	705	152	158	848	367	405	344	374	347
8	156	659	688	705	152	158	848	367	384	344	374	344
9	230	659	709	705	152	158	848	367	384	344	374	344
10	287	659	709	705	152	161	848	367	377	367	374	340
11	287	659	709	705	152	161	848	367	377	367	374	340
12	311	663	705	705	152	165	848	402	377	367	374	340
13	335	663	705	709	152	170	852	402	370	367	374	340
14	360	663	701	709	152	172	852	402	364	367	370	337
15	384	663	676	709	154	172	859	391	360	367	367	331
16	384	667	676	709	154	255	859	384	360	367	367	328
17	384	667	672	705	154	475	859	384	357	367	364	331
18	388	667	672	705	154	634	859	438	357	367	364	334
19	388	667	672	642	154	735	859	404	350	360	364	313
20	391	676	672	583	154	743	861	475	350	360	364	318
21	402	676	672	583	154	743	861	475	350	360	360	334
22	402	676	672	583	156	743	861	475	350	357	357	318
23	402	676	672	583	156	835	861	407	350	350	353	312
24	402	676	672	583	156	835	856	404	350	350	353	441
25	203	676	672	583	156	785	856	404	350	350	350	596
26	203	676	672	583	156	819	456	456	350	374	350	596
27	203	676	659	145	156	848	456	456	350	374	350	596
28	209	676	655	145	156	848	456	456	350	374	350	596
29	258	.....	651	145	156	848	402	456	350	374	347	617
30	258	.....	651	145	158	848	402	449	350	374	347	617
31	258	.....	651	.....	158	.....	402	449	.....	374	.....	617

NOTE.—Discharge determined from a well-defined rating curve. Discharge interpolated Jan. 12 to 14.

Monthly discharge of Truckee River at Tahoe, Cal., for 1911.

[Drainage area, 519 square miles.]

Month.	Discharge, in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total, in acre-feet.	
January	402	156	307	0.592	0.68	18,900	A.
February	676	204	590	1.14	1.19	32,800	A.
March	709	630	671	1.29	1.49	41,300	A.
April	709	145	592	1.14	1.27	35,200	A.
May	158	145	153	.295	.34	9,410	B.
June	848	158	447	.861	.96	26,600	A.
July	861	402	771	1.49	1.72	47,400	A.
August	475	204	409	.788	.91	25,100	A.
September	449	350	377	.726	.81	22,400	A.
October	374	344	359	.692	.80	22,100	A.
November	374	347	365	.703	.78	21,700	A.
December	617	312	400	.771	.89	24,600	A.
The year	861	145	452	.871	11.84	328,000	

TRUCKEE RIVER AT NEVADA-CALIFORNIA STATE LINE.

Location.—In the SE. ¼ sec. 6, T. 18 N., R. 18 E., 1 mile upstream from the State line, Calvada flag station.

Records available.—September 7, 1899, to December 31, 1911.

Drainage area.—955 square miles.

Gage.—Inclined staff on left bank with vertical section for low water. The original gage was at Farad, 2½ miles above the present location. The present gage was installed June 14, 1909.

Channel.—Gravel and small bowlders which shift at high stages.

Discharge measurements.—Made from car and cable 50 feet above gage.

Winter flow.—Affected but little by ice.

Artificial control.—Flow partly regulated by storage at Lake Tahoe and Donner Lake.

Accuracy.—Records may be considered good.

Cooperation.—Gage heights furnished by United States Reclamation Service.

Discharge measurements of Truckee River at Nevada-California State line in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Feb. 26[a]	H. D. McGlashan	2.06	831
Apr. 6	Stone & Webster Engineering Corporation	4.62	2,800
8	J. E. Stewart	4.60	2,830
May 25	Stone & Webster Engineering Corporation	5.09	3,600
June 5	do	5.76	4,620
8	J. E. Stewart	5.30	4,050
July 15	Stone & Webster Engineering Corporation	4.17	2,140
Aug. 4	do	2.84	733
Oct. 30	J. E. Stewart	2.56	470

[a] Slush ice running.

Daily gage height, in feet, of Truckee River at Nevada-California State line for 1911.

[E. C. Bigelów, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.2	3.6	3.05	4.4	5.2	5.0	4.6	3.0	2.7	2.6	2.6	2.6
2	2.2	3.4	3.0	4.6	4.8	5.2	4.5	2.9	2.7	2.6	2.6	2.6
3	2.3	3.4	3.0	4.9	5.2	5.5	4.6	2.7	2.7	2.6	2.6	2.6
4	2.3	3.3	3.0	4.9	5.6	5.7	4.6	2.85	2.7	2.6	2.6	2.6
5	2.3	3.0	3.0	4.6	6.2	5.9	4.5	2.85	2.7	2.6	2.6	2.6
6	2.2	3.0	3.0	4.7	5.3	5.9	4.5	2.85	2.7	2.6	2.65	2.6
7	2.3	3.0	3.0	4.8	5.1	5.5	4.5	2.8	2.7	2.6	2.65	2.6
8	2.3	3.0	2.9	4.7	5.5	5.5	4.5	2.8	2.65	2.6	2.65	2.6
9	2.3	3.0	3.05	4.8	5.2	5.6	4.4	2.75	2.65	2.6	2.65	2.6
10	2.3	3.0	3.05	4.5	4.8	5.5	4.3	2.8	2.7	2.6	2.7	2.6
11	2.3	3.0	3.1	4.3	5.0	5.5	4.3	2.7	2.6	2.55	2.65	2.7
12	2.4	3.0	3.1	4.3	5.3	5.5	4.1	2.7	2.6	2.55	2.65	2.65
13	2.6	3.1	3.1	4.0	5.1	5.9	4.1	2.6	2.6	2.55	2.65	2.6
14	2.7	3.1	3.15	4.1	4.9	5.5	4.1	2.8	2.6	2.55	2.6	2.5
15	2.8	3.1	3.1	4.0	4.6	5.8	4.3	2.75	2.6	2.55	2.6	2.55
16	2.8	3.1	3.1	4.1	4.8	5.5	4.2	2.7	2.6	2.55	2.65	2.6
17	2.9	3.1	3.15	4.4	4.5	5.7	4.2	2.7	2.6	2.6	2.65	2.55
18	3.0	3.1	3.15	4.6	4.3	5.7	4.1	2.7	2.6	2.6	2.65	2.5
19	3.1	3.1	3.15	5.0	4.5	5.9	4.2	2.7	2.6	2.6	2.65	2.55
20	3.0	3.1	3.3	4.6	4.6	5.9	4.1	2.7	2.6	2.6	2.65	2.5
21	3.1	3.1	3.3	4.8	4.8	5.9	4.0	2.8	2.6	2.6	2.65	2.6
22	3.0	3.0	3.4	5.0	5.2	5.5	3.8	2.8	2.6	2.55	2.65	2.5
23	2.9	3.0	3.55	5.3	5.6	5.2	3.75	2.8	2.6	2.55	2.6	2.6
24	2.9	3.0	3.65	5.8	5.8	5.0	3.75	2.75	2.6	2.55	2.65	2.6
25	2.8	3.0	3.7	6.2	5.1	4.8	3.75	2.75	2.6	2.55	2.6	2.9
26	2.8	3.0	3.7	6.4	5.0	4.6	3.65	2.75	2.6	2.55	2.6	2.9
27	2.8	3.1	3.8	6.2	5.0	5.0	3.6	2.7	2.6	2.6	2.6	2.9
28	2.6	3.1	3.85	5.3	4.9	5.2	3.2	2.7	2.6	2.6	2.65	2.9
29	2.8	.....	4.0	5.1	5.1	4.8	3.2	2.7	2.5	2.6	2.6	2.9
30	3.4	.....	4.1	5.0	5.2	4.6	3.15	2.7	2.5	2.6	2.65	2.9
31	3.6	.....	4.2	.....	5.0	.....	3.05	2.7	.....	2.6	.....	2.85

Daily discharge, in second-feet, of Truckee River at Nevada-California State line for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	385	1,480	918	2,530	3,780	3,460	2,830	873	628	498	498	498
2	385	1,260	873	2,830	3,140	3,780	2,680	786	628	498	498	498
3	418	1,260	873	3,300	3,780	4,280	2,830	628	628	498	498	498
4	418	1,160	873	3,300	4,450	4,620	2,830	744	628	498	498	498
5	418	873	873	2,830	5,470	4,060	2,680	744	628	498	498	498
6	385	873	873	2,980	3,040	4,060	2,680	744	628	498	534	498
7	418	873	873	3,140	3,620	4,280	2,680	703	628	498	534	498
8	418	873	786	2,980	4,280	4,280	2,680	703	595	498	534	498
9	418	873	918	3,140	3,780	4,450	2,530	666	595	498	534	498
10	418	873	918	2,680	3,140	4,280	2,380	703	628	498	570	498
11	418	873	994	2,380	3,400	4,280	2,380	628	562	465	534	570
12	437	873	994	2,380	3,940	4,280	2,100	628	562	465	534	534
13	562	994	994	1,970	3,620	4,060	2,100	562	562	465	534	498
14	628	994	1,010	2,100	3,300	4,280	2,100	703	562	465	498	432
15	703	994	994	1,970	2,830	4,700	2,380	666	562	465	498	465
16	703	994	994	2,100	3,140	4,280	2,230	628	498	465	534	498
17	729	994	1,010	2,530	2,680	4,620	2,230	628	498	498	534	465
18	873	994	1,010	2,830	2,380	4,620	2,100	628	498	498	534	432
19	994	994	1,010	3,460	2,680	4,060	2,230	628	498	498	534	465
20	873	994	1,160	2,830	2,830	4,060	2,100	628	498	498	534	432
21	994	994	1,160	3,140	3,140	4,060	1,970	703	498	498	534	498
22	873	873	1,260	3,460	3,780	4,280	1,710	703	498	465	534	432
23	786	873	1,420	3,940	4,450	3,780	1,650	703	498	465	498	498
24	786	873	1,540	4,700	4,700	3,460	1,650	666	498	465	534	498
25	703	873	1,590	5,470	3,620	3,140	1,650	666	498	465	498	730
26	703	873	1,590	5,830	3,460	2,830	1,540	666	498	465	498	730
27	703	994	1,710	5,470	3,460	3,460	1,480	628	498	498	498	730
28	562	994	1,780	3,940	3,300	3,780	1,060	628	498	498	534	730
29	703	.....	1,970	3,620	3,620	3,140	1,060	628	432	498	498	730
30	1,260	.....	2,100	3,460	3,780	2,830	1,010	628	432	498	534	730
31	1,480	.....	2,230	.....	3,460	.....	918	628	.....	498	.....	688

NOTE.--Discharge determined from a well-defined curve Jan. 1 to Sept. 15 and from a fairly well-defined curve Sept. 16 to Dec. 31.

Monthly discharge of Truckee River at Nevada-California State line for 1911.

[Drainage area, 955 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	1,480	385	664	0.695	0.80	40,800	B.
February	1,480	873	968	1.01	1.05	53,800	B.
March	2,230	786	1,200	1.26	1.45	73,800	B.
April	5,830	1,070	3,250	3.40	3.79	193,000	A.
May	5,470	2,380	3,580	3.75	4.32	220,000	A.
June	4,960	2,830	4,170	4.37	4.88	248,000	A.
July	2,830	918	2,080	2.18	2.51	128,000	A.
August	873	562	673	.705	.81	41,400	B.
September	628	432	545	.571	.64	32,400	B.
October	498	465	486	.509	.59	29,900	B.
November	570	498	521	.546	.61	31,000	B.
December	730	432	541	.566	.65	33,300	B.
The year	5,830	385	1,550	1.62	22.10	1,130,000	

TRUCKEE RIVER AT RENO, NEV.

Location.—At Virginia Street Bridge, in Reno, 6 miles above mouth of Steamboat Creek and 12 miles below the Nevada-California line.

Records available.—July 1, 1906, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff, fastened to retaining wall on left bank about 30 feet below the bridge. Datum 4,481.60 feet above sea level.

Channel.—Composed of gravel and bowlders and is permanent.

Discharge measurement.—Made at Rock Street Bridge about 800 feet below the gage. Low-water measurements made by wading.

Winter flow.—Affected but little by ice.

Artificial control.—Several power plants and storage above the station.

Diversions.—Water is diverted above and below the station for use in irrigation in the Truckee Valley.

Accuracy.—Results are good.

Cooperation.—Gage heights furnished by United States Weather Bureau.

Discharge measurements of Truckee River at Reno, Nev., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Feb. 20	H. D. McGlashan	2.12	321
Apr. 8	J. E. Stewart	4.26	3,[illegible]00
June 8	do	4.75	4,230
Oct. 30	do	1.41	315

Daily gage height, in feet, of Truckee River at Reno, Nev., for 1911.

[N. H. Hammonds, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.4	2.8	2.2	3.9	4.5	4.2	3.7	1.7	1.3	1.3	1.6	1.7
2	1.4	2.7	2.2	4.2	4.1	4.4	3.7	1.6	1.3	1.3	1.6	1.6
3	1.4	2.5	2.2	4.4	4.3	4.7	3.7	1.5	1.3	1.4	1.6	1.6
4	1.4	2.3	2.3	4.4	4.8	4.8	3.7	1.5	1.3	1.4	1.6	1.7
5	1.4	2.1	2.3	4.2	4.4	5.0	3.7	1.5	1.3	1.4	1.6	1 6
6	1.5	2.4	2.2	4.3	4.5	5.0	3.7	1.4	1.4	1.4	1.7	1.6
7	1.5	2.3	2.3	4.4	4.4	4.7	3.7	1.4	1.4	1.4	1.5	1.6
8	1.4	2.3	2.3	4.3	4.5	4.7	3.6	1.4	1.4	1.4	1.6	1.6
9	1.3	2.4	2.3	4.3	4.4	4.6	3.5	1.4	1.4	1.4	1.6	1.6
10	1.5	2.4	2.4	4.0	4.0	4.6	3.4	1.4	1.4	1.4	1.7	1.6
11	1.5	2.4	2.4	3.8	4.2	4.8	3.4	1.3	1.4	1.4	1.6	1.6
12	1.5	2.4	2.4	3.6	4.4	5.0	3.3	1.3	1.3	1.4	1.6	1.6
13	1.5	2.3	2.4	3.5	4.3	4.9	3.4	1.3	1.4	1.4	1.7	1.6
14	1.5	2.3	2.4	3.4	4.1	4.9	3.4	1.3	1.4	1.5	1.7	1.6
15	1.6	2.4	2.4	3.4	3.8	4.9	3.3	1.3	1.4	1.5	1.7	1.6
16	1.8	2.3	2.4	3.5	3.9	4.7	3.3	1.3	1.4	1.5	1.7	1.6
17	1.8	2.3	2.5	3.7	3.7	4.8	3.3	1.2	1.4	1.5	1.7	1.6
18	1.8	2.3	2.5	3.9	3.4	4.9	3.3	1.4	1.4	1.5	1.7	1.6
19	1.8	2.3	2.5	4.4	3.7	5.0	3.2	1.4	1.4	1.5	1.7	1.6
20	3.2	2.3	2.6	4.1	3.7	5.1	3.2	1.4	1.3	1.5	1.7	1.5
21	1.9	2.3	2.7	4.1	4.0	4.9	3.0	1.3	1.3	1.6	1.7	1.8
22	1.8	2.3	2.8	4.4	4.4	4.7	2.8	1.3	1.3	1.6	1.7	1.8
23	1.7	2.2	3.0	4.7	4.7	4.4	2.8	1.3	1.3	1.6	1.7	1.6
24	1.8	2.3	3.1	5.0	5.0	4.1	2.7	1.3	1.3	1.6	1.7	1.6
25	2.2	2.2	3.0	5.3	4.3	3.9	2.6	1.3	1.3	1.6	1.7	1.8
26	1.8	2.2	3 0	5.6	4.1	3.8	2.5	1.3	1.3	1.6	1.7	2.0
27	1.7	2.2	3.1	5.3	4.1	4.1	2.2	1.3	1.2	1.6	1.6	2.0
28	1.7	2.2	3.2	4.6	4.2	4.3	2.0	1.4	1.2	1.6	1.6	2.0
29	1.8	.....	3.4	4.3	4.2	4.1	2.1	1.4	1.1	1.6	1.6	2.0
30	3.0	.....	3.5	4.4	4.2	3.9	2.0	1.4	1.2	1.6	1.6	2.0
31	3.2	.....	3.7	.....	4.2	.....	1.8	1.3	.....	1.6	.....	2.0

Daily discharge, in second-feet, of Truckee River at Reno, Nev., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	338	1,420	860	2,740	3,720	3,200	2,460	500	293	293	441	500
2	338	1,320	860	3,200	3,040	3,540	2,460	441	293	293	441	441
3	338	1,120	860	3,540	3,360	4,100	2,480	388	293	338	441	441
4	338	940	940	3,540	4,300	4,300	2,460	388	293	338	441	500
5	338	780	940	3,200	3,540	4,700	2,460	388	293	338	441	441
6	388	1,030	860	3,360	3,720	4,700	2,460	338	338	338	500	441
7	388	940	940	3,540	3,540	4,100	2,460	338	338	338	388	441
8	338	940	940	3,360	3,720	4,100	2,330	338	338	338	441	441
9	293	1,030	940	3,360	3,540	3,900	2,200	338	338	338	441	441
10	388	1,030	1,030	2,880	2,880	3,900	2,070	338	338	338	500	441
11	388	1,030	1,030	2,600	3,200	4,300	2,070	293	338	338	441	441
12	388	1,030	1,030	2,330	3,540	4,700	1,960	293	293	338	441	441
13	388	940	1,030	2,200	3,360	4,500	2,070	293	338	338	500	441
14	388	940	1,030	2,070	3,040	4,500	2,070	293	338	388	500	441
15	441	1,030	1,030	2,070	2,600	4,500	1,960	293	338	388	500	441
16	562	940	1,030	2,200	2,740	4,100	1,960	293	338	388	500	441
17	562	940	1,120	2,460	2,460	4,300	1,960	250	388	388	500	441
18	562	940	1,120	2,740	2,070	4,500	1,960	338	338	388	500	441
19	562	940	1,120	3,540	2,460	4,700	1,850	338	338	388	500	441
20	1,850	940	1,220	3,040	2,460	4,920	1,850	338	293	388	500	388
21	630	940	1,320	3,040	2,880	4,500	1,630	293	293	441	500	562
22	562	940	1,420	3,540	3,540	4,100	1,420	293	293	441	500	562
23	500	860	1,630	4,100	4,100	3,540	1,420	293	293	441	500	441
24	562	940	1,740	4,700	4,700	3,040	1,320	293	293	441	500	441
25	860	860	1,630	5,360	3,360	2,740	1,220	293	293	441	500	562
26	562	860	1,630	6,060	3,040	2,600	1,120	293	293	441	500	700
27	500	860	1,740	5,360	3,040	3,040	860	293	250	441	441	700
28	500	860	1,850	3,900	3,200	3,360	700	338	250	441	441	700
29	562	.....	2,070	3,360	3,200	3,040	780	338	215	441	441	700
30	1,630	.....	2,200	3,540	3,200	2,740	700	338	250	441	441	700
31	1,850	.....	2,460	.....	3,200	.....	562	293	.....	441	.....	700

NOTE.—Daily discharge determined from a curve well defined for all stages.

Monthly discharge of Truckee River at Reno, Nev., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	1,850	293	590	36,300	A.
February	1,420	780	976	54,200	A.
March	2,460	860	1,280	78.700	A.
April	6,060	2,070	3,360	200,000	A.
May	4,700	2,070	3,250	200,000	A.
June	4,920	2,600	3,940	234,000	A.
July	2,460	562	1,780	109,000	A.
August	500	250	328	20,200	A.
September	338	215	306	18,200	A.
October	441	293	383	23,600	A.
November	500	388	454	27,000	A.
December	700	388	505	31,100	A.
The year	6,060	215	1,430	1,030,000	

TRUCKEE RIVER AT CLARKS, NEV.

Location.—At highway bridge in the SE. ¼ sec. 26, T. 20 N., R. 22 E., about 600 feet from the Southern Pacific Railroad station at Clarks.

Records available.—July 1, 1907, to June 6, 1910,[1] and August 1, 1910, to December 31, 1911.

Drainage area.—1,740 square miles.

Gage.—Vertical staff on south abutment of bridge.

Channel.—Composed of rock and gravel and appears permanent.

Discharge measurements.—Made from highway bridge.

Winter flow.—As the water is swift at the gage the records are not believed to be much affected by ice.

Artificial control.—Several power plants and storage above the station.

Diversions.—Water is used for irrigation in the Truckee Valley above the station.

Accuracy.—Results are good.

Cooperation.—Gage heights and discharge measurements furnished by United States Reclamation Service.

Records at this station show the amount of water available for use by the United States Reclamation Service on the Truckee-Carson project.

Discharge measurements of Truckee River at Clarks, Nev., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Jan. 5	D. S. Stuver	2.82	490
26	Stone & Webster Engineering Corporation	3.80	894
31	D. S. Stuver	6.17	3,080
Feb. 7	do	4.01	1,140
Apr. 5	Stone & Webster Engineering Corporation	6.72	3,450
June 5	do	7.67	4,640
July 14	do	5.68	2,440

[1] At Derby dam, where the discharge is practically the same as at Clarks.

Daily gage height, in feet, of Truckee River at Clarks, Nev., for 1911.

[E. R. Dack, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.9	5.9	3.9	6.3	7.0	6.7	6.5	3.7	2.7	2.6	3.1	3.1
2	2.8	5.2	3.9	6.6	6.8	6.8	6.4	3.7	2.7	2.6	3.3	3.1
3	2.8	4.6	4.0	7.0	6.7	7.0	6.4	2.9	2.8	2.8	3.2	3.1
4	2.8	4.3	4.2	7.0	7.2	7.5	6.4	3.1	2.7	3.0	3.1	3.1
5	2.9	4.1	4.2	6.8	7.7	7.4	6.2	2.9	2.7	2.9	3.0	3.1
6	2.8	4.1	4.1	6.7	7.7	7.4	6.2	2.9	2.6	2.8	3.0	3.1
7	2.9	4.0	4.1	6.8	7.2	7.4	6.0	2.7	2.8	2.7	3.1	3.0
8	2.9	4.0	4.8	6.8	7.1	7.5	6.0	2.7	2.7	2.7	3.1	3.0
9	2.9	4.0	4.6	6.7	7.0	7.5	5.9	2.7	2.6	2.7	3.2	3.1
10	2.9	4.1	4.5	6.2	6.7	7.4	5.9	2.5	2.7	2.6	3.3	3.1
11	2.8	4.2	4.4	6.3	6.6	7.4	5.8	2.3	2.7	2.7	3.4	3.1
12	2.6	4.1	4.4	6.0	6.8	7.5	5.6	2.5	2.9	2.8	3.3	3.1
13	2.7	4.1	4.3	5.7	6.8	7.5	5.4	2.5	2.8	2.9	3.2	3.1
14	3.2	4.1	4.2	5.5	6.7	7.6	5.3	2.5	2.7	3.0	3.2	3.1
15	3.1	4.1	4.2	5.4	6.5	7.6	5.2	2.5	2.6	3.1	3.2	3.1
16	3.1	4.0	4.3	5.8	6.3	7.6	5.8	2.7	2.6	3.0	3.4	3.1
17	3.1	3.9	4.5	5.8	6.0	7.5	5.6	2.7	2.7	2.9	3.3	3.1
18	3.1	3.9	4.4	6.1	5.5	7.5	5.4	2.3	2.6	3.0	3.2	3.1
19	3.1	3.9	4.4	6.8	5.9	7.6	5.2	2.4	2.7	3.0	3.2	3.0
20	3.1	3.9	4.5	6.9	5.9	7.6	5.1	2.6	2.6	3.0	3.2	3.0
21	4.1	3.9	4.9	6.8	6.1	7.4	5.0	2.7	2.6	3.1	3.2	3.0
22	4.7	3.9	5.1	6.9	6.4	7.5	4.8	2.7	2.6	3.1	3.1	2.9
23	4.2	3.9	5.2	7.1	6.7	6.7	4.6	2.6	2.6	3.0	3.1	2.9
24	4.6	3.9	5.3	7.5	7.2	6.6	4.6	2.6	2.7	3.0	3.1	3.0
25	4.1	3.9	5.3	7.8	7.1	6.5	4.6	2.5	2.8	3.0	3.1	3.1
26	4.2	3.8	5.2	8.0	6.6	6.4	4.4	2.6	2.7	3.1	3.1	3.3
27	3.9	3.8	5.3	8.2	6.6	6.3	4.3	2.6	2.6	3.2	3.1	3.5
28	3.7	3.9	5.3	8.0	6.6	6.5	4.2	2.7	2.6	3.2	3.1	3.7
29	3.9	.....	5.6	7.3	6.6	6.5	4.1	2.6	2.7	3.2	3.1	3.7
30	4.2	.....	5.7	7.1	6.7	6.4	3.9	2.7	2.6	3.1	3.1	3.7
31	6.0	.....	6.0	.....	6.7	.....	3.9	2.7	.....	3.1	.....	3.7

Daily discharge, in second-feet, of Truckee River at Clarks, Nev., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	500	2,660	1,020	3,060	3,840	3,490	3,260	900	420	380	580	580
2	460	2,000	1,020	3,370	3,600	3,600	3,160	900	420	380	680	580
3	460	1,510	1,080	3,840	3,490	3,840	3,160	500	460	460	630	580
4	460	1,280	1,210	3,840	4,080	4,440	3,160	580	420	540	580	580
5	500	1,140	1,210	3,600	4,680	4,320	2,960	500	420	500	540	580
6	460	1,140	1,140	3,490	4,680	4,320	2,960	500	380	460	540	580
7	500	1,080	1,140	3,600	4,080	4,320	2,760	420	460	420	580	540
8	500	1,080	1,670	3,600	3,960	4,440	2,760	420	420	420	580	540
9	500	1,080	1,510	3,490	3,840	4,440	2,660	420	380	420	630	580
10	500	1,140	1,430	2,960	3,490	4,320	2,660	350	420	380	680	580
11	460	1,210	1,350	3,060	3,370	4,320	2,560	290	420	420	730	580
12	380	1,140	1,350	2,760	3,600	4,440	2,360	350	500	460	680	580
13	420	1,140	1,280	2,460	3,600	4,440	2,180	350	460	500	630	580
14	630	1,140	1,210	2,270	3,490	4,560	2,090	350	420	540	630	580
15	580	1,140	1,210	2,180	3,260	4,560	2,000	350	380	580	630	580
16	580	1,080	1,280	2,560	3,060	4,560	2,560	420	380	540	730	580
17	580	1,020	1,430	2,560	2,760	4,440	2,360	420	420	500	680	580
18	580	1,020	1,350	2,860	2,270	4,440	2,180	290	380	540	630	580
19	580	1,020	1,350	3,600	2,660	4,560	2,000	320	420	540	630	540
20	580	1,020	1,430	3,720	2,660	4,560	1,910	380	380	540	630	540
21	1,140	1,020	1,750	3,600	2,860	4,320	1,830	420	380	580	630	540
22	1,500	1,020	1,910	3,720	3,160	4,440	1,670	420	380	580	580	500
23	1,210	1,020	2,000	3,960	3,490	3,490	1,510	380	380	540	580	500
24	1,510	1,020	2,090	4,440	4,080	3,370	1,510	380	420	540	580	540
25	1,140	1,020	2,090	4,800	3,960	3,260	1,510	350	460	540	580	580
26	1,210	960	2,000	5,050	3,370	3,160	1,350	380	420	580	580	680
27	1,020	960	2,090	5,310	3,370	3,060	1,380	380	380	630	580	780
28	900	1,020	2,090	5,050	3,370	3,260	1,210	420	380	630	580	900
29	1,020	.....	2,360	4,200	3,370	3,260	1,140	380	420	630	580	900
30	1,210	.....	2,460	3,960	3,490	3,160	1,020	420	380	580	580	900
31	2,760	.....	2,760	.....	3,490	.....	1,020	420	.....	580	.....	900

NOTE.—Daily discharge determined from a curve well defined for all stages.

Monthly discharge of Truckee River at Clarks, Nev., for 1911.

[Drainage area 1,740 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	2,760	380	804	0.462	0.53	49,400	A.
February	2,660	960	1,180	.678	.71	65,500	A.
March	2,760	1,020	1,590	.914	1.05	97,800	A.
April	5,210	2,180	3,570	2.05	2.29	212,000	A.
May	4,680	2,270	3,500	2.01	2.32	215,000	A.
June	4,560	3,060	4,040	2.32	2.59	240,000	A.
July	3,260	1,020	2,150	1.24	1.43	132,000	A.
August	900	290	431	.248	.29	26,500	B.
September	500	380	412	.237	.26	24,500	B.
October	630	380	514	.295	.34	31,600	A.
November	730	540	616	.354	.40	36,700	A.
December	900	500	618	.355	.41	38,000	A.
The year	5,210	290	1,620	.931	12.62	1,170,000	

DONNER CREEK NEAR TRUCKEE, CAL.

Location.—150 feet below the dam of the Donner Creek Ice Co., in NE. ¼ sec. 17, T. 17 N., R. 16 E., 1½ miles west of Truckee and below the mouth of Cold Creek, the principal tributary.

Records available.—October 23, 1902, to December 31, 1911.

Drainage area.—30 square miles.

Gage.—Inclined staff on the left bank 150 feet below the dam. Beginning with June 1, 1909, all gage heights are referred to the datum of the present gage. Before this date several gages were used.

Channel.—Gravel; shifts at high stages.

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

Winter flow.—Gage heights affected at times by ice.

Artificial control.—Flow is controlled by the operation of the outlet gates at the dam.

Accuracy.—Record considered fairly good.

Cooperation.—Gage heights furnished by United States Reclamation Service.

Discharge measurements of Donner Creek near Truckee, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Apr. 15[a]	J. E. Stewart	1.13	133
June 2	Stone & Webster Engineering Corporation	2.15	448
5[a]	J. E. Stewart	2.39	556
Aug. 5[a]	G. T. Peckema	.08	24
10	Stone & Webster Engineering Corporation	— .02	16
Sept. 20[b]	F. C. Ebert	— .25	4.6

[a] Wading 1,500 feet below dam. [b] Wading 15 feet below cable.

Daily gage height, in feet, of Donner Creek near Truckee, Cal., for 1911.

[W. O. Blinn, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.4	1.6	0.6	1.35	1.8	2.1	1.45	0.15	−0.2	−0.25	−0.2	0.0
2	.4	1.5	.5	1.45	1.8	2.2	1.45	.1	−.2	−.25	−.2	−.1
3	.4	1.4	.5	1.45	1.9	2.35	1.5	.1	−.2	−.25	−.2	.0
4	.3	1.3	.5	1.45	2.0	2.45	1.45	.1	−.2	−.25	−.2	−.1
5	.3	1.3	.5	1.5	1.95	2.5	1.4	.1	−.2	−.25	−.2	−.1
6	.3	1.3	.5	1.5	1.8	2.45	1.35	.1	−.2	−.25	−.2	−.1
7	.4	1.2	.5	1.5	1.9	2.45	1.3	.1	−.2	−.25	−.2	−.1
8	.4	1.2	.5	1.5	1.9	2.45	1.25	0	−.2	−.25	−.4	−.1
9	.4	1.0	.5	1.5	1.9	2.4	1.2	.0	−.2	−.25	−.3	−.1
10	.5	1.0	.55	1.4	1.8	2.45	1.1	.0	−.2	−.25	−.2	.0
11	.6	.9	.6	1.3	1.85	2.45	1.1	.0	−.2	−.25	−.2	.0
12	.6	.9	.6	1.3	1.9	2.5	1.0	.0	−.2	−.25	−.2	.0
13	.6	.9	.55	1.2	1.9	2.5	1.0	.0	−.2	−.2	−.2	.0
14	.6	1.0	.55	1.15	1.9	2.4	1.0	.0	−.2	−.2	−.2	.0
15	.6	1.0	.6	1.1	1.8	2.4	1.0	.0	−.2	−.2	−.2	.0
16	.6	1.0	.6	1.1	1.8	2.35	.95	−.1	−.2	−.2	−.2	.0
17	.7	1.0	.6	1.15	1.8	2.4	.9	−.1	−.08	−.2	−.2	.0
18	.7	1.1	.6	1.25	1.8	2.4	.85	−.1	−.04	−.2	−.1	−.1
19	.7	1.1	.6	1.3	1.7	2.3	.8	−.1	−.07	−.2	−.1	−.2
20	.7	1.1	.6	1.2	1.75	2.25	.75	−.1	−.2	−.2	.0	−.2
21	.7	1.0	.6	1.3	1.8	2.2	.7	−.1	−.2	−.2	.0	−.3
22	.7	.95	.7	1.45	2.0	2.0	.65	−.15	−.2	−.2	.0	−.2
23	.7	.8	.7	1.65	2.25	1.85	.6	−.15	−.2	−.2	.0	−.2
24	.8	.7	.7	1.75	2.25	1.75	.55	−.15	−.2	−.2	.0	−.2
25	.8	.6	.85	1.85	2.1	1.65	.5	−.2	−.25	−.2	.0	−.3
26	.8	.6	.9	2.0	2.0	1.7	.45	−.2	−.25	−.2	.0	−.2
27	.9	.6	.9	1.9	2.0	1.8	.4	−.2	−.25	−.2	.0	−.2
28	.9	.55	1.05	1.8	2.05	1.7	.3	−.2	−.25	−.2	.0	−.2
29	1.6	.....	1.1	1.75	2.1	1.65	.2	−.2	−.25	−.2	.0	−.2
30	1.6	.....	1.1	1.8	2.1	1.55	.2	−.2	−.25	−.2	.0	−.3
31	1.6	.....	1.2	.....	2.1	.....	.2	−.2	.....	−.2	.....	−.2

NOTE.—Gage heights Sept. 17, 18, and 19 determined from hydrograph; creek was regulated by drawing and filling the pond on these dates. Relation of gage heights to discharge probably not affected by ice during winter.

Daily discharge, in second-feet, of Donner Creek near Truckee, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	18	242	38	174	306	422	232	30	7	5	7	18
2	18	212	27	200	306	466	232	26	7	5	7	12
3	18	187	27	200	342	538	245	26	7	5	7	18
4	11	162	27	200	380	587	232	26	7	5	7	12
5	11	162	27	212	361	612	220	26	7	5	7	12
6	11	162	27	212	306	587	208	26	7	5	7	12
7	18	140	27	212	342	587	197	26	7	5	7	12
8	18	140	27	212	342	587	186	18	7	5	1	12
9	18	100	27	212	342	562	175	18	7	5	3	12
10	27	100	32	187	306	587	155	18	7	5	7	18
11	38	82	38	162	324	587	155	18	7	5	7	18
12	38	82	38	162	342	612	136	18	7	5	7	18
13	38	82	32	140	342	612	136	18	7	7	7	18
14	38	100	32	130	342	562	136	18	7	7	7	18
15	38	100	38	120	306	562	136	18	7	7	7	18
16	38	100	38	120	306	538	128	12	7	7	7	18
17	51	100	38	130	306	562	120	12	13	7	7	18
18	51	120	38	151	306	562	112	12	16	7	12	12
19	51	120	38	162	272	515	104	12	14	7	12	7
20	51	120	38	140	289	494	97	12	7	7	18	7
21	51	100	38	162	306	472	90	12	7	7	18	3
22	51	91	51	200	380	395	83	10	7	7	18	7
23	51	66	51	257	490	345	76	10	7	7	18	7
24	66	51	51	289	490	315	70	10	7	7	18	7
25	66	38	74	324	422	285	64	7	5	7	18	3
26	66	38	82	380	380	300	58	7	5	7	18	7
27	82	38	82	342	380	330	53	7	5	7	18	7
28	82	32	110	306	401	300	43	7	5	7	18	7
29	242	.....	120	289	422	285	34	7	5	7	18	7
30	242	.....	120	306	422	258	34	7	5	7	18	3
31	242	.....	140	.....	422	.....	34	7	.....	7	.....	7

NOTE.—Daily discharge determined from two fairly well defined curves, the first applicable from Jan. 1 to June 13, the other from June 14 to Dec. 31, 1911.

Monthly discharge of Donner Creek near Truckee, Cal., for 1911.

[Drainage area, 30 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	242	11	59.4	1.98	2.28	3,650	C.
February	242	32	110	3.67	3.82	6,110	B.
March	140	27	50.7	1.69	1.95	3,120	B.
April	380	120	210	7.00	7.81	12,500	B.
May	490	272	354	11.8	13.60	21,800	A.
June	612	258	481	16.0	17.85	28,600	A.
July	245	34	128	4.27	4.91	7,870	B.
August	30	7	15.5	.517	.60	953	C.
September	16	5	7.3	.243	.27	434	C.
October	7	5	6.2	.207	.24	381	C.
November	18	1	11.0	.367	.41	655	C.
December	18	3	11.5	.383	.44	707	C.
The year	612	1	120	4.00	54.18	86,800	

PROSSER CREEK NEAR TRUCKEE,[1] CAL.

Location.—At highway bridge in the SW. ¼ sec. 30, T. 18 N., R. 17 E., just below the mouth of Alder Creek, 2 miles above the mouth of Prosser Creek, 4 miles north of Truckee, and 3 miles below Hobart Mills, Cal.

Records available.—June 27, 1903, to October 15, 1904, and September 23, 1907, to December 31, 1911.

Drainage area.—48 square miles.

Gage.—Several gages with independent datums have been in use at this station. The 1911 gage heights, except those for March 1 to May 13, are referred to the datum of the gage painted on the left pier of the bridge January 15, 1909. From March 1 to May 13 gage heights were read only on a gage installed by the Stone & Webster Engineering Corporation; exact location of gage not known.

Channel.—Gravel; subject to change during floods.

Discharge measurements.—Made from car and cable 150 feet below gage, from the bridge, or by wading.

Winter flow.—Affected by ice.

Accuracy.—Record is considered fair.

Cooperation.—Gage heights furnished by the United States Reclamation Service and the Stone & Webster Engineering Corporation.

Discharge measurements of Prosser Creek near Truckee, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Apr. 15[a]	J. E. Stewart	3.32	163
May 31	Stone & Webster Engineering Corporation	4.35	454
June 5[b]	J. E. Stewart	4.78	603
July 18	Stone & Webster Engineering Corporation	3.55	194
Aug. 5[b]	G. T. Peckema	2.76	57
9	Stone & Webster Engineering Corporation	2.67	56
Sept. 26[b]	F. C. Ebert	2.27	19

[a] Made from downstream side of bridge. [b] Wading measurements.

[1] Published in former reports as "near Hobart Mills."

Daily gage height, in feet, of Prosser Creek near Truckee, Cal., for 1911.

[F. Lopez, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.4	.....	1.2	.....	1.9	4.4	3.95	2.9	2.35	2.22	2.4	1.7
2	2.4	.....	1.2	.....	1.9	4.6	3.85	2.9	2.35	2.22	2.4	1.7
3	2.4	.....	1.2	.....	1.9	4.7	3.85	2.78	2.32	2.22	2.4	1.6
4	2.4	.....	1.3	.....	2.2	4.8	3.85	2.8	2.3	2.3	2.4	1.7
5	2.4	.....	1.3	.....	2.3	4.9	3.75	2.8	2.3	2.3	2.4	1.7
6	2.4	.....	1.3	.....	2.2	4.85	3.7	2.8	2.3	2.3	2.4	1.7
7	2.4	.....	1.3	.....	2.1	4.7	3.75	2.8	2.3	2.3	2.4	1.7
8	2.4	.....	1.3	.....	2.2	4.65	3.7	2.8	2.3	.....	2.4	1.7
9	2.4	.....	1.1	.....	2.1	4.6	3.7	2.65	2.3	.....	2.4	1.6
10	2.5	.....	1.1	.....	2.1	4.6	3.6	2.58	2.3	.....	2.5	1.8
11	2.6	.....	1.1	.....	2.1	4.7	3.6	2.6	2.3	.....	2.5	1.8
12	2.6	.....	1.15	.....	2.1	4.8	3.6	2.6	2.3	.....	2.2	1.7
13	2.6	.....	1.2	.....	1.9	4.7	3.65	2.6	2.3	.....	2.3	1.8
14	2.6	.....	1.2	.....	4.6	4.6	3.55	2.6	2.3	.....	2.6	1.7
15	3.1	.....	1.2	3.32	4.6	4.7	3.5	2.6	2.25	.....	2.3	1.8
16	3.1	.....	1.3	1.8	4.6	4.7	3.6	2.6	2.25	.....	2.4	1.8
17	3.2	.....	1.3	1.8	4.6	4.65	3.6	2.6	2.25	.....	2.2	1.6
18	3.2	.....	1.4	1.9	4.5	4.6	3.45	2.6	2.20	.....	2.4	1.6
19	3.3	.....	1.2	1.9	4.5	4.65	3.48	2.5	2.20	.....	2.2	1.6
20	3.4	.....	1.0	1.8	4.4	4.75	3.48	2.5	2.25	.....	2.5	1.6
21	3.4	.....	1.1	1.8	4.4	4.6	3.25	2.5	2.25	.....	2.3	1.6
22	3.4	.....	1.1	1.9	4.6	4.4	3.18	2.5	2.25	.....	2.4	1.6
23	3.4	.....	1.3	1.9	4.85	4.2	3.15	2.5	2.25	.....	2.4	1.6
24	3.5	.....	1.2	2.1	4.8	4.1	3.15	2.48	2.25	.....	2.4	1.6
25	3.4	.....	1.1	2.2	4.6	3.9	3.15	2.42	2.25	.....	2.4	1.6
26	3.6	.....	1.2	2.3	4.5	4.1	3.10	2.45	2.25	.....	2.4	1.6
27	3.7	.....	1.4	2.2	4.5	4.25	3.02	2.40	2.25	.....	2.4	1.6
28	3.8	.....	1.3	1.9	4.5	4.2	3.0	2.4	2.25	.....	2.3	1.6
29	.....	.....	1.3	1.9	4.6	4.1	2.9	2.4	2.25	.....	2.2	1.6
30	.....	.....	1.3	1.9	4.6	3.85	2.9	2.4	2.25	.....	2.1	1.6
31	.....	.....	1.3	.....	4.6	.....	2.85	2.35	.....	.....	.....	1.6

NOTE.—Two gages at different locations were read during 1911. Readings Jan. 1 to 28, Apr. 15, and after May 13, refer to United States Reclamation Service gage. No record for missing periods at either gage. Stone & Webster gage read Mar. 1 to 31 and Apr. 16 to May 13. Gage heights Dec. 1 to 31 are considered unreliable. Relation of gage heights to discharge probably not greatly affected by ice during the winter months.

Daily discharge, in second-feet, of Prosser Creek near Truckee, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	28	320	85	153	318	463	302	79	24	16	28	*20
2	28	250	85	221	318	544	272	79	24	16	28	14
3	28	180	85	*290	318	586	272	65	22	16	28	*7
4	28	*110	107	265	492	630	272	67	21	21	28	*21
5	28	110	107	*240	562	675	244	67	21	21	28	*14
6	28	*110	107	250	492	652	230	67	21	21	28	*15
7	28	*120	107	*260	428	586	244	67	21	21	28	13
8	28	100	107	260	492	565	230	67	21	21	28	*11
9	28	*80	65	260	428	544	230	50	21	21	28	12
10	36	90	65	*260	428	544	205	43	21	21	36	*13
11	45	*70	65	237	428	586	205	45	21	21	36	13
12	45	80	75	214	428	630	205	45	21	*21	15	*13
13	45	*90	85	190	318	586	218	45	21	22	21	12
14	45	80	85	167	544	544	194	45	21	*22	45	10
15	107	*70	85	144	544	586	182	45	18	22	21	8
16	107	75	107	270	544	586	205	45	18	*21	28	*6
17	123	*80	107	270	544	565	205	45	18	*21	15	6
18	123	80	132	318	503	544	171	45	15	22	28	6
19	140	80	85	318	503	565	178	36	15	24	15	*6
20	160	80	47	270	463	608	178	36	18	*26	36	8

Daily discharge, in second-feet, of Prosser Creek near Truckee, Cal., for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
21	160	*80	65	270	463	544	132	36	18	24	21	10
22	160	*90	65	318	544	463	120	36	18	*22	28	*12
23	160	*85	107	318	652	388	115	36	18	24	28	10
24	182	85	85	428	630	352	115	34	18	*25	28	8
25	160	85	65	492	544	286	115	30	18	*23	28	7
26	205	85	85	562	503	352	107	32	18	23	28	6
27	230	85	132	492	503	406	95	28	18	*23	28	*5
28	258	85	107	318	503	388	92	28	18	24	21	7
29	289	.....	107	318	544	352	79	28	18	*25	15	*9
30	*320	.....	107	318	544	272	79	28	18	26	10	*7
31	320	.....	107	.....	544	.....	73	24	.....	27	.....	*8

NOTE.—Daily discharge determined from two fairly well-defined curves, the first applicable to United States Reclamation Service gage heights, the second applicable to Stone & Webster gage heights. Discharge marked *estimated from records of flow and hydrograph of Little Truckee River at Boca. Discharge interpolated for other days on which gage was not read. No use made of December gage heights in determining discharge for that month. Owing to the uncertainty of many of these data too great accuracy should not be accredited to the yearly run-off.

Monthly discharge of Prosser Creek near Truckee, Cal., for 1911.

[Drainage area, 48 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	320	28	118	2.46	2.84	7,260	C.
February	320	70	105	2.19	2.28	5,830	D.
March	132	47	91.1	1.90	2.19	5,600	C.
April	562	144	290	6.04	6.74	17,300	C.
May	652	318	486	10.1	11.64	29,900	A.
June	675	272	513	10.7	11.94	30,500	A.
July	302	73	179	3.73	4.30	11,000	B.
August	79	24	45.9	.956	1.10	2,820	B.
September	24	18	19.4	.404	.45	1,150	C.
October	27	16	22.0	.458	.53	1,350	D.
November	45	10	26.1	.543	.61	1,550	C.
December	21	5	10.2	.212	.24	627	D.
The year	675	5	159	3.31	44.86	115,000	

LITTLE TRUCKEE RIVER AT BOCA, CAL.

Location.—Five hundred feet below ice-pond dam and 150 feet above mouth of stream.

Records available.—January 1 to December 31, 1911. At Pine Station and Starr, 1903 to 1910. The station on this river was originally located about 3 miles north of Boca at Pine Station. It was moved to Starr, about 5 miles north of Boca, January 1, 1908, and discontinued at that point October 23, 1910.

Drainage area.—Not measured.

Gage.—Inclined staff on left bank 100 feet above railroad bridge.

Channel.—Gravel and appears permanent.

Discharge measurements.—Made from car and cable at gage.

Winter flow.—Affected by ice.

Artificial control.—Flow regulated by dam. Water passing through small power plant, which is operated only during the night, does not pass gage.

Accuracy.—On account of the regulation at the dam and the operation of the power plant, the record is not very satisfactory. The rating curve is well defined.

Cooperation.—Gage heights furnished by United States Reclamation Service.

Discharge measurements of Little Truckee River at Boca, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Apr. 14[a]	J. E. Stewart	2.49	608
May 9	Stone & Webster Engineering Corporation	3.70	1,320
June 7	J. E. Stewart	3.87	1,500
July 18	Stone & Webster Engineering Corporation	2.30	444
Aug. 5[b]	G. T. Peekema	1.30	86
12	Stone & Webster Engineering Corporation	1.13	60
Sept. 26[c]	F. C. Ebert	.89	35

[a] About 2 second-feet diverted through power canal above gage.
[b] Measurement made by wading at cable. About 3.5 second-feet in the power canal.
[c] Wading measurement. No water being diverted.

Daily gage height, in feet, of Little Truckee River at Boca, Cal., for 1911.

[Robert A. Tonini, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.05	1.8	1.25	2.7	3.7	3.35	2.75	1.6	0.85	.....	0.85	1.05
2	1.05	1.9	1.25	2.95	3.8	3.4	2.65	1.5	.8	.....	.8	.9
3	1.0	1.75	1.3	3.2	4.1	3.6	2.65	1.5	.8	.....	.75	.75
4	1.0	1.5	1.6	3.15	4.7	3.7	2.6	1.4	.8	.....	.75	1.1
5	1.05	1.5	1.3	3.05	4.5	3.8	2.6	1.35	.75	.....	.8	.9
6	1.05	1.45	1.3	3.1	4.0	3.9	2.6	1.3	.85	.8	.75	.95
7	1.1	1.55	1.55	3.1	3.8	3.7	2.6	1.3	.85	.75	.8	.9
8	1.1	1.4	1.4	3.1	4.0	3.7	2.55	1.25	.8	.75	.8	.75
9	.9	1.4	1.2	3.05	3.7	3.6	2.45	1.2	.85	.75	.85	.8
10	.75	1.45	1.4	2.8	3.55	3.65	2.4	1.15	.85	.....	1.0	.8
11	.5	1.3	1.4	2.65	3.7	3.8	2.4	1.15	.8	.75	.75	.85
12	.8	1.4	1.45	2.6	3.7	3.95	2.35	1.15	.....	.75	.85	.75
13	.5	1.45	1.45	2.6	3.65	3.8	2.35	1.15	.95	.8	.9	.7
14	.4	1.35	1.4	2.55	3.4	3.8	2.4	1.1	.9	.8	.9	.75
15	.45	1.35	1.4	2.6	3.2	3.75	2.3	1.1	.85	.75	.95	.65
16	1.4	1.3	1.35	2.75	3.2	3.7	2.35	1.05	.85	.75	.95	.6
17	1.4	1.2	1.4	2.9	3.05	3.65	2.35	1.05	.85	.75	.9	.6
18	1.4	1.25	1.4	3.3	3.05	3.65	2.3	1.55	.85	.8	.8	.55
19	1.25	1.2	1.5	3.3	3.05	3.7	2.2	1.0	.85	.8	.85	.5
20	1.3	1.2	1.6	3.2	3.2	3.7	2.2	1.0	.85	.9	.85	.55
21	1.05	1.15	1.65	3.4	3.3	3.65	1.95	.95	.9	.85	.85	.55
22	1.1	1.25	1.7	3.7	3.45	3.5	1.8	.95	.85	.75	.8	.6
23	1.1	1.2	1.85	4.0	3.7	3.2	1.8	.9	.9	.8	.85	.8
24	1.2	1.2	1.9	4.3	3.8	3.05	1.8	.95	.85	.85	.9	.7
25	1.15	1.15	2.0	4.7	3.4	2.85	1.75	.95	.85	.8	.9	.55
26	1.15	1.15	2.1	4.9	3.25	2.7	1.7	.9	.....	.8	1.0	.55
27	1.15	1.2	2.1	4.35	3.25	3.0	1.65	.9	.....	.8	.95	.4
28	1.1	1.2	2.15	4.1	3.3	3.1	1.9	.9	.....	.85	.8	.65
29	1.2	.....	2.2	4.1	3.3	2.9	1.7	.9	.....	.8	.85	.7
30	1.5	.....	2.35	4.0	3.3	2.9	1.6	.9	.....	.85	.85	.6
31	1.75	.....	2.5	.....	3.3	.....	1.6	.85	.....	.85	.....	.65

NOTE.—Sept. 12, pond emptied to be cleaned; Sept. 26 to Oct. 5 and Oct. 10, gates shut down for filling of pond. Relation of gage heights to discharge probably not affected by ice during the winter months.

Daily discharge, in second-feet, of Little Truckee River at Boca, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	50	235	78	695	1,350	1,110	725	162	32	0	32	50
2	50	275	78	848	1,420	1,140	665	131	28	0	28	36
3	45	216	86	1,010	1,630	1,280	665	131	28	0	24	24
4	45	131	162	978	2,100	1,350	635	107	28	0	24	56
5	50	131	86	912	1,940	1,420	635	96	24	0	28	36
6	50	119	86	945	1,560	1,490	635	86	32	28	24	40
7	56	146	146	945	1,420	1,350	635	86	32	24	28	36
8	56	107	107	945	1,560	1,350	608	78	28	24	28	24
9	36	107	70	912	1,350	1,280	552	70	32	24	32	28
10	24	119	107	755	1,240	1,320	525	63	32	0	45	28
11	10	86	107	665	1,350	1,420	525	63	28	24	24	32
12	28	107	119	635	1,350	1,520	498	63	100	24	32	24
13	10	119	119	635	1,320	1,420	498	63	40	28	36	21
14	6	96	107	608	1,140	1,420	525	56	36	28	36	24
15	8	96	107	635	1,010	1,380	470	56	32	24	40	18
16	107	86	96	725	1,010	1,350	498	50	32	24	40	15
17	107	70	107	815	912	1,320	498	50	32	24	36	15
18	107	78	107	1,080	912	1,320	470	146	32	28	28	12
19	78	70	131	1,080	912	1,350	415	45	32	28	32	10
20	86	70	162	1,010	1,010	1,350	415	45	32	36	32	12
21	50	63	180	1,140	1,080	1,320	298	40	36	32	32	12
22	56	78	197	1,350	1,180	1,210	235	40	32	24	28	15
23	56	70	255	1,560	1,350	1,010	235	36	36	28	32	28
24	70	70	275	1,780	1,420	912	235	40	32	32	36	21
25	63	63	320	2,100	1,140	785	216	40	32	28	36	12
26	63	63	365	2,260	1,040	695	197	36	0	28	45	12
27	63	70	365	1,820	1,040	880	180	36	0	28	40	6
28	56	70	390	1,630	1,080	945	275	36	0	32	28	18
29	70	.....	415	1,630	1,080	815	197	36	0	28	32	21
30	131	.....	498	1,560	1,080	815	162	36	0	32	32	15
31	216	.....	580	.....	1,080	.....	162	32	.....	32	.....	18

NOTE.—Discharge Sept. 12 estimated as 100 second-feet, as sudden opening of pond gates would increase discharge over previous flow. Estimated zero flow Sept. 26 to Oct. 5 and Oct 10.

Monthly discharge of Little Truckee River at Boca, Cal., for 1911.

[Drainage area, 186 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	216	6	61.4	0.331	0.38	3,780	B.
February	275	63	108	.581	.60	6,000	B.
March	580	70	194	1.04	1.20	11,900	A.
April	2,260	608	1,120	6.02	6.72	66,600	A.
May	2,100	912	1,260	6.77	7.80	77,500	A.
June	1,520	695	1,210	6.51	7.26	72,000	A.
July	725	162	435	2.34	2.70	26,700	B.
August	162	32	66.3	.356	.41	4,080	B.
September	100	0	28.7	.154	.17	1,710	B.
October	36	0	22.3	.120	.14	1,370	B.
November	45	24	32.3	.174	.19	1,920	B.
December	56	6	23.2	.125	.14	1,430	B.
The year	2,260	.0	380	2.04	27.71	275,000	

WARNER LAKE BASIN.

CRUMP LAKE NEAR ADEL, OREG.

Location.—On the west shore of the lake 8 miles north of Adel in sec. 27, T. 38 S., R. 24 E., unsurveyed.

Records available.—May 21, 1910, to December 31, 1911.

Gage.—Vertical staff fastened to a large bowlder 50 feet east of the county road.

The following gage readings were obtained during 1910:

		Feet.			Feet.
May	21	3.5	Nov.	14	0.05
June	2	3.05		24	.1
	13	2.65	Dec.	4	.25
	23	2.3		14	.9
July	8	1.8		24	1.3
	21	1.55			

Daily gage height, in feet, of Crump Lake near Plush, Oreg., for 1911.

[Ed. Keissling, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1										1.15		1.4
2							3.6					
3									1.5			
4	1.3	1.6	1.8	3.0		3.6						
5												
6								2.2				
7					3.65							
8										1.15		
9							3.25					
10									1.4			
11						3.75						
12												
13								2.0				
14	1.3	1.7	2.0	3.15	3.7							
15										1.1	1.2	1.5
16							3.0					
17									1.3			
18						3.7						
19												
20								1.85				
21					3.7							
22										1.1		
23							2.7					
24	1.5	1.75	2.1	3.5					1.2			
25						3.65						
26												
27								1.7				
28					3.7							
29										1.05		
30				3.6			2.45					
31												

HART LAKE NEAR PLUSH, OREG.

Location.—On line between secs. 22 and 27, T. 36 S., R. 24 E., 2 miles northeast of Plush and just north of the mouth of Honey Creek.

Records available.—June 8, 1910, to December 31, 1911. Fragmentary.

Gage.—Vertical staff nailed to a post.

The following gage readings were made during 1910: June 8, 3.42 feet; June 28, 3.23 feet; July 24, 2.84 feet.

Daily gage height, in feet, of Hart Lake near Adel, Oreg., for 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1								2.60	2.40	2.40
2		3.00								
3							2.90			
4										
5	2.10									
6						3.50				
7										
8								2.55		
9		3.10								
10							2.85			
11										
12	2.10									
13						3.35				
14										
15								2.50	2.45	2.45
16		3.40								
17					3.80		2.75			
18										
19	2.15									
20						3.15				
21										
22										
23		3.98			3.72					
24							2.65			
25										
26										
27										
28	2.95					3.01				
29										
30		4.02			3.60					
31										

NOTE.—First ice period Nov. 15, 1911.

FLAGSTAFF LAKE NEAR PLUSH, OREG.

Location.—In a slough at the south end of the lake in sec. 5, T. 35 S., R. 25 E., 15 miles north of Plush.

Records available.—May 31 to June 30, 1910; April 30 to December 31, 1911.

Gage.—Vertical staff.

The following gage readings were made during 1910: May 31, 4.15 feet; June 22, 3.90 feet; June 30, 3.82 feet.

Daily gage height, in feet, of Flagstaff Lake near Plush, Oreg., for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1								1.75	
2									
3					2.65				
4									
5							1.8		
6									
7		2.2							
8									1.7
9				3.05					
10								1.75	
11									
12			3.25						
13							1.85		
14		3.0		3.0	2.4				
15									1.7

Daily gage height, in feet, of Flagstaff Lake near Plush, Oreg., for 1911—Continued.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
16								1.75	
17									
18									
19							1.85		
20			3.1						
21				2.95		1.9			
22		3.05							
23								1.75	
24									
25									
26							1.8		
27									
28				2.7		1.9			1.65
29	2.4		3.1						
30		3.05						1.7	
31									

TWENTYMILE CREEK NEAR WARNER LAKE, OREG.

Location.—About one-fourth mile above the bridge at the mouth of the canyon in sec. 24, T. 40 S., R. 23 E., about 2 miles south of Warner Lake post office. It is below all tributaries.

Records available.—March 1, 1910, to December 31, 1911.

Drainage area.—126 square miles.

Gage.—Vertical staff in two sections about one-fourth mile above the bridge and above a fall in the stream. The gage was originally established at the bridge, but as the gage heights were affected by backwater from a dam below it was removed to the present site. So far as possible, however, all gage readings referred to the present gage have been reduced to the same datum.

Channel.—The bed is composed of bowlders and gravel and probably shifts slightly.

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

Winter flow.—Affected by ice.

Diversions.—Except for a small amount of water diverted in two ditches just above the gage, the records show the total run-off passing the station from the drainage area above.

Artificial control.—Backwater from the diversions dam below the bridge may reach the gage.

Accuracy.—Gage heights show marked diurnal fluctuations at times during the spring, thus causing considerable inaccuracy in the records.

Discharge measurements of Twentymile Creek near Warner Lake, Oreg., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Mar. 24	J. Dubuis	3.90	450
24	do	4.39	550
Apr. 4	do	3.56	359
4	do	3.22	275
24	Davenport and Dubuis	2.38	133
29	J. Dubuis	2.17	102
May 15	do	1.80	50.8
July 24[a]	do	.80	12.4
Aug. 17[a]	R. W. Davenport	.20	4.2
Oct. 1[a]	Stokes and Crower	.28	5.4
Nov. 7[a]	do	.43	5.7
17[a]	do	.50	7.0

[a] Wading measurements. Not at regular station.

Daily gage height, in feet, of Twentymile Creek near Warner Lake, Oreg., for 1911.

[Geo. Stombaugh, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.5	1.1	0.6	5.2	2.05	2.4	1.5	0.5	0.1	0.3	0.4	0.4
2	.5	1.0	.6	5.0	2.1	2.6	1.5	.5	.1	.3	.4	.4
3	.5	1.0	.6	4.2	2.25	2.6	1.5	.5	.1	.3	.4	.4
4	.5	1.0	.6	3.8	2.3	2.5	1.4	.4	.1	.4	.4	.4
5	.5	1.0	.6	4.6	2.5	2.6	1.4	.4	.2	.4	.4	.4
6	.5	.9	.6	4.0	2.15	2.5	1.3	.4	.3	.3	.4	.4
7	.5	.9	.7	3.9	2.0	2.7	1.3	.4	.3	.3	.4	.4
8	.5	1.0	.6	4.3	2.1	2.7	1.2	.4	.2	.3	.5	.4
9	.5	1.1	.5	3.8	2.0	2.7	1.2	.4	.1	.3	.5	.4
10	.4	.9	.8	3.4	1.85	2.5	1.2	.3	.1	.4	.5	.5
11	.4	.6	.8	3.0	1.85	2.6	1.0	.3	.1	.4	.5	.5
12	.4	.6	.8	2.0	1.9	2.6	1.1	.3	.1	.3	.5	.5
13	.4	.5	.8	2.2	1.9	2.5	1.1	.3	.1	.3	.5	.5
14	.4	.9	1.0	2.15	1.85	2.7	1.1	.2	.1	.3	.6	.5
15	.4	.8	1.2	2.1	1.8	2.6	1.0	.2	.1	.3	.7	.5
16	.4	.7	1.45	2.4	2.0	2.4	1.0	.2	.1	.2	.7	.5
17	.4	.7	1.75	2.7	2.15	2.4	1.1	.2	.1	.2	.5	.5
18	.5	.6	2.05	2.6	2.5	2.4	1.1	.2	.1	.2	.5	.6
19	.5	.5	2.5	1.9	1.9	2.4	1.0	.1	.1	.2	.5	.7
20	.4	.5	3.0	1.95	1.8	2.4	1.0	.1	.1	.2	.5	.4
21	.4	.5	3.45	2.4	1.8	2.3	.9	.1	.1	.2	.5	.4
22	.4	.6	4.2	2.45	1.9	2.0	.9	.2	.1	.2	.5	.4
23	.4	.6	5.2	2.4	1.9	1.9	.9	.2	.1	.2	.5	.4
24	.5	.6	4.2	2.55	2.1	1.8	.8	.2	.2	.2	.5	.4
25	.5	.6	4.0	2.6	2.0	1.7	.8	.2	.2	.3	.4	.4
26	.5	.6	3.4	2.5	2.0	1.7	.8	.2	.3	.3	.4	.4
27	.5	.6	3.5	2.3	2.0	1.6	.7	.1	.4	.3	.4	.4
28	.5	.6	4.6	2.35	1.9	1.6	.7	.1	.3	.3	.5	.4
29	.5	.....	4.8	2.25	2.0	1.5	.6	.1	.3	.3	.5	.4
30	1.0	.....	5.2	2.05	2.1	1.4	.5	.1	.3	.4	.4	.4
31	1.3	.....	5.2	.....	2.1	.....	.5	.1	.....	.4	.....	.4

NOTE.—Gage heights probably affected by ice about Jan. 1 to Mar. 13 and about Dec. 16 to 31.

Daily discharge, in second-feet, of Twentymile Creek near Warner Lake, Oreg., for 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	810	85	131	36	7	3.5	5	6	6
2	.....	750	91	163	36	7	3.5	5	6	6
3	.....	514	110	163	36	7	3.5	5	6	6
4	.....	410	117	147	31	6	3.5	6	6	6
5	.....	630	147	163	31	6	4	6	6	6
6	.....	460	97	147	26	6	5	5	6	6
7	.....	434	79	181	26	6	5	5	6	6
8	.....	542	91	181	22	6	4	5	7	6
9	.....	410	79	181	22	6	3.5	5	7	6
10	.....	318	63	147	22	5	3.5	6	7	7
11	.....	248	63	163	16	5	3.5	6	7	7
12	.....	79	68	163	19	5	3.5	5	7	7
13	.....	103	68	147	19	5	3.5	5	7	7
14	16	97	63	181	19	4	3.5	5	8	7
15	22	91	58	163	16	4	3.5	5	10	7
16	33	131	79	131	16	4	3.5	4	10	.....
17	54	181	97	131	19	4	3.5	4	7	.....
18	85	163	147	131	19	4	3.5	4	7	.....
19	147	68	68	131	16	3.5	3.5	4	7	.....
20	238	74	58	131	16	3.5	3.5	4	7	.....
21	329	131	58	117	14	3.5	3.5	4	7	.....
22	514	139	68	79	14	4	3.5	4	7	.....
23	810	131	68	68	14	4	3.5	4	7	.....
24	514	155	91	58	12	4	4	4	7	.....
25	460	163	79	49	12	4	4	5	6	.....
26	318	147	79	49	12	4	5	5	6	.....
27	340	117	79	42	10	3.5	6	5	6	.....
28	630	124	68	42	10	3.5	5	5	7	.....
29	690	110	79	36	8	3.5	5	5	7	.....
30	810	85	91	31	7	3.5	5	6	6	.....
31	810	.....	91	.....	7	3.5	.....	6	.....	.....

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

Monthly discharge of Twentymile Creek near Warner Lake, Oreg., for 1911.

[Drainage area, 126 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	.....	.....	5	0.040	0.05	307	D.
February	.....	.....	3	.024	.02	167	D.
March	810	.....	223	1.77	2.04	13,700	A.
April	810	68	260	2.06	2.30	15,500	A.
May	147	58	83.2	.660	.76	5,120	B.
June	181	31	122	.968	1.08	7,260	A.
July	36	7	18.8	.149	.17	1,160	B.
August	7	3.5	4.68	.037	.04	288	C.
September	6	3.5	3.95	.031	.03	235	C.
October	6	4	4.9	.039	.04	301	C.
November	10	6	6.9	.055	.06	411	C.
December	.....	.....	5.7	.045	.05	350	D.
The year	810	.....	61.8	.490	6.64	44,800	

NOTE.—Discharge Jan. 1 to Mar. 13 and Dec. 16 to 31 estimated, because of ice, from climatologic records.
Mean discharge Mar. 1 to 13 estimated 6 second-feet.
Mean discharge Dec. 16 to 31 estimated 5 second-feet.

DEEP CREEK AT BIG VALLEY, NEAR LAKEVIEW, OREG.

Location.—In sec. 4, T. 40 S., R. 22 E., near the Big Valley dam site, about 9 miles from Mud Creek stage station and about 12 miles east of Lakeview.

Records available.—May 3, 1911, to December 31, 1911.

Drainage area.—63 square miles.

Gage.—Vertical staff.

Channel.—Not likely to shift; bed composed of gravel and stone.

Discharge measurements.—Made from a cable or by wading.

Winter flow.—At times affected by ice.

Storage.—The dam site at Big Valley can probably be developed to any storage capacity warranted by the available water supply.

Cooperation.—Station maintained in cooperation with the Warner Lake Irrigation Co.

Discharge measurements of Deep Creek at Big Valley, near Lakeview, Oreg., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
June 15	John Dubuis	2.67	490
July 25	....do	.30	22.2
Aug. 19	R. W. Davenport	.06	9.1
Dec. 5	W. O. Harmon	− .30	10.0

Daily gage height, in feet, of Deep Creek at Big Valley, near Lakeview, Oreg., for 1911.

[Bessie Loftus, observer.]

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	2.4	1.4	.....	.....	0.10	0.30	.....
2	.....	2.5	1.4	.....	.....	.....	.....	.....
3	2.1	2.7	.....	.....	.....	.....	.....	.....
4	2.2	2.6	1.0	.....	.....	.15	.35	.....
5	2.1	2.9	.....	.....	.....	.....	.....	−0.30
6	2.0	2.8	.9	.....	.....	.....	.....	.....
7	2.0	3.0	.....	.....	.....	.18	.....	.....
8	2.0	2.8	.8	.....	.....	.....	.....	.....
9	1.7	2.7	.....	.....	.....	.....	.....	.....
10	1.6	2.7	.9	.....	.....	.20	.....	.....
11	.....	2.6	.....	.....	.....	.....	.25	.....
12	1.9	2.7	.6	.....	.....	.....	.....	.....
13	1.7	2.5	.....	.....	.....	.....	.....	.....
14	1.6	3.0	.5	.....	.....	.21	.....	.....
15	1.6	2.8	.....	.....	.....	.....	.....	.....
16	1.5	2.7	.5	.....	.....	.....	.....	.....
17	1.7	2.4	.....	.....	0.10	.21	.....	.....
18	1.6	2.5	.6	.....	.....	.....	.20	.....
19	1.9	2.3	.....	0.06	.....	.....	.....	.....
20	1.5	2.4	.5	.....	.....	.25	.....	.....
21	1.7	1.9	.....	.....	.....	.....	.....	.....
22	1.8	1.9	.4	.....	.....	.....	.....	.....
23	1.8	1.9	.....	.....	.15	.30	.....	.....
24	1.6	1.8	.3	.....	.15	.....	.....	.....
25	2.0	1.4	.3	.....	.....	.....	.20	.....
26	1.8	1.4	.....	.....	.....	.30	.....	.....
27	2.2	1.5	.....	.....	.....	.....	.....	.....
28	1.9	1.4	.....	.....	.15	.....	.....	.....
29	2.0	1.4	.....	.....	.....	.....	.....	.....
30	2.1	1.5	.....	.....	.....	.35	.17	.....
31	2.3	.....	.....	.....	.....	.....	.....	.....

Daily discharge, in second-feet, of Deep Creek at Big Valley, near Lakeview, Oreg., for 1911.

Day.	May.	June.	July.	Sept.	Oct.	Nov.	Day.	May.	June.	July.	Sept.	Oct.	Nov.
1	.....	400	161	.....	11	22	16	180	495	37	.....	17	17
2	.....	430	161	.....	12	23	17	220	400	42	11	17	16
3	315	495	128	.....	13	25	18	200	430	46	11	18	16
4	342	460	95	.....	14	26	19	265	371	42	12	18	16
5	315	565	88	.....	14	25	20	180	400	37	12	19	16
6	290	530	81	.....	15	24	21	220	265	33	13	20	16
7	290	600	74	.....	15	23	22	242	265	29	13	21	16
8	290	530	68	.....	15	22	23	242	265	26	14	22	16
9	220	495	74	.....	16	21	24	200	242	22	14	22	16
10	200	495	81	.....	16	20	25	290	161	22	14	22	16
11	232	460	64	.....	16	19	26	242	161	.....	14	22	16
12	265	495	46	.....	16	19	27	342	180	.....	14	23	15
13	220	430	42	.....	17	18	28	265	161	.....	14	24	15
14	200	600	37	.....	17	18	29	290	161	.....	13	25	15
15	200	530	37	.....	17	17	30	315	180	.....	12	26	14
							31	371	.....	.....	.....	24	.....

NOTE.—Daily discharge determined from a rating curve not well defined. Discharge interpolated for days on which gage was not read except July 26 to Sept. 16, and Dec. 1–31.

Monthly discharge of Deep Creek at Big Valley, near Lakeview, Oreg., for 1911.

[Drainage area, 63 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
May 3-31	371	180	257	4.08	4.40	14,800	B.
June	600	161	388	6.15	6.87	23,100	B.
July	161	.....	53.6	.851	.98	3,300	B.
August	.....	.....	10	.159	.18	615	D.
September	.....	.....	11.4	.181	.20	678	D.
October	26	11	18.2	.289	.33	1,120	B.
November	26	14	18.6	.295	.33	1,100	B.
December	.....	.....	10	.159	.18	615	D.
The period	.....	.....	.....	.....	.....	45,300	

NOTE.—Discharge July 26 to 31, approximately 15 second-feet; Aug. 1 to Sept 16, and Dec. 1 to 31, 10 second-feet; estimated from discharge measurements made Aug. 19 and Dec. 5.

DEEP CREEK[1] AT ADEL, OREG.

Location.—In the SE. ¼ NW. ¼ sec. 21, T. 39 S., R. 24 E., about one-eighth mile above the wagon bridge crossing the creek at Adel; below all tributaries.

Records available.—May 11, 1909, to December 31, 1911.

Drainage area.—272 square miles.

Gage.—A vertical staff in two sections about 500 feet above the bridge and above a series of rapids; datum unchanged.

Channel.—Probably permanent; bed of stream composed of gravel and stone.

Discharge measurements.—Made from the wagon bridge.

Diversions.—Several small ditches divert water for irrigation near the headwaters of the stream and five ditches take out within 6 or 8 miles above the station and carry water around it to irrigate several hundred acres of land; 2,000 or 3,000 acres of land are watered by natural flooding near Big Valley and Crane Lake, but much of the water is probably returned to the stream. The combined capacity of the five ditches above mentioned is about 30 second-feet. Measurements of the combined discharge showed 25 second-feet of water in June, 1910; 20 second-feet in April, 1911; 18 second-feet in July, 1911. Below the bridge the grade of the stream is very flat and water is diverted into the M. C. ditch by means of a temporary dam which is repaired at the beginning of each irrigation season.

Winter flow.—Relation between gage height and discharge affected by ice during periods of extreme cold weather and occasionally by backwater from ice jams.

Accuracy.—Determination of mean gage height is rendered rather difficult during the spring by the diurnal fluctuations. Gage heights may be affected by backwater from the temporary dam below the station.

Cooperation.—Station maintained in cooperation with the Warner Lake Irrigation Co.

Discharge measurements of Deep Creek at Adel, Oreg., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Mar. 22	J. Dubuis	4.80	542
23	do	5.80	1,360
27	do	4.30	364
Apr. 1	do	5.25	768
3	do	5.35	803
14	do	3.65	156
24	R. W. Davenport	4.75	557
24	J. Dubuis	4.72	576
May 8	do	4.55	522
15	do	4.15	339
July 21[a]	do	3.10	43.5
Aug. 21[a]	R. W. Davenport	2.68	7.0

[a] Waded above gage.

[1] Formerly called Warner Creek.

Daily gage height, in feet, of Deep Creek at Adel, Oreg., for 1911.

[Miss Myrtel Wible, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.1	3.1	3.1	5.8	4 35	4.35	3.4	2.8	2.8	2.8	2.9	3.0
2	3.0	3.1	3.1	5.15	4.05	4.75	3.4	2.8	2.8	2.8	2.9	3.0
3	3.0	3.1	3.1	5.2	3.95	4.9	3.4	2.8	2.8	2.8	2.9	3.0
4	3.0	3.1	3.1	4.55	3.95	4.8	3.4	2.8	2.85	2.8	2.9	3.0
5	3.0	3.1	3.1	5.3	5.15	4.8	3.3	2.8	2.9	2.8	2.9	3.0
6	3.0	3.1	3.0	4.6	5.2	4.6	3.3	2.8	2.9	2.8	2.9	3.0
7	3.0	3.1	3.0	4.45	4.8	4.7	3.3	2.8	2.8	2.8	2.9	3.0
8	3.1	3.2	3.0	4.8	4.3	4.7	3.3	2.8	2.8	2.8	2.9	3.0
9	3.05	3.2	3.1	4.7	4.2	4.7	3.25	2.8	2.8	2.8	3.0	2.9
10	3.0	3.2	3.1	4.4	4.1	4.65	3.2	2.8	2.8	2.8	3.0	2.9
11	3.0	3.2	3.2	4.25	4.0	4.55	3.2	2.8	2.8	2.8	3.0	2.9
12	3.0	3.35	3.1	3.55	4.8	4.55	3.2	2.8	2.8	2.8	3.0	2.9
13	3.0	3.3	3.0	3.9	4.5	4.75	3.2	2.8	2.8	2.8	3.0	2.9
14	3.0	3.2	2.95	4.05	4.8	5.3	3.2	2.8	2.8	2.8	3.1	2.9
15	3.0	3.1	3.1	4.15	4.6	4.95	3.2	2.8	2.8	2.8	3.1	2.9
16	3.0	3.1	3.25	4.3	4.65	4.75	3.2	2.8	2.8	2.8	3.1	2.9
17	3.0	3.1	3.2	3.5	4.6	4.55	3.2	2.8	2.8	2.8	2.9	2.9
18	3.0	3.1	3.25	3.7	4.8	4.5	3.35	2.8	2.8	2.8	2.8	2.9
19	3.05	3.1	3.25	3.7	4.5	4.5	3.25	2.8	2.8	2.8	2.8	2.9
20	3.15	3.1	3.55	3.7	4.4	4.4	3.15	2.8	2.8	2.8	2.9	2.9
21	3.15	3.1	3.95	3.75	4.35	4.25	3.1	2.8	2.8	2.8	2.9	2.9
22	3.25	3.1	4.95	4.5	4.5	4.05	3.0	2.8	2.8	2.8	2.9	2.9
23	3.25	3.1	5.8	4.25	4.75	4.0	3.0	2.8	2.8	2.8	2.8	2.9
24	3.35	3.1	5.3	4.35	4.7	3.85	2.9	2.8	2.8	2.8	2.8	2.8
25	3.35	3.1	4.9	4.8	4.65	3.8	2.9	2.8	2.8	2.8	2.8	2.8
26	3.35	3.1	4.7	5.0	4.45	3.7	2.9	2.8	2.8	2.8	2.8	2.8
27	3.3	3.0	4.85	4.9	4.4	3.6	2.9	2.8	2.8	2.8	2.9	2.8
28	3.3	3.0	4.6	4.65	4.3	3.5	2.85	2.8	2.8	2.9	2.9	2.8
29	3.3	.....	4.95	4.65	4.35	3.5	2.8	2.8	2.8	2.9	2.9	2.8
30	3.2	.....	5.45	4.35	4.15	3.45	2.8	2.8	2.8	2.9	2.9	2.8
31	3.2	.....	5.8	.....	4.0	.....	2.8	2.8	.....	2.9	.....	2.8

NOTE.—Ice Jan. 1 to about Mar. 13. Probably little or no effect from ice during December.

Daily discharge, in second-feet, of Deep Creek at Adel, Oreg., for 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1,260	390	390	99	11	11	11	18	30
2	.....	780	278	565	99	11	11	11	18	30
3	.....	810	244	640	99	11	11	11	18	30
4	.....	470	244	590	99	11	14	11	18	30
5	.....	880	780	590	89	11	18	11	18	30
6	.....	490	810	490	80	11	18	11	18	30
7	.....	430	590	540	80	11	11	11	18	30
8	.....	590	370	540	80	11	11	11	18	30
9	.....	540	330	540	70	11	11	11	30	18
10	.....	410	295	515	61	11	11	11	30	18
11	.....	350	260	470	61	11	11	11	30	18
12	.....	134	590	470	61	11	11	11	30	18
13	.....	229	250	565	61	11	11	11	30	18
14	24	278	590	880	61	11	11	11	44	18
15	44	312	490	665	61	11	11	11	44	18
16	70	370	515	565	61	11	11	11	44	18
17	61	122	490	470	61	11	11	11	18	18
18	70	171	590	450	90	11	11	11	11	18
19	70	171	450	450	70	11	11	11	11	18
20	134	171	410	410	52	11	11	11	18	18
21	244	185	390	350	44	11	11	11	18	18
22	665	450	450	278	30	11	11	11	18	18
23	1,260	350	565	260	30	11	11	11	11	18
24	880	390	540	214	18	11	11	11	11	11
25	640	590	515	199	18	11	11	11	11	11
26	540	690	430	171	18	11	11	11	11	11
27	615	640	410	145	18	11	11	11	18	11
28	490	515	370	122	14	11	11	18	18	11
29	665	515	390	122	11	11	11	18	18	11
30	985	390	312	110	11	11	11	18	18	11
31	1,260	.....	260	.....	11	11	.....	18	.....	11

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

Monthly discharge of Deep Creek at Adel, Oreg., for 1911.

[Drainage area, 272 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	.....	.....	25	0.092	0.11	1,540	D.
February	.....	.....	15	.055	.06	833	D.
March	1,260	.....	290	1.07	1.23	17,800	B.
April	1,260	122	456	1.68	1.87	27,100	B.
May	810	244	445	1.64	1.89	27,400	B
June	880	110	426	1.57	1.75	25,300	B.
July	99	11	55.1	.203	.23	3,390	A.
August	11	11	11.0	.040	.05	676	D.
September	18	11	11.6	.043	.05	690	D.
October	18	11	11.9	.044	.05	732	D.
November	44	11	21.2	.078	.09	1,260	B.
December	30	11	19.3	.071	.08	1,190	D.
The year	1,260	.....	149	.548	7.46	108,000	

NOTE.—Discharge Jan. 1 to Mar. 13, estimated, because of ice, from climatologic records. Mean discharge Mar. 1 to 13 estimated 20 second-feet.

CAMAS CREEK NEAR PLUSH, OREG.

Location.—In sec. 6, T. 39 S., R. 22 E., about half a mile above the mouth of Mud Creek, 20 miles east of Lakeview and about 22 miles southeast of Plush.

Records available.—April 25 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—In gravel and clay; shifting; banks soft; gradient moderate; valley open. At high stages a channel about one-fourth of a mile south of the gage carries considerable water.

Discharge measurements.—Made from a footbridge or by wading near gage.

Winter flow.—Ice present at times.

Accuracy.—Gage heights show large diurnal fluctuations during the spring and are affected by ice at times during the winter; high degree of accuracy is not possible. No satisfactory estimate of discharge can be made yet on account of the unstable condition of the stream bed.

Cooperation.—Station maintained in cooperation with the Warner Lake Irrigation Co.

Discharge measurements of Camas Creek near Plush, Oreg., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
May 11	John Dubuis	2.62	86.0
18	do	2.77	89.8
June 16	do	1.65	14.2
July 26	do	1.00	1.1
Aug. 22	R. W. Davenport	.92	[a] .6
Dec. 22	W. O. Harmon	1.49	18.5

[a] Estimated.

Daily gage height, in feet, of Camas Creek near Plush, Oreg., for 1911.

[H. J. Stine, observer.]

Day.	Apr.	May.	June.	Dec.	Day.	Apr.	May.	June.	Dec.	Day.	Apr.	May.	June.	Dec.
1	.....	3.7	2.5	.....	11	.....	2.6	1.95	.....	21	.....	2.5	1.45	.....
2	.....	3.2	2.3	.....	12	.....	2.5	1.8	.....	22	.....	2.2	1.4	.....
3	.....	3.6	2.1	.....	13	.....	2.55	1.8	.....	23	.....	2.4	1.4	.....
4	.....	3.9	2.3	.....	14	.....	2.5	1.75	.....	24	.....	2.3	1.35	.....
5	.....	3.7	2.2	.....	15	.....	2.5	1.7	.....	25	.....	2.25	1.3	1.5
6	.....	3.5	2.3	.....	16	.....	2.7	1.7	.....	26	4.0	2.1	1.3	.....
7	.....	3.3	2.4	.....	17	.....	2.6	1.65	.....	27	4.1	2.4	1.3	1.5
8	.....	3.1	2.25	.....	18	.....	2.8	1.6	.....	28	3.9	2.45	1.3	.....
9	.....	2.8	2.2	.....	19	.....	2.5	1.55	.....	29	3.7	2.5	1.3	1.5
10	.....	.....	2.0	.....	20	.....	2.4	1.5	.....	30	3.5	2.4	1.3	.....
										31	.....	2.3	.....	.....

NOTE.—Ice during the latter part of December.

MUD CREEK NEAR PLUSH, OREG.

Location.—In sec. 32, T. 38 S., R. 22 E., just above the crossing of the road between Lakeview and Plush, about half a mile above the junction of Mud Creek with Camas Creek and 22 miles from Plush.

Records available.—April 25 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Probably shifting; bed composed of bowlders and gravel.

Discharge measurements.—Made from a footbridge or by wading.

Winter flow.—No information.

Accuracy.—Conditions are more favorable for accurate determination of discharge than at the station on Camas Creek, but estimates are withheld until additional data are available.

Cooperation.—Station maintained in cooperation with Warner Lake Irrigation Co.

Discharge measurements of Mud Creek near Plush, Oreg., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Apr. 26	Davenport & Dubuis	2.20	69.6
May 12	John Dubuis	2.02	86.8
19	do	1.55	43.7
June 16	do	1.50	35.6
July 26	do	.80	6.8
Aug. 22	R. W. Davenport	.72	3.8
Dec. 24	W. O. Harmon	.80	7.8

Daily gage height, in feet, of Mud Creek near Plush, Oreg., for 1911.

[H. J. Stine, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		1.6	2.3						
2		1.9	2.2						
3		2.5	2.1						
4		2.8	2.4						
5		2.6	2.2						
6		2.3	2.3						
7		2.1	2.5						
8		1.9	2.0						
9		1.6	1.95						
10			1.9						
11		1.9	1.75						
12		2.0	1.7						
13		2.1	1.65						
14		2.1	1.65						
15		2.05	1.6						
16		2.2	1.6						
17		2.0	1.55						
18		1.8	1.5						
19		1.5	1.4						
20		1.8	1.4						
21		2.3	1.3						
22		2.6	1.2		0.72				
23		2.7	1.2						
24		2.1	1.2						0.8
25		2.0	1.15						.8
26	2.2	1.9	1.15	0.8					
27	2.1	2.0	1.15						.8
28	1.8	2.1	1.1						
29	1.7	2.3	1.1						.8
30	1.6	2.6	1.1						
31		2.1							.85

HONEY CREEK AT CHALSTRAND'S RANCH, NEAR PLUSH, OREG.

Location.—In sec. 13, T. 36 S., R. 22 E., 12 miles from Plush, Oreg., 1¼ miles above the mouth of Snyder Creek.

Records available.—June and July, 1910; January 1, 1911, to December 31, 1911, when station was discontinued.

Drainage area.—Not measured.

Gages.—Two staff gages have been used and the relation between them determined from simultaneous readings.

Channel.—In alluvial clay; probably permanent.

Discharge measurements.—Made by wading.

Winter flow.—Relation of gage height to discharge affected by ice.

Accuracy.—The creek shows considerable diurnal fluctuations, and for this reason the determinations of discharge are liable to considerable error.

Discharge measurements of Honey Creek at Chalstrand's ranch, near Plush, Oreg., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Apr. 27	R. W. Davenport	2.82	12.2
July 27	John Dubuis	.13	4.6
Dec. 22	W. O. Harmon	*a*.70	11.6

a Gage height affected by ice piled on control.

Daily gage height, in feet, of Honey Creek at Chalstrand's ranch, near Plush, Oreg., for 1911.

[C. A. Chalstrand, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.1	1.2	1.2	1.4	2.2	2.0	1.1	−0.1	−0.2	0.1	0.4	0.3
2	1.1	1.2	1.2	1.5	2.3	2.4	.9	−.1	−.15	.25	.35	.3
3	1.1	1.2	1.4	1.5	3.3	2.5	.0	.0	−.2	.25	.....	.3
4	1.1	1.2	1.4	1.8	3.0	2.5	.7	.05	−.1	.25	.4	.3
5	1.1	1.2	1.4	1.8	2.9	2.5	.7	.05	.05	.3	.35	.3
6	1.1	1.2	1.5	1.4	2.5	2.3	.5	.0	.1	.25	.4	.3
7	1.1	1.2	1.5	1.8	2.8	2.35	.5	.0	.05	.25	.35	.4
8	1.1	1.2	1.5	1.95	2.8	2.2	.3	−.05	−.05	.....	.4	.4
9	1.1	1.2	1.5	1.9	2.25	2.2	.4	−.05	−.1	.....	.35	.4
10	1.1	1.2	1.7	1.75	2.15	2.0	.4	−.05	−.05	.....	.4	.4
11	1.1	1.2	1.7	1.7	2.5	2.1	.4	−.1	.....	.35	.4	.4
12	1.1	1.2	1.7	1.7	2.8	1.9	.4	−.1	.....	.35	.4	.4
13	1.1	1.2	1.7	1.55	2.4	1.95	.4	−.1	.....	.35	.4	.4
14	1.1	1.2	1.7	1.4	2.25	1.9	.4	.....	−.05	.4	.45	.4
15	1.1	1.2	1.1	1.4	2.3	1.9	.4	−.1	−.05	.4	.35	.4
16	1.1	1.2	1.3	1.5	2.5	1.65	.3	−.1	−.05	.35	.5	.4
17	1.1	1.4	1.5	1.65	2.3	1.65	.3	−.1	−.05	.35	.5	.4
18	1.1	1.2	1.5	1.8	2.1	1.5	.3	−.15	−.05	.35	.4	.4
19	1.1	1.2	1.8	1.5	2.5	1.5	.35	−.15	−.05	.35	.4	.....
20	1.1	1.2	1.8	1.4	2.25	1.25	.3	−.1	−.05	.35	.4	.4
21	1.1	1.2	2.2	1.05	2.3	1.35	.2	−.15	−.05	.4	.4	.....
22	1.1	1.2	2.2	1.9	2.5	1.2	.2	−.1	−.05	.35	.3	.4
23	1.1	1.2	2.2	2.35	2.5	1.25	.2	−.15	−.05	.4	.4	.....
24	1.1	1.2	2.0	2.6	2.8	1.2	.15	−.1	−.05	.35	.35	.4
25	1.1	1.2	2.0	2.9	2.3	1.2	.15	−.15	.0	.4	.45	.....
26	1.1	1.2	1.8	3.1	2.3	1.0	.1	−.1	.1	.35	.55	.4
27	1.1	1.2	1.3	3.0	2.15	1.1	.15	−.1	.1	.35	.....	.....
28	1.1	1.2	1.1	2.4	2.2	1.0	.0	−.15	.1	.35	.3	.4
29	1.3	.....	1.1	2.3	2.15	1.0	.0	−.1	.1	.4	.4	.....
30	2.0	.....	1.1	2.4	2.3	1.1	−.05	−.2	.1	.....	.3	.4
31	1.5	.....	1.1	.....	2.5	.....	−.05	−.15	.....	.35	.....	.....

NOTE.—Ice at station Jan. 1 to Mar. 14 and during a large part of the period Nov. 9 to Dec. 31. Gage heights Jan. 1 to Apr. 6 read on Warner Lake Irrigation Co.'s gage; Apr. 7 to Dec. 31, on United States Geological Survey gage.

Daily discharge, in second-feet, of Honey Creek at Chalstrand's ranch, near Plush, Oreg., for 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	55	69	123	21	3.5	3.0	5.0	8
2	.....	63	76	83	16	3.5	3.2	6	8
3	.....	63	162	91	16	4.0	3.0	6	8
4	.....	71	132	91	12	4.5	3.5	6	8
5	.....	71	123	91	12	4.5	4.5	7	8
6	.....	55	91	76	9	4.0	5.0	6	8
7	.....	38	99	80	9	4.0	4.5	6	8
8	.....	54	99	69	7	3.3	3.3	6	8
9	.....	52	72	60	8	3.3	3.5	7	8
10	.....	44	66	57	8	3.3	3.3	7	8
11	.....	42	91	63	8	3.5	3.3	8	8
12	.....	42	99	52	8	3.5	3.3	8	8
13	.....	36	83	56	8	3.5	3.3	8	8
14	.....	30	72	52	8	3.5	3.3	8	8
15	35	30	76	52	8	3.5	3.3	8	10
16	48	34	91	42	7	3.5	3.3	8	9
17	63	40	76	42	7	3.5	3.3	8	9
18	63	47	63	34	7	3.2	3.3	8	8
19	88	34	91	34	8	3.2	3.3	8	8
20	88	30	72	26	7	3.5	3.3	8	8

Daily discharge, in second-feet, of Honey Creek at Chalstrand's ranch, near Plush, Oreg., for 1911—Continued.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
21	124	40	76	28	6	3.2	3.8	8	8
22	124	52	91	24	6	3.5	3.8	8	7
23	124	80	91	26	6	3.2	3.8	8	8
24	106	99	99	24	6	3.5	3.8	8	8
25	106	123	76	24	6	3.2	4.0	8	8
26	88	142	76	18	5	3.5	5.0	8	10
27	48	132	66	21	6	3.5	5.0	8	9
28	35	83	69	18	4	3.2	5.0	8	7
29	35	76	66	18	4	3.5	5.0	8	8
30	35	83	76	21	3.8	3.0	5.0	8	7
31	35	.....	91	.....	3.8	3.2	.....	8	.....

NOTE.—Daily discharge Apr. 7 to Nov. 30 determined from a poorly defined rating curve. Discharge Mar. 15 to Apr. 6 determined from the rating curve used for the latter part of the year by means of a curve of relation between the two gages. Discharge interpolated for days on which gage was not read. Discharge assumed unaffected by ice during November.

Monthly discharge of Honey Creek at Chalstrand's ranch, near Plush, Oreg., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	5	307	D.
February	.....	.....	3	167	D.
March	124	.....	46.5	2,660	B.
April	142	30	61.4	3,650	B.
May	162	66	86.5	5,320	B.
June	123	18	50.2	2,990	B.
July	21	3.8	8.08	497	C.
August	4.5	3.0	3.56	219	C.
September	5.0	3.0	4.00	238	C.
October	8	5.0	7.4	455	C.
November	10	7	8.1	482	C.
December	.....	.....	6	369	D.
The year	162	3.0	24.5	17,500	

NOTE.—Discharge Jan. 1 to Mar. 14 and Dec. 1 to 31 estimated, because of ice, from climatologic records and from a consideration of the discharge at the station below this one. Mean discharge Mar. 1 to 14 estimated 14 second-feet, varying from about 3 to 23 second-feet. No correction made to November discharge.

HONEY CREEK NEAR PLUSH, OREG.

Location.—In the SW. ¼ sec. 20, T. 36 S., R. 24 E., half a mile above the mouth of the canyon, 1½ miles northwest of Plush, and 1 mile above the wagon bridge near Plush; below all tributaries.

Records available.—May 13, 1909, to December 31, 1911.

Drainage area.—232 square miles.

Gages.—The first gage was a vertical staff fastened to the wagon bridge, but as the gage heights were affected by backwater from a temporary diversion dam below the station a vertical staff gage, in two sections, was installed by the Warner Lake Irrigation Co., February 24, 1910, half a mile above the mouth of the canyon and 1 mile above the bridge. On March 10, 1911, the gage was reset on the opposite side of the river and the datum was lowered 1.0 foot.

Channel.—Bed composed of gravel; shifts slightly.

Discharge measurements.—At the original site measurements were made from the bridge; now made from cable near the gage; at times of extreme low water measurements are made by wading.

Winter flow.—Slightly affected by ice.

Diversions.—The records at this point show the total run-off from the basin above the station except for a small amount of water diverted near the head of the stream and used to irrigate a few hundred acres.

Accuracy.—Records fairly reliable, although some inaccuracy is caused by diurnal fluctuations of the stream and by slight changes in conditions of flow during 1911.

Cooperation.—Station maintained in cooperation with the Warner Lake Irrigation Co.

Discharge measurements of Honey Creek near Plush, Oreg., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Mar. 24	J. Dubuis	3.75	615
28	do	2.20	179
29	do	1.92	120
29	do	2.50	251
Apr. 22	Davenport and Dubuis	1.92	111
May 9	J. Dubuis	1.88	113
July 27	do	−.20	4.85
Aug. 17[a]	R. W. Davenport	−.35	2.0

[a] Waded 25 feet below gage.

Daily gage height, in feet, of Honey Creek near Plush, Oreg., for 1911.

[A. C. Snow, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	−0.35		0.90	2.45	2.00	2.90	0.45			−0.40		
2			.90	2.40	1.85	2.45	.40				−0.30	
3	−.30		1.05	2.60	2.10	2.35	.30		−0.45			−0.20
4			1.05	1.80	2.45	2.45	.25	−0.01		−.35		
5	−.30		1.20	1.78	2.70	2.40	.20				−.30	
6			1.10	1.60	2.15	2.35	.15					
7			1.30	1.78	2.30	2.45	.10		−.40			
8				1.82	2.40	2.40	.09	−.06		−.35		−.20
9	−.20		.70	1.78	2.00	2.40					−.25	
10			.85	1.40	1.85	2.40	.05		−.45			−.15
11			1.00	1.50	2.00	2.35						
12	−.30		.80	1.60	2.35	2.30		−.06		−.30	−.20	
13			1.10	1.30	2.05	2.25			−.40			
14	−.35		1.60	1.05	1.90	2.10	−.10					−.10
15			2.30	1.35	1.85	2.05				−.30		
16			3.00	1.40	2.10	1.95		−.10			−.20	
17	−.10	−0.30	3.20	1.70	1.85	1.90	−.02		−.35			.70
18			3.00	1.35	1.85	1.70						
19		−.30	3.50	1.20	1.80	1.60		−.20		−.30	−.20	
20	−.15		3.70	1.15	1.80	1.50	−.62					
21		−.30	4.20	1.35	2.00	1.20			−.35			1.00
22	−.25		4.40	2.35	2.20	1.10		−.35		−.35		
23			4.60	2.20	2.40	1.10					−.20	
24	−.25		3.70	2.50	2.40	1.00	−.55		−.40			.60
25			3.00	2.70	2.00	.80						
26			2.60	2.90	1.90	.70		−.40		−.35	−.20	
27	−.30	−.25	2.20	2.50	1.95	.65						
28			3.00	2.55	2.00	.60	−.65		−.40			.60
29			2.10	2.00	2.05	.55		−.50				
30	−.20		2.65	1.90	2.15	.50				−.30	−.25	
31			2.70		2.20							.65

NOTE.—Gage heights Jan. 1 to Mar. 9 increased 1.0 foot to bring to same datum as gage established Mar. 10, 1911. No notes regarding ice during January and February and first part of March. Ice latter part of December.

Daily discharge, in second-feet, of Honey Creek near Plush, Oreg., for 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	234	136	352	17	6	1.5	2	3	4
2	.....	222	109	234	16	7	1.5	2	3	5
3	.....	272	156	210	14	8	1.5	2.5	3	5
4	.....	101	234	234	13	9	1.5	2.5	3	5
5	.....	98	298	222	12	9	2	2.5	3	5
6	.....	75	166	210	11	9	2	2.5	3	5
7	.....	98	198	234	10	8	2	2.5	3	5
8	.....	104	222	222	10	8	2	2.5	4	5
9	.....	98	136	222	9	8	1.5	2.5	4	6
10	.....	56	109	222	9	8	1.5	2.5	4	6
11	.....	65	136	210	9	8	1.5	3	5	6
12	50	75	210	198	8	8	2	3	5	6
13	76	48	146	187	7	8	2	3	5	7
14	134	35	117	156	6	8	2	3	5	7
15	258	52	109	146	6	7	2	3	5	7
16	430	56	156	126	7	7	2.5	3	5	8
17	490	87	109	126	8	7	2.5	3	5	.....
18	430	52	109	87	5	6	2.5	3	5	.....
19	600	42	101	75	3	5	2.5	3	5	.....
20	680	40	101	65	.9	4	2.5	3	5	.....
21	890	52	136	42	1.0	3	2.5	2.5	5	.....
22	990	210	176	37	1.0	2.5	2	2.5	5	.....
23	990	176	222	37	1.1	2.5	2	2.5	5	.....
24	600	246	222	33	1.2	2	2	2.5	5	.....
25	380	298	136	27	1.1	2	2	2.5	5	.....
26	272	352	117	24	1.0	2	2	2.5	5	.....
27	176	246	126	22	.9	2	2	2.5	5	.....
28	380	259	136	21	.8	1	2	2.5	5	.....
29	156	136	146	20	2.0	1	2	3	4	.....
30	285	117	166	18	3.2	1	2	3	4	.....
31	298	.....	176	.....	4.5	1	.....	3	.....	.....

NOTE.—Daily discharge Mar. 12 to 22 and July 27 to Dec. 16 determined from a rating curve fairly well defined; discharge Mar. 23 to July 26 from a rating curve well defined above 100 second-feet and poorly defined below that point. Discharge interpolated for days on which gage was not read.

Monthly discharge of Honey Creek near Plush, Oreg., for 1911.

[Drainage area, 232 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	.....	.....	7	0.030	0.03	430	D.
February	.....	.....	4	.017	.02	222	D.
March	990	.....	285	1.23	1.42	17,500	C.
April	352	35	133	.573	.64	7,910	B.
May	298	101	155	.668	.77	9,530	B.
June	352	18	130	.560	.62	7,740	C.
July	17	.8	6.41	.028	.03	394	D.
August	9	1	5.42	.023	.03	333	D.
September	2.5	1.5	1.98	.0085	.009	118	D.
October	3	2	2.68	.012	.01	165	D.
November	5	3	4.37	.019	.02	260	D.
December	.....	.....	5.3	.023	.03	326	D.
The year	990	.....	22.2	.268	3.629	44,900	

NOTE.—Discharge Jan. 1 to Mar. 11 and Dec. 17 to 31 estimated. The effect from ice was slight. Mean discharge Mar 1 to 11 estimated 25 second-feet. Mean discharge Dec. 17 to 31 estimated 5 second-feet.

TWELVEMILE CREEK NEAR PLUSH, OREG.

Location.—In sec. [illegible] T. 17 S., R. 29 E., 9 miles below R. F. Allen's ranch [illegible] below mouth of McDowell Creek, about 11 miles southeast of Plush.

Records available.—April 6 to December [illegible], 1921; discontinued December [illegible].

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Primarily permanent; bed composed of gravel and sand.

Discharge measurements.—Made from the footbridge or by wading.

Accuracy.—A good rating curve has been constructed.

Cooperation.—Station maintained in cooperation with the Warner Lake Irrigation Co.

Discharge measurements of Twelvemile Creek near Plush, Oreg., in 1921.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Second-feet.*
Apr. 27	Davenport and Dubois	[illegible]	[illegible]
May 5	John Dubois	[illegible]	[illegible]
19	do	[illegible]	[illegible]
July 26	do	[illegible]	[illegible]

Daily gage height, in feet, of Twelvemile Creek near Plush, Oreg., for 1921.

[V. G. Allen, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		2.0	2.5	1.4				1.1	
2		2.1	2.5	1.7					
3		1.6	2.4	1.4					
4		2.5	2.5	1.5	1.0		1.1		
5		2.4	2.55	1.4					1.1
6		2.3	2.6	1.4		1.1			
7		2.4	2.6	1.3					
8	2.0	2.2	2.75	1.3				1.1	
9	1.8	2.2	2.7	1.25	1.0				
10	2.0	2.3	2.6	1.3					
11	1.9	2.3	2.55	1.35			1.0		
12	2.1	2.2	2.6	1.4					
13	1.9	2.2	2.5	1.3		1.0			1.1
14	1.7	1.8	2.5	1.2				1.1	
15	1.8	1.7	2.6	1.25					
16	1.8	1.7	2.65						
17	1.7	1.9	2.6	1.2					
18	1.7	1.8	2.6				1.0		
19	1.8	1.75	2.5	1.3					
20	1.8	1.9	2.5			1.0			1.1
21	1.9	2.0	2.4						
22	1.7	2.1	2.5	1.2	1.0				
23	1.9	2.2	2.6					1.2	
24	1.9	2.2	2.4	1.2					
25	2.1	2.1	2.4				1.1		
26	2.0	2.2	2.2						
27	2.3	2.3	2.0	1.2		1.1			1.1
28	2.0	2.2	1.8						
29	2.1	2.3	1.7	1.1				1.05	
30	1.8	2.2	1.8		1.0				
31		2.4		1.05					

NOTE.—No record of effect of ice during November and December.

Daily discharge, in second-feet, of Twelvemile Creek near Plush, Oreg., for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		21	48	17				1.0	
2		25	48	10					
3		13	41	8					
4		48	48	6	.5		1.0		
5		41	52	4					1.0
6		35	56	4		1.0			
7		41	56	2.5					
8	21	30	70	2.5				1.0	
9	13	30	65	2.1	.5				
10	21	35	56	2.5					
11	17	35	52	3.2			.5		
12	25	30	56	4					
13	17	30	48	2.5		.5			1.4
14	10	13	48	1.7				1.7	
15	13	10	56	2.1					
16	13	10	60	1.9					
17	10	17	56	1.7					
18	10	13	56	2.1			.5		
19	13	12	48	2.5					
20	13	17	48	2.2		.5			1.4
1	17	21	41	1.9					
22	10	25	48	1.7	.5				
23	17	30	56	1.7				1.7	
24	17	30	41	1.7					
25	25	25	41	1.7			1.0		
26	21	30	30	1.7					
27	35	35	21	1.7		1.0			1.0
28	21	30	13	1.4					
29	25	35	10	1.0				.8	
30	13	30	13	.9	.5				
31		41		.8					

NOTE.—Discharge determined from well-defined rating curve. Discharge interpolated for days on which gage was not read. No correction made for possible effect of ice during December.

Monthly discharge of Twelvemile Creek near Plush, Oreg., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April 8-30	35	10	17.3	787	A.
May	48	10	27.0	1,660	A.
June	70	10	46.1	2,740	A.
July	17	.8	3.18	196	C.
August	.8	.5	.52	32	D.
September	1.0	.5	.71	42	D.
October	1.0	.5	.76	47	D.
November	1.7	.8	1.31	78	D.
December	1.4	.8	1.17	72	D.
The period				5,500	

SNYDER CREEK NEAR PLUSH, OREG.

Location.—In sec. 18, T. 36 S., R. 23 E., near the dam site about half a mile above the mouth of the stream, 8 miles from Plush.

Records available.—January 1 to December 31, 1911; discontinued December 31 1911.

Drainage area.—Not measured.

Gage.—Two gages have been used and the relationship partially determined from simultaneous readings.

Channel.—Probably permanent; bed composed of rock and gravel.

Discharge measurements.—Made by wading; high water measurements could not be obtained as the stream is very flashy.

Winter flow.—Relation between gage height and discharge affected by ice during the winter period.

Cooperation.—Gage heights during part of 1911 furnished by Warner Lake Irrigation Co.

The greater portion of the run-off from the basin passes off within a short time during the first warm weather of the spring, generally some time between January and March.

The following discharge measurement was made by Davenport and Dubuis:

April 27, 1911: Gage height, 1.85 feet; discharge, 22.8 second-feet.

Estimates of daily and monthly discharge are withheld for the present.

Daily gage height, in feet, of Snyder Creek near Plush, Oreg., for 1911.

[C. A. Chalstrand, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.0	0.1	.....	1.6	1.75	1.85	0.9	.....	.....	.....	.....	.....
2	.....	.0	.....	1.3	1.55	1.7	.9	.....	.....	.....	.....	.....
3	.....	.....	0.5	1.1	1.85	1.5	.75	.....	.....	.....	.....	.....
4	.....	.....	.....	1.0	1.85	1.65	.75	.....	.....	.....	.....	.....
5	.0	.....	.5	.8	2.0	1.45	.6	.....	.....	.....	.....	0.[illegible]
6	.....	.....	.7	.....	1.55	1.5	.6	.....	.....	.....	.....	.....
7	.....	.....	.....	.7	1.5	1.4	.5	.....	.....	.....	.....	.....
8	.1	.....	.7	2.0	1.6	1.45	.....	.....	.....	.....	0.7	.....
9	.0	.....	.....	1.9	1.5	1.3	.35	.....	.....	.....	.....	.....
10	.....	.....	.7	1.8	1.35	1.35	.....	.....	.....	.....	.....	.....
11	.....	.....	.7	1.75	1.5	1.3	.2	.....	.....	.....	.....	.....
12	.....	.....	.9	1.65	1.55	1.4	.....	.....	.....	.....	.....	.8
13	.....	.....	.....	1.6	1.4	1.2	.05	.....	.....	.....	.6	.....
14	.....	.....	.9	1.75	1.35	1.25	.....	.....	.....	.....	.....	.....
15	.0	.....	.9	1.9	1.35	1.25	.0	.....	.....	.....	.....	.....
16	.....	.....	1.0	1.8	1.5	1.1	.....	.....	.....	.....	.....	.....
17	.....	.3	1.0	1.85	1.55	1.0	.0	.....	.....	.....	.....	.....
18	.....	.....	1.4	1.8	1.6	1.1	.....	.....	.....	.....	.....	.....
19	.....	.3	1.7	1.7	1.4	1.0	.0	.....	.....	.....	.....	.8
20	.....	.....	2.0	1.6	1.45	1.05	.....	.....	.....	.....	.7	.....
21	.....	.....	2.0	1.7	1.5	.95	.0	.....	.....	.....	.....	.....
22	.....	.....	3.25	.....	1.5	1.0	.....	.....	.....	.....	.....	.....
23	.....	.....	2.5	2.2	1.5	.9	.....	.....	.....	.....	.....	.....
24	.....	.....	1.8	2.1	1.55	.9	.....	.....	.....	.....	.....	.....
25	.0	.3	1.8	2.3	1.35	.9	.....	.....	.....	.....	.....	.8
26	.....	.....	1.8	2.15	1.65	.95	.....	.....	.....	.....	.....	.....
27	.....	.....	1.7	1.95	1.7	.95	.....	.....	.....	.....	.8	.....
28	.....	.....	1.6	1.75	1.6	1.0	.....	.....	.....	.....	.....	.....
29	.9	.....	1.6	1.7	1.5	.95	.....	.....	.....	.....	.....	.....
30	1.3	.....	1.6	1.7	1.3	1.0	.....	.....	.....	0.8	.....	.....
31	.4	.....	1.6	.....	1.5	.....	.....	.....	.....	.....	.....	.....

NOTE.—Gage heights Jan. 1 to Apr. 7 and Oct. 30 to Dec. 25 read from Warner Lake Irrigation Co.'s gage. Gage heights Apr. 8 to July 21 read from United States Geological Survey gage. Datum and location of the two gages different. Gage heights affected by ice Jan. 1 to about Mar. 15 and Nov. 27 to Dec. 31. Water standing in pools about July 9 to 21; creek dry July 23 probably to the last of October.

ABERT LAKE BASIN.

CHEWAUCAN RIVER AT PAISLEY, OREG.

Location.—Half a mile above the town of Paisley, in the SE. ¼ sec. 23, T. 33 S., R. 18 E.

Records available.—January 4, 1905, to December 31, 1907; January 17, 1909, to December 31, 1911.

Drainage area.—272 square miles.

Gage.—Vertical staff.

Channel.—Probably permanent; bed composed of clean gravel; banks subject to some overflow at stages above gage height 8 feet.

Discharge measurements.—Made from cable 60 feet below gage or by wading.

Winter flow.—Affected by ice.

Diversions.—The station is above all diversions except George Conn's irrigation ditch, which heads about 2½ miles above the gage on the left bank and diverts water around the station. Conn's mill ditch diverts water from the left bank about 250 feet below the gage, where a low timber dam has been constructed. The current is fairly swift between the gage and the dam and practically no backwater was noticeable prior to 1910. During 1910 there was probably a little backwater. During the low water of 1911, flash boards were used on the dam, producing backwater at the gage. The Brattain ditch diverts water about 300 feet below the gage on the right bank; it follows the foothills for many miles down the river and supplies water for use in irrigating land immediately around Paisley and large areas of hay land in Chewaucan Marsh.

Storage.—It has been proposed to store the water of Chewaucan River at a point 20 miles upstream from Paisley to provide for the reclamation of a tract of 12,000 acres northeast of Paisley under the terms of the Carey Act. The development of this project, however, has been hindered by water-right claims of the owners of hay lands in Chewaucan Marsh. These lands have been flooded during the spring and winter to a depth of several feet and, as all the water is claimed for this flooding, development work can not proceed until water rights have been adjudicated.

Discharge measurements of Chewaucan River at Paisley, Oreg., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Jan. 17[a]	R. W. Davenport	3.96	51.3
May 7	do	6.20	618

[a] River frozen over except channel 6 to 12 inches wide in center. Ice 3 to 8 inches thick. Dam below gage had been removed for winter.

Daily gage height, in feet, of Chewaucan River at Paisley, Oreg., for 1911.

[Lula Banister, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.8	4.4	4.3	6.7	6.5	6.8	4.8	3.9	3.9	4.0	4.0	3.9
2	3.8	4.4	4.3	6.6	6.5	6.6	4.8	4.0	3.9	4.0	4.0	4.0
3	.....	4.2	4.3	6.4	6.6	6.6	4.8	4.0	3.9	4.0	4.0	3.9
4	3.8	4.3	4.5	6.4	6.7	6.5	4.6	4.0	3.9	4.0	4.0	3.9
5	3.8	.....	4.8	6.3	6.8	6.4	4.5	3.9	4.0	4.0	.....	3.9
6	3.8	4.4	4.5	6.3	6.3	6.4	4.5	3.9	4.1	4.0	4.0	.....
7	3.8	4.4	4.5	6.3	6.0	6.4	4.3	3.9	4.0	4.0	4.0	3.9
8	3.9	4.4	4.5	6.3	5.9	6.4	4.1	3.9	3.9	4.0	4.0	3.9
9	3.9	4.4	4.5	6.0	5.9	6.3	4.1	3.9	3.9	4.0	4.0	3.9
10	.....	4.4	4.4	5.8	5.8	6.2	.....	3.9	3.9	4.0	4.0	3.9
11	3.9	4.4	4.4	5.6	5.8	6.2	4.1	3.9	4.0	4.0	3.9	3.9
12	4.0	4.4	4.5	5.3	6.1	6.2	4.1	3.9	4.0	4.0	3.9	4.0
13	4.1	4.3	4.6	4.9	5.9	6.2	4.1	3.9	4.0	4.0	4.0	4.0
14	4.1	4.3	4.6	4.9	5.8	6.2	4.1	3.9	4.0	.....	4.0	4.2
15	4.1	4.4	4.6	5.1	5.9	6.4	4.1	3.9	4.0	4.0	4.0	4.0
16	4.1	4.5	4.6	5.2	6.0	6.0	4.1	3.9	3.9	4.0	4.0	3.9
17	4.0	4.3	4.5	5.0	6.1	6.0	4.1	3.9	4.0	4.0	4.0	3.9
18	3.9	4.4	4.5	4.9	6.2	5.9	4.1	3.9	3.9	4.0	4.0	3.9
19	3.9	4.4	4.8	4.8	6.2	5.7	4.1	3.9	3.9	3.9	.....	4.2
20	4.1	4.4	4.8	4.7	6.3	5.5	.....	3.9	3.9	3.9	4.0	4.5

Daily gage height, in feet, of Chewaucan River at Paisley, Oreg., for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
21	.....	4.4	5.4	4.9	6.3	5.3	4.0	3.9	3.9	3.9	4.0	4.8
22	4.4	4.5	6.1	5.0	6.2	5.0	4.0	3.9	.....	3.9	4.0	4.8
23	4.5	4.4	6.3	5.4	6.2	4.9	4.0	3.9	3.9	4.0	4.0	4.8
24	4.5	4.4	6.0	5.9	6.0	4.8	4.0	3.9	3.9	4.0	4.0	4.6
25	4.4	4.4	5.5	6.4	5.9	4.8	4.0	3.9	4.0	4.0	4.0	4.5
26	4.3	4.4	5.4	6.3	5.8	4.8	4.0	3.9	4.1	4.0	3.9	4.5
27	4.3	4.3	5.3	6.5	5.9	5.0	.....	3.9	4.0	4.1	3.9	4.5
28	4.3	4.3	5.3	6.6	6.0	4.8	3.9	3.9	4.0	4.0	3.9	4.5
29	4.3	.....	5.4	6.1	6.2	4.9	3.8	3.9	4.0	4.0	3.9	4.5
30	4.3	.....	5.6	6.1	6.4	4.9	3.8	3.9	4.0	4.0	3.9	4.4
31	4.3	.....	5.8	.....	6.4	.....	3.8	3.9	.....	4.0	.....	4.4

NOTE.—Gage heights probably affected by ice Jan. 1 to about Mar. 11 and about Dec. 14 to 31. Gage heights affected by backwater from temporary flashboards placed on the dam below from about Aug. 1 to about Nov. 10.

Daily discharge, in second-feet, of Chewaucan River at Paisley, Oreg., for 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	932	818	992	197	35	35	44	44	54
2	.....	874	818	874	197	44	35	44	44	65
3	.....	764	874	874	197	44	35	44	44	54
4	.....	764	932	818	156	44	35	44	44	54
5	.....	712	992	764	137	35	44	44	44	54
6	.....	712	712	764	137	35	54	44	44	54
7	.....	712	573	764	104	35	44	44	44	54
8	.....	712	533	764	77	35	35	44	44	54
9	.....	573	533	712	77	35	35	44	44	54
10	.....	495	495	662	77	35	35	44	44	54
11	.....	421	495	662	77	35	44	44	54	54
12	137	325	616	662	77	35	44	44	54	65
13	156	220	533	662	77	35	44	44	65	65
14	156	220	495	662	77	35	44	44	65	.....
15	156	268	533	764	77	35	44	44	65	.....
16	156	295	573	573	77	35	35	44	65	.....
17	137	243	616	573	77	35	44	44	65	.....
18	137	220	662	533	77	35	35	44	65	.....
19	197	197	662	457	77	35	35	35	65	.....
20	197	176	712	387	71	35	35	35	65	.....
21	355	220	712	325	65	35	35	35	65	.....
22	616	243	662	243	65	35	35	35	65	.....
23	712	355	662	220	65	35	35	44	65	.....
24	573	533	573	197	65	35	35	44	65	.....
25	387	764	533	197	65	35	44	44	65	.....
26	355	712	495	197	65	35	54	44	54	.....
27	325	818	533	243	60	35	44	54	54	.....
28	325	874	573	197	54	35	44	44	54	.....
29	355	616	662	220	44	35	44	44	54	.....
30	421	616	764	220	44	35	44	44	54	.....
31	495	.....	764	.....	44	35	.....	44	.....	.....

NOTE.—Discharge determined from a fairly well defined rating curve. Discharge Aug. 1 to Nov. 10 obtained by applying open-channel rating curve after reducing each gage height 0.2 foot (assumed as the effect of backwater). Discharge interpolated for days on which gage was not read.

Monthly discharge of Chewaucan River at Paisley, Oreg., for 1911.

[Drainage area, 272 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	.....	.....	40	0.147	0.17	2,460	D.
February	.....	.....	30	.110	.11	1,670	D.
March	712	.....	233	.857	.99	14,300	B.
April	932	176	520	1.91	2.13	30,900	A.
May	992	495	649	2.39	2.76	39,900	A.
June	992	197	539	1.98	2.21	32,100	A.
July	197	44	88.9	.327	.38	5,470	B.
August	44	35	35.9	.132	.15	2,210	D.
September	54	35	40.2	.148	.17	2,390	D.
October	54	35	43.2	.159	.18	2,660	D.
November	65	44	55.4	.204	.23	3,300	C.
December	.....	.....	47.0	.173	.20	2,890	D.
The year	992	.....	194	.713	9.68	140,000	

NOTE.—Discharge Jan. 1 to Mar. 11, and Dec. 14-31, estimated, because of ice, from climatologic records. Mean discharge Mar. 1 to 11, estimated, 80 second-feet. Mean discharge Dec. 14 to 31, estimated, 40 second-feet.

SILVER LAKE BASIN.

SILVER CREEK NEAR SILVER LAKE, OREG.

Location.—In sec. 28, T. 23 S., R. 14 E., 1½ miles southwest of Silver Lake post office.

Records available.—December 29, 1904, to March 31, 1907; January 11, 1909, to December 31, 1911.

Drainage area.—221 square miles.

Gage.—Inclined staff on the right bank. In April, 1910, the gage was found to have been raised from the true position and some of the 1909 gage readings are therefore subject to error.

Channel.—Fairly permanent; bed composed of rocks and gravel.

Discharge measurements.—Made from a cable near the gage, or by wading.

Storage.—As the normal summer flow of nearly all the streams in this region is appropriated for present irrigation requirements, any additional development will require storage. Several fairly good sites are available on Silver Creek above areas of agricultural land that could easily be irrigated form stored waters.

Accuracy.—Conditions favorable for good results. Records believed to be reliable.

Discharge measurements of Silver Creek near Silver Lake, Oreg., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Jan. 14[a]	R. W. Davenport	0.90	13.9
May 9	.....do	2.73	175

[a] River frozen over. Ice 6 to 8 inches thick.

Daily gage height, in feet, of Silver Creek near Silver Lake, Oreg., for 1911.

[Jas. H. Gowdy, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.60	0.75	1.05	4.80	2.90	2.10	1.15	0.90	0.86	0.95	0.82	0.82
2	.65	.75	1.05	5.20	2.80	1.90	1.10	.90	.86	.95	.82	.82
3	.60	.75	1.20	4.60	3.00	1.80	1.10	.90	.82	.95	.82	.82
4	.60	.70	1.20	4.10	3.50	1.70	1.05	.90	.86	.90	.82	.82
5	.70	.70	1.30	3.30	3.90	1.60	1.05	.90	.86	.90	.82	.82
6	.65	.70	1.05	3.40	3.80	1.55	1.00	.90	.86	.90	.82	.82
7	.60	.80	1.00	3.90	3.70	1.50	1.00	.90	.86	.90	.82	.82
8	.60	.90	.95	4.20	3.60	1.40	1.00	.90	.86	.90	.82	.82
9	.60	.90	.95	4.10	3.10	1.40	1.00	.90	.90	.90	.82	.82
10	.65	1.00	.95	3.90	2.50	1.40	1.00	.90	.90	.90	.82	.82
11	.70	1.00	1.00	2.35	2.50	1.35	1.00	.90	.90	.90	.82	.82
12	.75	1.20	.95	2.15	2.70	1.35	1.00	.90	.90	.90	.82	.82
13	.80	1.10	1.00	2.35	2.60	1.35	1.00	.90	.90	.90	.82	.82
14	.85	1.20	1.05	2.60	2.45	1.30	.95	.90	.90	.90	.82	.82
15	.80	1.00	1.10	2.60	2.35	1.30	.95	.90	.90	.90	.86	.86
16	.75	.80	1.10	2.70	2.35	1.30	.95	.90	.90	.90	.86	.86
17	.70	.70	1.30	3.10	2.45	1.20	.95	.90	.86	.86	.90	.86
18	.75	.70	1.30	3.10	2.45	1.20	.95	.90	.86	.86	.90	.86
19	.80	.70	1.30	2.60	2.45	1.20	.90	.90	.86	.86	.90	.90
20	.80	.70	1.50	2.60	2.45	1.20	.90	.90	.86	.82	.90	.90
21	.70	.65	1.68	3.10	2.35	1.15	.90	.86	.86	.82	.90	.90
22	.70	.65	2.00	3.20	2.35	1.15	.90	.86	.86	.82	.90	.90
23	.75	.70	2.25	3.50	2.45	1.20	.90	.86	.86	.82	.90	.90
24	.85	.70	2.70	3.80	2.45	1.20	.90	.86	.90	.82	.90	.90
25	.85	.80	2.80	3.90	2.45	1.20	.90	.86	.90	.82	.90	.90
26	.90	.80	2.50	3.90	2.35	1.20	.90	.86	.95	.82	.90	.90
27	.85	.85	2.50	3.80	2.25	1.20	.86	.86	1.00	.82	.86	.90
28	.80	.85	2.60	3.50	2.20	1.15	.86	.86	.95	.82	.86	.90
29	.80	.....	3.10	3.00	2.35	1.20	.86	.86	.90	.82	.86	.90
30	.85	.....	3.90	2.90	2.35	1.20	.90	.86	.90	.82	.86	.90
31	.85	.....	4.10	.....	2.35	.....	.90	.86	.....	.82	.....	.95

NOTE.—Ice at station Jan. 1 to about Mar. 10 and about Nov. 27 to Dec. 31.

Daily discharge, in second-feet, of Silver Creek near Silver Lake, Oreg., for 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	434	199	117	38	24	21	26	20	20
2	.....	376	188	98	35	24	21	26	20	20
3	.....	440	210	89	35	24	20	26	20	20
4	.....	352	269	80	33	24	21	24	20	20
5	.....	245	323	72	33	24	21	24	20	20
6	.....	257	309	68	29	24	21	24	20	20
7	.....	323	296	64	29	24	21	24	20	20
8	.....	368	282	56	29	24	21	24	20	20
9	.....	352	211	56	29	24	24	24	20	20
10	.....	323	157	56	29	24	24	24	20	20
11	29	142	157	52	29	24	24	24	20	20
12	26	121	177	52	29	24	24	24	20	20
13	29	142	167	52	29	24	24	24	20	20
14	32	167	152	48	26	24	24	24	20	20
15	35	167	142	48	26	24	24	24	21	.....
16	35	177	142	48	26	24	24	24	21	.....
17	48	221	152	41	26	24	21	21	21	.....
18	48	221	152	41	26	24	21	21	21	.....
19	48	167	152	41	24	24	21	21	21	.....
20	44	167	152	41	24	24	21	21	21	.....
21	78	221	142	38	24	21	21	20	21	.....
22	107	323	142	38	24	21	21	20	21	.....
23	152	269	152	41	24	21	21	20	21	.....
24	177	309	152	41	24	21	24	20	21	.....
25	188	323	152	41	24	21	24	20	21	.....
26	167	323	142	41	24	21	26	20	21	.....
27	157	309	133	41	21	21	26	20	21	.....
28	167	269	137	38	21	21	26	20	21	.....
29	221	210	142	41	21	21	24	20	21	.....
30	323	199	142	41	24	21	24	20	20	.....
31	352	.....	142	.....	24	21	.....	20	.....	.....

NOTE.—Discharge determined from a fairly well defined rating curve. Discharge assumed unaffected by ice Nov. 27 to Dec. 31.

Monthly discharge of Silver Creek near Silver Lake, Oreg., for 1911.

[Drainage area, 221 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	.....	.....	13	0.059	0.07	799	D.
February	.....	.....	12	.054	.06	666	D.
March	352	.....	85.6	.387	.45	5,260	C.
April	576	122	269	1.22	1.36	16,000	B.
May	323	127	180	.814	.94	11,100	B.
June	117	38	54.0	.244	.27	3,210	B.
July	38	22	27.1	.123	.14	1,670	B.
August	24	22	23.3	.105	.12	1,430	C.
September	29	20	23.2	.105	.12	1,370	C.
October	26	20	22.5	.102	.12	1,380	C.
November	24	20	21.7	.098	.11	1,290	C.
December	.....	.....	17.8	.080	.09	1,090	C.
The year	576	.....	62.5	.283	3.85	45,300	

NOTE.—Discharge Jan. 1 to Mar. 10 and Dec. 15 to 31 estimated, because of ice, from climatologic records and from a consideration of the discharge measurement Jan. 14. Mean discharge Mar. 1 to Mar. 10 estimated 20 second-feet. Mean discharge Dec. 15 to 31 estimated 16 second-feet.

BRIDGE CREEK NEAR SILVER LAKE, OREG.

Location.—At the county bridge in the SW. ¼ sec. 20, T. 28 S., R. 14 E., 2 miles west of Silverlake, Oreg.

Records available.—January 21, 1905, to July 21, 1906; September 24, 1910, to September 2, 1911; fragmentary.

Drainage area.—45 square miles.

Gage.—Vertical staff which was set at the same datum as that of the gage used in 1905–6.

Channel.—Somewhat shifting; bed composed of sand and gravel.

Discharge measurements.—Made by wading.

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

Records of flow at this station show the total run-off from the drainage area. Estimates are withheld until more data are available.

Discharge measurements of Bridge Creek near Silver Lake, Oreg., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Jan. 14[a]	R. W. Davenport	1.95	1.10
May 9[b]	do	2.58	17.0

[a] River frozen over. Ice 6 inches thick. Discharge estimated.
[b] About 0.6 second-feet being diverted just above gage.

Daily gage height, in feet, of Silver Creek near Silver Lake, Oreg., for 1911.

[Jas. H. Gowdy, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.60	0.75	1.05	4.80	2.90	2.10	1.15	0.90	0.86	0.95	0.82	0.82
2	.65	.75	1.05	5.20	2.80	1.90	1.10	.90	.86	.95	.82	.82
3	.60	.75	1.20	4.60	3.00	1.80	1.10	.90	.82	.95	.82	.82
4	.60	.70	1.20	4.10	3.50	1.70	1.05	.90	.86	.90	.82	.82
5	.70	.70	1.30	3.30	3.90	1.60	1.05	.90	.86	.90	.82	.82
6	.65	.70	1.05	3.40	3.80	1.55	1.00	.90	.86	.90	.82	.82
7	.60	.80	1.00	3.90	3.70	1.50	1.00	.90	.86	.90	.82	.82
8	.60	.90	.95	4.20	3.60	1.40	1.00	.90	.86	.90	.82	.82
9	.60	.90	.95	4.10	3.10	1.40	1.00	.90	.90	.90	.82	.82
10	.65	1.00	.95	3.90	2.50	1.40	1.00	.90	.90	.90	.82	.82
11	.70	1.00	1.00	2.35	2.50	1.35	1.00	.90	.90	.90	.82	.82
12	.75	1.20	.95	2.15	2.70	1.35	1.00	.90	.90	.90	.82	.82
13	.80	1.10	1.00	2.35	2.60	1.35	1.00	.90	.90	.90	.82	.82
14	.85	1.20	1.05	2.60	2.45	1.30	.95	.90	.90	.90	.82	.82
15	.80	1.00	1.10	2.60	2.35	1.30	.95	.90	.90	.90	.86	.86
16	.75	.80	1.10	2.70	2.35	1.30	.95	.90	.90	.90	.86	.86
17	.70	.70	1.30	3.10	2.45	1.20	.95	.90	.86	.86	.90	.86
18	.75	.70	1.30	3.10	2.45	1.20	.95	.90	.86	.86	.90	.86
19	.80	.70	1.30	2.60	2.45	1.20	.90	.90	.86	.86	.90	.90
20	.80	.70	1.50	2.60	2.45	1.20	.90	.90	.86	.82	.90	.90
21	.70	.65	1.68	3.10	2.35	1.15	.90	.86	.86	.82	.90	.90
22	.70	.65	2.00	3.20	2.35	1.15	.90	.86	.86	.82	.90	.90
23	.75	.70	2.25	3.50	2.45	1.20	.90	.86	.86	.82	.90	.90
24	.85	.70	2.70	3.80	2.45	1.20	.90	.86	.90	.82	.90	.90
25	.85	.80	2.80	3.90	2.45	1.20	.90	.86	.90	.82	.90	.90
26	.90	.80	2.50	3.90	2.35	1.20	.90	.86	.95	.82	.90	.90
27	.85	.85	2.50	3.80	2.25	1.20	.86	.86	1.00	.82	.86	.90
28	.80	.85	2.60	3.50	2.20	1.15	.86	.86	.95	.82	.86	.90
29	.80	.....	3.10	3.00	2.35	1.20	.86	.86	.90	.82	.86	.90
30	.85	.....	3.90	2.90	2.35	1.20	.90	.86	.90	.82	.82	.90
31	.85	.....	4.10	.....	2.35	.....	.90	.86	.....	.82	.....	.95

NOTE.—Ice at station Jan. 1 to about Mar. 10 and about Nov. 27 to Dec. 31.

Daily discharge, in second-feet, of Silver Creek near Silver Lake, Oreg., for 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	484	199	117	38	24	22	26	20	20
2	.....	576	188	98	35	24	22	26	20	20
3	.....	440	210	89	35	24	20	26	20	20
4	.....	352	269	80	32	24	22	24	20	20
5	.....	245	323	72	32	24	22	24	20	20
6	.....	257	309	68	29	24	22	24	20	20
7	.....	323	295	64	29	24	22	24	20	20
8	.....	368	282	56	29	24	22	24	20	20
9	.....	352	221	56	29	24	24	24	20	20
10	.....	323	157	56	29	24	24	24	20	20
11	29	142	157	52	29	24	24	24	20	20
12	26	122	177	52	29	24	24	24	20	20
13	29	142	167	52	29	24	24	24	20	20
14	32	167	152	48	26	24	24	24	20	20
15	35	167	142	48	26	24	24	24	22	.....
16	35	177	142	48	26	24	24	24	22	.....
17	48	221	152	41	26	24	22	22	24	.....
18	48	221	152	41	26	24	22	22	24	.....
19	48	167	152	41	24	24	22	22	24	.....
20	64	167	152	41	24	24	22	22	24	.....
21	78	221	142	38	24	22	22	20	24	.....
22	107	233	142	38	24	22	22	20	24	.....
23	132	269	152	41	24	22	22	20	24	.....
24	177	309	152	41	24	22	24	20	24	.....
25	188	323	152	41	24	22	24	20	24	.....
26	157	323	142	41	24	22	26	20	24	.....
27	157	309	132	41	22	22	24	20	22	.....
28	107	269	127	38	22	22	26	20	22	.....
29	221	210	142	41	22	22	24	20	22	.....
30	323	199	142	41	24	22	24	20	20	.....
31	352	.....	142	.....	24	22	.....	20	.....	.....

NOTE.—Discharge determined from a fairly well defined rating curve. Discharge assumed unaffected by ice Nov. 27 to Dec. 14.

Monthly discharge of Silver Creek near Silver Lake, Oreg., for 1911.

[Drainage area, 221 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	.....	.....	13	0.059	0.07	799	D.
February	.....	.....	12	.054	.06	666	D.
March	352	.....	85.6	.387	.45	5,260	C.
April	576	122	269	1.22	1.36	16,000	B.
May	323	127	180	.814	.94	11,100	B.
June	117	38	54.0	.244	.27	3,210	B.
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September	29	20	23.2	.105	.12	1,370	C.
October	26	20	22.5	.102	.12	1,380	C.
November	24	20	21.7	.098	.11	1,290	C.
December	.....	.....	17.8	.080	.09	1,090	C.
The year	576	.....	62.5	.283	3.85	45,300	

NOTE.—Discharge Jan. 1 to Mar. 10 and Dec. 15 to 31 estimated, because of ice, from climatologic records and from a consideration of the discharge measurement Jan. 14. Mean discharge Mar. 1 to Mar. 10 estimated 20 second-feet. Mean discharge Dec. 15 to 31 estimated 16 second-feet.

BRIDGE CREEK NEAR SILVER LAKE, OREG.

Location.—At the county bridge in the SW. ¼ sec. 20, T. 28 S., R. 14 E., 2 miles west of Silverlake, Oreg.

Records available.—January 21, 1905, to July 21, 1906; September 24, 1910, to September 2, 1911; fragmentary.

Drainage area.—45 square miles.

Gage.—Vertical staff which was set at the same datum as that of the gage used in 1905–6.

Channel.—Somewhat shifting; bed composed of sand and gravel.

Discharge measurements.—Made by wading.

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

Records of flow at this station show the total run-off from the drainage area. Estimates are withheld until more data are available.

Discharge measurements of Bridge Creek near Silver Lake, Oreg., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Jan. 14[a]	R. W. Davenport	1.95	1.10
May 9[b]	do	2.58	17.0

[a] River frozen over. Ice 6 inches thick. Discharge estimated.
[b] About 0.6 second-feet being diverted just above gage.

Daily gage height, in feet, of Bridge Creek near Silver Lake, Oreg., for 1911.

[W. J. Archer, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1				2.8					
2							2.3		1.7
3									
4		1.8	2.5						
5									
6									
7	1.8								
8									
9					2.58		2.0		
10									
11		1.8							
12									
13									
14	1.95								
15									
16									
17									
18		2.4							
19									
20									
21	2.0								
22							1.65		
23									
24									
25		2.5	2.0						
26									
27									
28	1.8								
29									
30							1.6		
31									

NOTE.—Ice at station during January, February, and first part of March.
Observer notes for latter part of July that about 40 inches of water was being diverted above the gage.

BEAR (BUCK) CREEK NEAR SILVER LAKE, OREG.

Location.—At the county highway bridge in sec. 17, T. 27 S., R. 14 E., 3 miles southwest of Silver Lake post office.

Records available.—January 21, 1905, to July 21, 1906; January 11, 1909, to September 3, 1911; fragmentary.

Drainage area.—77 square miles.

Gage.—An inclined staff.

Channel.—Probably shifts; bed composed of sand and gravel.

Discharge measurements.—Made by wading.

Winter flow.—Affected by ice.

Diversions.—A dam above the station and several brush dams put in each year below the station are used to divert water in small ditches or for flooding hay lands.

Accuracy.—As gage heights are affected by backwater from the temporary dams below, reliable estimates of discharge can not be made. Approximate estimates for 1905 to 1910 have been obtained by correcting gage heights for effect of backwater. Observations for 1911 are too fragmentary to be used as a basis for estimates of daily or monthly discharge.

The following discharge measurement was made by R. W. Davenport:
January 14, 1911; Gage height, 4.18[1]; discharge, 5.4 second-feet.

[1] Ice at the gage 4 inches thick.

Daily gage height, in feet, of Bear Creek near Silver Lake, Oreg., for 1911.

[W. J. Archer, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1				6.0					
2							5.8		
3									3.0
4		4.1	4.5						
5									
6									
7	4.2								
8								3.9	
9							5.6		
10									
11		4.1							
12									
13									
14	4.2								
15									
16									
17									
18		4.4							
19									
20									
21	4.2								
22							5.6		
23									
24									
25		4.4	4.5						
26									
27									
28	4.1								
29									
30									
31							4.1		

NOTE.—Ice at station during January, February, and first part of March. May 10, 1911, gage found drowned out by backwater from an irrigation dam; it was moved upstream about three-quarters of a mile. Gage heights prior to May 10 not comparable with those subsequent to that date.

MALHEUR AND HARNEY LAKES BASIN.

MALHEUR LAKE AT NARROWS, OREG.

Location.—In sec. 26, T. 26 S., R. 31 E., at the highway bridge across the narrow channel connecting Malheur and Harney Lakes, a few hundred feet from Narrows postoffice.

Records available.—March 14, 1903, to July 21, 1906; March 22, 1911, to September 9, 1911.

Gage.—Vertical staff on highway bridge; read once a week.

Channel.—Mud supporting a dense growth of tules and other vegetation, goes dry nearly every summer.

The station was established to determine fluctuations of the water elevation in Malheur Lake, which is several feet above the level of Harney Lake, but the gage heights indicate the outflow from Malheur Lake rather than the elevation of the water surface, although the two factors are probably related. The connecting channel was dry during the latter part of 1911 and there was no water within several miles of the gage. The relation between the gage readings at the Narrows and the elevation of Malheur Lake has not been determined.

Daily gage height, in feet, of Bridge Creek near Silver Lake, Oreg., for 1911.

[W. J. Archer, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1				2.8					
2							2.3		1.7
3									
4		1.8	2.5						
5									
6									
7	1.8								
8									
9					2.58		2.0		
10									
11		1.8							
12									
13									
14	1.95								
15									
16									
17									
18		2.4							
19									
20									
21	2.0								
22							1.65		
23									
24									
25		2.5	2.0						
26									
27									
28	1.8								
29									
30							1.6		
31									

NOTE.—Ice at station during January, February, and first part of March.
Observer notes for latter part of July that about 40 inches of water was being diverted above the gage.

BEAR (BUCK) CREEK NEAR SILVER LAKE, OREG.

Location.—At the county highway bridge in sec. 17, T. 27 S., R. 14 E., 3 miles southwest of Silver Lake post office.

Records available.—January 21, 1905, to July 21, 1906; January 11, 1909, to September 3, 1911; fragmentary.

Drainage area.—77 square miles.

Gage.—An inclined staff.

Channel.—Probably shifts; bed composed of sand and gravel.

Discharge measurements.—Made by wading.

Winter flow.—Affected by ice.

Diversions.—A dam above the station and several brush dams put in each year below the station are used to divert water in small ditches or for flooding hay lands.

Accuracy.—As gage heights are affected by backwater from the temporary dams below, reliable estimates of discharge can not be made. Approximate estimates for 1905 to 1910 have been obtained by correcting gage heights for effect of backwater. Observations for 1911 are too fragmentary to be used as a basis for estimates of daily or monthly discharge.

The following discharge measurement was made by R. W. Davenport:
January 14, 1911: Gage height, 4.18[1]; discharge, 5.4 second-feet.

[1] Ice at the gage 4 inches thick.

Daily gage height, in feet, of Bear Creek near Silver Lake, Oreg., for 1911.

[W. J. Archer, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1				6.0					
2									
3							5.8		
4		4.1	4.5						3.0
5									
6									
7	4.2								
8								3.9	
9							5.6		
10									
11		4.1							
12									
13									
14	4.2								
15									
16									
17									
18		4.4							
19									
20									
21	4.2								
22									
23							5.6		
24									
25		4.4	4.5						
26									
27									
28	4.1								
29									
30									
31							4.1		

NOTE.—Ice at station during January, February, and first part of March. May 10, 1911, gage found drowned out by backwater from an irrigation dam; it was moved upstream about three-quarters of a mile. Gage heights prior to May 10 not comparable with those subsequent to that date.

MALHEUR AND HARNEY LAKES BASIN.

MALHEUR LAKE AT NARROWS, OREG.

Location.—In sec. 26, T. 26 S., R. 31 E., at the highway bridge across the narrow channel connecting Malheur and Harney Lakes, a few hundred feet from Narrows postoffice.

Records available.—March 14, 1903, to July 21, 1906; March 22, 1911, to September 9, 1911.

Gage.—Vertical staff on highway bridge; read once a week.

Channel.—Mud supporting a dense growth of tules and other vegetation, goes dry nearly every summer.

The station was established to determine fluctuations of the water elevation in Malheur Lake, which is several feet above the level of Harney Lake, but the gage heights indicate the outflow from Malheur Lake rather than the elevation of the water surface, although the two factors are probably related. The connecting channel was dry during the latter part of 1911 and there was no water within several miles of the gage. The relation between the gage readings at the Narrows and the elevation of Malheur Lake has not been determined.

Daily gage height, in feet, of Malheur Lake at Narrows, Oreg., for 1911.

[R. L. Hass, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1			4.3	4.25	4.0			16							
2		3.45				3.6	1.6	17		4.15					
3			4.35					18			4.3	4.15			
4		3.45		4.25				19						2.8	
5						3.4		20		4.2					
6		3.55	4.35	4.2				21			4.3	4.15			
7								22	3.25				4.0		
8					4.0			23		4.25					
9		4.0	4.35	4.2			1.1	24			4.3	4.1			
10								25	3.35						
11		4.0						26		4.25				2.75	
12			4.35	4.2		3.1		27			4.35	4.05			
13								28	3.35						
14		4.1						29		4.3			3.8		
15			4.35	4.2	4.0			30			4.35	4.05			
								31	3.35						

NOTE.—Channel dry Sept. 16.

SILVIES RIVER NEAR SILVIES, OREG.

Location.—At the site of a proposed dam about 3 miles southwest of Silvies, Oreg., in sec. 14, T. 20 S., R. 31 E., three-fourths of a mile below Trout Creek and 1½ miles west of the Burns-Canyon City road.

Records available.—May 9, 1903, to December 31, 1904; January 1, 1909, to June 30, 1911, when station was discontinued.

Drainage area.—450 square miles.

Gage.—An inclined staff.

Channel.—Shifts somewhat at flood stages; bed composed of clean gravel; banks covered with heavy brush.

Discharge measurements.—Made from cable or by wading.

Winter flow.—Affected by ice.

Storage.—A dam constructed at the site of the station will impound all the run-off from the drainage basin above it and the water so stored could be diverted from this stream to irrigate lands in Harney Valley. The project was at one time under investigation by United States Reclamation Service but has since been taken up by the Silver Valley Irrigation Co.

Accuracy.—Conditions at this station are not favorable for accurate determinations of discharge owing to changes in conditions of flow. The relation between gage height and discharge is materially affected by ice during the winter, but allowance for this condition has been made.

Cooperation.—During 1911 station was maintained in cooperation with the Silver Valley Irrigation Co.

Discharge measurements of Silvies River near Silvies, Oreg., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Mar. 23	Rhea Luper	5.36	292
24	do	4.90	227
24	do	4.85	216
25	do	4.38	170
25	do	4.40	172
27	do	4.00	138
28	do	4.60	195
29	do	4.64	206
30	do	5.09	247
31	do	5.45	281
Apr. 2	do	6.55	414
3	do	7.06	487
4	do	7.26	500
5	do	6.58	422
7	do	5.50	283
8	do	5.70	304
9	do	6.08	376
11	do	5.76	328
13	do	4.95	238
14	do	4.75	214
17	do	4.91	234
18	do	5.02	241
July 28	R. W. Davenport	1.97	2.53

Daily gage height, in feet, and discharge, in second-feet, of Silvies River near Silvies, Oreg., for 1911.

[David Craddock, observer.]

Day.	January.		February.		March.		April.		May.		June.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Dis-ch'ge.
1	2.75						6.1	364	4.5	185	3.15	54
2			2.75				6.5	412	4.4	174	3.1	50
3							7.2	504	4.45	180	3.0	43
4			2.75		2.75		7.4	532	4.5	185	3.2	58
5							6.8	451	4.5	185	3.2	58
6							5.9	340	4.45	180	3.25	62
7							5.6	306	4.45	180	3.25	62
8	2.75						5.7	317	4.0	134	3.3	66
9							6.1	364	4.3	164	3.35	70
10	2.75						6.6	425	4.3	164	3.3	66
11			2.75		2.75	27	5.9	340	4.25	159	3.25	62
12						31	5.4	284	4.2	154	3.3	66
13						35	5.1	251	4.15	149	3.3	66
14						39	4.8	218	4.2	154	3.2	58
15					3.0	43	4.9	229	4.2	154	3.45	80
16					3.1	50	4.8	218	4.0	134	3.5	84
17			2.75		4.25	159	4.9	229	4.1	144	3.45	80
18					4.15	149	5.0	240	4.5	185	3.2	58
19					4.2	154	4.8	218	4.6	196	3.15	54
20	2.75				5.4	284	4.6	196	4.2	154	2.9	36
21					5.0	240	4.6	196	4.4	174	2.8	30
22					5.0	240	4.6	196	4.1	144	2.65	22
23					5.3	273	4.8	218	4.0	134	2.5	15
24			2.75		4.6	196	4.8	218	3.8	114	2.45	14
25					4.2	154	4.8	218	3.75	109	2.45	14
26					3.9	124	4.9	229	3.6	94	2.45	14
27					4.25	159	4.9	229	3.5	84	2.45	14
28	2.75				4.2	154	4.8	218	3.4	75	2.5	15
29					4.4	174	4.8	218	3.3	66	2.55	17
30					5.0	240	4.7	207	3.25	62	2.6	19
31					5.4	284			3.2	58		

NOTE.—Gage heights affected by ice Jan. 1 to Mar. 10. Discharge determined from a rating curve well defined above 100 second-feet. Discharge interpolated Mar. 12–14.

Monthly discharge of Silvies River at Silvies, Oreg., for 1911.

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	.....	.....	12	0.026	0.03	738	D.
February	.....	.....	13	.029	.03	722	D.
March	284	.....	108	.240	.28	6,640	C.
April	532	196	286	.636	.71	17,000	A.
May	196	58	143	.318	.37	8,790	A.
June	84	14	46.9	.104	.12	2,790	B.
The period	.....	.....	.....	.....	.....	36,700	

NOTE.—Discharge Jan. 1 to Mar. 10 estimated, because of ice, from climatologic records and records of discharge of Silvies at Burns, Oreg. Mean discharge Mar. 1 to 10 estimated 15 second-feet.

SILVIES RIVER NEAR BURNS, OREG.

Location.—10 feet below a wagon bridge near Parker's house, in sec. 7, T. 22 S., R. 30 E., 10 miles north of Burns.

Records available.—May 10, 1903, to July 24, 1906; December 14, 1908, to December 31, 1911.

Drainage area.—865 square miles.

Gages.—An inclined and vertical staff was used during 1911.

Channel.—May shift slightly; bed composed of gravel; stream flows through a flat alluvial bottom between banks covered with a dense growth of willows and underbrush. Above a gage height of 13 feet the stream overflows a wide area.

Discharge measurements.—Made from a cable at Lampshire's ranch 1 mile above the gage.

Winter flow.—Ice effect slight.

Utilization.—The water of Silvies River is largely used for the flood irrigation of hay lands in Harney Valley. As even the flood discharge is so used, any irrigation project that would require the diversion of the water would involve the settlement of accrued water rights.

Accuracy.—Conditions not favorable for accurate determination of discharge.

Cooperation.—Station maintained in 1911 in cooperation with the Silver Valley Irrigation Co.

Discharge measurements of Silvies River near Burns, Oreg., in 1911.

Date.		Hydrographer.	Gage height.	Discharge.
			Feet.	*Sec.-feet.*
Jan.	15	Cooper and Dodge	2.70	32.9
Mar.	23	M. V. Dodge	9.29	601
	24	do	10.38	723
	27	do	7.15	411
	28	do	7.78	487
	30	do	9.56	613
	31	do	10.28	700
Apr.	1	do	10.50	762
	1	do	11.08	815
	2	do	11.50	830
	4	do	11.93	910
	6	do	12.10	910
Aug.	1	R. W. Davenport	2.36	12.0
Dec.	3[a]	L. Crandall	2.42	17.5

[a] Some shore ice, but gage height probably not seriously affected.

Daily gage height, in feet, of Silvies River near Burns, Oreg., for 1911.

[E. P. Sylvester, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.60	2.60	2.70	10.40	6.60	3.40	2.63	2.38	2.25	.....	2.50	.....
2	2.60	2.60	2.70	11.40	5.20	3.30	2.63	2.38	2.25	.....	.....	.....
3	2.60	2.60	2.70	11.60	6.40	3.10	2.63	2.37	2.25	.....	.....	2.42
4	2.60	2.60	2.70	11.90	6.20	3.37	2.63	2.36	2.25	2.40	.....	.....
5	2.60	2.60	2.70	12.10	6.10	3.00	2.63	2.34	2.25	.....	.....	.....
6	2.60	2.60	2.70	11.60	6.20	3.00	2.60	2.33	2.25	.....	.....	2.55
7	2.60	2.60	2.80	10.30	5.80	3.05	2.60	2.31	2.27	.....	.....	.....
8	2.60	2.60	2.80	9.40	5.50	3.20	2.58	2.30	2.28	.....	2.55	.....
9	2.60	2.60	2.80	9.10	5.20	3.20	2.58	2.30	2.28	.....	.....	.....
10	2.65	2.60	2.80	9.40	5.10	3.25	2.55	2.30	2.28	.....	.....	.....
11	2.65	2.65	2.70	9.80	5.20	3.00	2.55	2.30	2.29	2.40	.....	.....
12	2.65	2.65	2.70	9.50	5.20	3.00	2.55	2.30	2.29	.....	.....	.....
13	2.65	2.70	2.75	8.50	5.10	2.90	2.53	2.30	2.30	.....	.....	2.50
14	2.70	2.70	2.80	7.50	5.20	2.83	2.53	2.29	2.30	.....	.....	.....
15	2.70	2.70	2.90	7.20	4.00	2.80	2.52	2.29	.....	.....	2.60	.....
16	2.65	2.70	3.00	7.00	4.50	2.75	2.52	2.28	.....	.....	.....	.....
17	2.60	2.70	3.20	6.90	4.50	2.90	2.50	2.27	.....	.....	.....	.....
18	2.60	2.70	3.50	7.20	4.80	2.95	2.50	2.27	.....	2.45	.....	.....
19	2.60	2.70	3.90	7.40	5.30	2.90	2.50	2.26	.....	.....	.....	.....
20	2.60	2.70	4.50	7.10	5.80	2.80	2.47	2.25	2.30	.....	.....	2.50
21	2.60	2.70	5.30	6.90	5.20	2.80	2.47	2.25	.....	.....	.....	.....
22	2.60	2.70	6.70	7.00	5.10	2.70	2.47	2.25	.....	.....	2.63	.....
23	2.60	2.70	9.00	6.90	4.90	2.65	2.45	2.25	.....	.....	.....	.....
24	2.60	2.70	10.40	7.40	4.50	2.58	2.43	2.25	.....	.....	.....	.....
25	2.60	2.70	9.50	7.60	4.40	2.58	2.43	2.24	.....	2.50	.....	.....
26	2.60	2.70	7.80	7.50	4.20	2.59	2.43	2.24	.....	.....	.....	.....
27	2.60	2.70	6.70	7.50	4.20	2.60	2.42	2.24	2.33	.....	.....	2.40
28	2.60	2.70	7.20	7.60	4.00	2.62	2.42	2.24	.....	.....	.....	.....
29	2.60	.....	8.30	7.30	3.90	2.62	2.41	2.24	.....	.....	2.63	.....
30	2.60	.....	9.40	7.00	3.65	2.63	2.40	2.23	.....	.....	.....	.....
31	2.60	.....	10.00	.....	3.17	.....	2.40	2.23	.....	.....	.....	.....

NOTE.—Relation of gage height to discharge probably not affected by ice. Gage heights probably affected by ice during January, February, early part of March, and latter part of December.

Daily discharge, in second-feet, of Silvies River near Burns, Oreg., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	28	28	35	713	358	90	30	13	6	12	21	22
2	28	28	35	827	234	82	30	13	6	13	21	18
3	28	28	35	851	340	66	30	12	6	13	21	15
4	28	28	35	887	322	88	30	12	6	14	22	18
5	28	28	35	914	313	58	30	10	6	14	22	21
6	28	28	35	851	322	58	28	10	6	14	23	24
7	28	28	42	702	286	62	28	9	6	14	23	24
8	28	28	42	610	259	74	27	8	7	14	24	23
9	28	28	42	583	234	74	27	8	7	14	24	23
10	32	28	42	610	226	78	24	8	7	14	25	22
11	32	32	35	650	234	58	24	8	8	14	25	22
12	32	32	35	620	234	58	24	8	8	15	26	21
13	32	35	38	520	226	50	23	8	8	15	27	21
14	35	35	42	439	234	45	23	8	8	16	27	21
15	35	35	50	412	138	42	22	8	8	16	28	21
16	32	35	58	394	178	38	22	7	8	17	28	21
17	28	35	74	385	178	50	21	6	8	17	28	21
18	28	35	98	412	202	54	21	6	8	18	29	21
19	28	35	130	430	242	50	21	6	8	18	29	21
20	28	35	178	403	286	42	19	6	8	18	30	21
21	28	35	242	385	234	42	19	6	8	19	30	20
22	28	35	307	394	226	35	19	6	8	19	30	19
23	28	35	574	385	210	32	18	6	9	20	30	18
24	28	35	713	430	178	27	16	6	9	20	30	17
25	28	35	620	448	170	27	16	5	9	21	30	16
26	28	35	460	439	154	27	16	5	10	21	30	15
27	28	35	307	439	154	28	15	5	10	21	30	14
28	28	35	412	448	138	29	15	5	11	21	30	14
29	28	.....	511	421	130	29	15	5	11	21	30	14
30	28	.....	610	394	110	30	14	4	12	21	26	14
31	28	.....	670	.....	72	.....	14	4	.....	21	.....	14

NOTE.—Discharge determined from a fairly well defined rating curve. Discharge interpolated for days on which gage was not read.

Monthly discharge of Silvies River near Burns, Oreg., for 1911.

[Drainage area, 865 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	35	28	29.1	0.034	0.04	1,790	D.
February	35	28	32.3	.037	.04	1,790	D.
March	713	35	215	.249	.29	13,200	C.
April	914	385	547	.632	.71	32,500	B.
May	358	72	220	.254	.29	13,500	B.
June	90	27	50.8	.059	.06	3,020	B.
July	30	14	22.0	.025	.03	1,350	B.
August	13	4	7.5	.0087	.01	461	C.
September	12	6	8.0	.0092	.01	476	C.
October	21	12	16.9	.020	.02	1,040	C.
November	30	21	26.6	.031	.03	1,580	C.
December	24	14	19.2	.022	.03	1,180	D.
The year	914	4	99.4	.115	1.56	71,900	

DONNER UND BLITZEN RIVER NEAR DIAMOND, OREG.

Location.—At the mouth of the canyon in sec. 20, T. 32 S., R. 32½ E., on the P ranch, 2 miles above the P ranch buildings, about 25 miles southwest of Diamond, and about 40 miles above Narrows.

Records available.—January 26, 1909, to July 31, 1910, and November 1 to 12, 1910, at old station below several diversion ditches; May 22, 1910, to December 31, 1911, at present station above all diversion ditches; records fragmentary part of period.

Drainage area.—238 square miles.

Gages.—The original gage was a vertical staff on the right bank just below the wagon bridge near the ranch buildings; the present gage is a vertical staff installed May 22, 1910, at the mouth of the canyon. It was read occasionally during the summer of 1910 and throughout 1911.

Channel.—Probably permanent; bed composed of gravel and sand; one channel at all stages. Banks of the stream covered with a dense growth of willows and underbrush; subject to overflow at flood stages.

Discharge measurements.—At the lower site measurements were made from the wagon bridge; at the present site measurements are made by wading or from a cable.

Winter flow.—Relation of gage height to discharge affected by ice.

Diversions.—The present gage is above all irrigation ditches. Five ditches divert water from the stream above the wagon bridge near the ranch buildings, and about 300 feet below the bridge is a brush and rock dam which is used to divert water into a sixth ditch. When water is to be diverted the dams are repaired and raised by adding more rocks and brush. Two of the ditches carry water during the entire year, three of them during the irrigation season only. No record has been kept of the actual time of operation.

Accuracy.—Conditions at the upper station are fairly good. During the spring the river is subject to considerable diurnal fluctuations and much of the water from the melting snow may pass the station at night when no record would be obtained.

Cooperation.—Station maintained in cooperation with the William Hanley Co., which has furnished record of gage heights.

Discharge measurements of Donner und Blitzen River near Diamond, Oreg., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Mar. 16	F. C. Dillard	3.06	145
18	do	3.85	463
22	R. W. Davenport	3.94	375
25	H. McLain	3.13	172
30	do	3.22	212
Apr. 5	do	3.19	202
10	do	3.00	132
15	do	2.90	105
26	do	3.40	266
May 31	do	3.75	382
31	do	3.70	340
June 20	do	3.60	318
July 17	do	2.80	84.9
Aug. 7[a]	R. W. Davenport	2.60	44.1

[a] Waded at cable section.

Daily gage heights, in feet, of Donner und Blitzen River near Diamond, Oreg., for 1911.

[Jesus Achurra, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		3.10	3.05	3.80	3.00			2.55		
2			3.05	3.80						
3			3.10	3.90			2.50			2.50
4			3.15	3.85		2.60				
5		3.19	3.35	3.75					2.50	
6		3.33	3.20	3.80						
7			3.20	3.80		2.60				
8			3.20	3.75	2.90			2.55		
9			3.15	3.70			2.50			
10		3.00	3.05	3.60						2.50
11		2.90	3.10	3.90		2.55				
12		2.90	3.10	4.05					2.50	
13		2.80	3.10	3.75						
14		2.85	3.00	3.70						
15		2.90	2.95	3.75	2.85			2.55		
16	3.05	2.85	2.90	3.65						
17		2.85	3.05	3.60	2.80		2.50			2.55
18	3.75	2.95	3.00	3.60		2.50				
19		2.90	2.95	3.60					2.50	
20		2.85	3.00	3.60						
21	6.00	2.85	3.05	3.55						
22	4.00	2.90	3.15	3.35	2.80			2.60		
23		3.10	3.35	3.30						
24	3.90	3.25	3.40	3.15			2.55			2.55
25	3.19	3.30	3.30	3.20		2.45				
26	3.00	3.37	3.20	3.10					2.50	
27	2.95	3.25	3.20	3.20						
28	2.95	3.15	3.20	5.10						
29	3.10	3.10	3.25	3.20				2.60		
30	3.25		3.40	3.00	2.65					2.55
31	3.30		3.70							

NOTE.—Gage heights probably affected by ice during latter part of December.

Daily discharge, in second-feet, of Donner und Blitzen River near Diamond, Oreg., for 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	160	146	405	132	50	31	38	40	32
2	.....	166	146	405	128	48	32	38	38	32
3	.....	173	160	445	124	46	32	38	36	32
4	.....	180	175	425	120	45	32	38	34	32
5	.....	187	238	385	116	45	32	38	32	32
6	.....	232	190	405	112	45	32	38	32	32
7	.....	207	190	405	109	45	32	38	32	32
8	.....	182	190	385	106	43	32	38	32	32
9	.....	157	175	365	104	41	32	38	32	32
10	.....	132	146	325	102	39	32	38	32	32
11	.....	106	160	445	100	38	32	38	32	.....
12	.....	106	160	508	99	37	32	38	32	.....
13	.....	83	160	385	97	36	32	38	32	.....
14	.....	94	132	365	96	35	32	38	32	.....
15	.....	106	119	385	94	34	32	38	32	.....
16	146	94	106	345	88	33	32	39	32	.....
17	266	94	146	325	83	32	32	40	32	.....
18	385	119	132	325	83	32	32	41	32	.....
19	757	106	119	325	83	32	33	42	32	.....
20	1,130	94	132	325	83	31	34	43	32	.....
21	1,500	94	146	306	83	30	35	44	32	.....
22	485	106	175	238	83	29	36	45	32	.....
23	465	160	238	222	79	28	37	45	32	.....
24	445	206	254	175	75	28	38	45	32	.....
25	187	222	222	190	72	28	38	45	32	.....
26	132	244	190	160	68	28	38	45	32	.....
27	119	206	190	190	64	29	38	45	32	.....
28	119	175	190	160	60	29	38	45	32	.....
29	160	160	206	190	57	30	38	45	32	.....
30	206	153	254	132	54	30	38	44	32	.....
31	222	.....	365	.....	52	31	.....	42	.....	.....

NOTE.—Discharge determined from a rating curve well defined between 40 and 500 second-feet. Discharge interpolated for days on which gage was not read.

Monthly discharge of Donner und Blitzen River near Diamond, Oreg., for 1911.

[Drainage area, 238 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
March 16-31	1,500	119	420	1.76	1.05	13,300	A.
April	244	83	150	.630	.70	8,930	A.
May	365	106	179	.752	.87	11,000	A.
June	508	132	322	1.35	1.51	19,100	A.
July	132	52	90.5	.380	.44	5,560	B.
August	50	28	35.7	.150	.17	2,200	C.
September	38	31	34.2	.144	.16	2,040	C.
October	45	38	40.8	.171	.20	2,510	C.
November	40	32	32.7	.137	.15	1,950	C.
December	.....	.....	28.1	.118	.14	1,730	D.
The period	.....	.....	.....	.....	.....	68,300	

NOTE.—Discharge Jan. 1 to Mar. 15 affected by ice; estimates not made on account of insufficient data. Mean discharge Dec. 11 to 15 estimated 30 second-feet. Mean discharge Dec. 16 to 31 estimated 25 second-feet.

MUD CREEK NEAR DIAMOND, OREG.

Location.—In sec. 4, T. 32 S., R. 32½ E., about 2 miles east of the P ranch buildings, about one-fourth mile east of the ranch field, and about 23 miles southwest from Diamond.

Records available.—March 18 to December 31, 1911.

Drainage area.—Not measured.

Gage.—A vertical staff.

Channel.—Shifts somewhat; bed composed of clean sand.

Discharge measurements.—Made from footbridge near the gage or by wading.

Cooperation.—Station was established by the Eastern Oregon Engineering Co. for the William Hanley Co.

The records show the total flow of the stream at the edge of the valley. As the stream is not spring-fed the channel is practically dry after the run-off from the melting snows on the steep slopes of Steens Mountain has passed.

Discharge measurements of Mud Creek near Diamond, Oreg., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Mar. 18	F. C. Dillard	2.60	12.3
26	H. McLain	2.35	8.1
Apr. 6	do	2.45	9.3
26	do	3.00	17.6
May 3	do	2.86	15.4
15	do	2.75	13.3
June 1	do	3.15	18.7
8	do	3.25	22.3
July 22	do	1.85	.6
Aug. 7	R. W. Davenport	1.75	[a] .2

[a] Estimated.

Daily gage height, in feet, of Mud Creek near Diamond, Oreg., for 1911.

[H. F. William Suhr, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		2.8	2.65	3.15				1.75		
2		2.9	2.65		2.25					
3		2.7	2.9				1.75			1.75
4		2.55	3.0			1.8				
5		2.6	3.4						1.7	
6		2.5	3.1	3.15						
7		2.5	2.95			1.75				
8		2.4	3.0	3.25				1.75		
9		2.55	2.9							
10		2.4	2.7				1.75			1.75
11		2.3	2.75			1.7				
12		2.3	2.85	2.9					1.7	
13		2.2	2.8	2.8	2.0					
14		2.1	2.7	2.8						
15		2.3	2.75	2.9				1.75		
16		2.3	2.65	2.9						
17		2.3	2.65	2.85			1.75			
18	2.6	2.35	2.55			1.7				1.75
19		2.25	2.5						1.75	
20		2.3	2.6	2.65						
21		2.25	2.6							
22		2.35	2.7		1.85			1.75		
23		2.45	2.95				1.75			1.75
24	2.7	2.7	2.95			1.75				
25	2.45	2.9	2.85	2.4					1.75	
26	2.35	3.0	3.0							
27	2.3	3.0	2.9							
28	2.3	2.8	2.85							
29	2.4	2.65	2.9		1.8			1.75		
30	2.5	2.6	2.9	2.35						1.75
31	2.7									

Daily discharge, in second-feet, of Mud Creek near Diamond, Crag., for 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		[illegible]	[illegible]	[illegible]	[illegible]			[illegible]		
2		[illegible]	[illegible]	[illegible]	[illegible]					
3		[illegible]	[illegible]	[illegible]	[illegible]		[illegible]			
4		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				[illegible]
5		[illegible]	[illegible]	[illegible]	[illegible]				[illegible]	
6		[illegible]	[illegible]	[illegible]	[illegible]					
7		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				
8		[illegible]	[illegible]	[illegible]	[illegible]			[illegible]		
9		[illegible]	[illegible]	[illegible]	[illegible]		[illegible]			
10		[illegible]	[illegible]	[illegible]	[illegible]					[illegible]
11		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				
12		[illegible]	[illegible]	[illegible]	[illegible]				[illegible]	
13		[illegible]	[illegible]	[illegible]	[illegible]					
14		[illegible]	[illegible]	[illegible]	[illegible]			[illegible]		
15		[illegible]	[illegible]	[illegible]	[illegible]					
16		[illegible]	[illegible]	[illegible]	[illegible]		[illegible]			
17	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				[illegible]
18	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				[illegible]	
19	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]					
20	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			[illegible]		
21	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]					
22	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]			
23	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				[illegible]
24	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				[illegible]	
25	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]					
26	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			[illegible]		
27	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]					[illegible]
28	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]					
29	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]					
30	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]					
31	[illegible]		[illegible]		[illegible]					[illegible]

NOTE.—Discharge Mar. 18 to June 4 determined from a well-defined rating curve; discharge for remainder of year practically estimated.

Monthly discharge of Mud Creek near Diamond, Crag., for 1911.

Month.	Discharge in second-feet.			Run-off in inches.	Accuracy.
	Maximum.	Minimum.	Mean.		
March 18–31	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
April	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
May	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
June	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
July	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
August	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
September			[illegible]	[illegible]	[illegible]
October			[illegible]	[illegible]	[illegible]
November			[illegible]	[illegible]	[illegible]
December			[illegible]	[illegible]	[illegible]
Total				[illegible]	

NOTE.—Discharge June to December practically estimated.

BEECH CREEK NEAR DIAMOND, ORE.

Location.—In sec. 34, T. 31 S., R. 33 E., about 4 miles northeast of the P ranch buildings and one-fourth mile east of the ranch field, and about 20 miles southwest from Diamond.

Records available.—March 18 to August 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—In alluvium and clay; shifts slightly.

Discharge measurements.—Made from footbridge near gage.

Accuracy.—The results obtained during the high-water stage in the spring are good and the flow of the stream is so steady that the discharge can be estimated during the remainder of the year.

Cooperation.—Station established and records furnished by the Eastern Oregon Engineering Co. for the William Hanley Co.

The records show the total flow of the stream at the edge of the valley.

Discharge measurements of Bridge Creek near Diamond, Oreg., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Mar. 18	F. C. Dillard	2.30	12.9
24	H. McLain	2.38	16.4
26	do	2.10	10.0
Apr. 6	do	2.20	13.8
27	do	2.58	24.2
May 3	do	2.48	20.2
June 1	do	2.35	17.4
20	do	2.10	11.6
July 22	do	2.00	10.2
Aug. 7	R. W. Davenport	1.98	9.8

Daily gage height, in feet, and discharge, in second-feet, of Bridge Creek near Diamond, Oreg., for 1911.

Day.	March.		April.		May.		June.		July.		August.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1				14		18	2.35	17				
2			2.31	16		19		17	2.05	11		
3				16	2.48	20		17				
4				15		20		17			2.00	10
5				14		20		17				
6			2.20	14		20	2.35	17				
7				15	2.45	20		17				
8				15		19	2.35	17				
9			2.30	16	2.42	19		17				
10				14		18		16				
11			2.15	13		18		15			2.00	10
12				13	2.35	17		15				
13				13		16		14	2.00	10		
14				13		16		13				
15				13	2.28	16		12				
16			2.16	13		15	2.10	12				
17				13		15						
18	2.30	14		13	2.25	15					2.00	10
19		14	2.14	13		15						
20		14		14		15	2.10	12				
21		15		14		16						
22		15		14		16			2.00	10		
23		16	2.26	15		17						
24	2.38	16		18	2.35	17						
25		13	2.50	21		16	2.05	11			2.00	10
26	2.10	10		22		16						
27		10	2.58	23		16						
28		11		21	2.25	15						
29	2.16	11		19		15			2.00	10		
30		13	2.36	17	2.25	15	2.05	11				
31	2.35	15				16						

NOTE.—Discharge Mar. 18 to Apr. 1 determined from a poorly defined rating curve; Apr. 2 to Aug. 31 determined from a well-defined curve. Discharge interpolated for days on which gage was not read, in order to compute monthly estimates.

Monthly discharge of Bridge Creek near Diamond, Oreg., for 1911.

Month.	Discharge in second-feet.			Run-off (in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
March 18-31	16	10	13.4	372	C.
April	23	13	15.5	922	B.
May	20	15	17.0	1,050	B.
June	17	11	13.7	815	B.
July	11	10	10.3	633	C.
August	10	10	10	615	C.
The period				4,410	

NOTE.—Discharge Jan. 1 to Mar. 17 and September to December was probably nearly constant at approximately 10 second-feet. The total run-off for the year with the addition of these periods was about 8,310 acre-feet.

KRUMBO CREEK NEAR DIAMOND, OREG.

Location.—Near the mouth of the stream, in sec. 19, T. 30 S., R. 32 E., about halfway between Diamond and the P ranch, half a mile west of the old Krumbo ranch house.

Records available.—March 17, 1911, to July 18, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Likely to shift; bed composed of clean sand and gravel.

Discharge measurements.—Made from footbridge.

Cooperation.—Station established by the Eastern Oregon Engineering Co., for the William Hanley Co.

The water of this stream is derived from springs and from the melting of the snow on Steens Mountain. Flood run-off seems to come somewhat earlier than on other streams in this region probably because of the lower elevation of the drainage basin.

The records show the total flow available from this stream for irrigation in the Donner und Blitzen Valley.

Discharge measurements of Krumbo Creek near Diamond, Oreg., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Mar. 17	Dillard and McLain	3.22	18.9
24	H. McLain	3.09	17.1
26	do	2.52	6.8
29	do	2.77	10.7
Apr. 3	do	2.65	9.1
11	do	2.35	5.8
14	do	2.25	4.9
23	do	2.12	4.0
June 16	do	2.05	3.5
Aug. 7	R. W. Davenport	1.96	4.2

Daily gage height, in feet, and discharge, in second-feet, of Krumbo Creek near Diamond, Oreg., for 1911.

[H. McLain, observer.]

Day.	March.		April.		May.		June.		July.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1				9.5		3.7		3.5		3.4
2				9.0		3.6		3.6	2.10	3.5
3			2.65	8.5	2.10	3.5		3.6		3.5
4				8.0		3.5		3.6		3.4
5				7.5		3.5		3.6		3.4
6			2.50	7.0		3.5	2.12	3.6		3.3
7				7.7	2.10	3.5		3.6		3.3
8				8.5		3.5	2.12	3.6		3.2
9			2.73	9.3	2.10	3.5		3.6		3.2
10				7.4		3.5		3.5		3.2
11			2.35	5.5		3.5		3.4		3.1
12				5.2	2.10	3.5		3.4		3.1
13				5.0		3.5		3.3	2.00	3.0
14			2.27	4.7		3.4		3.3		3.0
15				5.1	2.08	3.4		3.2		2.9
16			2.36	5.6		3.4	2.05	3.2		2.9
17	3.20	18		5.2		3.5		3.2		2.8
18		18		4.8	2.10	3.5		3.1	1.95	2.8
19		19	2.24	4.4		3.5		3.1		
20	3.26	19		4.2	2.10	3.5	2.00	3.0		
21		43		4.0		3.5		3.0		
22	4.70	68		3.8		3.5		3.0		
23		42	2.12	3.6		3.5		3.0		
24	3.09	16		4.0	2.10	3.5	2.00	3.0		
25		11	2.24	4.4		3.5		3.0		
26	2.49	7		5.0		3.5		3.0		
27		8	2.35	5.5		3.6		3.1		
28		9		5.0	2.12	3.6		3.1		
29	2.80	10		4.4		3.5		3.2		
30		10	2.15	3.8	2.10	3.5	2.05	3.2		
31	2.80	10				3.5				

NOTE.—Discharge determined from a rating curve well defined below 25 second-feet. Discharge interpolated for days on which gage was not read.

Monthly discharge of Krumbo Creek near Diamond, Oreg., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
March 17-31	68	7	20.5	610	C.
April	9.5	3.6	5.85	348	B.
May	3.7	3.4	3.51	216	B.
June	3.6	3.0	3.29	196	B.
July 1-18	3.5	2.8	3.17	103	C.

NOTE.—Discharge prior to Mar. 17 and subsequent to July 18 estimated as between 3 and 4 second-feet; hence the run-off for the year is about 3,150 acre-feet.

KEIGER CREEK NEAR DIAMOND, OREG.

Location.—In sec. 10, T. 30 S., R. 33 E., about 100 yards above the point where the creek forks; about 2½ miles southeast of Diamond and above all present diversions.

Records available.—January 26, 1909, to May 31, 1910, on old station; May 14 to August 31, 1911, on new station.

Drainage area.—50 square miles.

Gages.—The original gage, established January 26, 1909, was about 3 miles south of Diamond in sec. 10, T. 30 S., R. 33 E.; the present gage, established May 14, 1911, is a vertical staff a short distance from the site of the old gage.

Channel.—One at all stages; bed of the stream is composed of gravel and is probably permanent.

Discharge measurements.—Made from a footbridge or by wading.

Accuracy.—The results obtained at the original site were rendered somewhat inaccurate by the flat grade of the stream and the obstructions of the flow by willows and underbrush trailing in the water. Gage readings at the new site are rather fragmentary, but as the stream is spring fed and its flow very steady records are in general good.

Cooperation.—Station established in 1911 by the Eastern Oregon Engineering Co. for the William Hanley Co.

Discharge measuremnts of Keiger Creek near Diamond, Oreg., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Mar. 14	F. C. Dillard	1.65	33.7
20	H. McLain	1.84	43.5
23	do	2.28	74.6
27	do	1.80	42.7
Apr. 1	do	2.60	89.2
7	do	2.08	55.2
8	do	1.98	48.3
28	do	2.35	77.2
29	do	2.15	65.1
May 6	do	2.49	98.0
10	do	2.25	76.9
11	do	2.17	70.1
23	do	2.42	84.8
June 9	do	2.62	108
10	do	2.55	104
13	do	2.75	117
14	do	2.80	123
15	do	3.08	128
21	do	2.40	91.4
July 3	do	1.70	41.6
12	do	1.55	26.4
19	do	1.45	20.6
Aug. 5	R. W. Davenport	1.21	11.4

Daily gage height, in feet, and discharge, in second-feet, of Keiger Creek near Diamond, Oreg., for 1911.

[Christian Shaper, observer.]

Day.	March.		April.		May.		June.		July.		August.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1			2.60	103		79	2.75	117		43		11
2			2.80	122		85	3.00	142		38		11
3				100		91	3.20	162	1.70	34		11
4				97	2.55	98	3.40	183		32		11
5				85	2.85	127	2.90	132	1.65	31	1.20	11
6				73	2.50	94	2.80	122	1.70	34	1.20	11
7			2.10	61	2.60	103	2.80	122	1.70	34		11
8			1.98	53	2.55	98	2.90	132	1.70	34		11
9				50	2.30	77	2.60	103	1.65	31		11
10				46	2.15	65	2.65	108	1.60	28		11
11				43	2.20	69	2.95	137	1.55	26		11
12			1.80	40	2.25	73	3.20	162	1.55	26		11
13			1.96	51	2.20	69	2.75	117		25	1.20	11
14	1.65	31		51	2.20	69	2.80	122		24		11
15		33		51	2.15	65	3.00	142		23		11

Daily gage height, in feet, and discharge, in second-feet, of Keiger Creek near Diamond, Oreg., for 1911—Continued.

Day.	March.		April.		May.		June.		July.		August.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
16	.....	35	.....	50	2.20	69	2.75	117	1.50	23	.....	10
17	.....	37	1.95	50	2.15	65	2.55	98	.....	22	.....	10
18	.....	39	1.95	50	2.00	54	2.65	108	.....	21	.....	10
19	.....	42	.....	57	1.95	50	2.40	85	1.45	20	.....	9
20	1.85	44	.....	65	1.95	50	2.35	81	.....	18	1.10	9
21	.....	55	.....	72	2.00	54	2.45	90	.....	16	.....	9
22	.....	66	.....	79	2.20	69	2.35	81	.....	15	.....	9
23	2.30	77	.....	86	2.45	90	2.20	69	1.30	14	.....	9
24	.....	67	2.50	94	2.70	112	2.00	54	.....	14	.....	9
25	.....	58	.....	91	2.50	94	1.90	47	.....	13	.....	9
26	.....	49	.....	88	2.55	98	1.90	47	.....	13	.....	9
27	1.80	40	.....	85	2.40	85	2.00	54	.....	12	1.10	9
28	1.77	38	2.35	81	2.25	73	2.00	54	.....	12	.....	9
29	.....	54	2.15	65	2.35	81	1.90	47	.....	11	.....	9
30	.....	70	.....	72	2.40	85	1.90	47	1.20	11	.....	9
31	.....	87	.....	.....	2.40	85	.....	.....	.....	11	.....	9

NOTE.—Discharge determined from a fairly well defined rating curve. Discharge interpolated for days on which gage was not read.

Monthly discharge of Keiger Creek near Diamond, Oreg., for 1911.

[Drainage area, 50 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
March 14-31	87	31	51.2	1.02	0.68	1,730	B.
April	122	40	70.7	1.41	1.57	4,210	B.
May	127	50	79.0	1.60	1.84	4,910	A.
June	183	47	103	2.06	2.30	6,130	A.
July	43	11	22.9	.458	.53	1,410	B.
August	11	9	10.0	.200	.23	615	C.
The period	.....	.....	.....	.....	.....	19,000	

COCOMONGO CREEK NEAR DIAMOND, OREG.

Location.—In sec. 8, T. 30 S., R. 33 E., about 2½ miles southwest of Diamond and about 1 mile up the creek from the old Cummings place.

Records available.—March 14 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Sand, may shift.

Discharge measurements.—Made from footbridge.

Cooperation.—Station established by the Eastern Oregon Engineering Co. for the William Hanley Co.

The rating curve for this station has not yet been constructed and estimates of daily and monthly discharge for 1911 are therefore not available.

Discharge measurements of Cocomongo Creek near Diamond, Oreg., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
July 19	H. McLain	0.95	1.7
Aug. 5	R. W. Davenport	.35	.04

Daily gage height, in feet, of Cocomongo Creek near Diamond, Oreg., for 1911.

[H. McLain, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Day.	Mar.	Apr.	May.	June.	July.
1		1.85				16			1.20		
2		1.81		1.50		17		1.36	1.10		
3					1.10	18		1.45			
4			1.51			19					
5				1.45		20	1.61				
6			1.00		1.00	21			1.10		
7		1.70				22					
8		1.49			.90	23	1.96		1.25	1.10	
9				1.40		24		1.55			
10			1.40			25					
11			1.35			26					
12		1.33			.85	27	1.54				
13		1.30		1.40		28	1.49	1.70			
14						29		1.53	1.15	1.10	
15						30					
						31					

NOTE.—Channel dry August to December.

M'COY CREEK NEAR DIAMOND, OREG.

Location.—In sec. 12, T. 30 S., R. 32 E., about 5 miles southwest of Diamond and about 1,000 feet above Kesterson's ranch house.

Records available.—January 27, 1909, to May 22, 1910; May 23, 1910 (new site), to December 31, 1911.

Drainage area.—56 square miles.

Gages.—The original gage was 3 miles from Diamond post office; at the present site, 2½ miles above the original gage, which has been occupied since May 23, 1910; the gage is a vertical staff.

Channel.—Clean gravel and sand; liable to shift.

Discharge measurements.—Made from a foot bridge 25 yards above the vertical staff gage or by wading.

Winter flow.—Relation of gage height to discharge affected by ice.

Diversions.—The present station is above all diversions except one unimportant ditch. Several irrigation ditches divert water above the original site for use of hay lands in Diamond Swamp. No attempt was made to estimate the quantity of water carried by these ditches.

Accuracy.—Conditions at the new station favor accurate determination of discharge.

Discharge measurements of McCoy Creek near Diamond, Oreg., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Mar. 15	F. C. Dillard	2.30	20.2
19	H. McLain	2.63	28.5
26	do	2.30	17.3
Apr. 3	do	2.68	27.7
14	do	2.10	10.2
27	do	3.00	41.6
May 3	do	2.92	40.6
7	do	3.15	48.8
18	do	2.75	34.1
20	do	2.65	30.8
24	do	3.85	89.3
28	do	3.30	60.2
June 1	do	4.30	115
2	do	4.77	158
2	do	4.70	152
13	do	4.43	140
13	do	4.40	130
20	do	3.50	77.1
26	do	2.80	42.5
July 21	do	2.10	12.7
Aug. 5	R. W. Davenport	1.77	5.65

Daily gage height, in feet, of McCoy Creek near Diamond, Oreg., for 1911.

[Mrs. Grant Kesterson, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.00	2.50	1.80	2.55	2.80	4.60	2.70	1.85	1.60	1.72	1.80	.....
2	1.87	2.20	1.80	2.70	2.80	5.00	2.65	1.82	1.60	1.85	1.80	.....
3	1.90	2.30	1.80	2.70	2.95	5.00	2.70	1.80	1.60	1.87	1.80	.....
4	1.90	2.70	1.70	.....	3.25	4.90	2.80	1.80	1.60	1.90	1.80	.....
5	2.00	2.75	1.85	2.70	3.80	4.50	2.80	1.80	1.65	1.78	.....	.....
6	1.95	1.80	2.05	2.50	3.30	4.60	2.70	1.80	1.75	1.75	1.80	.....
7	1.85	1.80	2.00	2.50	3.10	4.40	2.60	1.80	1.75	1.78	1.80	1.70
8	1.80	.....	2.00	2.45	3.20	4.50	2.50	1.78	.....	1.80	1.80	1.70
9	1.85	.....	1.98	2.40	3.00	4.00	2.30	1.75	1.68	.....	.....	1.72
10	1.98	.....	1.95	2.40	2.85	4.40	2.30	1.75	1.68	1.90	1.85	1.70
11	1.97	.....	1.95	2.42	2.85	5.00	2.30	1.72	1.67	1.87	1.90	1.75
12	1.95	1.80	1.97	2.38	.....	5.20	2.28	1.70	1.65	1.90	.....	1.75
13	1.80	.....	2.10	2.36	3.15	4.50	2.30	1.70	1.65	1.90	1.85	1.70
14	1.80	1.80	2.26	2.35	2.90	4.40	2.40	1.70	1.65	1.90	1.85	1.70
15	1.80	1.80	2.55	2.35	2.85	4.50	2.30	1.70	.....	1.87	2.00	1.70
16	1.80	1.80	2.50	2.25	2.80	3.90	2.20	1.70	1.70	.....	1.90	1.65
17	1.90	1.80	3.20	2.28	2.80	4.00	2.20	1.70	1.70	1.87	.....	.....
18	1.98	1.80	2.30	2.35	2.75	.....	2.20	1.70	1.70	1.87	1.90	1.65
19	1.90	1.80	3.00	2.30	2.60	3.60	.....	1.68	1.70	1.87	1.90	1.65
20	1.90	1.75	3.00	2.30	2.60	3.70	2.10	1.68	1.70	1.85	1.90	1.70
21	1.90	1.75	3.25	2.30	.....	4.00	2.00	1.67	1.70	1.80	1.90	1.85
22	1.85	1.70	2.70	2.37	.....	4.20	2.00	1.67	1.68	1.80	1.87	1.85
23	.....	1.75	2.85	2.60	3.50	3.00	1.98	1.65	1.68	1.80	1.85	1.90
24	2.10	1.80	2.40	3.00	3.60	2.90	1.98	1.65	1.70	1.80	.....	1.90
25	2.05	1.80	2.40	3.00	3.60	3.00	2.00	1.65	.....	1.80	1.80	1.85
26	2.00	1.75	2.28	3.10	3.60	2.80	2.10	1.65	1.70	1.78	1.80	1.85
27	2.00	1.75	2.03	3.00	3.40	3.20	2.00	1.65	1.75	1.78	1.85	1.80
28	.....	1.80	2.25	2.90	3.30	3.00	1.90	1.65	1.75	1.80	1.85	1.80
29	2.05	.....	2.30	2.80	3.40	3.00	1.90	1.65	1.73	1.80	.....	.....
30	3.70	.....	2.35	2.75	4.00	2.80	1.88	1.63	1.73	1.78	.....	1.80
31	2.90	.....	2.45	.....	4.80	.....	1.86	1.63	.....	.....	.....	1.85

NOTE.—Gage heights probably affected by ice during January and February, first part of March, and latter part of December.

Daily discharge, in second-feet, of McCoy Creek near Diamond, Oreg., for 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	24	34	138	36	7	3	4.4	6	6
2	.....	30	34	166	34	6	3	7	6	6
3	.....	30	42	166	36	6	3	7	6	5
4	.....	30	56	168	40	6	3	8	6	5
5	.....	30	88	140	40	6	3.5	5.6	6	4
6	.....	22	59	147	36	6	5	5	6	4
7	.....	22	49	133	32	6	5	5.6	6	4
8	.....	20	54	140	28	5.6	4.4	6	6	4
9	.....	19	44	107	20	5	3.8	7	7	4.4
10	.....	19	36	133	20	5	3.8	8	7	4
11	.....	20	36	175	20	4.4	3.7	7	8	5
12	.....	18	44	191	19	4	3.5	8	7	5
13	10	18	52	140	20	4	3.5	8	7	4
14	15	18	39	133	24	4	3.5	8	7	4
15	24	18	36	140	20	4	3.8	7	10	4
16	22	14	34	101	16	4	4	7	8	3.5
17	54	15	34	107	16	4	4	7	8	3.5
18	16	18	32	95	16	4	4	7	8	3.5
19	44	16	26	83	15	3.8	4	7	8	3.5
20	44	16	26	89	13	3.8	4	7	8	.....
21	56	16	40	107	10	3.7	4	6	8	.....
22	30	18	55	119	10	3.7	3.8	6	7	.....
23	36	26	70	50	10	3.5	3.8	6	7	.....
24	19	44	76	45	10	3.5	4	6	6	.....
25	19	44	76	50	10	3.5	4	6	6	.....
26	15	49	76	40	13	3.5	4	5.6	6	.....
27	9	44	64	60	10	3.5	5	5.6	7	.....
28	14	39	59	50	8	3.5	5	6	7	.....
29	16	34	64	50	8	3.5	4.6	6	7	.....
30	18	32	100	40	8	3.3	4.6	5.6	6	.....
31	20	.....	152	.....	7	3.3	.....	5.8	.....	.....

NOTE.—Discharge determined from two well-defined rating curves, one applicable Jan. 1 to June 2, the other June 3 to Dec. 31. Discharge interpolated for days on which gage was not read.

Monthly discharge of McCoy Creek near Diamond, Oreg., for 1911.

[Drainage area, 56 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	.....	.....	7	0.125	0.14	430	D.
February	.....	.....	4	.071	.07	222	D.
March	56	.....	17.5	.312	.36	1,080	C.
April	49	14	25.4	.454	.51	1,510	B.
May	152	26	54.4	.971	1.12	3,340	A.
June	191	40	110	1.97	2.19	6,550	A.
July	40	7	19.5	.348	.40	1,200	B.
August	7	3.3	4.42	.079	.09	272	D.
September	5	3	3.94	.070	.08	234	D.
October	8	4.4	6.49	.116	.13	399	D.
November	10	6	6.93	.124	.14	412	D.
December	.....	.....	3.82	.068	.08	235	D.
The year	191	.....	21.9	.391	5.31	15,900	

NOTE.—Discharge Jan. 1 to Mar. 12 and Dec. 20 to 31 estimated, because of ice, from climatologic records. Mean discharge Mar. 1 to Mar. 12 estimated 5 second-feet. Mean discharge Dec. 20 to 31, estimated 3 second-feet.

RIDDLE CREEK NEAR SMITH, OREG.

Location.—In sec. 7, T. 29 S., R. 34 E., three-eighths mile above Riddle ranch house; about 3 miles east of Smith post office, and a short distance below the forks of the creek.

Records available.—March 11 to June 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Not likely to shift; bed composed of rocks and sand; banks may overflow at extreme high stages.

Discharge measurements.—Made from footbridge or by wading.

Cooperation.—Station established by the Eastern Oregon Engineering Co. for William Hanley Co.

Riddle Creek flows from the northern portion of Steens Mountain through Happy Valley about 10 miles northeast of Diamond. It is spring-fed and its flow is well maintained throughout the year. The records show the amount of water available from this stream for irrigation in Happy Valley.

Discharge measurements of Riddle Creek near Smith, Oreg., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Mar. 12	F. C. Dillard	1.15	12.7
21	H. McLain	1.98	64.3
22	do	2.32	80.7
27	do	1.61	37.9
Apr. 1	do	1.99	59.2
7	do	1.49	30.7
17	do	1.35	24.0
May 4	do	1.25	18.7
17	do	1.10	14.2
22	do	.98	9.7
June 3	do	.90	7.0
22	do	.80	4.9

Daily gage height, in feet, and discharge, in second-feet, of Riddle Creek near Smith, Oreg., for 1911.

Day.	March.		April.		May.		June.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1			1.99	59		20	0.90	8
2			1.80	47	1.20	18		8
3				40		18	.90	8
4			1.55	34	1.20	18		8
5				32		18	.90	8
6			1.50	31	1.20	18		8
7			1.50	31		18	.90	8
8			1.50	31	1.20	18		8
9				31		17	.90	8
10	1.53	32	1.50	31	1.15	16		8
11	1.15	16		28		16	.90	8
12	1.15	16	1.35	24	1.15	16		8
13		21		24		15	.80	5
14		26	1.35	24	1.10	14		5
15		31		24		14	.80	5
16		36	1.35	24	1.10	14		5
17		41	1.33	23	1.10	14	.80	5
18		46	1.35	24	1.05	12		5
19		51		24		12	.80	5
20		55	1.35	24	1.00	11		5
21	1.99	59		24		11	.80	5
22	2.68	117	1.35	24	1.00	11	.80	5
23		98		24		11	.80	5
24	2.25	79	1.35	24	1.05	12		5
25	2.00	60		24		12	.80	5
26		48	1.35	24	1.05	12		5
27	1.61	36		24		12	.80	5
28		48	1.35	24	1.05	12		5
29	2.00	60		23		12	.80	5
30		58	1.30	22	1.05	12		5
31	1.95	56				10		

NOTE.—Discharge determined from a well-defined rating curve. Discharge interpolated for days on which gage was not read.

Monthly discharge of Riddle Creek near Smith, Oreg., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
March 10-31	117	16	49.5	2,160	B.
April	59	22	28.2	1,680	A.
May	20	10	14.3	879	A.
June	8	5	6.20	369	C.

NOTE.—It is probable that the average discharge for July to December was approximately 5 second-feet.

SILVER CREEK NEAR RILEY, OREG.

Location.—In sec. 30, T. 22 S., R. 26 E., 12 miles above Riley, 3 miles below the junction of Nichols Creek.

Records available.—April 19, 1904, to July 14, 1906; February 15 to December 12, 1909; April 6 to October 19, 1910; December 31, 1910, to April 22, 1911, on which date the station was again discontinued.

Drainage area.—266 square miles.

Gages.—Vertical and inclined staff. At the point where this station has been located Silver Creek is divided into three channels by an earth and rock dam. The original gage, established in 1904, was placed in the third or left channel. When the station was reestablished in 1909 a new gage was installed on the right bank, and in December, 1910, a third gage was installed by the Silver Valley Irrigation Co. above the influence of the dam. This last gage was read until April 22, 1911.

Channel.—Clean gravel; not likely to shift.

Discharge measurements.—At the original station measurements were made from the three bridges which cross the channels. After the station was reestablished in 1909 measurements were made from a cable which was installed 50 feet below the new gage, 300 feet above the bridges, and about 100 feet above the dam. The dam is rather unstable, as the brush, earth, and smaller stones are washed away by the first flood and are not replaced until the water subsides in the spring. The 1909 gage heights were affected by these changes.

Winter flow.—Relation of gage height to discharge affected by ice.

Diversions and storage.—The water of Silver Creek is used to irrigate hay lands in the upper Silver Creek valley. Below this point the valley narrows to a canyon and opens out again near Silver Lake into lower Silver Valley. During the years of low run-off no water from the upper valley reaches the lower. The Silver Creek reservoir site, which was investigated by the United States Reclamation Service and also by the Silver Valley Irrigation Co., is 3 or 4 miles above the gaging section. Water stored at this point could be used to irrigate large areas of agricultural lands on both sides of the stream.

Accuracy.—Results at this station are only approximately accurate.

Cooperation.—Station maintained in cooperation with the Silver Valley Irrigation Co.

Discharge measurements of Silver Creek near Riley, Oreg., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Mar. 11[a]	R. W. Davenport	0.98	23.1
24	R. D. Cooper	4.15	346
27	do	3.00	229
30	do	4.00	341
31	do	4.70	406
31	do	4.70	441
Apr. 2	do	4.82	473
4	do	3.61	299
13	do	2.20	119
17	Cooper and Gowan	1.98	100
Aug. 2	R. W. Davenport	.10	.11

[a] Old gage read 1.75. Rotten ice and slush ice may have affected gage height.

Daily gage height, in feet, and discharge, in second-feet, of Silver Creek near Riley, Oreg., for 1911.

[Ben Mutter, observer.]

Day.	February.		March.		April.		Day.	February.		March.		April.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.		Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1			0.50	6	4.90	475	16			1.80	81	2.00	100
2			.70	12	4.70	445	17			1.70	72	2.00	100
3			.75	14	4.20	370	18			1.60	63	2.00	100
4			.70	12	3.60	287	19	0.75		2.00	100	2.00	100
5			.80	16	3.30	248	20	.80		1.90	90	1.90	90
6			.75	14	2.90	198	21	.70		2.50	152	1.90	90
7			.70	12	2.70	174	22	.85		3.20	235	1.95	95
8			.75	14	2.65	168	23	.75		4.30	385		
9			1.00	24	2.60	163	24	.70		4.20	370		
10			1.20	34	2.60	163	25	.75		3.70	300		
11			1.00	24	2.50	152	26	.45		3.20	235		
12			1.50	55	2.40	141	27	.70		3.00	210		
13			1.00	24	2.20	120	28	.75		3.60	287		
14			1.55	59	2.15	115	29			3.30	248		
15			2.00	100	2.05	105	30			4.10	356		
							31			4.60	430		

NOTE.—Ice probably affected gage heights during February and slightly from Mar. 1 to 10. No correction made for possible effect of ice Mar. 1 to 10. Stream probably went dry about July 1.

Monthly discharge of Silver Creek near Riley, Oreg., for 1911.

[Drainage area, 266 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
March	430	6	130	0.486	0.56	7,990	A.
April 1-22	475	90	182	.684	.56	7,940	B.

NOTE.—Discharge January and February estimated by engineer of Silver Lake Irrigation Co. to have been 1 second-foot.

ALVORD LAKE BASIN.

TROUT CREEK NEAR DENIO, OREG.

Location.—At the mouth of the canyon just below a bridge in sec. 26, T. 39 S., R. 36 E., 4½ miles east of Trout Creek ranch buildings and 14 miles northeast of Denio.

Records available.—March 25 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—May shift somewhat; bed composed of gravel and sand.

Discharge measurements.—Made by wading.

Diversions and storage.—The normal flow of the creek, which is derived chiefly from melting snow, is entirely appropriated for irrigation below the station. Water is diverted from the creek and its tributaries for use of three or four small ranches in the canyon above the station, and after the creek enters the valley much of the water is diverted for use of the Trout Creek ranch. Further irrigation from this stream will depend on the storage of the winter flow and on more efficient use of the water. An unsurveyed reservoir site about 1½ miles above the mouth of the canyon would probably store 10,000 acre-feet by means of a 100-foot dam.

Accuracy.—The results obtained at this station are reliable, conditions are fairly permanent; the flow is steady and the gage readings afford a sufficiently accurate estimate of the discharge.

Cooperation.—Station maintained in cooperation with Thomas & Walter, proprietors of the Trout Creek ranch.

Discharge measurements of Trout Creek near Denio, Oreg., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Mar. 25	R. W. Davenport	1.20	35.4
29	do	1.16	29.2
30	do	1.22	34.9
Apr. 3	do	1.46	50.7
6	do	1.39	45.0
7	do	1.32	39.3
14	do	1.13	25.6
17	do	1.10	24.1
Aug. 13	do	.66	1.6

Daily gage height, in feet, of Trout Creek near Denio, Oreg., for 1911.

[H. W. McAllister, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1		1.3		2.0					
2		1.4	1.6		1.15				
3		1.4		2.15					
4		1.4	1.7		1.1				
5		1.4		2.25					
6		1.4	1.85		1.1				
7		1.35	1.8	2.05					
8			1.75		1.1				
9		1.3	1.75	1.95					
10		1.3	1.6		1.0		0.62		
11		1.3		1.9					
12		1.25	1.7						
13		1.2		1.95		0.65			0.97
14		1.2	1.7						
15				1.95				0.82	

Daily gage height, in feet, of Trout Creek near Denio, Oreg., for 1911—Continued.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
16		1.15	1.55		1.0				
17		1.1		1.75					
18			1.45						
19		1.1		1.65					
20			1.4		1.0		0.6		
21		1.1		1.7					
22			1.55						
23		1.2		1.6				0.82	
24			1.9						
25	1.3	1.4		1.35					
26	1.3		1.85						
27	1.2	1.65		1.3	.95				
28	1.2		1.7						
29	1.15			1.25				.82	
30	1.2	1.5	1.8				.72		
31	1.25								

Daily discharge, in second-feet, of Trout Creek near Denio, Oreg., for 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1		38	58	104	30				
2		46	63	112	28				
3		46	68	120	26				
4		46	73	126	24				
5		46	80	132	24				
6		46	88	121	24				
7		42	83	110	24				
8		40	78	104	24				
9		38	78	98	21				
10		38	63	95	18		1.4		
11		38	68	93					
12		34	73	95					
13		31	73	98		2			16
14		31	73	98					
15		30	65	98				8	
16		28	58	88	18				
17		24	54	78					
18		24	50	73					
19		24	48	68					
20		24	46	70	18		1		
21		24	52	73					
22		28	58	68				8	
23		31	76	63					
24		38	93	52					
25	38	46	90	42					
26	38	57	88	40					
27	31	68	80	38	15				
28	31	64	73	36					
29	28	50	78	34				8	
30	31	54	83	32			3.8		
31	34		93						

NOTE.—Discharge determined from a curve fairly well defined between 20 and 60 second-feet. Discharge interpolated for days on which gage was not read during April to August.

Monthly discharge of Trout Creek near Denio, Oreg., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
March 25-31	38	28	33	458	B.
April	68	24	39.4	2,340	B.
May	93	46	71.1	4,370	B.
June	132	32	82.0	4,940	B.
July	30		18.9	1,160	B.
August			5	307	D.
September			2	119	D.
October			7	430	D.
November			16	952	D.
December			18	1,110	D.
The period				16,200	

NOTE.—Mean discharge August to December estimated and only roughly approximate.

LITTLE COTTONWOOD CREEK NEAR DENIO, OREG.

Location.—Near mouth of the canyon in sec. 28, T. 39 S., R. 35 E., about one-eighth mile above the crossing of the stage road to Andrews and 13 miles northeast of Denio.

Records available.—March 27 to December 31.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Probably permanent; bed composed of bowlders and stones.

Discharge measurements.—Made by wading.

Accuracy.—Results are good, although it is possible that some fluctuations in stage have occurred which have not been shown by the rather infrequent gage readings.

Cooperation.—Station maintained in cooperation with Thomas & Walter, proprietors of the Trout Creek ranch.

The results show the amount of water available in this stream for irrigation.

Discharge measurements of Little Cottonwood Creek near Denio, Oreg., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Mar. 27	R. W. Davenport	0.72	5.1
Apr. 4	do	.92	9.7
13	do	.77	6.1
17	do	.77	6.3
Aug. 14	do	.08	*a*.1

a Estimated.

Daily gage height, in feet, and discharge, in second-feet, of Little Cottonwood Creek near Denio, Oreg., for 1911.

Day.	March.		April.		May.		June.		July.		August.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1				9		11		8		0.8		0.4
2			0.90	9	1.00	12		8	0.20	.4		.4
3			.90	9		15	0.87	8		.5		.4
4			.90	9	1.15	18		8		.5		.4
5				9		14		8	.25	.6		.4
6				8	.95	10		7		.6	0.20	.4
7			.85	8		10	.80	7		.6		.3
8			.90	9		9		6	.25	.6		.1
9				9	.90	9	.70	5		.5		.0
10				8		9		5		5		.0

Daily gage height, in feet, and discharge, in second-feet, of Little Cottonwood Creek near Denio, Oreg., for 1911—Continued.

Day.	March.		April.		May.		June.		July.		August.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
11			0.85	8	0.95	10	0.75	6	0.20	0.4		0.0
12			.80	7		9		6		.4		.0
13			.80	7	.90	9		5		.3		.1
14				7		8		5		.3	0.08	.1
15			.75	6	.80	7	.68	5	.15	3		
16			.75	6		7		5		.6		
17			.75	6		6	.70	5		1.0		
18				6		6		5		1.3		
19				7	.70	5		4		1.6		
20			.80	7		6	.58	3	.50	2.0		
21				8		6		2		1.7		
22			.85	8		7	.55	2	.40	1.5		
23				10	.85	8		3		1.2		
24			1.00	12		8	.60	3		1.0		
25				22		7		3		.7		
26			1.50	32	.80	7		3	.20	.4		
27	0.75	6		24		7		2		.4		
28	.70	5		17		7	.50	2		.3		
29	.80	7	.95	10	.80	7		1.6	.15	.3		
30	.85	8		10		7		1.2		.3		
31		8				7			.20	.4		

NOTE.—Probably no flow from about Aug. 8 to Dec. 31, 1911. Discharge determined from a rating curve well defined between 5 and 10 second-feet.

Monthly discharge of Little Cottonwood Creek at Denio, Oreg., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
March 27-31	8	5	6.8	67	C.
April	32	7	10.2	607	B.
May	18	5	8.6	529	B.
June	8	1.2	4.73	281	C.
July	2	.3	.71	44	D.
August	.4	.0	.10	6	D.
The period				1,530	

TUMTUM LAKE BASIN.

VAN HORN CREEK NEAR DENIO, OREG.

Location.—In sec. 26, T. 40 S., R. 35 E., just below the road crossing 3½ miles north of Denio.

Records available.—March 28, 1911, to June 9, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Shifts somewhat; bed composed of sand and gravel; dry practically all the summer.

Discharge measurements.—Made by wading near gage.

Diversions.—Two ditches, each of which is said to carry sufficient water to irrigate about 20 acres, divert water above the station.

Cooperation.—Station maintained in cooperation with Thomas & Walter, proprietors of the Trout Creek ranch.

Discharge measurements of Van Horn Creek near Denio, Oreg., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-feet.*
Mar. 28	R. W. Davenport	1.02	9.3
31	do	1.01	13.1
Apr. 6	do	.97	9.0
8	do	1.00	12.0
13[a]	do	.92	8.0
18[a]	do	.90	6.7
Aug. 13	do	.35	.0

[a] About 1.5 second-feet diverted above gage.

Daily gage height, in feet, and discharge, in second-feet, of Van Horn Creek near Denio, Oreg., for 1911.

[H. W. McAllister, observer.]

Day.	March.		April.		May.		June.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1			1.10	17		2		
2			1.00	14		2		
3				12		1	0.35	0
4				11		1		
5				10		1		
6			.97	9		1		
7				10		1		
8			1.00	12		0		
9				12			.30	0
10				12				
11			1.00	12				
12				10				
13			.92	8				
14				8				
15				8				
16				8				
17				7				
18			.90	7				
19				7				
20			.90	7	0.30	0		
21				7	.35	0		
22				6				
23				6				
24				5				
25				5				
26				4				
27				4				
28	1.02	9		3				
29		10		3				
30		12		2				
31	1.01	13						

NOTE.—Daily discharge determined by the indirect method for shifting channels and by estimating.

Monthly discharge of Van Horn Creek near Denio, Oreg., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
March 28-31	13	9	11	87	D.
April	17	2	8.2	488	D.
May	2	0	.3	18	D.
June	0	0	.0	0	

HOME CREEK NEAR NARROWS, OREG.

Location.—At Home Creek ranch, in sec. 10, T. 35 S., R. 32 E.
Records available.—May 2 to July 30, 1911.
Drainage area.—Not measured.
Channel.—Gravel; probably permanent
Discharge measurements.—Made by wading.
Cooperation.—Station established by the Eastern Oregon Engineering Co. for the William Hanley Co., owner of the Home Creek ranch.

Home Creek drains the southern end of Steens Mountain, including the area known as Smith Flat.[1] The creek flows northwestward and sinks in Catlow Valley southeast of Rock Creek Sink.

Discharge measurements of Home Creek near Narrows, Oreg., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 21	H. McLain		11.0
May 2	do	2.40	35.9
13	do	2.15	20.4
25	do	2.00	14.0
June 17	do	1.70	5.6
July 14	do	1.55	4.0
Aug. 15	R. W. Davenport	1.50	2.1

Daily gage height, in feet, and discharge, in second-feet, of Home Creek near Narrows, Oreg., for 1911.

Day.	May.		June.		July.		Day.	May.		June.		July.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.		Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1						2.5	16	2.1	18			1.4	1.5
2					1.5	2.5	17	2.1	18				1.5
3						2.7	18	2.1	18				1.5
4						2.9	19	2.1	18				1.5
5	2.8	75				3.1	20	2.1	18				1.5
6	2.4	36				3.3	21	2.1	18				1.5
7	2.4	36				3.6	22	2.1	18				1.5
8	2.3	29				3.8	23	2.1	18			1.4	1.5
9	2.2	23			1.6	4.0	24	2.1	18				1.4
10	2.2	23				3.6	25	2.0	14				1.4
11	2.4	36				3.3	26	2.0	14				1.3
12	2.2	23				3.0	27	2.0	14				1.2
13	2.2	23				2.7	28	2.0	14				1.2
14	2.2	23				2.3	29	2.0	14				1.1
15	2.1	18				1.9	30	2.0	14			1.3	1.0
							31						1.0

Monthly discharge of Home Creek near Narrows, Oreg., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
May 5-30	75	14	22.7	1,170	B.
July	4	1	2.15	132	D.

[1] On Pl. III of Water-Supply Paper 231 the drainage of Smith Flat is indicated as passing to the head of Donner und Blitzen River, whereas it actually passes into Home Creek.

MISCELLANEOUS MEASUREMENTS.

The following miscellaneous discharge measurements were made on streams in the Great Basin during 1911:

Miscellaneous discharge measurements made in Great Basin in 1911.

[By G. H. Canfield, L. Crandall, H. S. Kleinschmidt, and J. J. Hayes.]

Bear River basin.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
Aug. 14	Bear River		Just above power house, Collinston, Utah.		68
14	West Side canal		do		384
14	East Side canal		do		354
July 14	Seaman's ditch		Near Battle Creek bridge, N. W. of Preston, Idaho.		1.03
14	West Cache canal		Near Battle Creek Fill, N. W. of Preston, Idaho.		26.0
Aug. 15	do		do		53.5

Sevier River basin.

June 24	South Fork	Sevier River	Junction, Utah	2.20	222
July 7	do	do	do	1.60	161
23	do	do	do	1.34	149
29	do	do	do	2.58	265
Aug. 5	do	do	do	.70	99
12	do	do	do	−.30	37
19	do	do	do	−.10	60
June 1	Asay Creek	do	Hatchtown, Utah	2.80	215
4	do	do	do	2.70	195
2	Mammoth Creek	do	do	2.00	331
3	do	do	do	[a] 1.90	322
Aug. 30	Asay Creek	do	do	1.95	79
31	Mammoth Creek	do	do	−.05	28.4

Owens River basin.

Jan. 25[b]	Rock Creek	Owens River	Below junction of Pine Creek, sec. 10, T. 6 S., R. 31 E.		59
24	South diversion of Bishop Creek.	do	Opposite California-Nevada Power Co.'s power house.		2.1
23	Division Creek	do	Former U. S. Geological Survey gaging station, about 10 miles north of Independence, Cal., secs. 4 and 5, T. 12 S., R. 34 E.		6.2
Feb. 1	do	do	do		8.6
1	Sawmill Creek	do	Former U. S. Geological Survey gaging station, about 8 miles north of Independence, Cal., sec. 9, T. 12 S., R. 34 E.		9.0
Jan. 12	North Branch of Shepard Creek.	do	Former U. S. Geological Survey gaging station, 3 miles east of mouth of canyon, just above irrigation diversions.		2.5
12	South Branch of Shepard Creek.	do	do		2.2
Feb. 23[c]	do	do	do		1.8
Jan. 12	Bairs Creek	do	Former U. S. Geological Survey gaging station, 3 miles east of mouth of canyon, sec. 16, T. 14 S., R. 35 E.		1.2
Feb. 23	do	do	do		.9
Jan. 12	George Creek	do	Former U. S. Geological Survey gaging station, 1 mile west of road from Independence to Lone Pine, Cal., sec. 27, T. 14 S., R. 35 E.		2.9
Feb. 23	do	do	do		1.9
Jan. 4	Ash Creek	do	Former U. S. Geological Survey gaging station, near Olancha, Cal., just above forks of creek near mouth of canyon, 16 miles south of Lone Pine, Cal., 8 miles north of Olancha, sec. 11, T. 18 S., R. 36 E.		2.1
Feb. 8	do	do	do		5.8

[a] Gage doubtful. Might be 1.95 feet.
[b] The surplus water over and above that measured in Rock and Pine creeks above the junction (see regular U. S. Geological Survey gaging stations) comes from springs in the canyon.
[c] North Branch of Shepard Creek was dry this date, 9.30 a. m.

Miscellaneous discharge measurements made in Great Basin in 1911—Continued.

Mono Lake basin.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
July 22	Rush Creek	Mono Lake	1 mile south of Farrington post office, Cal., above Parker and Walker creeks.		641
22	Parker Creek [a]	Rush Lake	At road crossing half mile south of Farrington, Cal.		45
23	Walker Creek [a]	do	At road crossing, Farrington, Cal.		11
22	Mill Creek [b]	Mono Lake	Above Lake Canyon, about one-fourth mile above Lundy Lake, at Lundy, Cal.		146
22	Lake Canyon Creek [b]	Mill Creek	At mouth, at Lundy, Cal.		2.8

Carson River basin.

Feb. 22	Carson River	Carson Sink	At Southern Pacific Railroad bridge, 1 mile north of Fort Churchill, Nev.	3.12	444
July 30	Town ditch	Markleeville Creek.	At Markleeville, Cal.		8.3
Nov. 6	do	do	do		4.2
July 30	J. Maisterrena ditch	Pleasant Valley Creek.	do		3.9
30	J. E. Mayo ditch	do	do		8.0

Truckee River basin.

Aug. 5	Alder Creek	Prosser Creek.	Near mouth, about 3½ miles northeast of Truckee, Cal.	0.66	6.7
Sept. 23	do	do	do	.59	4.0

Surprise Valley.

Mar. 25	Bidwell Creek	Upper Lake	Fort Bidwell, Cal.	0.33	11.6
Apr. 30	do	do	do	1.22	39.2
Nov. 3	do	do	do	.28	4.02

Warner Valley.

May 2	Twelvemile Creek	Twenty mile Creek.	1 mile west of Oregon, Nevada, and California corner.	1.21	37.6
Aug. 18	do	do	do	.40	2.5
Nov. 17	do	do	do	.39	2.2
May 2	do	do	Near Oregon, Nevada, and California corner.	1.97	62.3
Aug. 18	do	do	do	1.0	3.9
Nov. 17	do	do	do	1.11	4.6
May 1	Cowhead Lake outlet	Twelve mile Creek.	One-fourth mile below lake outlet.	1.35	21.3
Aug. 18	do	do	do		Dry.
May 2	Fifteenmile Creek	do	Three-fourths mile above mouth.	1.34	16.0
Aug. 18	do	do	do	.49	1.4
Nov. 6	do	do	do	.16	1.07
May 1	Rock Creek	do	4 miles above mouth		6.3
Aug. 18	do	do	At mouth		Dry.
22	Blue Creek	Camas Creek	1 mile above mouth		1.25

[a] In addition to the discharge of Parker and Walker creeks, some 20 second-feet inflow is contributed between the mouth of Walker Creek and regular U. S. Geological Survey gaging station on Rush Creek near Mono Lake.

[b] About 3 second-feet should be added to the combined discharge of Mill Creek and Lake Canyon Creek to give the total flow of Lundy Lake on July 22.

MISCELLANEOUS MEASUREMENTS.

The following miscellaneous discharge measurements were made on streams in the Great Basin during 1911:

Miscellaneous discharge measurements made in Great Basin in 1911.

[By G. H. Canfield, L. Crandall, H. S. Kleinschmidt, and J. J. Hayes.]

Bear River basin.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
Aug. 14	Bear River		Just above power house, Collinston, Utah.		68
14	West Side canal		do		384
14	East Side canal		do		354
July 14	Seaman's ditch		Near Battle Creek bridge, N. W. of Preston, Idaho.		1.03
14	West Cache canal		Near Battle Creek Fill, N. W. of Preston, Idaho.		26.0
Aug. 15	do		do		53.5

Sevier River basin.

June 24	South Fork	Sevier River	Junction, Utah	2.20	222
July 7	do	do	do	1.60	161
23	do	do	do	1.34	149
29	do	do	do	2.58	265
Aug. 5	do	do	do	.70	99
12	do	do	do	−.30	37
19	do	do	do	−.10	60
June 1	Asay Creek	do	Hatchtown, Utah	2.80	215
4	do	do	do	2.70	195
3	Mammoth Creek	do	do	2.00	331
3	do	do	do	[a] 1.90	322
Aug. 30	Asay Creek	do	do	1.95	79
31	Mammoth Creek	do	do	−.05	28.4

Owens River basin.

Jan. 25[b]	Rock Creek	Owens River	Below junction of Pine Creek, sec. 10, T. 6 S., R. 31 E.		59
24	South diversion of Bishop Creek.	do	Opposite California-Nevada Power Co.'s power house.		2.1
23	Division Creek	do	Former U. S. Geological Survey gaging station, about 10 miles north of Independence, Cal., secs. 4 and 5, T. 12 S., R. 34 E.		6.2
Feb. 1	do	do	do		8.6
1	Sawmill Creek	do	Former U. S. Geological Survey gaging station, about 8 miles north of Independence, Cal., sec. 9, T. 12 S., R. 34 E.		9.0
Jan. 12	North Branch of Shepard Creek.	do	Former U. S. Geological Survey gaging station, 3 miles east of mouth of canyon, just above irrigation diversions.		2.5
12	South Branch of Shepard Creek.	do	do		2.2
Feb. 23[c]	do	do	do		1.8
Jan. 12	Bairs Creek	do	Former U. S. Geological Survey gaging station, 3 miles east of mouth of canyon, sec. 16, T. 14 S., R. 35 E.		1.2
Feb. 23	do	do	do		.9
Jan. 12	George Creek	do	Former U. S. Geological Survey gaging station, 1 mile west of road from Independence to Lone Pine, Cal., sec. 27, T. 14 S., R. 35 E.		2.9
Feb. 23	do	do	do		1.9
Jan. 4	Ash Creek	do	Former U. S. Geological Survey gaging station, near Olancha, Cal., just above forks of creek near mouth of canyon, 16 miles south of Lone Pine, Cal., 8 miles north of Olancha, sec. 11, T. 18 S., R. 36 E.		2.1
Feb. 8	do	do	do		5.8

[a] Gage doubtful. Might be 1.95 feet.
[b] The surplus water over and above that measured in Rock and Pine creeks above the junction (see regular U. S. Geological Survey gaging stations) comes from springs in the canyon.
[c] North Branch of Shepard Creek was dry this date, 9.30 a. m.

Miscellaneous discharge measurements made in Great Basin in 1911—Continued.

Mono Lake basin.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
July 22	Rush Creek	Mono Lake	1 mile south of Farrington post office, Cal., above Parker and Walker creeks.		641
22	Parker Creek [a]	Rush Lake	At road crossing half mile south of Farrington, Cal.		45
23	Walker Creek [a]	do	At road crossing, Farrington, Cal.		11
22	Mill Creek [b]	Mono Lake	Above Lake Canyon, about one-fourth mile above Lundy Lake, at Lundy, Cal.		146
22	Lake Canyon Creek [b]	Mill Creek	At mouth, at Lundy, Cal.		2.8

Carson River basin.

Feb. 22	Carson River	Carson Sink	At Southern Pacific Railroad bridge, 1 mile north of Fort Churchill, Nev.	3.12	444
July 30	Town ditch	Markleeville Creek.	At Markleeville, Cal.		8.3
Nov. 6	do	do	do		4.2
July 30	J. Maisterrena ditch	Pleasant Valley Creek.	do		3.9
30	J. E. Mayo ditch	do	do		8.0

Truckee River basin.

Aug. 5	Alder Creek	Prosser Creek.	Near mouth, about 3½ miles northeast of Truckee, Cal.	0.66	6.7
Sept. 26	do	do	do	.59	4.0

Surprise Valley.

Mar. 25	Bidwell Creek	Upper Lake	Fort Bidwell, Cal.	0.33	11.6
Apr. 30	do	do	do	1.22	39.2
Nov. 3	do	do	do	.28	4.02

Warner Valley.

May 2	Twelvemile Creek	Twenty mile Creek.	1 mile west of Oregon, Nevada, and California corner.	1.21	37.6
Aug. 18	do	do	do	.40	2.5
Nov. 17	do	do	do	.39	2.2
May 2	do	do	Near Oregon, Nevada, and California corner.	1.97	62.3
Aug. 18	do	do	do	1.0	3.9
Nov. 17	do	do	do	1.11	4.6
May 1	Cowhead Lake outlet	Twelve mile Creek.	One-fourth mile below lake outlet.	−1.35	21.3
Aug. 18	do	do	do		Dry.
May 2	Fifteenmile Creek	do	Three-fourths mile above mouth.	1.34	16.0
Aug. 18	do	do	do	.49	1.4
Nov. 6	do	do	do	.16	1.07
May 1	Rock Creek	do	4 miles above mouth		6.3
Aug. 18	do	do	At mouth		Dry.
22	Blue Creek	Camas Creek	1 mile above mouth		1.25

[a] In addition to the discharge of Parker and Walker creeks, some 20 second-feet inflow is contributed between the mouth of Walker Creek and regular U. S. Geological Survey gaging station on Rush Creek near Mono Lake.

[b] About 3 second-feet should be added to the combined discharge of Mill Creek and Lake Canyon Creek to give the total flow of Lundy Lake on July 22.

Miscellaneous discharge measurements made in Great Basin in 1911.—Continued.

Canals in Warner Valley diverting from Deep Creek.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
June 3	Givens ditch		Adel, Oreg		3.21
3	Crump ditch		do		.97
Apr. 24	Company ditch		do		15.7
June 3	do		do		10.6
Apr. 24	Wible & Messner ditch		do		2.15
June 3	do		do		7.76
Apr. 24	Wible's ditch		do		.8
June 3	M. C. ditch		do		54.1
Aug. 10	do		do		39.6

Catlow Valley.

Apr. 20	Roaring Springs	Marsh River	Sec. 6, T. 345, R. 32 E., Willamette meridian.		6.05
Aug. 14	Threemile Creek	Marsh in Catlow Valley.	Mouth of canyon above Threemile Springs.		1.90
14	Threemile Springs	Threemile Creek.	One-fourth mile below head		.3
14	Skull Creek	Marsh	Mouth of canyon		.2

Alvord Lake basin.

Apr. 3	Trout Creek	Alvord Lake	One-fourth mile above mouth of Little Trout Creek.		40.0
Mar. 30	Trout Creek and ditches.	do	2½ miles below gaging station		29.7
Apr. 3	Little Trout Creek	Trout Creek	200 feet above mouth		6.5
3	Stony Creek	do	do		6.2
Mar. 27	Little Cottonwood Creek.	do	Near Catlow's, near Denio	1.09	5.7
Apr. 4	do	do	do	1.16	10.0
7	do	do	do	1.12	8.0

Canals diverting from Trout Creek.

Mar. 30	North ditch		At head gate		2.75
30	do		2½ miles below head gate		2.30
30	do		4½ miles below head gate		.5

Tumtum Lake basin.

Apr. 13	Pueblo Creek	Tumtum Lake	Mouth of canyon		0.84
Mar. 31	Big Cottonwood Creek	do	do		25.7
Apr. 13	Oliver Creek	do	do		.60
13	Thompson Springs	do	Near Denio-Andrews stage road		.28
13	Catlow Creek	do	do		.81
13	Arizona Creek	do	do		.30

Harney Valley.

Apr. 11	Knox Springs	Donner und Blitzen River.	Sec. 22, T. 315, R. 32½ E., Willamette meridian.		1.5
May 23	Smith Creek	do	Smith, Oreg		1.8

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