

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

GEORGE OTIS SMITH, DIRECTOR

WATER-SUPPLY PAPER 308

SURFACE WATER SUPPLY OF THE
UNITED STATES

1911

PART VIII. WESTERN GULF OF MEXICO

PREPARED UNDER THE DIRECTION OF M. O. LEIGHTON

BY

W. W. FOLLETT, W. B. FREEMAN
AND G. K. LARRISON



WASHINGTON
GOVERNMENT PRINTING OFFICE
1913

CONTENTS.

	Page.
Authority for investigations.....	5
Publications.....	6
Definition of terms.....	8
Convenient equivalents.....	9
Explanation of data.....	10
Accuracy and reliability of field data and comparative results.....	12
Cooperation and acknowledgments.....	13
Division of work.....	14
Brazos River basin.....	14
Brazos River at Waco, Tex.....	14
Colorado River (of Texas) basin.....	16
Colorado River at Austin, Tex.....	16
Evaporation at Austin, Tex.....	17
Colorado River at Columbus, Tex.....	18
Rio Grande basin.....	20
Seepage investigations on the Rio Grande.....	20
Rio Grande at Thirtymile bridge, near Creede, Colo.....	22
Rio Grande near Creede, Colo.....	23
Rio Grande near Del Norte, Colo.....	25
Rio Grande near Lobatos, Colo.....	27
Rio Grande near Buckman, N. Mex.....	30
Rio Grande near San Marcial, N. Mex.....	32
Rio Grande near El Paso, Tex.....	34
Rio Grande above Presidio, Tex.....	37
Rio Grande below Presidio, Tex.....	39
Rio Grande near Langtry, Tex.....	42
Rio Grande below Devils River, Tex.....	44
Rio Grande at Eagle Pass, Tex.....	47
Rio Grande near Laredo, Tex.....	49
Rio Grande near Roma, Tex.....	50
Rio Grande near Brownsville, Tex.....	52
South Fork of Rio Grande at South Fork, Colo.....	53
Saguache Creek near Saguache, Colo.....	55
San Luis Creek at Villa Grove, Colo.....	57
Kerber Creek near Villa Grove, Colo.....	59
Rio Alamosa near Monte Vista, Colo.....	60
Conejos River near Mogote, Colo.....	60
Culebra River at San Luis, Colo.....	63
Rio Colorado above Questa, N. Mex.....	63
Rio Colorado below Questa, N. Mex.....	64
Rio Hondo near Arroyo Hondo, N. Mex.....	65
Rio Pueblo de Taos near Taos, N. Mex.....	66
Rio Pueblo de Taos at Los Cordovas, N. Mex.....	68
Rio Lucero near Taos, N. Mex.....	71
Horn River near Canjilon, N. Mex.....	73
Rio Vallecitos at Vallecitos, N. Mex.....	73
Santa Fe Creek at Monument Rock, near Santa Fe, N. Mex.....	74

Rio Grande basin—Continued.	Page.
Santa Fe Creek at Santa Fe, N. Mex.....	75
Rio San Antonio near Ortiz, N. Mex.....	76
Rio Puerco at Rio Puerco, N. Mex.....	77
Rio Puerco near La Joya, N. Mex.....	77
San Jose River near Suwanee, N. Mex.....	78
Pecos River basin.....	79
Pecos River at Cowles, N. Mex.....	79
Pecos River near Anton Chico, N. Mex.....	81
Pecos River at Santa Rosa, N. Mex.....	82
Pecos River near Dayton, N. Mex.....	84
Pecos River near Lakewood, N. Mex.....	85
Pecos River near Moorhead, Tex.....	86
Gallinas River near Las Vegas, N. Mex.....	88
South Fork of Gallinas River at El Porvenir, N. Mex.....	90
Rio Ruidoso near Glencoe, N. Mex.....	91
Rio Ruidoso near Ruidoso, N. Mex.....	92
Penasco River at Elk, N. Mex.....	93
Penasco River at Cleve's ranch, near Elk, N. Mex.....	94
Devils River basin.....	95
Devils River at Devils River, Tex.....	95
Rio Salado basin.....	97
Rio Salado near Guerrero, Tamaulipas, Mexico.....	97
Rio San Juan basin.....	98
Rio San Juan near Santa Rosalia ranch, Tamaulipas, Mexico.....	98
Interior basins in New Mexico.....	100
General features.....	100
Rio Tularosa basin.....	100
Rio Tularosa near Bent, N. Mex.....	100
Rio Tularosa at Mescalero, N. Mex.....	101
Rio La Luz basin.....	102
Rio La Luz near La Luz, N. Mex.....	102
Mimbres River basin.....	103
Mimbres River near Faywood, N. Mex.....	103
Cameron Creek at Fort Bayard, N. Mex.....	104
Stevens Creek near Fort Bayard, N. Mex.....	105
Miscellaneous measurements in western Gulf of Mexico drainage basin.....	106
Index.....	109

ILLUSTRATIONS.

PLATE		Page.
I.	Map of United States showing mean annual precipitation.....	12
II.	Map of United States showing mean annual run-off.....	12
III.	Typical gaging stations: A, Cable station with automatic gage; B, For bridge measurement.....	12
IV.	Small Price current meters.....	13

SURFACE WATER SUPPLY OF THE WESTERN GULF OF MEXICO DRAINAGE BASINS, 1911.

By W. W. FOLLETT, W. B. FREEMAN, and G. K. LARRISON.

AUTHORITY FOR INVESTIGATIONS.

This volume is Part VIII 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 various private and State organizations have cooperated. Acknowledgment for such cooperation is made on page 13, and also in connection with the description of each station affected by the cooperative work.

PUBLICATIONS.

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

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

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

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

Report.	Character of data.	Year.
10th A, pt. 2.....	Descriptive information only.....	1884 to Sept., 1890.
11th A, pt. 2.....	Monthly discharge.....	1884 to June 30, 1891.
12th A, pt. 2.....	do.....	1884 to Dec. 31, 1892.
13th A, pt. 3.....	Mean discharge in second-feet.....	1888 to Dec. 31, 1893.
14th A, pt. 2.....	Monthly discharge (long-time records, 1871 to 1893).....	1893 and 1894.
B 131.....	Descriptions, measurements, gage heights, and ratings.....	1895.
16th A, pt. 2.....	Descriptive information only.....	1896.
B 140.....	Descriptions, measurements, gage heights, ratings, and monthly discharge (also many data covering earlier years).....	1895 and 1896.
WS 11.....	Gage heights (also gage heights for earlier years).....	1897.
18th A, pt. 4.....	Descriptions, measurements, ratings, and monthly discharge (also similar data for some earlier years).....	1897.
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).....	1898.
WS 27.....	Measurements, ratings, and gage heights, eastern United States, eastern Mississippi River and Missouri River.....	1898.
WS 28.....	Measurements, ratings, and gage heights, Arkansas River and western United States.....	1898.
20th A, pt. 4.....	Monthly discharge (also for many earlier years).....	1898.
WS 35 to 39.....	Descriptions, measurements, gage heights, and ratings.....	1899.
21st A, pt. 4.....	Monthly discharge.....	1899.
WS 47 to 52.....	Descriptions, measurements, gage heights, and ratings.....	1900.
22d A, pt. 4.....	Monthly discharge.....	1900.
WS 65, 66.....	Descriptions, measurements, gage heights, and ratings.....	1901.
WS 75.....	Monthly discharge.....	1901.
WS 82 to 85.....	Complete data.....	1902.
WS 97 to 100.....	do.....	1903.
WS 124 to 135.....	do.....	1904.
WS 165 to 178.....	do.....	1905.
WS 201 to 214.....	Complete data, except descriptions.....	1906.
WS 241 to 252.....	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 <i>a</i>	1900 <i>b</i>	1901	1902	1903	1904
North Atlantic coast (St. John River to York River).....	35	47, <i>c</i> 48	65, 75	82	97	<i>d</i> 124, <i>e</i> 125, <i>f</i> 126
South Atlantic coast and eastern Gulf of Mexico (James River to the Mississippi).....	<i>g</i> 35, 36	48	65, 75	<i>g</i> 82, 83	<i>g</i> 97, 98	<i>f</i> 126, 127
Ohio River basin.....	36	48, <i>h</i> 49	65, 75	83	98	128
St. Lawrence River and Great Lakes.....	36	49	65, 75	<i>i</i> 82, 83	97	129
Hudson Bay and upper Mississippi River.....	36	49	<i>j</i> 65, 66, 75	<i>j</i> 83, 85	<i>j</i> 98, 99, 100	<i>j</i> 128, 130
Missouri River.....	<i>k</i> 36, 37	49, <i>l</i> 50	66, 75	84	99	130, <i>m</i> 131
Lower Mississippi River.....	37	50	<i>j</i> 65, 66, 75	<i>j</i> 83, 84	<i>j</i> 98, 99	<i>j</i> 128, 131
Western Gulf of Mexico.....	37	50	66, 75	84	99	132
Colorado River.....	<i>n</i> 37, 38	50	66, 75	85	100	133
Great Basin.....	38, <i>p</i> 39	51	66, 75	85	100	133, <i>q</i> 134
Pacific coast in California.....	38, <i>r</i> 39	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).....	<i>d</i> 165, <i>e</i> 166, <i>f</i> 167	<i>d</i> 201, <i>e</i> 202, <i>f</i> 203	241	261	281	301
South Atlantic coast and eastern Gulf of Mexico (James River to the Mississippi).....	<i>f</i> 167, 168	<i>f</i> 203, 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.....	<i>f</i> 169, 173	<i>f</i> 205, 209	247	267	287	307
Western Gulf of Mexico.....	174	210	248	268	288	308
Colorado River.....	175, <i>o</i> 177	211	249	269	289	309
Great Basin.....	176, <i>q</i> 177	212, <i>q</i> 213	250, <i>q</i> 251	270, <i>q</i> 271	290	310
Pacific coast in California.....	177	213	251	271	291	311
North Pacific coast.....	<i>s</i> 177, 178	214	252	272	292	312

a Rating tables and index to Water-Supply Papers 35-39 contained in Water-Supply Paper 39.

b Rating tables and index to Water-Supply Papers 47-52 and data on precipitation, wells, and irrigation in California and Utah contained in Water-Supply Paper 52.

c Wissahickon and Schuylkill rivers to James River.

d New England rivers only.

e Hudson River to Delaware River, inclusive.

f Susquehanna River to Yadkin River, inclusive.

g James River only.

h Scioto River.

i Lake Ontario and tributaries to St. Lawrence River proper.

j Tributaries of Mississippi from east.

k Gallatin River.

l Loup and Platte rivers near Columbus, Nebr., and all tributaries below junction with Platte.

m Platte and Kansas rivers.

n Green and Gunnison rivers and Grand River above junction with Gunnison.

o Below junction with Gila.

p Mohave River only.

q Great Basin in California, excepting Truckee and Carson drainage basins.

r Kings and Kern rivers and south Pacific coast drainage basins.

s Rogue, Umpqua, and Siletz rivers only.

DEFINITION OF TERMS.

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

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

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

"Run-off 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 of water required to cover an acre to the depth of 1 foot. The term is commonly used in connection with storage for irrigation work.

CONVENIENT EQUIVALENTS.

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

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

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

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

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

Discharge (second- feet).	Run-off (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 the values for one day by the number of days.

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

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

EXPLANATION OF DATA.

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

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

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

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

The rating table gives, either directly or by interpolation, the discharge in second-feet corresponding to every stage of the river recorded during the period for which it is applicable. It is not published in this report but can be determined from the tables of daily gage heights and daily discharge, 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 headed "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 9, 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 run-off and rainfall in the United States as determined from the measurements of stream flow made by the Geological Survey and records of rainfall collected by the Weather Bureau. Plate III shows typical gaging stations, indicating the method of suspending the current meter; Plate IV shows current meters¹ 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; and, third, to errors due to misinterpretation of stage and flow data.

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

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.



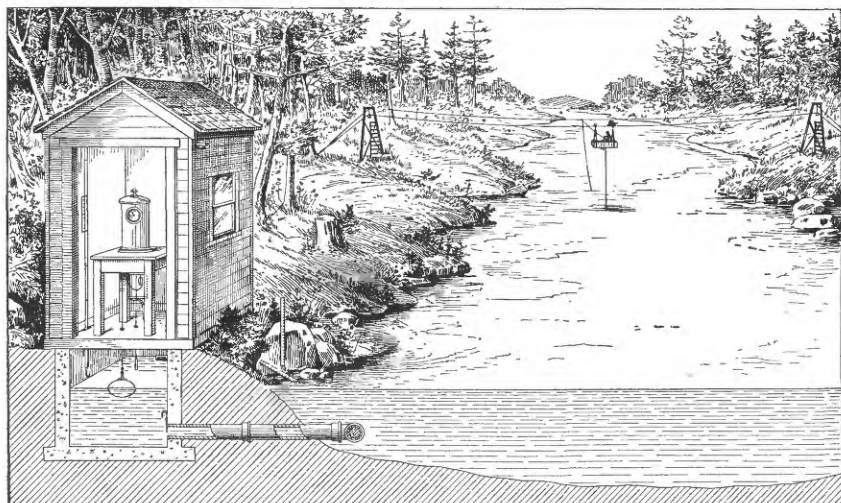
MAP OF UNITED STATES, SHOWING MEAN ANNUAL PRECIPITATION
Blue lines and figures indicate average annual precipitation in depth in inches

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



MAP OF UNITED STATES, SHOWING MEAN ANNUAL RUN-OFF
Blue lines and figures indicate average annual run-off in depth in inches

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

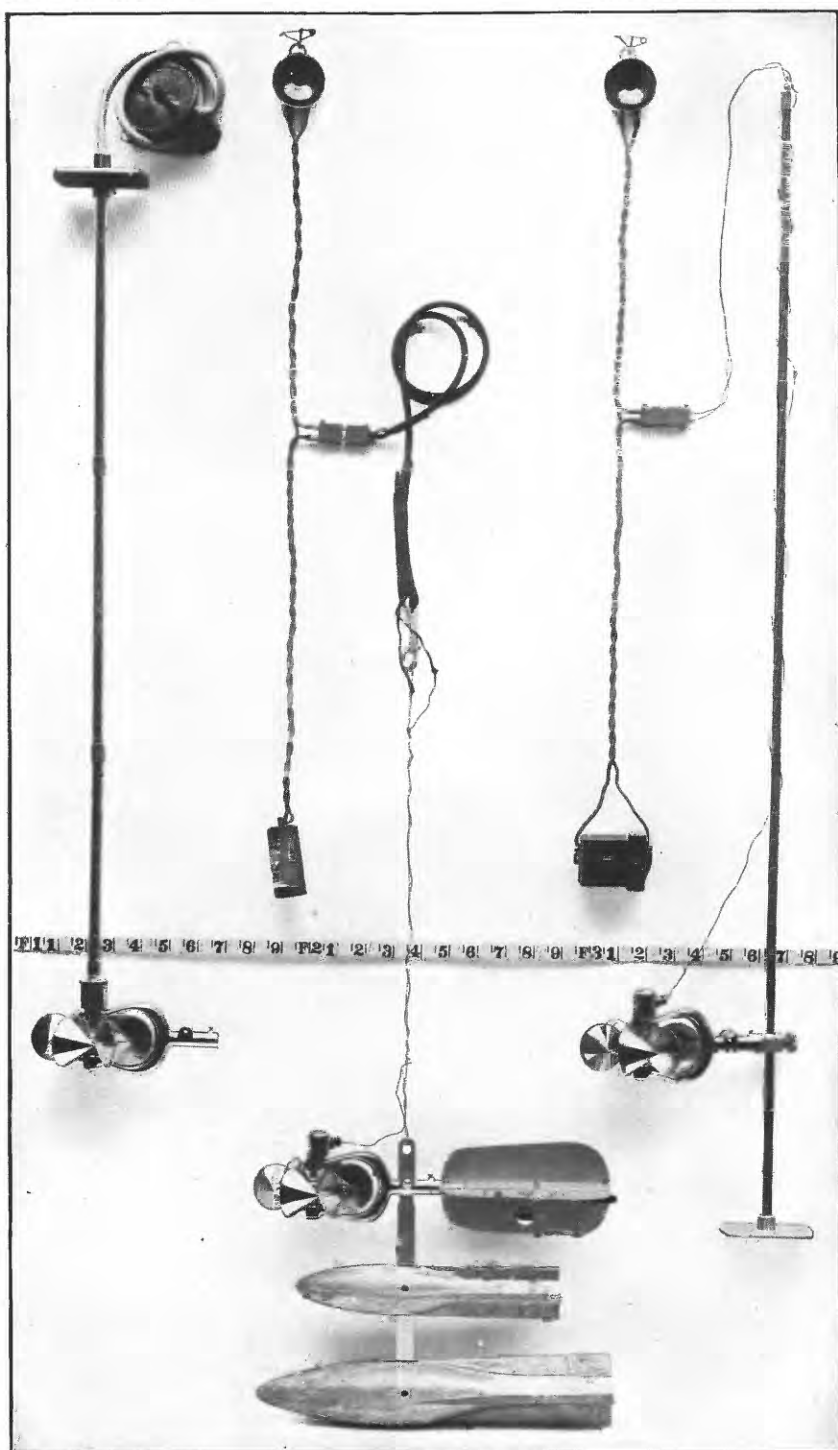


A. CABLE STATION, WITH AUTOMATIC GAGE.



B. FOR BRIDGE MEASUREMENT.

TYPICAL GAGING STATIONS



SMALL PRICE CURRENT METERS.

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

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

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

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

COOPERATION AND ACKNOWLEDGMENTS.

The work in Colorado was carried on in cooperation with C. W. Comstock, State engineer, who collected the field data on the stations on the Rio Grande and furnished the entire records at a number of other stations, as noted in connection with the station descriptions; and with the United States Forest Service, which provided the services of a hydrographer for measuring the streams in the national forests and also furnished the gage heights.

In New Mexico the work was carried on in cooperation with C. D. Miller, Territorial engineer, who paid the field expenses incurred for most of the New Mexico stations and also paid the gage observers. Cooperation with the Atchison, Topeka & Santa Fe Railway Co.

and with other private parties was arranged by the Territorial engineer.

The records for Pecos River at Dayton and Lakewood were furnished by the United States Reclamation Service.

Gage heights on the Rio Pueblo de Taos and the Rio Lucero were collected by the United States Indian Office.

The stations on the Rio Grande in Texas and Mexico have been maintained in cooperation with the International Boundary Commission, Wilbur Keblinger, commissioner on the part of the United States; Señor Fernando Beltrán y Puga, commissioner on the part of Mexico; and W. W. Follett, consulting engineer on the part of the United States.

DIVISION OF WORK.

The field data in the Rio Grande basin were collected by the United States Geological Survey under the direction of W. B. Freeman, district engineer, who was assisted by G. A. Gray, E. O. Christiansen, J. B. Stewart, G. H. Russell, O. M. Wimmer, and H. B. Waha. Assistance in New Mexico was also rendered by R. L. Cooper and C. B. Digby, of the Territorial engineer's office.

With the exception of certain data furnished completely by the State of Colorado and the United States Reclamation Service, the computations and general review of the data were carried on under the direction of R. H. Bolster, hydraulic engineer, by G. K. Larrison, H. D. Padgett, A. H. Tuttle, H. J. Dean, and M. I. Walters.

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

BRAZOS RIVER BASIN.

BRAZOS RIVER AT WACO, TEX.

Location.—Suspension Bridge on Bridge Street, Waco, Tex.

Records available.—September 14, 1898, to December 31, 1911.

Drainage area.—30,800 square miles.

Gage.—Chain; attached to downstream upper chord of stiffening truss of bridge.

So far as known datum unchanged since establishment of station.

Channel.—Bed is composed of sand, is free from vegetation, and shifts. Right bank of limestone; not inundated by floods; left bank is high but is overflowed at flood stages. A single-span truss bridge crosses the river at an angle of about 76° about 300 feet above the bridge. A few hundred feet below the gage sand is taken out of the river for commercial purposes. Between this point and the gage the channel is modified at low stages to direct the current away from or toward certain discharge pipes from factories.

Discharge measurements.—Made from suspension bridge.

Accuracy.—The low-stage rating curve is unstable on account of the shifting sands.

The following measurement was made by R. G. Tyler:

December 27, 1911: Gage height, 5.2 feet; discharge, 2,780 second-feet. This measurement does not agree with the 1907-1910 rating curve by a considerable difference, and hence estimates of discharge for 1911, which are based on this curve, are probably very poor.

Daily gage height, in feet, of Brazos River at Waco, Tex., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	1.5	1.0	4.0	4.5	2.8	1.1	1.0	3.1	12.6	3.0	1.8	1.8
2.....	1.5	1.0	3.6	3.6	2.2	1.0	.9	3.0	9.0	2.8	1.8	1.8
3.....	1.4	1.0	3.5	3.2	1.9	1.0	.9	2.8	8.6	2.8	1.7	1.7
4.....	1.4	.9	3.3	7.1	1.9	.9	.9	2.6	7.1	2.6	1.7	1.7
5.....	1.3	.9	3.2	4.6	3.6	.9	.8	2.6	11.4	2.5	1.8	1.7
6.....	1.3	.9	3.0	3.3	3.3	.9	.8	2.5	15.5	2.5	1.8	1.8
7.....	1.1	.8	3.0	2.8	3.2	.8	.8	2.4	11.4	2.4	1.8	2.2
8.....	1.1	.8	2.9	2.4	3.0	.8	.8	3.8	13.0	2.4	2.0	2.0
9.....	1.0	1.0	2.7	2.2	2.9	2.4	1.4	5.4	9.6	2.4	2.0	2.0
10.....	1.0	1.2	2.6	2.2	2.8	2.2	2.6	4.6	7.8	2.3	2.0	2.4
11.....	1.1	1.5	2.5	2.1	2.5	2.0	1.6	6.1	7.4	2.3	2.0	2.6
12.....	1.1	1.5	2.5	2.0	2.6	1.9	1.6	5.0	6.6	2.8	2.0	2.4
13.....	1.1	1.5	2.4	2.0	3.6	1.7	2.8	4.6	6.0	3.3	2.0	10.1
14.....	1.0	1.5	2.1	1.9	2.4	1.5	2.2	3.6	5.4	3.0	1.8	8.2
15.....	1.0	1.4	2.0	2.3	2.2	1.4	5.5	3.1	6.4	2.5	1.8	7.1
16.....	1.0	1.4	2.0	2.6	2.0	1.3	3.0	2.8	5.1	2.5	1.8	7.4
17.....	1.0	1.6	2.0	3.0	2.0	1.2	5.5	2.5	4.8	2.0	2.0	6.1
18.....	1.1	1.5	1.9	2.6	1.9	1.2	18.5	2.3	4.2	1.7	2.0	4.8
19.....	1.1	1.5	2.0	2.4	1.8	1.2	8.1	2.2	3.8	2.5	1.8	4.1
20.....	1.1	1.8	2.0	2.2	1.8	1.1	10.1	2.1	3.5	2.1	1.8	5.0
21.....	1.1	1.8	2.0	2.1	2.0	1.0	7.6	2.0	3.4	2.0	1.8	4.4
22.....	1.0	10.6	2.1	2.5	2.0	1.0	8.0	2.0	3.1	2.0	1.8	9.6
23.....	1.0	7.8	2.0	2.7	1.9	1.0	6.2	1.8	5.2	2.0	1.9	9.1
24.....	1.0	6.6	2.0	2.4	1.8	1.8	5.5	2.6	4.1	1.9	1.9	6.5
25.....	1.0	6.4	2.0	1.9	1.7	1.6	9.5	2.5	3.4	1.8	1.9	6.0
26.....	.9	5.5	2.2	1.8	1.6	1.5	6.6	2.5	3.0	1.8	1.8	5.4
27.....	1.1	4.6	2.0	1.8	1.5	1.4	5.1	2.5	2.5	1.8	1.8	4.6
28.....	1.1	4.2	2.0	1.8	1.4	1.4	4.5	5.2	2.5	1.9	1.8	4.0
29.....	1.1	.....	1.9	1.8	1.3	1.2	4.1	4.4	2.5	1.8	1.8	4.0
30.....	1.0	.....	1.9	1.7	1.3	1.1	3.8	11.5	3.0	1.9	1.8	4.0
31.....	1.0	.....	1.9	.....	1.2	.....	3.2	13.6	.....	1.9	.....	4.0

Daily discharge, in second-feet, of Brazos River at Waco, Tex., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	34	8	1,060	1,500	290	10	8	410	16,410	365	70	70
2.....	34	8	740	740	140	8	6	365	8,190	290	70	70
3.....	26	8	665	460	86	8	6	290	7,410	290	56	56
4.....	26	6	520	4,800	86	6	6	234	4,800	234	56	56
5.....	20	6	460	1,600	740	6	4	234	13,500	208	70	56
6.....	20	6	365	520	520	6	4	208	24,800	208	70	70
7.....	10	4	365	290	460	4	4	184	13,500	184	70	140
8.....	10	4	325	184	365	4	4	900	17,400	184	102	102
9.....	8	8	260	140	325	184	26	2,460	9,410	184	102	102
10.....	8	14	234	140	290	140	234	1,600	5,940	162	102	184
11.....	10	34	208	120	208	102	44	3,360	5,280	162	102	234
12.....	10	34	208	102	234	86	44	2,000	4,060	290	102	184
13.....	10	34	184	102	740	56	290	1,600	3,220	520	102	10,500
14.....	8	34	120	86	184	34	140	740	2,460	365	70	6,660
15.....	8	26	102	162	140	26	2,580	410	3,770	208	70	4,800
16.....	8	26	102	234	102	420	365	290	2,120	208	70	5,280
17.....	8	44	102	365	102	14	2,580	208	1,800	102	102	3,360
18.....	10	34	86	234	86	14	35,400	162	1,240	56	102	1,800
19.....	10	34	102	184	70	14	6,480	140	900	208	70	1,150
20.....	10	70	102	140	70	10	10,500	120	665	120	70	2,000
21.....	10	70	102	120	102	8	5,600	102	590	102	70	1,410
22.....	8	11,600	120	208	102	8	6,300	102	410	102	70	9,410
23.....	8	5,940	102	260	86	8	3,490	70	2,220	102	86	8,400
24.....	8	4,060	102	184	70	70	2,580	234	1,150	86	86	3,910
25.....	8	3,770	102	86	56	44	9,200	208	590	70	86	3,220
26.....	6	2,580	140	70	44	34	4,060	208	365	70	70	2,460
27.....	10	1,600	102	70	34	26	2,120	208	208	70	70	1,600
28.....	10	1,240	102	70	26	26	1,500	2,220	208	86	70	1,060
29.....	10	.....	86	70	20	14	1,150	1,410	208	70	70	1,060
30.....	8	.....	86	56	20	10	900	13,700	365	86	70	1,060
31.....	8	.....	86	.....	14	.....	460	19,100	.....	86	.....	1,060

NOTE.—Daily discharge determined from a rating curve of doubtful accuracy.

Monthly discharge of Brazos River at Waco, Tex., for 1911.

[Drainage area, 30,800 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.....	34	8	12.3	0.0004	0.0005	756	D.
February.....	11,600	4	1,120	.036	.04	62,200	D.
March.....	1,060	86	240	.0078	.01	14,800	D.
April.....	4,800	56	443	.014	.02	26,400	D.
May.....	740	14	187	.006	.01	11,500	D.
June.....	184	4	33.3	.0011	.001	1,980	D.
July.....	35,400	4	3,100	.101	.12	191,000	D.
August.....	19,100	70	1,720	.056	.06	106,000	D.
September.....	24,800	208	5,110	.166	.19	304,000	D.
October.....	520	56	177	.0057	.01	10,900	D.
November.....	102	56	79.2	.0026	.003	4,710	D.
December.....	10,500	56	2,310	.075	.01	142,000	D.
The year.....	35,400	4	1,210	.0393	.47	876,000	

COLORADO RIVER (OF TEXAS) BASIN.**COLORADO RIVER AT AUSTIN, TEX.**

Location.—At the Congress Avenue Bridge, south of the city of Austin, to which point it was removed on the failure of the Austin dam in April, 1900.

Records available.—December 21, 1897, to December 31, 1911.

Drainage area.—37,000 square miles.

Gage.—A staff consisting of upright posts driven into the bed of the river near the bathhouse about 150 feet above the bridge. At stages not readable on the staff gage observations are made at the first pier (from the north) on the bridge which has been marked up to 21 feet; at stages above 21 feet the chain gage is used.

Channel.—Bed of stream composed of sand and gravel; shifts slightly; current moderately rapid; neither bank has been overflowed since the dam was washed away. The low-water level at this point has been gradually falling for several years as a result of erosion of the channel about 200 yards below the highway bridge. Under the highway bridge the water spreads out into a large pool, the outlet of which is through two contracted channels below, the main one being that in which the erosion has taken place; the lowest level recorded was 0.45 foot by gage August 13–20, 1910.

Discharge measurements.—Made from the bridge. No measurements were made during 1911, and hence estimates of discharge are withheld.

Daily gage height, in feet, of Colorado River at Austin, Tex., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	1.0	1.1	2.0	1.6	2.5	1.0	.9	1.9	8.0	1.8	1.0	.9
2.....	1.0	1.1	1.8	1.6	3.0	.9	.9	1.9	6.0	1.8	.9	.9
3.....	1.0	1.1	1.7	1.6	5.8	.9	.8	1.8	4.2	1.7	.9	.9
4.....	1.0	1.0	1.6	1.9	4.9	2.0	.8	1.6	2.5	1.7	1.0	.9
5.....	1.0	1.0	1.7	3.2	3.7	2.0	.8	1.8	2.5	1.5	1.0	.9
6.....	.9	1.0	1.7	2.9	3.0	1.8	.8	3.2	9.0	1.4	1.0	.9
7.....	.9	1.0	1.7	2.5	2.8	1.6	.8	3.0	10.0	1.4	1.0	1.0
8.....	.9	1.0	1.6	2.2	2.5	1.4	.8	2.6	8.6	1.4	1.1	1.0
9.....	.9	.9	1.6	2.2	2.3	1.3	.7	2.3	6.5	1.4	1.2	1.0
10.....	.9	.9	1.6	2.4	2.0	1.3	.7	2.0	4.6	1.3	1.1	1.0
11.....	.9	1.2	1.6	2.5	2.0	1.2	.7	1.9	3.0	1.3	1.0	1.1
12.....	.9	1.3	1.5	2.3	2.1	1.1	.7	1.9	2.5	1.3	1.0	1.1
13.....	.9	1.2	1.5	2.1	2.0	1.1	.7	1.7	2.3	1.4	1.0	1.1
14.....	.9	1.2	1.5	2.0	2.0	1.0	.7	1.5	2.3	1.4	1.0	7.5
15.....	1.0	2.0	1.4	1.8	2.0	1.0	1.6	1.4	2.2	1.3	1.0	3.8

Daily gage height, in feet, of Colorado River at Austin, Tex., for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
16.....	1.0	1.9	1.4	1.8	2.0	1.0	1.5	1.6	2.0	1.3	1.0	2.6
17.....	1.0	1.7	1.4	6.2	2.3	1.0	1.5	1.6	1.9	1.3	1.0	2.2
18.....	1.1	1.5	1.4	6.3	2.3	.9	1.6	1.5	1.8	1.2	1.0	2.0
19.....	1.1	1.8	1.5	4.5	2.2	.9	1.8	1.4	1.8	1.2	.9	1.8
20.....	1.1	1.9	1.6	3.5	2.1	.9	3.5	1.3	1.8	1.2	.9	1.6
21.....	1.1	2.2	1.5	2.4	1.8	.9	4.5	1.1	1.6	1.2	.9	1.5
22.....	1.1	8.6	1.5	1.8	1.5	.9	2.9	1.0	1.5	1.3	.9	1.4
23.....	1.1	9.0	1.5	3.6	1.4	.8	2.6	.9	1.4	1.4	.9	2.0
24.....	1.2	8.2	1.5	8.0	1.3	.8	2.5	.9	1.5	1.3	.9	2.5
25.....	1.2	6.4	1.5	5.0	1.3	.8	2.4	.9	1.5	1.3	1.0	2.4
26.....	1.2	4.8	1.5	3.9	1.1	.8	2.3	.9	1.5	1.3	1.0	2.3
27.....	1.2	3.2	1.5	3.7	1.1	1.2	5.2	.9	1.8	1.3	.9	2.1
28.....	1.1	2.6	1.5	2.9	1.0	1.0	6.6	1.8	1.8	1.2	.9	2.0
29.....	1.1	.....	1.5	2.5	1.0	.9	4.3	1.4	1.7	1.2	.9	1.8
30.....	1.1	.....	1.5	2.4	1.0	1.0	3.1	6.0	1.8	1.1	.9	1.7
31.....	1.1	.....	1.5	.....	1.0	.....	2.4	5.2	.....	1.0	.....	1.6

EVAPORATION AT AUSTIN, TEX.

The rate of evaporation at Austin has been measured during 1911 at a station at the residence of H. B. Beck, adjoining Hyde Park. A cement pit 5 feet square and 5 feet deep is kept practically full of water in which floats a galvanized pan, 30 inches long by $24\frac{1}{16}$ inches wide, so that 1 gill of water will raise the level of the water 0.01 inch over the surface of the pan. The pan is protected from waves and other disturbing influences by a border of floating planks. The results of the measurements are shown in the following table:

The total evaporation for the year amounted to 50.92 inches; rain fell on 58 days of the year.

Evaporation data for 1911 at Austin, Tex.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	0.14	0.01	R.	0.11	0.14	0.24	0.20	0.35	0.22	0.27	0.18	0.08
2.....	.14	.12	0.11	.14	R.	.27	.16	.28	.26	.19	.00	.06
3.....	.14	.11	.13	.12	.03	.24	.16	.34	.30	.22	.03	.14
4.....	.14	.17	.08	.15	.01	.20	.32	.30	.23	.15	.04	.06
5.....	.16	.03	.09	.17	.17	.23	.26	.48	.23	.18	.08	.10
6.....	.16	.08	.04	.19	.09	.28	R.	.18	.24	R.	R.	.08
7.....	.16	.09	.04	.31	.20	.26	.14	.28	.24	.01	R.	R.
8.....	.08	.07	.18	.16	.07	.27	.22	.32	.22	.20	R.	R.
9.....	.08	R.	.14	R.	.20	.27	.30	.38	.22	.10	.03	R.
10.....	.12	R.	.14	.10	.19	.26	.23	.22	.31	.00	.08	R.
11.....	.13	.02	.07	.13	.10	.23	.26	.28	.25	R.	.06	.08
12.....	.20	R.	.16	.12	R.	.24	.26	.33	.26	R.	.04	.12
13.....	R.	.03	.22	.24	.07	.23	.26	.29	.29	R.	.02	.08
14.....	R.	.02	R.	R.	.18	.25	.23	.28	.22	R.	.03	.06
15.....	.05	.01	.18	.05	.16	.30	R.	.12	.28	R.	.04	.08
16.....	.05	.02	R.	.10	.16	.27	.14	.25	.26	.23	.08	.00
17.....	R.	R.	R.	R.	.15	.27	R.	.29	.22	.13	.18	.01
18.....	R.	R.	R.	R.	.19	.28	.24	.35	.24	.12	.00	R.
19.....	.07	.12	.08	R.	.08	.21	.28	.29	.32	.12	.03	R.
20.....	.03	.18	R.	R.	.18	.34	.25	.35	.16	.18	.04	.12
21.....	.09	.18	.12	.08	.22	.27	.31	.33	.08	.14	.08	.01
22.....	.17	.14	.14	.56	.28	.20	.37	.34	R.	R.	.03	.00
23.....	R.	.15	.14	R.	.24	.30	.32	.30	.11	.08	.04	.00
24.....	.04	.15	R.	.14	.24	.25	.39	.30	.17	.06	.10	R.
25.....	.03	.02	R.	R.	.28	.29	.28	R.	.25	.08	.01	R.
26.....	.02	R.	.20	.02	.20	.36	.25	.25	.25	.12	.06	.00
27.....	.01	R.	.08	.08	.20	.30	.30	.30	.35	.10	.04	.12
28.....	.00	R.	.14	.04	.18	.28	.30	.06	.24	.12	.04	R.
29.....	.08	.....	.10	.06	.18	.31	.26	.16	R.	R.	.03	.12
30.....	.14	.....	.04	.....	.17	.26	.34	.32	.27	R.	.02	.00
31.....	.09	.....	.....	.....	.14	.....	.30	.26	.....	.06	.10	.04
Total.....	2.52	1.72	2.62	3.07	4.70	7.96	7.33	8.58	6.69	2.86	1.51	1.36

NOTE.—Total for year=50.92 inches=4.24 feet; 58 days rain (R.).

COLORADO RIVER AT COLUMBUS, TEX.

Location.—Highway bridge east of Columbus, Tex.

Records available.—January 1, 1903, to December 31, 1911.

Drainage area.—40,000 square miles.

Gage.—Marked on the downstream side of pier on the west side of the river. No change of datum so far as known.

Channel.—Bed is composed of gravel and sand and is fairly permanent. At low stages the channel is unobstructed by piers, but at high stages the flow is obstructed by two piers. At extreme high stages the left bank is overflowed for several hundred feet under the trestle approach to the bridge.

Discharge measurements.—Made from the bridge.

The following discharge measurement was made by R. G. Tyler:

December, 1911: Gage height, 10 feet; discharge, 3,890 second-feet. This measurement plots about 30 per cent in excess of the 1907–1910 rating curve, and hence estimates of discharge for 1911 which are based on this curve are probably very poor.

Daily gage height, in feet, of Colorado River at Columbus, Tex., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	7.4	4.9	10.9	6.7	17.5	6.5	5.3	12.0	9.8	7.0	6.4	5.0
2.....	7.7	4.8	10.0	7.8	14.4	6.4	5.3	10.8	15.0	6.9	6.2	5.0
3.....	6.5	4.8	9.4	7.5	15.1	6.2	5.2	9.8	19.6	7.2	6.1	4.9
4.....	6.4	4.8	8.9	10.8	13.4	6.0	5.0	9.1	15.7	7.4	6.0	4.9
5.....	6.2	4.7	8.4	10.7	16.1	5.9	4.9	8.5	13.2	7.1	5.9	4.8
6.....	6.1	4.7	8.1	8.2	14.8	5.8	4.9	8.0	11.5	6.9	5.8	4.8
7.....	6.0	4.7	7.4	8.7	13.4	5.8	4.9	7.7	10.3	6.8	6.1	4.8
8.....	6.0	4.7	7.2	10.2	12.2	7.7	4.9	7.4	17.2	6.7	6.5	4.8
9.....	5.9	4.6	7.2	8.2	11.1	7.5	5.0	10.8	22.2	6.6	6.7	4.8
10.....	5.8	4.6	7.1	8.6	10.3	7.3	5.3	10.9	20.6	6.4	6.8	5.6
11.....	5.8	4.6	7.0	8.2	9.7	7.1	5.2	9.8	16.1	6.2	6.6	12.5
12.....	5.6	4.5	7.0	8.2	13.8	6.9	5.1	8.9	14.3	6.2	6.5	6.8
13.....	5.6	4.5	6.8	8.3	14.6	6.8	5.0	8.2	12.5	6.6	6.3	6.6
14.....	5.5	4.5	6.7	8.6	14.8	6.6	5.0	7.9	11.4	7.4	6.1	6.4
15.....	5.5	4.5	6.6	8.2	11.4	6.2	5.0	7.6	10.5	6.8	6.0	14.5
16.....	5.4	4.5	6.5	7.8	9.4	6.0	5.1	7.4	9.7	6.4	5.9	17.5
17.....	5.4	4.5	6.4	7.3	8.9	5.9	5.1	7.1	9.1	6.3	5.9	13.5
18.....	5.3	4.5	6.3	7.1	8.4	5.8	5.2	6.9	8.7	6.1	5.8	11.3
19.....	5.2	6.6	6.2	19.2	8.2	5.7	5.3	6.7	8.3	6.0	5.8	10.2
20.....	5.3	12.5	7.5	15.2	9.2	5.7	6.5	6.6	8.0	5.9	5.7	12.7
21.....	5.2	8.8	6.5	13.7	12.5	5.6	6.4	6.6	7.6	5.9	5.7	11.3
22.....	5.2	7.9	6.4	12.5	9.6	5.5	8.8	6.5	7.4	5.8	5.6	9.9
23.....	5.2	7.4	6.7	11.5	8.8	7.1	12.7	6.4	7.3	6.8	5.6	8.6
24.....	5.2	20.2	7.5	13.3	8.2	6.0	11.6	6.3	7.2	6.7	5.5	8.1
25.....	5.1	21.3	7.9	15.1	7.9	5.9	10.6	6.2	7.1	6.6	5.4	7.9
26.....	5.1	18.7	15.1	18.2	7.6	5.8	9.6	6.1	7.0	6.4	5.4	7.8
27.....	5.1	14.4	10.0	16.5	7.4	5.6	9.3	6.0	7.1	6.3	5.3	8.2
28.....	5.0	12.2	8.2	14.2	7.2	5.5	8.9	5.9	7.0	6.2	5.2	9.4
29.....	5.0	.....	7.0	13.1	7.0	5.4	14.9	5.9	6.8	6.1	5.2	8.9
30.....	5.0	.....	6.7	11.8	6.8	5.4	17.0	6.0	6.6	6.1	5.1	8.7
31.....	5.0	.....	6.5	.....	6.6	.....	13.6	5.9	.....	6.6	.....	8.4

Daily discharge, in second-feet, of Colorado River at Columbus, Tex., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	1,520	215	3,970	1,120	10,500	1,000	400	4,850	3,130	1,280	950	260
2.....	1,700	175	3,270	1,760	6,990	950	400	3,890	7,590	1,220	850	260
3.....	1,000	175	2,850	1,580	7,690	850	350	3,130	13,400	1,400	800	215
4.....	950	175	2,500	3,890	6,070	750	260	2,640	8,330	1,520	750	215
5.....	850	135	2,150	3,810	8,780	700	215	2,220	5,890	1,340	700	175
6.....	800	135	1,940	2,010	7,390	650	215	1,880	4,450	1,220	650	175
7.....	750	135	1,520	2,360	6,070	650	215	1,700	3,490	1,170	800	175
8.....	750	135	1,400	3,410	5,010	1,700	215	1,520	10,100	1,120	1,000	175
9.....	700	100	1,400	2,010	4,130	1,580	260	3,890	17,400	1,060	1,120	175
10.....	650	100	1,340	2,290	3,490	1,460	400	3,970	14,900	950	1,170	590
11.....	650	100	1,280	2,010	3,060	1,340	350	3,130	8,780	850	1,060	5,260
12.....	550	70	1,280	2,010	6,430	1,220	305	2,500	6,890	850	1,000	1,170
13.....	550	70	1,170	2,080	7,190	1,170	260	2,010	5,260	1,060	900	1,060
14.....	500	70	1,120	2,290	7,390	1,060	260	1,820	4,370	1,520	800	950
15.....	500	70	1,060	2,010	4,370	850	260	1,640	3,650	1,170	750	7,090
16.....	450	70	1,000	1,760	2,850	750	305	1,520	3,060	950	700	10,500
17.....	450	70	950	1,400	2,500	700	305	1,340	2,640	900	700	6,160
18.....	400	70	900	1,340	2,150	650	350	1,220	2,360	800	650	4,290
19.....	350	1,060	850	12,800	2,010	600	400	1,120	2,080	750	650	3,410
20.....	400	5,260	1,580	7,790	2,710	600	1,000	1,060	1,880	700	600	5,440
21.....	350	2,430	1,000	6,340	5,260	550	950	1,060	1,640	700	600	4,290
22.....	350	1,820	950	5,260	2,990	500	2,430	1,000	1,520	650	550	3,200
23.....	350	1,520	1,120	4,450	2,430	1,340	5,440	950	1,460	1,170	550	2,290
24.....	350	14,300	1,580	5,980	2,010	750	4,530	900	1,400	1,120	500	1,940
25.....	305	15,900	1,820	7,690	1,820	700	3,730	850	1,340	1,060	450	1,820
26.....	305	12,100	7,690	11,400	1,640	650	2,990	800	1,280	950	450	1,760
27.....	305	6,990	3,270	9,260	1,520	550	2,780	750	1,340	900	400	2,010
28.....	260	5,010	2,010	6,790	1,400	500	2,500	700	1,280	850	350	2,850
29.....	260	.....	1,280	5,800	1,280	450	7,490	700	1,170	800	350	2,500
30.....	260	.....	1,120	4,690	1,170	450	9,860	750	1,060	800	305	2,360
31.....	260	.....	1,000	.....	1,060	.....	6,250	700	.....	1,060	.....	2,150

NOTE.—Daily discharge determined from a rating curve of doubtful accuracy.

Monthly discharge of Colorado River at Columbus, Tex., for 1911.

[Drainage area, 40,000 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.....	1,700	260	575	0.014	0.02	35,400	D.
February.....	15,900	70	2,440	.061	.06	136,000	D.
March.....	7,690	850	1,820	.046	.05	112,000	D.
April.....	12,800	1,120	4,250	.106	.12	253,000	D.
May.....	10,500	1,060	4,170	.104	.12	256,000	D.
June.....	1,700	450	856	.021	.02	50,900	D.
July.....	9,860	215	1,800	.045	.05	111,000	D.
August.....	4,850	700	1,810	.045	.05	111,000	D.
September.....	17,400	1,060	4,770	.119	.13	284,000	D.
October.....	1,520	650	1,030	.026	.03	63,300	D.
November.....	1,170	305	704	.018	.02	41,900	D.
December.....	10,500	175	2,420	.060	.07	149,000	D.
The year.....	17,400	70	2,210	.055	.74	1,600,000	

RIO GRANDE BASIN.

SEEPAGE INVESTIGATIONS ON THE RIO GRANDE.

An attempt to determine the gains and losses due to seepage on the Rio Grande, by measuring the river and all tributaries at various points between the State bridge near Lobatos, Colo., and San Marcial, N. Mex., was made by G. H. Russell, junior engineer. A series of measurements at different times had been planned, but as yet these additional measurements have not been made.

The work was begun at the State bridge near Lobatos, Colo., on March 7, and measurements were successively made down the river as far as San Marcial, N. Mex., the last measurement being made March 23.

The gage-height record shows a practically uniform stage of the river at Lobatos during this period, but a rise at Buckman, N. Mex., of 0.7 feet on March 11. This rise is thought to have been caused mostly by Chama River, which enters the Rio Grande a short distance above, but a part was undoubtedly due to melting of snow and a rain which occurred in the region around Taos about March 7. This rise, however, preceded the measurements all the way down, and as the Buckman gage record shows the stage of the river to have been practically constant for the several days succeeding the rise during which measurements were made, it is thought that the condition of the river was fairly even throughout the period.

From the State line down to a point a few miles below Embudo the river flows through a box canyon which is cut in a lava formation and ranges in depth from 50 feet at the State line to about 1,000 feet at Embudo. In this stretch the river is accessible at only a few places, as little water is contributed over the surface except by Red River, Rio Pueblo de Taos, and Embudo Creek. The water flowing at the heads of several other streams sinks soon after it reaches the sheet of lava that borders the river on either side and enters the river as seepage.

Between Embudo and Buckman the canyon widens out into a narrow valley in which some irrigation is carried on, and the river spreads out over a sandy bed and among islands.

From Buckman the river flows in a comparatively narrow channel through White Rocks Canyon to Cochiti. At Cochiti the valley opens again into a flat sandy plain, and thence practically to San Marcial the river spreads out over a broad bed and among sand bars. Along this stretch considerable irrigation is practiced.

The following tables show the results of the discharge measurements of the tributaries and of the Rio Grande at Lobatos, Dunn's ranch, Velarde, San Juan, Buckman, Cochiti, Bernalillo, Albuquerque, Belen, and San Marcial, including the record of daily gage heights taken from automatic gages at Lobatos and Buckman, for the period covered by the investigation.

At the Lobatos, the mouth of the Rio Hondo, San Juan, Buckman, Cochiti, and San Marcial, very good measurements of the Rio Grande were obtained. Conditions at the other measured sections were unfavorable and results are only fair.

It should be noted that the river loses little, if any, water by diversion or otherwise above Embudo, and that below Embudo more or less water is being diverted for irrigation; also, that in the lower stretch considerable loss from evaporation results from the spreading of the river over so much area and the openness of the valley.

The tables show an increase in seepage from Lobatos to San Juan, a decrease through the open valley from San Juan to Buckman, and an increase through White Rocks Canyon from Buckman to Cochiti and as far as Albuquerque. Below Albuquerque the increase from seepage lessens, and the lessening continues as far as San Marcial. The decrease in flow below Albuquerque is probably to a large extent due to evaporation, for at the time of the measurements very little water was being diverted for irrigation. Below Albuquerque the river probably receives little if any seepage water.

Seepage measurements on the Rio Grande from Lobatos, Colo., to San Marcial, N. Mex.

[Second-feet.]

Date (March, 1911).	Stream.	Place.	Dis-charge.	In-crease in discharge of Rio Grande over that near Lobatos.	Surface contributions between sections.	Surface contribution to Rio Grande between Lobatos and the measured section.	In-crease in discharge over surface contribution between Lobatos and measured section.	Remarks.
7	Rio Grande.....	Lobatos.....	426					
7	Costilla Creek.....	Mouth.....	0					
7	Latir Creek.....	do.....	1					
8	Rio Colorado.....	Below Questa.....	30					
9	Cebolla Creek.....	Mouth.....	3					Estimated.
10	Rio Grande.....	Dunn's ranch.....	594	168	34	34	134	Good measurement.
9	Rio Hondo.....	Mouth.....	13					
12	Rio Pueblo de Taos.....	Los Cordovas.....	50					
12	Hondo Creek.....	Mouth.....	0					Not visited; no discharge.
	No Agua.....							
13	Embudo Creek.....	Dixon.....	68					
13	Truchas River.....	Mouth.....	0					
13	Rio Grande.....	Velarde.....	860	434	a 131.7	165.7	268.3	No water diverted.
14	do.....	San Juan.....	863	437		165.7	271.3	Good measurement.
14	Rio Chama.....	Mouth.....	530					
14	Santa Cruz Creek.....	do.....	26					
15	Santa Clara Creek.....	do.....	4					
15	Poague Creek.....	do.....	8					
15	Rio Grande.....	Buckman.....	1,400	974	568	733.7	240.3	Do.
17	do.....	Cochiti.....	1,390	964		733.7	230.3	Do.
18	Rio Jemez.....	Mouth.....	144					
18	Rio Grande.....	Bernalillo.....	1,590	1,164	144	877.7	286.3	Fair measurement.
20	do.....	Albuquerque.....	1,775	1,349		877.7	471.3	Do.
21	do.....	Belen.....	1,750	1,324		877.7	446.3	Do.
22	Rio Puerco.....	Mouth.....	90					
23	Rio Salado.....	do.....	3					
23	Alamillo Creek.....	do.....	0					
23	Rio Grande.....	San Marcial.....	1,715	1,289	93	970.7	318.3	Good measurement.

a Cieneguilla Creek running 0.7 second-foot Mar. 12, 1911.

Daily gage height, in feet, and discharge, in second feet, of Rio Grande near Lobatos, Colo., Buckman, N. Mex., and San Marcial, N. Mex.; Rio Colorado below Questa, N. Mex., and Rio Pueblo de Taos at Los Cordovas, N. Mex., Mar. 7-23, 1911.

Date.	Rio Grande near Lobatos.		Rio Grande near Buckman.		Rio Grande near San Marcial.		Rio Colorado below Questa.		Rio Pueblo de Taos at Los Cordovas.	
	Gage height.	Dis-charge.	Gage height.	Dis-charge.	Gage height.	Dis-charge.	Gage height.	Dis-charge.	Gage height.	Dis-charge.
Mar. 7.....	1.7	345	5.15	3,440	10.90	620	2.3		1.30	45
8.....	1.65	320	4.15	2,190	11.00	800	2.3		1.22	35
9.....	1.65	320	3.75	1,760	12.45	3,380	2.3		1.28	43
10.....	1.7	345	3.95	1,960	11.50	1,870	2.3		1.38	56
11.....	1.7	345	4.70	2,840	11.35	1,620	2.4		1.65	101
12.....	1.8	400	4.25	2,300	11.40	1,700	2.4		1.35	52
13.....	1.85	430	3.55	1,560	11.55	2,130	2.4		1.42	62
14.....	1.85	430	3.55	1,560	12.10	3,700	2.35		1.30	45
15.....	1.8	400	3.40	1,420	11.25	2,020	2.2		1.30	45
16.....	1.75	372	3.25	1,200	10.75	1,160	2.25		1.35	52
17.....	1.7	345	3.25	1,200	10.80	1,240	2.3		1.32	48
18.....	1.7	345	3.35	1,260	10.85	1,290	2.3		1.30	45
19.....	1.65	320	3.45	1,360	10.95	1,380	2.3		1.35	52
20.....	1.7	345	3.45	1,360	11.05	1,480	2.3		1.38	56
21.....	1.7	345	3.55	1,450	11.05	1,480	2.4		1.40	59
22.....	1.7	345	3.50	1,400	11.15	1,570	2.4		1.42	62
23.....	1.75	372	3.50	1,400	11.30	1,720	2.4		1.38	56

RIO GRANDE AT THIRTYMILE BRIDGE, NEAR CREEDE, COLO.

Location.—In the Rio Grande National Forest, about 30 miles west of Creede, in sec. 13, T. 40 N., R. 4 W., half a mile downstream from the dam site of the Farmers' Union Irrigation Co.'s reservoir; 200 feet above mouth of big Squaw Creek.

Records available.—June 18, 1909, to October 4, 1911.

Drainage area.—163 square miles (measured from topographic sheets).

Gage.—Chain gage 200 feet upstream from Thirtymile Bridge; washed out October 5, 1911.

Channel.—Somewhat shifting after high water.

Discharge measurements.—Made from car and cable except during low stages, when they are made by wading.

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

Diversions.—So far as known no water is diverted above the station and therefore the records represent the natural run-off.

Accuracy.—Although the channel shifts somewhat at this station, sufficient measurements have been made to afford a basis for reliable estimates.

Cooperation.—Field data furnished through the courtesy of Mr. O. P. Pennock, of Creede.

Discharge measurements of Rio Grande at Thirtymile Bridge, near Creede, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		<i>Feet.</i>	<i>Sec.-feet.</i>
Apr. 23	O. P. Pennock.....	3.26	237
May 3	do.....	3.38	254
5	do.....	4.16	462
6	do.....	4.47	577
8	do.....	4.81	681
10	do.....	4.68	609
20	do.....	4.54	571
24	do.....	5.35	914
26	do.....	5.19	827
31	do.....	5.49	958
June 1	B. S. Clayton.....	5.68	981
3	O. P. Pennock.....	5.88	1,120
4	do.....	6.18	1,260
6	do.....	6.45	1,480
8	do.....	7.14	1,880
July 25	B. S. Clayton.....	4.62	551
26	do.....	4.49	507
Aug. 9 ^a	Wimmer and French.....	3.32	182

^a Poor measurement.

Daily gage height, in feet, of Rio Grande at Thirtymile Bridge, near Creede, Colo., for 1911.

[O. P. Pennock, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1....	3.2	5.95	5.4	3.8	2.8	5.0	16....	4.35	6.2	5.05	3.3	2.85	.....		
2....	3.3	6.0	6.05	3.7	2.8	4.75	17....	4.65	6.0	4.8	3.15	2.75	.....		
3....	3.35	6.05	6.15	3.7	2.85	4.35	18....	5.0	6.0	4.8	3.1	2.7	.....		
4....	3.75	6.35	5.8	3.55	2.85	3.95	19....	5.05	6.3	5.1	3.05	2.8	.....		
5....	4.15	6.6	5.5	3.45	2.8	.....	20....	4.55	6.1	4.95	3.0	2.75	.....		
6....	4.4	6.7	5.4	3.4	2.75	.....	21....	4.5	6.4	4.9	3.1	2.65	.....		
7....	4.5	6.7	5.4	3.35	2.7	.....	22....	3.15	4.8	6.2	4.75	3.7	2.65	.....	
8....	4.7	7.15	5.2	3.25	2.65	.....	23....	3.2	5.2	6.1	4.75	3.4	3.25	.....	
9....	4.9	7.25	4.95	3.2	2.65	.....	24....	3.15	5.5	5.9	4.6	3.15	2.8	.....	
10....	4.75	6.85	4.85	3.35	2.65	.....	25....	3.1	5.45	5.6	4.6	3.05	2.7	.....	
11....	4.45	6.85	4.7	3.25	2.6	.....	26....	3.35	5.3	5.5	4.45	3.0	3.35	.....	
12....	4.55	6.65	4.65	3.15	2.65	.....	27....	3.45	5.05	5.6	4.3	3.05	3.3	.....	
13....	4.6	6.3	6.05	3.15	3.1	.....	28....	3.6	5.25	5.6	4.3	3.0	3.2	.....	
14....	4.3	6.2	5.6	3.1	2.9	.....	29....	3.5	5.35	5.4	4.1	2.95	3.35	.....	
15....	4.3	6.1	5.3	3.15	2.9	.....	30....	3.3	5.5	5.7	4.0	2.85	4.3	.....	
							31....	5.65	.....	3.9	2.8	.....	.....	.....	

Daily discharge, in second-feet, of Rio Grande at Thirtymile Bridge, near Creede, Colo., for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1.		213	1,140	880	313	105	697
2.		235	1,160	1,210	287	105	605
3.		246	1,190	1,260	287	113	471
4.		344	1,350	1,080	251	113	353
5.		458	1,560	930	228	105	
6.		537	1,620	880	217	98	
7.		571	1,620	880	206	92	
8.		641	1,880	790	185	86	
9.		715	1,950	678	175	86	
10.		659	1,700	641	206	86	
11.		554	1,700	587	185	81	
12.		588	1,560	570	165	86	
13.		605	1,360	1,210	165	155	
14.		505	1,300	980	155	121	
15.		505	1,240	830	165	121	
16.		521	1,300	717	195	113	
17.		623	1,180	623	165	98	
18.		753	1,180	623	155	92	
19.		773	1,360	735	146	105	
20.		588	1,240	678	137	98	
21.		571	1,410	659	155	86	
22.	203	677	1,300	605	287	86	
23.	213	835	1,240	605	217	185	
24.	203	973	1,140	553	165	105	
25.	193	949	980	553	146	92	
26.	246	879	930	503	137	206	
27.	269	773	980	455	146	195	
28.	305	857	980	455	137	175	
29.	281	902	880	395	129	206	
30.	235	973	1,030	367	113	455	
31.		1,050		339	105		

NOTE.—Daily discharge Apr. 22 to May 31 and June 5 to 8 determined from a rating curve well defined between 193 and 2,200 second-feet; daily discharge June 1 to 4 and July 25 to Sept. 9, from a curve well defined between 200 and 1,800 second-feet. Daily discharge June 9 to July 24 computed by indirect method for shifting channels.

Monthly discharge of Rio Grande at Thirtymile Bridge, near Creede, Colo., 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.	
Apr. 22-30.	305	193	239	1.47	0.49	4,270	A.
May.	1,050	213	643	3.98	4.59	39,800	A.
June.	1,950	880	1,320	8.10	9.04	78,600	A.
July.	1,260	339	718	4.40	5.07	44,100	A.
August.	313	105	185	1.13	1.30	11,400	A.
September.	455	81	128	.785	.88	7,620	A.
Oct. 1-4.	697	353	532	3.26	.49	4,220	
The period.						190,000	

RIO GRANDE NEAR CREEDE, COLO.

Location.—In the Rio Grande National Forest, at highway bridge in sec. 6, T. 41 N., R. 1 E., one-fourth mile from Wason siding and 3 miles east of Creede. Nearest tributary, Willow or Goblin Creek, enters a short distance upstream.

Records available.—April 24, 1907, to December 31, 1911.

Drainage area.—705 square miles.

Gage.—An automatic recording gage, the property of the State engineer. It is referred to the same datum as the chain gage used previously.

Channel.—Practically permanent.

Discharge measurements.—Made from bridge.

Winter flow.—River frozen over during winter months; ice causes backwater at gage.

Diversions.—Except for a little meadow irrigation no water is diverted above the station. A number of irrigation reservoirs are being constructed above the station; one a short distance above will have a capacity nearly equal to the normal annual flow of the river.

Accuracy.—Good.

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

Discharge measurements of Rio Grande near Creede, Colo., in 1911.

Date.	Hydrographer.	Gage height.	dis-charge.
		<i>Feet.</i>	<i>Sec.-feet.</i>
Jan. 19 ^a	G. H. Russell.....	0.44	170
Feb. 25 ^a	Turner and Clayton.....	.16	156
Mar. 28	B. S. Clayton.....	.42	219
Apr. 28	do.....	1.74	982
May 31	do.....	3.45	2,560
June 2	do.....	3.82	3,230
July 27	O. M. Wimmer.....	2.90	2,010
Aug. 11	B. S. Clayton.....	2.40	1,420
Sept. 8	Wimmer and French.....	1.43	571
Oct. 2	B. S. Clayton.....	.92	431
Oct. 12	H. B. Waba.....	2.60	1,840
Dec. 20 ^a	B. S. Clayton.....	2.17	1,320
	do.....	.58	220

^a Ice conditions.

Daily gage height, in feet, of Rio Grande near Creede, Colo., for 1911.

[G. K. Munsell, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....		0.2	0.1	0.8	1.45	3.6	3.35	2.0	1.15	2.3	1.1	.....
2.....		.25	.1	.85	1.45	3.7	3.75	1.9	1.15	2.3	1.1	.....
3.....		.3	.15	.85	1.5	3.65	3.5	1.85	1.15	2.15	1.05	.....
4.....		.2	.1	.85	1.75	3.9	3.55	1.8	1.15	1.85	1.0	.....
5.....			.1	.75	2.2	4.15	3.15	1.7	1.15	4.55	1.05	.....
6.....			.05	.75	2.5	4.3	2.95	1.6	1.1	5.15	1.05	.....
7.....			.1	.7	2.55	4.25	3.1	1.55	1.0	3.9	1.0	.....
8.....			.1	.75	2.8	4.25	2.95	1.5	1.0	3.25	1.1	.....
9.....		.1	.1	.7	3.05	4.6	2.7	1.45	.9	2.75	1.05	.....
10.....		.2	.15	.75	3.1	4.45	2.55	1.45	.85	2.5	1.05	.....
11.....		.2	.25	.7	2.75	4.3	2.4	1.5	.85	2.35	.95	.....
12.....		.2	.2	.75	2.7	4.2	2.35	1.45	.85	2.2	.95	.....
13.....		.15	.15	.7	2.7	3.95	2.95	1.45	.85	2.05	.95	.....
14.....		.2	.1	.7	2.35	3.9	3.5	1.4	1.0	1.95	1.0	.....
15.....		.15	.1	.65	2.3	3.7	3.2	1.4	.95	1.85	.9	.....
16.....		.2	.15	.75	2.3	3.75	3.0	1.45	1.1	1.7	.95	.....
17.....		.2	.2	.9	2.45	3.7	2.5	1.4	.95	1.65	.95	.....
18.....		.25	.15	.8	2.7	3.6	2.55	1.4	.85	1.55	.9	.....
19.....	0.45	.2	.15	.9	2.95	3.65	2.45	1.35	.85	1.45	.....	.....
20.....		.2	.2	1.05	2.7	3.8	2.45	1.3	.95	1.4	.....	0.58
21.....		.2	.3	1.15	2.65	3.6	2.45	1.3	.85	1.4	.....	.....
22.....		.2	.35	1.25	2.65	3.75	2.4	1.9	.8	1.4	.....	.....
23.....		.15	.25	1.3	2.95	3.45	2.4	1.8	.95	1.35	.....	.....
24.....		.2	.25	1.25	3.25	3.3	2.4	1.6	.9	1.3	.....	.....
25.....		.15	.35	1.25	3.3	3.1	2.4	1.5	.85	1.35	.....	.....
26.....		.1	.3	1.4	3.4	2.95	2.4	1.4	1.05	1.3	.....	.....
27.....		.05	.25	1.65	3.05	2.9	2.4	1.4	1.2	1.3	.....	.....
28.....			.35	1.7	3.05	3.0	2.4	1.4	1.1	1.25	.....	.....
29.....			.45	1.8	3.1	2.95	2.3	1.3	1.1	1.2	.....	.....
30.....			.55	1.8	3.15	3.2	2.2	1.2	1.7	1.15	.....	.....
31.....			.7	.....	3.4	.....	2.1	1.15	.....	1.15	.....	.....

NOTE.—Gage heights estimated from hydrograph from July 15 to 26. Ice affected the gage heights from Jan. 1 to Feb. 26 and Nov. 19 to Dec. 31.

Daily discharge, in second-feet, of Rio Grande near Creede, Colo., for 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1.....	120	370	728	2,880	2,560	1,120	542	1,380	515
2.....	120	392	728	3,010	3,070	1,050	542	1,380	515
3.....	132	392	760	2,940	2,740	1,010	542	1,250	490
4.....	120	392	938	3,270	2,810	975	542	1,010	465
5.....	120	348	1,290	3,620	2,310	900	542	4,230	490
6.....	108	348	1,580	3,840	2,070	830	515	5,170	490
7.....	120	325	1,630	3,770	2,240	795	465	3,270	465
8.....	120	348	1,900	3,770	2,070	760	465	2,430	515
9.....	120	325	2,180	4,310	1,790	728	415	1,840	490
10.....	132	348	2,240	4,070	1,630	728	392	1,580	490
11.....	160	325	1,840	3,840	1,480	760	392	1,430	440
12.....	145	348	1,790	3,700	1,430	728	392	1,290	440
13.....	132	325	1,790	3,340	2,070	728	392	1,160	440
14.....	120	325	1,430	3,279	2,740	695	465	1,090	465
15.....	120	305	1,380	3,010	2,370	695	440	1,010	415
16.....	132	348	1,380	3,070	2,120	728	515	900	440
17.....	145	415	1,520	3,010	1,580	695	440	865	440
18.....	132	370	1,790	2,880	1,630	695	392	795	415
19.....	132	415	2,070	2,940	1,520	662	392	728	.....
20.....	145	490	1,790	3,140	1,520	630	440	695	.....
21.....	175	542	1,740	2,880	1,520	630	392	695	.....
22.....	192	600	1,740	3,070	1,480	1,050	370	695	.....
23.....	160	630	2,070	2,680	1,480	975	440	662	.....
24.....	160	600	2,430	2,500	1,480	830	415	630	.....
25.....	192	600	2,500	2,240	1,480	760	392	662	.....
26.....	175	695	2,620	2,070	1,480	695	490	630	.....
27.....	160	865	2,180	2,010	1,480	695	570	630	.....
28.....	192	900	2,180	2,120	1,480	695	515	600	.....
29.....	228	975	2,240	2,070	1,380	630	515	570	.....
30.....	265	975	2,310	2,370	1,290	570	900	542	.....
31.....	325	.....	2,620	.....	1,200	542	.....	542	.....

NOTE.—Daily discharge Mar. 1 to Nov. 18 determined from a rating curve well defined between 95 and 5,000 second-feet.

Monthly discharge of Rio Grande near Creede, Colo., for 1911.

[Drainage area, 705 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.....	.....	.....	150	0.213	0.25	9,220	C.
February.....	.....	.....	145	.206	.21	8,050	B.
March.....	325	108	155	.220	.25	9,530	A.
April.....	975	305	488	.692	.77	29,000	A.
May.....	2,620	728	1,790	2.54	2.93	110,000	A.
June.....	4,310	2,010	3,060	4.34	4.84	182,000	A.
July.....	3,070	1,200	1,860	2.64	3.04	114,000	A.
August.....	1,120	542	774	1.10	1.27	47,600	A.
September.....	900	370	474	.672	.75	28,200	A.
October.....	5,170	542	1,300	1.84	2.12	79,900	A.
November.....	515	.....	414	.587	.65	24,600	C.
December.....	.....	.....	232	.329	.38	14,300	C.
The year.....	5,170	.....	907	1.29	17.46	656,000	.....

NOTE.—Discharge estimated Jan. 1 to Feb. 28 and Nov. 19 to Dec. 31 on account of ice.
Mean discharge Nov. 19 to 30 estimated 333 second-feet.

RIO GRANDE NEAR DEL NORTE, COLO.

Location.—At highway bridge about sec. 30, T. 40 N., R. 5 E., 6 miles west of Del Norte, a short distance below the mouth of West Creek. From October 11, 1889, to November 30, 1906, a station was maintained about 4 miles below the present station. The flow at the two points is not directly comparable as a number of small tributaries enter between.

Records available.—May 16, 1908, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Automatic recording gage, the property of the State engineer. The gage is referred to the same datum as was the chain gage installed May 16, 1908.

Channel.—Slightly shifting.

Discharge measurements.—Made from bridge.

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

Diversions.—There are court decrees for diversions of 51 second-feet from the Rio Grande between the Creede station and Del Norte, and for diversions of 55 second-feet from intervening tributaries.

Cooperation.—Station maintained in cooperation with the State engineer.

Discharge measurements of Rio Grande near Del Norte, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Dis-charge.
		<i>Feet.</i>	<i>Sec.-feet.</i>
Jan. 20 ^a	G. H. Russell	1.98	287
Feb. 26 ^a	Clayton and Turner	.68	246
Mar. 29	B. S. Clayton	1.04	431
Apr. 29	do	2.55	1,960
June 3	do	4.27	5,300
July 5	do	3.74	3,850
Sept. 10	C. E. Turner	1.34	565
Oct. 16	B. S. Clayton	2.15	1,390

^a Ice conditions.

Daily gage height, in feet, of Rio Grande near Del Norte, Colo., for 1911.

[J. G. Duncan, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		0.65	0.65	1.45	2.05	4.1	3.75	2.25	1.6	2.75	1.45	1.15
2		.6	.75	1.45	2.0	4.25	3.85	2.15	1.55	2.9	1.45	1.15
3		.6	.75	1.45	2.1	4.2	4.05	2.2	1.55	2.55	1.45	1.05
4		.65	.75	1.5	2.3	4.35	3.95	2.0	1.55	2.3	1.3	1.05
5		.6	.65	1.4	2.65	4.35	3.6	1.9	1.55	5.4	1.3	1.05
6		.55	.65	1.3	3.1	4.45	3.5	1.8	1.5	6.0	1.3	1.05
7		.65	.6	1.2	3.45	4.45	3.35	1.8	1.4	4.9	1.3	1.05
8		.65	.65	1.2	3.6	4.5	3.3	1.75	1.35	4.1	1.3	1.05
9		.65	.7	1.2	3.95	4.8	3.0	1.6	1.3	3.6	1.3	1.05
10		.7	.85	1.25	3.85	4.75	2.9	1.6	1.3	3.2	1.3	1.05
11		.7	1.0	1.25	3.45	4.65	2.8	1.6	1.3	3.1	1.3	1.0
12		.7	.8	1.3	3.3	4.55	2.7	1.4	1.3	2.8	1.3	1.0
13		.65	.7	1.3	3.3	4.4	2.7	1.6	1.3	2.6	1.3	.9
14		.6	.7	1.2	3.15	4.35	3.8	1.6	1.4	2.4	1.3	.85
15		.65	.65	1.2	3.15	4.15	3.3	1.45	1.4	2.3	1.3	.85
16		.6	.7	1.35	3.15	4.05	3.05	1.5	1.3	2.15	1.3	.95
17		.6	.75	1.65	3.25	3.95	2.9	1.55	1.3	2.1	1.25	.95
18		.6	.8	1.5	3.45	3.85	2.8	1.5	1.3	2.05	1.25	.95
19		.65	.75	1.55	3.65	3.9	2.95	1.55	1.4	1.95	1.25	.95
20	2.0	.6	.85	1.75	3.4	3.95	3.1	1.5	1.5	1.85	1.25	1.05
21		.65	.8	1.95	3.15	4.05	3.05	1.6	1.35	1.7	1.25	1.05
22		.6	1.0	2.1	3.1	4.05	2.9	2.0	1.2	1.7	1.25	1.05
23		.7	.9	2.2	3.3	3.9	2.95	2.15	1.4	1.7	1.25	1.0
24		.65	.8	2.1	3.65	3.9	3.05	1.9	1.45	1.7	1.25	1.0
25		.65	.95	2.0	3.85	3.7	2.9	1.8	1.5	1.7	1.25	1.0
26		.65	.9	2.05	3.95	3.5	3.05	1.7	1.6	1.65	1.25	1.0
27		.6	.75	2.35	3.75	3.45	2.85	1.9	1.8	1.65	.65	1.0
28		.6	.95	2.4	3.75	3.45	2.75	1.8	1.5	1.65	.65	1.05
29	0.7		1.1	2.5	3.75	3.4	2.75	1.8	1.5	1.5	.7	1.05
30	.65		1.25	2.2	3.65	3.45	2.55	1.7	1.6	1.55	1.05	1.0
31	.65		1.35		3.95		2.4	1.6		1.5		.95

NOTE.—Gage heights affected by presence of ice Jan. 1 to Mar. 8 and Nov. 27 to Dec. 31.

Daily discharge, in second-feet, of Rio Grande near Del Norte, Colo., for 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1.		750	1,320	4,920	3,920	1,520	810	2,190	678
2.		750	1,260	5,250	4,100	1,400	765	2,420	678
3.		750	1,370	5,160	4,480	1,460	765	1,910	678
4.		790	1,650	5,470	4,280	1,220	765	1,580	555
5.		710	2,150	5,470	3,590	1,110	765	10,700	555
6.		635	2,870	5,650	3,400	1,000	720	14,000	555
7.		560	3,470	5,630	3,140	1,000	635	6,370	555
8.		560	3,740	5,740	3,060	955	595	4,540	555
9.	270	560	4,420	6,450	2,570	810	555	3,580	555
10.	345	598	4,220	6,250	2,420	810	555	2,900	555
11.	425	598	3,480	6,000	2,260	810	555	2,730	555
12.	320	635	3,220	5,780	2,120	635	555	2,280	555
13.	270	635	3,230	5,450	2,120	810	555	1,980	555
14.	270	560	2,980	5,330	3,960	810	635	1,710	555
15.	248	560	2,980	4,920	3,060	678	635	1,580	555
16.	270	672	3,000	4,680	2,650	720	555	1,400	555
17.	295	920	3,180	4,480	2,420	765	555	1,340	518
18.	320	790	3,540	4,280	2,260	720	555	1,280	518
19.	295	852	3,920	4,350	2,490	765	635	1,160	518
20.	345	1,010	3,450	4,450	2,730	720	720	1,060	518
21.	320	1,210	3,030	4,630	2,650	810	595	905	518
22.	425	1,370	2,950	4,620	2,420	1,220	480	905	518
23.	370	1,490	3,320	4,330	2,490	1,400	635	905	518
24.	320	1,370	3,950	4,310	2,650	1,110	678	905	518
25.	398	1,260	4,350	3,910	2,420	1,000	720	905	518
26.	370	1,320	4,550	3,500	2,650	905	810	858	518
27.	295	1,090	4,200	3,410	2,340	1,110	1,000	858	.....
28.	398	1,760	4,200	3,410	2,190	1,000	720	858	.....
29.	490	1,900	4,200	3,280	2,190	1,000	720	720	.....
30.	598	1,490	4,040	3,380	1,910	905	810	765	.....
31.	672	.....	4,620	.....	1,710	810	.....	720	.....

NOTE.—Daily discharge Mar. 9 to Apr. 29 determined from the 1910 rating curve; discharge Apr. 30 to July 5 obtained by indirect method for shifting channels; discharge July 6 to Nov. 26 determined from a rating curve well defined between 415 and 4,340 second-feet.

Monthly discharge of Rio Grande near Del Norte, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre- feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
January.....	.....	.....	248	15,200	C.
February.....	.....	.....	239	13,300	B.
March.....	.....	.....	336	20,700	A.
April.....	672	.....	958	57,000	A.
May.....	4,620	1,260	3,320	204,000	A.
June.....	6,450	3,280	4,820	287,000	A.
July.....	4,480	1,710	2,800	172,000	A.
August.....	1,520	635	967	59,500	A.
September.....	1,000	555	668	39,700	A.
October.....	14,000	720	2,450	151,000	A.
November.....	678	.....	543	32,300	A.
December.....	.....	.....	407	25,000	B.
The year.....	14,000	.....	1,490	1,080,000	.....

NOTE.—Discharge Jan. 1 to Mar. 8 and Nov. 27 to Dec. 31 estimated on account of ice.

Mean discharge Mar. 1-8 estimated 261 second-feet; mean discharge Nov. 27-30 estimated 465 second-feet.

RIO GRANDE NEAR LOBATOS, COLO.¹

Location.—At highway bridge in sec. 22, T. 33 N., R. 11 E., 10 miles east of Lobatos, and a few miles above the Colorado-New Mexico line; 7 miles below mouth of Conejos River.

Records available.—June 28, 1899, to November 6, 1911.

Drainage area.—7,700 square miles.

¹ Originally known as Rio Grande at Ceniceiro, Colo.

Gage.—Automatic recording gage, the property of the State engineer. This gage is referred to the datum of the original gage.

Channel.—A gash cut in lava rock; fairly permanent.

Discharge measurements.—Made from bridge.

Winter flow.—Ice causes backwater varying in amount during the three winter months.

Diversions.—There are court decrees for diversions from the Rio Grande of 2,912 second-feet between the Del Norte station and this one. Nearly 300,000 acres are being irrigated in the Rio Grande basin in Colorado.

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

Discharge measurements of Rio Grande near Lobatos, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		<i>Feet.</i>	<i>Sec.-feet.</i>
Jan. 26 ^a	G. H. Russell.....	1.94	449
Feb. 23 ^a	Clayton and Turner.....	2.00	331
Mar. 7	G. H. Russell.....	1.73	426
27	B. S. Clayton.....	1.70	385
Apr. 19	G. H. Russell.....	1.38	194
27	B. S. Clayton.....	2.57	1,140
May 29	do.....	3.62	2,310
July 3	do.....	4.81	3,990
Sept. 2	I. G. Ferguson.....	2.40	833
7	B. S. Clayton.....	2.25	719
Oct. 9	do.....	6.72	7,100
18	do.....	3.62	2,280

^a Ice conditions.

Daily gage height, in feet, of Rio Grande near Lobatos, Colo., for 1911.

[C. E. Mondragon, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1.....	2.1	1.8	1.9	1.7	2.7	.....	3.45	3.55	2.4	2.7	2.9
2.....	.....	1.8	1.9	1.7	2.5	.....	3.75	3.3	2.35	3.4	2.8
3.....	.....	1.8	1.9	1.75	2.4	.....	4.6	2.9	2.25	3.9	2.8
4.....	.....	1.8	2.0	1.8	2.55	.....	5.0	2.6	2.2	4.0	2.7
5.....	.....	1.9	1.8	1.8	2.75	.....	5.4	2.3	2.2	4.05	2.6
6.....	.....	1.8	1.8	1.75	3.05	.....	5.5	2.1	2.15	4.95	2.6
7.....	.....	1.7	1.7	1.65	3.4	4.9	5.5	1.8	2.2	6.65	.....
8.....	.....	1.7	1.65	1.6	3.85	4.95	5.3	1.5	2.15	6.6	.....
9.....	.....	1.7	1.65	1.55	4.35	5.15	5.05	1.35	2.1	6.6	.....
10.....	.....	1.6	1.7	1.5	4.75	5.45	4.85	1.2	2.0	6.95	.....
11.....	.....	1.6	1.7	1.45	4.8	5.65	4.5	1.2	1.9	6.55	.....
12.....	.....	1.6	1.8	1.45	4.5	5.8	4.2	1.1	1.95	5.9	.....
13.....	.....	1.7	1.85	1.4	3.95	5.9	4.05	1.0	1.9	5.25	.....
14.....	.....	1.7	1.85	1.4	3.5	5.7	4.05	.95	1.95	4.7	.....
15.....	2.1	1.7	1.8	1.25	3.5	5.35	4.3	.95	2.1	4.3	.....
16.....	2.1	1.7	1.75	1.25	3.5	5.25	4.55	.95	2.15	3.9	.....
17.....	2.0	1.8	1.7	1.2	3.4	5.05	4.55	.90	2.15	3.7	.....
18.....	2.0	1.8	1.7	1.3	3.25	4.9	4.45	1.05	2.15	3.6	.....
19.....	2.0	1.4	1.65	1.35	3.3	4.7	4.35	1.05	2.1	3.55	.....
20.....	1.8	1.8	1.7	1.4	3.5	4.7	4.55	1.05	2.1	3.45	.....
21.....	1.8	1.8	1.7	1.45	3.45	4.7	4.7	1.05	2.25	3.3	.....
22.....	1.8	2.1	1.7	1.65	3.15	4.9	4.9	1.15	2.35	3.15	.....
23.....	1.8	2.0	1.75	1.95	2.9	5.2	4.7	1.25	2.35	3.1	.....
24.....	1.8	2.0	1.8	2.15	2.9	5.3	4.5	1.95	2.3	3.1	.....
25.....	1.9	2.0	1.8	2.2	.....	5.3	4.45	2.5	2.2	3.0	.....
26.....	1.9	2.0	1.75	2.2	.....	4.9	4.45	2.45	2.2	3.0	.....
27.....	1.9	2.0	1.7	2.6	.....	4.3	4.3	2.5	2.2	2.95	.....
28.....	1.8	2.0	1.65	2.9	.....	4.15	4.3	2.5	2.3	3.0	.....
29.....	1.7	.....	1.65	2.95	3.6	3.7	4.3	2.6	2.45	3.05	.....
30.....	1.7	.....	1.65	3.0	.....	3.55	4.0	2.65	2.55	3.0	.....
31.....	1.8	.....	1.65	.....	.....	.....	3.8	2.5	.....	2.95	.....

NOTE.—Gage heights affected by presence of ice Jan. 1 to Feb. 28 and Nov. 7 to Dec. 31.

Daily discharge, in second-feet, of Rio Grande near Lobatos, Colo., for 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1.....	460	345	1,200	2,780	2,065	2,195	900	1,200	1,410
2.....	460	345	1,000	2,960	2,460	1,870	850	2,000	1,300
3.....	460	372	900	3,150	3,700	1,410	752	2,670	1,300
4.....	530	400	1,050	3,340	4,310	1,100	705	2,810	1,200
5.....	400	400	1,250	3,520	4,950	800	705	2,880	1,100
6.....	400	372	1,575	3,710	5,110	615	660	4,230	1,100
7.....	345	320	2,000	4,150	5,110	400	705	6,975	.....
8.....	320	295	2,600	4,230	4,790	250	660	6,890	.....
9.....	320	272	3,325	4,550	4,390	185	615	6,890	.....
10.....	345	250	3,925	5,080	4,075	135	530	7,510	.....
11.....	345	228	4,000	5,350	3,550	135	460	6,805	.....
12.....	400	228	3,550	5,590	3,100	110	495	5,750	.....
13.....	430	205	2,740	5,750	2,880	85	460	4,710	.....
14.....	430	205	2,130	5,430	2,880	75	495	3,850	.....
15.....	400	150	2,130	4,870	3,250	75	615	3,250	.....
16.....	372	150	2,130	4,710	3,625	75	660	2,670	.....
17.....	345	135	2,000	4,390	3,625	65	660	2,390	.....
18.....	345	165	1,810	4,150	3,475	98	660	2,260	.....
19.....	320	185	1,870	3,850	3,325	98	615	2,195	.....
20.....	345	205	2,130	3,850	3,625	98	615	2,065	.....
21.....	345	228	2,065	3,850	3,850	98	752	1,870	.....
22.....	345	320	1,690	4,150	4,150	122	850	1,690	.....
23.....	372	490	1,410	4,630	3,850	150	850	1,630	.....
24.....	400	660	1,410	4,790	3,550	495	800	1,630	.....
25.....	400	705	1,650	4,790	3,475	1,000	705	1,520	.....
26.....	372	705	1,810	4,150	3,475	950	705	1,520	.....
27.....	345	1,100	1,980	3,250	3,250	1,000	705	1,465	.....
28.....	320	1,410	2,140	3,025	3,250	1,000	800	1,520	.....
29.....	320	1,465	2,320	2,390	3,250	1,100	950	1,575	.....
30.....	320	1,520	2,410	2,195	2,810	1,150	1,050	1,520	.....
31.....	320	.....	2,590	.....	2,530	1,000	.....	1,465	.....

NOTE.—Discharge Mar. 1 to Nov. 6 determined from a rating curve well defined between 200 and 7,600 second-feet; discharge May 25 to 28, and May 30 to June 6 estimated for days on which gage heights are missing.

Monthly discharge of Rio Grande near Lobatos, Colo., for 1911.

[Drainage area, 7,700 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.....	.....	.....	370	0.048	0.06	22,800
February.....	.....	.....	380	.049	.05	21,100
March.....	530	320	375	.049	.06	23,100
April.....	1,520	135	461	.060	.07	27,400
May.....	4,000	900	2,090	.271	.31	129,000
June.....	5,750	2,195	4,090	.531	.59	243,000
July.....	5,110	2,065	3,600	.468	.54	222,000
August.....	2,195	65	579	.075	.09	35,600
September.....	1,050	460	699	.091	.10	41,600
October.....	7,510	1,200	3,140	.408	.47	193,000
November 1-6.....	1,410	1,100	1,240	.174	.04	14,700
The period.....	.....	.....	.....	.....	.....	973,000

NOTE.—Discharge January and February estimated on account of ice.

RIO GRANDE NEAR BUCKMAN, N. MEX.¹

Location.—At the Denver & Rio Grande Railroad bridge 4 miles above Buckman and 2 miles below the Indian village of San Ildefonso about sec. 18, T. 19 N., R. 8 E. The nearest stream is Tesuque Creek, which enters near San Ildefonso. There is an arroyo just above the station.

Records available.—February 1, 1895, to December 31, 1905; June 23, 1909, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Automatic recording gage installed in June, 1910. The original gage was located on the left bank 180 feet above the bridge. On March 30, 1904, a vertical staff gage was established at a new datum at the bridge. The same gage was used when the station was reestablished in 1909; the datum of the gage is the same as that of the original gage.

Channel.—Shifting during high water, but fairly permanent at other times.

Discharge measurements.—Made from car and cable 3 miles below the gage. No diversions or important tributaries between two points.

Winter flow.—Only slightly affected by ice.

Diversions.—For many miles above the station many large and small ditches divert water for irrigation.

Accuracy.—Prior to the flood in October conditions were favorable for accurate results, but the flood caused considerable change, which was not fully covered by field work. Thus the estimates for October to December can not be considered better than fair.

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

Discharge measurements of Rio Grande near Buckman, N. Mex., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		<i>Feet.</i>	<i>Sec.-feet.</i>
Feb. 8	C. B. Digby.....	2.50	725
Mar. 15	G. H. Russell.....	3.38	1,400
Apr. 15	R. L. Cooper.....	3.45	1,250
May 4	Freeman and Waha.....	5.80	4,420
May 17	W. B. Freeman.....	7.85	7,200
June 12	R. L. Cooper.....	7.35	6,970
Aug. 5	W. B. Freeman.....	4.15	2,010
Oct. 30	A. S. Kirkpatrick.....	4.50	3,410

^a Gage not read. Gage height determined from the automatic gage sheet.

Daily gage height, in feet, of Rio Grande near Buckman, N. Mex., for 1911.

[Territorial engineer, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	2.25	3.05	2.55	4.05	.....	6.4	5.15	5.6	2.8	5.1	4.3	3.2
2.....	2.1	2.95	2.65	4.1	.....	6.45	5.5	5.3	3.25	5.0	4.3	3.2
3.....	2.1	2.9	2.75	4.25	.....	6.65	6.05	4.9	3.31	5.1	4.15	3.2
4.....	2.1	2.6	2.8	4.3	5.85	6.7	6.5	4.45	3.43	5.2	4.15	3.2
5.....	2.15	2.65	3.05	4.3	6.3	6.75	6.85	4.2	3.37	5.4	4.1	3.2
6.....	2.15	2.65	4.1	4.2	6.75	6.8	7.0	3.85	3.27	5.6	4.0	3.2
7.....	2.0	2.55	5.15	3.95	7.3	6.85	7.3	3.7	3.17	8.4	3.95	3.2
8.....	.....	2.5	4.15	3.85	8.0	6.8	7.25	3.35	3.09	11.0	3.9	3.2
9.....	.....	2.5	3.75	3.7	8.6	6.9	6.85	3.1	3.06	9.2	3.95	3.2
10.....	.....	2.5	3.95	3.5	8.95	7.0	6.5	2.85	3.02	8.4	3.9	3.2

¹ In earlier reports this station was designated as near Rio Grande and at Watertank.

Daily gage height, in feet, of Rio Grande near Buckman, N. Mex., for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
11.		2.5	4.7	3.4	8.7	7.3	6.45	2.6	2.98	7.8	3.9	3.2
12.		2.45	4.25	3.45	8.3	7.4	6.0	2.65	2.81	7.2	3.7	3.1
13.		2.4	3.55	3.55	7.9	7.45	5.9	2.9	2.77	6.8	3.6	3.1
14.	3.5	2.4	3.55	3.5	7.7	7.5	6.1	2.7	2.82	6.5	3.6	3.1
15.	3.0	2.4	3.4	3.4	7.85	7.4	6.1	2.45	2.92	6.1	3.6	3.0
16.	2.8	2.4	3.25		7.8	7.15	6.2	2.3	3.13		3.6	2.85
17.	2.9	2.45	3.25		7.45	6.85	6.95	2.3	3.05		3.65	2.85
18.	2.9	2.4	3.35		7.2	6.7	6.35	2.3	3.01		3.7	2.85
19.	2.7	2.4	3.45		7.1	6.5	6.9	2.3	2.96		3.65	2.85
20.	2.6	2.25	3.45		6.95	6.35	7.9	2.35	2.93		3.6	2.85
21.	2.5	2.25	3.55		6.75	6.35	7.15	2.35	3.24		3.6	2.85
22.	2.6	2.25	3.5	4.5	6.35	6.45	7.7	2.4	3.11		3.6	2.85
23.	2.6	2.25	3.5		6.15	6.6	7.2	2.4	3.17		3.65	2.85
24.	2.55	2.3	3.25		5.95	6.75	7.6	2.7	3.17		3.6	2.9
25.	2.55	2.45	3.1		6.1	6.8	7.4	2.9	3.15		3.5	2.9
26.	2.6	2.5	3.2		6.15	6.6	6.85	2.6	3.1		3.4	2.85
27.	2.85	2.45	3.2		6.45	6.25	6.7	2.5	3.05		3.3	2.9
28.	2.85	2.5	3.05		6.5	5.8	6.5	2.5	3.35		3.3	2.9
29.	2.65		3.15	6.35	6.4	5.45	6.75	2.6	3.27		3.25	2.9
30.	2.75		3.45		6.4	5.15	6.35	2.7	4.2	4.45	3.25	2.9
31.	3.0		3.65		6.4		5.9	2.7		4.4		2.9

NOTE.—Friez automatic gage removed Apr. 16 and replaced by a Barrett & Lawrence automatic gage May 4. Gage readings Apr. 22 and 29 refer to the staff gage attached to the float box. From Aug. 17 to Sept. 2 and Sept. 23 to Oct. 29, the automatic gage did not record satisfactorily. Gage heights Aug. 17 to Sept. 2 and Sept. 23 to Oct. 15 have been estimated from a hydrograph of the Rio Grande at Lobatos, with an additional allowance for tributary streams between Lobatos and Buckman. The crest gage height on Oct. 8 was 13.1 feet, as obtained from the automatic sheet.

Daily discharge, in second-feet, of Rio Grande near Buckman, N. Mex., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.	602	1,130	775	1,920	5,020	5,200	3,240	3,900	835	3,170	3,010	1,510
2.	525	1,050	838	2,000	4,860	5,290	3,750	3,460	1,160	3,030	3,010	1,510
3.	525	1,020	905	2,180	4,700	5,650	4,610	2,900	1,210	3,170	2,800	1,510
4.	525	805	940	2,220	4,540	5,740	5,380	2,320	1,310	3,310	2,800	1,510
5.	550	838	1,130	2,300	5,260	5,830	6,020	2,040	1,260	3,600	2,740	1,510
6.	550	838	2,130	2,200	6,080	5,920	6,300	1,680	1,180	3,900	2,600	1,510
7.	480	775	3,440	1,920	7,140	6,020	6,890	1,540	1,100	9,260	2,550	1,510
8.	500	745	2,190	1,800	8,630	5,920	6,790	1,240	1,040	15,600	2,500	1,420
9.	500	745	1,760	1,750	9,990	6,110	6,020	1,040	1,020	13,000	2,550	1,420
10.	500	745	1,960	1,460	10,800	6,300	5,380	868	985	11,000	2,500	1,420
11.	500	745	2,840	1,380	10,200	6,890	5,290	710	956	9,640	2,500	1,420
12.	500	715	2,300	1,430	9,300	7,090	4,530	740	842	8,300	2,250	1,350
13.	1,000	685	1,560	1,550	8,410	7,200	4,370	900	816	7,450	2,050	1,350
14.	1,510	685	1,560	1,460	7,970	7,300	4,690	770	848	6,830	2,050	1,350
15.	1,090	685	1,420	1,380	8,300	7,090	4,690	622	914	6,050	2,050	1,260
16.	940	685	1,200	1,540	8,190	6,590	4,860	540	1,070	5,500	2,050	1,160
17.	1,020	715	1,200	1,700	7,440	6,020	6,200	540	1,010	5,000	2,100	1,160
18.	1,020	685	1,260	1,870	6,940	5,740	5,120	540	978	4,500	2,150	1,160
19.	870	685	1,360	2,040	6,740	5,380	6,110	540	942	4,000	2,100	1,160
20.	805	602	1,360	2,210	6,460	5,120	8,150	568	921	4,000	2,050	1,050
21.	745	602	1,450	2,380	6,080	5,120	6,590	568	1,150	4,000	2,050	1,050
22.	805	602	1,400	2,550	5,350	5,290	7,720	595	1,050	3,700	2,050	1,050
23.	805	602	1,400	2,950	5,000	5,560	6,690	595	1,100	3,700	2,100	1,050
24.	775	630	1,200	3,350	4,660	5,830	7,510	770	1,100	3,700	2,050	1,100
25.	775	715	1,080	3,750	4,920	5,920	7,090	900	1,080	3,700	1,920	1,100
26.	805	745	1,160	4,150	5,000	5,560	6,020	710	1,040	3,500	1,730	1,050
27.	978	715	1,160	4,550	5,530	4,940	5,740	650	1,010	3,500	1,630	1,100
28.	978	745	1,050	4,950	5,620	4,210	5,380	650	1,240	3,500	1,630	1,100
29.	838		1,130	5,350	5,440	3,680	5,830	710	1,180	3,500	1,550	1,100
30.	905		1,360	5,180	5,440	3,240	5,120	770	2,040	3,340	1,550	1,050
31.	1,090		1,550		5,440		4,370	770		3,260		1,010

NOTE.—Daily discharge Jan. 1 to Mar. 15, and May 5 to 31, June 1 to Oct. 8, and Oct. 9–15 determined from three fairly well-defined rating curves. Daily discharge Mar. 16 to May 4 and Oct. 30 to Dec. 31 determined by the indirect method for shifting channels. Discharge Jan. 8 to 13 and Oct. 16 to 29 estimated; discharge Apr. 16–21, 23–28, and Apr. 30 to May 3 interpolated.

Monthly discharge of Rio Grande near Buckman, N. Mex., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
January.....	1,510	480	775	47,700	B.
February.....	1,130	602	748	41,500	B.
March.....	3,440	775	1,490	91,600	B.
April.....	5,350	1,380	2,520	150,000	C.
May.....	10,800	4,540	6,630	408,000	B.
June.....	7,300	3,240	5,720	340,000	B.
July.....	8,150	3,240	5,690	350,000	B.
August.....	3,900	540	1,130	69,500	B.
September.....	2,040	816	1,080	64,300	B.
October.....	15,600	3,030	5,470	336,000	C.
November.....	3,010	1,550	2,220	132,000	B.
December.....	1,510	1,010	1,260	77,500	C.
The year.....	15,600	480	2,910	2,110,000	

RIO GRANDE NEAR SAN MARCIAL, N. MEX.

Location.—At the Atchison, Topeka & Santa Fe Railway bridge, 1 mile south of San Marcial, N. Mex. No important tributaries enter in the immediate vicinity of the station.

Records available.—January 29, 1895, to December 31, 1911.

Gage.—Inclined gage established January 29, 1895, and carried away by flood in 1896, and a wire gage established in its place at the same datum; this was soon abandoned and gage heights have since been measured with a graduated rod from the bridge deck to the water surface. The gage datum of the inclined-staff and wire gages is still used.

Channel.—Sandy and very shifting; a number of bridge piers interfere with the accuracy of discharge measurements, but not with gage-height fluctuations.

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

Cooperation.—Station operated since 1901 by the United States section of the International Boundary Commission.

Discharge measurements of Rio Grande near San Marcial, N. Mex., in 1911.

[By G. W. King.]

Date.	Gage height.	Dis- charge.	Date.	Gage height.	Dis- charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>		<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 10.....	10.5	41	Apr. 3.....	11.3	1,289
Jan. 11.....	10.8	542	Apr. 6.....	11.5	1,653
Jan. 14.....	11.0	595	Apr. 9.....	11.4	1,672
Jan. 17.....	11.0	793	Apr. 12.....	11.0	1,032
Jan. 22.....	10.9	749	Apr. 15.....	11.1	971
Jan. 25.....	10.7	643	Apr. 18.....	11.2	1,034
Jan. 28.....	10.6	578	Apr. 21.....	11.1	928
Jan. 31.....	10.9	784	Apr. 25.....	12.0	2,408
Feb. 3.....	10.7	847	Apr. 28.....	12.0	2,938
Feb. 6.....	10.9	795	Apr. 30.....	12.5	3,684
Feb. 9.....	10.8	669	May 3.....	12.3	3,707
Feb. 12.....	10.7	582	May 6.....	12.3	3,754
Feb. 15.....	10.8	522	May 9.....	13.0	5,281
Feb. 18.....	10.9	655	May 12.....	13.5	8,103
Feb. 22.....	10.8	680	May 16.....	13.0	6,508
Feb. 25.....	10.7	466	May 19.....	12.5	5,654
Mar. 1.....	10.8	468	May 22.....	12.4	5,219
Mar. 4.....	10.9	626	May 25.....	11.7	3,540
Mar. 7.....	10.9	620	May 28.....	12.0	3,817
Mar. 9.....	12.6	3,649	May 31.....	12.2	4,073
Mar. 12.....	11.4	1,699	June 3.....	12.0	4,067
Mar. 14.....	11.9	3,130	June 6.....	12.5	4,517
Mar. 17.....	10.8	1,245	June 9.....	12.2	4,290
Mar. 20.....	11.0	1,428	June 13.....	12.6	5,218
Mar. 23.....	11.3	1,716	June 16.....	12.7	5,817
Mar. 31.....	10.8	836	June 19.....	12.5	4,574

Discharge measurements of Rio Grande near San Marcial, N. Mex., in 1911—Continued.

Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.
	<i>Fect.</i>	<i>Sec.-ft.</i>		<i>Fect.</i>	<i>Sec.-ft.</i>
June 22.....	12.3	4,217	Sept. 30.....	10.7	1,285
June 25.....	11.8	3,968	Oct. 3.....	11.4	2,117
June 27.....	12.5	4,163	Oct. 6.....	12.95	5,300
June 30.....	12.1	3,267	Oct. 7.....	14.2	11,301
July 3.....	14.0	8,426	Oct. 10.....	14.0	11,528
July 6.....	11.9	5,702	Oct. 13.....	13.2	9,435
July 10.....	12.7	5,750	Oct. 16.....	12.1	4,799
July 14.....	12.8	6,000	Oct. 19.....	11.3	3,215
July 15.....	13.6	10,200	Oct. 22.....	11.3	3,046
July 19.....	12.5	5,997	Oct. 25.....	11.1	2,527
July 22.....	13.2	9,874	Oct. 29.....	11.6	3,745
July 27.....	12.9	7,456	Oct. 31.....	11.5	3,066
July 29.....	12.0	5,007	Nov. 3.....	11.6	2,670
July 31.....	12.0	4,871	Nov. 6.....	11.5	2,361
Aug. 3.....	11.2	3,201	Nov. 9.....	11.3	2,329
Aug. 6.....	10.4	1,290	Nov. 12.....	11.2	2,175
Aug. 10.....	9.9	641	Nov. 15.....	11.1	1,611
Aug. 13.....	9.4	283	Nov. 18.....	11.1	1,536
Aug. 16.....	8.9	28	Nov. 21.....	11.1	1,466
Aug. 19.....	9.6	381	Nov. 24.....	11.0	1,597
Aug. 22.....	9.4	289	Nov. 27.....	11.0	1,467
Aug. 25.....	10.0	810	Nov. 30.....	10.9	1,334
Aug. 28.....	10.1	821	Dec. 3.....	10.5	818
Aug. 31.....	10.1	673	Dec. 6.....	11.0	1,278
Sept. 3.....	10.0	609	Dec. 9.....	11.1	1,403
Sept. 6.....	9.9	546	Dec. 12.....	11.1	1,276
Sept. 9.....	9.9	556	Dec. 15.....	10.9	1,028
Sept. 12.....	9.9	609	Dec. 19.....	10.9	968
Sept. 15.....	9.9	479	Dec. 22.....	11.0	945
Sept. 18.....	9.9	503	Dec. 25.....	10.8	781
Sept. 21.....	10.4	1,000	Dec. 28.....	10.6	428
Sept. 24.....	9.9	564	Dec. 31.....	10.6	204
Sept. 27.....	10.2	654			

Daily gage height, in feet, of Rio Grande near San Marcial, N. Mex., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	10.5	10.75	10.8	10.95	12.6	11.95	11.95	11.85	9.9	11.3	11.55	10.75
2.....	10.2	10.7	10.9	11.15	12.35	12.3	11.8	11.5	9.95	10.7	11.55	10.75
3.....	11.0	10.7	11.0	11.3	12.2	12.4	14.0	11.2	10.0	11.3	11.6	10.6
4.....	10.9	10.85	10.9	11.4	12.1	12.2	14.1	10.95	10.05	11.7	11.6	10.65
5.....	11.05	10.8	11.5	12.05	12.5	12.45	10.75	9.9	11.95	11.6	10.85	
6.....	10.9	10.85	11.45	12.2	12.5	11.95	10.45	9.9	13.5	11.5	10.95	
7.....	10.9	10.9	11.55	12.3	12.35	12.3	10.3	9.95	14.3	11.4	11.0	
8.....	10.85	11.0	11.5	12.7	12.3	12.55	10.3	9.95	13.95	11.45	10.95	
9.....	10.85	12.45	11.4	12.9	12.2	12.35	10.15	9.95	13.75	11.3	11.05	
10.....	10.5	10.8	11.5	11.25	13.2	12.35	12.55	9.95	9.9	14.0	11.3	11.05
11.....	10.8	10.75	11.35	11.05	13.45	12.4	12.25	9.75	10.05	13.55	11.25	11.1
12.....	10.9	10.7	11.4	11.0	13.5	12.45	12.2	9.55	9.95	13.35	11.2	11.05
13.....	11.0	10.6	11.55	11.05	13.45	12.6	12.05	9.4	9.95	13.3	11.25	10.95
14.....	11.1	10.6	12.1	11.0	13.2	12.7	12.45	9.4	10.0	12.85	11.15	10.85
15.....	11.2	10.75	11.25	11.05	12.9	12.85	12.85	9.25	10.0	12.7	11.1	10.9
16.....	11.15	10.8	10.75	11.15	12.9	12.75	12.0	9.0	9.95	12.3	11.15	10.9
17.....	11.05	10.9	10.8	11.2	12.65	12.6	11.7	8.9	10.0	11.75	11.05	10.95
18.....	11.05	10.9	10.85	11.15	12.7	12.9	12.95	8.75	9.9	11.55	11.1	10.9
19.....	11.0	10.9	10.95	11.1	12.55	12.5	12.4	9.15	9.9	11.35	11.1	10.85
20.....	11.05	10.75	11.05	11.15	12.45	12.3	12.25	9.5	10.3	11.2	11.15	10.85
21.....	10.95	10.75	11.05	11.1	12.45	12.3	13.45	9.4	10.4	11.15	11.1	10.9
22.....	10.9	10.75	11.15	11.05	12.4	12.3	13.15	9.35	10.4	11.25	11.2	10.95
23.....	10.85	10.8	11.3	11.1	12.1	12.3	13.45	9.9	10.05	11.05	11.05	11.0
24.....	10.75	10.8	11.4	11.45	11.85	11.95	12.65	10.4	9.9	11.1	11.05	10.85
25.....	10.75	10.7	11.4	11.95	11.75	11.85	12.8	10.05	10.05	11.1	11.1	10.8
26.....	10.75	10.7	11.35	12.0	11.7	11.85	12.85	10.15	9.95	11.05	11.2	10.75
27.....	10.7	10.7	11.25	11.95	11.75	12.45	12.8	10.0	10.25	11.1	11.05	10.65
28.....	10.65	10.7	11.15	12.0	11.9	12.25	12.2	10.1	10.2	11.2	10.95	10.55
29.....	10.55	11.0	12.25	12.0	12.1	12.0	12.0	10.1	10.4	11.4	10.85	10.55
30.....	10.75	10.9	12.6	12.15	12.05	12.05	10.1	10.7	11.35	10.85	10.45	10.45
31.....	10.9	10.8	12.25	12.25	12.25	12.0	10.1	10.1	11.5	10.85	10.55	10.55

NOTE.—No flow Jan. 3-9.

Daily discharge, in second-feet, of Rio Grande near San Marcial, N. Mex., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	350	740	α 470	970	3,830	3,950	3,040	4,560	545	2,000	2,980	1,140
2.....	170	770	570	1,150	3,730	4,390	2,820	3,830	575	1,280	2,760	1,140
3.....	0	α 850	670	α 1,290	α 3,670	α 4,520	α 3,430	α 3,200	α 610	α 2,000	α 2,670	α 950
4.....	0	895	α 625	1,470	3,420	4,250	8,630	2,600	640	2,730	2,650	955
5.....	0	985	545	1,650	3,360	4,520	6,440	2,000	545	3,240	2,630	1,140
6.....	0	α 795	585	α 1,560	α 3,610	α 4,520	α 5,770	α 1,390	α 545	α 7,940	α 2,360	α 1,230
7.....	0	795	α 620	1,740	3,750	4,400	5,910	1,150	575	11,780	2,340	1,280
8.....	0	730	800	1,720	4,630	4,370	5,980	1,120	575	10,640	2,350	1,220
9.....	0	α 730	α 3,380	α 1,670	α 5,060	α 4,290	5,590	930	α 575	10,180	α 2,330	α 1,340
10.....	α 40	670	1,870	1,430	6,340	4,600	α 5,600	α 690	575	α 11,530	2,330	1,300
11.....	α 540	620	1,620	1,110	7,570	4,750	5,300	535	680	10,350	2,250	1,320
12.....	570	α 580	α 1,700	α 1,030	α 8,100	4,910	5,250	390	α 640	9,830	α 2,170	α 1,220
13.....	600	480	2,130	1,030	7,940	α 5,220	5,100	α 280	595	α 9,690	2,150	1,090
14.....	α 625	440	α 3,700	925	7,150	α 5,580	α 5,580	280	585	7,940	1,830	965
15.....	760	α 490	2,020	920	6,190	5,970	α 6,270	205	α 540	7,050	α 1,610	α 1,030
16.....	800	540	1,160	1,000	α 6,190	α 5,870	5,230	α 80	515	5,400	1,690	1,010
17.....	α 820	640	α 1,240	1,030	5,910	5,720	4,780	30	555	4,110	1,460	1,050
18.....	815	α 655	1,290	α 1,000	6,000	6,120	7,720	15	α 505	3,710	α 1,540	985
19.....	795	680	1,380	950	α 5,740	α 4,570	α 5,850	α 185	505	α 3,310	1,510	α 920
20.....	815	585	α 1,480	975	5,480	4,320	5,620	335	900	2,910	1,590	875
21.....	770	615	1,480	α 930	5,400	4,270	11,000	290	α 1,000	2,730	α 1,470	885
22.....	α 750	α 640	1,570	890	α 5,220	α 4,220	α 9,650	α 265	1,000	α 2,920	1,780	α 895
23.....	725	635	α 1,720	970	4,530	4,220	10,870	725	695	2,400	1,590	945
24.....	670	590	1,820	1,530	3,930	4,040	8,030	1,160	α 565	2,530	α 1,690	820
25.....	α 670	α 465	1,820	α 2,330	α 3,640	α 3,990	8,040	α 855	610	α 2,530	1,700	α 780
26.....	675	460	1,710	2,580	3,540	3,980	7,750	885	580	2,410	1,810	675
27.....	645	450	1,550	2,680	3,590	α 4,150	α 7,160	780	α 670	2,530	α 1,540	535
28.....	α 610	440	1,390	α 2,940	α 3,720	3,690	5,550	α 820	655	2,770	1,400	α 390
29.....	545	.....	1,160	3,310	3,820	3,370	α 5,010	770	905	α 3,260	1,270	315
30.....	680	.....	1,000	3,830	4,010	α 3,190	4,990	725	α 1,285	2,910	α 1,270	160
31.....	α 785	.....	α 835	4,140	.....	.....	α 4,870	α 675	.....	α 3,070	.....	α 165

α Date of measurement.

Monthly discharge of Rio Grande near San Marcial, N. Mex., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet.).
	Maximum.	Minimum.	Mean.	
January.....	820	0	491	30,198
February.....	985	440	642	35,633
March.....	3,700	470	1,416	87,094
April.....	3,830	890	1,554	92,450
May.....	8,100	3,360	4,942	303,888
June.....	6,120	3,190	4,530	269,554
July.....	11,000	2,820	6,382	392,390
August.....	4,560	15	1,027	63,164
September.....	1,285	505	658	38,164
October.....	11,780	1,280	5,086	312,754
November.....	2,980	1,270	1,957	116,469
December.....	1,340	160	927	56,975
The year.....	11,780	0	2,490	1,799,733

RIO GRANDE NEAR EL PASO, TEX.

Location.—Courchesné's limekiln, about 4 miles north of El Paso.

Records available.—May 10, 1889, to June 30, 1893, and January 25, 1895, to December 31, 1911.

Gage.—Inclined rod bolted to steel piers set with cement in holes drilled in solid rock 60 feet upstream from pumping station. Originally located at Old Fort Bliss about 1,500 feet above the Mexican dam; maintained 1889 to 1893. Re-established 1895 $1\frac{1}{2}$ miles farther upstream and 3 miles north of El Paso; maintained until April 30, 1897. Moved 1 mile farther upstream to its present location

May 1, 1897. Gage heights at the kiln measured at the masonry pump foundation pier with a graduated rod until October, 1902, when the pier was torn down. From October, 1902, to August 19, 1906, an inclined wooden gage 60 feet above the pier was used. Subsequent to August 19, 1906, a gage 300 feet below the inclined gage has been used. Datum of gages at the kiln has remained unchanged.

Channel.—Bed is unstable and channel shifts. Left bank is the loose rock embankment of the Atchison, Topeka & Santa Fe Railway; right bank is of made ground and subject to inundation by floods.

Discharge measurements.—Made from cable.

Cooperation.—Station operated by the United States section of the International Boundary Commission since May 1, 1897.

Discharge measurements of Rio Grande near El Paso, Tex., in 1911.

[By W. L. Follett, E. G. Piper, and W. C. Stewart.]

Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>		<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 6.	6.5	8	July 11.	13.5	8,800
Jan. 17.	8.1	277	July 13.	12.3	6,978
Jan. 21.	8.7	597	July 16.	11.9	6,205
Jan. 26.	7.8	174	July 19.	11.4	5,127
Jan. 28.	7.7	162	July 21.	12.3	6,777
Feb. 1.	7.4	141	July 24.	13.65	9,366
Feb. 4.	7.2	117	July 27.	13.6	9,594
Feb. 8.	8.3	460	July 30.	11.7	5,367
Feb. 11.	7.9	161	Aug. 4.	10.2	2,944
Feb. 14.	7.9	170	Aug. 7.	9.2	1,676
Feb. 17.	7.3	130	Aug. 10.	8.4	744
Feb. 20.	8.3	274	Aug. 13.	7.7	325
Feb. 23.	8.55	325	Aug. 16.	7.2	120
Feb. 27.	8.1	272	Aug. 20.	6.7	12
Mar. 3.	7.8	190	Aug. 23.	6.5	8
Mar. 6.	8.3	491	Aug. 26.	6.5	6
Mar. 9.	7.75	165	Aug. 29.	6.5	10
Mar. 13.	9.7	1,719	Aug. 31.	7.0	77
Mar. 16.	10.2	1,996	Sept. 4.	6.3	6
Mar. 20.	8.5	601	Sept. 11.	7.0	67
Mar. 24.	9.1	1,031	Sept. 15.	7.4	173
Mar. 27.	8.6	693	Sept. 20.	7.15	134
Mar. 30.	8.5	622	Sept. 23.	8.6	914
Apr. 3.	8.0	193	Sept. 27.	7.6	214
Apr. 9.	9.2	1,125	Sept. 30.	7.5	119
Apr. 16.	8.3	289	Oct. 4.	9.0	1,342
Apr. 19.	7.6	116	Oct. 8.	11.95	5,578
Apr. 22.	7.5	102	Oct. 10.	13.8	9,706
Apr. 26.	7.9	167	Oct. 14.	13.7	9,121
Apr. 30.	10.0	1,746	Oct. 17.	12.2	6,542
May 3.	11.1	3,290	Oct. 21.	10.6	3,493
May 6.	10.4	2,464	Oct. 24.	10.4	2,924
May 10.	10.9	3,118	Oct. 27.	10.0	2,413
May 14.	12.8	6,295	Oct. 30.	10.2	3,026
May 16.	13.05	7,443	Nov. 3.	10.4	2,874
May 20.	12.0	5,665	Nov. 6.	10.05	2,550
May 23.	11.0	4,267	Nov. 9.	10.1	2,566
May 27.	10.15	3,001	Nov. 12.	9.6	1,867
May 31.	10.0	2,464	Nov. 15.	9.65	1,752
June 3.	10.4	2,914	Nov. 19.	9.55	1,677
June 6.	10.2	2,936	Nov. 22.	9.4	1,506
June 9.	10.9	3,815	Nov. 25.	9.5	1,566
June 12.	11.1	4,014	Nov. 30.	9.4	1,355
June 15.	11.5	4,631	Dec. 3.	9.2	1,306
June 17.	11.8	5,112	Dec. 6.	8.8	722
June 20.	11.5	5,101	Dec. 10.	9.4	1,294
June 23.	11.35	4,811	Dec. 13.	9.45	1,306
June 26.	11.0	4,233	Dec. 17.	9.3	1,120
June 29.	10.8	3,763	Dec. 20.	9.15	841
July 2.	10.5	3,120	Dec. 23.	9.05	698
July 5.	11.9	5,180	Dec. 26.	9.15	829
July 6.	13.9	9,715	Dec. 30.	8.95	710
July 8.	11.9	6,342			

Daily gage height, in feet, of Rio Grande near El Paso, Tex., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....		7.45	7.7	8.1	10.35	10.25	10.55	11.15	6.85	7.9	10.65	9.45
2.....	6.4	7.2	7.8	8.0	10.65	10.25	10.6	11.05	6.75	8.05	10.4	9.4
3.....	6.7	7.05	7.8	8.0	11.05	10.3	10.9	10.65	6.6	8.75	10.3	9.25
4.....	6.7	7.15	7.7	7.95	11.1	10.6	10.7	10.1	6.35	9.15	10.2	9.2
5.....	6.55	7.2	8.25	7.9	10.85	10.8	12.2	9.7	6.3	9.4	10.2	9.05
6.....	6.35	7.65	8.3	8.3	10.55	10.2	13.75	9.5	6.3	10.1	10.05	8.8
7.....	6.35	8.05	8.0	8.8	10.3	10.3	13.6	9.3	6.3	10.8	10.0	8.8
8.....		8.3	7.6	9.05	10.25	10.55	11.85	8.95	6.3	11.65	10.0	9.25
9.....		8.1	7.75	9.2	10.45	11.0	11.7	8.75	6.3	13.35	10.05	9.3
10.....		8.05	7.5	9.3	10.8	10.8	12.8	8.35	6.65	13.75	9.85	9.35
11.....	6.35	7.9	7.3	9.05	11.25	11.1	13.7	8.1	6.95	13.8	9.75	9.45
12.....	6.7	7.7	10.45	8.85	11.8	11.1	13.8	7.95	7.25	14.5	9.6	9.45
13.....	6.7	7.85	9.7	8.8	12.15	11.1	12.35	7.75	7.3	14.5	9.6	9.45
14.....	6.4	7.9	9.25	8.55	12.85	11.25	11.8	7.55	7.3	13.75	9.6	9.45
15.....		7.5	9.2	8.4	12.95	11.5	11.8	7.35	7.3	13.4	9.65	9.4
16.....		7.35	10.05	8.3	13.05	11.65	11.75	7.25	7.3	12.9	9.8	9.4
17.....	7.95	7.3	9.55	8.15	12.8	11.8	12.6	7.05	7.05	12.45	9.65	9.3
18.....	8.15	7.25	8.85	7.85	12.25	11.85	13.2	6.95	7.2	11.55	9.5	9.35
19.....	8.2	7.6	8.4	7.6	12.05	11.7	11.3	6.85	7.1	11.05	9.5	9.15
20.....	8.65	8.2	8.5	7.55	11.9	11.5	11.55	6.75	7.45	11.35	9.4	9.15
21.....	8.7	8.1	8.4	7.9	11.6	10.75	13.0	6.65	8.1	10.6	9.4	9.15
22.....	8.2	8.1	8.4	7.55	11.4	10.45	12.35	6.5	8.4	10.55	9.4	9.2
23.....	8.2	8.5	8.4	7.35	11.1	10.85	13.4	6.5	8.15	10.3	9.55	9.05
24.....	8.3	8.55	9.05	7.35	11.05	10.6	13.8	6.5	8.15	10.35	9.5	9.05
25.....	8.15	8.35	8.75	7.6	10.7	10.6	14.0	6.5	7.95	10.25	9.5	9.1
26.....	7.9	8.4	8.7	7.7	10.35	10.85	13.4	6.5	7.95	10.15	9.5	9.15
27.....	7.8	8.15	8.6	8.0	10.05	10.5	13.7	6.5	7.65	10.0	9.55	9.05
28.....	7.7	7.75	8.55	9.95	10.0	10.55	13.8	6.4	7.35	10.0	9.5	9.25
29.....	7.65		8.5	10.0	10.0	10.75	12.55	6.45	7.3	10.0	9.5	9.1
30.....	7.8		8.5	9.9	9.9	10.55	11.85	7.4	7.45	10.2	9.45	8.95
31.....	7.8		8.4		10.1		11.4	7.05		10.8		8.7

NOTE.—No flow on days for which no gage heights are given.

Daily discharge, in second-feet, of Rio Grande near El Paso, Tex., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	0	a 155	140	315	2,240	2,740	3,350	4,390	60	360	3,550	1,370
2.....	5	115	190	220	2,660	2,740	3,270	4,240	50	450	3,030	1,350
3.....	20	100	a 190	a 195	a3,220	a2,810	3,710	3,630	35	1,110	a2,720	a1,320
4.....	20	a 110	130	170	3,290	3,200	3,410	a2,840	a 10	a1,480	2,690	1,240
5.....	10	115	460	145	2,990	3,460	a5,860	2,360	5	1,910	2,690	1,030
6.....	a 5	255	a 490	445	a2,640	a2,940	a9,380	2,070	5	2,920	a2,550	a 720
7.....	5	380	315	820	2,360	3,060	9,110	a1,780	5	3,920	2,530	720
8.....	0	a 460	80	1,010	2,310	3,380	a6,270	1,380	5	a5,140	2,530	1,150
9.....	0	310	a 165	a1,120	2,560	a3,910	6,040	1,140	5	8,700	a2,550	1,200
10.....	0	275	115	1,210	a2,990	3,710	7,730	a 720	35	a9,590	2,220	a1,240
11.....	5	a 160	75	985	3,700	4,010	a9,300	570	a 65	9,710	2,080	1,310
12.....	20	125	2,220	805	4,620	a4,010	9,550	475	130	11,810	a1,870	1,310
13.....	20	155	a1,720	750	5,200	4,010	a7,060	a 350	145	11,810	1,800	a1,310
14.....	10	a 170	1,470	530	a6,440	4,240	6,010	265	145	a9,290	1,740	1,300
15.....	0	140	1,440	390	6,940	a4,630	6,010	180	a 145	8,610	a1,750	1,240
16.....	0	130	a1,910	a 290	a7,440	4,870	a5,920	a 140	155	7,740	1,860	1,230
17.....	a 220	a 130	1,480	250	7,020	a5,110	7,740	85	115	a6,970	1,510	a1,120
18.....	305	125	925	175	6,090	5,190	9,060	65	140	5,300	1,640	1,130
19.....	330	175	555	a 115	5,750	5,150	a4,940	45	125	4,350	a1,640	885
20.....	570	a 260	a 600	110	5,520	a5,100	5,400	a 20	a 295	4,920	1,550	a 840
21.....	a 595	235	530	160	5,110	3,980	a8,060	10	645	a3,490	1,530	825
22.....	360	235	530	a 110	4,830	3,530	6,870	10	810	3,330	a1,510	865
23.....	360	a 315	530	80	a4,410	a4,100	8,890	a 10	a 675	2,880	1,600	a 700
24.....	410	325	a 995	80	4,340	3,680	a9,660	5	600	a2,850	1,570	710
25.....	340	300	795	120	3,820	3,680	10,240	5	460	2,730	a1,570	770
26.....	a 220	305	760	a 135	3,300	a4,020	9,270	a 5	460	2,600	1,540	a 830
27.....	175	280	a 690	265	a2,850	3,480	a9,790	5	a 250	a2,410	1,540	770
28.....	a 160	155	660	1,660	2,700	3,530	9,850	5	95	2,520	1,480	890
29.....	155		620	1,720	2,620	a3,710	7,210	a 10	70	2,620	1,450	800
30.....	175		a 620	a1,680	2,390	3,510	a5,670	125	a 105	a3,030	a1,390	a 710
31.....	175		550		a2,610		4,770	a 80		3,930		560

a Date of measurement.

Monthly discharge of Rio Grande near El Paso, Tex., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January.....	595	0	151	9,263
February.....	460	100	214	11,891
March.....	2,220	75	708	43,537
April.....	1,720	80	535	31,855
May.....	7,440	2,240	4,031	247,855
June.....	5,190	2,740	3,850	229,071
July.....	10,240	3,270	7,081	435,372
August.....	4,390	5	871	53,583
September.....	810	5	195	11,593
October.....	11,810	360	4,790	294,506
November.....	3,550	1,390	1,997	118,850
December.....	1,370	560	1,014	62,370
The year.....	11,810	0	2,140	1,549,746

RIO GRANDE ABOVE PRESIDIO, TEX.

Location.—At the Haciendita, 9 miles above Presidio. From April, 1900, to September, 1905, the station was located at a point 9 miles above Presidio, 8 miles above the mouth of Rio Conchos, and about 200 miles below El Paso. Owing to the formation of a cut-off around the station it was necessary to abandon this site and, in September, 1905, the station was moved to a point 8 miles farther upstream. The cut-off formed in 1905 having since been closed and caving banks necessitating the abandonment of the new station, it was moved back to its original site on July 6, 1909, with a different gage datum from that of the first station.

Records available.—April 4, 1900, to December 31, 1911.

Gage.—An inclined rod fastened to posts sunk in the ground. Datum changed in September, 1905, and on July 6, 1909.

Channel.—The bed is sandy and shifting. Both banks are fairly permanent and are inundated by extreme floods.

Discharge measurements.—Made from a cable.

Cooperation.—Station established and operated by the United States section of the International Boundary Commission.

Discharge measurements of Rio Grande above Presidio, Tex., in 1911.

[By W. T. Millington.]

Date.	Gage height.	Dis- charge.	Date.	Gage height.	Dis- charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>		<i>Feet.</i>	<i>Sec.-ft.</i>
Feb. 18.....	6.1	238	May 21.....	10.6	2,871
Feb. 19.....	6.2	302	May 24.....	10.9	4,537
Feb. 22.....	4.55	30	May 27.....	10.9	4,847
Mar. 22.....	6.85	208	May 30.....	10.7	3,420
Mar. 25.....	5.55	62	June 2.....	8.8	1,043
Mar. 27.....	5.45	24	June 5.....	9.3	1,517
Mar. 30.....	5.0	12	June 8.....	9.7	2,520
Apr. 2.....	6.1	64	June 11.....	9.5	2,363
Apr. 5.....	5.7	41	June 14.....	11.85	4,975
Apr. 8.....	5.1	7	June 17.....	10.2	3,198
Apr. 19.....	5.2	14	June 20.....	9.7	1,956
Apr. 22.....	4.9	4	June 23.....	10.4	2,616
Apr. 25.....	6.9	160	June 26.....	10.8	2,958
Apr. 29.....	5.2	10	June 29.....	9.8	1,716
May 6.....	7.0	291	July 3.....	11.1	4,772
May 9.....	8.9	1,353	July 6.....	9.55	1,414
May 12.....	8.1	563	July 9.....	10.7	3,687
May 15.....	9.3	1,293	July 12.....	11.5	5,440
May 18.....	10.4	2,596	July 15.....	10.9	4,162

Discharge measurements of Rio Grande above Presidio, Tex., in 1911—Continued.

Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>		<i>Feet.</i>	<i>Sec.-ft.</i>
July 18.....	11.1	4,021	Oct. 12.....	9.85	1,940
July 21.....	12.9	6,457	Oct. 15.....	10.6	3,820
July 24.....	12.65	6,786	Oct. 18.....	11.0	4,396
July 27.....	12.05	5,953	Oct. 21.....	11.3	5,046
July 30.....	11.8	5,316	Oct. 24.....	10.95	3,505
Aug. 3.....	12.15	6,495	Oct. 27.....	9.0	1,790
Aug. 6.....	9.65	2,371	Oct. 30.....	8.9	1,752
Aug. 9.....	8.3	1,059	Nov. 2.....	9.05	2,125
Aug. 12.....	7.3	622	Nov. 5.....	8.9	1,693
Aug. 15.....	6.8	284	Nov. 8.....	8.5	1,241
Aug. 18.....	6.2	175	Nov. 11.....	8.8	1,590
Aug. 21.....	5.7	105	Nov. 14.....	8.5	1,270
Aug. 24.....	5.8	145	Nov. 17.....	8.3	1,109
Aug. 27.....	6.2	229	Nov. 20.....	8.3	1,126
Aug. 30.....	6.1	193	Nov. 23.....	8.2	1,218
Sept. 2.....	5.7	129	Nov. 26.....	8.1	861
Sept. 5.....	5.5	97	Nov. 29.....	8.2	873
Sept. 8.....	7.9	880	Dec. 3.....	8.2	1,093
Sept. 11.....	5.45	100	Dec. 6.....	7.9	926
Sept. 14.....	5.8	197	Dec. 9.....	7.7	843
Sept. 17.....	5.3	101	Dec. 12.....	7.6	705
Sept. 20.....	5.1	71	Dec. 15.....	7.8	711
Sept. 23.....	5.7	157	Dec. 18.....	7.9	794
Sept. 26.....	5.2	88	Dec. 21.....	8.0	951
Sept. 29.....	5.0	47	Dec. 24.....	7.9	1,072
Oct. 3.....	5.6	102	Dec. 27.....	7.6	872
Oct. 6.....	5.3	72	Dec. 30.....	7.6	939
Oct. 9.....	5.1	42			

Daily gage height, in feet, of Rio Grande above Presidio, Tex., for 1911.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....			4.9	4.85	8.95	9.4	12.4	5.8	4.9	8.95	8.0
2.....			6.05		8.75	10.5	12.35	5.7	5.65	9.0	8.05
3.....			6.05		8.85	11.1	12.35	5.6	5.55	9.6	8.2
4.....			5.85		9.25	9.5	12.25	5.6	5.35	9.6	8.0
5.....			5.65		9.3	9.55	10.6	5.5	5.3	8.85	8.0
6.....			5.45	7.0	9.25	9.65	9.6	5.6	5.25	8.8	7.9
7.....			5.35	8.0	9.25	9.8	9.1	5.25	5.1	8.65	7.85
8.....			5.05	8.7	9.8	9.8	8.55	7.2	5.1	8.55	7.75
9.....			4.8	8.9	9.8	11.0	8.2	6.0	5.05	8.85	7.85
10.....				8.6	9.6	12.15	7.85	5.55	7.4	8.9	7.45
11.....				8.4	9.4	11.65	7.55	5.75	8.95	8.85	7.5
12.....				8.15	10.85	11.45	7.3	6.3	9.75	8.65	7.6
13.....				8.35	12.6	11.0	7.1	5.9	10.0	8.65	7.7
14.....				9.3	11.2	10.9	6.85	5.75	10.5	8.5	7.8
15.....				9.35	10.3	11.35	6.7	5.4	10.55	8.3	7.8
16.....				9.35	10.2	11.75	6.45	5.35	10.5	8.2	7.95
17.....				11.35	10.2	11.2	6.35	5.25	10.75	8.3	7.9
18.....				10.35	10.25	11.65	6.15	5.2	11.0	8.3	7.9
19.....	5.3			10.5	10.25	12.5	5.95	5.1	11.0	8.35	7.9
20.....	5.4		5.05	10.55	10.05	12.5	5.75	5.7	11.05	8.3	7.9
21.....	4.95		5.0	10.65	11.35	12.95	5.65	6.35	11.4	8.2	8.0
22.....	4.6	6.8	4.9	10.75	10.6	13.05	5.6	6.0	11.75	8.15	7.7
23.....		6.35	4.9	10.85	10.5	12.55	5.65	5.7	11.7	8.15	7.85
24.....		5.75		10.9	10.65	12.5	5.75	5.5	10.95	8.1	7.75
25.....		5.5	7.15	10.9	10.8	12.0	8.35	5.35	9.65	8.1	7.65
26.....		5.65	6.5	10.9	10.75	11.65	6.55	5.2	9.45	8.1	7.8
27.....		5.6	6.1	10.85	10.2	11.95	6.3	5.15	9.05	8.4	7.65
28.....		5.55	5.6	11.6	10.0	12.3	7.0	5.1	9.25	8.2	7.6
29.....		5.2	5.2	10.85	9.7	12.05	7.05	5.0	9.1	8.2	7.5
30.....		4.95	4.9	10.7	9.45	11.8	6.1	4.9	8.85	8.1	7.6
31.....		4.9		10.6		12.05	6.0		8.65		7.6

NOTE.—No flow during January and on days for which no gage heights are given.

Daily discharge, in second-feet, of Rio Grande above Presidio, Tex., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	0	0	0	10	5	1,220	1,400	6,700	145	30	1,990	760
2.....	0	0	0	a 60	0	a1,000	3,580	6,660	a130	105	a2,060	875
3.....	0	0	0	60	0	1,090	a4,770	a6,830	115	a95	2,780	a1,090
4.....	0	0	0	50	0	1,470	1,490	6,660	115	75	2,780	980
5.....	0	0	0	a 40	0	a1,520	1,500	3,940	a95	70	a1,640	980
6.....	0	0	0	30	a290	1,470	a1,610	a2,320	105	a65	1,580	a925
7.....	0	0	0	25	850	1,470	1,910	1,840	70	40	1,410	905
8.....	0	0	0	5	1,240	a2,720	1,910	1,300	a655	40	a1,300	865
9.....	0	0	0	5	a1,350	2,720	a4,290	a1,010	270	a35	1,650	a995
10.....	0	0	0	0	1,060	2,480	6,640	860	135	975	1,710	580
11.....	0	0	0	0	860	a2,240	5,690	730	a185	1,590	a1,640	615
12.....	0	0	0	0	a595	4,360	a5,230	a620	340	a1,900	1,430	a705
13.....	0	0	0	0	715	6,950	4,370	485	225	2,370	1,430	710
14.....	0	0	0	0	1,295	a4,270	4,160	315	a190	3,490	a1,270	710
15.....	0	0	0	0	a1,350	3,310	a4,580	a285	120	a3,750	1,110	710
16.....	0	0	0	0	1,350	3,200	5,520	220	110	3,680	1,030	795
17.....	0	0	0	0	4,500	a3,200	4,250	205	a95	4,040	a1,110	785
18.....	0	a 130	0	0	a2,530	3,250	a4,760	a170	85	a4,400	1,120	a795
19.....	0	a 120	0	a 10	2,730	3,250	5,910	140	70	4,400	1,160	825
20.....	0	140	0	10	2,900	a2,780	5,910	110	a155	4,500	a1,130	860
21.....	0	70	0	10	a3,020	3,510	6,560	a100	245	a5,250	1,100	a950
22.....	0	a35	a205	a5	3,580	2,800	7,030	90	195	5,950	1,120	830
23.....	0	0	155	5	4,130	a2,710	6,310	105	a155	5,790	a1,180	980
24.....	0	0	85	0	a4,540	2,830	a6,580	a130	130	a3,510	1,050	a970
25.....	0	0	a55	a 180	4,640	2,960	5,880	1,090	110	2,360	950	905
26.....	0	0	60	125	4,740	a2,900	5,400	370	a90	2,180	a860	1,010
27.....	0	0	a40	90	a4,700	2,210	a5,810	a265	80	a1,830	1,100	a900
28.....	0	0	30	45	6,670	1,970	6,590	515	70	1,990	870	895
29.....	0	0	20	a 10	4,140	a1,640	5,950	535	a45	1,890	a870	755
30.....	0	0	a10	5	a3,420	1,440	a5,320	a195	30	a1,720	790	a940
31.....	0	0	10	0	3,220	0	5,820	180	0	1,600	0	940

a Date of measurement.

Monthly discharge of Rio Grande above Presidio, Tex., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January.....	0	0	0	0
February.....	140	0	18	982
March.....	205	0	22	1,329
April.....	180	0	26	1,547
May.....	6,670	0	2,268	139,478
June.....	6,950	1,000	2,631	156,575
July.....	7,030	1,400	4,743	291,630
August.....	6,830	90	1,450	89,167
September.....	655	30	152	9,045
October.....	5,950	30	2,249	138,288
November.....	2,780	790	1,374	81,759
December.....	1,090	580	856	52,641
The year.....	7,030	0	1,330	962,441

RIO GRANDE BELOW PRESIDIO, TEX.

Location.—6 miles below Presidio and 7 miles below the mouth of Rio Conchos, at the west end of the canyon section of the Rio Grande.

Records available.—April 8, 1900, to December 31, 1911.

Gage.—Inclined rod bolted to posts sunk into the ground. An additional flood gage is nailed to a tree at the gravel hills.

Channel.—The bed is of shifting sand and is affected by a drainage line called Alamos Creek, which enters the river one-fourth mile below the station. This creek is subject to torrential floods, which bring large quantities of bowlders and gravel

into the Rio Grande, forming a temporary dam which remains, throwing back-water onto the gage until a flood in the river scours it out. The right bank is a rock bluff. The left bank is an alluvial deposit and overflows above a stage of about 13 feet for a distance of 750 feet back from the stream to gravel hills.

Discharge measurements.—From cable for stream proper and from boat for flooded left bank.

Cooperation.—Station established and operated by the United States section of the International Boundary Commission.

Discharge measurements of Rio Grande below Presidio, Tex., in 1911.

[By W. T. Millington.]

Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>		<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 4.	6.2	48	July 4.	10.4	4,683
Jan. 7.	6.2	39	July 7.	11.4	6,200
Jan. 10.	6.2	34	July 10.	11.8	8,561
Jan. 13.	6.2	33	July 13.	14.6	17,046
Jan. 16.	6.2	30	July 16.	12.0	9,968
Jan. 19.	6.2	27	July 19.	14.7	16,585
Jan. 22.	6.1	26	July 22.	13.75	14,306
Jan. 25.	6.2	29	July 25.	14.7	18,720
Jan. 28.	6.3	40	July 28.	11.9	10,445
Jan. 31.	6.4	50	July 31.	13.4	13,582
Feb. 4.	6.4	47	Aug. 4.	12.9	11,551
Feb. 7.	6.4	68	Aug. 7.	11.35	7,324
Feb. 10.	6.5	95	Aug. 10.	10.35	5,362
Feb. 13.	6.4	120	Aug. 13.	9.8	4,033
Feb. 16.	6.6	191	Aug. 16.	9.2	3,095
Feb. 18.	8.05	823	Aug. 19.	8.6	2,193
Feb. 19.	7.5	359	Aug. 22.	8.3	1,572
Feb. 22.	6.9	243	Aug. 25.	9.1	2,494
Feb. 25.	6.7	173	Aug. 28.	9.4	2,803
Feb. 28.	6.6	151	Aug. 31.	9.1	2,603
Mar. 4.	6.5	118	Sept. 3.	10.2	4,174
Mar. 7.	6.4	89	Sept. 6.	12.9	13,283
Mar. 10.	6.3	82	Sept. 9.	12.45	9,184
Mar. 13.	6.2	74	Sept. 12.	12.05	8,360
Mar. 16.	6.4	92	Sept. 15.	11.0	6,494
Mar. 19.	6.2	73	Sept. 18.	10.0	4,159
Mar. 22.	6.2	64	Sept. 21.	10.6	5,538
Mar. 25.	7.0	230	Sept. 24.	9.5	2,933
Mar. 28.	6.7	130	Sept. 27.	10.3	4,371
Mar. 31.	6.4	97	Sept. 30.	9.5	2,708
Apr. 3.	6.9	197	Oct. 4.	9.1	2,042
Apr. 6.	6.7	92	Oct. 8.	10.35	5,067
Apr. 9.	6.2	56	Oct. 10.	9.55	3,538
Apr. 12.	6.1	29	Oct. 13.	12.6	8,038
Apr. 15.	5.9	22	Oct. 16.	13.05	10,391
Apr. 18.	5.9	18	Oct. 19.	12.8	8,463
Apr. 21.	5.9	17	Oct. 22.	12.4	7,793
Apr. 24.	6.6	121	Oct. 25.	11.5	6,083
Apr. 27.	8.7	1,443	Oct. 28.	11.0	4,623
Apr. 30.	6.7	107	Oct. 31.	10.4	4,177
May 4.	6.4	95	Nov. 3.	10.6	3,641
May 7.	8.2	734	Nov. 6.	10.6	3,434
May 10.	9.1	1,422	Nov. 9.	10.5	2,984
May 13.	8.8	1,094	Nov. 12.	10.1	2,768
May 14.	13.8	9,801	Nov. 15.	10.7	4,062
May 16.	9.1	1,674	Nov. 18.	10.3	3,616
May 19.	10.9	3,234	Nov. 21.	10.0	2,787
May 22.	10.9	4,195	Nov. 24.	9.7	2,278
May 25.	10.8	3,505	Nov. 27.	9.6	2,295
May 28.	12.9	8,888	Nov. 30.	9.4	2,415
May 31.	11.05	5,971	Dec. 4.	9.4	3,206
June 3.	9.4	2,517	Dec. 7.	9.3	3,196
June 6.	9.4	2,376	Dec. 10.	9.2	3,339
June 9.	9.7	3,403	Dec. 13.	8.9	3,247
June 12.	11.1	6,344	Dec. 16.	9.3	4,139
June 15.	16.6	30,875	Dec. 19.	9.5	4,288
June 18.	11.6	8,166	Dec. 22.	9.6	4,719
June 21.	11.8	8,903	Dec. 25.	9.2	3,290
June 24.	10.8	4,875	Dec. 28.	9.0	3,046
June 27.	10.6	4,104	Dec. 31.	8.8	2,560
June 30.	10.5	4,651			

^a Heavy wind downstream.

Daily gage height, in feet, of Rio Grande below Presidio, Tex., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	6.3	6.35	6.6	6.4	6.6	10.7	10.4	13.55	10.7	9.55	10.5	9.4
2.....	6.3	6.3	6.6	6.95	6.5	9.6	11.1	12.9	11.15	9.4	10.5	9.3
3.....	6.25	6.3	6.5	6.9	6.35	9.3	11.4	12.85	10.45	9.2	10.65	9.5
4.....	6.2	6.3	6.5	6.85	6.35	9.5	10.4	12.9	11.55	9.1	10.8	9.4
5.....	6.2	6.3	6.5	6.7	6.3	9.4	10.85	12.15	12.8	9.45	10.75	9.3
6.....	6.2	6.35	6.4	6.6	6.6	9.4	11.05	11.65	13.05	9.95	10.65	9.3
7.....	6.2	6.4	6.4	6.4	8.3	9.4	11.55	11.25	13.15	9.8	10.85	9.3
8.....	6.2	6.4	6.4	6.35	8.85	9.45	11.55	10.85	12.9	10.3	10.65	-9.2
9.....	6.2	6.45	6.4	6.2	9.1	9.6	11.6	10.75	12.4	10.0	10.5	9.35
10.....	6.2	6.5	6.3	6.2	9.05	9.4	12.05	10.2	12.1	9.7	10.4	9.2
11.....	6.2	6.5	6.3	6.1	8.8	9.65	13.35	10.0	11.75	10.9	10.3	9.05
12.....	6.2	6.4	6.3	6.1	8.75	11.75	14.0	9.9	12.1	11.35	10.1	9.0
13.....	6.2	6.4	6.2	6.1	8.85	13.45	14.25	9.75	12.25	12.6	10.35	8.95
14.....	6.2	6.5	6.3	6.05	12.4	14.7	13.1	9.55	11.6	12.6	10.95	9.1
15.....	6.2	6.6	6.4	5.95	10.05	16.45	12.3	9.35	10.95	12.65	10.7	9.2
16.....	6.2	6.6	6.4	5.9	9.05	14.05	12.1	9.15	10.6	13.0	10.55	9.3
17.....	6.2	7.4	6.3	5.9	13.9	13.2	11.95	8.95	10.2	12.95	10.45	9.2
18.....	6.2	8.3	6.2	5.9	11.1	11.5	12.6	8.75	9.95	12.8	10.3	9.35
19.....	6.2	7.5	6.2	5.9	10.8	10.75	14.9	8.55	9.9	12.8	10.2	9.5
20.....	6.1	7.45	6.2	5.9	10.3	11.05	14.1	8.5	10.2	12.6	10.1	9.5
21.....	6.1	7.25	6.2	5.9	10.45	11.35	14.0	8.35	10.8	12.55	10.0	9.5
22.....	6.1	6.9	6.2	5.9	10.85	10.85	13.7	8.3	9.7	12.4	9.9	9.6
23.....	6.2	6.8	7.25	6.6	10.75	10.9	13.85	8.1	9.5	12.45	9.8	9.45
24.....	6.2	6.75	7.0	6.6	10.8	10.75	13.15	7.9	9.8	12.2	9.7	9.3
25.....	6.2	6.7	7.0	7.75	10.75	10.6	14.85	9.15	11.2	11.5	9.7	9.1
26.....	6.2	6.7	7.15	8.6	10.8	10.6	14.0	8.75	10.6	11.35	9.6	9.0
27.....	6.2	6.7	7.2	8.7	10.75	10.55	12.6	9.5	10.7	11.15	9.6	9.0
28.....	6.3	6.7	6.7	7.25	12.45	10.35	11.95	9.7	9.95	10.95	9.5	8.95
29.....	6.4	.....	6.65	6.8	11.7	10.35	13.0	9.5	9.75	10.8	9.5	8.8
30.....	6.4	.....	6.5	6.7	11.0	10.5	13.05	9.25	9.55	10.7	9.4	8.85
31.....	6.4	.....	6.4	.....	11.05	.....	13.35	9.1	.....	10.4	.....	8.8

Daily discharge, in second-feet, of Rio Grande below Presidio, Tex., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	55	50	150	95	105	5,240	4,510	13,880	5,800	2,790	4,050	2,610
2.....	55	45	145	205	100	2,940	5,970	11,610	6,700	2,540	3,770	2,710
3.....	50	45	120	195	95	2,320	6,630	11,430	64,990	2,210	3,720	3,110
4.....	a50	a45	a120	165	a95	2,670	a4,690	a11,550	8,670	a2,040	3,870	a3,210
5.....	45	50	115	115	90	2,420	5,370	9,500	12,850	2,870	3,730	3,200
6.....	40	60	90	a85	110	a2,380	5,670	8,140	a13,810	4,000	a3,510	3,200
7.....	a40	a70	a90	70	a810	2,520	a6,500	a7,130	13,320	3,830	3,710	a3,200
8.....	35	70	90	65	1,230	2,760	7,020	6,340	11,600	a4,970	3,310	3,180
9.....	35	80	90	a55	1,420	a3,200	7,640	6,150	a9,080	4,400	a2,980	3,410
10.....	a35	a95	a80	50	a1,370	2,770	a9,320	a5,000	8,460	a3,760	2,930	a3,340
11.....	35	110	80	35	1,090	3,300	13,260	4,520	7,740	5,520	3,900	3,290
12.....	35	105	80	a30	1,040	a9,210	15,240	4,270	a8,450	6,180	a2,770	3,280
13.....	a35	a120	a75	30	a1,150	16,800	a16,090	a3,960	8,720	a8,040	3,310	a3,300
14.....	30	155	80	30	7,380	22,390	12,970	3,640	7,560	8,300	4,600	3,610
15.....	30	190	90	a25	3,320	a30,190	10,790	3,330	a6,380	8,730	a4,060	3,870
16.....	a30	a190	a90	20	a1,600	19,300	a10,210	a3,020	5,560	a10,220	3,900	4,140
17.....	30	545	85	20	9,970	15,440	9,850	2,720	4,630	9,690	3,780	4,070
18.....	30	a940	75	a20	3,700	a7,920	11,440	2,420	a4,040	8,810	a3,620	4,180
19.....	a25	a360	a75	20	a3,070	6,040	a17,060	a2,060	3,930	a8,460	3,340	a4,290
20.....	20	350	70	15	2,590	6,860	15,140	1,990	4,620	8,130	3,060	4,400
21.....	20	310	65	a15	3,150	a7,090	14,900	1,680	a6,010	8,040	a2,790	4,510
22.....	a25	a245	a65	15	a4,100	5,070	a14,190	a1,570	3,410	a7,790	2,620	a4,720
23.....	30	210	340	120	3,730	5,280	14,550	1,340	2,930	7,890	2,450	4,230
24.....	30	190	240	a120	3,670	a4,680	12,870	1,110	a3,530	7,410	a2,280	3,730
25.....	a30	a175	a240	845	a3,500	4,110	a19,280	a2,550	6,330	a6,080	2,320	a3,190
26.....	30	175	300	1,380	3,500	4,110	16,650	2,130	5,020	5,640	2,260	3,080
27.....	30	175	320	a1,445	3,380	a4,000	12,520	2,910	a5,200	5,060	a2,290	3,060
28.....	a40	a175	a130	470	a8,180	3,850	a10,600	a3,250	3,640	a4,590	2,300	a3,000
29.....	50	.....	125	170	6,990	4,100	12,740	3,030	3,220	4,480	2,410	2,750
30.....	50	.....	110	a105	5,890	a4,650	12,850	2,760	a2,810	4,400	a2,420	2,710
31.....	a50	.....	a95	.....	a5,970	.....	a13,480	a2,600	.....	a4,180	.....	a2,560

a Date of measurement.

Monthly discharge of Rio Grande below Presidio, Tex., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January.....	55	20	36	2, 231
February.....	940	45	190	10, 572
March.....	340	65	126	7, 775
April.....	1, 445	15	201	11, 960
May.....	9, 970	90	2, 980	183, 263
June.....	30, 190	2, 320	7, 120	423, 689
July.....	19, 280	4, 510	11, 290	694, 215
August.....	13, 880	1, 110	4, 762	292, 800
September.....	13, 810	2, 810	6, 634	394, 731
October.....	10, 220	2, 040	5, 840	359, 107
November.....	4, 600	2, 260	3, 168	188, 509
December.....	4, 720	2, 560	3, 456	212, 509
The year.....	30, 190	15	3, 840	2, 781, 361

RIO GRANDE NEAR LANGTRY, TEX.

Location.—One-half mile south of Langtry station on the Southern Pacific Railroad and at the east end of the canyon section of the Rio Grande, a short distance above the confluence of the Pecos and the Rio Grande.

Records available.—April, 1900, to December 31, 1911.

Gage.—Vertical rod bolted to the bluff on the right bank.

Channel.—Bed sandy and shifting. The right (Mexican) bank is a rock bluff; the left bank is an alluvial deposit for 200 feet back to a rock bluff, and overflows at about 29.5 feet on the gage.

Discharge measurements.—Made from cable.

Cooperation.—Station was established and operated by the United States section of the International Boundary Commission.

Discharge measurements of Rio Grande near Langtry, Tex., in 1911.

[By E. E. Winter and W. H. Dodd.]

Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>		<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 2.....	— 0.1	478	May 3.....	0.4	788
Jan. 7.....	— .05	478	May 8.....	.0	557
Jan. 12.....	— .05	485	May 12.....	.4	779
Jan. 16.....	— .05	490	May 16.....	13.8	34, 500
Jan. 20.....	— .1	482	May 18.....	6.65	16, 349
Jan. 24.....	— .1	465	May 22.....	2.7	3, 750
Jan. 28.....	— .1	466	May 26.....	2.9	4, 259
Feb. 1.....	— .1	462	May 31.....	5.1	9, 936
Feb. 6.....	— .1	458	June 2.....	2.9	4, 259
Feb. 10.....	— .15	455	June 7.....	1.9	2, 348
Feb. 15.....	— .15	442	June 12.....	2.0	2, 485
Feb. 19.....	.8	1, 058	June 16.....	6.8	12, 900
Feb. 22.....	.7	1, 001	June 23.....	4.7	8, 983
Feb. 25.....	.5	840	June 27.....	3.1	4, 292
Mar. 2.....	.1	608	July 2.....	3.0	4, 020
Mar. 6.....	.0	557	July 7.....	2.95	3, 715
Mar. 10.....	— .05	530	July 11.....	4.1	6, 362
Mar. 15.....	— .1	505	July 15.....	5.9	12, 610
Mar. 20.....	— .1	510	July 21.....	5.4	10, 720
Mar. 24.....	— .1	488	July 24.....	6.6	13, 482
Mar. 28.....	— .1	511	July 28.....	5.65	11, 693
Apr. 2.....	.3	654	Aug. 2.....	5.7	11, 288
Apr. 6.....	.0	570	Aug. 7.....	4.45	7, 574
Apr. 10.....	.0	566	Aug. 11.....	3.2	4, 636
Apr. 14.....	.0	562	Aug. 15.....	2.6	3, 635
Apr. 19.....	— .1	457	Aug. 19.....	1.9	2, 261
Apr. 23.....	— .1	462	Aug. 24.....	1.2	1, 449
Apr. 26.....	1.9	2, 329	Aug. 28.....	4.15	6, 806
Apr. 28.....	2.8	4, 136	Sept. 2.....	1.7	1, 988

Discharge measurements of Rio Grande near Langtry, Tex., in 1911.

Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>		<i>Feet.</i>	<i>Sec.-ft.</i>
Sept. 6.....	3.1	4,376	Nov. 8.....	2.9	4,416
Sept. 11.....	4.35	7,411	Nov. 12.....	2.85	4,219
Sept. 15.....	4.0	6,197	Nov. 16.....	2.9	4,467
Sept. 20.....	2.4	3,076	Nov. 21.....	2.5	3,274
Sept. 24.....	2.85	4,216	Nov. 25.....	2.2	2,734
Sept. 27.....	3.05	4,891	Nov. 29.....	2.0	2,421
Oct. 2.....	2.0	2,645	Dec. 2.....	1.95	2,333
Oct. 6.....	1.7	2,236	Dec. 7.....	1.95	2,339
Oct. 10.....	2.85	4,264	Dec. 12.....	1.95	2,307
Oct. 14.....	2.95	4,473	Dec. 16.....	1.6	1,920
Oct. 18.....	4.35	7,538	Dec. 20.....	1.6	1,946
Oct. 23.....	4.3	7,367	Dec. 24.....	1.6	1,941
Oct. 28.....	3.4	5,324	Dec. 28.....	1.6	1,885
Nov. 3.....	2.8	4,208			

Daily gage height, in feet, of Rio Grande near Langtry, Tex., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	-0.05	-0.1	0.25	0.3	0.75	3.1	2.9	5.5	1.6	2.3	2.85	1.95
2.....	-1	-1	.1	.3	.55	2.85	2.95	5.6	1.7	2.05	2.8	1.95
3.....	-.05	-1	.1	.3	.35	3.25	2.85	5.5	2.75	2.0	2.8	1.9
4.....	-.05	-1	.1	.2	.25	2.85	2.85	5.0	3.0	1.95	2.8	1.9
5.....	.0	-1	.1	.05	.15	2.25	2.8	5.05	3.1	1.8	2.8	1.9
6.....	.0	-1	.0	.0	.05	1.9	2.75	5.05	3.3	1.7	2.8	1.95
7.....	-.05	-.15	.0	.05	.0	1.9	2.9	4.45	3.25	1.65	2.85	1.95
8.....	-.05	-.15	-.05	.1	.0	1.85	3.55	4.05	3.9	1.9	2.9	1.9
9.....	-.05	-.15	.1	.05	.0	1.85	4.15	3.75	5.35	3.9	2.9	1.8
10.....	-.05	-.15	-.05	.0	.0	1.9	5.0	3.5	4.8	2.85	2.9	1.8
11.....	-.05	-.15	-.05	.0	.0	1.9	4.25	3.1	4.4	2.45	2.9	1.85
12.....	-.05	-.15	.1	.4	.4	2.1	4.55	2.95	3.95	2.2	2.8	1.95
13.....	-.05	-.15	.1	-.05	.25	2.15	4.8	2.8	3.6	2.2	2.6	1.85
14.....	-.05	-.15	-.15	.0	1.6	3.05	6.75	2.75	3.65	3.05	2.75	1.7
15.....	-.05	-.15	.1	-1	7.45	3.9	5.95	2.6	3.8	3.55	2.8	1.6
16.....	-.05	-.15	-.15	-.05	13.25	6.8	5.2	2.45	3.75	4.35	2.9	1.6
17.....	-.05	-.15	-.15	-.05	6.95	6.5	4.2	2.2	3.25	4.05	2.9	1.65
18.....	-.05	.55	.1	-1	6.3	5.15	4.8	2.05	2.85	4.3	2.7	1.65
19.....	-1	.8	-.05	-1	4.5	3.95	4.6	1.85	2.6	4.45	2.65	1.65
20.....	-1	.65	-1	-1	3.5	3.4	4.85	1.65	2.35	4.4	2.5	1.6
21.....	-1	.7	-2	-1	2.95	3.55	5.5	1.6	2.05	4.35	2.5	1.6
22.....	-1	.65	-2	-1	2.7	3.55	5.15	1.6	1.95	4.2	2.45	1.6
23.....	-1	.55	-.15	-1	3.05	4.5	6.45	1.45	2.45	4.25	2.3	1.6
24.....	-1	.55	-1	-1	3.0	3.75	6.45	1.2	2.85	4.1	2.25	1.6
25.....	-1	.45	-1	.0	3.0	3.55	4.95	1.2	2.45	4.2	2.2	1.55
26.....	-1	.45	-1	1.6	2.9	3.3	5.5	1.45	2.1	4.1	2.2	1.55
27.....	-1	.35	-1	1.75	3.55	3.1	5.8	1.6	3.1	3.6	2.15	1.55
28.....	-1	.3	-1	2.8	3.9	3.05	5.6	4.3	2.7	3.35	2.1	1.6
29.....	-1	.....	-1	1.7	3.65	2.95	4.8	2.7	2.6	3.2	2.0	1.55
30.....	-1	.....	.15	1.05	4.8	2.85	4.75	2.3	2.5	3.1	2.0	1.5
31.....	-1	.....	.3	.....	4.8	.....	5.8	2.6	.....	2.95	.....	1.5

Daily discharge, in second-feet, of Rio Grande near Langtry, Tex., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	500	a460	695	655	1,270	4,790	3,750	10,890	1,790	3,280	4,280	2,330
2.....	a480	460	a610	a655	1,000	a4,130	a3,920	a11,060	a1,990	a2,750	a4,210	a2,330
3.....	490	460	610	655	a760	4,930	3,680	10,660	3,780	2,640	a4,210	2,260
4.....	485	460	610	625	700	4,160	3,640	9,340	4,210	2,580	4,220	2,260
5.....	495	460	610	585	645	3,020	3,500	9,290	4,380	2,380	4,230	2,260
6.....	490	a460	a555	a570	585	2,350	3,360	9,120	a4,860	a2,240	4,240	2,340
7.....	a480	455	555	585	555	a2,350	a3,610	a7,570	4,740	2,150	4,330	a2,340
8.....	490	455	530	600	a555	2,280	5,100	6,660	6,320	2,590	a4,420	2,270
9.....	480	455	505	580	555	2,280	6,480	5,950	9,840	6,110	4,380	2,150
10.....	480	a455	a530	a565	555	2,350	8,430	5,340	8,510	a4,260	4,350	2,140

a Date of measurement.

Daily discharge, in second-feet, of Rio Grande near Langtry, Tex., for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
11.....	485	455	530	565	550	2,350	a 6,880	a 4,470	a 7,530	3,430	4,320	2,190
12.....	a 485	450	505	530	a 780	a 2,700	7,920	4,220	6,370	2,910	a 4,140	a 2,310
13.....	485	450	505	545	690	2,810	8,790	3,970	5,460	2,910	3,890	2,200
14.....	485	445	480	a 560	2,310	4,760	15,560	3,890	5,550	a 4,690	4,160	2,030
15.....	490	a 440	a 505	515	16,720	6,610	12,780	a 3,630	a 5,830	5,790	4,270	1,920
16.....	a 490	440	485	515	a 33,100	a 12,900	10,510	3,330	5,710	7,540	a 4,470	1,920
17.....	490	440	485	500	17,100	12,340	7,510	2,870	4,730	6,880	4,390	1,980
18.....	490	875	510	470	a 15,230	9,810	9,110	2,570	3,940	a 7,430	3,910	1,990
19.....	480	a 1,060	530	a 455	9,490	7,570	8,580	a 2,200	3,470	7,780	3,730	1,990
20.....	a 480	975	a 510	460	6,300	6,540	9,240	1,970	a 2,980	7,640	3,350	a 1,950
21.....	480	1,000	465	460	4,540	6,820	a 10,950	1,910	2,380	7,510	a 3,270	1,950
22.....	475	a 960	460	460	a 3,750	6,820	10,140	1,910	2,180	7,130	3,180	1,940
23.....	470	880	475	a 460	4,640	a 8,400	13,130	1,740	3,310	a 7,250	2,910	1,940
24.....	a 465	880	a 490	460	4,510	6,200	a 13,200	a 1,450	a 4,220	6,910	2,820	a 1,940
25.....	465	a 810	495	490	4,510	5,610	10,380	1,450	3,420	7,140	a 2,730	1,870
26.....	465	810	500	a 1,970	a 4,260	4,880	11,410	1,750	2,720	6,910	2,730	1,860
27.....	465	755	505	2,150	5,940	a 4,290	11,980	1,930	a 5,000	5,780	2,660	1,840
28.....	a 465	725	a 510	a 4,140	6,840	4,160	a 11,590	a 7,100	4,140	a 5,220	2,580	a 1,890
29.....	465	-----	510	2,600	6,190	3,880	9,990	3,950	3,930	4,920	a 2,420	1,830
30.....	465	-----	600	1,690	9,160	3,610	9,890	3,160	3,710	4,720	2,420	1,780
31.....	465	-----	655	-----	a 9,160	-----	11,990	3,750	-----	4,420	-----	1,780

a Date of measurement.

Monthly discharge of Rio Grande near Langtry, Tex., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January.....	500	465	480	29,484
February.....	1,060	440	622	34,572
March.....	695	460	533	32,767
April.....	4,140	455	869	51,709
May.....	33,100	550	5,579	343,041
June.....	12,900	2,280	5,190	308,826
July.....	15,560	3,360	8,613	529,587
August.....	11,060	1,450	4,810	295,735
September.....	9,840	1,790	4,567	271,735
October.....	7,780	2,150	5,028	309,183
November.....	4,470	2,420	3,707	220,602
December.....	2,340	1,780	2,057	126,506
The year.....	33,100	440	3,527	2,553,747

RIO GRANDE BELOW DEVILS RIVER, TEX.

Location.—About 1 mile below the mouth of Devils River and the station of Devils River and about 480 miles below El Paso, Tex.

Records available.—April, 1900, to December 31, 1911.

Gage.—Inclined rod spiked to posts set in the ground.

Channel.—Bed is composed of gravel and sand and is shifting; right bank is an alluvial deposit which is inundated by extreme floods for a distance of about 500 feet back from the river proper; left bank is a loose rock embankment of the Southern Pacific Railroad.

Discharge measurements.—Made from cable.

Cooperation.—Station established and operated by the United States section of the International Boundary Commission.

Discharge measurements of Rio Grande below Devils River, Tex., in 1911.

[By E. E. Winter and W. H. Dodd.]

Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>		<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 6.	3.5	1,221	July 10.	5.15	5,040
Jan. 11.	3.5	1,237	July 14.	6.5	10,054
Jan. 15.	3.5	1,289	July 19.	6.2	9,302
Jan. 19.	3.5	1,258	July 23.	6.9	11,917
Jan. 23.	3.5	1,233	July 27.	6.3	9,447
Jan. 27.	3.5	1,223	July 31.	6.5	11,204
Jan. 31.	3.5	1,217	Aug. 5.	6.95	11,591
Feb. 4.	3.5	1,160	Aug. 10.	5.6	7,134
Feb. 9.	3.45	1,140	Aug. 14.	5.1	4,795
Feb. 14.	3.45	1,139	Aug. 18.	4.7	4,123
Feb. 18.	4.05	2,542	Aug. 23.	4.25	2,566
Feb. 20.	5.45	6,486	Aug. 26.	4.0	2,161
Feb. 24.	4.0	2,415	Aug. 31.	5.2	5,116
Feb. 28.	3.9	2,061	Sept. 5.	5.75	7,452
Mar. 5.	3.7	1,571	Sept. 8.	5.9	7,172
Mar. 9.	3.6	1,365	Sept. 13.	5.5	6,357
Mar. 14.	3.55	1,271	Sept. 19.	4.9	4,535
Mar. 18.	3.5	1,196	Sept. 23.	4.6	3,657
Mar. 23.	3.6	1,351	Sept. 26.	4.6	3,628
Mar. 27.	3.6	1,371	Sept. 30.	4.8	4,260
Mar. 31.	3.7	1,544	Oct. 5.	4.4	3,090
Apr. 5.	5.55	7,188	Oct. 9.	5.15	6,878
Apr. 8.	3.9	2,081	Oct. 13.	4.6	3,669
Apr. 13.	3.7	1,543	Oct. 17.	5.8	7,901
Apr. 17.	3.8	1,889	Oct. 21.	6.0	8,264
Apr. 22.	3.65	1,453	Oct. 26.	5.75	7,577
Apr. 27.	4.35	2,924	Oct. 31.	5.1	5,258
Apr. 30.	4.35	2,978	Nov. 6.	5.05	5,121
May 6.	3.9	2,120	Nov. 11.	5.0	5,032
May 11.	3.6	1,439	Nov. 15.	4.75	4,311
May 17.	9.5	28,363	Nov. 20.	4.8	4,318
May 21.	5.5	6,874	Nov. 24.	4.65	3,701
May 25.	5.1	5,004	Nov. 28.	4.5	3,404
May 29.	5.25	5,805	Nov. 30.	4.5	3,194
June 6.	4.5	3,659	Dec. 6.	4.45	3,022
June 10.	4.3	3,126	Dec. 11.	4.4	2,995
June 15.	4.5	3,709	Dec. 15.	4.35	2,829
June 17.	7.25	13,359	Dec. 19.	4.3	2,710
June 26.	5.35	5,552	Dec. 23.	4.3	2,674
June 30.	5.0	4,743	Dec. 27.	4.3	2,679
July 3.	5.0	4,856	Dec. 31.	4.25	2,534

Daily gage height, in feet, of Rio Grande below Devils River, Tex., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.	3.5	3.5	3.7	3.7	4.6	5.25	4.9	6.6	5.0	4.65	5.0	4.5
2.	3.5	3.5	3.7	3.7	4.55	4.95	4.9	6.35	4.7	4.5	5.0	4.5
3.	3.5	3.5	3.65	5.2	4.15	5.3	4.9	7.0	4.4	4.5	5.0	4.5
4.	3.5	3.5	3.65	6.8	4.0	4.9	4.65	7.1	5.0	4.5	4.9	4.45
5.	3.5	3.5	3.7	6.2	4.0	4.75	4.75	7.0	5.45	4.35	5.0	4.45
6.	3.5	3.45	3.7	4.75	3.9	4.5	4.8	7.05	5.3	4.3	5.0	4.45
7.	3.5	3.45	3.7	4.05	3.85	4.4	4.9	6.6	5.0	4.2	5.15	4.45
8.	3.5	3.45	3.6	3.9	3.75	4.35	5.0	6.1	5.55	4.2	5.1	4.4
9.	3.5	3.45	3.6	3.9	3.65	4.3	5.1	5.9	6.35	5.15	5.1	4.4
10.	3.5	3.5	3.6	3.8	3.65	4.3	5.2	5.55	6.2	5.15	5.15	4.4
11.	3.5	3.5	3.55	3.75	3.6	4.3	6.35	5.3	5.4	4.9	5.0	4.4
12.	3.5	3.45	3.55	3.7	3.65	4.3	5.45	5.2	5.1	4.75	4.9	4.45
13.	3.5	3.45	3.55	3.7	3.9	4.3	5.75	5.1	5.35	4.6	4.9	4.55
14.	3.5	3.45	3.55	3.7	4.75	4.3	6.6	5.1	5.5	4.8	4.8	4.4
15.	3.5	3.5	3.5	3.7	5.9	4.9	6.95	5.0	5.55	5.1	4.75	4.35
16.	3.5	3.5	3.55	4.0	8.05	6.75	6.55	5.0	5.6	5.2	4.75	4.3
17.	3.5	3.55	3.5	3.75	8.2	7.2	6.1	4.9	5.2	5.8	4.75	4.25
18.	3.5	4.1	3.5	3.7	5.6	6.25	6.1	4.7	5.0	5.8	5.0	4.3
19.	3.5	4.6	3.75	3.65	6.3	5.8	6.1	4.6	4.9	6.0	4.9	4.3
20.	3.5	5.5	3.6	3.65	5.9	5.7	6.05	4.5	4.75	5.85	4.8	4.3
21.	3.5	4.5	3.5	3.65	5.4	5.6	6.45	4.4	4.7	6.0	4.8	4.3
22.	3.5	4.1	3.65	3.65	5.05	5.5	7.05	4.3	4.55	5.9	4.75	4.3
23.	3.5	4.1	3.6	3.6	5.35	5.7	6.9	4.25	4.7	5.8	4.7	4.3
24.	3.5	4.0	3.6	3.6	5.25	5.65	7.1	4.2	5.0	5.8	4.65	4.3
25.	3.5	4.0	3.6	3.65	5.1	5.5	7.55	4.1	4.9	5.85	4.6	4.25

Daily gage height, in feet, of Rio Grande below Devils River, Tex., for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
26.	3.5	3.95	3.7	3.65	5.0	5.35	6.4	4.0	4.6	5.75	4.6	4.25
27.	3.5	3.9	3.6	4.35	5.0	5.2	6.65	4.35	4.45	5.55	4.55	4.3
28.	3.5	3.85	3.6	4.4	5.5	5.1	7.25	4.0	5.05	5.4	4.5	4.25
29.	3.5	.....	3.6	4.65	5.3	5.05	6.15	6.7	4.8	5.3	4.5	4.2
30.	3.5	.....	3.6	4.35	5.85	5.0	6.15	6.0	4.8	5.35	4.5	4.25
31.	3.5	.....	3.75	.....	5.65	.....	6.7	5.2	.....	5.1	.....	4.2

Daily discharge, in second-feet, of Rio Grande below Devils River, Tex., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.	1,270	1,200	1,640	1,540	3,800	6,360	4,580	11,320	4,760	3,850	4,980	3,180
2.	1,260	1,190	1,620	1,540	3,680	5,280	4,620	10,200	4,220	3,440	4,980	3,170
3.	1,250	1,170	1,510	6,110	2,720	6,540	4,660	12,240	3,680	3,410	4,980	3,160
4.	1,240	a 1,160	1,490	11,090	2,360	5,100	4,140	12,350	5,350	3,370	4,700	3,050
5.	1,230	1,160	a 1,370	a 9,530	2,360	4,560	4,320	a 11,760	a 6,700	a 2,990	4,980	3,030
6.	a 1,220	1,140	1,560	4,720	a 2,120	a 3,660	4,400	11,920	6,330	2,890	a 4,980	a 3,020
7.	1,220	1,140	1,560	2,540	2,010	3,390	4,590	10,440	5,580	2,690	5,300	3,020
8.	1,230	1,140	1,370	2,080	1,780	3,260	4,770	8,790	a 6,580	2,690	5,210	3,000
9.	1,230	a 1,140	a 1,370	2,080	1,550	3,130	4,950	8,130	8,750	a 6,880	5,210	3,000
10.	1,230	1,160	1,360	1,810	1,550	a 3,130	a 5,220	a 6,980	8,330	6,560	5,300	2,990
11.	a 1,240	1,160	1,280	1,680	a 1,440	3,130	9,490	6,020	6,090	5,360	a 5,030	a 2,990
12.	1,250	1,140	1,280	1,540	1,560	3,130	6,150	5,510	5,250	4,510	4,740	3,080
13.	1,260	1,140	1,270	a 1,540	2,150	3,130	7,270	5,000	a 5,950	a 3,670	4,740	3,260
14.	1,280	a 1,140	a 1,270	1,560	4,180	3,130	a 10,450	a 4,790	6,360	4,370	4,400	2,950
15.	a 1,290	1,160	1,200	1,580	9,250	a 5,110	11,850	4,630	6,510	5,430	4,310	a 2,930
16.	1,280	1,160	a 1,270	2,410	20,650	11,600	10,540	4,630	6,660	5,790	4,310	2,710
17.	1,270	1,190	1,200	a 1,790	a 21,380	a 13,150	9,060	4,460	5,450	7,900	4,310	2,590
18.	1,270	a 2,680	a 1,200	1,660	7,420	9,250	9,060	a 4,120	a 5,840	7,900	4,940	2,710
19.	a 1,260	4,090	1,650	1,530	11,180	7,400	a 9,030	3,780	a 4,540	8,260	4,630	a 2,710
20.	1,250	a 6,630	1,350	1,510	9,030	6,990	8,850	3,430	4,130	7,850	3,620	2,700
21.	1,250	3,820	1,150	1,480	a 6,400	6,580	10,300	3,090	3,970	a 8,260	4,260	2,690
22.	1,240	2,690	1,450	a 1,450	4,770	6,170	12,460	2,740	3,570	7,990	4,070	2,680
23.	a 1,230	2,690	a 1,350	1,350	6,170	6,990	a 11,920	a 2,570	a 3,960	6,420	3,890	a 2,670
24.	1,230	a 2,410	1,360	1,350	5,700	6,780	12,740	2,480	4,550	7,710	a 3,700	2,680
25.	1,230	2,380	1,360	1,450	a 5,000	6,170	14,600	2,320	4,540	7,850	3,600	2,580
26.	1,230	2,240	1,530	1,450	4,700	a 5,550	9,860	a 2,160	a 3,630	a 7,590	3,600	2,580
27.	a 1,220	2,100	a 1,370	a 2,920	4,700	5,200	a 10,850	2,860	3,150	6,940	3,500	a 2,680
28.	1,220	a 1,960	1,370	3,090	7,050	4,970	13,250	2,160	5,050	6,420	a 3,400	2,570
29.	1,220	.....	1,370	3,860	6,050	4,860	9,000	10,260	4,260	6,030	3,300	2,460
30.	1,220	.....	1,370	a 2,980	6,300	a 4,740	9,000	7,860	a 4,260	6,020	a 3,190	2,550
31.	1,220	.....	a 1,630	.....	7,800	.....	a 12,000	a 5,120	.....	a 5,260	.....	a 2,440

a Date of measurement.

Monthly discharge of Rio Grande below Devils River, Tex., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January.	1,290	1,220	1,243	76,443
February.	6,630	1,140	1,906	105,878
March.	1,650	1,150	1,398	85,944
April.	11,690	1,350	2,727	182,288
May.	21,380	1,440	5,704	350,697
June.	13,150	3,130	5,615	334,096
July.	14,600	4,140	5,515	325,597
August.	12,350	2,160	6,262	385,031
September.	8,750	2,150	5,242	311,940
October.	8,260	2,690	5,733	352,502
November.	5,300	3,190	4,431	263,643
December.	3,260	2,440	2,830	174,010
The year.	21,380	1,140	4,320	3,126,069

RIO GRANDE AT EAGLE PASS, TEX.

Location.—Half a mile above the highway bridge at Eagle Pass and about 540 miles below El Paso, Tex.

Records available.—April, 1900, to December 31, 1911.

Gage.—A vertical rod bolted to a shale cliff read to stage 10.5 feet; an inclined rod spiked to posts set in the shale is used for stages above 10.5 feet.

Channel.—The bed is sandy and shifting. At low water the depth is considerable and the current is slow. Right bank is an alluvial deposit and is inundated by floods for a distance of about 1,500 feet back from the stream; left bank is of shale and rises abruptly from the river to a height above flood stages.

Discharge measurements.—Made from cable.

Cooperation.—Station established and operated by the United States section of the International Boundary Commission.

Discharge measurements of Rio Grande at Eagle Pass, Tex., in 1911.

[By J. K. Wilson and Robert Boubel.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>		<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 3.	0.7	1,476	July 3.	2.3	4,531
Jan. 6.	.7	1,428	July 6.	2.3	4,422
Jan. 9.	.7	1,416	July 9.	3.5	6,655
Jan. 12.	.7	1,363	July 12.	4.9	11,492
Jan. 15.	.7	1,338	July 15.	4.2	10,662
Jan. 18.	.7	1,609	July 18.	4.2	9,953
Jan. 21.	.7	1,575	July 21.	3.8	8,973
Jan. 24.	.7	1,570	July 24.	3.8	8,566
Jan. 27.	.7	1,532	July 27.	6.0	18,191
Jan. 31.	.7	1,481	July 31.	4.5	11,107
Feb. 3.	.7	1,507	Aug. 3.	5.1	14,217
Feb. 6.	.7	1,494	Aug. 6.	5.4	14,975
Feb. 9.	.7	1,444	Aug. 9.	4.0	9,940
Feb. 12.	.7	1,422	Aug. 12.	3.7	8,102
Feb. 15.	.7	1,423	Aug. 15.	3.3	7,276
Feb. 18.	.7	1,395	Aug. 18.	3.1	6,218
Feb. 21.	2.1	3,192	Aug. 21.	1.7	3,857
Feb. 24.	1.7	2,526	Aug. 24.	1.7	3,715
Feb. 28.	1.7	2,462	Aug. 27.	2.1	4,687
Mar. 3.	1.7	2,273	Aug. 31.	3.8	8,653
Mar. 6.	1.7	2,083	Sept. 3.	1.9	3,468
Mar. 9.	1.4	1,996	Sept. 6.	3.7	6,752
Mar. 12.	1.2	1,871	Sept. 9.	3.6	6,677
Mar. 15.	1.0	1,772	Sept. 12.	3.4	6,204
Mar. 18.	1.0	1,742	Sept. 15.	3.3	5,881
Mar. 21.	1.5	2,187	Sept. 18.	3.0	6,775
Mar. 24.	1.5	2,303	Sept. 21.	2.2	4,734
Mar. 27.	1.2	2,136	Sept. 24.	2.1	4,431
Mar. 31.	1.1	1,819	Sept. 27.	2.4	5,351
Apr. 3.	1.0	1,728	Sept. 30.	2.8	6,167
Apr. 5.	4.7	5,166	Oct. 3.	2.2	4,845
Apr. 8.	2.3	2,891	Oct. 6.	1.9	4,076
Apr. 11.	1.0	1,800	Oct. 9.	3.6	8,963
Apr. 14.	1.0	1,689	Oct. 12.	2.6	6,567
Apr. 17.	1.0	1,700	Oct. 13.	5.0	13,883
Apr. 20.	1.0	1,604	Oct. 15.	3.3	7,993
Apr. 23.	1.0	1,611	Oct. 18.	3.7	8,316
Apr. 28.	1.7	2,725	Oct. 21.	3.9	10,358
Apr. 30.	1.7	2,641	Oct. 24.	3.8	9,241
May 3.	2.0	2,904	Oct. 27.	3.4	8,052
May 6.	1.0	1,739	Oct. 31.	3.2	7,030
May 9.	.8	1,472	Nov. 3.	3.0	6,193
May 12.	.8	1,417	Nov. 6.	2.7	5,153
May 15.	.7	1,312	Nov. 9.	3.0	5,806
May 16.	3.3	6,431	Nov. 12.	2.5	4,691
May 18.	4.8	9,822	Nov. 15.	2.4	4,403
May 21.	4.5	7,750	Nov. 18.	2.3	5,114
May 24.	3.0	5,706	Nov. 21.	2.2	4,680
May 27.	2.8	5,010	Nov. 24.	2.1	4,343
May 31.	4.0	6,892	Nov. 27.	2.0	4,052
June 3.	2.9	5,354	Nov. 30.	2.0	3,738
June 6.	2.5	4,680	Dec. 3.	2.0	4,165
June 9.	1.8	3,622	Dec. 6.	1.9	3,844
June 12.	1.6	3,276	Dec. 9.	1.8	3,550
June 15.	1.4	2,995	Dec. 12.	1.8	3,383
June 16.	3.5	7,482	Dec. 15.	1.7	3,263
June 17.	5.0	11,506	Dec. 18.	1.6	3,042
June 20.	3.5	7,082	Dec. 21.	1.6	2,893
June 23.	2.5	4,566	Dec. 24.	1.5	2,852
June 26.	3.4	6,291	Dec. 27.	1.4	2,722
June 30.	2.3	4,917	Dec. 31.	1.3	2,653

Daily gage height, in feet, of Rio Grande at Eagle Pass, Tex., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	0.7	0.7	1.7	1.0	1.6	3.45	2.3	4.9	2.95	2.6	3.1	1.8
2.....	.7	.7	1.7	1.0	1.6	3.3	2.3	5.25	2.05	2.3	3.05	1.8
3.....	.7	.7	1.7	1.0	2.0	2.9	2.3	5.05	1.9	2.2	3.0	2.0
4.....	.7	.7	1.7	3.25	1.45	2.7	2.3	5.2	2.1	2.2	3.0	1.95
5.....	.7	.7	1.7	3.85	1.35	2.5	2.3	5.15	2.75	2.05	2.75	1.9
6.....	.7	.7	1.65	2.85	1.0	2.5	2.3	5.4	3.45	1.9	2.7	1.9
7.....	.7	.7	1.6	2.55	.8	2.25	2.3	5.25	3.0	1.9	3.2	1.85
8.....	.7	.7	1.45	2.2	.8	1.9	2.3	4.4	3.05	1.95	3.2	1.8
9.....	.7	.7	1.35	2.0	.8	1.8	3.5	3.9	3.6	3.5	3.0	1.8
10.....	.7	.7	1.3	1.85	.8	1.8	3.0	3.8	3.5	2.85	3.0	1.8
11.....	.7	.7	1.2	1.0	.8	1.7	2.75	3.7	3.5	2.75	3.0	1.8
12.....	.7	.7	1.1	1.0	.8	1.6	4.9	3.7	3.4	2.6	2.5	1.8
13.....	.7	.7	1.0	1.0	.8	1.55	4.6	3.5	3.4	4.75	2.5	1.7
14.....	.7	.7	1.0	1.0	.8	1.4	4.4	3.35	3.35	3.6	2.4	1.7
15.....	.7	.7	1.0	1.0	.7	1.4	4.2	3.3	3.3	3.3	2.4	1.7
16.....	.7	.7	1.0	1.0	3.3	3.5	3.45	3.2	3.35	3.3	2.4	1.7
17.....	.7	.7	1.0	1.0	7.45	5.0	3.3	3.2	3.0	3.45	2.35	1.6
18.....	.7	.7	1.0	1.0	4.9	4.8	4.2	3.05	2.85	3.65	2.3	1.6
19.....	.7	.7	1.0	1.0	4.95	3.75	4.05	3.0	2.7	3.75	2.3	1.6
20.....	.7	2.85	1.5	1.0	4.5	3.5	3.95	2.3	2.6	3.9	2.3	1.6
21.....	.7	2.05	1.5	1.0	4.5	3.2	3.8	1.7	2.2	3.8	2.2	1.6
22.....	.7	2.0	1.5	1.0	4.5	2.55	3.8	1.7	2.2	3.6	2.2	1.6
23.....	.7	1.9	1.5	1.0	2.8	2.5	3.8	1.7	2.2	3.8	2.2	1.5
24.....	.7	1.7	1.5	1.1	3.0	2.5	3.8	1.7	2.05	3.8	2.1	1.5
25.....	.7	1.7	1.5	1.1	2.9	2.5	3.8	1.5	2.3	3.7	2.1	1.45
26.....	.7	1.7	1.2	1.1	2.8	3.2	3.9	1.5	2.35	3.7	2.1	1.4
27.....	.7	1.7	1.2	1.7	2.8	2.8	5.75	2.1	2.35	3.4	2.0	1.4
28.....	.7	1.7	1.1	1.7	2.6	2.7	4.9	2.0	2.1	3.2	2.0	1.35
29.....	.7	.....	1.1	1.7	3.25	2.4	4.55	2.05	2.8	3.2	2.0	1.3
30.....	.7	.....	1.1	2.05	3.75	2.3	4.3	2.3	2.75	3.2	2.0	1.3
31.....	.7	.....	1.1	.....	3.75	.....	4.5	3.65	.....	3.2	.....	1.3

Daily discharge, in second-feet, of Rio Grande at Eagle Pass, Tex., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	1,540	1,490	2,400	1,730	2,550	6,020	4,790	13,190	6,330	5,730	6,670	3,580
2.....	1,510	1,500	2,340	1,730	2,550	5,840	4,660	15,010	3,880	5,070	6,430	3,720
3.....	1,480	1,510	2,270	1,730	2,900	5,350	4,530	14,090	3,470	4,250	6,190	4,160
4.....	1,400	1,500	2,210	3,820	2,290	5,020	4,490	14,470	3,890	4,790	6,100	4,030
5.....	1,440	1,500	2,150	4,360	2,180	4,680	4,460	14,340	5,020	4,430	5,370	3,900
6.....	1,430	1,490	2,070	3,410	1,790	4,680	4,420	14,980	6,500	4,080	5,150	3,840
7.....	1,420	1,480	2,040	3,120	1,550	4,300	4,420	14,430	5,390	4,080	6,240	3,720
8.....	1,420	1,460	2,000	2,810	1,510	3,770	4,420	11,380	5,540	4,220	6,240	3,600
9.....	1,420	1,440	1,960	2,640	1,470	3,620	6,650	9,590	6,080	8,720	5,810	3,550
10.....	1,400	1,440	1,930	2,510	1,450	3,620	5,650	8,980	6,440	7,160	5,810	3,490
11.....	1,380	1,430	1,870	1,800	1,440	3,450	5,150	8,360	6,440	6,920	5,810	3,440
12.....	1,360	1,420	1,820	1,760	1,420	3,280	11,490	8,100	6,200	6,570	4,690	3,380
13.....	1,360	1,420	1,770	1,730	1,410	3,210	11,130	7,690	6,160	13,110	4,660	3,260
14.....	1,350	1,420	1,770	1,690	1,400	3,000	10,900	7,380	6,020	9,280	4,430	3,200
15.....	1,340	1,420	1,770	1,690	1,310	3,000	10,660	7,280	5,880	7,990	4,400	3,260
16.....	1,430	1,420	1,760	1,700	6,430	7,480	8,410	6,850	6,480	7,990	4,710	3,220
17.....	1,520	1,410	1,750	1,700	23,050	11,510	7,960	6,640	6,280	8,110	4,910	3,080
18.....	1,610	1,400	1,740	1,670	10,300	10,920	9,950	6,130	6,480	8,270	5,110	3,040
19.....	1,600	1,400	1,740	1,670	9,880	7,820	9,580	6,050	6,030	8,950	5,040	2,990
20.....	1,590	4,690	2,190	1,600	8,140	7,080	9,340	4,870	5,680	9,880	4,960	2,940
21.....	1,580	3,110	2,190	1,610	7,750	6,320	8,970	3,860	4,730	10,060	4,680	2,890
22.....	1,570	3,020	2,230	1,610	7,750	4,690	8,840	3,840	4,680	9,190	4,630	2,890
23.....	1,570	2,860	2,260	1,610	5,440	4,570	8,700	3,830	4,630	9,510	4,590	2,850
24.....	1,570	2,530	2,300	1,800	5,710	4,570	8,570	3,820	4,330	9,240	4,340	2,850
25.....	1,560	2,510	2,300	1,910	5,410	4,570	8,570	3,430	4,940	8,930	4,310	2,790
26.....	1,540	2,490	2,140	2,020	5,110	6,040	8,870	3,430	5,140	8,870	4,680	2,740
27.....	1,530	2,480	2,140	2,610	5,010	5,540	17,000	4,690	5,250	8,050	4,050	2,720
28.....	1,520	2,460	2,000	2,720	4,730	5,420	13,000	4,450	4,740	7,420	3,950	2,680
29.....	1,510	.....	1,940	2,680	5,640	5,040	11,350	4,790	6,170	7,290	3,840	2,650
30.....	1,490	.....	1,880	2,950	6,340	4,920	10,170	5,150	6,070	7,160	3,740	2,650
31.....	1,480	.....	1,820	.....	6,340	.....	11,110	8,300	.....	7,030	.....	2,650

α Date of measurement.

Monthly discharge of Rio Grande at Eagle Pass, Tex., for 1911.

Month	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January.....	1,610	1,340	1,483	91,200
February.....	4,690	1,400	1,918	106,512
March.....	2,400	1,740	2,024	124,463
April.....	4,360	1,600	2,212	131,623
May.....	23,050	1,310	4,847	298,017
June.....	11,510	3,000	5,311	316,026
July.....	17,000	4,420	8,329	512,152
August.....	15,010	3,430	8,038	494,241
September.....	6,680	3,470	5,514	328,086
October.....	13,110	4,080	7,515	462,049
November.....	6,670	3,740	5,038	299,782
December.....	4,160	2,650	3,220	197,990
The year.....	23,050	1,310	4,600	3,362,141

RIO GRANDE NEAR LAREDO, TEX.

Location.—Two miles above Laredo and about 670 miles below El Paso.

Records available.—May, 1900, to December 31, 1911, except March 1 to July 31, 1903. Earlier records fragmentary.

Gage.—An inclined-rod fastened to posts and trees. Gage was originally located at highway bridge at Laredo, Tex.; maintained April, 1900, to February 28, 1903. Measurements were made at this point only from April to September 24, 1900. Records at this location were poor, hence station was moved 2 miles upstream, where it has been maintained since August 1, 1903.

Channel.—Bed is sandy and shifting; right bank is of alluvial deposit; left bank is a shale bluff; both banks are above flood level.

Discharge measurements.—Made from cable.

Cooperation.—Station established and operated by the Mexican section of the International Boundary Commission.

Discharge measurements of Rio Grande near Laredo, Tex., in 1911.

[By L. Varela.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>		<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 6.....	2.0	1,228	May 7.....	2.7	2,302
Jan. 11.....	2.1	1,206	May 12.....	2.1	1,418
Jan. 16.....	2.0	1,379	May 13.....	6.4	11,946
Jan. 21.....	2.0	1,293	May 18.....	9.7	24,786
Jan. 26.....	2.0	1,360	May 20.....	5.0	8,232
Jan. 31.....	2.0	1,233	May 26.....	4.4	5,357
Feb. 4.....	1.9	1,220	May 30.....	4.1	5,133
Feb. 12.....	2.0	1,392	June 2.....	5.1	7,589
Feb. 16.....	2.0	1,319	June 8.....	2.6	3,585
Feb. 19.....	4.2	5,598	June 13.....	3.1	2,846
Feb. 25.....	3.0	2,565	June 17.....	4.6	6,300
Feb. 28.....	2.5	1,990	June 19.....	6.8	13,908
Mar. 5.....	2.4	1,776	June 23.....	4.3	5,760
Mar. 10.....	2.1	1,567	June 29.....	4.4	5,086
Mar. 16.....	1.9	1,271	July 5.....	4.4	5,224
Mar. 21.....	2.1	1,572	July 12.....	4.5	5,514
Mar. 22.....	5.0	7,518	July 15.....	5.2	8,184
Mar. 31.....	1.9	1,616	July 17.....	6.5	12,321
Apr. 5.....	5.0	7,129	July 22.....	5.4	7,859
Apr. 6.....	6.4	12,771	July 26.....	8.0	19,434
Apr. 11.....	2.8	2,138	July 29.....	5.5	10,724
Apr. 15.....	2.6	1,994	Aug. 3.....	6.5	12,723
Apr. 20.....	2.6	1,990	Aug. 8.....	6.9	13,621
Apr. 29.....	2.2	1,689	Aug. 13.....	4.6	5,740
May 1.....	3.9	4,093	Aug. 18.....	4.0	4,155

Discharge measurements of Rio Grande near Laredo, Tex., in 1911—Continued.

Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>		<i>Feet.</i>	<i>Sec.-ft.</i>
Aug. 23.....	3.5	2,799	Oct. 27.....	5.3	9,408
Aug. 29.....	2.9	3,784	Nov. 1.....	4.9	7,038
Sept. 2.....	4.7	5,837	Nov. 7.....	4.6	6,040
Sept. 8.....	4.7	5,832	Nov. 13.....	4.5	5,588
Sept. 12.....	5.5	9,881	Nov. 18.....	4.1	4,787
Sept. 19.....	4.6	5,645	Nov. 24.....	4.1	4,645
Sept. 25.....	4.0	3,522	Nov. 29.....	4.0	4,089
Sept. 30.....	4.2	4,402	Dec. 5.....	3.9	3,364
Oct. 5.....	3.6	3,131	Dec. 9.....	3.8	3,712
Oct. 11.....	3.8	4,076	Dec. 16.....	3.8	3,599
Oct. 14.....	18.0	43,701	Dec. 22.....	3.7	3,715
Oct. 15.....	5.0	9,657	Dec. 26.....	3.5	3,294
Oct. 21.....	5.5	9,572	Dec. 29.....	3.5	3,178

Daily gage height, in feet, of Rio Grande near Laredo, Tex., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	2.1	1.95	2.5	2.0	3.85	4.15	4.2	6.1	5.1	4.1	4.95	4.05
2.....	2.0	1.9	2.4	2.1	3.5	5.0	4.1	6.5	4.7	4.15	4.95	4.0
3.....	2.0	1.9	2.4	2.0	3.1	4.4	4.15	6.4	3.55	4.2	4.85	4.15
4.....	2.0	1.9	2.4	2.5	3.05	4.3	4.25	6.55	3.2	3.95	4.8	4.1
5.....	2.0	1.9	2.4	4.5	2.7	4.3	4.4	6.8	3.0	3.55	4.65	3.9
6.....	2.0	1.9	2.4	6.2	2.7	4.2	4.3	6.8	3.15	3.45	4.55	3.9
7.....	2.0	1.9	2.3	4.35	2.7	3.95	4.3	6.85	3.55	3.65	4.6	3.85
8.....	2.0	1.9	2.2	3.45	2.45	3.6	4.15	6.75	4.65	3.7	4.5	3.85
9.....	2.0	1.9	2.1	2.95	2.3	3.15	4.1	6.2	4.55	3.55	4.65	3.8
10.....	2.1	2.0	2.1	2.8	2.3	3.0	4.1	5.9	4.65	3.5	4.7	3.7
11.....	2.1	2.0	2.1	2.75	2.1	3.0	4.15	5.6	5.55	3.8	4.75	3.7
12.....	2.05	2.0	2.1	2.65	2.1	3.1	4.45	5.1	5.45	4.45	4.7	3.6
13.....	2.0	2.0	2.0	2.6	5.2	3.1	4.6	4.6	5.25	6.8	4.6	3.6
14.....	2.0	2.0	1.9	2.6	3.45	3.0	4.85	4.45	5.0	14.75	4.5	3.75
15.....	2.0	2.0	1.9	2.6	3.1	3.05	5.3	4.3	4.9	5.0	4.5	3.8
16.....	2.0	2.0	1.9	2.6	3.0	3.25	6.55	4.25	4.9	4.85	4.35	3.8
17.....	2.0	2.0	2.0	2.6	4.0	4.7	6.7	4.15	4.85	5.05	4.25	3.85
18.....	2.0	2.0	2.05	2.6	9.55	6.7	5.75	4.0	4.7	5.2	4.1	3.8
19.....	2.0	4.1	2.1	2.6	8.1	6.5	5.5	3.9	4.6	5.35	4.1	3.9
20.....	2.0	3.4	2.1	2.6	4.7	5.2	5.45	3.9	4.4	5.45	4.25	3.9
21.....	2.0	3.05	2.1	2.5	4.05	4.9	5.45	3.8	4.4	5.45	4.1	3.7
22.....	1.9	2.8	4.0	2.3	4.0	4.8	5.45	3.75	4.3	5.4	4.1	3.7
23.....	1.9	2.65	3.15	2.3	3.7	4.3	6.2	3.5	4.25	5.4	4.0	3.6
24.....	1.9	2.7	2.7	2.3	3.7	4.4	6.5	3.2	4.05	5.3	4.1	3.65
25.....	1.9	3.0	2.6	2.3	4.1	4.5	6.9	3.1	4.0	5.25	4.1	3.65
26.....	2.0	2.85	2.6	2.3	4.4	4.45	7.9	3.0	4.15	5.3	4.0	3.5
27.....	2.0	2.5	2.55	2.2	4.3	4.4	6.55	2.95	4.2	5.25	4.05	3.55
28.....	2.0	2.5	2.5	2.2	4.2	4.4	5.6	2.9	4.0	5.15	4.05	3.55
29.....	2.0	.....	2.5	2.2	4.05	4.35	5.5	3.5	3.95	5.15	4.0	3.5
30.....	2.0	.....	2.3	2.2	4.55	4.3	5.4	4.5	4.15	4.85	4.1	3.55
31.....	2.0	.....	1.9	.....	4.05	.....	5.3	5.4	.....	4.9	.....	3.5

RIO GRANDE NEAR ROMA, TEX.

Location.—Near Roma and about 775 miles below El Paso, Tex.

Records available.—August 14, 1900, to December 31, 1911, except March and April, 1903.

Gage.—An inclined rod spiked to posts and trees.

Channel.—Bottom sandy and shifting. Right bank, an alluvial deposit covered with mesquite brush and subject to overflow for the width of 250 feet back from the stream; left bank is of hard material and is above flood level.

Discharge measurements.—Made from cable.

Cooperation.—Station established and operated by the Mexican section of the International Boundary Commission.

Discharge measurements of Rio Grande near Roma, Tex., in 1911.

[By H. P. Guerra.]

Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-feet.</i>		<i>Feet.</i>	<i>Sec.-feet.</i>
Jan. 2.	3.0	1,578	June 30.	5.4	4,187
Jan. 6.	3.0	1,577	July 4.	5.0	3,900
Jan. 10.	2.9	1,489	July 8.	5.1	3,957
Jan. 14.	2.9	1,475	July 12.	5.6	4,607
Jan. 18.	2.9	1,478	July 17.	7.4	12,240
Jan. 22.	2.7	1,313	July 21.	6.4	9,340
Jan. 26.	2.7	1,320	July 25.	7.3	12,231
Jan. 30.	2.7	1,309	July 29.	7.5	12,704
Feb. 2.	2.6	1,239	Aug. 2.	7.0	11,631
Feb. 6.	2.6	1,236	Aug. 7.	7.3	12,217
Feb. 10.	2.6	1,236	Aug. 11.	6.1	8,690
Feb. 14.	2.7	1,305	Aug. 15.	5.3	4,978
Feb. 18.	2.6	1,235	Aug. 19.	4.9	3,684
Feb. 20.	4.0	3,042	Sept. 1.	6.6	9,746
Feb. 23.	5.0	5,489	Sept. 5.	4.9	3,664
Feb. 28.	3.6	2,340	Sept. 9.	5.4	5,536
Mar. 2.	3.4	2,097	Sept. 13.	6.3	9,169
Mar. 6.	3.0	1,560	Sept. 18.	5.9	8,454
Mar. 10.	2.9	1,468	Sept. 24.	5.1	4,421
Mar. 14.	2.9	1,463	Sept. 26.	4.9	4,159
Mar. 18.	2.6	1,242	Sept. 30.	4.6	3,701
Mar. 22.	2.9	1,464	Oct. 4.	4.8	4,003
Mar. 24.	4.8	4,751	Oct. 8.	21.6	77,571
Mar. 30.	3.8	2,610	Oct. 10.	6.6	5,977
Apr. 2.	3.4	2,104	Oct. 14.	14.5	43,551
Apr. 6.	6.1	8,366	Oct. 18.	6.4	8,285
Apr. 10.	4.5	3,590	Oct. 22.	6.9	8,206
Apr. 14.	3.8	2,581	Oct. 26.	6.4	7,906
Apr. 18.	3.0	1,598	Oct. 30.	6.1	6,608
Apr. 22.	2.9	1,464	Nov. 3.	7.5	10,170
May 3.	4.6	4,395	Nov. 8.	6.8	7,850
May 8.	3.5	2,346	Nov. 13.	6.1	6,430
May 12.	2.8	1,551	Nov. 18.	5.3	4,580
May 16.	3.1	1,841	Nov. 24.	5.1	4,219
May 19.	10.7	22,527	Nov. 28.	4.6	3,451
June 2.	7.0	14,053	Dec. 2.	4.3	2,925
June 6.	5.6	6,526	Dec. 6.	4.2	2,753
June 10.	4.2	3,122	Dec. 12.	4.1	2,571
June 14.	3.8	2,683	Dec. 16.	4.0	2,416
June 18.	5.9	7,658	Dec. 20.	3.8	2,152
June 22.	6.0	5,474	Dec. 27.	3.7	2,022
June 26.	5.5	4,431			

Daily gage height, in feet, of Rio Grande near Roma, Tex., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.	3.0	2.6	3.45	3.3	3.2	6.4	5.3	6.3	6.65	4.5	6.35	4.3
2.	3.0	2.6	3.35	3.3	3.75	6.55	5.2	6.7	6.5	5.1	6.7	4.3
3.	3.0	2.6	3.2	3.05	4.45	6.55	5.25	7.15	5.8	5.15	7.25	4.3
4.	3.0	2.6	3.15	3.0	4.2	6.05	5.3	7.0	5.45	4.9	7.7	4.2
5.	3.0	2.7	3.1	3.35	3.85	5.5	5.5	7.1	5.1	4.7	6.35	4.2
6.	3.0	2.65	3.05	5.15	4.25	5.4	5.3	7.4	4.5	4.5	5.65	4.2
7.	2.9	2.6	3.0	6.15	4.05	5.45	5.15	7.3	4.7	4.85	6.15	4.3
8.	2.9	2.6	3.0	5.75	3.55	4.75	5.0	7.4	5.65	20.2	6.75	4.2
9.	2.9	2.6	3.0	5.05	3.25	4.65	5.25	7.25	5.45	8.25	6.55	4.15
10.	2.9	2.6	2.9	4.4	3.05	4.3	5.05	6.5	5.75	6.8	6.4	4.1
11.	2.9	2.6	2.9	4.05	2.95	4.0	4.9	6.2	6.45	5.75	5.65	4.1
12.	2.9	2.6	2.95	3.9	2.8	3.8	5.6	5.8	6.85	6.7	5.75	4.1
13.	2.9	2.65	2.9	3.85	4.95	3.8	5.9	5.65	6.45	6.4	6.2	4.1
14.	2.85	2.65	2.8	3.7	6.4	3.8	6.7	5.55	6.3	10.9	5.65	4.1
15.	2.8	2.55	2.75	3.45	4.5	3.8	6.65	5.4	6.05	12.45	5.35	4.0
16.	2.8	2.5	2.7	3.15	3.3	3.9	6.85	5.3	5.8	7.0	5.25	4.0
17.	2.7	2.5	2.6	3.0	2.75	4.05	7.2	5.15	5.6	6.0	5.2	4.0
18.	2.7	2.6	2.6	3.0	2.45	5.45	7.35	5.05	5.85	6.35	5.25	4.0
19.	2.7	2.6	2.5	2.9	10.5	7.6	6.65	4.95	6.15	6.65	5.3	3.85
20.	2.7	3.6	2.45	2.9	7.45	7.25	6.5	4.9	5.7	6.9	5.4	3.75

Daily gage height, in feet, of Rio Grande near Roma, Tex., for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
21.....	2.7	5.3	2.4	3.0	6.4	6.4	6.4	4.75	5.6	6.65	5.35	3.7
22.....	2.7	4.5	2.4	2.95	6.8	6.4	6.35	4.7	5.7	6.9	5.2	3.7
23.....	2.7	5.35	3.0	2.9	6.05	5.7	6.45	4.6	5.45	6.65	5.1	3.85
24.....	2.7	4.7	4.65	2.9	5.55	5.5	7.25	4.35	5.05	6.5	5.05	3.95
25.....	2.7	4.15	4.25	4.35	5.35	5.4	7.35	4.05	4.95	6.35	4.95	3.95
26.....	2.7	3.95	3.85	4.05	5.45	5.7	8.4	3.85	4.85	6.35	4.75	3.85
27.....	2.7	3.75	4.2	3.85	5.65	5.95	8.0	3.65	5.05	6.35	4.65	3.7
28.....	2.7	3.6	4.05	3.5	5.75	5.75	7.75	3.55	4.85	6.45	4.6	3.7
29.....	2.7	.....	3.9	3.35	5.65	5.65	7.6	3.6	4.75	6.4	4.5	3.7
30.....	2.7	.....	3.7	3.25	5.55	5.45	7.3	4.2	4.6	6.15	4.4	3.7
31.....	2.65	.....	3.45	.....	5.8	.....	7.0	6.55	.....	6.05	.....	3.7

RIO GRANDE NEAR BROWNSVILLE, TEX.

Location.—About a mile above Brownsville, Tex., and opposite Matamoros, Tamaulipas, Mexico; about 900 miles below El Paso.

Records available.—April 29, 1900, to December 31, 1911, except March and April, 1903.

Gage.—Vertical rod, fastened to fender pile on right bank.

Channel.—Bed is sandy and shifting; both banks are alluvial deposits and are inundated by extreme floods only; right bank is protected by piling.

Discharge measurements.—Made from cable.

Cooperation.—Station established and operated by the Mexican section of the International Boundary Commission.

Between Roma and Brownsville there are many lagoons (old river beds) into which the river water flows during moderate floods, and a large area is overflowed deeply by the higher floods. Much of this water returns slowly to the river as the flood subsides, so that the flow passes Brownsville more uniformly than it passes Roma. Large quantities of water also leave the river entirely, reaching the Gulf of Mexico through channels remote from the Rio Grande. Local run-off, however, keeps the total discharge at Brownsville well up toward the combined flow of the San Juan and the Rio Grande at Roma.

Discharge measurements of Rio Grande near Brownsville, Tex., in 1911.

[By P. Guerra.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>		<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 2.....	1.8	2,141	Mar. 31.....	4.2	3,569
Jan. 6.....	1.3	1,758	Apr. 3.....	4.0	3,503
Jan. 10.....	1.4	1,902	Apr. 7.....	1.9	2,520
Jan. 14.....	1.5	2,024	Apr. 11.....	5.3	6,120
Jan. 18.....	1.3	1,804	Apr. 15.....	2.2	2,623
Jan. 22.....	1.1	1,687	Apr. 19.....	1.3	2,289
Jan. 26.....	1.2	1,774	Apr. 23.....	1.1	2,158
Jan. 30.....	1.1	1,678	Apr. 27.....	1.5	2,437
Feb. 3.....	.6	1,470	May 2.....	5.4	6,247
Feb. 7.....	.4	1,357	May 6.....	4.1	3,596
Feb. 11.....	.5	1,425	May 10.....	3.8	3,179
Feb. 15.....	.3	1,311	May 14.....	3.6	2,929
Feb. 19.....	.6	1,461	May 18.....	5.0	5,599
Feb. 23.....	1.4	1,934	May 22.....	9.6	15,445
Feb. 27.....	3.0	3,133	May 26.....	5.7	6,663
Mar. 3.....	1.6	2,022	May 30.....	5.1	5,815
Mar. 7.....	1.2	1,749	June 3.....	5.4	6,234
Mar. 11.....	.4	1,365	June 7.....	5.2	5,734
Mar. 15.....	.5	1,399	June 11.....	3.6	2,951
Mar. 19.....	.6	1,452	June 15.....	2.1	2,538
Mar. 23.....	— .3	1,042	June 19.....	1.8	2,432
Mar. 27.....	2.4	2,341	June 23.....	6.0	7,102

Discharge measurements of Rio Grande near Brownsville, Tex., in 1911—Continued.

Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>		<i>Feet.</i>	<i>Sec.-ft.</i>
June 27.....	4.5	3,872	Sept. 27.....	3.8	3,900
June 30.....	4.3	3,813	Sept. 30.....	3.2	3,242
July 3.....	4.5	3,913	Oct. 3.....	2.9	3,202
July 7.....	4.0	3,488	Oct. 7.....	3.1	3,184
July 11.....	3.7	3,034	Oct. 11.....	10.8	15,908
July 15.....	3.4	2,836	Oct. 15.....	4.9	4,609
July 19.....	8.3	10,204	Oct. 20.....	6.7	6,581
July 23.....	6.3	7,396	Oct. 24.....	7.9	9,281
July 27.....	8.6	10,476	Oct. 28.....	7.4	8,391
July 30.....	8.9	12,746	Oct. 31.....	7.1	8,037
Aug. 3.....	7.1	7,631	Nov. 4.....	9.55	18,364
Aug. 7.....	8.8	13,039	Nov. 8.....	6.5	7,652
Aug. 11.....	8.3	9,669	Nov. 12.....	7.8	8,740
Aug. 15.....	5.7	6,645	Nov. 16.....	5.9	5,588
Aug. 19.....	4.7	4,192	Nov. 20.....	5.2	5,072
Aug. 23.....	3.5	3,411	Nov. 24.....	5.0	4,736
Aug. 27.....	3.2	3,623	Nov. 28.....	4.5	4,355
Aug. 31.....	1.7	1,991	Dec. 1.....	3.8	4,061
Sept. 3.....	6.2	7,177	Dec. 5.....	3.6	3,793
Sept. 7.....	3.9	3,926	Dec. 9.....	3.3	3,402
Sept. 11.....	5.4	5,794	Dec. 17.....	3.1	3,143
Sept. 15.....	6.6	7,737	Dec. 21.....	2.9	3,133
Sept. 19.....	5.5	6,045	Dec. 25.....	2.8	2,881
Sept. 23.....	5.0	5,142	Dec. 29.....	2.7	2,710

Daily gage height, in feet, of Rio Grande near Brownsville, Tex., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	1.65	0.9	2.4	4.4	6.2	5.0	4.6	7.8	1.7	3.15	6.85	3.8
2.....	1.8	.75	2.05	4.7	5.35	4.95	4.6	7.7	3.2	3.05	6.35	3.75
3.....	1.65	.55	1.55	3.9	5.1	5.3	4.5	7.1	6.4	2.95	6.45	3.7
4.....	1.55	.5	1.35	2.85	4.65	5.9	4.4	7.5	6.65	2.8	8.2	3.6
5.....	1.45	.5	1.4	2.3	4.25	6.25	4.25	8.15	5.55	3.0	11.5	3.55
6.....	1.35	.5	1.45	2.0	4.0	5.95	4.05	8.4	4.9	3.2	10.1	3.35
7.....	1.3	.45	1.25	1.9	3.75	5.45	3.95	8.65	4.3	3.1	7.85	3.2
8.....	1.3	.25	.75	1.75	3.55	4.7	3.9	8.75	3.9	3.1	6.7	3.25
9.....	1.4	.2	.5	2.25	3.5	4.25	4.15	8.7	3.95	8.25	6.25	3.3
10.....	1.4	.5	.4	4.85	3.9	3.95	3.95	8.65	4.05	13.3	7.05	3.3
11.....	1.4	.5	.4	5.35	4.3	3.5	3.75	8.2	5.1	11.5	8.0	3.3
12.....	1.3	.5	.5	4.3	4.3	3.1	3.55	7.35	6.0	7.85	7.95	3.3
13.....	1.4	.5	.6	3.5	4.15	2.8	3.25	6.65	6.4	5.85	7.2	3.3
14.....	1.5	.45	.75	3.15	3.75	2.55	3.1	6.3	6.6	5.1	6.6	3.3
15.....	1.5	.3	.55	2.3	3.35	2.05	3.25	5.8	6.65	5.65	6.35	3.3
16.....	1.5	.3	.1	2.1	4.0	1.85	5.4	5.35	6.45	13.15	5.95	3.2
17.....	1.4	.4	.0	2.05	5.45	1.7	6.25	5.0	6.25	13.35	5.75	3.1
18.....	1.3	.45	.2	1.5	4.85	1.7	6.45	4.9	6.0	8.75	5.6	3.0
19.....	1.2	.55	.8	1.25	4.55	1.8	7.85	4.75	5.6	6.95	5.45	2.95
20.....	1.2	.6	.2	1.2	5.25	1.85	8.1	4.65	5.2	6.75	5.15	2.9
21.....	1.1	.75	.1	.95	10.2	4.05	7.2	4.4	5.25	6.9	4.95	2.9
22.....	1.1	.95	—	.95	9.7	6.55	6.5	4.0	5.25	7.3	4.7	2.75
23.....	1.2	1.35	—	3	1.1	7.55	6.15	3.6	4.9	7.8	4.75	2.55
24.....	1.2	1.65	—	1	1.2	7.4	5.45	6.35	3.4	4.2	7.9	4.95
25.....	1.2	2.55	.3	1.3	6.25	5.15	6.4	3.2	4.15	7.95	4.9	2.85
26.....	1.15	2.85	1.6	1.35	5.55	5.0	7.2	3.2	3.95	7.8	4.75	3.1
27.....	1.0	3.05	2.5	1.45	5.15	4.5	8.7	3.2	3.75	7.7	4.65	2.95
28.....	.9	3.05	3.85	1.7	5.0	4.5	9.15	2.6	3.5	7.4	4.45	2.8
29.....	1.1	.....	4.4	5.8	5.1	4.35	9.7	2.2	3.35	7.3	4.25	2.7
30.....	1.1	.....	4.5	6.95	5.1	4.35	8.8	1.85	3.2	7.2	3.95	2.7
31.....	1.0	.....	4.25	.....	5.1	.....	7.9	1.7	.....	7.05	.....	2.7

SOUTH FORK OF RIO GRANDE AT SOUTH FORK, COLO.

Location.—At highway bridge half a mile west of South Fork station, in sec. 34, T. 40 N., R. 3 E. No tributaries between the station and the mouth and none for several miles above.

Records available.—August 9, 1910, to December 31, 1911. Also a number of discharge measurements made in 1909 by the United States Geological Survey.

Drainage area.—216 square miles (State engineer's report).

Gage.—Inclined staff. The original gage was washed out by flood October 5, 1911, and was replaced October 16 by a new gage at a different datum.

Channel.—Shifting during high water but fairly permanent at other times.

Discharge measurements.—Made from bridge.

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

Diversions.—Little if any water is diverted above the station, and therefore the records represent the natural run-off.

Cooperation.—Records furnished by the State engineer, by whom the station is maintained.

Discharge measurements of South Fork of Rio Grande at South Fork, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		<i>Feet.</i>	<i>Sec.-feet.</i>
Jan. 20 ^a	G. H. Russell		37
Feb. 26 ^a	Clayton and Turner	2.00	34
Mar. 29	B. S. Clayton	1.85	139
Apr. 30	do	2.60	378
30	do	2.58	369
June 3	do	3.78	1,100
July 18	do	2.59	391
Sept. 10	do	1.67	110
Oct. 16	do	b 2.40	272
Nov. 19	do	b 1.92	118

^a Ice conditions.

^b Gage heights from gage to a new datum.

Daily gage height, in feet, of South Fork of Rio Grande at South Fork, Colo., for 1911.

[Lelia Singles, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.0	2.2	2.2	1.8	2.9	3.85	3.8	2.2	1.95	3.0	2.0	2.0
2	2.0	2.2	2.2	1.75	2.7	3.9	3.65	2.2	1.85	2.8	2.0	2.0
3	2.0	2.2	2.2	2.0	2.7	3.85	4.4	2.3	1.95	2.25	2.0	2.0
4	2.1	2.2	2.2	2.0	3.0	3.9	4.35	2.15	1.85	2.3	2.0	2.0
5	2.15	2.2	2.2	2.0	3.7	4.05	3.85	2.1	1.75		2.0	2.0
6	2.2	2.2	2.2	1.9	3.6	4.25	3.4	1.95	1.8		2.0	2.0
7	2.25	2.2	2.2	2.15	3.45	4.4	3.6	1.9	1.75		2.05	2.0
8	2.25	2.2	2.2	2.0	3.6	4.55	3.15	1.9	1.75		2.05	2.0
9	2.25	2.2	2.2	2.0	3.3	4.85	3.3	1.9	1.65		2.0	1.95
10	2.3	2.2	2.3	1.9	3.7	4.35	3.1	1.9	1.65		2.0	1.95
11	2.3	2.2	2.3	1.7	3.45	4.75	2.9	1.8	1.65		2.0	1.95
12	2.3	2.2	2.25	1.95	3.5	4.65	3.1	1.7	1.65		2.0	1.9
13	2.3	2.2	2.2	1.9	3.45	4.55	3.35	1.75	1.65		2.0	1.9
14	2.3	2.2	2.2	1.9	3.5	4.25	3.25	1.9	1.6		2.0	1.9
15	2.3	2.2	2.2	1.9	3.6	3.6	3.4	1.7	1.6		2.0	1.9
16	2.25	2.2	2.2	2.0	3.3	3.55	3.15	1.6	1.55	2.4	2.0	1.9
17	2.25	2.2	2.2	2.1	3.3	3.5	3.1	1.65	1.6	2.4	2.0	2.0
18	2.25	2.2	2.15	2.35	3.35	3.5	2.75	1.55	1.6	2.3	2.0	2.3
19	2.25	2.2	2.1	2.0	3.4	3.7	2.75	1.65	2.25	2.3	2.0	2.5
20	2.25	2.2	2.0	2.25	3.3	3.65	2.75	1.65	2.15	2.3	2.0	2.6
21	2.25	2.2	1.75	2.4	3.0	3.55	2.7	2.45	2.0	2.2	2.0	2.6
22	2.25	2.2	1.65	2.35	3.1	3.75	2.7	2.4	1.95	2.2	2.0	2.65
23	2.25	2.2	1.6	2.65	3.5	3.6	2.7	2.15	1.85	2.2	2.0	2.85
24	2.25	2.2	1.6	2.6	3.4	3.5	2.8	2.05	1.5	2.1	2.0	3.0
25	2.25	2.2	1.6	2.65	3.0	3.45	2.7	1.95	1.6	2.1	2.0	3.25
26	2.25	2.2	1.5	2.7	3.55	3.5	2.6	1.8	2.05	2.1	2.0	3.5
27	2.25	2.2	1.6	2.6	3.55	3.4	2.6	1.75	2.4	2.05	2.0	3.5
28	2.25	2.2	1.65	2.75	3.65	3.25	2.55	1.85	2.25	2.05	2.0	3.55
29	2.25		1.85	3.15	3.6	3.15	2.45	1.95	2.1	2.0	2.0	3.6
30	2.25		1.9	2.8	3.5	3.6	2.45	1.95	1.8	2.0	2.0	3.6
31	2.25		2.1		3.5		2.3	2.0		2.0		3.6

NOTE.—Gage was washed out Oct. 5; gage heights Oct. 16 to Dec. 31 read on new gage the datum of which differs from that of the original gage. Gage heights affected by presence of ice Jan. 1 to Mar. 23 and Dec. 17 to 31.

Daily discharge, in second-feet, of South Fork of Rio Grande at South Fork, Colo., for 1911.

Day.	Mar.	Apr.	May.	June.	July	Aug.	Sept.	Oct.	Nov.	Dec.
1.....		134	528	1,166	1,127	240	170	582	140	140
2.....		123	430	1,206	1,014	240	145	477	140	140
3.....		182	430	1,166	1,621	272	170	256	140	140
4.....		182	582	1,206	1,578	225	145	272	140	140
5.....		182	1,052	1,326	1,166	210	123	.....	140	140
6.....		157	977	1,492	833	170	134	.....	140	140
7.....		225	869	1,621	977	157	123	.....	155	140
8.....		182	977	1,754	670	157	123	.....	155	140
9.....		182	765	2,029	765	157	102	.....	140	130
10.....		157	1,052	1,578	640	157	102	.....	140	130
11.....		112	869	1,937	528	134	102	.....	140	130
12.....		170	905	1,845	640	112	102	.....	140	116
13.....		157	869	1,754	799	123	102	.....	140	116
14.....		157	905	1,492	733	157	92	.....	140	116
15.....		157	977	977	833	112	92	.....	140	116
16.....		182	765	941	670	92	84	272	140	116
17.....		210	765	905	640	102	92	272	140	.....
18.....		200	799	905	454	84	92	230	140	.....
19.....		182	833	1,052	454	102	256	230	140	.....
20.....		256	765	1,014	454	102	225	230	140	.....
21.....		307	582	941	430	326	182	200	140	.....
22.....		290	640	1,090	430	307	170	200	140	.....
23.....	92	408	905	977	430	225	145	200	140	.....
24.....	92	386	833	905	477	196	75	170	140	.....
25.....	92	408	582	869	430	170	92	170	140	.....
26.....	75	430	941	905	386	134	196	170	140	.....
27.....	92	386	941	833	386	123	307	155	140	.....
28.....	102	454	1,014	733	365	146	256	155	140	.....
29.....	146	670	977	670	326	170	210	140	140	.....
30.....	157	477	905	977	326	170	134	140	140	.....
31.....	210	.....	905	.....	272	182	.....	140	.....	.....

Monthly discharge of South Fork of Rio Grande at South Fork, Colo., for 1911.

[Drainage area, 216 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.....			36.2	0.168	0.19	2,230	C.
February.....			33.3	.154	.16	1,850	C.
March.....	210		65.1	.301	.35	4,000	C.
April.....	670	112	260	1.20	1.34	15,500	A.
May.....	1,050	430	817	3.78	4.36	50,300	A.
June.....	2,030	670	1,210	5.60	6.25	71,900	A.
July.....	1,620	272	673	3.12	3.60	41,400	A.
August.....	326	84	169	.782	.90	10,400	A.
September.....	307	75	145	.671	.75	8,610	A.
October (20 days).....			233	1.08	.80	9,240	A.
November.....	155	140	141	.653	.73	8,390	A.
December.....	140		106	.491	.57	6,540	B.
The periods.....						230,000	

NOTE.—Discharge estimated Jan. 1 to Mar. 22, and Dec. 17–31. Mean discharge, Mar. 1–22, estimated, 44 second-feet; mean discharge Dec. 17–31, estimated, 81 second-feet.

SAGUACHE CREEK NEAR SAGUACHE, COLO.

Location.—At the dam site of the Stark-Hagadorn Irrigation Co., 9 miles above Saguache. Ford Creek, the nearest important tributary, enters some distance below.

Records available.—August 7, 1910, to November 30, 1911.

Drainage area.—595 square miles (State engineer's report).

Gage.—An automatic recording gage.

Channel.—Shifting.

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

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

Diversions.—There are court decrees for diversions of 47 second-feet from Saguache River and 29 second-feet from tributaries entering above. Below the station there are decrees for diversions of 364 second-feet from Saguache River and 278 second-feet from tributaries entering below.

Corporation.—Records are furnished by the State engineer through the courtesy of the Stark-Hagadorn Irrigation Co.

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

Date.	Hydrographer.	Gage height.	Discharge.
		<i>Feet.</i>	<i>Sec.-feet.</i>
Mar. 30	B. S. Clayton.....	0.50	39
May 1	do.....	.75	71
30	do.....	1.27	156
July 30	do.....	1.52	189
Sept. 11	do.....	.74	69
Oct. 11	do.....	1.04	129

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

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	1.8	0.75	0.85	1.6	1.5	1.5	1.05	0.90	0.65
2	2.45	.85	.85	1.6	1.85	1.4	1.0	.95	.6
3	1.9	.90	.85	1.55	2.2	1.35	1.0	.9	.55
4	1.65	.75	.9	1.55	2.0	1.25	1.0	1.0	.55
5	1.95	.75	1.05	1.6	1.65	1.25	1.0	1.2	.6
6	2.05	.65	1.15	1.65	1.65	1.15	1.0	1.4	.6
7	1.9	.6	1.25	1.65	1.85	1.1	.85	1.3	.55
8	1.85	.6	1.3	1.7	1.9	1.1	.8	1.05	.55
9	2.1	.5	1.4	1.75	1.65	1.1	.85	1.0	.55
10	2.3	.5	1.35	1.8	1.5	1.1	.8	1.05	.5
11	2.3	.45	1.25	1.7	1.45	1.1	.75	1.0	.6
12	2.0	.45	1.2	1.6	1.55	1.05	.7	.9	.5
13	1.6	.4	1.2	1.6	1.5	1.2	.65	1.05	.....
14	1.3	.35	1.1	1.55	1.65	1.15	.65	1.0	.65
15	.85	.4	1.15	1.7	1.6	1.15	.5	1.0	.8
16	.85	.6	1.15	1.7	1.55	1.0	.4	.95	.65
17	.7	.65	1.1	1.65	1.35	1.0	.35	.95	.9
18	.7	.65	1.1	1.7	1.5	1.05	.3	.75	.9
19	.7	.7	1.2	1.65	1.8	1.0	.3	.7	1.0
20	.7	.8	1.15	1.65	1.8	1.0	.3	.75	1.05
21	.75	.85	1.1	1.65	1.85	1.0	.3	.8	1.0
22	.8	.95	1.2	1.9	1.85	1.35	.4	.8	.95
23	.75	1.0	1.2	1.7	1.7	1.7	.65	.85	.9
24	.75	1.0	1.3	1.55	1.65	1.35	.65	.85	.85
25	.7	.85	1.35	1.5	1.65	1.15	.65	.85	.85
26	.6	.85	1.4	1.4	1.8	1.15	.65	.85	.85
27	.5	.95	1.4	1.35	1.9	1.15	.65	.85	.8
28	.5	1.0	1.35	1.3	1.7	1.1	.65	.85	.6
29	.6	1.0	1.35	1.35	1.55	1.05	.65	.8	.65
30	.6	.9	1.35	1.35	1.55	1.0	.7	.8	.65
31	.65	.....	1.4	.....	1.5	1.0	.....	.7	.....

NOTE.—Gage heights affected by ice Mar. 1 to 16 and Nov. 13 to 30.

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

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1		71	86	220	192	186	115	93	66
2		86	86	220	260	168	107	101	60
3		93	86	209	329	159	107	93	53
4		71	93	209	290	140	108	109	53
5		71	118	218	220	140	108	146	60
6		58	135	227	220	124	108	185	60
7		51	153	227	259	116	86	169	53
8		51	162	237	269	116	78	125	53
9		39	181	246	219	116	86	118	53
10		39	172	256	191	117	78	129	48
11		34	153	236	182	117	71	122	60
12		34	144	217	200	109	64	105	48
13		29	144	217	190	135	58	130	.....
14		24	126	206	217	127	58	122	.....
15		29	135	235	208	127	39	122	.....
16		51	135	235	197	102	29	113	.....
17	64	58	126	255	160	102	24	113	.....
18	64	58	126	234	189	111	20	81	.....
19	64	64	144	224	246	103	20	74	.....
20	64	78	135	224	246	103	20	81	.....
21	71	86	126	224	255	104	20	89	.....
22	78	101	144	283	255	166	29	89	.....
23	71	109	144	233	226	233	58	97	.....
24	71	109	162	204	216	167	58	97	.....
25	64	86	172	194	216	130	58	97	.....
26	51	86	181	175	244	130	58	97	.....
27	39	101	181	165	264	131	58	97	.....
28	39	109	172	156	224	122	58	97	.....
29	51	109	172	165	196	114	58	89	.....
30	51	93	172	165	196	106	64	89	.....
31	58	.....	181	.....	186	106	.....	74	.....

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

[Drainage area, 595 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.
March	78	.....	59.5	0.100	0.12	3,660
April	109	24	69.3	.116	.13	4,120
May	181	86	143	.240	.28	8,790
June	283	156	216	.363	.40	12,900
July	329	160	225	.378	.44	13,800
August	233	102	130	.218	.25	7,990
September	115	20	63.4	.107	.12	3,770
October	185	74	108	.182	.21	6,640
November	66	.....	47.9	.080	.09	2,850
The period	.....	.....	.....	.....	.....	64,520

NOTE.—Discharge estimated Mar. 1-16 and Nov. 13-30 account of ice. Mean discharge Mar. 1-16 estimated 59 second-feet. Mean discharge Nov. 13-30 estimated 43 second-feet.

SAN LUIS CREEK AT VILLA GROVE, COLO.

Location.—Opposite Villa Grove post office, a short distance below the mouth of Kerber Creek. From September 30, 1910, to October 10, a station was maintained 5 miles south of Villa Grove, about sec. 5, T. 45 N., R. 10 E. The records at the two points are not comparable as there are court decrees for diversions of 33 second-feet between the two points.

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

Drainage area.—218 square miles (State engineer's report).

Gage.—Vertical staff.

Channel.—Apparently permanent.

Discharge measurements.—Made from footbridge.

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

Diversions.—There are court decrees for diversions from San Luis Creek of 31 second-feet above the station, and 114 second-feet below.

Cooperation.—Records are furnished by the State engineer, by whom the station is maintained.

Discharge measurements of San Luis Creek at Villa Grove, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		<i>Feet.</i>	<i>Sec.-ft.</i>
July 28	B. S. Clayton	1.68	48.0
Sept. 11	do	1.22	11.4
Oct. 11	do	1.41	24.0
Nov. 20 ^a	do	1.22	11.2

^a Very slight ice conditions.

Daily gage height, in feet, and discharge in second-feet, of San Luis Creek at Villa Grove, Colo., for 1911.

[Grace Shepard, observer.]

Day.	July.		August.		September.		October.		November.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1.			1.5	31	1.15	8	1.4	23	1.2	10
2.			1.5	31	1.25	13	1.3	16	1.2	10
3.			1.55	36	1.25	13	1.3	16	1.2	10
4.			1.4	23	1.3	16	1.3	16	1.3	16
5.			1.4	23	1.3	16	2.0	82	1.3	16
6.			1.35	20	1.3	16	1.85	66	1.3	16
7.			1.3	16	1.25	13	1.5	31	1.2	10
8.			1.2	10	1.2	10	1.5	31	1.3	16
9.			1.1	6	1.25	13	1.45	27	1.3	16
10.			1.15	8	1.25	13	1.4	23	1.3	16
11.			1.15	8	1.25	13	1.4	23	1.3	16
12.			1.15	8	1.2	10	1.4	23	1.3	16
13.			1.2	10	1.2	10	1.4	23	1.3	16
14.			1.15	8	1.25	13	1.4	23	1.3	16
15.			1.1	6	1.3	16	1.35	20	1.3	16
16.			1.05	4	1.25	13	1.35	20	1.3	16
17.			1.1	6	1.2	10	1.35	20	1.2	10
18.			1.15	8	1.2	10	1.35	20	1.2	10
19.			1.1	6	1.2	10	1.35	20	1.2	10
20.			1.1	6	1.3	16	1.25	13	1.25	13
21.			1.1	6	1.25	13	1.15	8	1.25	13
22.			1.4	23	1.2	10	1.2	10	1.2	10
23.			1.5	31	1.2	10	1.2	10	1.2	10
24.			1.35	20	1.2	10	1.2	10	1.2	10
25.			1.4	23	1.2	10	1.3	16	1.2	10
26.			1.3	16	1.25	13	1.3	16	1.2	10
27.			1.3	16	1.3	16	1.2	10	1.2	10
28.			1.3	16	1.25	13	1.3	16	1.15	8
29.			1.25	13	1.3	16	1.3	16	1.15	8
30.	1.65	45	1.2	10	1.35	20	1.3	16	1.1	6
31.	1.5	31	1.2	10			1.3	16		

Monthly discharge of San Luis Creek at Villa Grove, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
July 30-31.....	45	31	38.0	151
August.....	36	4	14.8	908
September.....	20	8	12.8	760
October.....	82	8	21.9	1,349
November.....	16	6	12.3	734
The period.....				3,902

KERBER CREEK NEAR VILLA GROVE, COLO.

Location.—6 miles above Villa Grove, about sec. 19, T. 46 N., R. 9 E.

Records available.—October 17, 1911, to December 31, 1911.

Drainage area.—80 square miles. (State engineer's report).

Gage.—Vertical staff.

Channel.—Records not sufficient to show.

Discharge measurements.—Made by wading.

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

Diversions.—There are court decrees for diversions of 10 second-feet from Kerber Creek above the station and 46 second-feet below.

Cooperation.—Station maintained in cooperation with the State engineer, by whom the records are furnished.

Discharge measurements of Kerber Creek near Villa Grove, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Dis- charge.
Oct. 17	B. S. Clayton.....	<i>Feet.</i> 1.01	<i>Sec.-ft.</i> 10.0
Nov. 20 ^a	do.....	1.10	11.6

^a Ice conditions.

Daily gage height, in feet, of Kerber Creek near Villa Grove, Colo., for 1911.

[Mrs. Geo. Ellis, observer.]

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1.....		1.1	1.3	11.....		1.0	1.35	21.....	1.1	1.2	1.7
2.....		1.1	1.3	12.....		1.05	1.3	22.....	1.2	1.15	1.7
3.....		1.1	1.4	13.....		1.2	1.3	23.....	1.3	1.1	1.75
4.....		1.1	1.4	14.....		1.3	1.3	24.....	1.2	1.3	1.8
5.....		1.1	1.4	15.....		1.2	1.4	25.....	1.1	1.3	1.8
6.....		1.1	1.35	16.....		1.2	1.4	26.....	1.1	1.3	1.8
7.....		1.1	1.3	17.....	1.0	1.15	1.4	27.....	1.1	1.3	1.85
8.....		1.1	1.35	18.....	1.0	1.2	1.4	28.....	1.1	1.3	1.9
9.....		1.1	1.4	19.....	1.0	1.2	1.4	29.....	1.1	1.3	1.9
10.....		1.1	1.4	20.....	1.05	1.2	1.6	30.....	1.1	1.3	1.85
								31.....	1.1	.....	1.85

NOTE.—Gage heights affected by presence of ice Nov. 13 to Dec. 31.

RIO ALAMOSA NEAR MONTE VISTA, COLO.

Location.—In the Rio Grande National Forest, in sec. 2, T. 36 N., R. 5 E., 28 miles southwest of Monte Vista, a short distance below the mouth of French Creek.

Records available.—September 30, 1911, to December 31, 1911.

Drainage area.—96 square miles (measured from Hayden's Atlas).

Gage.—Vertical staff.

Channel.—Data too few to be conclusive.

Discharge measurements.—Made from bridge 1 mile above gage during high water and by wading at ordinary stages.

Winter flow.—No information available.

Diversions.—The station is above all diversions except a ditch and flume used for hydraulic power at Terrace Reservoir, which takes water half a mile above. There are court decrees for diversions of 1,700 second-feet from Rio Alamosa below the station and 410 second-feet from tributaries entering below.

Accuracy.—Owing to the short length of records the station has not been rated and estimates of discharge are not available.

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

Discharge measurements of Rio Alamosa near Monte Vista, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Dis-charge.
		<i>Feet.</i>	<i>Sec.-feet.</i>
Sept. 29	H. B. Waha	2.97	123
Nov. 20	do.....	2.40	52.2
21	do.....	2.33	48.8

Daily gage height, in feet, of Rio Alamosa near Monte Vista, Colo., for 1911.

[Geo. Fleischman, observer.]

Day.	Sept.	Oct.	Nov.	Dec.	Day.	Sept.	Oct.	Nov.	Dec.
1.....		3.70	2.58	2.25	16.....		2.95	2.45	2.20
2.....		3.50	2.56	2.24	17.....		2.96	2.60	2.20
3.....		3.15	2.56	2.24	18.....		2.81	2.60	.....
4.....		3.20	2.56	2.24	19.....		2.79	2.60	2.20
5.....		11.00	2.54	2.22	20.....		2.76	2.40	.....
6.....		5.00	2.54	2.22	21.....		2.75	2.38	2.20
7.....			2.52	2.22	22.....		2.74	2.35	.....
8.....			2.47	2.22	23.....		2.70	2.36	2.20
9.....		3.80	2.47	2.21	24.....		2.69	2.39	2.00
10.....		3.65	2.45	2.22	25.....		2.68	2.36	2.00
11.....		3.40	2.42	2.20	26.....		2.65	2.39	.....
12.....		3.30	2.42	2.20	27.....		2.64	2.25	2.10
13.....		3.18	2.42	2.20	28.....		2.62	2.29	2.00
14.....		3.08	2.40	.....	29.....	2.50	2.60	2.29	.....
15.....		3.00	2.42	2.20	30.....	2.84	2.58	2.28	2.00
					31.....		2.58	.....	2.00

CONEJOS RIVER NEAR MOGOTE, COLO.

Location.—At Jacob's ranch, in sec. 15, T. 33 N., R. 6 E., 11 miles above Mogote. Nearest important tributary, Elk Creek, enters 5 miles above the station. From September 1, 1899, to March 31, 1900, and from April 17, 1903, to October 31, 1905, a station was maintained 4 miles below the present one. The flow at the two points is very nearly comparable, as there are no important intervening tributaries.

Records available.—March 21, 1907, to October 5, 1911.

Drainage area.—Not measured.

Gage.—Chain; datum unchanged since its establishment in 1907. The gage was washed away by a flood on October 6, 1911, and has not been replaced, as the flood so shifted the channel that a new station will have to be selected.

Channel.—Fairly permanent.

Discharge measurements.—Made from bridge at station.

Winter flow.—The river is frozen over during the winter months.

Diversions.—There are no court decrees for diversions above, but below the station there are decrees for 3,476 second-feet from the Conejos and 1,355 second-feet from tributaries entering below.

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

Cooperation.—Maintained in cooperation with the State engineer.

Discharge measurements of Conejos River near Mogote, Colo., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 21 ^a	G. H. Russell.....	^b 0.30	50.0
Feb. 24 ^a	Clayton and Turner.....	.50	31.0
Mar. 26	B. S. Clayton.....	.43	83.0
Apr. 25	do.....	1.80	661
May 28	do.....	2.60	1,570
July 2	do.....	3.25	2,590
Sept. 6	do.....	.99	259

^a Ice conditions.

^b Gage height taken from daily gage-height book.

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

[F. Jacob, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1.....		0.95	1.65	2.9	2.7	1.6	1.1	2.45
2.....		.95	1.7	3.2	3.2	1.45	1.05	2.2
3.....		1.0	1.9	3.2	2.85	1.4	1.15	1.85
4.....		.95	2.0	3.0	2.7	1.3	1.05	1.75
5.....		.8	2.15	3.1	2.7	1.25	1.0	4.4
6.....		.8	2.45	3.1	2.45	1.2	1.0	
7.....		.7	2.7	3.1	2.4	1.2	.9	
8.....		.8	2.8	3.2	2.25	1.15	.85	
9.....		.8	2.8	3.5	2.15	1.05	.8	
10.....		.8	2.7	3.4	2.1	1.0	.85	
11.....		.75	2.55	3.2	2.0	1.0	.8	
12.....	0.6	.8	2.4	3.1	2.05	1.0	.8	
13.....	.5	.8	2.4	3.0	2.2	1.05	.95	
14.....	.5	.75	2.3	2.95	2.25	.95	.8	
15.....	.55	.9	2.3	2.9	2.1	.9	1.05	
16.....	.5	1.0	2.4	2.9	2.1	.9	.95	
17.....	.45	1.0	2.6	2.8	2.1	.9	.9	
18.....	.45	1.0	2.6	2.75	2.05	.9	.8	
19.....	.45	1.15	2.55	2.8	2.65	1.05	1.0	
20.....	.45	1.45	2.5	2.9	2.4	.9	1.4	
21.....	.4	1.55	2.3	2.95	2.35	.95	1.2	
22.....	.4	1.65	2.2	3.0	2.25	1.5	1.1	
23.....	.45	1.7	2.4	2.9	2.05	1.7	1.1	
24.....	.45	1.7	2.6	2.85	2.15	1.45	1.0	
25.....	.45	1.75	2.8	2.7	2.0	1.45	1.0	
26.....	.45	1.85	2.8	2.5	2.0	1.35	1.65	
27.....	.5	2.0	2.65	2.4	1.85	1.25	1.45	
28.....	.55	1.95	2.6	2.45	1.85	1.3	1.25	
29.....	.7	2.0	2.6	2.5	1.8	1.25	1.3	
30.....	.7	1.75	2.7	2.5	1.75	1.15	1.7	
31.....	.8		2.8		1.6	1.05		

NOTE.—Gage heights affected by presence of ice Jan. 1 to Mar. 11. Gage washed out Oct. 6.

Daily discharge, in second-feet, of Conejos River near Mogote, Colo., for 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1		222	560	2,010	1,710	542	290	1,370
2		222	590	2,500	2,500	455	271	1,070
3		240	750	2,500	1,940	428	311	728
4		222	835	2,170	1,710	378	271	648
5		175	980	2,330	1,710	355	253	4,500
6		175	1,340	2,330	1,370	332	253	.....
7		147	1,680	2,330	1,300	332	219	.....
8		175	1,830	2,500	1,120	311	204	.....
9		175	1,830	3,040	1,010	271	188	.....
10		175	1,680	2,850	959	253	204	.....
11		161	1,480	2,500	860	253	188	.....
12	100	175	1,290	2,330	910	253	188	.....
13	95	175	1,290	2,170	1,070	271	236	.....
14	95	161	1,160	2,090	1,120	236	188	.....
15	108	205	1,160	2,010	959	219	271	.....
16	95	240	1,290	2,010	959	219	236	.....
17	85	240	1,550	1,860	959	219	219	.....
18	85	240	1,550	1,780	910	219	188	.....
19	85	298	1,500	1,860	1,640	271	253	.....
20	85	440	1,440	2,010	1,300	219	428	.....
21	75	498	1,180	2,090	1,240	236	332	.....
22	75	560	1,070	2,170	1,120	452	290	.....
23	85	592	1,300	2,010	910	610	290	.....
24	85	592	1,570	1,940	1,010	455	253	.....
25	85	627	1,860	1,710	860	455	253	.....
26	85	701	1,860	1,440	860	403	576	.....
27	95	820	1,640	1,300	728	355	455	.....
28	108	780	1,570	1,370	728	378	355	.....
29	147	820	1,570	1,440	696	355	378	.....
30	147	627	1,710	1,440	648	311	610	.....
31	175	.....	1,860	.....	542	271	.....	.....

NOTE.—Daily discharge Mar. 12 to Apr. 25 determined from 1910 rating curve. Discharge Apr. 26 to May 28 computed by indirect method for shifting channels. Discharge May 29 to Oct. 5 determined from a rating curve well defined between 188 and 3,040 second-feet.

Monthly discharge of Conejos River near Mogote, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
January			54.8	3,370	B.
February			44.9	2,490	B.
March			80.8	4,970	A.
April	820	147	363	21,600	A.
May	1,860	560	1,390	85,500	A.
June	3,040	1,300	2,070	123,000	A.
July	2,500	542	1,140	70,100	A.
August	610	219	334	20,500	A.
September	610	188	288	17,100	A.
October 1-5	4,500	648	1,660	16,500	A.
The period				365,000	

NOTE.—Discharge Jan. 1 to Mar. 11 estimated on account of ice. Mean discharge Mar. 1-11 estimated 46 second-feet.

CULEBRA RIVER AT SAN LUIS, COLO.

Location.—At highway bridge in San Luis, just above the mouth of Rito Seco.

Records available.—November 27, 1909, to December 31, 1911.

Drainage area.—260 square miles (State engineer's report).

Diversions.—There are court decrees for diversions of 145 second-feet from Culebra River and 32 second-feet from the tributaries. It is not known what portion of these diversions is above the station.

Cooperation.—Records furnished by the State engineer through the courtesy of the Costilla Estates Development Co.

Monthly discharge of Culebra River at San Luis, Colo., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January.....			36.3	2,234
February.....			34.4	1,911
March.....			39.4	2,421
April.....			37.6	2,240
May.....			75.9	4,668
June.....			57.5	3,424
July.....			74.0	4,548
August.....			58.3	3,614
September.....			33.6	2,019
October.....			70.6	4,380
November.....			42.4	2,544
December.....			48.0	2,978
The year.....			50.7	36,981

NOTE.—The above data were furnished to the State engineer by the Costilla Estates Development Co. On July 28 there was an estimated mean flood discharge for 24 hours of 2,859 second-feet and an estimated maximum discharge of 600 second-feet. On Oct. 5 there was an estimated mean flood discharge for 24 hours of 390.5 second-feet with an estimated maximum discharge of 600 second-feet.

RIO COLORADO¹ ABOVE QUESTA, N. MEX.

Location.—Three miles above Questa, in Taos County, and 3 miles above Cabresto Creek, the nearest tributary near sec. 2, T. 28 N., R. 13 E.

Records available.—October 14, 1910, to July 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Apparently permanent.

Discharge measurements.—Made by wading.

Winter flow.—No information available.

Diversions.—No data.

Accuracy.—Owing to the small number of gage heights, satisfactory estimates can not be made.

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

Discharge measurements of Rio Colorado above Questa, N. Mex., in 1911.

Date.	Hydrographer.	Gage height.	Dis- charge.
		<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 27	G. H. Russell.....	0.50	11.2
Mar. 8	do.....	.65	16.5
Apr. 20	do.....	1.05	46.6
June 13	H. B. Waha.....	2.10	188.

¹ Also known as Red River.

Daily gage height, in feet, of Rio Colorado above Questa, N. Mex., for 1911.

[C. V. Dickman, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.		0.2	0.2		1.15	2.1			
2.							1.8		
3.		.2				2.0	1.8		
4.						1.9	1.5		1.1
5.							1.8		
6.					1.8		1.9		
7.							1.6		
8.		.4	.65						
9.									
10.				0.6			1.8		
11.									
12.							1.4		
13.					1.2	2.1	1.4		
14.				.3		2.05			
15.				.3					
16.							1.4		
17.			.4						
18.		.3							
19.		.3				1.9	1.5		
20.		.3		1.05				-0.05	
21.					.9	1.8			
22.						1.9			
23.					1.0		1.7		
24.							1.55	1.3	
25.					2.0				
26.						1.7		1.2	
27.	0.5	.4					1.3	1.2	
28.						1.6		1.0	
29.					2.2				
30.									
31.									

NOTE.—Gage reader reported a shift in the channel during the first part of August.

RIO COLORADO ¹ BELOW QUESTA, N. MEX.

Location.—Two miles below Questa, at the head of Lower Canyon near sec. 1, T. 28 N., R. 12 E.; below all important tributaries, the nearest one above being Cabresto Creek.

Records available.—April 8, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Discharge measurements.—Made by wading.

Winter flow.—Affected by ice from about November to March.

Diversions.—There are no diversions below.

Accuracy.—Owing to radical changes in the stream bed, estimates of discharge can not be made.

Cooperation.—Station maintained in cooperation with the Territorial engineer and the United States Reclamation Service.

Discharge measurements of Rio Colorado below Questa, N. Mex., in 1911.

Date.	Hydrographer.	Gage height.	Dis-charge.
		<i>Feet.</i>	<i>Sec.-feet.</i>
Jan. 27	G. H. Russell.....	2.16	25.8
Mar. 8	do.....	2.24	30.5
Apr. 20	do.....	2.50	54.1
June 7	R. L. Cooper.....	3.10	209.

¹ Also known as Red River.

Daily gage height, in feet, of Rio Colorado below Questa, N. Mex., for 1911.

[Narciso Virgil, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....		2.2	2.1	2.5	3.1	3.2	2.8		2.5	2.5	3.9	3.45
2.....		2.3	2.35	2.6	3.1	3.25	2.8		2.4	2.4	3.9	3.55
3.....		2.15	2.35	2.6	3.1	3.25	2.8		2.45	2.4	3.8	3.55
4.....	2.2	2.15	2.3	2.5	3.1	3.25	2.8		2.45	2.45	3.8	3.55
5.....	2.15	2.2	2.3	2.5	3.2	3.2	2.8		2.4	4.0	3.8	3.6
6.....	2.15	2.15	2.3	2.5	3.45	3.15	2.8		2.4	5.05	3.8	3.6
7.....	2.15	2.3	2.3	2.5	3.65	3.15	2.75	2.5	2.4	5.25	3.8	3.6
8.....	2.2	2.1	2.3	2.45	3.65	3.15	2.7	2.4	2.4	4.95	3.8	3.6
9.....	2.1	2.1	2.3	2.4	3.7	3.15	2.7	2.4	2.45	4.7	3.8	3.6
10.....	2.15	2.15	2.3	2.5	3.7	3.15	2.65	2.35	2.4	4.75	3.8	3.6
11.....	2.3	2.15	2.4	2.5	3.6	3.15	2.6	2.3	2.4	4.7	3.8	3.6
12.....	2.3	2.3	2.4	2.5	3.45	3.05	2.65	2.3	2.4	4.7	3.55	3.45
13.....	2.4	2.2	2.4	2.5	3.35	3.05	2.65	2.35	2.35	4.6	3.7	3.45
14.....	2.3	2.2	2.35	2.4	3.4	3.0	2.65	2.3	2.3	4.45	3.7	3.4
15.....	2.25	2.2	2.2	2.4	3.45	3.0	2.65	2.3	2.4	4.35	3.7	3.4
16.....	2.25	2.2	2.25	2.45	3.5	3.0	2.65	2.3	2.35	4.25	3.7	3.45
17.....	2.25	2.3	2.3	2.5	3.45	3.0	2.65	2.4	2.3	4.2	3.7	3.45
18.....	2.35	2.2	2.3	2.5	3.45	2.95	2.6	2.4	2.3	4.2	3.7	3.55
19.....	2.2	2.15	2.3	2.5	3.4	2.9	2.6	2.35	2.3	4.2	3.7	3.6
20.....	2.2	2.15	2.3	2.5	3.25	2.9	2.6	2.3	2.4	4.15	3.7	3.55
21.....	2.2	2.15	2.4	2.6	3.2	2.9	2.7	2.3	2.3	4.1	3.7	3.5
22.....	2.2	2.05	2.4	2.7	3.05	2.85	2.6	2.45	2.3	4.1	3.7	3.5
23.....	2.3	2.0	2.4	2.8	3.05	2.85	2.7	2.7	2.3	4.1	3.7	3.45
24.....	2.1	2.0	2.4	2.9	3.05	2.8	2.8	2.65	2.3	4.05	3.55	3.55
25.....	2.1	2.15	2.3	2.95	3.05	2.75	2.7	2.8	2.3	4.05	3.55	3.6
26.....	2.1	2.15	2.25	2.95	3.15	2.75	2.75	2.65	2.3	4.0	3.6	3.4
27.....	2.1	2.25	2.2	3.0	3.25	2.75	2.7	2.6	2.3	4.05	3.65	3.25
28.....	2.2	2.15	2.3	3.1	3.2	2.7	2.7	2.55	2.3	4.0	3.4	3.35
29.....	2.2		2.3	3.1	3.15	2.7	2.75	2.5	2.3	4.0	3.4	3.5
30.....	2.2		2.4	3.1	3.1	2.7	2.75	2.5	2.5	3.95	3.4	3.55
31.....	2.2		2.5		3.1		2.7	2.5		3.9		3.35

NOTE.—Gage heights affected by ice Nov. 28 to Dec. 31.

HONDO CREEK NEAR ARROYO HONDO, N. MEX.

Location.—At highway bridge at Dunn's ranch, 200 yards above the mouth of the stream and 1 mile west of Arroyo Hondo post office near sec. 31, T. 27 N., R. 12 E.; no tributary between station and mouth.

Records available.—April 8, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Shifting.

Discharge measurements.—Made by wading.

Winter flow.—Ice causes slight backwater during portions of the winter months.

Diversions.—None below.

Accuracy.—Owing to the shifting character of the stream and to the uncertainty regarding the accuracy of the gage heights, no estimates of discharge can be made.

Cooperation.—Station maintained in cooperation with the Territorial engineer and the United States Reclamation Service.

Discharge measurements of Hondo Creek near Arroyo Hondo, N. Mex., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		<i>Feet.</i>	<i>Sec.-feet.</i>
Jan. 29	G. H. Russell.....	1.60	10.7
Mar. 9	do.....	1.65	12.6
Apr. 23	do.....	2.27	56.0
June 7	R. L. Cooper.....	2.90	129.

Daily gage height, in feet, of Hondo Creek near Arroyo Hondo, N. Mex., for 1911.

[John Dunn, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	Juné.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	1.88	1.82	1.75	2.22	2.15	3.00	.....	2.00	1.25	3.00	2.15	2.00
2.....	1.88	1.82	1.75	2.22	2.18	3.00	2.60	2.00	2.70	3.00	2.15	2.00
3.....	1.92	1.82	1.72	2.25	2.18	3.00	2.25	2.00	3.40	2.90	2.15	2.00
4.....	1.90	1.70	1.72	2.25	2.28	3.00	2.00	2.00	4.10	2.90	2.15	2.00
5.....	1.68	1.70	1.95	2.30	2.28	3.10	2.00	1.95	3.20	2.90	2.15	2.00
6.....	1.70	1.70	1.95	2.28	2.28	3.00	1.90	1.95	2.60	2.90	2.15	2.00
7.....	1.70	1.70	1.95	2.20	2.30	3.00	1.82	1.95	2.60	4.25	2.15	2.00
8.....	1.70	1.70	1.95	2.20	2.45	3.00	1.80	1.95	2.45	4.25	2.15	2.00
9.....	1.70	1.70	1.80	2.20	3.40	3.00	1.80	1.85	2.20	4.25	2.15	2.00
10.....	1.70	1.65	1.88	2.12	3.40	3.00	3.00	1.80	2.15	4.25	2.15	2.00
11.....	1.70	1.65	1.88	2.12	3.20	3.00	2.50	1.80	2.15	4.25	2.15	2.00
12.....	1.70	1.65	1.72	2.12	3.00	3.00	2.10	1.80	2.15	4.25	2.60	2.00
13.....	1.75	1.65	1.72	2.12	3.00	2.90	2.22	1.70	2.10	4.25	2.20	2.00
14.....	1.65	1.65	1.72	2.12	3.20	2.90	2.25	1.70	2.10	4.25	2.00	1.95
15.....	1.65	1.65	1.72	2.08	3.20	2.90	2.25	1.65	2.05	3.10	2.00	1.95
16.....	1.68	1.65	1.92	2.08	3.20	3.00	2.25	1.65	2.05	3.10	2.00	1.95
17.....	1.70	1.62	2.05	2.08	3.20	3.90	2.18	1.65	2.05	2.50	2.00	1.95
18.....	1.70	1.65	2.05	2.08	3.20	3.00	3.70	1.60	2.05	2.40	2.00	1.95
19.....	1.70	1.65	2.05	2.02	3.30	2.90	2.32	1.60	2.00	2.20	2.00	1.95
20.....	1.70	1.65	2.05	2.02	3.10	2.70	2.20	1.60	2.00	2.20	2.00	1.95
21.....	1.60	1.65	1.88	2.02	3.00	2.60	2.20	1.55	2.00	2.20	2.00	1.90
22.....	1.60	1.65	1.88	2.02	3.00	2.42	2.32	1.50	2.00	2.15	2.05	1.90
23.....	1.60	1.70	1.88	2.02	3.00	2.15	2.25	1.50	1.95	2.15	2.05	1.90
24.....	1.60	1.70	1.70	2.02	3.00	2.10	2.25	1.50	1.95	2.15	2.05	1.90
25.....	1.68	1.65	1.70	2.02	3.20	2.05	2.25	1.40	1.95	2.15	2.05	1.90
26.....	1.62	1.65	1.70	2.12	3.00	2.02	2.20	1.40	2.42	2.15	2.05	1.90
27.....	1.62	1.65	1.92	2.15	3.00	2.00	2.15	1.40	2.45	2.15	2.05	1.90
28.....	1.60	1.75	2.20	2.15	3.00	1.88	2.15	1.40	2.45	2.15	2.00	1.80
29.....	1.77	.....	2.20	2.15	3.10	1.70	2.15	1.35	3.20	2.15	2.00	1.80
30.....	1.85	.....	2.20	2.15	3.00	2.18	2.05	1.25	3.20	2.15	2.00	1.80
31.....	1.85	.....	2.28	.....	2.90	.....	2.02	1.25	.....	2.15	.....	1.80

NOTE.—Observer's gage heights do not agree with hydrographer's gage heights on days of measurements, and hence the entire record for 1911 is questionable and should be used with caution. Backwater from ice gorge Nov. 12 and 13.

RIO PUEBLO DE TAOS NEAR TAOS, N. MEX.

Location.—Two miles above Taos Pueblo and $4\frac{1}{2}$ miles northeast of Taos at Glorieta Grove, near sec. 2, T. 25 N., R. 13 E. A number of intermittent tributaries enter above and below the station.

Records available.—December 19, 1910, to December 12, 1911. Records prior to December, 1910, fragmentary and not published.

Drainage area.—Not measured.

Gage.—An automatic recording gage installed by the United States Indian Service December 19, 1910. A vertical staff gage was installed first but was destroyed before July 12, 1910. On October 12, 1910, a new gage was installed which was referred to a datum 0.27 foot lower than the original. The automatic gage was referred to the datum of the second gage.

Channel.—Somewhat shifting, especially during high stages.

Discharge measurements.—Made by wading.

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

Accuracy.—The few discharge measurements indicate that there was not much shift during 1911, and therefore the estimates may be considered fairly good.

Cooperation.—Station maintained in cooperation with the Territorial engineer, United States Indian Office, and United States Forest Service.

Discharge measurements of Rio Pueblo de Taos near Taos, N. Mex., in 1911.

Date.	Hydrographer.	Gage height.	Dis-charge.
		<i>Feet.</i>	<i>Sec.-feet.</i>
Jan. 28 ^a	G. H. Russell.....	1.11	7.8
Mar. 11	do.....	1.96	42.0
Apr. 21	do.....	2.15	57.0
June 9	R. L. Cooper.....	2.50	87.2

^a Slight ice conditions.*Daily gage height, in feet, of Rio Pueblo de Taos near Taos, N. Mex., for 1911.*

[B. G. Phillips, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	1.9	1.15	1.2	1.9	2.7	2.65	1.65	1.55	1.5	1.7	1.5	2.3
2.....	1.85	1.1	1.15	1.95	2.7	2.7	1.7	1.55	1.5	1.55	1.55	1.95
3.....	2.0	1.15	1.15	1.95	2.75	2.65	1.65	1.55	1.4	1.45	1.55	1.5
4.....	2.0	1.15	1.15	1.85	2.85	2.6	1.6	1.5	1.4	1.5	1.55	1.5
5.....	1.8	1.15	1.25	1.8	3.15	2.55	1.55	1.4	1.4	2.45	1.55	1.5
6.....	1.8	1.1	1.35	1.7	3.3	2.5	1.55	1.4	1.4	3.3	1.55	1.5
7.....	2.1	1.2	1.35	1.65	3.5	2.5	1.6	1.4	1.35	2.9	1.5	1.5
8.....	2.1	1.15	1.35	.....	3.5	2.45	1.6	1.35	1.35	2.6	1.5	1.5
9.....	2.1	1.2	1.45	.....	3.6	2.5	1.5	1.4	1.35	2.35	1.55	1.5
10.....	2.1	1.25	1.6	.....	3.55	2.5	1.45	1.4	1.35	2.15	1.55	1.45
11.....	2.1	1.25	1.85	.....	3.25	2.3	1.45	1.4	1.3	2.05	1.6	1.45
12.....	2.1	1.3	1.6	1.65	3.1	2.25	1.5	1.4	1.35	1.95	1.5	1.45
13.....	2.1	1.3	1.5	1.6	3.05	2.25	1.45	1.3	1.35	1.95	1.55	.....
14.....	2.1	1.25	1.45	1.6	2.95	2.2	1.5	1.25	1.4	1.85	1.55	.....
15.....	2.1	1.25	1.5	1.65	2.95	2.2	1.5	1.25	1.45	1.8	1.5	.....
16.....	2.1	1.25	1.55	1.75	2.95	2.2	1.5	1.25	1.4	1.7	1.55	.....
17.....	2.1	1.3	1.55	1.9	2.95	2.0	1.5	1.35	1.35	1.65	1.5	.....
18.....	2.1	1.3	1.5	1.95	2.9	2.0	1.5	1.35	1.3	1.65	1.5	.....
19.....	2.1	1.25	1.5	1.9	2.9	1.95	1.5	1.35	1.3	1.65	1.5	.....
20.....	2.1	1.35	1.55	1.95	2.8	1.9	1.6	1.2	.....	1.65	1.45	.....
21.....	1.0	1.3	1.55	2.1	2.65	1.95	1.6	1.2	.....	1.65	1.5	.....
22.....	1.05	1.25	1.6	2.3	2.55	1.9	1.6	1.4	.....	1.6	1.55	.....
23.....	1.05	1.3	1.55	2.5	2.45	1.9	1.55	1.65	1.25	1.6	1.55	.....
24.....	1.1	1.35	1.55	2.45	2.45	1.85	1.7	1.6	1.2	1.6	1.5	.....
25.....	1.1	1.3	1.5	2.55	2.6	1.7	1.65	1.6	1.15	1.55	1.5	.....
26.....	1.1	1.1	1.4	2.65	2.7	1.6	1.65	1.5	1.15	1.6	1.5	.....
27.....	1.1	1.05	1.4	2.8	2.7	1.75	1.6	1.45	1.15	1.6	1.5	.....
28.....	1.05	1.0	1.45	2.85	2.65	1.65	1.65	1.4	1.25	1.6	1.5	.....
29.....	1.05	.....	1.6	2.85	2.6	1.65	1.6	1.45	1.4	1.6	1.8	.....
30.....	1.05	.....	1.7	2.8	2.55	1.7	1.65	1.55	1.9	1.6	2.1	.....
31.....	1.1	.....	1.85	.....	2.55	.....	1.6	1.5	.....	1.55	.....	.....

NOTE.—Gage heights affected by ice to about the end of January and Dec. 13 to 31.

Daily discharge, in second-feet, of Rio Pueblo de Taos near Taos, N. Mex., for 1911.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	11	12	40	111	104	28	24	22	30	22	67
2.....	10	11	43	111	111	30	24	22	24	24	43
3.....	11	11	43	118	104	28	24	18	20	24	22
4.....	11	11	38	133	98	26	22	18	22	24	22
5.....	11	14	35	186	92	24	18	18	81	24	22
6.....	10	16	30	215	86	24	18	18	215	24	22
7.....	12	16	28	260	86	26	18	16	141	22	22
8.....	11	16	28	260	81	26	16	16	98	22	22
9.....	12	20	28	285	86	22	18	16	72	24	22
10.....	14	26	28	272	86	20	18	16	56	24	22
11.....	14	38	28	205	67	20	18	15	49	26	20
12.....	15	26	28	176	63	22	18	16	43	22	20
13.....	15	22	26	167	63	20	15	16	43	24	.....
14.....	14	20	26	150	59	22	14	18	38	24	.....
15.....	14	22	28	150	59	22	14	20	35	22	.....

Daily discharge, in second feet, of Rio Pueblo de Taos near Taos, N. Mex. for 1911—Con.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
16.....	14	24	32	150	59	22	14	18	30	24	.....
17.....	15	24	40	150	46	22	16	16	28	22	.....
18.....	15	22	43	141	46	22	16	15	28	22	.....
19.....	14	22	40	141	43	22	16	15	28	22	.....
20.....	16	24	43	125	40	26	12	15	28	20	.....
21.....	15	24	52	104	43	26	12	14	28	22	.....
22.....	14	26	67	92	40	26	18	14	26	24	.....
23.....	15	24	86	81	40	24	28	14	26	24	.....
24.....	16	24	81	81	38	30	26	12	26	22	.....
25.....	15	22	92	98	30	28	26	11	24	22	.....
26.....	10	18	104	111	26	28	22	11	26	22	.....
27.....	9	18	125	111	32	26	20	11	26	22	.....
28.....	8	20	133	104	28	28	18	14	26	22	.....
29.....		26	133	98	28	26	20	18	26	35	.....
30.....		30	125	92	30	28	24	40	26	52	.....
31.....		38		92		26	22		24		.....

NOTE.—Daily discharge determined from a rating curve well defined below 100 second-feet.

Monthly discharge of Rio Pueblo de Taos near Taos, N. Mex., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
January.....			7	430	D.
February.....	16	8	12.9	716	B.
March.....	38	11	21.5	1,320	B.
April.....	133	26	55.8	3,320	A.
May.....	285	81	147	9,040	B.
June.....	111	26	60.5	3,600	A.
July.....	30	20	24.8	1,520	B.
August.....	28	12	19.0	1,170	B.
September.....	40	11	16.8	1,000	B.
October.....	215	20	44.9	2,760	B.
November.....	52	20	24.3	1,450	B.
December.....	67		19.6	1,210	D.
The year.....	285		38.1	27,500	

NOTE.—Discharge January and Dec. 13-31 estimated on account of ice. Mean discharge Dec. 13-31 estimated 15 second-feet.

RIO PUEBLO DE TAOS AT LOS CORDOVAS, N. MEX.

Location.—At Los Cordovas, 100 feet below the mouth of Little Rio Grande and Arroyo Seco near sec. 22, T. 25 N., R. 12 E.

Records available.—April 6, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Fairly permanent; probably shifts during extreme high water.

Discharge measurements.—Made by wading.

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

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

Cooperation.—Station maintained in cooperation with the Territorial engineer and the United States Reclamation Service.

Discharge measurements of Rio Pueblo de Taos at Los Cordovas, N. Mex., in 1911.

Date.	Hydrographer.	Gage height.	Dis- charge.
Jan. 28	G. H. Russell.....	<i>Feet.</i> 1.08	<i>Sec.-ft.</i> 21.4
Mar. 12	do.....	1.30	50.1
Apr. 22	do.....	1.46	68.7
June 9	R. L. Cooper.....	1.70	103.

Daily gage height, in feet, of Rio Pueblo de Taos at Los Cordovas, N. Mex., for 1911.

[Alex. J. Anderson, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	1.15	1.10	1.10	1.52	1.90	2.15	1.15	.....	1.10	1.80	1.50	1.30
2.....	1.15	1.10	1.15	1.60	1.85	2.20	1.35	.....	1.10	1.80	1.60	1.30
3.....	1.15	1.10	1.20	1.65	1.90	2.10	1.45	.....	1.10	1.45	1.60	1.20
4.....	1.15	1.10	1.25	1.60	1.95	2.05	1.40	.....	1.10	1.50	1.50	1.20
5.....	1.15	1.18	1.32	1.52	1.95	2.00	1.35	.....	1.05	2.76	1.60	1.20
6.....	1.15	1.12	1.48	1.50	2.10	1.85	1.40	0.90	1.00	3.10	1.60	1.25
7.....	1.15	1.10	1.30	1.48	2.30	1.80	1.35	.80	1.00	2.70	1.55	1.35
8.....	1.15	1.08	1.22	1.40	2.45	1.80	1.25	.80	1.00	2.35	1.60	1.30
9.....	1.35	1.08	1.28	1.40	2.60	1.80	1.30	.75	1.10	2.15	1.50	1.30
10.....	1.32	1.08	1.38	1.35	2.65	1.80	1.20	.75	1.00	2.00	1.50	1.35
11.....	1.45	1.08	1.65	1.32	2.45	1.70	1.15	.80	1.00	1.95	1.50	1.40
12.....	1.35	1.08	1.35	1.32	2.45	1.65	1.50	.75	1.05	1.85	1.45	1.45
13.....	1.28	1.12	1.42	1.35	2.40	1.55	1.40	.80	1.05	1.80	1.40	1.45
14.....	1.12	1.10	1.30	1.35	2.60	1.40	1.30	.75	1.05	1.80	1.45	1.35
15.....	1.15	1.10	1.30	1.32	2.55	1.45	1.30	.80	1.10	1.75	1.40	1.30
16.....	1.10	1.15	1.35	1.35	2.45	1.35	1.45	.85	1.10	1.65	1.40	1.40
17.....	1.10	1.12	1.32	1.40	2.45	1.30	1.25	1.56	1.00	1.60	1.40	1.35
18.....	1.10	1.12	1.30	1.42	2.40	1.40	1.15	1.10	1.00	1.60	1.40	1.35
19.....	1.10	1.12	1.35	1.40	2.35	1.35	1.25	1.00	1.00	1.55	1.40	1.30
20.....	1.10	1.12	1.38	1.32	2.30	1.30	1.30	.90	1.10	1.50	1.40	1.39
21.....	1.10	1.12	1.40	1.40	2.15	1.35	1.40	.90	1.10	1.50	1.40	1.30
22.....	1.10	1.10	1.42	1.50	2.05	1.30	1.35	1.00	1.10	1.40	1.45	1.30
23.....	1.10	1.15	1.38	1.70	1.90	1.25	1.45	1.20	1.10	1.40	1.50	1.30
24.....	1.10	1.15	1.35	1.80	1.80	1.20	1.50	1.20	1.05	1.40	1.45	1.50
25.....	1.10	1.10	1.35	1.80	1.85	1.15	1.50	1.20	1.00	1.40	1.40	.....
26.....	1.10	1.10	1.32	1.90	1.85	1.05	1.55	1.30	1.00	1.40	1.35	1.60
27.....	1.08	1.10	1.30	1.90	1.90	1.00	1.55	1.30	1.00	1.65	1.30	1.60
28.....	1.08	1.10	1.30	2.00	1.95	1.00	1.60	1.30	1.00	1.70	1.20	1.50
29.....	1.10	.....	1.40	2.10	1.90	1.00	1.60	1.25	1.35	1.65	1.30	1.50
30.....	1.10	.....	1.45	1.95	1.85	1.05	1.50	1.20	1.90	1.60	1.35	1.49
31.....	1.12	.....	1.52	.....	2.00	.....	1.45	1.15	.....	1.55	.....	1.40

NOTE.—Gage heights affected by ice Jan. 1 to 12, Feb. 22 to 24, and about Nov. 29 to Dec. 31.

Daily discharge, in second-feet, of Rio Pueblo de Taos at Los Cordovas, N. Mex., for 1910-11.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.									
1.....	.....	300	59	1.5	3.0	4.5	4.5	15	15
2.....	.....	270	45	1.5	1.5	4.5	4.5	15	15
3.....	.....	242	45	1.5	1.5	4.5	9	15	15
4.....	.....	242	33	1.5	4.5	4.5	9	15	15
5.....	.....	229	33	1.5	4.5	4.5	6.8	15	23
6.....	67	216	23	1.5	4.5	4.5	4.5	15	23
7.....	75	216	19	1.5	4.5	4.5	6.8	15	23
8.....	84	204	12	1.5	4.5	4.5	4.5	15	19
9.....	75	229	9	1.5	1.5	4.5	6.8	15	23
10.....	75	192	9	4.5	1.5	4.5	6.8	15	19
11.....	75	192	4.5	4.5	3.0	4.5	9	15	23
12.....	75	192	4.5	3.0	4.5	3.0	6.8	15	19
13.....	129	192	4.5	4.5	4.5	1.5	6.8	15	19
14.....	149	192	4.5	4.5	4.5	4.5	9	15	19
15.....	129	216	4.5	1.5	1.5	4.5	6.8	15	23
16.....	120	181	4.5	1.5	4.5	4.5	6.8	15	19
17.....	129	170	4.5	1.5	4.5	4.5	9	15	.....
18.....	139	149	3.0	1.5	4.5	4.5	6.8	15	.....
19.....	149	129	3.0	1.5	4.5	4.5	9	15	.....
20.....	170	110	1.5	1.5	4.5	4.5	9	15	.....
21.....	192	101	1.5	1.5	4.5	4.5	9	15	.....
22.....	204	110	1.5	1.5	4.5	4.5	12	15	.....
23.....	192	92	1.5	1.5	4.5	4.5	12	15	.....
24.....	192	75	1.5	1.5	4.5	4.5	15	15	.....
25.....	204	59	1.5	1.5	4.5	4.5	12	15	.....
26.....	242	39	4.5	1.5	4.5	4.5	15	15	.....
27.....	242	33	4.5	1.5	4.5	4.5	12	15	.....
28.....	270	28	1.5	1.5	4.5	4.5	15	15	.....
29.....	300	33	1.5	1.5	4.5	4.5	12	15	.....
30.....	315	39	1.5	6.8	4.5	4.5	15	15	.....
31.....	.....	52	.....	4.5	4.5	.....	15	.....	.....

Daily discharge, in second-feet, of Rio Pueblo de Taos at Los Cordovas, N. Mex., for 1910-11—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1911.											
1		23	23	78	149	204	28	57	23	129	75
2		23	28	92	139	216	52	48	23	129	92
3		23	33	101	149	192	67	38	23	67	92
4		23	39	92	160	181	59	28	23	75	75
5		31	48	78	160	170	52	19	19	378	92
6		25	72	75	192	139	59	9	15	495	92
7		23	45	72	242	129	52	4.5	15	360	84
8		21	35	59	285	129	39	4.5	15	256	92
9		21	43	59	330	129	45	3.0	23	204	75
10		21	56	52	345	129	33	3.0	15	170	75
11		21	101	48	285	110	28	4.5	15	160	75
12		21	52	48	285	101	75	3.0	19	139	67
13		25	62	52	270	84	59	4.5	19	129	59
14		43	23	45	330	59	45	3.0	19	129	67
15		28	23	45	315	67	45	4.5	23	120	59
16	23	28	52	52	285	52	67	6.8	23	101	59
17	23	25	48	59	285	45	39	85	15	92	59
18	23	25	45	62	270	59	28	23	15	92	59
19	23	25	52	59	256	52	39	15	15	84	59
20	23	25	56	48	242	45	45	9	23	75	59
21	23	25	59	59	204	52	59	9	23	75	59
22	23	23	62	75	181	45	52	15	23	59	67
23	23	20	56	110	149	39	67	33	23	59	75
24	23	20	52	129	129	33	75	33	19	59	67
25	23	23	52	129	139	28	75	33	15	59	59
26	23	23	48	149	139	19	84	45	15	59	52
27	21	23	45	149	149	15	84	45	15	101	45
28	21	23	45	170	160	15	92	45	15	110	33
29	23		59	192	149	15	92	39	52	101	30
30	23		67	160	139	19	75	33	149	92	30
31	25		78		170		67	28		84	

NOTE.—Daily discharge 1910-11 determined from a rating curve well defined below 150 second-feet. Discharge Feb. 23-24 and Nov. 29-30, 1911, estimated on account of ice.

Monthly discharge of Rio Pueblo de Taos at Los Cordovas, N. Mex., for 1910-11.

Month.	Discharge in second-feet.			Run-off (total in acre- feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
1910.					
April 6-30	315	67	160	7,930	B.
May	300	28	152	9,350	B.
June	59	1.5	11.6	690	C.
July	6.8	1.5	2.20	135	D.
August	4.5	1.5	3.92	241	D.
September	4.5	1.5	4.35	259	D.
October	15	4.5	9.23	568	D.
November	15	15	15.0	893	D.
December	23	18	18.8	1,160	C.
The period				21,200	
1911.					
January	43	15	20.7	1,270	C.
February	31	20	23.4	1,300	C.
March	101	23	51.7	3,180	B.
April	192	48	86.9	5,170	B.
May	345	129	216	13,300	B.
June	216	15	85.7	5,100	B.
July	92	28	57.4	3,530	B.
August	85	3.0	23.6	1,450	B.
September	149	15	24.3	1,450	B.
October	495	59	137	8,420	B.
November	92	30	66.1	3,930	B.
December			20.0	1,230	D.
The year	345	3.0	68.1	49,300	

NOTE.—Mean discharge Dec. 17-31, 1910, estimated 18 second-feet. Jan. 1-12, 1911, estimated 15 second-feet, and Dec. 1-31, 1911, estimated 20 second-feet, on account of ice.

RIO LUCERO NEAR TAOS, N. MEX.

Location.—Just above the headgate of the Seco ditch at the mouth of the canyon 9 miles above Taos, about sec. 11, T. 26 N., R. 13 E. No important tributaries near the station.

Records available.—December 17, 1910, to December 12, 1911, and fragmentary records from May to August, 1910.

Drainage area.—Not measured.

Gage.—An automatic recording gage, installed by the United States Indian Service December 17, 1910, referred to the datum of vertical staff gage originally installed.

Channel.—Somewhat shifting.

Discharge measurements.—Made by wading.

Winter flow.—Ice causes slight backwater at gage during the winter months.

Diversions.—No diversions above the station. Records represent the natural runoff. Below the station water is diverted for irrigation.

Accuracy.—Although the channel is somewhat shifting, it is probable that the estimates may be considered fair.

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

Discharge measurements of Rio Lucero near Taos, N. Mex., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		<i>Feet.</i>	<i>Sec.-feet.</i>
Jan. 28 ^a	G. H. Russell.....	0.75	8.0
Mar. 11	do.....	.85	12.5
Apr. 21	do.....	1.18	29.7
June 8	R. L. Cooper.....	1.75	88.4

^a Slight ice conditions.

Daily gage height, in feet, of Rio Lucero near Taos, N. Mex., for 1911.

[B. G. Phillips, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	0.7	0.7	0.7	1.25	1.2	1.85	1.55	1.5	1.3	1.45	1.05	1.2
2.....	.65	.7	.7	1.2	1.2	1.8	1.55	1.5	1.25	1.4	1.05	1.0
3.....	.65	.7	.7	1.15	1.2	1.8	1.55	1.5	1.2	1.35	1.05	1.0
4.....	.75	.7	.75	1.1	1.3	1.75	1.55	1.4	1.15	1.35	1.1	1.0
5.....	.9	.7	.75	1.0	1.45	1.7	1.55	1.35	1.15	^a 1.95	1.1	1.0
6.....	1.05	.7	.75	.95	1.5	1.7	1.55	1.3	1.15	2.3	1.05	1.0
7.....	1.0	.7	.75	.95	1.5	1.75	1.5	1.25	1.15	1.8	1.1	1.0
8.....	.75	.7	.75	.9	1.6	1.75	1.45	1.25	1.15	1.6	1.1	1.0
9.....	.65	.7	.8	.....	1.6	1.8	1.35	1.25	1.15	1.65	1.1	1.0
10.....	.65	.75	.85	.....	1.65	1.8	1.35	1.25	1.15	1.5	1.1	1.0
11.....	.65	.75	.85	.....	1.65	1.75	1.35	1.25	1.1	1.4	1.05	1.0
12.....	.7	.75	.8	.....	1.7	1.7	1.35	1.25	1.15	1.4	1.15	1.0
13.....	.7	.75	.8	.95	1.65	1.7	1.35	1.25	1.1	1.35	1.2	.....
14.....	.7	.7	.8	1.0	1.65	1.7	1.35	1.2	1.1	1.3	1.15	.....
15.....	.7	.7	.8	1.0	1.65	1.7	1.35	1.2	1.15	1.3	1.1	.....
16.....	.65	.7	.85	1.05	1.7	1.7	1.35	1.15	1.1	1.2	1.1	.....
17.....	.65	.7	.85	1.15	1.7	1.7	1.35	1.2	.....	1.1	1.15	.....
18.....	.65	.75	.85	1.1	1.7	1.65	1.35	1.2	.....	1.1	1.15	.....
19.....	.65	.7	.85	1.1	1.75	1.6	1.4	1.15	.....	1.1	1.1	.....
20.....	.7	.75	.85	1.15	1.7	1.6	1.5	1.1	.....	1.1	1.1	.....
21.....	.7	.75	.85	1.2	1.6	1.6	1.55	1.05	.....	1.15	1.05	.....
22.....	.7	.8	.9	1.2	1.6	1.6	1.55	1.2	.....	1.1	1.05	.....
23.....	.7	.9	.85	1.2	1.6	1.6	1.55	1.35	1.05	1.05	1.05	.....
24.....	.7	.85	.85	1.2	1.65	1.6	1.5	1.35	1.05	1.05	1.1	.....
25.....	.7	.8	.85	1.2	1.65	1.6	1.55	1.4	1.05	1.0	1.4	.....
26.....	.75	.7	.8	1.2	1.75	1.55	1.6	1.4	1.0	1.05	1.35	.....
27.....	.75	.7	.8	1.2	1.8	1.55	1.6	1.35	1.05	1.05	1.25	.....
28.....	.75	.7	.8	1.25	1.8	1.55	1.6	1.35	1.15	1.05	1.95	.....
29.....	.7	.....	.9	1.3	1.7	1.55	1.55	1.3	1.71	1.0	2.6	.....
30.....	.7	.....	1.05	1.2	1.7	1.55	1.5	1.3	1.4	1.0	2.2	.....
31.....	.7	.....	1.2	.....	1.75	.....	1.5	1.25	.....	.....	.....	.....

^a Maximum gage height Oct. 5, 3 feet.

NOTE.—Gage heights affected by ice Jan. 1 to 7, Jan. 26 to 28, about Nov. 25 to 30, and Dec. 13 to 31.

Daily discharge, in second-feet, of Rio Lucero near Taos, N. Mex., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	6	6	6	36	31	100	66	60	40	55	21	31
2.....	5	6	6	31	31	94	66	60	36	50	21	18
3.....	5	6	6	28	31	94	66	60	31	45	21	18
4.....	5	6	8	24	40	88	66	50	28	45	24	18
5.....	5	6	8	18	55	82	66	45	28	112	24	18
6.....	5	6	8	16	60	82	66	40	28	158	21	18
7.....	5	6	8	16	60	88	60	36	28	94	24	18
8.....	8	6	8	13	71	88	55	36	28	71	24	18
9.....	5	6	9	14	71	94	45	36	28	76	24	18
10.....	5	8	11	14	76	94	45	36	28	60	24	18
11.....	5	8	11	15	76	88	45	36	24	50	21	18
12.....	6	8	9	15	82	82	45	36	28	50	28	18
13.....	6	8	9	16	76	82	45	36	24	45	31	.....
14.....	6	6	9	18	76	82	45	31	24	40	28	.....
15.....	6	6	9	18	76	82	45	31	28	40	24	.....
16.....	5	6	11	21	82	82	45	28	24	31	24	.....
17.....	5	6	11	28	82	82	45	31	23	24	28	.....
18.....	5	8	11	24	82	76	45	31	23	24	28	.....
19.....	5	6	11	24	88	71	50	28	23	24	24	.....
20.....	6	8	11	28	82	71	60	24	22	24	24	.....
21.....	6	8	11	31	71	71	66	21	22	28	21	.....
22.....	6	9	13	31	71	71	66	31	22	24	21	.....
23.....	6	13	11	31	71	71	66	45	21	21	21	.....
24.....	6	11	11	31	76	71	60	45	21	21	20	.....
25.....	6	9	11	31	76	71	66	50	21	18	20	.....
26.....	8	6	9	31	88	66	71	50	18	21	20	.....
27.....	8	6	9	31	94	66	71	45	21	21	20	.....
28.....	8	6	9	36	94	66	71	45	28	21	20	.....
29.....	6	.....	13	40	82	66	66	40	24	18	20	.....
30.....	6	.....	21	31	82	66	60	40	50	18	20	.....
31.....	6	.....	31	.....	88	.....	60	36	.....	20	.....	.....

NOTE.—Daily discharge determined from a fairly well defined rating curve. Discharge estimated on account of ice Jan. 4-7 and Nov. 24-30.

Monthly discharge of Rio Lucero near Taos, N. Mex., for 1911.

Month.	Discharge in second-feet.			Run-off (in acre- feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
January.....	8	5	5.8	357	C.
February.....	13	6	7.1	394	C.
March.....	31	6	10.6	652	B.
April.....	40	13	24.7	1,470	B.
May.....	94	31	71.6	4,400	B.
June.....	100	66	79.6	4,740	B.
July.....	71	45	57.9	3,560	B.
August.....	60	21	39.3	2,420	B.
September.....	50	18	26.5	1,580	B.
October.....	158	18	43.5	2,670	B.
November.....	31	20	23.0	1,370	C.
December.....	.....	.....	15.0	922	D.
The year.....	158	5	33.9	24,500	

^a Estimated.

HORN RIVER¹ NEAR CANJILON, N. MEX.

Location.—In the Carson National Forest, at Canjilon ranger station, in sec. 2, T. 26 N., R. 5 E., 5 miles northeast of Canjilon; no important tributaries near by.

Records available.—June 19, 1911, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Not sufficient data to indicate.

Discharge measurements.—Made by wading.

Diversions.—No water diverted above the station; the records represent the natural run-off.

Accuracy.—Owing to a lack of discharge measurements, no estimates of daily or monthly discharge can be made.

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

The following discharge measurement was made by H. B. Waha:

June 19, 1911: Gage height, 1.79 feet; discharge, 5.6 second-feet.

Daily gage height, in feet, of Horn River near Canjilon, N. Mex., for 1911.

[L. A. Shartzer, observer.]

Day.	June.	July.	Aug.	Sept.	Day.	June.	July.	Aug.	Sept.
1.....		1.68		1.41	16.....		1.70	1.42	1.40
2.....		1.74		1.37	17.....		1.66	1.42	
3.....		1.77		1.46	18.....		2.12		1.41
4.....		1.72	1.46	1.45	19.....	1.76	2.05		1.43
5.....		1.62	1.46	1.44	20.....	1.74	1.82	1.44	
6.....		1.82	1.45	1.43	21.....	1.76	1.80		
7.....		1.84	1.43	1.41	22.....	1.73	1.75	2.15	1.39
8.....		1.68	1.42		23.....	1.72	1.72	1.74	1.40
9.....		1.64	1.41	1.40	24.....	1.59	1.68	1.67	1.38
10.....		1.60	1.39		25.....	1.58	1.78	1.67	
11.....		1.59	1.38	1.39	26.....	1.57		1.66	1.51
12.....		1.60	1.38		27.....	1.60	1.92	1.52	1.65
13.....		1.75	1.48	1.39	28.....	1.58	1.78	1.49	
14.....		1.68	1.47	1.38	29.....	1.69	1.68	1.48	
15.....		1.65			30.....	1.68	1.62	1.47	2.05
					31.....		1.52	1.43	

RIO VALLECITOS AT VALLECITOS, N. MEX.

Location.—At Vallecitos, in sec. 17, T. 26 N., R. 8. E., in the Carson National Forest.

Records available.—June 17, 1911, to December 5, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Not sufficient data to indicate.

Discharge measurements.—Made by wading.

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

Diversions.—Water is diverted in small amounts for a distance of 6 miles above the station.

Accuracy.—Owing to a lack of discharge measurements, no estimates of daily or monthly discharge are available at present.

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

¹ Rio Canjilon.

The following discharge measurement was made by H. B. Waha:
June 17, 1911: Gage height, 1.63 feet; discharge, 27.7 second-feet.

Daily gage height, in feet, of Rio Vallecitos at Vallecitos, N. Mex., for 1911.

[C. E. Hulbert, observer.]

Day.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....		1.17	1.32	1.20		1.54	1.50	16.....		1.82	.94	1.25	1.50		
2.....		1.55	1.28	1.04	1.40		1.57	17.....	1.63	1.50	.98	1.13			
3.....		1.46	1.24	1.06	1.23	1.45	1.56	18.....	1.61	1.55	.92	1.08	1.63		
4.....		1.35	1.35	1.06	1.20	1.46	1.56	19.....	1.56	1.58	1.06	1.08			
5.....		1.27	1.14	1.06			1.55	20.....	1.48	1.73	1.07	1.42	1.51	1.59	
6.....								21.....	1.46	1.57	.96	1.20	1.42	1.56	
7.....		3.30	1.13	1.26	2.33	1.41		22.....	1.44	1.56	1.38	1.14	1.46	1.56	
8.....		1.50	1.08	1.14	2.26	1.40		23.....	1.40	1.48	1.45	1.12	1.44	1.54	
9.....		1.41	1.06	1.10	2.11	1.52		24.....	1.37	1.83	1.29	1.16		1.52	
10.....		1.32	.92		1.96	1.52		25.....	1.25	1.63	1.26	1.17	1.38	1.50	
		1.26	.93	1.07	1.82	1.53									
11.....								26.....	1.17	2.20	1.18	1.14			
12.....		1.20	.95	1.07	1.74			27.....	1.16	1.56	1.13	1.25	1.47	1.60	
13.....		1.27	1.12	1.08	1.68			28.....	1.16	1.65	1.21	1.18	1.45	1.60	
14.....		1.26	1.03	1.28	1.62			29.....	1.16		1.18	1.22			
15.....		1.64	.92	1.16	1.58			30.....	1.22		1.09	1.28	1.64	1.58	
		1.45	.90	1.26	1.53			31.....			1.10		1.59		

SANTA FE CREEK AT MONUMENT ROCK, NEAR SANTA FE, N. MEX.

Location.—At Monument Rock, a large conspicuous boulder 7 miles above Santa Fe, in sec. 30, T. 17 N., R. 11 E. No tributaries within several miles of the station. From June 1, 1907, to July 16, 1910, and March 8 to November 12, 1911, a station was maintained at Santa Fe. Between the two stations there are no important tributaries, but the Santa Fe Water & Light Co. diverts water.

Records available.—August 29, 1910, to February 25, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Somewhat shifting.

Discharge measurements.—Made from footbridge.

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

Diversions.—Little or no water is diverted above the station, and therefore the records represent closely the natural run-off.

Accuracy.—Owing to the meager data, no estimates of discharge are made for 1911.

Cooperation.—Station maintained in cooperation with the Territorial engineer.

A record of gage heights from February 5 to 25, 1911, showed an average stage of 0.8 foot.

Discharge measurements of Santa Fe Creek at Monument Rock, near Santa Fe, N. Mex., for 1911.

Date.	Hydrographer.	Gage height.	Dis-charge.
Mar. 8 ^a	Cooper and Meier	<i>Fed.</i>	<i>Sec.-feet.</i>
Aug. 7	W. B. Freeman		7.1
			^b 7.0

^a Measurement made 1 mile above Santa Fe Water & Light Co.'s reservoir in Santa Fe Canyon. Gage at Don Gaspar bridge in Santa Fe read 0.60 feet.

^b Estimated.

SANTA FE CREEK AT SANTA FE, N. MEX.

Location.—At Don Gaspar Avenue Bridge in Santa Fe, in sec. 24, T. 17 N., R. 9 E. No tributaries within several miles of this station.

Records available.—Fragmentary records from May 31, 1907, to November 12, 1911.

Drainage area.—About 40 square miles.

Gage.—The datum of the original staff gage was changed August 13, 1908, and again August 22, 1908. Since that time it has remained permanent.

Channel.—Shifting.

Discharge measurements.—Made from bridge and by wading.

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

Diversions.—Water is diverted for the Santa Fe waterworks above the station and one small irrigation ditch diverts just above.

Accuracy.—Owing to the lack of gage heights, no estimates of daily discharge have been made.

Cooperation.—Maintained in cooperation with the Territorial engineer.

Discharge measurements of Santa Fe Creek at Santa Fe, N. Mex., in 1911.

Date.	Hydrographer.	Gage height.	Dis-charge.	Date.	Hydrographer.	Gage height.	Dis-charge.
		<i>Fect.</i>	<i>Sec.-ft.</i>			<i>Fect.</i>	<i>Sec.-ft.</i>
Mar. 4	W. B. Freeman.....		0	Aug. 1	W. B. Freeman.....		^a 0.25
5	do.....		0	2	do.....		^a .10
6	do.....		0	3	do.....		^a .05
7	do.....		0	4	do.....		^a .10
8	do.....	0.60	9.7	5	do.....		^a .05
8	do.....		^a 10.0	6	do.....		^a .05
19	do.....	.30	6.0	8	do.....		^a .05
June 1	do.....	.72	18.9	Sept. 23	do.....		0
July 23	do.....		^a 6.0	Oct. 27	do.....	0.10	^a 7.0
24	do.....		^a 6.0	28	do.....	.20	^a 9.0
25	do.....		^a 6.0	30	do.....	.50	^a 8.0
26	do.....		^a 4.0	Nov. 3	do.....	.10	^a 7.0
27	do.....		^a 3.0	11	do.....		^a 10.0
29	do.....		^a 8.0	12	do.....		^a 9.0
30	do.....		^a 8.0	12	do.....	.40	^a 12.0
31	do.....		^a 3.0				

^a Estimated.

Daily gage height, in feet, of Santa Fe Creek at Santa Fe, N. Mex., for 1911.

[A. S. Kirkpatrick, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1.				0.70					
2.				.50					
3.				.40					0.10
4.									
5.				.40					
6.				.20					
7.									
8.	0.60								
9.									
10.									
11.									
12.									.40
13.									
14.									
15.			0.10						
16.			.30						
17.			.40						
18.			.50						
19.	.30								
20.			.80						

Daily gage height, in feet, of Santa Fe Creek at Santa Fe, N. Mex., for 1911—Continued.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
21.....			0.50						
22.....									
23.....									
24.....									
25.....			.58						
26.....			.55						
27.....			.42					0.10	
28.....			.80					.20	
29.....			.55					.50	
30.....			.45	1.90					
31.....			.68						

NOTE.—No flow in the creek from June 7 to 29.

RIO SAN ANTONIO NEAR ORTIZ, N. MEX.

Location.—At the lower San Antonio ranger station in the Carson National Forest, in sec. 1, T. 30 N., R. 7 E.; nearest tributary, a small stream entering from the south just above the station; Nutritus Creek enters 2 miles above.

Records available.—June 16, 1911, to November 27, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Data too meager to determine.

Discharge measurements.—Made by wading.

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

Diversions.—Four small diversions above the station.

Accuracy.—Owing to lack of discharge measurements no estimates of flow are available at present.

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

The following discharge measurement was made by H. B. Waha:

June 16, 1911: Gage height, 1.10 feet; discharge, 8.5 second-feet.

Daily gage height, in feet, of Rio San Antonio near Ortiz, N. Mex., for 1911.

[T. A. Graham, observer.]

Day.	June.	July.	Aug.	Sept.	Oct.	Nov.	Day.	June.	July.	Aug.	Sept.	Oct.	Nov.
1.....		1.0	1.1			1.0	16.....	1.1	1.1	0.0	0.8		
2.....		1.1	1.0	1.1		1.0	17.....	1.1	1.1				1.1
3.....		1.1	1.0	.0	0.8		18.....	1.1	1.15		.8		1.1
4.....			1.0	.4	.8	1.0	19.....	1.1	1.15		.8		1.0
5.....		1.0	1.0	.8			20.....	1.0	1.0		.8		1.0
6.....		1.05	.0	.8			21.....	1.0	1.0				1.1
7.....		1.05	.0	.8			22.....		1.05				
8.....		1.0	.0	.82			23.....	1.0	1.15			0.0	
9.....		1.0	.0	.8			24.....	1.0	1.25				
10.....		1.1	.0				25.....	1.0	1.25		.8	1.0	1.2
11.....		1.1	.0				26.....	.0	1.2		.8	1.1	1.1
12.....		1.1	.0				27.....	.5	1.2		.8	1.1	1.1
13.....		1.55	.0				28.....	.5	1.15		.8	1.1	
14.....		1.35	.0			1.1	29.....	.0	1.1		.8		
15.....		1.1	.0				30.....	1.0	1.1		.8	1.1	
							31.....		1.1			1.0	

^a Maximum gage height, 5.6 feet Sept. 30.

NOTE.—No flow in the river from Aug. 5 to Oct. 3, where the gage heights are omitted.

RIO PUERCO AT RIO PUERCO, N. MEX.

Location.—At the Atchison, Topeka & Santa Fe Railway bridge between Pavo and Rio Puerco, in sec. 31, T. 7 N., R. 1 W.; nearest tributary, a small stream entering from the west just below; San Jose River enters about 6 miles above.

Records available.—Fragmentary records September 7, 1910, to October 2, 1911.

Drainage area.—Not measured.

Gage.—Automatic recording gage.

Channel.—Somewhat shifting.

Discharge measurements.—Made by wading.

Accuracy.—Owing to the meager data no estimates of discharge can be made.

Cooperation.—Station maintained in cooperation with the Territorial engineer.

Discharge measurements of Rio Puerco at Rio Puerco, N. Mex., in 1911.

Date.	Hydrographer.	Gage.	Dis-charge.
		<i>Feet.</i>	<i>Sec.-ft.</i>
Aug. 6	G. H. Russell.....		0
Sept. 2	do.....		0

Daily gage height, in feet, of Rio Puerco at Rio Puerco, N. Mex., for 1911.

[Chas. Lembke, observer.]

Day.	Aug.	Sept.	Oct.	Day.	Aug.	Sept.	Oct.	Day.	Aug.	Sept.	Oct.
1.....			2.05	11.....				21.....	1.65		
2.....			1.85	12.....				22.....	1.45		
3.....				13.....				23.....			
4.....				14.....				24.....	3.3		
5.....		1.1		15.....				25.....	2.4		
6.....		1.1		16.....				26.....	1.6		
7.....				17.....				27.....	1.2		
8.....				18.....				28.....	.9		
9.....				19.....	2.45			29.....	.8		
10.....				20.....	2.0			30.....	.7	a 2.3	
								31.....	.65		

^a Estimated.

RIO PUERCO NEAR LA JOYA, N. MEX.

Location.—At the Atchison, Topeka & Santa Fe Railway bridge 2 miles north of La Joya railway station, in sec. 20, T. 2 N., R. 1 E.; 1 mile above the mouth of the river; above all tributaries; no important tributaries for several miles above.

Records available.—Fragmentary records September 10, 1910, to November 9, 1911.

Drainage area.—Not measured.

Gage.—Automatic recording gage.

Channel.—Very shifting.

Discharge measurements.—Made by wading.

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

Accuracy.—Owing to the extreme changes in conditions and the few measurements, it is not possible to make estimates of discharge.

Cooperation.—Station maintained in cooperation with the Territorial engineer.

Discharge measurements of Rio Puerco near La Joya, N. Mex., in 1911.

Date.	Hydrographer.	Gage height.	Dis-charge.
		<i>Fect.</i>	<i>Sec.-feet.</i>
Feb. 14	C. B. Digby		^a 0.25
Mar. 22	G. H. Russell	3.10	89.8
Aug. 6	do	4.40	^a 2.0
Nov. 1	W. B. Freeman	4.75	34.8

^a Estimated.*Daily gage height, in feet, of Rio Puerco near La Joya, N. Mex., for 1911.*

[S. C. Elliott, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1						6.0	4.7	6.8	4.75
2					5.8	5.9	4.7	6.8	4.7
3					^a 6.7	5.8	4.6	6.8	4.65
4					6.0	5.7	4.6	6.8	4.6
5					5.0	4.9	4.5	6.0	4.55
6						4.8	4.5	5.5	4.5
7						4.8	4.4	5.5	4.45
8	2.7					4.7	4.4	4.8	4.4
9	3.2		5.1		5.1	4.7	4.4	4.7	4.35
10	3.25		5.1		5.0	4.6	4.7		
11	3.2		5.1			4.4	4.7		
12	3.35		5.1			4.3	4.6		
13	3.4		5.0		6.45	4.1	4.6		
14	3.45		5.0		6.9	4.0	4.5		
15	3.5		4.9		^b 8.0	3.8	4.5		
16	3.45		5.2		6.2	3.6	4.5		
17	3.2		5.3		6.6	3.3	4.5		
18	3.0		5.2		5.4	6.3	4.6		
19	2.95	5.3	5.1		5.6	5.9	4.6		
20	3.0	5.1	5.1		6.8	5.8	4.7		
21	3.05	5.0			7.4	5.2	4.7		
22	3.1				7.95	5.1	4.7		
23	3.0				6.1	6.8	4.7		
24	3.0				6.1	7.4	4.6		
25	2.5				6.4	7.2	4.6		
26	2.9				7.4	6.8	4.6		
27	2.8				6.8	6.2	4.6		
28	2.8				6.1	5.5	4.5		
29	2.7			5.1	6.0	5.0	4.5		
30	2.6				5.9	4.9	5.6		
31					6.1	4.8			

^a Approximate maximum gage height July 3, 8.0 feet.^b Maximum gage height July 15, 10.0 feet.

NOTE.—No flow in the river where gage heights are omitted except Oct. 29, 30, and 31, when there was a small flow.

SAN JOSE RIVER NEAR SUWANEE, N. MEX.

Location.—Two miles below the railroad station at Suwanee, near sec. 29, T. 8 N., R. 2 W.; about 6 miles above the mouth of the river and 3 miles below the Rio Lucero.

Records available.—Fragmentary records August 30, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Automatic recording gage.

Channel.—Shifting.

Discharge measurements.—Made by wading.

Accuracy.—Owing to the shifting character of the stream, and the lack of discharge measurements, no estimates of discharge can be made.

Cooperation.—Station maintained in cooperation with the Territorial engineer.

Discharge measurements of San Jose River near Suwanee, N. Mex., in 1911.

Date.	Hydrographer.	Gage height.	Dis-charge.
Aug. 10	G. H. Russell.....	<i>Fect.</i> 0.52	<i>Sec.-ft.</i> a 1.5
Sept. 2	do.....	.50	a 1.5
Nov. 2	W. B. Freeman.....	1.20	18.5

a Estimated.

Daily gage height, in feet, of San Jose River near Suwanee, N. Mex., for 1911.

[Chas. Lembke, observer.]

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....		0.80	1.80		0.98	16.....	0.65	1.00		1.10	0.48
2.....	.50	1.20		1.30		17.....	a 3.10	.85		1.10	.48
3.....	.50			1.22		18.....	4.00	.80		1.10	.50
4.....	1.50			1.22		19.....	2.40	1.00		1.10	.50
5.....	1.10			1.40		20.....	1.80	b 2.50		1.10	.48
6.....	.80			1.50		21.....	2.10	1.30		1.05	.25
7.....	.50			1.20		22.....	c 2.90	1.10		1.05	.22
8.....	.50			1.15		23.....	3.20	1.00		1.05	.20
9.....	.50			1.10		24.....	3.70	.80		1.02	.21
10.....	0.50	.60		1.05		25.....	3.60	.80		1.00	.28
11.....	.50	.80		1.05		26.....	2.30	.80		1.00	.23
12.....	.50	1.10		1.05		27.....	1.80	1.00		1.00	.33
13.....	.50	1.20		1.05		28.....	1.40	1.30		1.00	.35
14.....	.70	1.80		1.05		29.....	1.30	1.30		.98	.32
15.....	.50	1.30		1.05	.50	30.....	1.25	3.00		.98	.38
						31.....	1.10				.38

a Maximum gage height Aug. 17, 6.2 feet.

b Maximum gage height Sept. 20, 3.9 feet.

c Maximum gage height Aug. 22, 4.8 feet.

PECOS RIVER BASIN.**PECOS RIVER AT COWLES, N. MEX.**

Location.—At highway bridge about sec. 28, T. 18 N., R. 12 E., three-fourths mile below Cowles post office; midway between Espiritu Santo and Willow creeks.

Records available.—March 9, 1910, to December 15, 1911.

Drainage area.—Not measured.

Gage.—Automatic recording gage.

Channel.—Fairly permanent except during high water, when it may shift slightly.

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

Winter flow.—Ice causes backwater during a portion of the winter months.

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

Cooperation.—Maintained in cooperation with the Territorial engineer.

Discharge measurements of Pecos River at Cowles, N. Mex., in 1911.

Date.	Hydrographer.	Gage height.	Dis-charge.
		<i>Fect.</i>	<i>Sec.-ft.</i>
Jan. 5a	C. B. Digby.....	2.10	21.1
Mar. 31	R. L. Cooper.....	1.30	66.1
May 25	do.....	2.25	256
June 9	Jones and Jones.....	1.74	157
16	G. H. Russell.....	1.65	124
Aug. 7	W. B. Freeman.....	1.70	134
Oct. 31	do.....	1.47	75.2

a Ice present.

Daily gage height, in feet, of Pecos River at Cowles, N. Mex., for 1911.

[E. Rivera, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.		0.9	1.25	1.35	1.7	2.7	1.65				1.5	1.6
2.		.9	1.2	1.3	1.75	2.55	2.1		1.2		1.45	1.6
3.		.9	1.2	1.3	1.8	2.4	1.85				1.55	1.6
4.		.9	1.05	1.25	2.05	2.3	1.6				1.5	1.6
5.	2.1	.9	.95	1.15	2.25	2.25	1.7	1.8			1.5	1.6
6.	2.1	.9	1.0	1.15	2.55	2.2	1.9				1.5	1.6
7.	2.1	.95	1.0	1.1	2.8	2.1	1.9	1.7		2.4	1.5	1.6
8.	2.1	.9	1.0	1.1	2.95	2.1	1.8		1.2		1.45	1.55
9.	2.0	.9	1.0	1.1	3.05	2.0	1.85		1.2		1.45	1.55
10.	2.1	.95	1.1	1.15	2.9	1.95	1.75				1.45	1.35
11.	2.2	.9	1.1	1.2	2.75	1.9	1.9				1.35	1.35
12.	2.1	.8	1.0	1.2	2.65	1.8	1.95	1.5			1.4	1.35
13.	1.6	.8	.95	1.2	2.6	1.75	2.25				1.45	1.35
14.	1.1	.8	.9	1.2	2.75	1.7	2.45			1.4	1.45	1.35
15.	.85	.8	.95	1.3	2.85	1.7	2.75				1.45	1.35
16.	.8	.8	1.0	1.35	2.75	1.65	3.2		1.2		1.45	
17.	.8	.8	1.0	1.4	2.7	1.6	2.85				1.6	
18.	.85	.8	1.0	1.35	2.7	1.6	2.6				1.6	
19.	.85	.78	1.0	1.4	2.6	1.6	2.6	1.5			1.6	
20.	.9	.78	1.0	1.5	2.45	1.6	2.55				1.6	
21.	.9	.77	1.0	1.55	2.35	1.65	2.5	1.3		1.75	1.6	
22.	.9	.9	1.0	1.7	2.25	1.6	2.45				1.6	
23.	.9	1.15	1.0	1.7	2.2	1.55	2.35		1.2		1.55	
24.	.95	1.3	1.0	1.6	2.25	1.5	3.0				1.6	
25.	.95	1.3	1.0	1.6	2.3	1.5	2.8				1.65	
26.	.9	1.3	1.0	1.6	2.3	1.45	2.6	1.35			1.6	
27.	.95	1.25	1.0	1.7	2.3	1.45	2.5		1.3		1.6	
28.	.9	1.25	1.05	1.8	2.3	1.4				1.7	1.6	
29.	.9		1.15	1.75	2.4	1.4	2.7				1.6	
30.	.95		1.25	1.65	2.35	1.4			1.4		1.6	
31.	.9		1.35		2.7					1.5		

a Maximum gage height July 16, 3.5 ft. Staff gage read July 29 to Oct. 28.

NOTE.—Gage heights affected by ice Jan. 5 to 14 and Dec. 16 to 31.

Daily discharge, in second-feet, of Pecos River at Cowles, N. Mex., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.		20	62	79	149	433	122	338	45	93	80	99
2.		20	55	70	160	384	227	308	45	112	72	99
3.		20	55	70	172	337	166	253	45	122	90	99
4.		20	36	62	236	307	112	202	45	144	80	99
5.		20	25	48	292	292	133	155	45	202	80	99
6.		20	30	48	384	278	178	144	45	523	80	99
7.		25	30	42	467	250	178	133	45	295	80	99
8.		20	30	42	520	250	155	122	45	189	72	90
9.		20	30	42	491	223	166	112	45	131	72	56
10.		25	42	48	443	210	144	102	45	110	72	56
11.		20	42	55	397	197	178	102	45	90	56	56
12.		13	30	55	367	172	190	93	45	80	63	56
13.		13	25	55	352	144	256	93	45	72	72	56
14.		13	20	55	397	133	323	93	45	63	72	56
15.	16	13	25	70	428	133	416	93	45	63	72	56
16.	13	13	30	79	397	122	560	93	45	63	72	
17.	13	13	30	88	382	112	448	98	45	63	99	
18.	16	13	30	79	382	112	369	93	45	63	99	
19.	16	12	30	88	352	112	369	93	45	63	99	
20.	20	12	30	107	309	112	354	75	45	80	99	
21.	20	11	30	117	281	122	338	59	45	131	99	
22.	20	20	30	149	254	112	323	59	45	120	99	
23.	20	48	30	149	240	102	294	59	45	120	90	
24.	25	70	30	127	254	93	496	59	45	120	99	
25.	25	70	30	127	267	93	432	59	45	120	110	
26.	20	70	30	127	267	84	369	67	52	120	99	
27.	25	62	30	149	267	84	338	59	59	120	99	
28.	20	62	36	172	267	75	369	52	59	120	99	
29.	20		48	160	295	75	400	45	67	110	99	
30.	25		62	138	281	75	400	45	75	99	99	
31.	20		79		382		369	45		80		

NOTE.—Daily discharge determined from three fairly well-defined rating curves applicable as follows: No. 1, Jan. 15 to May 8 and June 1 to June 12; No. 2, May 9 to 31 and Oct. 6 to Dec. 15; No. 3, June 13 to Oct. 5. Discharge for the periods during which gage was not read determined by comparison with records of Pecos River at Anton Chico and Gallinas River at Las Vegas.

Monthly discharge of Pecos River at Cowles, N. Mex., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre- feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
January.....	25	13	19.5	1,200	C.
February.....	70	11	27.1	1,510	C.
March.....	79	20	36.2	2,230	C.
April.....	172	42	89.9	5,350	B.
May.....	520	149	327	20,100	B.
June.....	433	75	174	10,400	B.
July.....	560	112	296	18,200	B.
August.....	338	45	110	6,760	C.
September.....	75	45	47.9	2,850	C.
October.....	523	63	125	7,690	C.
November.....	110	56	85.8	5,110	B.
December.....	99	.....	58.5	3,600	C.
The year.....	560	11	117	85,000	

NOTE.—Mean discharge Jan. 1 to 14 estimated 19 second-feet, and Dec. 16 to 31 estimated 40 second-feet on account of ice.

PECOS RIVER NEAR ANTON CHICO, N. MEX.

Location.—About 1 mile below the settlement of Tecolotito, about sec. 31, T. 12 N., R. 17 E., about 3 miles northwest of Anton Chico; 1½ miles below the mouth of Tecolote Creek.

Records available.—April 28, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Automatic recording gage, which was moved three-fourths of a mile downstream on May 15, 1911, and referred to a new datum.

Channel.—Apparently permanent.

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

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

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

Cooperation.—Maintained in cooperation with the Territorial engineer and V. K. Jones, Las Vegas, N. Mex.

Discharge measurements of Pecos River near Anton Chico, N. Mex., in 1911.

Date.	Hydrographer.	Gage height.	Dis- charge.
		<i>Fet.</i>	<i>Sec.-ft.</i>
Jan. 9	C. B. Digby.....	—0.20	17.6
Mar. 29	R. L. Cooper.....	.12	41.0
May 13	G. H. Russell.....	3.60	2,380
17	do.....	2.20	378
13 ^a	do.....	3.20	2,380
17	do.....	2.43	378
June 2	Jones and Jones.....	2.60	520
July 28	G. H. Russell.....	2.54	545
Sept. 16	V. K. Jones.....	1.44	30.6
Oct. 28	do.....	1.70	148

^a Float measurement.

NOTE.—First four measurements referred to original gage; last six measurements referred to new gage.

67443°—wsp 308—13—6

Daily gage height, in feet, of Pecos River near Anton Chico, N. Mex., for 1911.

[J. M. Abercrombie, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	-0.15	-0.20	-0.10	0.70	1.60	2.50	1.80	2.20	1.50	1.65	1.75	1.80
2.....	.15	.20	.10	.90	1.55	2.35	2.90	2.15	1.50	1.75	1.75	1.80
3.....	.15	.20	.10	1.00	1.60	2.30	2.90	2.10	1.50	1.70	1.75	1.80
4.....	.15	.20	.10	1.15	1.65	2.30	2.60	2.05	1.65	1.65	1.75	1.80
5.....	.15	.20	.15	1.10	1.90	2.25	2.30	1.90	1.60	2.45	1.80	1.80
6.....	.15	.20	.00	.95	1.95	2.20	2.20	1.85	1.55	3.65	1.85	1.80
7.....	.15	.20	.15	.85	2.00	2.20	2.20	1.80	1.55	2.90	1.80	1.80
8.....	.20	.20	.35	.95	2.00	2.20	2.20	1.75	1.55	2.45	1.80	1.80
9.....	.20	.20	.37	1.05	2.10	2.15	2.20	1.70	2.05	2.25	1.85	1.75
10.....	.05	.20	.37	1.00	2.10	2.10	2.20	1.70	1.70	2.15	1.80	1.75
11.....	.10	.20	.50	.90	2.20	2.10	2.20	1.70	1.55	2.05	1.85	1.75
12.....	.08	.20	.85	.85	2.40	2.10	2.30	1.65	1.55	2.00	1.85	1.95
13.....	.10	.20	.80	.85	3.00	2.10	2.30	1.65	1.55	1.95	1.85	2.00
14.....	.10	.20	.62	.90	2.70	2.05	2.40	1.65	1.55	1.90	1.95	2.00
15.....	.05	.20	.42	.85	2.60	2.00	2.40	1.60	1.55	1.85	1.90	2.00
16.....	.00	.15	.30	.80	2.50	2.00	2.40	1.65	1.50	1.80	1.85	2.00
17.....	.05	.10	.32	.80	2.45	2.00	2.55	1.75	1.50	1.80	1.85	2.00
18.....	.10	.00	.35	.85	2.40	2.00	2.55	1.85	1.50	1.80	1.80	2.00
19.....	.10	.00	.40	.85	2.40	a 2.20	2.45	1.80	1.45	1.75	1.80	2.00
20.....	.15	.10	.40	.75	2.35	2.00	3.30	1.70	1.55	1.75	1.80	2.00
21.....	.20	.20	.40	.85	2.30	2.20	2.80	1.65	1.50	1.75	1.80	2.00
22.....	.20	.20	.40	.95	2.30	2.10	b 2.30	1.60	1.50	1.70	1.80	2.00
23.....	.20	.20	.40	1.15	2.20	2.00	2.35	1.65	1.50	1.70	1.80	2.00
24.....	.20	.20	.40	1.45	2.20	1.90	2.50	1.75	1.50	1.70	1.80	2.00
25.....	.20	.15	.35	1.45	2.20	1.80	2.45	1.70	1.50	1.70	1.75	1.95
26.....	.20	.05	.30	1.45	2.20	1.80	2.35	1.60	1.50	1.70	1.75	1.90
27.....	.20	.15	.25	1.40	2.20	1.80	2.25	1.55	1.50	1.90	1.90	1.85
28.....	.20	.10	.25	1.40	2.70	1.95	2.40	1.55	1.50	1.80	1.80	1.85
29.....	.20	.25	1.55	2.95		1.80	2.40	1.90	1.50	1.85	1.80	1.80
30.....	.20	.30	1.65	2.30		1.75	2.40	1.65	1.60	1.80	1.80	1.85
31.....	.20	.45		2.20			2.30	1.60		1.80		1.90

a Maximum gage height June 19, 4.7 feet.

b Maximum gage height July 22, 5.2 feet.

NOTE.—Gage heights affected by presence of ice Jan. 1 to 14 and Dec. 12 to 31; gage heights after May 14 read from a gage three-fourths mile downstream from the original gage. This gage is referred to a new datum.

PECOS RIVER AT SANTA ROSA, N. MEX.

Location.—At highway bridge at Santa Rosa, 1 mile above the mouth of Rio Agua Negra Chiquita and 6 miles above Canyon Pintada in sec. 11, T. 8 N., R. 21 E. From May 5, 1903, to December 31, 1906, a station was maintained near the present one by the United States Reclamation Service, but the gage heights were referred to a different datum.

Records available.—February 1, 1910, to July 31, 1911.

Drainage area.—2,780 square miles (measured from Land Office map).

Gage.—Chain gage.

Channel.—Very shifting.

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

Winter flow.—Practically no ice at this station.

Accuracy.—Owing to the shifting character of the stream the estimates can not be considered better than fair.

Cooperation.—Maintained in cooperation with the Territorial engineer.

Discharge measurements of Pecos River at Santa Rosa, N. Mex., in 1911.

Date.	Hydrographer.	Gage height.	Dis-charge.
		<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 12	C. B. Digby.....	0.60	12.0
Apr. 4	Russell and Waha.....	.44	7.2
May 18	G. H. Russell.....	1.79	314.

Daily gage height, in feet, of Pecos River at Santa Rosa, N. Mex., for 1911.

[W. C. Baker, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.
1....	0.65	0.56	0.66	0.56	1.34	2.40	1.45	16....	0.64	0.64	0.64	0.76	1.85	1.40	2.40
2....	.78	.54	.72	.60	1.50	2.90	1.40	17....	.64	.63	.62	.78	1.85	1.15	2.40
3....	.80	.54	.69	.58	1.46	2.00	2.50	18....	.68	.62	.54	.72	1.80	1.10	2.70
4....	.65	.54	.62	.61	1.38	1.75	2.25	19....	.62	.74	.56	.69	1.70	1.10	2.45
5....	.62	.56	.59	.54	1.19	1.70	2.10	20....	.66	.76	.64	.70	1.60	3.40	2.65
6....	.65	.49	.64	.76	1.26	1.80	2.25	21....	.64	.74	.56	.90	1.95	1.85	6.80
7....	.72	.54	.64	.84	1.60	1.70	2.35	22....	.65	.70	.62	.82	1.90	2.65	2.40
8....	.72	.54	.64	.76	1.56	1.65	3.15	23....	.65	.73	.68	.92	1.80	2.15	2.35
9....	.62	.52	.55	.82	1.71	1.55	2.05	24....	.62	.62	.69	.90	1.60	1.65	2.34
10....	.60	.54	.64	.83	1.75	1.70	3.20	25....	.65	.74	.65	1.40	1.40	1.65	2.09
11....	.70	.54	.55	.97	1.75	1.55	2.60	26....	.63	.66	.66	1.30	1.40	1.45	1.99
12....	.60	.56	.64	.90	2.15	1.55	2.55	27....	.66	.66	.60	1.12	1.35	1.45	2.69
13....	.62	.56	.59	.82	2.90	1.50	2.40	28....	.65	.69	.56	1.13	1.55	1.30	1.79
14....	.66	.52	.58	.83	3.50	1.40	2.25	29....	.65	.....	.56	1.15	2.95	1.45	2.14
15....	.62	.58	.62	.69	2.55	1.40	2.10	30....	.58	.....	.64	1.10	3.20	1.80	2.14
								31....	.59	.....	.60	.....	2.20	.....	2.04

Daily discharge, in second-feet, of Pecos River at Santa Rosa, N. Mex., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.
1....	15	11	16	11	155	780	146	16....	14	14	14	25	352	127	780
2....	27	10	20	12	230	1,290	127	17....	14	14	13	27	352	57	780
3....	29	10	17	11	210	460	870	18....	17	13	10	20	320	46	1,060
4....	15	10	13	13	175	290	655	19....	13	22	11	17	260	46	825
5....	13	11	12	10	62	260	535	20....	16	25	14	18	210	1,840	1,010
6....	15	8.8	14	25	110	320	655	21....	14	22	11	46	422	352	6,080
7....	20	10	14	36	250	260	738	22....	15	18	13	32	385	1,010	780
8....	20	10	10	25	230	235	1,540	23....	15	21	17	51	320	575	738
9....	13	9.6	10	32	320	188	498	24....	13	13	17	46	210	235	729
10....	12	10	14	34	315	260	1,600	25....	15	22	15	200	127	235	528
11....	18	10	10	63	315	188	965	26....	14	16	16	155	127	146	452
12....	12	11	14	46	600	188	918	27....	16	16	12	95	111	146	1,050
13....	13	11	12	32	1,300	165	780	28....	15	17	11	97	188	95	314
14....	16	9.6	11	34	1,960	127	655	29....	15	.....	11	105	1,320	146	567
15....	13	11	13	17	918	127	535	30....	11	.....	14	75	1,600	320	567
								31....	12	.....	12	.....	615	.....	490

NOTE.—Daily discharge Jan. 1 to Apr. 24 determined from a fairly well-defined rating curve; discharge Apr. 25 to May 13 computed by indirect method for shifting channels; discharge May 14 to July 31 determined from a poorly-defined rating curve.

Monthly discharge of Pecos River at Santa Rosa, N. Mex., for 1911.

[Drainage area, 2,780 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.....	29	11	15.5	0.0056	0.007	953	A.
February.....	25	8.8	13.8	.0050	.005	766	A.
March.....	20	10	13.3	.0048	.006	818	A.
April.....	200	10	47.0	.017	.02	2,800	B.
May.....	1,960	62	454	.163	.19	27,900	B.
June.....	1,840	46	349	.126	.14	20,800	B.
July.....	6,080	127	902	.324	.37	55,500	B.
The period.....						109,000	

PECOS RIVER NEAR DAYTON, N. MEX.

Location.—Three miles east of Dayton, in sec. 13, T. 18 S., R. 26 E.; 100 feet below the mouth of Penasco River.

Records available.—March 24, 1905, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff. The original gage was washed out September 6, 1905, and was relocated September 7, 1905, half a mile upstream. Datum unchanged since then.

Channel.—Shifting during high water.

Discharge measurements.—Made from car and cable.

Winter flow.—Ice has little effect on the relation of gage height to discharge.

Diversions.—The station is about 10 miles above the dam at the outlet of Lake Millan, one of the reservoirs in the United States Reclamation Service Carlsbad project, which will irrigate about 20,000 acres in the vicinity of Carlsbad.

Accuracy.—Owing to the shifting character of the stream, the estimates can not be considered better than fair.

Cooperation.—Station maintained in cooperation with the United States Reclamation Service, by which the field data are furnished.

Discharge measurements of Pecos River near Dayton, N. Mex., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		<i>Feet.</i>	<i>Sec.-feet.</i>
Mar. 2	United States Reclamation Service engineers.	3.50	266
11	do.	3.00	163
Apr. 28	do.	3.70	306
June 3	do.	4.95	434
July 12	do.	5.00	1,090
Nov. 1	do.	3.30	406
Dec. 20	do.	3.15	290

Daily gage height, in feet, of Pecos River near Dayton, N. Mex., for 1911.

[Hattie Cramer, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	3.6	3.6	3.5	2.8	3.9	5.2	3.3	3.9	3.5	2.5	3.4	3.1
2.....	3.6	3.6	3.5	2.8	3.8	5.4	2.7	3.8	3.6	2.5	3.2	3.1
3.....	3.8	3.5	3.5	2.7	3.5	5.0	2.6	3.6	2.7	2.5	3.2	3.2
4.....	3.9	3.4	3.4	2.8	3.4	4.5	2.5	3.5	2.6	2.5	3.2	3.2
5.....	3.9	3.5	3.4	2.7	3.2	5.1	2.4	3.3	2.6	2.5	3.2	3.3
6.....	4.2	3.4	3.4	2.6	3.2	4.4	2.5	3.2	2.6	2.5	3.3	3.2
7.....	3.6	3.4	3.4	2.6	3.1	4.0	3.0	3.0	2.5	2.5	3.2	3.2
8.....	3.5	3.4	3.2	2.7	3.1	3.7	4.0	2.9	2.5	2.5	3.2	3.1
9.....	3.5	3.4	3.1	2.6	3.0	3.6	3.8	2.9	2.4	2.6	3.0	3.1
10.....	3.4	3.4	3.1	2.6	2.9	3.4	3.8	2.8	2.4	4.6	3.0	3.1
11.....	3.6	3.2	3.1	2.7	2.9	3.3	4.8	2.8	2.4	4.3	3.0	3.2
12.....	3.8	3.2	3.0	2.7	2.8	3.4	5.0	2.7	2.7	4.0	3.9	3.2
13.....	3.8	3.1	3.0	2.7	3.0	3.2	4.8	2.7	2.7	3.8	3.7	3.4
14.....	3.6	3.1	3.0	2.7	4.0	3.2	4.7	2.5	2.6	3.6	3.4	3.4
15.....	3.6	3.1	3.0	2.6	6.2	3.1	4.9	2.4	2.5	3.4	3.0	3.4
16.....	3.5	3.1	2.9	2.6	5.6	3.1	5.2	2.3	2.7	3.3	3.0	3.3
17.....	3.5	3.1	2.9	2.6	5.1	3.0	5.3	2.3	2.7	3.1	3.0	3.4
18.....	3.6	3.1	2.9	2.7	4.8	2.9	4.3	2.3	2.6	3.0	3.1	3.4
19.....	3.6	3.7	2.9	2.6	4.3	2.8	4.3	2.2	2.6	3.0	3.1	3.3
20.....	3.5	3.8	2.9	2.7	4.3	2.8	4.2	2.1	2.5	2.9	3.1	3.2
21.....	3.5	3.7	2.9	2.6	4.3	2.8	4.9	2.1	2.4	2.8	3.1	3.2
22.....	3.5	3.7	3.0	2.6	4.0	2.9	5.1	2.1	2.4	2.8	3.2	3.2
23.....	3.5	3.6	3.0	2.6	3.8	3.4	9.2	2.3	2.7	2.9	3.2	3.2
24.....	3.5	3.6	3.0	2.6	3.7	3.9	.....	2.4	2.6	3.2	3.2	3.2
25.....	3.5	3.5	3.0	3.0	3.5	3.5	8.9	2.4	2.5	3.1	3.2	3.2
26.....	3.5	3.5	2.9	3.1	3.5	3.6	4.3	4.1	2.4	2.9	3.2	3.2
27.....	3.5	3.5	2.9	4.0	3.4	3.5	3.7	4.2	2.4	2.8	3.3	2.8
28.....	3.6	3.5	2.9	3.8	3.3	3.5	4.0	4.1	2.4	2.8	3.1	2.6
29.....	3.9	.....	3.0	4.0	3.2	3.2	4.3	3.6	2.4	2.8	3.1	2.3
30.....	3.5	.....	3.0	4.0	3.5	3.0	4.0	3.4	2.4	2.8	3.2	2.0
31.....	3.6	.....	2.9	.....	4.0	.....	4.0	3.4	.....	2.9	.....	2.9

NOTE.—Gage heights affected by presence of ice Dec. 27 to 31; water surface over top of the gage July 24.

Daily discharge, in second-feet, of Pecos River near Dayton, N. Mex., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	300	300	270	132	414	680	135	750	510	170	463	284
2.....	300	300	270	132	372	740	75	679	561	170	320	284
3.....	372	270	270	120	270	500	65	561	210	170	320	320
4.....	414	244	244	132	244	280	65	510	188	170	320	320
5.....	414	270	244	120	198	555	55	418	188	170	320	358
6.....	570	244	244	110	198	245	65	376	188	170	358	320
7.....	300	244	244	110	178	155	110	300	170	170	320	320
8.....	270	244	198	120	178	120	380	266	170	170	320	284
9.....	270	244	178	110	160	110	300	266	154	188	250	284
10.....	244	244	178	110	145	95	300	236	154	1,370	250	284
11.....	300	198	178	120	145	80	895	236	154	1,090	250	320
12.....	372	198	160	120	132	100	1,050	210	210	830	680	320
13.....	372	178	160	120	160	80	950	210	210	679	545	398
14.....	300	178	160	120	460	80	870	170	188	561	398	398
15.....	300	178	160	110	2,470	75	1,040	154	170	463	250	398
16.....	270	178	145	110	1,730	75	1,300	139	210	418	250	358
17.....	270	178	145	110	1,130	75	1,400	139	210	337	250	398
18.....	300	178	145	120	880	65	585	139	188	300	284	398
19.....	300	334	145	110	480	60	585	125	188	300	284	358
20.....	270	372	145	120	480	60	525	112	170	266	284	320
21.....	270	334	145	110	430	65	1,040	112	154	236	284	320
22.....	270	334	160	110	310	75	1,210	112	154	236	320	320
23.....	270	300	160	110	230	125	8,440	139	210	266	320	320
24.....	270	300	160	110	205	200	11,000	154	188	376	320	320
25.....	270	270	160	160	155	150	7,900	154	170	337	320	320
26.....	270	270	145	178	155	170	1,090	915	154	266	320	320
27.....	270	270	145	460	125	150	617	1,000	154	236	358	200
28.....	300	270	145	372	120	150	830	915	154	236	284	180
29.....	414	.....	160	460	105	110	1,090	561	154	236	284	160
30.....	270	.....	160	460	130	100	830	463	154	236	320	150
31.....	300	.....	145	.....	190	.....	830	463	.....	266	.....	200

NOTE.—Daily discharge determined from four poorly defined rating curves and by the use of the indirect method for shifting channels from May 15 to July 12; discharge July 24 estimated.

• *Monthly discharge of Pecos River near Dayton, N. Mex., for 1911.*

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
January.....	570	244	312	19,200	A.
February.....	372	178	254	14,100	A.
March.....	270	145	180	11,100	A.
April.....	460	110	163	9,700	A.
May.....	2,470	105	406	25,000	C.
June.....	740	60	184	10,900	D.
July.....	a 11,000	55	1,470	90,400	C.
August.....	1,000	112	354	21,800	C.
September.....	561	154	201	12,000	C.
October.....	1,370	170	358	22,000	C.
November.....	680	250	328	19,500	C.
December.....	398	a 150	308	18,900	C.
The year.....	a 11,000	55	379	275,000	

a Maximum discharge occurred July 24, estimated 11,000 second-feet.

PECOS RIVER NEAR LAKEWOOD, N. MEX.

Location.—Three miles southeast of Lakewood, half a mile below the McMillan reservoir dam, in sec. 11, T. 20 S., R. 26 E.; no tributary between the station and the reservoir; Seven Rivers enters 3 miles below.

Records available.—January 11, 1906, to December 16, 1911.

Drainage area.—Not measured.

Gage.—Inclined staff gage. The original gage was at the lower side of the dam in the discharge gates, but was moved to a point near the lower end of the outlet canal February 8, 1906.

Discharge measurements.—Made from car and cable some distance below.

Winter flow.—Not affected by ice.

Diversions.—Lake McMillan is the upper reservoir in the Carlsbad project of the United States Reclamation Service. Although the flow from the lake passes the station, that over the flood spillways reaches the river below the station and is not recorded.

Cooperation.—Station maintained in cooperation with the United States Reclamation Service, by which the field data are furnished.

Daily gage height, in feet, of Pecos River near Lakewood, N. Mex., for 1911.

[H. C. Holcomb, observer.]

Day.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1....			1.5	1.4	0.80	1.0		6....		1.2	1.2	0.9	1.2		0.55
2....	2.5		.85	1.4	.8	1.15		17....		2.4	1.2	1.05	1.2		
3....	2.5		1.2	1.4	.8	1.3		18....		2.4	1.0	1.05	1.15		
4....	2.5		2.2	1.4	.8	1.3		19....		2.4	.7	1.0	.95		
5....	1.8		2.2	1.35	.8	1.3		20....		1.6	.55	.95	.9		
6....	.8		2.2	1.3	.8	1.3		21....		.8	.55	.9	.9		
7....	.5		2.15	1.3	.8	1.3		22....		.65	.55	.8	.9		
8....	.3		2.0	1.25	.8	1.3		23....		.5	.6	.8	.9		
9....			1.75	1.2	.8	1.3		24....		4.45	.7	.8	.9		
10....			1.6	1.15	.8	1.3		25....		9.3	.9	.8	.9		
11....			1.45	.95	1.9	1.3		26....		9.9	1.2	.8	1.15		
12....			1.3	.9	2.85	1.0		27....		9.4	1.5	.8	1.3		
13....			1.3	1.1	2.35	1.0	.55	28....		8.0	1.85	.8	1.3		
14....			1.3	1.1	1.6	1.0	.9	29....		5.5	2.2	.8	1.3		
15....		0.7	1.25	.9	1.2	.6	.9	30....		4.25	1.8	.8	1.15		
								31....		2.85	1.4		1.0		

PECOS RIVER NEAR MOORHEAD, TEX.

Location.—At the high bridge of the Southern Pacific Railroad near Moorhead, Tex.

Records available.—April, 1900, to December 31, 1911.

Gage.—Rod bolted to one of the bridge piers; read with field glasses from the top of the cliff.

Channel.—A series of pools and rapids in a canyon about 300 feet deep; straight above and below the station; both banks are of rock and above flood level; the bottom of the pool at the station is of mud.

Discharge measurements.—Made from cable.

Cooperation.—Station established and operated by the United States section of the International Boundary Commission.

Discharge measurements of Pecos River near Moorhead, Tex., in 1911.

[By E. E. Winter and W. H. Dodd.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>		<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 4.....	0.45	224	Feb. 11.....	0.4	207
Jan. 9.....	.45	237	Feb. 16.....	.4	189
Jan. 13.....	.45	239	Feb. 19.....	5.4	3,683
Jan. 17.....	.45	230	Feb. 20.....	1.8	814
Jan. 21.....	.45	225	Feb. 23.....	1.0	453
Jan. 25.....	.55	279	Feb. 26.....	.9	424
Jan. 29.....	.5	263	Mar. 3.....	.7	297
Feb. 2.....	.5	214	Mar. 7.....	.7	286
Feb. 7.....	.45	218	Mar. 11.....	.7	277

Discharge measurements of Pecos River near Moorhead, Tex., in 1911—Continued.

Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>		<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 16.....	0.7	273	Aug. 8.....	2.35	1,295
Mar. 21.....	.6	265	Aug. 12.....	1.3	593
Mar. 25.....	.7	273	Aug. 16.....	1.3	594
Mar. 29.....	.7	274	Aug. 21.....	.95	371
Apr. 4.....	10.6	13,132	Aug. 25.....	.7	321
Apr. 7.....	1.3	596	Sept. 2.....	.6	264
Apr. 11.....	.9	428	Sept. 7.....	.6	272
Apr. 15.....	.7	368	Sept. 12.....	.5	246
Apr. 20.....	.7	321	Sept. 16.....	.4	221
Apr. 24.....	.7	309	Sept. 21.....	.4	225
Apr. 28.....	.9	365	Sept. 25.....	.5	233
May 4.....	1.0	505	Sept. 28.....	.4	230
May 9.....	.9	376	Oct. 3.....	.4	225
May 13.....	2.35	1,281	Oct. 7.....	.4	225
May 16.....	.9	362	Oct. 11.....	.6	259
May 19.....	.7	314	Oct. 16.....	.5	253
May 23.....	2.25	1,185	Oct. 19.....	.5	247
May 27.....	1.3	611	Oct. 24.....	.5	250
May 31.....	.9	377	Oct. 29.....	.5	248
June 3.....	.7	321	Nov. 4.....	.7	254
June 8.....	.6	286	Nov. 9.....	.9	259
June 13.....	.55	279	Nov. 13.....	.7	246
June 16.....	.55	270	Nov. 17.....	.7	236
June 24.....	.4	240	Nov. 22.....	.65	237
June 28.....	.3	228	Nov. 29.....	.6	230
July 2.....	.3	193	Dec. 4.....	.6	224
July 8.....	.3	192	Dec. 8.....	.6	240
July 12.....	.3	190	Dec. 13.....	.9	357
July 17.....	.9	369	Dec. 17.....	.8	300
July 21.....	.85	350	Dec. 21.....	.8	304
July 25.....	.4	205	Dec. 26.....	.8	313
July 29.....	.3	189	Dec. 29.....	.85	335
Aug. 3.....	3.4	2,117			

Daily gage height, in feet, of Pecos River near Moorhead, Tex., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	0.4	0.4	0.7	0.7	2.4	0.9	0.3	2.35	0.6	0.4	0.5	0.6
2.....	.5	.45	.7	.75	2.25	.8	.3	2.9	.6	.4	.55	.6
3.....	.5	.45	.7	3.15	1.25	.7	.3	3.35	.55	.4	.55	.6
4.....	.45	.45	.7	9.3	1.05	.7	.3	3.55	.55	.4	.7	.6
5.....	.45	.45	.7	3.6	.95	.7	.3	3.75	.55	.4	.7	.6
6.....	.45	.45	.7	1.5	.9	.7	.3	3.95	.6	.4	.7	.6
7.....	.45	.45	.7	1.35	.9	.65	.3	3.7	.6	.4	.75	.6
8.....	.45	.45	.7	1.1	.9	.6	.3	2.35	.5	.55	.8	.6
9.....	.45	.4	.7	1.05	.9	.6	.3	1.9	.5	.8	.9	.6
10.....	.45	.4	.7	1.0	.9	.6	.3	1.65	.5	.7	.8	.6
11.....	.45	.4	.7	.9	.9	.6	.3	1.5	.5	.6	.8	.65
12.....	.45	.4	.7	.85	.85	.6	.3	1.35	.5	.55	.7	.85
13.....	.45	.45	.7	.7	1.9	.6	.3	1.2	.5	.5	.7	.9
14.....	.45	.5	.7	.7	1.75	.55	.3	1.2	.5	.5	.7	.8
15.....	.45	.4	.7	.7	.95	.55	.3	1.2	.5	.5	.7	.8
16.....	.45	.4	.7	.7	.9	.55	.9	1.3	.4	.5	.7	.8
17.....	.45	.4	.6	.7	.8	.55	.85	1.2	.4	.5	.7	.8
18.....	.45	2.95	.6	.7	.75	.5	.85	1.0	.4	.5	.7	.8
19.....	.45	5.25	.6	.7	.7	.5	.7	1.0	.4	.5	.7	.8
20.....	.4	1.65	.6	.7	.95	.45	.65	1.0	.4	.5	.7	.8
21.....	.4	1.35	.7	.7	.75	.4	.7	.95	.4	.5	.7	.8
22.....	.4	1.05	.7	.7	2.4	.4	.5	.9	.45	.5	.65	.8
23.....	.45	1.0	.7	.7	2.3	.4	.5	.8	.6	.5	.65	.8
24.....	.5	.85	.7	.7	1.7	.4	.5	.8	.5	.5	.6	.8
25.....	.55	.75	.7	.75	1.45	.4	.4	.7	.5	.5	.6	.8
26.....	.55	.7	.7	.85	1.3	.4	.4	.7	.4	.5	.6	.8
27.....	.5	.7	.7	.95	1.25	.35	.3	.7	.4	.5	.6	.8
28.....	.5	.8	.7	.9	1.15	.3	.3	.7	.4	.5	.6	.8
29.....	.5		.7	.9	1.1	.3	.3	.8	.4	.5	.6	.85
30.....	.5		.7	.9	.95	.3	.3	.75	.4	.5	.6	.8
31.....	.5		.7		.9		.8	.7		.5		.8

Daily discharge, in second-feet, of Pecos River near Moorhead, Tex., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	220	200	340	275	1,310	375	200	1,400	270	230	250	230
2.....	240	a 215	315	290	1,220	350	a 195	1,780	a 265	225	250	230
3.....	230	215	a 295	2,040	645	a 320	195	a 2,090	260	a 225	250	225
4.....	a 225	215	290	a 10,770	a 535	320	190	2,230	260	225	a 255	a 225
5.....	225	215	290	2,330	460	320	190	2,390	260	225	255	230
6.....	230	220	285	750	420	320	190	2,550	270	225	255	230
7.....	230	a 220	a 285	a 635	405	305	190	2,350	a 270	a 225	255	235
8.....	235	220	285	510	390	a 285	a 190	a 1,290	255	260	255	a 240
9.....	a 235	205	280	490	a 375	285	190	1,010	255	325	a 260	250
10.....	235	205	280	470	375	285	190	840	250	290	255	260
11.....	240	a 205	a 275	a 430	375	285	190	730	250	a 260	255	285
12.....	240	205	275	415	340	285	a 190	a 625	a 245	255	245	335
13.....	a 240	210	275	370	a 1,000	a 285	190	545	245	255	a 245	a 355
14.....	235	215	275	370	905	280	190	545	240	255	245	325
15.....	235	195	275	a 370	395	275	190	545	240	255	240	315
16.....	230	a 190	a 275	360	a 360	a 270	370	595	a 230	a 255	235	310
17.....	a 230	190	265	350	340	270	a 350	535	220	250	a 235	a 300
18.....	230	1,720	265	340	325	260	350	425	225	250	235	300
19.....	230	a 3,560	265	330	a 315	260	290	415	225	a 245	240	300
20.....	225	a 745	265	a 320	455	250	270	405	225	250	240	305
21.....	a 225	610	a 275	320	340	240	a 300	a 370	a 225	250	240	a 305
22.....	225	475	275	315	1,270	240	240	360	230	250	a 235	305
23.....	245	a 455	275	310	a 1,210	240	240	340	250	250	235	310
24.....	260	410	275	a 310	855	a 240	240	340	235	a 250	230	310
25.....	a 280	380	a 275	325	705	240	a 205	a 320	a 235	250	230	310
26.....	280	365	275	350	610	240	205	315	230	250	230	a 315
27.....	265	365	275	380	a 580	235	190	310	230	250	230	315
28.....	265	a 395	275	a 365	520	a 230	190	305	a 230	250	230	320
29.....	a 265	.....	a 275	365	490	a 220	190	320	230	a 230	a 230	a 335
30.....	255	.....	275	365	400	210	190	305	230	250	230	325
31.....	245	.....	275	.....	a 375	.....	330	290	.....	250	.....	325

a Date of measurement.

Monthly discharge of Pecos River near Moorhead, Tex., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January.....	280	220	240	14,777
February.....	3,560	190	465	25,825
March.....	340	265	280	17,217
April.....	10,770	275	854	50,817
May.....	1,310	315	590	36,307
June.....	375	210	274	16,304
July.....	370	190	226	13,924
August.....	2,550	290	867	53,296
September.....	270	220	243	14,430
October.....	225	225	250	15,342
November.....	260	230	242	14,430
December.....	355	225	289	17,772
The year.....	10,770	190	401	290,441

GALLINAS RIVER NEAR LAS VEGAS, N. MEX.

Location.—At Las Vegas Hot Springs, 6 miles northwest of Las Vegas near sec. 1, T. 16 N., R. 15 E. No tributaries between the station and Las Vegas nor for several miles above.

Records available.—August 13, 1903, to December 31, 1911.

Drainage area.—89 square miles (measured on topographic sheets).

Gage.—Vertical staff 600 feet above the power house footbridge, installed to replace the original gage, which was washed out September 29, 1904; datum of new gage, 0.71 foot lower than that of the original gage.

Channel.—Somewhat shifting during high water.

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

Winter flow.—Gage heights unaffected by ice, as channel is kept open by the hot springs.

Diversions.—A short distance above the station is a timber dam which forms a pond from which ice is cut, but this dam does not control the flow in any way. A small amount of water is diverted at this point by the Aqua Pura Co., which furnishes Las Vegas and the Atchison, Topeka & Santa Fe Railway with water. A mile below the station is a dam which diverts the flood flow of the Gallinas to the San Guyilla basin. The fall of the river is so heavy that the gaging station is above the influence of this dam.

Accuracy.—Although the river is somewhat shifting at this station, it is believed that the estimates of discharge may be considered fair.

Cooperation.—Maintained in cooperation with the Territorial engineer.

Discharge measurements of Gallinas River near Las Vegas, N. Mex., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		<i>Feet.</i>	<i>Sec.-ft.</i>
May 10	H. B. Waha.....	2.29	42.0
June 14	G. H. Russell.....	1.82	3.7
July 27	do.....	2.38	55.7
28	do.....	2.58	11.0

Daily gage height, in feet, of Gallinas River near Las Vegas, N. Mex., for 1911.

[William Prager, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	1.6	1.6	1.7	2.05	2.2	2.2	2.0	2.35	1.9	1.7	2.1	1.9
2.....	1.6	1.6	1.7	2.05	2.1	2.1	1.95	2.3	1.9	1.7	2.1	1.9
3.....	1.65	1.6	1.7	2.0	2.1	2.05	2.3	2.2	1.8	1.7	2.1	1.9
4.....	1.7	1.6	1.7	2.0	2.1	2.0	2.25	2.15	1.9	1.8	2.1	1.9
5.....	1.7	1.6	1.9	2.1	2.1	2.0	2.26	2.1	1.8	2.95	2.1	1.9
6.....	1.65	1.65	1.8	2.1	2.1	2.0	2.72	2.1	1.8	2.95	2.1	1.9
7.....	1.6	1.7	1.8	2.0	2.2	2.0	2.2	2.05	1.8	2.6	2.1	1.9
8.....	1.6	1.7	1.95	2.05	2.3	1.95	2.25	2.0	1.8	2.3	2.1	1.9
9.....	1.6	1.65	2.25	2.1	2.3	1.9	2.52	2.0	1.8	2.05	2.1	1.9
10.....	1.6	1.6	2.2	2.0	2.3	1.9	3.13	1.9	1.8	2.3	2.1	1.9
11.....	1.6	1.65	1.9	2.0	2.3	1.9	2.35	1.9	1.8	2.2	2.1	1.9
12.....	1.6	1.7	2.0	2.0	2.25	1.9	2.2	1.9	1.8	2.0	2.0	1.9
13.....	1.6	1.6	2.05	2.0	2.2	1.9	2.2	1.8	1.8	1.9	2.0	1.9
14.....	1.6	1.7	1.9	2.0	2.2	1.9	2.4	1.8	1.7	1.8	2.0	1.9
15.....	1.6	1.7	1.95	2.0	2.43	1.9	2.4	1.8	1.7	1.7	2.0	1.8
16.....	1.6	1.7	2.05	2.0	2.4	1.85	2.4	1.8	1.7	1.85	2.0	1.8
17.....	1.6	1.7	2.05	2.0	2.3	1.8	2.4	1.9	1.7	1.9	2.0	1.8
18.....	1.6	1.7	1.9	2.0	2.2	1.8	2.4	1.95	1.7	1.9	2.0	1.8
19.....	1.6	1.7	1.9	2.0	2.2	1.8	2.35	1.9	1.7	1.9	2.0	1.8
20.....	1.6	1.7	1.95	2.0	2.2	1.8	2.95	1.9	1.6	1.9	2.0	1.8
21.....	1.6	1.7	1.9	2.0	2.2	1.8	2.75	1.9	1.6	1.9	2.0	1.7
22.....	1.6	1.7	1.9	2.05	2.15	1.8	2.45	2.0	1.6	1.85	2.0	1.7
23.....	1.6	1.7	1.9	2.1	2.1	1.8	3.1	2.0	1.6	1.8	2.0	1.7
24.....	1.6	1.7	1.9	2.15	2.1	1.8	2.5	2.0	1.6	1.8	2.0	1.7
25.....	1.6	1.7	1.9	2.1	2.05	1.8	2.45	1.95	1.6	1.8	2.0	1.7
26.....	1.6	1.7	1.9	2.1	2.0	1.8	2.35	1.9	1.6	1.8	2.0	1.7
27.....	1.6	1.7	1.9	2.1	2.0	2.03	2.4	1.9	1.7	1.9	2.0	1.7
28.....	1.6	1.7	2.0	2.1	2.05	1.85	2.78	2.44	1.7	2.05	2.0	1.7
29.....	1.6	.....	2.05	2.2	2.63	1.85	2.6	2.05	1.7	2.1	1.9	1.7
30.....	1.6	.....	2.0	2.2	2.15	1.8	2.5	2.0	1.7	2.2	1.8	1.7
31.....	1.6	.....	2.0	.....	2.15	.....	2.45	1.9	.....	2.2	.....	1.7

Daily discharge, in second-feet, of Gallinas River near Las Vegas, N. Mex., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	0.3	0.3	1.8	20	31	30	12	52	7	1	19	7
2.....	.3	.3	1.8	20	21	19	9.5	43	7	1	19	7
3.....	1.0	.3	1.8	15	21	16	43	30	3	1	19	7
4.....	1.8	.3	1.8	15	21	12	36	24	7	3	19	7
5.....	1.8	.3	10.5	25	21	12	38	19	3	260	19	7
6.....	1.0	1.0	5.0	25	21	12	158	19	3	260	19	7
7.....	.3	1.8	5.0	15	31	12	30	16	3	116	19	7
8.....	.3	1.8	15	18	44	9.5	36	12	3	43	19	7
9.....	.3	1.0	44	23	44	7	92	12	3	16	19	7
10.....	.3	.3	37	14	43	7	358	7	3	43	19	7
11.....	.3	1.0	9	14	43	7	52	7	3	30	19	7
12.....	.3	1.8	17	14	36	7	30	7	3	12	12	7
13.....	.3	.3	22	14	30	7	30	3	3	7	12	7
14.....	.3	1.8	9	14	30	7	61	3	1	3	12	7
15.....	.3	1.8	13	14	68	7	61	3	1	1	12	3
16.....	.3	1.8	22	14	61	5	61	3	1	5	12	3
17.....	.3	1.8	22	14	43	3	61	7	1	7	12	3
18.....	.3	1.8	9	14	30	3	61	9.5	1	7	12	3
19.....	.3	1.8	9	14	30	3	52	7	1	7	12	3
20.....	.3	1.8	13	14	30	3	260	7	.5	7	12	3
21.....	.3	1.8	9	14	30	3	170	7	.5	7	12	1
22.....	.3	1.8	9	18	24	3	74	12	.5	5	12	1
23.....	.3	1.8	9	23	19	3	340	12	.5	5	12	1
24.....	.3	1.8	8	26	19	3	86	12	.5	3	12	1
25.....	.3	1.8	8	21	16	3	74	9.5	.5	3	12	1
26.....	.3	1.8	8	21	12	3	52	7	.5	3	12	1
27.....	.3	1.8	8	21	12	14	61	7	1	7	12	1
28.....	.3	1.8	15	21	16	5	182	71	1	16	12	1
29.....	.3	.....	20	31	126	5	116	16	1	19	7	1
30.....	.3	.....	15	31	24	3	86	12	1	30	3	1
31.....	.3	.....	15	.....	24	.....	74	7	.....	30	.....	1

NOTE.—Discharge determined from two fairly well defined rating curves applicable Jan. 1 to Mar. 8 and May 10 to Dec. 31. Discharge Mar. 9 to May 9 determined by the indirect method for shifting channels.

Monthly discharge of Gallinas River near Las Vegas, N. Mex., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
January.....	1.8	0.3	0.44	27	D.
February.....	1.8	.3	1.34	74.4	D.
March.....	44	1.8	12.7	781	D.
April.....	31	14	18.6	1,110	D.
May.....	126	12	32.9	2,020	B.
June.....	30	3	7.78	463	C.
July.....	358	9.5	92.1	5,660	B.
August.....	71	3	14.9	916	C.
September.....	7	.5	2.15	128	D.
October.....	260	1	30.8	1,890	C.
November.....	19	3	14.1	839	C.
December.....	7	1	4.1	252	D.
The year.....	358	.3	19.6	14,200	

SOUTH FORK OF GALLINAS RIVER NEAR EL PORVENIR, N. MEX.

Location.—At the Gallinas planting station of the United States Forest Service, in the Pecos National Forest, in sec. 14, T. 17 N., R. 14 E., 3 miles southeast of El Porvenir post office; 10 miles above the junction of the North and South forks.

Nearest tributary is a small stream entering from the north a short distance above.

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

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Data too meager to determine.

Discharge measurements.—Made by wading.

Winter flow.—Ice present at this station during the winter months.

Diversions.—No diversions above except an intermittent one of less than 0.5 second-foot. Just below the station the Forest Service has a ditch of 3 second-feet capacity.

Accuracy.—Owing to a lack of discharge measurements no estimates of flow are available at the present time.

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

The following discharge measurement was made by H. B. Waha:

May 9, 1911: Gage height, 1.98 feet; discharge, 20 second-feet.

Daily gage height, in feet, of South Fork of Gallinas River near El Porvenir, N. Mex., for 1911.

[H. D. Burrall, observer.]

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....		1.63	1.50	1.87	1.30	1.28	.....	1.66
2.....		1.56	1.90	1.88	1.28	1.24	1.78	1.63
3.....		1.54	2.05	1.77	1.30	1.23	1.67	1.66
4.....		1.47	1.85	1.68	1.35	1.67	1.66	1.62
5.....		1.46	1.80	1.61	1.28	4.24	1.70	1.59
6.....		1.41	1.78	1.58	1.24	4.22	1.70	1.59
7.....		1.40	1.75	1.53	1.23	3.16	1.67	1.53
8.....		1.38	1.67	1.53	1.23	2.37	1.68	.....
9.....	1.98	1.38	1.84	1.47	1.24	1.98	1.70	1.53
10.....	2.00	1.34	1.96	1.44	1.26	1.90	1.68	1.54
11.....	1.87	1.31	2.24	1.41	1.25	1.86	1.70	1.48
12.....	1.84	1.31	2.04	1.40	1.24	1.78	1.72	1.48
13.....	1.86	1.30	1.98	1.39	1.24	1.73	1.77	1.56
14.....	2.04	1.30	2.00	1.38	1.21	1.70	1.67	1.64
15.....	2.08	1.30	.....	.....	1.20	1.74	1.68	1.63
16.....	2.00	1.30	.....	.....	1.20	1.67	1.68	1.70
17.....	1.94	1.30	2.39	1.49	1.20	1.57	1.68	1.70
18.....	1.87	1.25	2.33	1.44	1.18	1.54	1.78	.....
19.....	1.79	1.25	2.15	1.46	1.20	1.52	1.62	.....
20.....	1.85	1.28	2.10	1.38	1.24	1.50	1.60	1.69
21.....	1.76	1.28	2.55	1.38	1.21	1.50	1.62	1.62
22.....	1.68	1.30	2.15	1.40	1.21	1.54	1.62	1.49
23.....	1.64	1.23	2.01	1.56	1.19	1.51	1.60	1.44
24.....	1.54	1.20	2.20	1.42	1.18	1.48	1.45	1.43
25.....	1.58	1.16	2.19	1.38	1.16	1.49	1.80	1.40
26.....	1.56	1.15	2.24	1.35	1.20	1.47	1.64	1.40
27.....	1.53	1.17	2.23	1.35	1.20	1.59	1.61	1.39
28.....	1.52	1.19	2.20	1.40	1.20	1.65	1.30	1.38
29.....	1.52	1.15	2.12	1.40	1.26	.....	1.58	1.36
30.....	1.50	1.20	1.98	1.38	1.39	.....	1.66	1.36
31.....	1.58	.....	1.96	1.35	.....	.....	.....	1.40

NOTE.—Gage heights affected by presence of ice Nov. 18, Nov. 24 to Dec. 31.

RIO RUIDOSO NEAR GLENCOE, N. MEX.

Location.—At the forest ranger station in the Lincoln National Forest, in sec. 33, T. 10 S., R. 15 E., about 2 miles above Glencoe post office; $1\frac{1}{2}$ miles above the mouth of Perry Canyon and $2\frac{1}{2}$ miles above the mouth of Eagle Creek.

Records available.—August 17, 1910, to November 6, 1911.

Drainage area.—Not measured.

Gage.—Inclined staff.

Channel.—Apparently permanent.

Discharge measurements.—Made by wading.

Winter flow.—Ice exists at this station during the winter months.

Diversions.—Numerous small ditches divert water for irrigation for a distance of 16 miles above the station.

Accuracy.—Owing to lack of discharge measurements, no estimates of discharge can be made.

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

The following measurement was made by H. B. Waha:

June 1, 1911: Gage height, 1.75 feet; discharge, 22.2 second-feet.

Daily gage height, in feet, of Rio Ruidoso near Glencoe, N. Mex., for 1911.

[R. L. Bateman, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1.			1.50	2.15	2.18	1.90	2.50	1.82		1.65	
2.			1.54	2.05	2.08	1.82	2.37	1.72	1.60	1.65	1.60
3.	2.20	1.45	1.56	2.02		1.68	2.15	1.70		1.65	
4.	2.10		1.55	2.00		1.62	2.00	1.65	1.60	1.65	1.60
5.		1.40	1.60	1.90		1.60	2.05	1.60	1.60	1.80	1.60
6.		1.35	1.68	1.78		1.68	2.05	1.52	1.60	2.50	1.60
7.		1.25	1.68	1.70		1.62	2.08	1.50		2.40	
8.	1.50	1.25				1.62		1.47		2.40	
9.	1.50	1.24				1.65		1.45		2.15	
10.		1.22	1.76	1.90		1.72		1.45		1.95	
11.		1.21	1.80	1.90			2.20	1.40		1.90	
12.		1.21	1.86	1.80		1.68	2.30	1.35		1.85	
13.			1.82	1.80		1.60	2.30			1.85	
14.		1.22		1.90		1.52	2.35	1.35		1.85	
15.		1.22		1.80		1.50	2.45	1.34			
16.			1.70	1.80	2.25	1.48	2.25	1.30		1.75	
17.		2.30	1.70	1.80	1.95	1.72	2.45	1.30		1.75	
18.			1.73		1.95		2.57		1.65		
19.	1.50		1.76		1.95	1.62	2.50	1.10	1.65	1.65	
20.	1.50		1.79	1.80	1.82	1.55	2.45	1.05		1.65	
21.	1.50		1.79	1.80	1.82	1.50		1.08		1.60	
22.	1.50			1.80	1.72	1.55		1.05		1.60	
23.	1.50	1.32	1.80	1.80	1.78	1.62		1.05	1.65	1.60	
24.	1.50	1.41	1.80		1.68	1.90	2.50	1.10	1.60	1.60	
25.	1.50	1.46	1.85		1.62	1.70		1.15	1.60	1.60	
26.	1.50	1.41	1.88	2.10	1.62	1.58		1.50	1.60	1.60	
27.	1.50	1.42		2.10	1.60	1.80	2.40	1.60	1.62	1.60	
28.	1.50	1.51		2.10	1.55	1.70	2.15	1.65	1.58	1.60	
29.	1.45			2.15	2.60	1.65	2.00	1.60		1.75	
30.	1.45			2.30	1.75		1.90	1.60	1.65		
31.	1.45		2.15		1.88		1.88				

NOTE.—Gage heights affected by presence of ice Jan. 3 to Feb. 6.

RIO RUIDOSO NEAR RUIDOSO, N. MEX.

Location.—At Wingfield's ranch, in sec. 21, T. 11 S., R. 13 E., in the Lincoln National Forest, about 3 miles northwest of Ruidoso, 1 mile above the mouth of Carrizo Creek. A small stream enters from the north just above the station.

Records available.—May 30, 1911, to July 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Apparently permanent.

Discharge measurements.—Made by wading.

Accuracy.—Owing to the meagerness of the data no estimates of flow can be made.

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

The following discharge measurement was made by H. B. Waha:
May 30, 1911: Gage height, 1.24 feet; discharge, 10.4 second-feet.

Daily gage height, in feet, of Rio Ruidoso near Ruidoso, N. Mex., for 1911.

[I. N. Wingfield, observer.]

Day.	May.	June.	July.	Day.	May.	June.	July.	Day.	May.	June.	July.
1.....		1.22	1.00	11.....	.....	1.04	1.33	21.....	.....	1.23	1.58
2.....		1.22	1.64	12.....	.....	1.12	1.44	22.....	.....	1.16	1.53
3.....		1.18	1.54	13.....	.....	1.13	1.62	23.....	.....	1.11	1.49
4.....		1.14	1.50	14.....	.....	1.12	1.80	24.....	.....	1.10	1.48
5.....		1.13	1.45	15.....	.....	1.12	1.49	25.....	.....	1.08	1.42
6.....		1.13	1.54	16.....	.....	1.08	1.43	26.....	.....	1.07	1.38
7.....		1.12	1.68	17.....	.....	1.05	1.62	27.....	.....	1.04	1.30
8.....		1.12	1.55	18.....	.....	1.02	1.72	28.....	.....	1.03	1.24
9.....		1.12	1.51	19.....	.....	1.00	1.72	29.....	.....	1.04	1.23
10.....		1.07	1.38	20.....	.....	1.32	1.66	30.....	.....	1.23	1.21
								31.....	.....	1.24	1.20

PENASCO RIVER AT ELK, N. MEX.

Location.—At Elk post office, in sec. 5, T. 16 S., R. 16 E. Nearest tributary, Burned Canyon, which enters a short distance above. Elk Canyon enters $1\frac{1}{2}$ miles below.

Records available.—Fragmentary records from August 15, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Chain gage established November 25, 1910, replacing a staff gage established August 15, 1910, and destroyed by flood September 1. Chain gage datum differs from that of the staff gage.

Channel.—Data too meager to determine.

Discharge measurements.—Made by wading.

Winter flow.—No data.

Diversions.—Many small irrigation ditches divert water for 30 miles above the station.

Accuracy.—Owing to the lack of discharge measurements no estimates of flow can be made.

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

Discharge measurements of Penasco River at Elk, N. Mex., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
Jan. 16	Digby and Benson.....	<i>Feet.</i> 1.98	<i>Sec.-ft.</i> 19.4
May 27	H. B. Waha.....	1.73	5.5

Daily gage height, in feet, of Penasco River at Elk, N. Mex., for 1911.

[A. N. Bailey, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.								1.9	1.5
2.						1.8	1.9		
3.			1.9		1.8		1.95		1.55
4.				1.9	1.8	1.75			1.6
5.				1.9	1.8	1.82			1.5
6.						1.78		1.8	1.5
7.				1.9	1.8				1.45
8.			1.9	1.9	1.8	1.7			
9.					1.8	1.65	2.0		2.45
10.					1.8		2.05	1.75	
11.			1.8			1.7	2.0	1.7	2.0
12.				1.8		1.8		1.7	1.75
13.							1.95	1.7	1.75
14.						1.9	2.0		
15.	1.9		1.8		1.9	1.9		1.65	1.7
16.	1.85			1.8		1.85	1.95		
17.							1.95	1.5	1.7
18.				1.8	1.9	1.88	1.95		1.75
19.			1.8	1.8	1.8				1.65
20.			1.8					1.45	
21.									1.8
22.			1.8						
23.				1.9			1.9	1.45	
24.				1.9					
25.						1.7			1.9
26.			1.8			1.7	1.9	1.5	1.9
27.					1.73	1.65		1.5	
28.					1.7	1.6	1.95		
29.							2.0		1.85
30.				1.9	1.78	1.7	2.15		1.8
31.			1.8					1.45	

PENASCO RIVER AT CLEVE'S RANCH, NEAR ELK, N. MEX.

Location.—At Cleve's ranch, about sec. 12, T. 16 S., R. 17 E., and 4 miles below Elk post office; below the springs which give rise to the Lower Penasco.

Records available.—January 17, 1911, to March 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Data too few to determine.

Discharge measurements.—Made from foot bridge.

Diversions.—No water is diverted from the Lower Penasco above this station.

Accuracy.—Owing to the lack of discharge measurements, no estimates of discharge can be made.

Cooperation.—Gage heights furnished by Mr. Walter Coleman.

The following discharge measurement was made by Digby and Benson:

January 17, 1911: Gage height, 2.35 feet; discharge, 59 second-feet.

Daily gage height, in feet, of Penasco River near Elk, N. Mex., for 1911.

Day.	Jan.	Feb.	Mar.	Day.	Jan.	Feb.	Mar.	Day.	Jan.	Feb.	Mar.
1.		2.4	2.4	11.		2.3	2.4	21.	2.4	2.2	2.2
2.		2.4	2.3	12.		2.3	2.4	22.	2.4	2.2	2.3
3.		2.3	2.3	13.		2.3	2.3	23.	2.4	2.3	2.3
4.		2.3	2.3	14.		2.3	2.3	24.	2.5	2.4	2.3
5.		2.3	2.4	15.		2.2	2.3	25.	2.35	2.5	2.3
6.		2.3	2.4	16.		2.2	2.25	26.	2.2	2.3	2.4
7.		2.3	2.4	17.	2.4	2.3	2.2	27.		2.4	2.4
8.		2.2	2.2	18.	2.4	2.4	2.2	28.		2.4	2.4
9.		2.2	2.2	19.	2.4	2.5	2.2	29.		2.3	2.4
10.		2.2	2.2	20.	2.4	2.2	2.2	30.		2.4	2.4
								31.	2.4		2.3

DEVILS RIVER BASIN.

DEVILS RIVER AT DEVILS RIVER, TEX.

Location.—Opposite the Southern Pacific Railroad station at Devils River, Tex.

Records available.—April, 1900, to December 31, 1911.

Gage.—A vertical rod spiked to a tree.

Channel.—The channel is rocky and permanent but rough, with fissures and faults, resulting in shifting currents. Right bank is the talus of a cliff and the left bank is a bottom heavily wooded.

Discharge measurements.—Made from cable.

Cooperation.—Station established and operated by the United States section of the International Boundary Commission.

Discharge measurements of Devils River at Devils River, Tex., in 1911.

[By E. E. Winter and W. H. Dodd.]

Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>		<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 5.....	2.15	376	July 9.....	2.2	366
Jan. 10.....	2.15	387	July 13.....	2.15	374
Jan. 18.....	2.2	391	July 18.....	2.15	362
Jan. 22.....	2.15	382	July 22.....	2.2	383
Jan. 30.....	2.15	379	July 30.....	2.15	361
Feb. 3.....	2.15	381	Aug. 4.....	2.15	363
Feb. 8.....	2.1	336	Aug. 9.....	2.1	319
Feb. 13.....	2.15	384	Aug. 17.....	2.1	318
Feb. 18.....	2.6	729	Aug. 22.....	2.1	323
Feb. 27.....	2.3	508	Aug. 30.....	2.1	305
Mar. 8.....	2.3	473	Sept. 4.....	2.1	311
Mar. 13.....	2.3	482	Sept. 14.....	2.1	297
Mar. 22.....	2.3	482	Sept. 22.....	2.1	307
Mar. 26.....	2.3	492	Sept. 26.....	2.1	305
Mar. 30.....	2.3	500	Sept. 30.....	2.1	308
Apr. 5.....	2.6	702	Oct. 8.....	2.15	325
Apr. 12.....	2.4	577	Oct. 12.....	2.15	333
Apr. 17.....	2.5	643	Oct. 20.....	2.15	331
Apr. 27.....	2.4	581	Oct. 25.....	2.15	329
Apr. 30.....	2.35	540	Oct. 31.....	2.2	368
May 5.....	2.3	453	Nov. 5.....	2.2	351
May 14.....	2.3	461	Nov. 14.....	2.2	358
May 20.....	2.25	449	Nov. 19.....	2.2	367
May 24.....	2.2	391	Nov. 27.....	2.2	370
May 30.....	2.2	395	Nov. 30.....	2.2	361
June 5.....	2.2	393	Dec. 10.....	2.2	424
June 9.....	2.2	396	Dec. 14.....	2.2	422
June 17.....	2.15	386	Dec. 22.....	2.25	462
June 25.....	2.15	374	Dec. 27.....	2.2	420
June 30.....	2.15	383	Dec. 30.....	2.25	437

Daily gage height, in feet, of Devils River at Devils River, Tex., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	2.15	2.15	2.25	2.25	2.3	2.2	2.15	2.2	2.15	2.1	2.2	2.2
2.....	2.15	2.15	2.25	2.45	2.35	2.2	2.2	2.2	2.15	2.1	2.25	2.2
3.....	2.15	2.15	2.25	2.9	2.35	2.2	2.2	2.15	2.1	2.1	2.25	2.2
4.....	2.15	2.15	2.25	2.85	2.3	2.2	2.2	2.15	2.1	2.1	2.2	2.2
5.....	2.15	2.15	2.3	2.65	2.3	2.2	2.2	2.15	2.1	2.1	2.2	2.2
6.....	2.15	2.1	2.3	2.6	2.3	2.2	2.2	2.15	2.1	2.1	2.2	2.2
7.....	2.15	2.1	2.3	2.5	2.3	2.2	2.2	2.15	2.1	2.1	2.4	2.2
8.....	2.15	2.1	2.3	2.45	2.3	2.2	2.2	2.1	2.1	2.15	2.35	2.2
9.....	2.15	2.1	2.3	2.4	2.3	2.2	2.2	2.1	2.1	2.15	2.2	2.25
10.....	2.15	2.15	2.3	2.4	2.3	2.2	2.2	2.1	2.1	2.15	2.2	2.2
11.....	2.15	2.15	2.3	2.4	2.35	2.2	2.15	2.15	2.1	2.15	2.2	2.2
12.....	2.15	2.15	2.3	2.4	2.35	2.2	2.15	2.15	2.1	2.15	2.2	2.2
13.....	2.15	2.15	2.3	2.4	2.35	2.2	2.15	2.1	2.1	2.15	2.2	2.2
14.....	2.15	2.15	2.3	2.35	2.3	2.2	2.15	2.15	2.1	2.15	2.2	2.2
15.....	2.15	2.2	2.3	2.35	2.3	2.15	2.2	2.15	2.1	2.2	2.2	2.2
16.....	2.15	2.2	2.3	2.8	2.25	2.15	2.2	2.15	2.1	2.15	2.2	2.2
17.....	2.15	2.4	2.3	2.55	2.25	2.15	2.2	2.1	2.1	2.15	2.2	2.2
18.....	2.2	2.6	2.3	2.35	2.25	2.15	2.15	2.1	2.1	2.15	2.2	2.2
19.....	2.2	2.5	2.65	2.3	2.25	2.15	2.15	2.1	2.1	2.15	2.2	2.3
0.....	2.15	2.35	2.35	2.3	2.25	2.15	2.15	2.1	2.1	2.15	2.2	2.25

Daily gage height, in feet, of Devils River at Devils River, Tex., for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
21.....	2.15	2.3	2.3	2.4	2.25	2.15	2.2	2.1	2.1	2.15	2.2	2.25
22.....	2.15	2.3	2.3	2.4	2.25	2.15	2.2	2.1	2.1	2.15	2.2	2.25
23.....	2.15	2.3	2.3	2.4	2.25	2.15	2.2	2.1	2.1	2.15	2.2	2.25
24.....	2.15	2.3	2.3	2.35	2.2	2.15	2.3	2.1	2.1	2.15	2.2	2.25
25.....	2.15	2.3	2.3	2.4	2.2	2.15	2.3	2.1	2.1	2.15	2.2	2.25
26.....	2.15	2.3	2.3	2.4	2.2	2.15	2.2	2.1	2.1	2.15	2.2	2.2
27.....	2.15	2.3	2.3	2.4	2.2	2.15	2.2	2.1	2.1	2.15	2.2	2.2
28.....	2.15	2.3	2.3	2.4	2.2	2.15	2.2	2.1	2.1	2.2	2.2	2.2
29.....	2.15	.....	2.3	2.35	2.2	2.15	2.15	2.1	2.1	2.2	2.2	2.25
30.....	2.15	.....	2.3	2.35	2.2	2.15	2.15	2.1	2.1	2.2	2.2	2.25
31.....	2.15	.....	2.3	.....	2.2	.....	2.15	2.1	.....	2.2	.....	2.25

Daily discharge, in second-feet, of Devils River at Devils River, Tex., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	375	380	470	470	500	395	380	380	325	310	365	365
2.....	375	380	460	3,370	520	395	400	380	325	310	390	375
3.....	375	380	455	1,130	505	395	395	370	310	310	390	380
4.....	375	380	455	1,060	465	395	390	365	310	310	355	385
5.....	375	375	495	770	455	395	385	360	310	310	350	390
6.....	380	340	490	700	455	395	380	355	310	310	350	395
7.....	380	340	480	640	455	395	375	350	310	310	475	405
8.....	380	335	475	610	455	395	370	325	305	325	445	410
9.....	385	335	475	580	455	395	365	320	305	325	355	440
10.....	385	370	475	580	460	395	370	320	305	330	355	425
11.....	385	375	480	575	490	395	350	340	305	330	355	425
12.....	385	380	480	575	490	395	360	340	300	335	360	420
13.....	385	385	480	575	490	395	375	320	300	335	360	420
14.....	380	385	480	545	460	395	370	340	295	335	360	420
15.....	380	420	480	545	465	385	390	340	300	355	360	425
16.....	380	420	480	980	440	385	380	340	300	335	360	425
17.....	380	575	480	700	440	385	380	320	300	335	365	430
18.....	390	730	480	550	445	385	360	320	300	330	365	430
19.....	390	660	725	520	445	385	360	320	300	330	365	480
20.....	380	555	515	520	450	380	360	320	305	330	365	460
21.....	380	520	480	580	440	380	380	320	305	330	365	460
22.....	380	520	480	580	435	380	380	325	305	330	365	460
23.....	380	515	485	580	425	375	380	320	305	330	365	460
24.....	380	515	485	550	390	375	420	320	305	330	370	455
25.....	380	515	490	580	390	375	420	315	305	330	370	455
26.....	380	510	490	580	390	375	380	315	305	330	370	425
27.....	380	510	495	580	395	375	380	315	305	335	370	420
28.....	380	510	495	570	395	380	380	310	305	360	365	420
29.....	380	.....	500	540	395	380	360	310	310	360	365	435
30.....	380	.....	500	540	395	385	360	305	310	365	360	435
31.....	380	.....	500	.....	395	.....	360	305	.....	370	.....	435

a Date of measurement.

Monthly discharge of Devils River at Devils River, Tex., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January.....	390	375	381	23,405
February.....	730	335	451	25,022
March.....	725	455	491	30,169
April.....	3,370	470	722	42,992
May.....	520	390	445	27,342
June.....	395	375	387	23,038
July.....	420	350	377	23,197
August.....	380	305	332	20,400
September.....	325	295	306	18,208
October.....	370	310	331	20,370
November.....	475	350	370	22,036
December.....	480	365	425	26,112
The year.....	3,370	295	417	302,291

RIO SALADO BASIN.

RIO SALADO NEAR GUERRERO, TAMAULIPAS, MEXICO.

Location.—2 miles above Guerrero and 6 miles above the confluence of the Rio Salado and the Rio Grande.

Records available.—December 27, 1900, to December 31, 1911, except March and April, 1903.

Gage.—An inclined rod fastened to posts sunk in the bank.

Channel.—A series of pools and rapids between permanent banks of sandy clay. The station is at a pool with a mud bed. Channel curves to the left both above and below the station.

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

Cooperation.—Station established and operated by the Mexican section of the International Boundary Commission.

Discharge measurements of Rio Salado near Guerrero, Tamaulipas, Mexico, in 1911.

[By M. G. Garcia.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>		<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 3.....	2.7	494	July 15.....	0.2	a 43
Jan. 7.....	2.7	491	July 19.....	.1	a 29
Jan. 11.....	2.7	487	July 23.....	.0	a 21
Jan. 15.....	2.6	454	July 26.....	2.7	473
Jan. 19.....	2.6	454	July 28.....	4.3	1,131
Jan. 23.....	2.4	a 276	Aug. 3.....	1.7	a 179
Jan. 28.....	2.3	a 251	Aug. 7.....	1.0	a 110
Feb. 3.....	2.2	a 235	Aug. 11.....	.8	a 83
Feb. 7.....	2.0	a 221	Aug. 15.....	.6	a 72
Feb. 11.....	2.0	a 222	Aug. 19.....	.4	a 56
Feb. 15.....	1.9	a 201	Aug. 23.....	.3	a 46
Feb. 19.....	1.9	a 203	Aug. 28.....	.2	a 40
Feb. 23.....	1.8	a 184	Aug. 31.....	2.7	468
Feb. 28.....	2.4	a 279	Sept. 1.....	6.3	3,928
Mar. 3.....	2.3	a 257	Sept. 5.....	2.0	a 215
Mar. 7.....	2.1	a 219	Sept. 9.....	1.8	a 190
Mar. 11.....	2.0	a 206	Sept. 13.....	1.6	a 156
Mar. 15.....	2.1	a 222	Sept. 17.....	1.2	a 102
Mar. 19.....	2.1	a 232	Sept. 21.....	.8	a 86
Mar. 23.....	1.8	a 186	Sept. 25.....	.5	a 62
Mar. 28.....	3.9	986	Sept. 29.....	.2	a 45
Apr. 3.....	2.5	a 285	Oct. 3.....	.0	a 37
Apr. 7.....	2.5	a 279	Oct. 7.....	.0	a 34
Apr. 11.....	2.4	a 255	Oct. 8.....	9.7	9,250
Apr. 15.....	2.3	a 239	Oct. 11.....	1.9	a 195
Apr. 19.....	2.2	a 223	Oct. 15.....	4.2	1,071
Apr. 23.....	2.2	a 226	Oct. 19.....	3.2	742
Apr. 28.....	2.7	474	Oct. 23.....	2.2	a 244
May 3.....	2.5	a 276	Oct. 28.....	1.5	a 125
May 7.....	2.5	a 275	Nov. 3.....	4.0	1,057
May 11.....	2.3	a 244	Nov. 7.....	3.1	694
May 15.....	2.3	a 247	Nov. 11.....	2.5	a 277
May 19.....	2.0	a 199	Nov. 15.....	2.2	a 241
May 23.....	2.1	a 228	Nov. 19.....	1.7	a 173
May 28.....	2.3	a 254	Nov. 23.....	1.3	a 128
June 3.....	1.8	a 182	Nov. 28.....	1.0	a 106
June 7.....	1.8	a 184	Dec. 3.....	.7	a 80
June 11.....	1.2	a 121	Dec. 7.....	.5	a 67
June 15.....	.9	a 89	Dec. 11.....	.4	a 56
June 19.....	.8	a 84	Dec. 15.....	.3	a 50
June 23.....	.7	a 75	Dec. 19.....	.2	a 45
June 28.....	.6	a 66	Dec. 23.....	.2	a 47
July 3.....	.6	a 67	Dec. 28.....	.2	a 45
July 7.....	.5	a 59			
July 11.....	.5	a 51			

a Taken at rocks.

Daily gage height, in feet, of Rio Salado near Guerrero, Tamaulipas, Mexico, for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	2.7	2.2	2.3	2.7	2.7	2.0	0.4	2.05	5.95	0.1	1.2	0.8
2.....	2.7	2.2	2.3	2.6	2.6	1.9	.4	1.85	4.25	.1	1.1	.8
3.....	2.7	2.2	2.3	2.5	2.5	1.8	.6	1.65	3.05	.0	4.45	.7
4.....	2.7	2.1	2.2	2.5	2.5	1.7	.6	1.45	2.8	.0	4.75	.7
5.....	2.7	2.1	2.2	2.5	2.5	1.7	.6	1.25	1.95	.0	4.25	.6
6.....	2.7	2.1	2.2	2.5	2.55	1.6	.5	1.1	1.75	.0	3.35	.6
7.....	2.7	2.0	2.1	2.5	2.5	1.75	.5	1.0	1.55	.0	3.05	.5
8.....	2.6	2.0	2.1	2.4	2.4	1.55	.5	1.0	1.4	7.8	3.05	.5
9.....	2.6	2.0	2.1	2.4	2.4	1.35	.4	.9	1.7	2.75	4.35	.5
10.....	2.6	2.0	2.1	2.4	2.4	1.2	.4	.9	1.35	2.2	3.25	.4
11.....	2.7	2.0	2.0	2.35	2.3	1.2	.3	.8	1.2	1.85	2.45	.4
12.....	2.7	2.0	2.0	2.3	2.3	1.1	.3	.8	1.85	1.4	2.4	.4
13.....	2.6	2.0	2.0	2.3	2.45	1.1	.3	.7	1.6	1.15	2.3	.3
14.....	2.6	2.0	2.0	2.3	2.4	1.0	.3	.7	1.5	1.0	2.2	.3
15.....	2.6	1.9	2.1	2.3	2.3	.9	.2	.6	1.4	4.3	2.2	.3
16.....	2.5	1.9	2.1	2.3	2.2	.9	.2	.6	1.3	3.95	2.0	.3
17.....	2.5	1.9	2.1	2.2	2.1	.9	.2	.5	1.15	3.75	1.9	.3
18.....	2.7	1.9	2.1	2.2	2.0	.9	.2	.5	1.0	3.45	1.8	.3
19.....	2.6	1.9	2.1	2.2	2.0	.8	.1	.4	.9	3.15	1.7	.2
20.....	2.5	1.9	2.0	2.2	1.9	.8	.1	.4	.9	2.85	1.6	.2
21.....	2.45	1.8	1.9	2.2	1.8	.8	.1	.3	.8	2.65	1.6	.2
22.....	2.4	1.8	1.9	2.2	1.8	.7	.1	.3	.8	2.4	1.45	.2
23.....	2.4	2.0	1.8	2.2	2.3	.7	.0	.3	.7	2.15	1.3	.2
24.....	2.4	2.6	1.8	2.2	2.85	.6	.0	.3	.6	1.95	1.3	.2
25.....	2.3	2.55	2.4	2.25	2.45	.6	.0	.2	.5	1.75	1.2	.2
26.....	2.3	2.5	2.65	2.95	2.3	.6	2.5	.2	.4	1.65	1.1	.2
27.....	2.3	2.45	3.25	2.75	2.3	.6	2.95	.2	.4	1.55	1.0	.2
28.....	2.3	2.4	3.8	2.8	2.3	.6	3.95	.2	.3	1.45	1.0	.2
29.....	2.2	.....	3.4	3.1	2.1	.5	3.2	.1	.2	1.4	.9	.1
30.....	2.2	.....	3.1	3.0	2.5	.4	2.6	.1	.2	1.3	.8	.1
31.....	2.2	.....	2.85	.....	2.15	.....	2.25	2.1	.....	1.3	.....	.1

RIO SAN JUAN BASIN.

RIO SAN JUAN NEAR SANTA ROSALIA RANCH, TAMAULIPAS, MEXICO.

Location.—Near the Santa Rosalia ranch, 12 miles above the original station established in 1900 near La Quemada, 18 miles above Camargo, and 24 miles above the confluence of the Rio San Juan and the Rio Grande, which is about 15 miles below Roma, Tex.; removed to present site July 14, 1902, to obviate effect of backwater from the Rio Grande during floods.

Records available.—October 1900, to December 31, 1911 except March and April, 1903.

Gage.—An inclined rod spiked to posts and a tree.

Channel.—The bed is sandy and shifts slightly in floods. Both banks are above flood level, are composed of sandy clay, and do not erode.

Discharge measurements.—Made from cable.

Zero flow.—Low water (no flow) was approximately zero on the gage prior to the flood of 1909, which swept away the station. The restored gage has not the same datum as the old. No flow is now -8.5 feet on the gage.

Cooperation.—Station installed and operated by the Mexican section of the International Boundary Commission.

Discharge measurements of San Juan River near Santa Rosalia ranch, Tamaulipas, Mexico, in 1911.

[By S. Jaso.]

Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>		<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 3.	-0.6	321	June 27.	-3.1	31
Jan. 7.	- .6	317	July 2.	-3.7	30
Jan. 11.	- .8	275	July 6.	-3.2	30
Jan. 15.	-1.1	247	July 10.	-3.4	30
Jan. 20.	-1.1	249	July 14.	-3.6	29
Jan. 24.	-1.3	199	July 17.	-2.8	31
Jan. 28.	-1.7	153	July 21.	-3.7	28
Feb. 2.	-1.8	151	July 26.	- .7	749
Feb. 6.	-2.1	111	July 28.	-4.0	31
Feb. 11.	-2.7	91	Aug. 2.	-4.3	30
Feb. 15.	-2.6	90	Aug. 6.	-4.4	25
Feb. 20.	-3.0	40	Aug. 10.	-4.6	25
Feb. 24.	-3.3	40	Aug. 14.	-4.7	23
Feb. 27.	-3.3	40	Aug. 18.	-4.9	23
Mar. 2.	-3.3	39	Aug. 22.	-5.1	23
Mar. 6.	-3.4	39	Aug. 27.	-5.2	23
Mar. 10.	-3.6	37	Sept. 2.	-4.8	23
Mar. 15.	-3.8	37	Sept. 4.	-2.2	184
Mar. 20.	-3.9	34	Sept. 7.	-3.4	31
Mar. 22.	1.2	1,251	Sept. 11.	-3.9	26
Mar. 25.	5.4	2,763	Sept. 17.	-4.3	23
Mar. 28.	2.9	2,461	Sept. 21.	-4.4	23
Mar. 29.	4.25	2,863	Sept. 25.	-4.5	23
Apr. 3.	- .1	876	Sept. 28.	-4.5	23
Apr. 7.	- .7	787	Oct. 2.	-4.6	22
Apr. 11.	- .05	760	Oct. 6.	-4.6	22
Apr. 16.	-2.1	122	Oct. 10.	2.1	1,858
Apr. 20.	-1.9	125	Oct. 12.	-1.5	495
Apr. 25.	-1.8	132	Oct. 16.	-2.7	174
Apr. 26.	9.5	10,361	Oct. 20.	-3.1	31
Apr. 28.	8.05	5,590	Oct. 25.	-3.2	28
May 2.	.5	841	Oct. 28.	-3.4	23
May 6.	.7	961	Nov. 6.	1.0	1,390
May 8.	3.5	2,628	Nov. 11.	.5	984
May 10.	3.6	2,918	Nov. 15.	-1.3	454
May 12.	1.9	1,853	Nov. 19.	-2.0	281
May 16.	.6	1,026	Nov. 22.	-2.4	244
May 20.	3.7	2,662	Nov. 25.	-2.6	166
May 24.	- .4	572	Dec. 2.	-2.6	161
May 28.	-1.5	192	Dec. 6.	-2.6	160
June 2.	-1.7	144	Dec. 10.	-2.7	146
June 6.	-1.9	125	Dec. 16.	-3.0	34
June 10.	-2.3	91	Dec. 20.	-2.6	121
June 13.	-2.6	71	Dec. 24.	-2.7	86
June 18.	-2.9	31	Dec. 28.	-2.8	75
June 22.	-3.4	31			

Daily gage height, in feet, of Rio San Juan near Santa Rosalia ranch, Tamaulipas, Mexico, for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.	-0.5	-1.9	-3.3	0.3	0.85	-1.3	-3.7	-4.05	-3.6	-4.5	-3.4	-2.7
2.	- .6	-1.8	-3.3	.05	.5	-1.8	-3.7	-4.3	-4.8	-4.6	-3.3	-2.6
3.	- .6	-1.9	-3.4	- .1	.55	-1.6	-3.55	-4.3	-4.8	-4.6	5.9	-2.6
4.	- .6	-2.05	-3.4	- .2	.45	-1.3	-3.0	-4.3	-2.35	-4.6	7.55	-2.6
5.	- .6	-2.1	-3.4	- .3	.6	-1.65	-3.05	-4.4	-2.4	-4.6	3.2	-2.6
6.	- .6	-2.15	-3.4	- .6	.7	-1.8	-3.25	-4.4	-3.15	-4.6	.9	-2.6
7.	- .6	-2.2	-3.5	-.75	4.35	-1.9	-3.3	-4.45	-3.45	-4.6	.35	-2.65
8.	- .6	-2.3	-3.5	-1.0	3.35	-2.1	-3.4	-4.5	-3.65	-2.8	- .2	-2.7
9.	- .65	-2.5	-3.5	-1.05	4.35	-2.2	-3.4	-4.5	-3.75	5.2	-.35	-2.7
10.	- .75	-2.5	-3.6	-1.25	3.35	-2.35	-3.4	-4.6	-3.9	1.8	1.7	-2.75
11.	- .8	-2.7	-3.6	- .1	2.75	-2.45	-3.5	-4.6	-3.95	- .6	.5	-2.8
12.	- .85	-2.7	-3.65	-.55	1.75	-2.55	-3.5	-4.7	-4.1	-1.75	-.35	-2.85
13.	- .9	-2.7	-3.7	-1.1	1.4	-2.65	-3.5	-4.7	-4.1	-2.25	- .9	-2.9
14.	-1.0	-2.6	-3.7	-1.35	1.1	-2.7	-3.6	-4.75	-4.1	-2.5	-1.3	-2.9
15.	-1.1	-2.6	-3.8	-1.65	.75	-2.8	-3.55	-4.8	-4.2	-2.5	-1.35	-3.0

Daily gage height, in feet, of Rio San Juan near Santa Rosalia ranch, Tamaulipas, Mexico, for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
16.....	-1.25	-2.7	-3.8	-2.05	0.6	-2.8	-2.8	-4.9	-4.2	-2.7	-1.55	-3.0
17.....	-1.45	-2.7	-3.8	-2.1	.55	-2.9	-2.8	-4.9	-4.3	-2.7	-1.6	-3.0
18.....	-1.5	-2.7	-3.85	-2.1	.35	-2.9	-2.65	-4.9	-4.3	-2.7	-1.7	-3.0
19.....	-1.5	-2.8	-3.9	-2.1	.1	-3.05	-2.5	-5.1	-4.4	-3.0	-2.0	-2.55
20.....	-1.1	-3.0	-3.9	-1.9	3.1	-3.25	-2.65	-5.1	-4.4	-3.1	-2.3	-2.6
21.....	-1.1	-3.2	-3.9	-1.9	1.1	-3.4	-3.65	-5.1	-4.4	-3.2	-2.3	-2.6
22.....	-1.1	-3.3	.95	-1.9	.4	-3.45	-3.6	-5.1	-4.5	-3.2	-2.4	-2.7
23.....	-1.3	-3.3	.0	-1.9	.3	-3.5	-3.7	-5.1	-4.5	-3.2	-2.5	-2.7
24.....	-1.4	-3.3	.2	-2.4	.55	-3.5	-3.7	-5.1	-4.5	-3.2	-2.6	-2.7
25.....	-1.95	-3.3	4.9	-1.8	.45	-3.3	-3.7	-5.1	-4.5	-3.2	-2.6	-2.7
26.....	-1.7	-3.3	3.9	9.5	.35	-3.1	-1.9	-5.2	-4.5	-3.3	-2.6	-2.8
27.....	-1.7	-3.3	2.0	9.9	-1.05	-3.15	-3.75	-5.2	-4.5	-3.3	-2.6	-2.8
28.....	-1.7	-3.3	4.8	7.35	-1.45	-3.35	-4.0	-5.2	-4.5	-3.4	-2.7	-2.8
29.....	-1.7	.....	5.95	4.95	-1.65	-3.5	-4.3	-5.2	-4.5	-3.4	-2.7	-2.8
30.....	-1.8	.....	2.05	1.5	.25	-3.5	-4.6	-5.3	-4.5	-3.5	-2.7	-2.8
31.....	-2.0	.....	0.7	.....	-1.15	.....	-4.15	-3.8	.....	-3.5	.....	-2.8

INTERIOR BASINS IN NEW MEXICO.

GENERAL FEATURES.¹

The southern portions of Arizona and New Mexico and the western part of Texas resemble the Great Basin in climate, and they contain a number of small interior basins [basins completely encircled by lines of water parting]. These are not so fully determined in extent as the Great Basin, but several of them may be approximately indicated. One of the largest lies between the Rio Grande and its eastern branch, the Pecos, extending from latitude 35° in central New Mexico to latitude 31° in western Texas. In its broadest part it is bounded on the west by the San Andreas and Organ Mountains, and on the east by the Sacramento and Guadalupe. Its area, of which two-thirds lies in New Mexico, is about 12,500 square miles. [In this area are Rio Tularosa and Rio La Luz.] Southwest of the Rio Grande, in Mexico, there is a larger tract of interior drainage, containing a number of saline lakes, and to one of these, Lake Guzman, the valley of the Mimbres River of New Mexico descends. Other basins adjacent on either side to that of the Mimbres are believed to bear the same relation to Lake Guzman, sloping gently toward it but contributing no water unless during periods of rare and exceptional storm. Yet other basins without exterior drainage are contiguous to these, and unite to form in southwestern New Mexico an arm of the Mexican district of interior drainage, the area within New Mexico probably falling between 7,000 and 7,500 square miles.

RIO TULAROSA BASIN.

RIO TULAROSA NEAR BENT, N. MEX.

Location.—In sec. 28, T. 13 S., R. 12 E., 2 miles east of Bent. No important tributaries within several miles of the station.

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

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Data too meager to determine.

Discharge measurements.—Made by wading.

¹ Extract from Gilbert, G. K., Lake Bonneville: Mon. U. S. Geol. Survey, vol. 1, 1890, pp. 2-12, Pl. II. This report is now out of print but may be consulted in the libraries of most of the larger cities.

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

Diversions.—A number of small ditches divert water for irrigation above the station.

Accuracy.—Owing to a lack of discharge measurements no estimates of flow can be made.

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

The following discharge measurement was made by H. B. Waha:

May 24, 1911: Gage height, 1.32 feet; discharge, 9.4 second-feet.

Daily gage height, in feet, of Rio Tularosa, near Bent, N. Mex., for 1911.

[Paul E. Jette, observer.]

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....		1.31	1.72	1.40	1.32	1.35	1.35	1.40
2.....		1.31	1.65	1.40	1.34	1.35	1.35	1.40
3.....		1.35	1.67	1.40	1.36	1.35	1.35	1.40
4.....		1.34	1.45	1.40	1.35	1.35	1.37	1.40
5.....		1.38	1.40	1.40	1.36	1.38	1.37	1.40
6.....		1.40	1.40	1.40	1.35	1.40	1.37	1.40
7.....		1.40	1.39	1.39	1.35	1.40	1.40	1.40
8.....		1.40	1.39	1.38	1.35	1.40	1.40	1.40
9.....		1.34	1.41	1.38	1.35	1.36	1.40	1.40
10.....		1.35	1.42	1.36	1.35	1.35	1.40	.....
11.....		1.31	1.86	1.35	1.35	1.35	1.40	.....
12.....		1.31	1.38	1.35	1.35	1.35	1.40	.....
13.....		1.32	1.38	1.38	1.35	1.35	1.40	.....
14.....		1.31	1.39	1.35	1.35	1.35	1.40	.....
15.....		1.35	1.39	1.35	1.35	1.35	1.40	.....
16.....		1.35	1.40	1.35	1.35	1.35	1.40	.....
17.....		1.32	1.38	1.35	1.35	1.35	1.40	1.40
18.....		1.40	1.39	1.35	1.35	1.35	1.40	1.41
19.....		1.39	1.62	1.34	1.35	1.35	1.40	1.44
20.....		1.38	1.40	1.34	1.35	1.35	1.40	1.45
21.....		1.36	1.39	1.32	1.35	1.35	1.40	1.45
22.....		1.36	1.40	1.32	1.35	1.35	1.40	1.45
23.....		1.35	1.39	1.30	1.35	1.35	1.40	1.45
24.....	1.32	1.36	1.39	1.30	1.35	1.38	1.40	1.45
25.....	1.34	1.36	1.40	1.30	1.35	1.40	1.40	1.45
26.....	1.35	1.37	1.40	1.30	1.35	1.40	1.40	1.45
27.....	1.38	1.36	1.40	1.30	1.35	1.40	1.40	1.45
28.....	1.35	1.35	1.40	1.30	1.35	1.40	1.40	1.45
29.....	1.38	1.38	1.40	1.30	1.35	1.40	1.40	1.45
30.....	1.32	1.39	1.40	1.30	1.35	1.37	1.40	1.45
31.....	1.34	.....	1.40	1.30	.....	1.35	.....	.....

RIO TULAROSA AT MESCALERO, N. MEX.

Location.—At highway bridge one-fourth mile below the Indian agency at Mescalero; south of the center of T. 13 S., R. 12 E.

Records available.—November 27, 1910, to June 3, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Data too meager to determine.

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

Accuracy.—Owing to the lack of discharge measurements no estimates of flow can be made.

Cooperation.—Station maintained in cooperation with the Territorial engineer and the United States Indian Office.

The following discharge measurement was made by H. B. Waha:
May 24, 1911: Gage height, 1.98 feet; discharge, 11.6 second-feet.

Daily gage height, in feet, of Rio Tularosa at Mescalero, N. Mex., for 1911.

[Hiram Jones, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May	June.	Day.	Jan.	Feb.	Mar.	Apr.	May.	June.
1.	1.84	1.80	1.94	.....	2.05	1.88	16. ....	.....	2.00	1.86	1.98	1.98	.....
2.	1.86	1.70	1.98	1.72	2.00	1.86	17. ....	.....	2.10	1.84	1.46	2.00	.....
3.	1.82	1.90	1.92	1.70	1.98	1.84	18. ....	.....	2.05	1.82	1.50	1.98	.....
4.	1.88	2.00	1.96	1.82	1.94	.....	19. ....	.....	1.90	1.84	1.50	1.96	.....
5.	1.84	1.90	1.84	1.82	1.84	.....	20. ....	.....	1.95	1.84	1.54	1.90	.....
6.	1.90	1.50	1.82	1.84	1.82	.....	21. ....	.....	1.96	1.88	1.50	1.96	.....
7.	1.94	1.40	1.82	1.90	1.80	.....	22. ....	.....	1.94	1.86	1.60	1.96	.....
8. ....	.....	1.60	1.86	2.10	1.88	.....	23. ....	.....	1.96	1.90	2.05	1.98	.....
9. ....	.....	1.55	1.84	2.05	1.84	.....	24. ....	.....	1.98	1.84	2.00	1.98	.....
10. ....	.....	1.50	1.80	2.02	1.90	.....	25. ....	.....	1.92	1.92	2.10	1.88	.....
11. ....	.....	1.94	1.82	2.00	1.94	.....	26. ....	.....	1.90	1.90	2.10	1.90	.....
12. ....	.....	1.98	1.82	1.98	1.88	.....	27. ....	.....	1.88	1.90	2.05	1.92	.....
13. ....	.....	1.92	1.84	1.98	2.00	.....	28. ....	.....	1.94	1.80	2.00	1.96	.....
14. ....	.....	1.90	1.84	2.00	1.96	.....	29. ....	.....	.....	1.74	2.10	1.98	.....
15. ....	.....	1.88	1.86	1.94	1.94	.....	30. ....	.....	.....	1.82	.....	1.94	.....
							31. ....	.....	.....	1.82	.....	1.98	.....

RIO LA LUZ BASIN.

RIO LA LUZ NEAR LA LUZ, N. MEX.

Location.—In the Alamo National Forest, 1 mile above La Luz, in sec. 30, T. 15 S.,

R. 11 E.; half a mile below the mouth of Rio Fresnal, the nearest tributary.

Records available.—Fragmentary records August 13, 1910, to June 21, 1911.

Drainage area.—Not measured.

Gage.—Inclined staff. The original gage was washed out and a second gage established November 23, 1910, at a different datum.

Channel.—Data too meager to determine.

Discharge measurements.—Made by wading.

Winter flow.—No data.

Diversions.—There are no important diversions above the station, but several below. The records at the station represent closely the natural run-off.

Accuracy.—Owing to the meagerness of the data no estimates of flow can be made.

Cooperation.—Station was maintained in cooperation with the United States Forest Service and the Territorial engineer.

Discharge measurements of Rio La Luz near La Luz, N. Mex., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
Jan. 28	C. D. Miller.....	<i>Feet.</i> 0.98	<i>Sec.-ft.</i> 10.0
May 22	H. B. Waha.....	.90	3.4

Daily gage height, in feet, of Rio La Luz near La Luz, N. Mex., for 1911.

[M. W. Parker, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	Day.	Jan.	Feb.	Mar.	Apr.	May.	June.
1.....						0.90	16.....						0.95
2.....						.80	17.....						.95
3.....						.80	18.....						.95
4.....						.90	19.....						1.00
5.....						.85	20.....						1.00
6.....						.85	21.....						1.50
7.....						.85	22.....					0.90	
8.....						.90	23.....						
9.....						.85	24.....						
10.....						1.00	25.....						
11.....						1.00	26.....					.95	
12.....						1.00	27.....					.90	
13.....						1.00	28.....	0.98				.90	
14.....						.90	29.....					.85	
15.....						1.00	30.....					.85	
							31.....					1.03	

MIMBRES RIVER BASIN.

MIMBRES RIVER NEAR FAYWOOD, N. MEX.

Location.—About 6 miles northeast of Faywood Hot Springs, and 10 miles from Faywood, a station on the Silver City branch of the Atchison, Topeka & Santa Fe Railway in sec. 7, T. 20 S., R. 10 W.

Records available.—April 8, 1908, to December 31, 1911.

Drainage area.—Approximately 450 square miles.

Gage.—An automatic recording gage installed August 13, 1909, at a point 200 feet upstream from the site of the chain gage originally installed. The chain gage datum was lowered 4 feet on July 8, 1909, and the datum of the recording gage is 3 feet lower than the new datum of the chain gage.

Channel.—Very shifting.

Discharge measurements.—Made from car and cable during high water, and by wading at other times.

Winter flow.—Practically no backwater from ice at this point.

Diversions.—Some water is diverted for irrigation below the station, and 400 feet above is the dam site of the Rio Mimbres reservoir, which is designed to control the flood water for irrigation.

Accuracy.—Owing to the shifting character of the stream and the few discharge measurements, no estimates of flow can be made.

Cooperation.—Station maintained in cooperation with the Territorial engineer.

Discharge measurements of Mimbres River near Faywood, N. Mex., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		<i>Feet.</i>	<i>Sec.-feet.</i>
Feb. 1	C. D. Miller.....		0
Apr. 1	G. H. Russell.....	1.60	13.2
Aug. 17	do.....	.75	2.0

Daily gage height, in feet, of Mimbres River near Faywood, N. Mex., for 1911.

[R. C. Trujillo, observer.]

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....		1.40	1.60	1.50	1.20	1.00	1.05	0.75	1.70	1.04	0.62
2.....		1.50	1.60	1.50	1.20	1.00	.95	.75	1.55	1.03	.62
3.....		1.60	1.60	1.45	1.20	^a 1.00	.95	.75	1.50	1.03	.60
4.....		1.60	1.60	1.50	1.15	1.45	.95	.75	1.50	1.03	.60
5.....		1.70	1.60	1.45	1.15	1.40	.95	.75		.95	.60
6.....		1.70	1.55	1.45	1.15	1.30	.80	.75		.95	.60
7.....		1.80	1.55	1.45	1.15	1.45	.80	.75		.94	.60
8.....		1.75	1.50	1.45	1.15	1.50	.80	.70		.94	.60
9.....		1.75	1.50	1.45	1.15	1.40	.80	.85		.93	.60
10.....		1.70	1.50	1.45	1.15	^b 2.35	.75	.79		.92	.60
11.....		1.75	1.50	1.45	1.15	1.50	.75	.78	1.10	.92	.55
12.....		1.75	1.50	1.45	1.15	1.40	.75	.85	1.10	.88	.55
13.....		1.65	1.50	1.45	1.15	1.50		.85	1.10	.83	.55
14.....		1.65	1.45	1.45	1.15	1.40		.82	1.10	.80	.54
15.....		1.65	1.45	1.45	1.15	1.30	.75	.82	1.10	.80	.53
16.....		1.60	1.45	1.45	1.15	1.30	.75	.82	1.10	.77	.52
17.....		1.60	1.50	1.45	1.15	1.80	.75	.83	1.10	.75	.52
18.....		1.60	1.50	1.45	1.15	1.70	.75	.84	1.10	.75	.52
19.....		1.65	1.50	1.45	1.15	2.00	.75	.84	1.10	.78	.50
20.....		1.60	1.50	1.40	1.15	1.50	.70	1.35	1.10	.75	.50
21.....		1.70	1.50	1.40	1.35	1.30	.70	.90	1.10	.72	.50
22.....		1.60	1.50	1.40	1.60	1.30	1.20	.90	1.10	.70	.50
23.....		1.60	1.50	1.40	1.20			.85	1.10	.67	.50
24.....		1.65	1.50	1.40	1.00		1.00	.85	1.10	.66	.50
25.....		1.60	1.50	1.35	1.00		1.00	.85	1.08	.65	.50
26.....		1.70	1.50	1.35	1.00		1.00	.85	1.06	.65	.50
27.....		1.60	1.50	1.30	1.00		1.00	.85	1.05	.63	.50
28.....	1.20	1.65	1.50	1.25	1.00	1.15	1.00	.82	1.05	.62	.50
29.....		1.70	1.45	1.25	1.00	1.10	1.00	.84	1.05	.62	.50
30.....		1.65	1.50	1.20	1.00	1.15	.80	2.00	1.05	.62	.50
31.....		1.65		1.20		1.10	.80		1.05		.50

^a Maximum gage height July 3, 3.7 feet.

^b Maximum gage height July 10, 3.8 feet.

NOTE.—River dry from Jan. 1 to Feb. 27.

CAMERON CREEK AT FORT BAYARD, N. MEX.

Location.—Near the pumping plant at Fort Bayard, in sec. 25, T. 17 S., R. 13 W., 1 mile below the mouth of the nearest tributary, Beartooth Creek—an intermittent stream.

Records available.—January 17, 1907, to September 11, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Shifting.

Discharge measurements.—Made by wading. For the greater part of the year the flow comes from springs and amounts to less than 1 second-foot.

Winter flow.—Ice does not appreciably affect the flow at this station.

Diversions.—The intake for the Army post water supply is above the station and a small amount of water is also diverted for garden irrigation.

Accuracy.—Owing to the shifting character of the stream and a lack of discharge measurements, no estimates of flow can be made.

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

Daily gage height, in feet, of Cameron Creek at Fort Bayard, N. Mex., for 1911.

[T. J. McBurney, observer.]

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....		1.67	1.35	1.35	1.35	1.35		
2.....		1.65	1.35	1.35	1.35	1.35		
3.....		1.58	1.35	1.35	1.35	1.35		
4.....		1.55	1.35	1.35	1.35	1.35		
5.....		1.55	1.35	1.35	1.35	1.35		
6.....		1.52	1.35	1.35	1.35	1.35		
7.....		1.42	1.35	1.35	1.35	1.35		
8.....		1.38	1.35	1.35	1.35	1.35		
9.....		1.35	1.35	1.35	1.35	1.35		
10.....		1.35	1.35	1.35	1.35	2.20		
11.....		1.35	1.35	1.35	1.35			3.00
12.....		1.35	1.35	1.35	1.35			
13.....		1.35	1.35	1.35	1.35			
14.....		1.35	1.35	1.35	1.35			
15.....		1.35	1.35	1.35	1.35			
16.....		1.35	1.35	1.35	1.35			
17.....		1.35	1.35	1.35	1.35			
18.....		1.35	1.35	1.35	1.35			
19.....		1.35	1.35	1.35	1.35			
20.....		1.35	1.35	1.35	1.35			
21.....		1.35	1.35	1.35	1.72			
22.....		1.35	1.35	1.35	1.35			
23.....		1.35	1.35	1.35	1.35		3.80	
24.....		1.35	1.35	1.35	1.35			
25.....		1.35	1.35	1.35	1.35			
26.....		1.35	1.35	1.35	1.35			
27.....		1.35	1.35	1.35	1.35			
28.....	1.89	1.35	1.35	1.35	1.35			
29.....		1.35	1.35	1.35	1.35			
30.....		1.35	1.35	1.35	1.35			
31.....		1.35		1.35				

NOTE.—Creek dry from Jan. 1 to Feb. 27.

STEVENS CREEK NEAR FORT BAYARD, N. MEX.

Location.—About 3 miles north of Fort Bayard and 2 miles above the mouth, in sec. 12, T. 17 S., R. 13 W. No tributary below the station.

Records available.—Fragmentary records January 17, 1907, to October 28, 1911.

Drainage area.—Not measured.

Gage.—Inclined staff whose position and datum have remained unchanged.

Channel.—Somewhat shifting.

Discharge measurements.—Made by wading.

Winter flow.—Ice has practically no effect on the discharge.

Diversions.—The intake for the planting station ditch of the Forest Service is located above the station.

Accuracy.—Owing to a lack of discharge measurements, no estimates of flow can be made.

Cooperation.—Station was maintained in cooperation with the Territorial engineer and the Engineer Corps of the U. S. A.

Gage height, in feet, of Stevens Creek near Fort Bayard, N. Mex., 1911.

Date.	Gage height.	Date.	Gage height.
June 22.....	1.6	Sept. 30.....	1.2
July 9.....	1.5	Oct. 3.....	1.5
July 10.....	1.8	Oct. 4.....	1.2
Aug. 23.....	1.5	Oct. 27.....	1.1
Sept. 11.....	1.7	Oct. 28.....	1.3
Sept. 20.....	1.4		

NOTE.—Creek was dry on all other days during 1911.

MISCELLANEOUS MEASUREMENTS.

The following miscellaneous measurements have been made on streams tributary to the western Gulf of Mexico.

Miscellaneous measurements in western Gulf of Mexico drainage basins in 1911.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Dis-charge.
				<i>Feet</i>	<i>Sec.-ft.</i>
Nov. —	San Antonio River....	Gulf of Mexico.....	Hot wells, San Antonio, Tex.	.....	16
May 30 ^a	Guadalupe River.....	San Antonio River....	1,500 yards above dam at Seguin, Tex.	.....	394
1910....	Comal River.....	Guadalupe River.....	Highway bridge at New Braunfels, Tex.	.....	299
1911....	do.....	do.....	do.....	.....	267
Nov. —	Leona River.....	Frio River.....	Brickyard crossing, 1½ miles below Uvalde, Tex.	.....	.0
July 18	Rio Grande.....	do.....	South Fork, Colo.....	2.82	391
Oct. 3	Clear Creek.....	Rio Grande.....	Santa Maria Lake, Colo.....	1.68	73
Aug. 9	do.....	do.....	Texas Club, Colo.....	2.50	94
July 22	San Antonio Creek....	Conejos River.....	1 mile south of Antonito, Colo.	.....	b 50
Aug. 9	do.....	do.....	do.....	.....	b 3
Aug. 10	Los Pinos Creek.....	San Antonio Creek....	Osier, Colo.....	.....	b 7
Dec. 27	Costilla Creek.....	Rio Grande.....	Costilla, N. Mex.....	.....	b 25
27	do.....	do.....	Eastdale, Colo.....	.....	.0
Jan. 28	Rio Fernando de Taos.	do.....	Near Taos, N. Mex.....	.78	2.1
Mar. 12	do.....	do.....	do.....	.95	5.1
Apr. 22	do.....	do.....	do.....	1.17	13.7
June 9	do.....	do.....	do.....	1.00	5.2
Aug. 14	Big Chama Creek.....	Big Chama River.....	Chama, N. Mex.....	.....	b 12.0
May 6	Medio Creek.....	Rio Chiquito.....	Near Nambe, N. Mex.....	1.05	3.9
6	Nambe Creek.....	Rio Grande.....	Nambe, N. Mex.....	.....	19.0
6	do.....	do.....	Near Nambe, N. Mex.....	1.30	26
6	Tesuque Creek.....	Nambe Creek.....	Tesuque Pueblo, N. Mex.....	.....	b 3.0
6	Ditch from Medio Creek	do.....	Nambe, N. Mex.....	.....	1.6
Mar. 19	Santa Fe Creek.....	Rio Grande.....	3 miles above Santa Fe, N. Mex.	.....	6.0
Jan. 24	do.....	do.....	2 miles above Santa Fe, N. Mex.	c. 40	b 2.0
Mar. 8	do.....	do.....	do.....	.....	9.7
8	do.....	do.....	1 mile above Santa Fe, N. Mex.	.....	7.1
14	do.....	do.....	La Banada, N. Mex.....	.....	b 8.0
Nov. 14	Galisteo Creek.....	do.....	Above Lamy, N. Mex.....	.....	b 2.5
14	do.....	do.....	Lamy, N. Mex.....	.....	b 2.5
July 27	do.....	do.....	Los Cerrillos, N. Mex.....	.....	b 4.0
29	do.....	do.....	do.....	.....	b 4.0
Nov. 14	do.....	do.....	Mouth, N. Mex.....	.....	b 4.0
11	San Cristobal Creek....	Galisteo River.....	Kennedy, N. Mex.....	.....	b 2.0
11	Jaspe Creek.....	San Cristobal Creek....	2 miles south of Kennedy, N. Mex.	.....	.0
July 28	Cottonwood Creek.....	Bluewater Creek.....	Above mouth of Bluewater Creek, N. Mex.	.....	b 25
28	Bluewater Creek.....	Cottonwood Creek....	Near Copperton, N. Mex.....	.....	b 100
28	do.....	do.....	Above confluence with Cottonwood Creek, N. Mex.	.....	b 75
Mar. 11	Pecos River.....	Rio Grande.....	San Miguel, N. Mex.....	.....	92
11	do.....	do.....	1 mile above La Cuesta, N. Mex.	.....	77
11	do.....	do.....	La Cuesta, N. Mex.....	.....	87
10	do.....	do.....	4 miles below La Cuesta, N. Mex.	.....	92
11	do.....	do.....	1 mile below Anton Chico, N. Mex.	.....	81
13	do.....	do.....	1 mile below Colonias, N. Mex.	.....	20
Nov. 11	do.....	do.....	Santa Rosa, N. Mex.....	.....	b 20
Mar. 14	do.....	do.....	6 miles below Santa Rosa, N. Mex.	.....	88
14	do.....	do.....	4 miles below Porte de Luna, N. Mex.	.....	88
Jan. 13	do.....	do.....	Fort Sumner, N. Mex.....	.....	b 3.0
May 11	do.....	do.....	do.....	.....	b 100
Jan. 5	Willow Creek.....	Pecos River.....	Cowles, N. Mex.....	.....	d 25
Oct. 31	San Antonio Creek....	do.....	Below Cowles, N. Mex.....	.....	b 3.0
31	Cebadilla Creek.....	do.....	do.....	.....	b 4.0

^a Rod float measurement by P. S. Knittel, city engineer of Seguin, Tex.

^b Estimated.

^c From old United States Geological Survey gage.

^d Estimated under ice conditions.

Miscellaneous measurements in western Gulf of Mexico drainage basin in 1911—Contd.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Dis-charge.
				<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 6	Holy Ghost Creek.....	Pecos River.....	Lloyd's ranch, N. Mex.....		a 4.0
Mar. 31	do.....	do.....	Mouth, N. Mex.....		a 2.5
May 25	do.....	do.....	do.....		a 4.0
Oct. 31	do.....	do.....	Below Cowles, N. Mex.....		a 5.0
Mar. 31	Indian Creek.....	do.....	Mouth, N. Mex.....		a 1.5
May 25	do.....	do.....	do.....		a 1.0
Aug. 7	Dark Canyon.....	do.....	Santa Fe-Pecos trail, N. Mex.....		a .5
May 25	El Macho Creek.....	Dark Canyon.....	Mouth, N. Mex.....		a .5
Aug. 7	do.....	do.....	Santa Fe-Pecos trail, N. Mex.....		a 1.0
Mar. 31	do.....	do.....	Mouth, N. Mex.....		a 3.0
31	Dalton Creek.....	Pecos River.....	do.....		a 2.0
May 25	do.....	do.....	do.....		b .5
Aug. 7	Indian Creek.....	do.....	10 miles below Cowles, N. Mex.....		a 2.0
Oct. 31	do.....	do.....	do.....		a 1.0
Aug. 20	Gallinas River.....	do.....	Las Vegas, N. Mex.....		a .25
Nov. 11	Pintada Canyon.....	do.....	Pintada, N. Mex.....		.0
June 1	Río Ruidoso.....	do.....	6 miles west of Ruidoso, N. Mex.....	1.60	10.3
Nov. 15	Peansco River.....	do.....	5 miles below Elk, N. Mex.....		69
Jan. 18	Hope ditch.....	From Penasco River.....	Head of ditch, N. Mex.....		33
18	do.....	do.....	Charley White draw, N. Mex.....		29
Nov. —	San Felipe Creek.....	Rio Grande.....	Just south of Southern Pacific Railroad bridge, at Del Rio, Tex.....		71
—	Las Moras Creek.....	do.....	Near Brackettville, Tex.....		8.4

a Estimated.

INDEX.

	Page.		Page.
Accuracy of discharge measurements, degree of.....	12-13	Brazos River at—	
Acknowledgments to those aiding.....	13-14	Waco, Tex.:	
Acre-foot, definition of.....	9	description.....	14
Alamillo Creek at—		discharge.....	14
mouth, N. Mex.:		discharge, daily.....	15
seepage.....	21	discharge, monthly.....	16
Albuquerque, N. Mex.,		gage height.....	15
Rio Grande at:		Brazos River basin, stream flow in.....	14-16
seepage.....	21	Bridge measurements, making of, view of....	12
Anton Chico, N. Mex.,		Brownsville, Tex.,	
Pecos River near:		Rio Grande near:	
description.....	81	description.....	52
discharge.....	81, 106	discharge.....	52-53
gage height.....	82	gage height.....	53
Antonito, Colo.,		Buckman, N. Mex.,	
San Antonio Creek near:		Rio Grande near:	
discharge.....	106	description.....	30
Appropriations, amount of.....	6	discharge.....	30
Arroyo Hondo, N. Mex.,		discharge, daily.....	21, 31
Hondo Creek near:		discharge, monthly.....	32
description.....	65	gage height.....	21, 30-31
discharge.....	65	seepage.....	21
gage height.....	66	Cameron Creek at—	
Austin, Tex.,		Fort Bayard, N. Mex.:	
Colorado River (of Texas) at:		description.....	104
description.....	16	gage height.....	105
discharge.....	16	Canjilon, N. Mex.,	
evaporation.....	17	Horn River near:	
gage height.....	16-17	description.....	73
Authority for investigations.....	5	discharge.....	73
Belen, N. Mex.,		gage height.....	73
Rio Grande at:		Cebadilla Creek near—	
seepage.....	21	Cowles, N. Mex.:	
Bent, N. Mex.,		discharge.....	106
Rio Tularosa near:		Cebolla Creek at—	
description.....	100-101	mouth, N. Mex.:	
discharge.....	101	seepage.....	21
gage height.....	101	Chama, N. Mex.,	
Bernalillo, N. Mex.,		Big Chama Creek at:	
Rio Grande at:		discharge.....	106
seepage.....	21	Christiansen, E. O., work of.....	14
Big Chama Creek at—		Clear Creek at—	
Chama, N. Mex.:		Santa Maria Lake, Colo.:	
discharge.....	106	discharge.....	106
Bluewater Creek (mouth), N. Mex.,		Texas Club, Colo.:	
Cottonwood Creek near:		discharge.....	106
discharge.....	106	Cleve's ranch, near Elk, N. Mex. See Elk, N.	
Bluewater Creek near—		Mex.	
Copperton, N. Mex.:		Cochiti, N. Mex.,	
discharge.....	106	Rio Grande at:	
Bolster, R. H., work of.....	14	seepage.....	21
Brackettville, Tex.,		Colonias, N. Mex.,	
Las Moras Creek near:		Pecos River near:	
discharge.....	107	discharge.....	106

	Page.		Page.
Colorado River (of Texas) at—		Creede, Colo.,	
Austin, Tex.:		Rio Grande near:	
description.....	16	description.....	22, 23-24
discharge.....	16	discharge.....	22, 24
evaporation.....	17	discharge daily.....	23, 25
gage height.....	16-17	discharge monthly.....	23, 25
Columbus, Tex.:		gage height.....	22, 24
description.....	18	Culebra River at—	
discharge.....	18	San Luis, Colo.:	
discharge, daily.....	19	description.....	63
discharge, monthly.....	19	discharge monthly.....	63
gage height.....	18	Current meters, view of.....	13
Colorado River (of Texas) basin, stream flow		Current-meter stations, views of.....	12
in.....	16-19	Dalton Creek at—	
Columbus, Tex.,		mouth, N. Mex.:	
Colorado River (of Texas) at:		discharge.....	107
description.....	18	Dark Canyon at—	
discharge.....	18	Santa Fe-Pecos trail, N. Mex.:	
discharge, daily.....	19	discharge.....	107
discharge, monthly.....	19	Data, explanation of.....	10-12
gage height.....	18	Dayton, N. Mex.,	
Comal River at—		Pecos River near:	
New Braunfels, Tex.:		description.....	84
discharge.....	106	discharge.....	84
Conejos River near—		discharge daily.....	85
Mogote, Colo.:		discharge monthly.....	85
description.....	60-61	gage height.....	84
discharge.....	61	Dean, H. J., work of.....	14
discharge, daily.....	62	Definition of terms.....	8-9
discharge, monthly.....	62		
gage height.....	61	Del Norte, Colo.,	
Cooper, R. L., work of.....	14	Rio Grande near:	
Cooperation, credit for.....	13-14	description.....	25-26
Copperton, N. Mex.,		discharge.....	26
Bluewater Creek near:		discharge, daily.....	27
discharge.....	106	discharge, monthly.....	27
Costilla, N. Mex.,		gage height.....	26
Costilla Creek at:			
discharge.....	106	Del Rio, Tex.,	
Costilla Creek at—		San Felipe Creek, at:	
Costilla, N. Mex.:		discharge.....	107
discharge.....	106		
Eastdale, Colo.:		Devils River, Tex.,	
discharge.....	106	Devils River at:	
mouth, N. Mex.:		description.....	95
seepage.....	21	discharge.....	95
Cottonwood Creek near—		discharge, daily.....	96
Bluewater Creek (mouth), N. Mex.:		discharge, monthly.....	96
discharge.....	106	gage height.....	95-96
Cowles, N. Mex.,		Rio Grande near:	
Cebadilla Creek near:		description.....	44
discharge.....	106	discharge.....	45
Holy Ghost Creek near:		discharge daily.....	46
discharge.....	107	discharge, monthly.....	46
Indian Creek near:		gage height.....	45-46
discharge.....	107		
Pecos River at:		Devils River at—	
description.....	79	Devils River, Tex.:	
discharge.....	79	description.....	95
discharge daily.....	80	discharge.....	95
discharge monthly.....	81	discharge, daily.....	96
gage height.....	80	discharge, monthly.....	96
San Antonio Creek near:		gage height.....	95-96
discharge.....	106	Devils River basin, stream flow in.....	95-96
Willow Creek at:		Digby, C. B., work of.....	14
discharge.....	106	Dicharge, definition of.....	8
		Discharge measurements, accuracy of.....	12-13
		tables of, explanation of.....	11-12

	Page.		Page.
Dixon, N. Mex.,		Galisteo Creek near—Continued.	
Embudo Creek at:		Los Cerrillos, N. Mex.:	
seepage.....	21	discharge.....	106
Drainage basins, list of.....	5	mouth, N. Mex.:	
Dunn's ranch, N. Mex.,		discharge.....	106
Rio Grande at:		Gallinas River near—	
seepage.....	21	Las Vegas, N. Mex.:	
Eagle Pass, Tex.,		description.....	88-89
Rio Grande near:		discharge.....	89, 107
description.....	47	discharge, daily.....	90
discharge.....	47	discharge, monthly.....	90
discharge, daily.....	48	gage height.....	89
discharge, monthly.....	49	Gallinas River (South Fork) near—	
gage height.....	48	El Porvenir, N. Mex.:	
Eastdale, Colo.,		description.....	90-91
Costilla River at:		discharge.....	91
discharge.....	106	gage height.....	91
Elk, N. Mex.,		Glencoe, N. Mex.,	
Penasco River at and near:		Rio Ruidoso near:	
description.....	93, 94	description.....	91-92
discharge.....	93, 94, 107	discharge.....	92
gage height.....	94	gage height.....	92
El Macho Creek at—		Gray, G. A., work of.....	14
mouth, N. Mex.:		Guadalupe River at—	
discharge.....	107	Seguin, Tex.:	
Santa Fe-Pecos trail, N. Mex.:		discharge.....	106
discharge.....	107	Guerrero, Tamaulipas, Mexico,	
El Paso, Tex.,		Rio Salado near:	
Rio Grande near:		description.....	97
description.....	34-35	discharge.....	97
discharge.....	35	gage height.....	98
discharge, daily.....	36	Holy Ghost Creek at or near—	
discharge, monthly.....	37	Cowles, N. Mex.:	
gage height.....	36	discharge.....	107
El Porvenir, N. Mex.,		Lloyd's ranch, N. Mex.:	
Gallinas River (South Fork), near:		discharge.....	107
description.....	90-91	mouth, N. Mex.:	
discharge.....	91	discharge.....	107
gage height.....	91	Hondo Creek at or near—	
Embudo Creek at—		Arroyo Hondo, N. Mex.:	
Dixon, N. Mex.:		description.....	65
seepage.....	21	discharge.....	65
Equivalents, list of.....	9-10	gage height.....	66
Field data, accuracy and reliability of.....	12-13	mouth, N. Mex.:	
Faywood, N. Mex.,		seepage.....	21
Mimbres River near:		Hope ditch at—	
description.....	103	Charley White Draw, N. Mex.:	
discharge.....	103	discharge.....	107
gage height.....	104	head, N. Mex.:	
Fort Bayard, N. Mex.,		discharge.....	107
Cameron Creek at:		Horn River near—	
description.....	104	Canjilon, N. Mex.:	
gage height.....	105	description.....	73
Stevens Creek at:		discharge.....	73
description.....	105	gage height.....	73
gage height.....	105	Indian Creek at or near—	
Fort Sumner, N. Mex.,		Cowles, N. Mex.:	
Pecos River at:		discharge.....	107
discharge.....	106	mouth, N. Mex.:	
Freeman, W. B., work of.....	14	discharge.....	107
Gage heights, table of, explanation of.....	11	Investigations, authority for.....	5
Gaging stations, views of.....	12	Jaspe Creek near—	
Galisteo Creek near—		Kennedy, N. Mex.:	
Lamy, N. Mex.:		discharge.....	106
discharge.....	106		

	Page.		Page.
Kennedy, N. Mex.,		Lobatos, Colo.,	
Jaspe Creek near:		Rio Grande near:	
discharge.....	106	description.....	27-28
San Cristobal Creek at:		discharge.....	28
discharge.....	106	discharge, daily.....	21, 29
Kerber Creek near—		discharge, monthly.....	29
Villa Grove, Colo.:		gage height.....	21, 28
description.....	59	seepage.....	21
discharge.....	59	Los Cerillos, N. Mex.,	
gage height.....	59	Galisteo Creek at:	
La Banada, N. Mex.,		discharge.....	106
Santa Fe Creek at:		Los Cordovas, N. Mex.,	
discharge.....	106	Rio Pueblo de Taos at:	
La Cuesta, N. Mex.,		description.....	68
Pecos River near:		discharge.....	68
discharge.....	106	discharge, daily.....	21, 69-70
La Joya, N. Mex.,		discharge, monthly.....	70
Rio Puerco near:		gage height.....	21, 69
description.....	77	seepage.....	21
discharge.....	78	Los Pinos Creek at—	
gage height.....	78	Osier, Colo.:	
Lakewood, N. Mex.,		discharge.....	106
Pecos River near:		Map showing mean annual precipitation in	
description.....	85-86	United States.....	12
gage height.....	86	Map showing mean annual run-off in United	
La Luz, N. Mex.,		States.....	12
Rio La Luz near:		Medio Creek near—	
description.....	102	Narbe, N. Mex.:	
discharge.....	102	discharge.....	106
gage height.....	103	Mescalero, N. Mex.,	
Lamy, N. Mex.,		Rio Tularosa at:	
Galisteo Creek near:		description.....	101
discharge.....	106	discharge.....	102
Langtry, Tex.,		gage height.....	102
Rio Grande near:		Mimbres River basin, stream flow in.....	103-105
description.....	42	Mimbres River near—	
discharge.....	42-43	Faywood, N. Mex.:	
discharge, daily.....	43-44	description.....	103
discharge, monthly.....	44	discharge.....	103
gage height.....	43	gage height.....	104
Laredo, Tex.,		Mogote, Colo.,	
Rio Grande near:		Conejos River near:	
description.....	49	description.....	60-61
discharge.....	49-50	discharge.....	61
gage height.....	50	discharge, daily.....	62
Larrison, G. K., work of.....	14	discharge, monthly.....	62
Las Moras Creek near—		gage height.....	61
Brackettville, Tex.:		Monte Vista, Colo.,	
discharge.....	107	Rio Alamosa near:	
Las Vegas, N. Mex.,		description.....	60
Gallinas River near:		discharge.....	60
description.....	88-89	gage height.....	60
discharge.....	89, 107	Monument Rock, near Santa Fe, N. Mex.,	
discharge, daily.....	90	Santa Fe Creek at:	
discharge, monthly.....	90	description.....	74
gage height.....	89	discharge.....	74
Latir Creek at—		Moorhead, Tex.,	
mouth, N. Mex.:		Pecos River near:	
discharge.....	21	description.....	86
Leona River near—		discharge.....	86-87
Uvalde, Tex.:		discharge, daily.....	88
discharge.....	106	discharge, monthly.....	88
Lloyd's ranch, N. Mex.,		gage height.....	87
Holy Ghost Creek at:			
discharge.....	106		

	Page.		Page.
Nambe, N. Mex.,		Penasco River at or near—	
Medio Creek near:		Cleve's ranch, near Elk, N. Mex. <i>See</i>	
discharge.....	106	Elk, N. Mex.	
Nambe Creek at:		Penasco River at and near:	
discharge.....	106	Elk, N. Mex.:	
Nambe Creek at—		description.....	93, 94
Nambe, N. Mex.:		discharge.....	93, 94, 107
discharge.....	106	gage height.....	94
New Braunfels, Tex.,		Pintada, N. Mex.,	
Comal River at:		Pintada Canyon at:	
discharge.....	106	discharge.....	107
New Mexico, interior basins in, general		Pintada Canyon at—	
features of.....	100	Pintada, N. Mex.:	
stream flow in.....	100-105	discharge.....	107
Ortiz, N. Mex.,		Pojague Creek at—	
Rio San Antonio near:		mouth, N. Mex.:	
description.....	76	seepage.....	21
discharge.....	76	Porte de Luna, N. Mex.,	
gage height.....	76	Pecos River near:	
Osier, Colo.,		discharge.....	106
Los Pinos Creek at:		Precipitation in United States, mean annual,	
discharge.....	106	map showing.....	12
Padgett, H. D., work of.....	14	Presidio, Tex.,	
Pecos River at or near—		Rio Grande above:	
Anton Chico, N. Mex.:		description.....	37
description.....	81	discharge.....	37
discharge.....	81, 106	discharge, daily.....	39
gage height.....	82	discharge, monthly.....	39
Colonias, N. Mex.:		gage height.....	38
discharge.....	106	Rio Grande below:	
Cowles, N. Mex.:		description.....	39-40
description.....	79	discharge.....	40
discharge.....	79	discharge, daily.....	41
discharge, daily.....	80	discharge, monthly.....	42
discharge, monthly.....	81	gage height.....	41
gage height.....	80	Price meters, views of.....	13
Dayton, N. Mex.:		Publications, lists of.....	5, 7, 8
description.....	84	Questa, N. Mex.,	
discharge.....	84	Red River near. <i>See</i> Rio Colorado.	
discharge, daily.....	85	Questa, N. Mex.,	
discharge, monthly.....	85	Rio Colorado above:	
gage height.....	84	description.....	63
Fort Sumner, N. Mex.:		discharge.....	63
discharge.....	106	gage height.....	64
La Cuesta, N. Mex.:		Rio Colorado below:	
discharge.....	106	description.....	64
Lakewood, N. Mex.:		discharge.....	64
description.....	85-86	discharge, daily.....	21
gage height.....	86	gage height.....	21, 65
Moorhead, Tex.:		seepage.....	21
description.....	86	Rating curves and tables, accuracy of.....	12
discharge.....	86-87	construction of.....	11
discharge, daily.....	88	Rio Alamosa near—	
discharge, monthly.....	88	Monte Vista, Colo.:	
gage height.....	87	description.....	60
Porte de Luna, N. Mex.:		discharge.....	60
discharge.....	106	gage height.....	60
San Miguel, N. Mex.:		Rio Chama at—	
discharge.....	106	mouth, N. Mex.:	
Santa Rosa, N. Mex.:		seepage.....	21
description.....	82	Rio Colorado above—	
discharge.....	82, 106	Questa, N. Mex.:	
discharge, daily.....	83	description.....	63
discharge, monthly.....	83	discharge.....	63
gage height.....	83	gage height.....	64
Pecos River basin, stream flow in.....	79-94		

Rio Colorado below—

Questa, N. Mex.:	Page.
description.....	64
discharge.....	64
discharge, daily.....	21
gage height.....	21, 65
seepage.....	21

Rio Fernando de Taos near—

Taos, N. Mex.:	
discharge.....	106

Rio Grande, seepage investigations on.....

Seepage measurements on.....	21
------------------------------	----

Rio Grande at or near—

Albuquerque, N. Mex.:	
seepage.....	21

Brownsville, Tex.:

description.....	52
discharge.....	52-53
gage height.....	53

Belen, N. Mex.:	
seepage.....	21

Bernalillo, N. Mex.:	
seepage.....	21

Rio Grande at or near—

Buckman, N. Mex.:	
description.....	30
discharge.....	30
discharge, daily.....	21, 31
discharge, monthly.....	32
gage height.....	21, 30-31
seepage.....	21

Rio Grande at—

Cochiti, N. Mex.:	
seepage.....	21

Rio Grande near—

Creede, Colo.:	
description.....	22, 23-24
discharge.....	22, 24
discharge, daily.....	23, 25
discharge, monthly.....	23, 25
gage height.....	22, 24

Del Norte, Colo.:

description.....	25-26
discharge.....	26
discharge, daily.....	27
discharge, monthly.....	27
gage height.....	26

Devils River, Tex.:

description.....	44
discharge.....	45
discharge, daily.....	46
discharge, monthly.....	46
gage height.....	45-46

Dunn's ranch, N. Mex.:	
seepage.....	21

Eagle Pass, Tex.:

description.....	47
discharge.....	47
discharge, daily.....	48
discharge, monthly.....	49
gage height.....	48

El Paso, Tex.:

description.....	34-35
discharge.....	35
discharge, daily.....	36
discharge, monthly.....	37
gage height.....	36

Rio Grande near—Continued.

Langtry, Tex.:	Page.
description.....	42
discharge.....	42-43
discharge, daily.....	43-44
discharge, monthly.....	44
gage height.....	43

Laredo, Tex.:

description.....	49
discharge.....	49-50
gage height.....	50

Lobatos, Colo.:

description.....	27-28
discharge.....	28
discharge, daily.....	21, 29
discharge, monthly.....	29
gage height.....	21, 28
seepage.....	21

Presidio, Tex. (above):

description.....	37
discharge.....	37
discharge, daily.....	39
discharge, monthly.....	39
gage height.....	38

Presidio, Tex. (below):

description.....	39-40
discharge.....	40
discharge, daily.....	41
discharge, monthly.....	42
gage height.....	41

Roma, Tex.:

description.....	50
discharge.....	51
gage height.....	51-52

San Juan, N. Mex.:

seepage.....	21
--------------	----

San Marcial, N. Mex.:

description.....	32
discharge.....	32-33
discharge, daily.....	21, 34
discharge, monthly.....	34
gage height.....	21, 33
seepage.....	21

South Fork, Colo.:

discharge.....	106
----------------	-----

Thirtymile Bridge, near Creede, Colo.

See Creede, Colo.

Velarde, N. Mex.:

seepage.....	21
--------------	----

Rio Grande basin, stream flow in.....

Rio Grande (South Fork) at—

South Fork, Colo.:

description.....	53-54
discharge.....	54
discharge, daily.....	55
discharge, monthly.....	55
gage height.....	54

Rio Hondo at—

mouth, N. Mex.:

seepage.....	21
--------------	----

Rio Jemez at—

mouth, N. Mex.:

seepage.....	21
--------------	----

Rio La Luz basin, stream flow in.....

	Page.		Page.
Rio La Luz near—		Rio San Juan basin, stream flow in.....	98-100
La Luz, N. Mex.:		Rio San Juan near—	
description.....	102	Santa Rosalia ranch, Tamaulipas, Mexico:	
discharge.....	102	description.....	98
gage height.....	103	discharge.....	99
Rio Lucero near—		gage height.....	99-100
Taos, N. Mex.:		Rio Tularosa at or near—	
description.....	71	Bent, N. Mex.:	
discharge.....	71	description.....	100-101
discharge, daily.....	72	discharge.....	101
discharge, monthly.....	72	gage height.....	101
gage height.....	71	Mescalero, N. Mex.:	
Rio Pueblo de Taos at or near—		description.....	101
Los Cordovas, N. Mex.:		discharge.....	102
description.....	68	gage height.....	102
discharge.....	68	Rio Tularosa basin, stream flow in.....	100-102
discharge, daily.....	21, 69-70	Rio Vallecitos at—	
discharge, monthly.....	70	Vallecitos, N. Mex.:	
gage height.....	21, 69	description.....	73
seepage.....	21	discharge.....	74
Taos, N. Mex.:		gage height.....	74
description.....	66	Roma, Tex.,	
discharge.....	67	Rio Grande near:	
discharge, daily.....	67-68	description.....	50
discharge, monthly.....	68	discharge.....	51
gage height.....	67	gage height.....	51-52
Rio Puerco, N. Mex.,		Ruidoso, N. Mex.,	
Rio Puerco at:		Rio Ruidoso near:	
description.....	77	description.....	92
discharge.....	77	discharge.....	93, 107
gage height.....	77	gage height.....	93
Rio Puerco at or near—		Run-off, definition of.....	8, 9
La Joya, N. Mex.:		Run-off in United States, mean annual, map	
description.....	77	showing.....	12
discharge.....	78	Russell, G. H., work of.....	14
gage height.....	78	Saguache, Colo.,	
mouth, N. Mex.:		Saguache Creek near:	
seepage.....	21	description.....	55-56
Rio Puerco at—		discharge.....	56
Rio Puerco, N. Mex.:		discharge, daily.....	57
description.....	77	discharge, monthly.....	57
discharge.....	77	gage height.....	56
gage height.....	77	Saguache Creek near—	
Rio Ruidoso near—		Saguache, Colo.:	
Glencoe, N. Mex.:		description.....	55-56
description.....	91-92	discharge.....	56
discharge.....	92	discharge, daily.....	57
gage height.....	92	discharge, monthly.....	57
Ruidoso, N. Mex.:		gage height.....	56
description.....	92	San Antonio, Tex.,	
discharge.....	93, 107	San Antonio River at:	
gage height.....	93	discharge.....	106
Rio Salado at—		San Antonio Creek near—	
mouth, N. Mex.:		Antonito, Colo.:	
seepage.....	21	discharge.....	106
Rio Salado basin, stream flow in.....	97-98	Cowles, N. Mex.:	
Rio Salado near—		discharge.....	106
Guerrero, Tamaulipas, Mexico:		San Antonio River at—	
description.....	97	San Antonio, Tex.:	
discharge.....	97	discharge.....	106
gage height.....	98	San Cristobal Creek at—	
Rio San Antonio near—		Kennedy, N. Mex.:	
Ortiz, N. Mex.:		discharge.....	106
description.....	76	San Felipe Creek at—	
discharge.....	76	Del Rio, Tex.:	
gage height.....	76	discharge.....	107

	Page.		Page.
San Jose River near—		Santa Rosa, N. Mex.—Continued.	
Suwanee, N. Mex.:		Pecos River at—Continued.	
description.....	78	discharge, daily.....	83
discharge.....	79	discharge, monthly.....	83
gage height.....	79	gage height.....	83
San Juan, N. Mex.,		Santa Rosalia ranch, Tamaulipas, Mexico,	
Rio Grande at:		Rio San Juan near:	
seepage.....	21	description.....	98
San Luis, Colo.,		discharge.....	99
Culebra River at:		gage height.....	99-100
description.....	63	Second-feet, definition of.....	9
discharge, monthly.....	63	Seepage investigations on the Rio Grande.....	20-21
San Luis Creek at—		Seguin, Tex.,	
Villa Grove, Colo.:		Guadalupe River at:	
description.....	57-58	discharge.....	106
discharge.....	58	South Fork, Colo.,	
discharge, daily.....	58	Rio Grande (South Fork) at:	
discharge, monthly.....	59	description.....	53-54
gage height.....	58	discharge.....	54, 106
San Marcial, N. Mex.,		discharge, daily.....	55
Rio Grande near:		discharge, monthly.....	55
description.....	32	gage height.....	54
discharge.....	32-33	Stevens Creek near—	
discharge, daily.....	21, 34	Fort Bayard, N. Mex.:	
discharge, monthly.....	34	description.....	105
gage height.....	21, 33	gage height.....	105
seepage.....	21	Stewart, J. B., work of.....	14
San Miguel, N. Mex.,		Stream measurement, accuracy of.....	12-13
Pecos River at:		publications on, by United States Geolog- ical Survey.....	5, 7, 8
discharge.....	106	Suwanee, N. Mex.,	
Santa Clara Creek at—		San Jose River near:	
mouth, N. Mex.:		description.....	78
seepage.....	21	discharge.....	79
Santa Cruz Creek at—		gage height.....	79
mouth, N. Mex.:		Tables, explanation of.....	11-12
seepage.....	21	Tamaulipas, Mexico. <i>See</i> Guerrero, Mexico;	
Santa Fe, N. Mex.:		Santa Rosalia ranch, Mexico.	
Santa Fe Creek at—		Taos, N. Mex.,	
description.....	75	Rio Fernando de Taos at:	
discharge.....	75, 106	discharge.....	106
gage height.....	75-76	Rio Lucero near:	
<i>See also</i> Monument Rock.		description.....	71
Santa Fe Creek at or near —		discharge.....	71
La Banada, N. Mex.:		discharge, daily.....	72
discharge.....	106	discharge, monthly.....	72
Monument Rock, near Santa Fe, N. Mex.:		gage height.....	71
description.....	74	Rio Pueblo de Taos near:	
discharge.....	74	description.....	66
Santa Fe, N. Mex.:		discharge.....	67
description.....	75	discharge, daily.....	67-68
discharge.....	75, 106	discharge, monthly.....	68
gage height.....	75-76	gage height.....	67
<i>See also</i> Monument Rock.		Terms, definitions of.....	8-9
Santa Fe-Pecos trail, N. Mex.,		Tesuque Creek at—	
Dark Canyon at:		Tesuque Pueblo, N. Mex.:	
discharge.....	107	discharge.....	106
El Macho Creek at:		Tesuque Pueblo, N. Mex.,	
discharge.....	107	Tesuque Creek at:	
Santa Maria Lake, Colo.,		discharge.....	106
Clear Creek at:		Texas Club, Colo.,	
discharge.....	106	Clear Creek at:	
Santa Rosa, N. Mex.,		discharge.....	106
Pecos River at:			
description.....	82		
discharge.....	82, 106		

Thirtymile Bridge, near Creede, Colo. <i>See</i>		Villa Grove, Colo.—Continued.	
Creede, Colo.	Page.	San Luis Creek at:	Page.
Truchas River at—		description.....	57-58
mouth, N. Mex.:		discharge.....	58
seepage.....	21	discharge, daily.....	58
Tuttle, A. H., work of.....	14	discharge, monthly.....	59
Uvalde, Tex.,		gage height.....	58
Leona River near:		Waco, Tex.,	
discharge.....	106	Brazos River at:	
Vallecitos, N. Mex.,		description.....	14
Rio Vallecitos at:		discharge.....	14
description.....	73	discharge, daily.....	15
discharge.....	74	discharge, monthly.....	16
gage height.....	74	gage height.....	15
Velarde, N. Mex.,		Waha, H. B., work of.....	14
Rio Grande at:		Walters, M. I., work of.....	14
seepage.....	21	Willow Creek at—	
Villa Grove, Colo.,		Cowles, N. Mex.:	
Kerber Creek near:		discharge.....	106
description.....	59	Wimmer, O. M., work of.....	14
discharge.....	59	Wood, B. D., work of.....	14
gage height.....	59	Work, subdivision of.....	14



