

$$62.4 \times 2.11 = 131.7$$

$$80.4 \times 2.42 = 194.6$$

$$98.7 \times 1 = 98.7$$

$$5.53 \overline{) 425.0} \\ \underline{76.9\%}$$

$$99.1 \times 2.11 = 2,099.1$$

$$112.8 \times 2.42 = 273.0$$

$$118.0 \times 1 = 118.0$$

$$5.53 \overline{) 600.1} \\ \underline{108.5}$$

$$145.5 \times 2.11 = 307.0$$

$$131.8 \times 2.42 = 319.0$$

$$121.7 \times 1 = 121.7$$

$$5.53 \overline{) 747.7} \\ \underline{135.2}$$

Apr - July

~~57.6 x 2.11~~

~~81.8 x 2~~

$$57.6 \times 2.17 = 125.0$$

$$81.8 \times 2.43 = 198.8$$

$$105.3 \times 1 = 105.3$$

$$5.60 \overline{) 429.1} \\ \underline{76.6}$$

$$83.0 \times 2.17 = 180.1$$

$$112.2 \times 2.43 = 272.6$$

$$101.1 \times 1 = 101.1$$

$$5.60 \overline{) 553.8} \\ \underline{98.9}$$

$$161.4 \times 2.17 = 350.2$$

$$145.2 \times 2.43 = 352.8$$

$$116.6 \times 1 = 116.6$$

$$5.60 \overline{) 819.6} \\ \underline{146.4}$$

Annual
Colorado

altho unfortunately there are only three years, viz. 1914-17, in which there are simultaneous records of ^{run-off in} the major tributaries and the main stream, groups consisting of a single tributary, ^{as the Green and} and the main stream ^{at Yuma} the Green and the Colorado, are available covering periods of 9 to 11 years. ^{Fort.} Unfortunately, some of the stations which were disc. in 1916-17 have now been reestablished. On this page, records ~~of~~ must be based, the compar. of the comparison of the

Var. bet. Comb. Seas, Run Off of Maj. Tribs. and ~~the~~ Main Stream at Yuma with Complete Record for Basin ^{Pine.} Records Adjusted to that of Yuma

Divisor 6 mean annual	Dividend 6,123 sec. ft.	Quotient 1,021
6 Apr-July 5 & Aug-Nov means of total of months (3 ac ft.)	16,223 17,653	2,704 3,531

Mult. 1.98347	Mult. 365 305	Prod. 723.9666 60.4958
------------------	---------------------	------------------------------

723.9666 mean annual acre ft.	1,021	739,170.
----------------------------------	-------	----------

60.4958	2,704 mean Apr.-July acre ft.	163,581
	3,531 mean Aug.-Nov. acre ft.	213,611

Divisor .9943	Dividend 739,170 Corrected annual normal	Quo. 743,407
------------------	--	-----------------

1.0452	163,581 corrected Apr.-July normal	156,507.
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.854	213,611 corrected Aug.-Nov. normal.	250,130
------	--	---------

.9943	1,021 corr. Ann. Normal (sec. ft.)	1,027
-------	---------------------------------------	-------

1.0452	2,704 corr. Apr.-July normal (sec. ft.)	2,587
--------	--	-------

Gila R.
Mouth
corrections
annual.

+	-
26.4	25.3
25.2	41.2
10.6	66.5
0.9	63.1
+63.1	6 <u>- 3.4</u>
	- 0.57%

Apr.-July

+	-
39.8	25.3
28.1	40.2
14.9	65.5
9.8	
+92.6	
65.5	
6 <u>+ 27.1</u>	
+ 4.52%	

Aug.-Nov.

+	-
32.2	10.6
	35.4
	40.8
	18.4
	105.2
	32.2
	5 <u>- 73.0</u>
	- 14.6

Gila R.

Month

Divisor	Dividend	Quotient.
1,027	2,010	195.7%
Annual	452	44.0
	302	29.4
	1,806	175.9
	597	58.1
	956	93.1
2,587	11,500	444.5%
Apr.-July	291	11.2
	1,754	67.8
	2,058	79.6
Period	0	0
	620	24.0

Monthly discharge of San Juan River ^{at} near Bluff, Utah
 for the years ending Sept. 30, 1917

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF IN ACRE- FEET.
	Maximum.	Minimum.	Mean.	
October	28,300	1,740	7,850	483,000
November	2,010	990	1,040	61,900
December	1,130	199	669	41,100
January	990	350	649	42,700
February	2,800	410	1,250	69,400
March	3,610	758	1,370	84,200
April	12,400	2,100	5,910	352,000
May	14,700	5,630	9,110	560,000
June	18,700	6,620	14,000	833,000
July	14,700	5,000	8,470	521,000
August	5,310	1,660	2,880	177,000
September	2,490	1,340	1,870	111,000
The year period	28,300	199	4,630	3,340,000
October				
November				
December				
January				
February				
March				
April				
May				
June				
July				
August				
September				
The year period				

NOTE:

Monthly discharge of Saw Juan River at Bluff, Utah
 for the years ending Sept. 30, 1915 and 1916.

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF IN ACRE- FEET.
	Maximum.	Minimum.	Mean.	
<i>1915</i>				
October				
November	2,360	1,140	1,580	94,000
December	1,210	505	1,020	62,700
January	2,060	630	1,010	62,100
February	4,820	1,080	2,330	129,000
March	4,980	960	2,230	137,000
April	13,900	3,740	8,040	478,000
May	13,100	4,980	9,270	570,000
June	12,900	4,820	10,100	601,000
July	21,900	2,610	6,490	399,000
August	3,880	705	1,660	102,000
September	5,830	380	1,050	62,500
The year period	21,900	380	4,060	2,700,000
<i>1916</i>				
October	1,960	552	941	57,900
November	824	552	667	39,700
December	793	388	637	39,200
January	5,790	505	1,310	80,600
February	2,390	854	1,400	80,500
March	16,200	1,340	6,210	382,000
April	11,000	4,850	7,570	450,000
May	15,500	5,470	9,340	574,000
June	14,400	7,130	10,500	625,000
July	7,670	2,800	5,160	317,000
August	14,500	2,290	7,120	438,000
September	5,790	1,740	2,590	154,000
The year period	16,200	388	4,460	3,240,000

NOTE:

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

WATER RESOURCES BRANCH

403 POST OFFICE BUILDING, DENVER, COLORADO

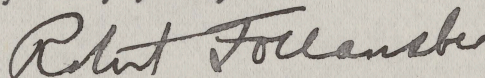
November 8, 1922.

Mr. J.E. Church, Jr.,
Mount Rose Observatory,
Reno, Nevada.

Dear Mr. Church:

In accordance with your letter of November 2, I am enclosing herewith the monthly records of flow for 1915 to 17, inclusive, for the San Juan River, 25 miles west of Bluff, the lowest gaging station on the river. This station has been maintained since 1917, but the records have not yet been published. It is probable that you can obtain them from the district office at Salt Lake City.

Very truly yours,



District Engineer.

UNITED STATES GEOLOGICAL SURVEY
WATER RESOURCES BRANCH

Monthly discharge in *acre-feet*, of *San Juan* River ^{at} *Bluff, Utah*. [Drainage area, *24,000* square miles]

of annual.

Month.	1898-9	1899-1900	1900-01	1901-02	1902-03	1903-04	1904-05	1905-06	1906-07	1907-08	Total 1908-09	1909-10	1910-11	1911-12	Mean.
October							57,900	483,000			2,540,900	8.22(3) 5.82			
November							94,000	39,700	61,900		195,600	2.11			
December							62,700	39,200	41,100		143,000	1.54			
January							62,100	80,600	42,700		185,400	2.0			
February							129,000	80,500	69,400		278,900	3.0			
March							137,000	382,000	84,200		603,200	6.49			
April							478,000	450,000	352,000		1,280,000	13.78			
May							570,000	574,000	560,000		1,704,000	18.34			
June							601,000	625,000	833,000		2,059,000	22.16			
July							399,000	317,000	521,000		1,237,000	13.32		67.60	
August							102,000	438,000	177,000		717,000	7.72			
September							62,500	154,000	111,000		327,500	3.53			
The { year period }							2,710,000 ^(a)	3,240,000	3,340,000		9,290,000				
Max. Day							21,900	16,200	28,300		Mean 3,096,667				
Min. Day							380	388	199						

^(a) For period Oct. 30 - Sept. 30.

error + 12.80%

Station established Oct. 30, 1914; discontinued Sept. 30, 1917.

April 478,000 450,000 352,000
May 570,000 574,000 560,000
June 601,000 625,000 833,000
July 399,000 317,000 521,000

Totals 2,048,000 1,966,000 2,266,000 6,280,000
 Mean 2,093,333 Error + 7.67%

Divisor	Dividend	Quotient
1.128	3,098,667	2,745,272
2,745,272	2,710,000	98.7%
Annual	3,240,000	118.0
	3,340,000	121.7
1.0767	2,093,353	1,944,211
1,944,211	2,048,000	105.3
Period	1,966,000	101.1
	2,266,000	116.6

San Juan River
near Bluff, Utah

corrected Normals

2,745,272 Annual
1,944,211 Period

Divisor	Dividend	Quotient	
.9914	5,747,900	5,797,760	
Annual	5,368,500	92.6	
	7,073,000	122.0	
	3,615,600	62.4	
	5,744,000	99.1	
	8,434,300	145.5	
	5,107,000	88.1	
	3,228,300	55.7	
Period	5,945,400	102.5	
	7,215,000	124.4	
	1.0180	4,288,800	4,212,967
	4,212,967	4,620,000	109.7
		3,826,000	90.8
		5,456,000	129.5
		2,426,000	57.6
3,918,000		93.0	
6,798,000		161.4	
3,670,000		87.1	
2,051,000	48.7		
	4,686,000	111.2	
	5,437,000	129.1	

Green River
at
Little Valley, Utah

Corrected Normals
5,797,760 Annual
4,212,967 Period

GREEN RIVER AT LITTLE VALLEY UTAH
(Drainage Area, 41,000 sq. mi.)

	1911-12	1912-13	1913-14	1914-15	1915-16	1916-17	1917-18	1918-19	1919-20	1920-21	Total	NORMAL	Per Cent of Annual									
October		225,000	219,000	243,000	242,000	307,000	2,000,000	226,000	122,000	160,000		216,000 ⁹	3.76									
November		209,000	193,000	162,000	168,000	152,000	184,000	179,000	125,000	197,000		174,300 ⁸	3.03									
December		935,000	103,000	94,100	116,000	127,000	167,000	130,000	904,000	117,000		115,300 ⁸	2.01									
January	106,000	141,000	120,000	927,000	106,000	79,300	144,000	87,300	108,000	171,000		110,500 ⁸	1.92									
February	104,000	124,000	147,000	983,000	129,000	116,000	136,000	972,000	140,000	169,000		124,100 ⁸	2.16									
March	227,000	256,000	395,000	186,000	558,000	206,000	251,000	277,000	244,000	472,000		307,200 ⁸	5.34									
April	390,000	762,000	750,000	443,000	625,000	708,000	385,000	474,000	389,000	443,000		536,900 ⁸	9.34									
May	990,000	1,010,000	175,000	676,000	129,000	161,000	848,000	916,000	164,000	155,000		122,800 ⁸	21.36									
June	224,000	115,000	212,000	928,000	137,000	276,000	173,000	553,000	203,000	278,000		176,610 ⁸	30.73									
July	1,000,000	904,000	836,000	379,000	633,000	172,000	707,000	108,000	627,000	664,000		757,800 ⁸	13.18	74.61%								
August	422,000	266,000	284,000	128,000	354,000	410,000	202,000	738,000	279,000	338,000		275,700 ⁸	4.77									
September	215,000	228,000	156,000	186,000	153,000	239,000	153,000	107,000	151,000	204,000		179,200 ⁸	3.12									
Annual		5368500	7073000	3615600	5744000	8434300	5107000	3228300	5945400	7215000		5744900 ⁹	100.00									
April	390,000	762,000	750,000	443,000	625,000	708,000	385,000	474,000	389,000	443,000			Err	-0.86%								
May	990,000	1,010,000	175,000	676,000	129,000	161,000	848,000	916,000	164,000	155,000												
June	224,000	115,000	212,000	928,000	137,000	276,000	173,000	553,000	203,000	278,000												
July	1,000,000	904,000	836,000	379,000	633,000	172,000	707,000	108,000	627,000	664,000												
Period	4620000	3826000	5456000	2426000	3918000	6798000	3670000	2051000	4686000	5437000		4288800 ¹⁰	74.62									
					314	155	152	42.5	105					Err	+1.80%							

Green River
at
Lute Valley

	1902-03	1903-04	1904-05	1905-06	1906-07	1907-08	1908-09	1909-10	1910-11	1911-12	1912-13	1913-14	1914-15	1915-16	1916-17	1917-18	1918-19	1919-20	1920-21	1921-22	
Green River																					
Grand River																					
San Juan River																					
Sala River																					
Colorado River	74.2 <u>63.4</u>	66.3 <u>56.6</u>	126.8 <u>108.4</u>	128.8 <u>110.1</u>	174.1 <u>148.8</u>	91.2 <u>77.9</u>	175.2 <u>149.7</u>	100.5 <u>85.9</u>	109.2 <u>93.3</u>	131.8 <u>112.7</u>	81.3 <u>69.5</u>	134.7 <u>115.1</u>	54.9 <u>87.0</u>	74.3 <u>123.0</u>	76.8 <u>126.4</u>	46.3 <u>74.7</u>	37.7 <u>58.8</u>	148.8 <u>125.2</u>	67.3 <u>118.6</u>	100.9	
Green River																					
Grand River																					
San Juan River																					
Sala River																					
Colorado River	87.8 <u>74.8</u>	64.9 <u>55.3</u>	117.7 <u>100.3</u>	132.5 <u>112.9</u>	167.3 <u>142.5</u>	76.3 <u>64.9</u>	170.3 <u>145.1</u>	93.1 <u>79.3</u>	114.0 <u>97.1</u>	137.0 <u>116.7</u>	84.0 <u>71.5</u>	157.8 <u>129.3</u>	51.2 <u>82.9</u>	60.6 <u>100.3</u>	84.1 <u>137.8</u>	48.4 <u>74.7</u>	37.7 <u>59.8</u>	151.9 <u>128.1</u>	69.5 <u>114.9</u>	109.8	



Percentage Relationships
Tributaries of Main Stream
of Colorado River

Divisor	Dividend	Quotient
1,0595	61,915	58,438
	1,002,123	945,845
945,845	522,721	55.3
	180,950	19.1
	443,547	46.9
Annual	2,950,200	311.9
	1,334,540	141.1
	580,780	61.4
	152,040	16.1
	735,750	77.8
1.0675	158,915	148,867
148,867	142,821	95.9
	34,320	23.1
	127,557	85.7
	455,200	305.8
Period	114,110	76.7
	79,480	53.4
	14,860	10.0
	354,860	238.4

Gila River

at
Kelvin, Ariz.

Corrected normals
945,845 Annual
148,867 Period

- Alameda at guma -

*Lea River
at
Kelowna, Ariz.*

