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WATER BULLETIN NUMBER 21

Flow of the Rio Grande and Related Data

From Elephant Butte Dam, New Mexico to the Gulf of Mexico

1951

WITH MAXIMUMS, MINIMUMS, AND NORMALS

STORAGE CAPACITIES AND WATER IN STORAGE

SOURCES OF RIVER FLOW

DIVERSIONS

SILT, CHEMICAL AND SANITARY ASPECTS OF WATER QUALITY

RAINFALL AND EVAPORATION

DRAINAGE BASIN AND IRRIGATED AREAS

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FOREWORD

This bulletin presents the twenty-first compilation of stream discharges and related data concerning the international portion of the Rio Grande, prepared jointly by the United States and Mexican Sections of the International Boundary and Water Commission. The stream flow data and kindred subjects pertain to the Rio Grande and its important tributaries near their confluence with the main stream from Elephant Butte Dam, New Mexico to the Gulf of Mexico. The first publication in the series was Water Bulletin No. 1 for the year 1931. The present volume contains the information for the year 1951.

International stream gaging on the Rio Grande was initiated in 1889, when the station at El Paso, Texas was established. A number of stations on the Rio Grande and its tributaries downstream from El Paso were established in 1900 and operated until 1914. Between 1914 and 1923, except for a few months in 1919 and 1920, all stream gaging work on the international reach of the river was suspended. In 1923 the work was resumed and carried on independently by the two countries until 1931, when the present joint program of stream measurement was started.

During 1951 the United States Section of the Commission operated the stream gaging stations on the Rio Grande at El Paso, American Dam, Island, County Line, Fort Quitman, Upper Presidio, Lower Presidio, Johnson Ranch, Langtry, Del Rio, Zapata, Rio Grande City, Hidalgo, and Lower Brownsville. The Mexican Section operated the stream gaging stations on the main stream at Juárez, Eagle Pass, Laredo, Roma, and Matamoros. Each Section operated the gaging stations on tributary streams, floodways, and diversions within its own country.

The total drainage area within the outer rim of the Rio Grande Basin is 335,500 square miles. However, nearly half of this area yields no runoff to the river, the estimated productive area of the watershed being 171,900 square miles. Approximately 8,300,000 acre-feet of storage has been provided. A present total of 2,700,000 acres are irrigated. The residual flow from the Rio Grande that escaped to the Gulf of Mexico averaged 2,800,000 acre-feet per year for the period 1934-1951.

Acknowledgments

Other agencies which have each contributed to some part of the data published herein include: the Bureau of Plant Industry, the Division of Soils and Agricultural Engineering, and the Soil Conservation Service of the U. S. Department of Agriculture; the Bureau of Reclamation and the Geological Survey of the U. S. Department of the Interior; the Weather Bureau of the U. S. Department of Commerce; the Texas Board of Health; the Colorado State Engineer; the New Mexico State Engineer; the Red Bluff Water Power Control District; the Willacy County Water Control and Improvement District No. 1; the El Paso Department of Water and Sewerage; the Laredo City Water Department; the Ministry of Hydraulic Resources of Mexico; the Mexican Department of Agriculture and Livestock; the Meteorological Service of Mexico; the Cía. Agrícola de Fuerza Eléctrica del Río Conchos, S. A.; and the Federal Board of Public Improvement Works of Nuevo Laredo, Tamaulipas.

Additional contributions have been made by individuals and corporations, and specific notation is made for such, as well as for those of the above-named agencies, where the data appear. The courtesy and cooperation of those who made these contributions are acknowledged with our appreciation.

General Hydrologic Conditions for 1951

Along and Adjacent to The International Portion of the Rio Grande

During the year 1951, the weather was drier and slightly warmer than usual on the watershed of the Rio Grande below Elephant Butte Dam. Mean annual temperatures averaged about 101% of normal on the effective watershed and about normal in the Lower Rio Grande Valley. Evaporation in both the United States and Mexico averaged about 107% of normal. Rainfall was subnormal on practically all subdivisions of the watershed, averaging about 61% of normal on the effective watershed and about 88% in the Lower Valley.

The volume of yearly flow of the Rio Grande was the lowest of record at all places from below Elephant Butte Dam to the Gulf, except at Langtry, where the flow was about 43% of normal. The yearly flow of 5,795 acre-feet at County Line gaging station was only about 2% of its normal volume of 233,587 acre-feet. At Rio Grande City gaging station, where the largest annual volume was recorded, it was 1,920,600 acre-feet, or 41% of the normal flow of 4,635,415 acre-feet. At Lower Brownsville gaging station, the lowermost station on the Rio Grande, the annual flow was 618,873 acre-feet, or 23% of the 1934-1951 normal flow of 2,724,634 acre-feet.

The total annual flow of the measured tributaries below Fort Quitman, in both the United States and Mexico, was also below normal. The total flow of these tributaries in the United States was 398,141 acre-feet, or 41% of the normal total flow of 968,654 acre-feet. New minimum yearly flows were recorded at Alamito Creek, Pecos River, Goodenough Spring, Devils River, and San Felipe Creek gaging stations. In Mexico, the total measured tributary flow, excluding the Río San Juan, was 865,094 acre-feet, or about 50% of the normal flow of 1,742,854 acre-feet. The yearly flow of the Río Conchos near Ojinaga and the flow of the Río San Juan entering the Rio Grande above and below Rio Grande City were the lowest of record.

Return flow to the Rio Grande at Maverick Power Plant near Eagle Pass was 658,500 acre-feet, or 93% of the 3-year average.

There were no floods of consequence on the Rio Grande during 1951. The greatest rate of discharge recorded was 78,750 second-feet at Roma gaging station on September 15.

For all reservoirs in the Rio Grande Basin of greater capacity than 15,000 acre-feet, excepting Bluewater Reservoir, the average amount of water in storage in 1951 was 1,412,600 acre-feet, or 36% of the normal 3,969,600 acre-feet. In the United States, stored water in these reservoirs averaged only 24% of normal, while in Mexico, it averaged 43% of normal. Elephant Butte and Caballo Reservoirs, together, held less water at the end of 1951 than they have at the end of any year since storage began. They also held less water in storage, on the average, during 1951 than for any year since storage began. La Boquilla Reservoir in Mexico held less water in storage at the end of 1951 and less on the average during the year than for any year since 1930.

Diversions from the Rio Grande into the American Canal near El Paso, Acequia Madre near Juárez, and the Maverick Canal at Las Moras Creek were the lowest of record. Diversions for irrigation on the United States side below Rio Grande City were 94% of the 1942-1951 average. Diversions for irrigation to Mexico through the Retamal Canal were 50% of the 1942-1951 average. Diversions for municipal uses in the United States and in Mexico were 130% and 148%, respectively, of the average for the most recent ten years.

Water available for irrigation in the Lower Rio Grande Valley was critically short during the year. At Lower Brownsville gaging station, there was no flow in the river all day, or part of the day, for 193 days of the year. The longest period of continuous no-flow was for 26 days in January.

The total reported acreage irrigated from the Rio Grande and its tributaries below El Paso, Texas did not change greatly during 1951. There was an increase of 3% on the United States side and a decrease of 14% on the Mexican side. The increase in area irrigated in the United States was quite uniformly distributed along the river from Presidio, Texas to the Gulf of Mexico. The decrease in Mexico occurred principally above Fort Quitman, along the Río San Juan below Marte Gómez Dam, and between Hidalgo and Matamoros.

The 1951 investigations of the quality of Rio Grande water extended from El Paso to Mercedes, Texas. The annual tonnage of salts, or total dissolved solids carried by the river, was below normal. At all silt-sampling stations on the Rio Grande, the total quantity of suspended silt which passed during the year was much below normal.

RIO GRANDE BELOW ELEPHANT BUTTE DAM, NEW MEXICO

DESCRIPTION: Water-stage recorder 3,800 feet below Elephant Butte Dam, and cable with sit-down cable car and winch 100 feet below the recorder. Elephant Butte Dam is 135.1 river miles above the American Dam at El Paso, Texas. The zero of the gage is 4,242.09 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 50 current meter measurements during the year, a continuous record of gage heights, and a stable rating curve. Records (marked "subject to revision") were furnished by the United States Geological Survey. Records available: January 1915 through December 1951.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. Beginning December 1940, hydroelectric power generation facilities for 27,000 kva were placed in operation at Elephant Butte Dam.

EXTREME FLOWS FROM RECORDS:

Average Flow in Second-Feet

Daily:	Max.	8,220	May 22, 1942	Min.	0	occasionally	
Monthly:	Max.	7,600	May 1942	Min.	3.0	Jan.	1930
Yearly:	Max.	2,510	1942	Min.	592		1951

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	590	1,040	995	1,510	436	812	1,130	482	476	3.4	3.4	3.4
2	806	1,140	941	1,480	514	834	1,090	560	748	3.4	4.0	4.6
3	895	821	930	1,510	508	804	1,060	458	762	3.7	3.4	4.0
4	926	658	860	1,450	510	847	1,050	557	762	6.9	27.0	3.7
5	869	858	951	1,470	493	872	1,040	550	762	7.8	4.3	3.7
6	890	863	956	1,450	510	1,050	1,010	237	806	3.7	3.7	3.7
7	684	982	906	1,460	403	1,050	1,050	6.0	762	3.4	3.4	3.4
8	946	962	1,010	1,380	276	1,060	1,050	4.6	741	7.4	3.4	3.4
9	1,070	1,050	900	1,450	267	1,040	1,070	4.6	635	3.7	3.4	3.7
10	1,010	886	844	1,520	291	1,040	1,070	242	476	3.4	3.4	4.9
11	990	704	674	1,520	354	1,020	1,060	498	386	3.4	3.4	4.3
12	1,010	916	715	1,530	194	1,050	1,060	504	25.0	3.4	4.3	5.2
13	914	1,020	1,210	1,510	11.0	1,060	994	448	5.1	3.4	3.4	4.9
14	696	1,020	1,440	1,500	156	1,060	1,000	516	5.1	3.4	3.4	3.7
15	904	1,030	1,330	1,470	220	1,080	1,010	530	4.2	3.1	3.7	3.7
16	936	1,360	1,000	1,160	327	1,070	1,000	524	5.1	3.1	3.4	3.4
17	957	1,340	984	789	341	1,060	1,010	612	3.2	3.1	3.4	3.4
18	902	930	884	741	372	1,060	1,020	608	3.2	3.4	4.6	4.0
19	976	913	1,250	662	471	1,050	1,030	610	3.5	3.4	4.0	13.0
20	847	875	992	676	464	1,060	986	616	3.5	3.4	3.4	4.0
21	706	937	954	530	504	1,050	498	632	2.9	3.4	3.4	4.3
22	890	907	962	332	501	1,050	452	630	2.6	3.4	3.4	3.7
23	891	908	1,010	720	539	1,030	712	696	8.6	2.8	3.4	3.7
24	864	941	918	695	530	993	659	859	3.2	2.8	3.7	3.4
25	898	775	832	473	788	1,040	739	862	2.9	6.7	63.0	3.4
26	932	900	985	418	847	1,320	1,310	835	2.9	4.3	4.0	3.4
27	905	1,100	1,190	430	831	1,190	675	730	4.8	3.1	3.7	3.4
28	701	1,030	1,300	444	843	1,380	330	494	3.8	4.0	3.4	3.4
29	880		1,540	280	832	1,310	286	318	4.2	3.1	3.4	3.4
30	1,020		1,660	504	854	1,300	578	530	3.5	4.0	3.4	14.0
31	1,270		1,550		782		616	497		4.0		4.6
Sum	27,775	26,866	32,673	31,064	14,969.0	31,642	27,645	15,650.2	7,413.3	121.5	191.2	138.8

Month	Current Year 1951: Extreme Gage Feet High	Low	ϕ Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1924-1951: Acre-Feet Normal	Maximum	Minimum	Average 1942-1951
Jan.			31	1,270	1	590	896	55,100	26,459	86,500	184	60,620
Feb.			16	1,360	4	658	960	53,300	38,471	76,300	969	58,730
Mar.			30	1,660	11	674	1,050	64,800	64,179	95,300	1,520	72,220
Apr.			12	1,530	29	280	1,040	61,600	100,914	162,000	57,200	82,310
May			30	854	13	11.0	483	29,700	106,411	467,000	29,700	111,450
June			28	1,380	3	804	1,050	62,800	113,808	363,000	62,800	104,160
July			26	1,310	29	286	892	54,800	112,171	211,000	54,800	89,980
Aug.			25	862	‡ 8	4.6	505	31,000	104,661	161,000	31,000	74,440
Sept.			6	806	22	2.6	247	14,700	64,885	129,000	14,700	50,320
Oct.			5	7.8	‡23	2.8	3.9	241	29,619	72,100	241	45,700
Nov.			25	63.0	‡ 1	3.4	6.4	379	28,340	158,000	379	42,016
Dec.			30	14.0	‡ 1	3.4	4.5	275	27,924	87,300	275	45,456
Yearly				1,660		2.6	592	428,695	817,842	1,818,800	428,695	837,402

‡ And other days ϕ Mean daily

RIO GRANDE BELOW CABALLO DAM, NEW MEXICO

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights, located .8 river mile below Caballo Dam and 106.8 river miles above the American Dam at El Paso, Texas. The zero of the gage is 4,140.90 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 86 meter measurements during the year and a continuous record of gage heights. Records, subject to revision, were furnished by the El Paso office of the United States Bureau of Reclamation. Records available: February 26, 1938 through December 1951.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. In addition to the outflow from Caballo Dam listed below, 1,426 acre-feet of water was diverted in 1951 into Bonita Lateral, a small irrigation canal just below Caballo Dam. Prior to 1938, discharge records were kept at Percha Dam, a low diversion dam about 1.5 miles downstream from this station. Small accretions to the river take place between this station and Percha Dam.

EXTREME FLOWS FROM RECORDS:

	Average Flow in Second-Feet					
Daily:	Max. 7,650	May 20, 1942	Min. .6	several days Nov., Dec. 1951
Monthly:	Max. 6,710	May 1942	Min. .6	Dec. 1951
Yearly:	Max. 2,480	1942	Min. 648	1951

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.3	1.9	2.7	1,780	583	548	1,980	1,680	1,000	1.2	.6	.7
2	1.4	2.0	2.7	1,750	534	532	1,840	1,680	1,050	1.2	.6	.6
3	1.3	1.8	2.7	1,760	278	427	1,820	1,610	1,020	1.2	.6	.6
4	1.1	1.7	2.7	1,760	298	412	1,510	1,660	1,020	1.1	.6	.6
5	1.0	1.6	2.7	1,680	287	413	1,260	1,670	1,060	1.1	.6	.6
6	1.1	1.6	185	1,690	262	615	1,100	1,530	1,130	1.1	.6	.7
7	1.2	1.6	465	1,670	257	713	1,120	1,430	1,230	1.0	.6	.7
8	1.3	1.7	463	1,600	156	802	1,260	1,360	1,330	1.0	.7	.7
9	1.3	1.7	474	1,580	208	955	1,240	1,240	1,340	1.0	.7	.6
10	1.3	1.7	558	1,640	299	882	1,380	1,380	1,290	1.0	.7	.6
11	1.3	1.6	603	1,580	295	871	1,570	1,740	1,180	.9	.7	.6
12	1.3	1.6	877	1,470	298	919	1,600	1,840	510	.9	.7	.6
13	1.3	1.6	979	1,440	314	1,050	1,640	1,810	22.0	.8	.7	.6
14	1.2	1.6	1,080	1,190	343	1,160	1,760	1,850	4.3	.8	.7	.6
15	1.2	1.5	1,170	1,030	410	1,270	1,910	1,970	4.0	.7	.7	.6
16	1.2	1.5	1,250	960	362	1,440	1,770	1,950	3.7	.7	.7	.6
17	1.2	1.5	1,310	924	422	1,620	1,590	1,950	3.5	.7	.6	.6
18	1.2	1.5	1,550	881	491	1,560	1,520	2,130	3.3	.7	.6	.6
19	1.2	1.5	1,750	806	438	1,530	1,460	2,310	3.1	.7	.6	.6
20	1.2	1.7	1,690	778	551	1,630	1,540	2,280	2.9	.7	.6	.6
21	1.3	2.0	1,620	758	453	1,600	1,950	2,280	2.7	.7	.6	.6
22	1.3	2.3	1,560	729	450	1,670	2,220	2,300	2.5	.7	.7	.6
23	1.3	2.6	1,670	723	378	1,840	2,190	2,190	2.3	.7	.7	.6
24	1.3	2.6	2,020	622	435	2,070	2,140	1,810	2.1	.7	.7	.6
25	1.3	2.5	2,140	492	361	2,040	2,070	1,600	2.0	.7	.7	.6
26	1.3	2.5	2,110	460	429	1,970	1,940	1,590	1.8	.7	.7	.6
27	1.4	2.6	2,050	505	434	1,970	1,720	1,340	1.6	.7	.7	.6
28	1.5	2.6	1,960	631	436	1,910	1,660	1,130	1.5	.7	.7	.6
29	1.6		1,950	714	440	1,850	1,740	1,010	1.4	.7	.7	.6
30	1.7		1,860	608	460	1,870	1,670	933	1.3	.7	.7	.6
31	1.8		1,810		465		1,600	887		.7		.6
Sum	40.4	52.6	35,167.5	34,211	11,827	38,139	51,770	52,140	13,226.0	26.2	19.8	19.0

Month	Current Year 1951: Extreme Gage Feet High	Extreme Gage Feet Low	ϕ Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1938-1951: Acre-Feet Normal	Maximum	Minimum	Average 1942-1951
Jan.			31	1.8	5	1.0	1.3	80.1	1,140	4,850	80.1	1,243
Feb.			‡23	2.6	‡15	1.5	1.9	104	17,637	64,300	104	18,476
Mar.			25	2,140	‡ 1	2.7	1,130	69,800	82,078	120,000	49,300	86,570
Apr.			1	1,780	26	460	1,140	67,900	120,600	212,000	67,900	124,100
May			1	583	8	156	382	23,500	116,808	412,000	23,500	123,280
June			24	2,070	4	412	1,270	75,600	131,872	354,000	75,600	137,290
July			22	2,220	6	1,100	1,670	103,000	135,943	234,000	97,800	140,810
Aug.			19	2,310	31	887	1,680	103,000	131,129	179,000	103,000	136,250
Sept.			9	1,340	30	1.3	441	26,200	66,136	181,000	26,200	67,410
Oct.			‡ 1	1.2	‡15	.7	.8	52.0	11,835	35,400	52.0	11,322
Nov.			‡ 8	.7	‡ 1	.6	.7	39.3	6,306	14,400	39.3	5,702
Dec.			‡ 1	.7	‡ 2	.6	.6	37.7	6,539	19,100	37.7	6,290
Yearly				2,310		.6	648	469,313.1	828,023	1,795,670	469,313.1	858,743

‡ And other days ϕ Mean daily

RIO GRANDE AT EL PASO, TEXAS

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights. The recorder is located 5 miles northwest of El Paso, Texas, 6 miles northwest of Juárez, Chihuahua, and 1.9 river miles above the American Dam. The cable and staff gage are located 1 mile downstream from the recorder in the pass opposite Courchesne Quarry. The zeros of the gages at the recorder and at the cable are 3,722.30 feet and 3,720.51 feet, respectively, above mean sea level, U.S.C. & G.S. datum.

RECORDS: Discharges in 1951 were computed by taking the sum of the flows in the American Canal and the flows at the station below American Dam. Records available: 1889 through December 1951.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 24,000 second-feet on June 12, 1905, with a gage height of 6.0 feet at the lower gage. Min. occasionally no flow. Since Elephant Butte Dam was closed in 1915, the largest peak flow to pass this station was 13,500 second-feet on September 3, 1925.

Average Flow in Second-Feet

Daily:	Max.	23,680	June 12, 1905	Min.	0	occasionally
Monthly:	Max.	14,300	June 1905	Min.	0	occasionally
Yearly:	Max.	2,780	1905	Min.	70.1	1902

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	137	136	83.3	546	436	283	736	767	416	141	94.8	93.6
2	147	140	84.2	526	478	293	704	721	353	133	89.7	92.8
3	140	140	81.2	459	448	340	656	747	325	129	91.7	90.2
4	144	137	76.5	470	454	362	658	676	286	125	98.2	89.6
5	148	138	77.4	475	430	326	676	736	268	130	97.5	86.4
6	142	132	74.5	470	339	338	578	856	263	132	96.1	86.3
7	140	131	70.9	391	305	330	443	692	255	128	95.4	84.2
8	137	128	76.2	426	282	320	438	613	226	122	94.7	92.7
9	138	127	67.5	503	273	305	429	609	277	113	94.0	90.1
10	136	128	50.5	561	268	331	421	544	450	115	95.0	87.6
11	135	127	259	582	254	360	412	487	602	111	102	89.5
12	131	124	324	626	234	473	416	472	529	107	101	88.5
13	129	122	402	717	221	449	614	714	560	107	95.6	88.3
14	124	130	458	715	214	479	678	748	523	110	92.3	88.2
15	129	127	553	765	212	614	831	725	412	108	94.3	84.1
16	133	122	579	688	275	684	908	728	284	105	89.4	86.2
17	132	115	550	589	219	713	914	801	242	106	90.5	87.6
18	129	113	553	561	227	736	861	783	230	105	96.0	85.5
19	131	108	588	639	243	800	806	827	228	105	99.7	84.2
20	132	104	600	641	242	796	748	948	249	109	94.7	82.9
21	134	102	638	632	236	771	686	952	217	106	95.7	82.8
22	133	103	564	610	239	761	736	1,030	196	107	96.4	82.3
23	138	103	472	607	264	721	1,000	1,040	190	100	94.6	82.2
24	141	97.1	469	560	278	817	1,020	1,150	179	101	93.6	82.9
25	146	102	508	519	270	820	1,060	1,040	166	116	93.6	84.0
26	148	100	850	526	277	792	1,020	1,060	155	110	93.4	82.3
27	146	91.0	697	414	267	787	1,020	964	141	96.7	93.3	83.0
28	142	86.2	792	314	276	788	1,010	874	133	100	94.4	83.8
29	147		693	334	282	777	928	632	135	99.3	93.7	84.6
30	133		565	406	294	737	770	596	143	104	92.5	84.9
31	141		554		289		759	543		115		82.3
Sum	4,263	3,313.3	12,410.2	16,272	9,026	17,103	22,936	24,075	8,633	3,496.0	2,843.8	2,673.6

Month	Current Year 1951: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1924-1951: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Average 1942-1951
Jan.	3.30	2.82	1	193	14	122	138	8,460	10,955	17,500	7,770	11,012
Feb.	3.23	2.77	2	158	28	78.7	118	6,570	18,266	52,200	6,510	16,196
Mar.	6.10	2.70	26	2,840	11	15.8	400	24,600	39,625	62,500	18,400	41,510
Apr.	4.67	3.47	15	784	28	296	542	32,300	64,857	139,000	32,300	68,560
May	4.10	3.06	2	499	15	159	291	17,900	73,912	357,000	17,900	87,370
June	4.76	3.33	24	857	2	278	570	33,900	75,405	304,000	33,900	85,570
July	5.23	3.77	25	1,140	‡11	397	740	45,500	82,268	198,000	45,500	85,670
Aug.	5.43	3.86	24	1,220	12	443	777	47,800	84,734	158,000	47,800	82,790
Sept.	4.41	2.95	11	614	29	125	288	17,100	62,518	171,000	17,100	61,480
Oct.	3.00	2.75	25	165	29	89.9	113	6,930	25,605	57,900	6,930	25,393
Nov.	3.02	2.62	19	135	16	70.1	94.8	5,640	16,822	29,500	5,640	14,784
Dec.	2.78	2.61	1	97.9	21	78.0	86.2	5,300	15,816	27,700	5,300	14,506
Yearly	6.10	2.61		2,840		15.8	348	252,000	570,783	1,559,200	252,000	594,841

‡ And other days

RIO GRANDE BELOW AMERICAN DAM

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights, located 3,200 feet below the American Dam and 1.5 miles above the International Dam, west of El Paso, Texas. The American Dam is 1,241.4 river miles above the Gulf of Mexico. The zero of the gage is 3,712.30 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 50 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: June 1, 1938 through December 1951.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. The operation of the American Dam began June 2, 1938. At this dam, part of the flow passing the El Paso gaging station was diverted into the American Canal (see records of "Diversions from the Rio Grande") and the remainder, including excess flood flows, passed this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 6,770 second-feet on May 18, 1942, with a gage height of 9.77 feet., Min. .2 second-foot on September 12, 1951.

Average Flow in Second-Feet

Daily:	Max.	6,040	May 20, 1942	Min.	.7	Sept. 9, 1951
Monthly:	Max.	4,880	May 1942	Min.	2.0	Dec. 1942
Yearly:	Max.	1,510	1942	Min.	70.4	1951

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	90.2	* 14.0	83.3	31.8	56.5	103	135	165	43.6	12.7	7.4	7.0
2	147	* 13.0	84.2	44.4	72.5	102	108	160	34.9	12.0	7.2	6.0
3	140	* 12.0	81.2	38.4	77.9	101	115	164	16.3	12.1	6.9	6.0
4	144	* 11.0	76.5	35.5	116	92.5	112	165	9.5	13.3	6.7	6.2
5	148	* 13.0	77.4	36.3	117	89.0	106	169	12.0	13.4	6.4	6.0
6	142	* 12.5	74.5	37.2	111	93.4	101	178	12.0	15.9	6.2	5.8
7	140	* 12.0	70.9	36.8	112	93.2	91.8	182	8.0	14.8	6.2	6.0
8	137	* 11.5	76.2	36.6	83.0	92.9	89.6	187	1.5	12.7	6.2	6.3
9	138	* 11.0	67.5	35.3	83.8	95.1	87.3	186	.7	10.7	6.2	6.1
10	136	* 10.5	50.5	34.0	86.6	92.4	85.1	180	12.5	10.9	6.1	6.0
11	135	67.9	23.7	34.7	92.1	87.5	86.8	182	25.0	10.4	6.1	6.2
12	131	124	8.4	36.4	92.9	87.2	86.2	179	4.0	12.0	6.1	5.8
13	129	122	7.7	36.0	91.3	83.9	95.0	175	7.5	13.7	6.1	6.2
14	124	130	8.0	32.8	102	85.3	104	169	11.1	13.2	5.9	6.6
15	129	127	5.1	31.7	109	147	169	173	3.5	12.7	5.6	7.1
16	133	122	5.4	27.4	108	172	190	170	3.5	12.9	5.4	6.7
17	132	115	6.3	33.0	105	169	181	168	8.7	13.4	5.1	7.1
18	129	113	7.2	33.9	99.1	163	169	168	9.4	13.8	4.9	7.1
19	131	108	6.8	37.8	93.3	161	168	169	25.7	13.6	4.6	6.7
20	132	104	8.9	35.8	87.5	158	160	166	40.6	14.0	4.4	6.3
21	134	102	8.5	32.1	86.5	156	159	167	34.1	11.8	* 4.4	6.3
22	133	103	7.6	32.0	85.4	159	158	168	27.4	8.5	4.2	5.9
23	138	103	9.0	35.1	85.4	150	173	162	21.4	9.0	4.1	5.8
24	141	97.1	8.0	36.3	85.2	160	173	169	19.2	8.7	4.0	5.8
25	146	102	6.4	43.4	85.2	154	198	172	13.6	8.2	3.8	* 6.2
26	148	100	85.5	45.6	85.2	161	199	176	12.9	7.8	3.6	* 6.2
27	146	91.0	11.7	47.7	85.1	163	201	170	12.1	8.7	3.5	7.0
28	142	86.2	9.0	50.1	89.7	167	195	163	11.4	8.8	3.6	7.0
29	110		6.1	49.7	92.0	176	177	157	10.8	8.6	3.7	7.0
30	* 15.4		6.9	46.6	86.2	170	182	158	13.4	7.9	5.0	6.6
31	* 15.0		6.9		92.1		172	144		7.7		30.8
Sum	3,935.6	2,037.7	995.3	1,124.4	2,854.5	3,884.4	4,426.8	5,261	466.3	353.9	159.6	221.8

Month	Current Year 1951: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period June 1938-1951 Acre-Feet Normal	Maximum	Minimum	Average 1942-1951
Jan.	5.82		1	193	1	‡ 7.2	127	7,810	8,710	12,000	4,170	8,396
Feb.	5.58		14	137	11	‡ 10.0	72.8	4,040	5,168	32,800	521	5,941
Mar.	7.26	4.54	26	1,190	30	4.6	32.1	1,970	3,584	17,500	* 1,390	3,680
Apr.	5.06	4.59	13	57.1	1	6.5	37.5	2,230	12,628	74,500	2,230	13,917
May	5.78	4.96	7	244	1	42.4	92.1	5,660	34,658	300,000	5,660	41,176
June	5.66	5.31	16	187	5	77.3	129	7,700	29,306	250,000	7,700	34,962
July	5.75	5.30	15	224	9	82.6	143	8,780	23,330	155,000	8,780	26,982
Aug.	5.66	5.42	1	204	31	132	170	10,400	20,236	114,000	6,040	23,259
Sept.	5.45	4.58	1	140	12	.2	15.5	925	19,946	124,000	925	21,292
Oct.	4.73	4.52	21	18.8	26	6.7	11.4	702	3,796	19,000	197	3,725
Nov.	4.58	4.46	1	7.4	27	3.3	5.3	317	2,603	8,700	‡ 119	1,189
Dec.	5.25	4.54	31	97.4	¶13	5.4	7.2	440	1,658	7,760	120	604
Yearly	7.26			1,190		.2	70.4	50,974	165,623	1,093,553	50,974	185,123

‡ Estimated * Partly estimated ¶ And other days

RIO GRANDE AT JUAREZ, CHIHUAHUA

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights, located 2.9 river miles downstream from El Paso, Texas and Juárez, Chihuahua. This station is 7.0 river miles below the American Dam at El Paso, Texas and 4.9 river miles below the International Dam. The zero of the gage is 3,683.98 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 159 meter measurements during the year, 138 by the Mexican and 21 by the United States Section of this Commission, and a continuous record of gage heights. Computations by shifting channel methods. Records available: April 1, 1938 through December 1951.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 6,600 second-feet on May 18, 1942, with a gage height of 11.15 feet. Min. 15.2 second-feet on December 22, 1944, with a gage height of 2.17 feet.

Average Flow in Second-Feet

Daily:	Max.	6,460	May 20, 1942	Min.	17.0	Dec. 21, 1944
Monthly:	Max.	5,290	May 1942	Min.	45.9	Dec. 1947
Yearly:	Max.	1,820	1942	Min.	170	1951

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	144	59.7	80.9	315	136	45.9	328	309	106	114	39.6	* 55.8
2	136	56.1	70.6	273	156	42.0	335	267	71.0	97.5	41.7	* 81.2
3	129	59.0	69.2	239	145	45.6	255	288	54.7	102	42.4	* 77.7
4	137	57.2	57.6	231	102	54.0	263	228	37.4	87.6	95.3	* 91.8
5	112	59.7	56.1	230	¤ 87.9	52.3	295	244	38.8	40.6	96.8	* 91.5
6	115	59.3	53.7	220	¤ 62.2	77.3	222	329	32.8	38.8	86.2	* 80.5
7	107	55.4	54.7	170	138	51.9	81.6	* 250	29.7	33.9	84.0	* 75.9
8	105	56.1	65.7	162	159	55.1	65.3	* 148	31.1	36.0	81.2	* 95.0
9	109	52.6	57.6	246	64.6	51.6	51.2	144	58.3	37.1	78.4	* 87.9
10	113	51.6	53.3	291	51.2	52.6	53.0	109	209	35.0	84.0	* 87.9
11	135	62.5	160	388	45.2	64.3	55.4	65.3	396	33.9	75.6	* 95.0
12	133	102	240	410	44.8	207	54.0	79.5	357	37.8	87.6	87.9
13	133	100	302	413	41.0	184	171	191	367	41.0	82.6	87.9
14	133	105	334	396	46.6	182	261	278	337	41.3	77.0	87.9
15	141	104	424	441	43.1	242	360	267	254	102	81.6	66.7
16	137	95.3	371	434	49.8	295	340	245	101	95.0	85.5	39.6
17	127	91.8	357	317	42.0	374	399	308	50.9	87.2	67.8	44.1
18	130	94.3	396	281	39.6	424	413	345	53.7	95.2	43.1	44.1
19	129	104	445	315	42.0	505	346	371	43.4	89.3	43.1	39.6
20	124	91.8	¤ 399	291	39.9	491	305	501	50.5	95.3	43.8	39.6
21	119	80.9	¤ 445	297	42.0	353	228	508	42.4	80.9	44.5	39.6
22	115	88.6	¤ 371	274	¤ 33.2	424	280	579	35.3	83.7	41.7	35.0
23	115	90.8	¤ 314	270	¤ 42.4	392	516	558	28.6	82.3	43.1	32.5
24	116	82.6	¤ 309	228	¤ 43.4	445	664	671	36.7	67.5	39.2	35.0
25	135	86.5	¤ 309	181	¤ 33.5	480	643	597	116	49.4	39.6	32.5
26	122	84.4	¤ 872	202	¤ 35.3	413	646	667	115	45.9	44.8	32.5
27	113	71.0	¤ 438	¤ 117	39.6	364	614	568	106	43.1	45.2	32.5
28	103	73.5	¤ 586	¤ 45.9	164	364	650	498	97.5	39.9	40.6	32.5
29	106		¤ 487	¤ 56.5	123	357	583	224	101	45.9	41.7	30.0
30	82.3		385	¤ 134	168	327	339	166	111	43.8	48.0	27.9
31	70.3		385		66.4		319	139		54.4		57.9
Sum	3,725.6	2,175.7	*8,948.4	7,868.4	2,326.7	7,415.6	10,135.5	10,141.8	3,468.8	1,977.3	1,845.7	*1,845.5

Month	Current Year 1951: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period April 1938-1951: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Average 1942-1951
Jan.	3.44	2.95	1	201	31	64.6	120	7,390	10,798	13,270	7,390	10,858
Feb.	3.54	2.72	11	219	11	42.4	77.7	4,320	10,610	42,690	4,320	11,598
Mar.	6.04	2.46	26	¤ 2,490	11	16.6	*289	* 17,750	26,507	45,790	14,140	28,678
Apr.	4.56		15	477	28	¤ 45.9	262	15,610	41,981	111,500	15,610	44,797
May	4.10	2.53	7	353	22	28.6	75.1	4,620	48,958	325,100	4,620	57,304
June	4.79	2.62	28	512	6	37.4	247	14,710	52,047	272,400	14,710	57,602
July	5.38	2.69	23	904	12	47.3	327	20,100	52,892	162,500	20,100	56,112
Aug.	5.41	2.62	24	735	11	56.9	327	20,120	50,372	127,300	20,120	52,400
Sept.	4.30	2.46	11	413	24	19.1	116	6,880	37,701	143,800	6,880	37,876
Oct.	3.35	2.46	20	181	11	27.9	63.8	3,920	17,137	45,390	3,920	17,875
Nov.	3.54	2.56	16	185	3	33.2	61.5	3,660	9,102	13,670	3,570	7,941
Dec.	3.18	2.43	31	132	31	20.5	* 59.5	* 3,660	9,511	18,060	2,820	9,270
Yearly	6.04			¤ 2,490		16.6	170	122,740	367,616	1,315,890	122,740	392,311

¤ Estimated * Partly estimated

RIO GRANDE AT ISLAND STATION

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights, located near Clint, Texas and San Agustín, Chihuahua. This station is on the rectified channel of the Rio Grande 27.1 river miles below the American Dam at El Paso, Texas. The zero of the gage is 3,608.99 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 49 meter measurements during the year, 37 by the United States and 12 by the Mexican Section of this Commission, and a continuous record of gage heights. Computations by shifting channel methods. Records available: August 17, 1938 through December 1951.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 6,490 second-feet on May 19, 1942, with a gage height of 16.06 feet. Min. occasionally no flow.

Average Flow in Second-Feet

Daily:	Max.	6,140	May 19, 1942	Min.	0	occasionally
Monthly:	Max.	4,880	May 1942	Min.	0	Oct., Nov., & Dec. 1951
Yearly:	Max.	1,490	1942	Min.	12.3	1951

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	90.3	62.1	9.2	9.5	5.0	1.3	2.6	6.9	7.3	0	0	0
2	91.2	56.7	8.8	9.5	5.0	1.0	4.0	6.8	5.0	0	0	0
3	91.2	57.9	8.4	8.9	5.4	1.0	4.4	7.2	3.4	0	0	0
4	91.0	39.3	8.0	7.6	5.0	1.6	4.3	7.4	2.8	0	0	0
5	95.1	21.3	7.5	7.2	4.6	1.5	5.1	6.2	2.8	0	0	0
6	97.2	14.3	7.4	7.5	4.1	.9	6.3	6.0	1.3	0	0	0
7	93.3	11.3	7.3	8.1	4.3	.7	4.6	7.2	.7	0	0	0
8	93.3	15.6	6.8	7.8	5.1	.5	2.4	5.8	.5	0	0	0
9	95.4	9.3	6.5	8.1	5.1	.5	1.4	5.5	.3	0	0	0
10	93.5	8.6	6.4	8.1	4.2	0	1.2	4.8	.3	0	0	0
11	91.6	7.8	7.2	8.1	3.6	0	.9	3.0	* 2.8	0	0	0
12	91.2	30.3	7.6	9.2	3.2	* 1.8	.6	.9	* 3.2	0	0	0
13	88.6	18.2	9.0	9.5	2.5	* 3.4	.4	.9	2.6	0	0	0
14	86.1	16.7	10.2	9.8	2.0	3.3	.5	2.4	3.7	0	0	0
15	85.5	* 15.9	10.6	10.1	2.3	3.6	.5	2.6	4.5	0	0	0
16	89.0	11.9	11.0	9.9	2.8	3.5	‡ .8	1.6	4.1	0	0	0
17	86.4	10.5	11.0	9.6	3.4	4.0	‡ 1.7	.8	2.2	0	0	0
18	85.9	9.0	10.4	7.1	3.4	4.6	* 4.4	1.6	1.1	0	0	0
19	91.4	8.0	10.7	6.1	3.2	4.1	5.5	2.1	.3	0	0	0
20	91.0	6.6	10.7	8.4	3.1	3.0	5.5	2.4	0	0	0	0
21	84.5	7.2	* 10.0	7.8	2.0	2.1	4.1	2.2	0	0	0	0
22	88.1	7.4	‡ 10.4	6.9	1.3	1.0	2.1	3.5	0	0	0	0
23	87.7	7.9	9.6	6.7	1.2	1.1	2.9	5.6	0	0	0	0
24	85.6	8.1	9.4	6.2	1.3	.5	7.8	7.3	0	0	0	0
25	87.4	10.5	8.9	5.5	.8	.9	11.4	7.1	0	0	0	0
26	85.4	10.2	* 157	5.6	0	2.2	9.1	63.2	0	0	0	0
27	83.2	9.8	‡ 18.6	5.7	0	2.1	7.2	53.1	0	0	0	0
28	79.1	9.6	* 12.0	5.8	0	2.4	4.8	12.6	0	0	0	0
29	74.9		* 22.1	4.8	1.4	2.6	5.8	8.3	0	0	0	0
30	74.8		11.9	4.3	1.3	2.1	4.8	16.8	0	0	0	0
31	41.2		11.3		1.4		3.9	22.2		0		0
Sum	2,690.1	502.0	* 455.9	229.4	88.0	57.3	121.0	284.0	48.9	0	0	0

Month	Current Year 1951: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period Sept. 1938-1951 Acre-Feet Normal	Maximum	Minimum	Average 1942-1951
Jan.	10.10	9.60	1	125	31	33.0	86.8	5,340	8,781	11,900	5,340	8,856
Feb.	9.89	9.09	12	72.3	20	6.6	17.9	996	6,990	37,000	996	7,962
Mar.	11.80	9.07	26	1,300	10	6.4	* 14.7	* 904	4,618	21,000	876	5,450
Apr.	9.33	9.17	14	10.4	30	3.9	7.6	455	8,793	70,500	455	10,549
May	9.22		‡ 2	5.4	‡25	0	2.8	175	26,130	299,800	175	32,982
June	9.25		18	4.6	‡10	0	1.9	114	22,076	241,000	114	27,243
July	9.51	8.89	24	22.0	13	.2	3.9	240	16,767	* 118,500	240	20,004
Aug.	10.08	9.00	27	116	‡12	.5	9.2	563	15,288	99,400	563	15,654
Sept.	9.38		1	8.5	‡19	0	1.6	97.0	17,871	* 119,200	97.0	17,862
Oct.				0		0	0	0	8,075	42,800	0	9,589
Nov.				0		0	0	0	1,894	7,270	0	2,204
Dec.				0		0	0	0	3,660	12,900	0	3,748
Yearly	11.80			1,300		0	12.3	8,884	140,943	1,079,340	8,884	162,103

‡ Estimated * Partly estimated ‡ And other days

RIO GRANDE AT COUNTY LINE

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights, located .8 mile downstream from the El Paso-Hudspeth county line. This gaging station is on the rectified channel of the Rio Grande 47.3 river miles below the American Dam at El Paso, Texas. The zero of the gage is 3,547.59 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 10 meter measurements during the year, 6 by the United States and 4 by the Mexican Section of this Commission, and a continuous record of gage heights. Computations by shifting channel methods. Records available: January 1, 1938 through December 1951.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 6,340 second-feet on May 19, 1942, with a gage height of 8.66 feet. Min. occasionally no flow.

Average Flow in Second-Feet

Daily:	Max.	6,180	May 18, 1942	Min.	0	occasionally
Monthly:	Max.	4,920	May 1942	Min.	0	8 months, 1951
Yearly:	Max.	1,720	1942	Min.	8.0	1951

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	114	25.5	0	0	0	0	0	0	0	0	0	0
2	120	29.4	0	0	0	0	0	0	0	0	0	0
3	105	16.9	¤ 1.0	0	0	0	0	0	0	0	0	0
4	104	15.8	¤ 1.0	0	0	0	0	0	0	0	0	0
5	104	3.2	¤ 1.0	0	0	0	0	0	0	0	0	0
6	105	0	¤ 1.0	0	0	0	0	0	0	0	0	0
7	109	0	2.8	0	0	0	0	0	0	0	0	0
8	106	0	0	0	0	0	0	0	0	0	0	0
9	106	0	0	0	0	0	0	0	0	0	0	0
10	103	0	0	0	0	0	0	0	0	0	0	0
11	102	0	0	0	0	0	0	0	0	0	0	0
12	102	0	0	0	0	0	0	0	0	0	0	0
13	103	0	0	0	0	0	0	0	0	0	0	0
14	99.8	0	0	0	0	0	0	0	0	0	0	0
15	101	0	0	0	0	0	0	0	0	0	0	0
16	120	0	0	0	0	0	0	0	0	0	0	0
17	123	* .4	0	0	0	0	0	0	0	0	0	0
18	117	0	0	0	0	0	0	0	0	0	0	0
19	105	0	0	0	0	0	0	0	0	0	0	0
20	94.2	0	0	0	0	0	0	0	0	0	0	0
21	92.9	0	0	0	0	0	0	0	0	0	0	0
22	76.9	0	0	0	0	0	0	0	0	0	0	0
23	60.2	0	0	0	0	0	0	0	0	0	0	0
24	58.6	0	0	0	0	0	0	0	0	0	0	0
25	57.0	0	0	0	0	0	0	0	0	0	0	0
26	56.9	0	1.3	0	0	0	0	0	0	0	0	0
27	56.9	0	5.8	0	0	0	0	0	0	0	0	0
28	53.5	0	0	0	0	0	0	0	0	0	0	0
29	50.4		0	0	0	* 5.4	0	0	0	0	0	0
30	50.3		0	0	0	* 3.0	0	0	0	0	0	0
31	51.3		0		0		0	0		0		0
Sum	2,807.9	91.2	* 13.9	0	0	* 8.4	0	0	0	0	0	0

Month	Current Year 1951: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1938-1951: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Average 1942-1951
Jan.	3.15	2.47	1	144	31	41.6	90.6	5,570	14,129	20,000	5,570	14,040
Feb.	2.67		2	60.6	‡ 5	0	3.3	181	12,213	47,900	181	12,836
Mar.	2.94		27	100	‡ 1	0	* .4	* 27.6	10,697	38,900	* 27.6	11,048
Apr.				0		0	0	0	16,202	84,200	0	17,589
May				0		0	0	0	31,230	303,000	0	38,628
June	1.97		29	* 11.0	‡ 1	0	* .3	* 16.7	27,586	239,000	* 16.7	31,710
July				0		0	0	0	25,189	140,000	0	26,046
Aug.				0		0	0	0	24,150	123,000	0	24,100
Sept.				0		0	0	0	27,630	140,000	0	26,262
Oct.				0		0	0	0	18,424	61,400	0	18,653
Nov.				0		0	0	0	12,428	20,400	0	12,207
Dec.				0		0	0	0	13,709	29,700	0	13,556
Yearly	3.15			144		0	8.0	5,795.3	233,587	1,247,500	5,795.3	246,675

¤ Estimated * Partly estimated ‡ And other days

RIO GRANDE AT FORT QUITMAN, TEXAS

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights, located on the rectified channel of the Rio Grande 1.5 miles below Old Fort Quitman and 81.1 river miles below the American Dam at El Paso, Texas. The zero of the gage is 3,450.57 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 44 meter measurements during the year, 35 by the United States and 9 by the Mexican Section of this Commission, and a continuous record of gage heights, except during the period April through July when the very low flows were based on hydrographer's estimates. Computations by shifting channel methods. Records available: January 1923 through December 1951.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 10,600 second-feet October 5, 1946, with a gage height of 10.00 feet. Min. occasionally no flow.

Average Flow in Second-Feet

Daily:	Max.	5,890	May 19, 1942	Min.	0	occasionally
Monthly:	Max.	5,030	May 1942	Min.	¤ .3	May & June 1951
Yearly:	Max.	1,750	1942	Min.	* 35.5	1951

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	93.8	49.6	35.2	8.4	¤ 5.6	0	0	0	¤ 19.4	17.9	27.1	24.0
2	126	46.8	34.8	19.5	¤ .2	0	0	0	¤ 20.0	17.1	24.9	27.3
3	126	92.7	34.3	24.2	¤ .2	0	0	0	¤ 21.3	17.5	25.0	28.0
4	115	95.4	34.5	25.5	¤ .2	0	0	10.4	¤ 23.3	18.4	26.2	25.9
5	109	79.1	37.9	23.0	¤ .2	¤ 3.8	33.6	58.4	* 27.6	14.6	55.9	26.6
6	97.1	56.2	39.7	20.0	¤ .2	¤ .4	0	16.9	23.1	17.8	40.7	22.1
7	100	52.9	38.5	16.5	¤ .2	¤ 3.4	0	0	20.0	15.2	37.2	21.3
8	99.7	62.2	36.7	11.4	¤ .2	¤ .2	0	0	19.3	18.3	38.2	22.7
9	106	54.2	35.6	16.7	¤ .2	¤ .2	0	0	60.6	18.0	35.7	23.0
10	106	50.3	33.8	16.9	¤ .2	¤ .2	0	0	50.3	18.3	31.3	24.5
11	101	57.7	31.2	17.6	¤ .2	¤ .2	0	45.2	* 17.8	14.7	27.0	32.8
12	97.4	52.9	36.3	11.4	¤ .2	¤ .2	0	54.6	16.6	17.4	28.0	26.0
13	85.4	45.2	32.3	¤ 3.0	¤ .2	¤ .2	0	28.6	17.0	22.1	25.5	23.8
14	85.4	54.4	32.8	¤ 3.0	¤ .2	¤ .2	0	19.8	16.9	24.4	21.2	25.8
15	95.4	47.6	28.4	¤ 6.0	¤ .2	¤ .2	2.0	0	19.0	28.0	20.0	24.8
16	101	42.6	31.9	¤ 3.0	¤ .2	¤ .2	337	0	20.0	35.3	18.7	24.6
17	106	40.6	28.9	¤ 1.8	¤ .2	¤ .2	116	0	22.3	27.0	18.6	24.5
18	114	48.2	34.2	¤ 1.8	¤ .2	¤ .2	¤ .3	0	29.3	35.2	17.2	25.3
19	96.8	54.1	34.2	¤ 4.0	¤ .2	¤ .2	¤ .3	0	15.5	27.8	18.3	24.3
20	82.7	54.0	32.6	¤ 4.0	¤ .1	¤ .2	¤ .3	0	13.5	26.4	18.2	28.1
21	72.5	48.8	25.5	0	¤ .1	0	¤ .2	0	15.0	22.7	22.7	¤ 45.5
22	79.7	45.0	16.9	0	0	0	¤ .2	179	14.1	23.6	23.9	¤ 51.8
23	73.1	42.9	16.2	0	0	0	¤ .2	399	16.7	19.9	25.7	¤ 58.1
24	56.2	42.6	14.2	0	0	0	¤ .1	¤ 1.0	17.6	16.3	32.9	¤ 65.4
25	51.3	40.6	15.4	0	0	0	¤ .1	4.8	16.8	21.3	29.2	¤ 65.4
26	50.4	43.8	16.1	0	0	0	¤ .1	68.4	18.2	27.4	27.4	* 50.5
27	50.6	42.7	10.4	0	0	0	¤ .1	128	18.6	25.5	31.0	44.0
28	49.0	38.8	22.9	0	0	0	0	* 15.2	20.2	24.7	27.4	38.5
29	49.1		20.7	0	0	0	0	¤ 1.0	17.1	21.6	23.4	34.0
30	49.3		9.9	¤ 3.4	0	0	0	* 2,900	17.5	23.1	23.1	41.1
31	49.4		8.7		0		0	¤ 52.9		27.0		50.3
Sum	2,674.3	1,481.9	860.7	241.1	¤ 9.4	¤ 10.2	490.5	* 3,983.2	644.6	684.5	821.6	*1,050.0

Month	Current Year 1951: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1924-1951: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Average 1942-1951
Jan.	2.89	2.28	2	141	27	48.8	86.3	5,300	12,923	20,900	5,300	14,603
Feb.	2.98	2.15	3	130	28	35.0	52.9	2,940	12,862	50,100	2,940	13,991
Mar.	2.24	1.71	6	44.1	31	7.6	27.8	1,710	10,680	38,900	1,090	10,589
Apr.	2.09		2	27.5	‡21	0	8.0	478	13,294	* 77,000	478	14,430
May			1	¤ 6.7	‡22	0	¤ .3	¤ 18.6	24,089	309,000	¤ 18.6	38,811
June			5	ϕ¤ 3.8	‡ 1	0	¤ .3	¤ 20.2	21,948	240,000	¤ 20.2	31,691
July	6.21		16	2,830	‡ 1	0	15.8	973	22,248	140,000	973	26,130
Aug.	10.76		30	10,400	‡ 1	0	*128	* 7,900	27,775	* 127,000	2,490	23,313
Sept.	2.77	1.78	9	166	20	11.6	21.5	1,280	31,729	147,000	1,280	28,654
Oct.	1.99	1.75	26	43.6	11	12.6	22.1	1,360	23,392	66,500	1,360	25,066
Nov.	2.06	1.80	5	63.9	18	12.6	27.4	1,630	15,052	24,500	1,630	14,273
Dec.	2.28	1.85	¤ 24	69.2	6	17.5	* 33.9	* 2,080	15,545	31,000	* 2,080	14,954
Yearly	10.76			10,400		0	* 35.5	*25,689.8	231,537	1,270,400	*25,689.8	256,505

¤ Estimated * Partly estimated ‡ And other days ϕ Mean daily

RIO GRANDE AT UPPER PRESIDIO STATION

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights, located 7.8 river miles above the confluence of the Río Conchos, about 10 miles northwest of Presidio, Texas and Ojinaga, Chihuahua, and 285.7 river miles below the American Dam at El Paso, Texas. The zero of the gage is 2,576.66 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 22 meter measurements during the year and a continuous record of gage heights. The gage height record was affected by backwater during the period February 16 to May 9 and several other short periods of low flow. Computations by shifting channel methods. Records available: May 1900 to March 1914 and August 1923 through December 1951.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 15,200 second-feet on June 12, 1912. A gage height of 10.57 feet was recorded on May 26, 1942, with a flow of 5,160 second-feet. This level was the highest reached during the years 1923-1951, inclusive. Min. occasionally no flow.

Average Flow in Second-Feet

Daily:	Max.	15,200	June 12, 1912	Min.	0	occasionally
Monthly:	Max.	10,150	June 1912	Min.	0	occasionally
Yearly:	Max.	1,970	1907	Min.	23.8	1951

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	66.1	39.0	‡ 2.5	‡ .9	‡ .1	0	0	.2	136	0	0	0
2	60.0	40.2	‡ 2.0	‡ .9	‡ .1	16.8	114	0	552	0	0	0
3	54.3	35.2	* 1.5	‡ .8	‡ .1	76.5	27.0	0	130	0	0	0
4	51.6	33.8	‡ 1.5	‡ .7	‡ .1	174	1.8	0	‡ 30.5	0	0	0
5	55.4	29.6	‡ 1.5	‡ .6	‡ .1	18.4	71.0	0	‡ 3.3	0	0	0
6	59.3	30.2	‡ 1.5	‡ .6	‡ .1	3.2	6.9	0	‡ .4	0	0	0
7	60.3	31.0	‡ 1.5	‡ .5	‡ .1	‡ .3	1.2	0	‡ .2	0	0	0
8	62.3	28.4	‡ 1.5	‡ .4	‡ .1	‡ .2	1.1	0	0	0	0	0
9	66.6	21.3	* 1.5	‡ .4	‡ .1	‡ .1	1.0	0	0	0	0	0
10	60.4	22.7	‡ 1.5	‡ .3	0	0	.9	0	136	0	0	0
11	52.7	22.0	‡ 1.5	‡ .3	0	0	.8	0	335	0	0	0
12	51.0	22.4	‡ 1.5	‡ .2	0	0	.8	0	517	0	0	0
13	52.8	15.7	‡ 1.5	* .2	0	0	1.2	0	570	0	0	0
14	56.6	16.7	‡ 1.5	‡ .2	0	0	38.6	0	* 277	0	0	0
15	56.5	17.1	‡ 1.5	‡ .2	0	0	114	0	* 77.3	0	0	0
16	53.6	‡ 15.7	* 1.5	‡ .2	0	0	6.8	0	39.6	0	0	0
17	51.7	‡ 14.2	‡ 1.5	‡ .2	0	0	1.9	0	15.2	.2	0	0
18	51.6	‡ 12.8	‡ 1.5	‡ .2	0	0	.2	0	* 2.0	.1	0	0
19	48.1	‡ 11.4	‡ 1.5	‡ .2	0	0	0	0	* .4	0	0	0
20	48.0	‡ 9.9	‡ 1.5	‡ .1	‡ .1	0	.1	0	* .2	0	0	0
21	50.5	‡ 8.5	‡ 1.5	‡ .1	0	0	0	0	* .1	0	0	0
22	53.1	‡ 7.0	‡ 1.5	‡ .1	0	0	0	0	* .1	0	0	0
23	59.7	* 5.6	‡ 1.5	‡ .1	0	0	0	0	0	0	0	0
24	56.7	‡ 5.1	‡ 1.5	‡ .1	26.4	0	291	0	0	0	0	0
25	55.6	‡ 4.8	‡ 2.0	‡ .1	115	0	992	0	0	0	0	0
26	52.7	‡ 4.1	‡ 1.5	‡ .1	6.0	0	446	0	0	0	0	0
27	52.4	‡ 3.6	‡ 1.0	* .1	‡ .5	0	153	0	0	0	0	0
28	52.1	‡ 3.0	‡ 1.0	‡ .1	‡ .3	0	28.1	312	0	0	0	0
29	49.1		‡ 1.0	‡ .1	‡ .1	0	22.0	165	0	0	0	0
30	43.5		‡ 1.0	‡ .1	0	0	3.6	238	0	0	0	0
31	42.5		‡ 1.0		‡ .1		‡ .5	140		0		0
Sum	1,686.8	511.0	‡ 46.0	‡ 9.1	149.4	289.5	2,325.5	855.2	2,822.3	.3	0	0

Month	Current Year 1951: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1924-1951: Acre-Feet Normal	Maximum	Minimum	Average 1942-1951
Jan.	2.84	2.48	6	77.5	31	40.0	54.4	3,350	12,156	24,400	644	14,633
Feb.	2.53		2	43.6	28	ϕ‡ 3.0	18.2	1,010	11,257	40,800	1,010	12,580
Mar.			1	ϕ‡ 2.5	‡27	ϕ‡ 1.0	‡ 1.5	‡ 91.2	8,922	39,100	‡ 91.2	9,876
Apr.			‡ 1	ϕ‡ .9	‡20	ϕ‡ .1	‡ .3	‡ 18.0	7,322	41,600	0	7,266
May	4.93		24	277	‡10	0	4.8	296	17,536	240,000	0	27,265
June	6.38		4	580	‡ 1	0	9.6	574	16,976	216,000	* 218	26,376
July	8.86		25	1,080	‡ 1	0	75.0	4,610	23,240	158,000	* 13.1	29,238
Aug.	5.80		30	463	‡ 2	0	27.6	1,700	29,692	133,000	* 128	21,332
Sept.	7.62		12	826	‡ 8	0	94.1	5,600	34,229	* 151,000	602	28,582
Oct.	2.30		17	4.3	‡ 1	0	0	.6	29,236	105,000	0	26,316
Nov.				0		0	0	0	14,156	34,500	0	11,637
Dec.				0		0	0	0	13,753	30,900	0	13,097
Yearly	8.86			1,080		0	23.8	17,249.8	218,475	1,176,700	17,249.8	228,198

‡ Estimated * Partly estimated ‡ And other days ϕ Mean daily

RIO CONCHOS AT CUCHILLO PARADO, CHIHUAHUA

DESCRIPTION: Water-stage recorder and cable with cable car, located in Salineta Canyon, 3.1 miles north of the town of Cuchillo Parado, Chihuahua, 28.6 air-line miles westward from Ojinaga, Chihuahua and 49.1 river miles above the confluence of the Río Conchos with the Rio Grande, which is 293.5 river miles below the American Dam at El Paso, Texas. The zero of the gage is 2,914.23 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 211 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: January 1, 1945 through December 1951.

REMARKS: The flow of this stream is modified by irrigation diversions and drainage returns and by the operation of La Rosetilla, La Colina, and La Boquilla reservoirs situated 139, 199, and 206 river miles, respectively, above this station and also by Madero Reservoir on the Río San Pedro, which enters the Río Conchos 122 river miles above this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 34,360 second-feet on October 9, 1945, with a gage height of 15.85 feet. Min. 53.3 second-feet on September 17, 1945, with a gage height of 2.00 feet.

Average Flow in Second-Feet

Daily:	Max.	17,660	Oct. 9, 1945	Min.	57.2	Sept. 17, 1945
Monthly:	Max.	3,580	Sept. 1946	Min.	120	Sept. 1945
Yearly:	Max.	972	1946	Min.	494	1948

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	364	537	770	307	388	724	555	784	289	313	367	378
2	477	809	975	452	427	568	597	646	322	326	470	353
3	431	932	1,010	299	639	734	639	547	346	316	357	374
4	381	1,010	1,020	244	399	749	724	512	491	281	417	452
5	501	1,010	964	275	321	749	671	427	364	290	519	367
6	448	791	756	336	328	812	650	466	280	337	364	413
7	597	823	791	309	431	802	533	388	257	364	307	374
8	526	795	798	283	360	749	512	413	246	470	427	338
9	473	675	837	265	385	724	495	371	280	399	456	310
10	424	957	862	266	392	653	431	353	300	455	406	263
11	537	1,040	854	227	773	643	406	696	703	491	530	317
12	554	1,090	816	227	961	699	449	622	431	402	452	321
13	611	1,060	748	288	509	682	657	643	367	378	357	323
14	713	1,170	681	299	396	699	826	501	310	357	360	357
15	780	1,080	657	337	323	639	1,730	417	360	364	338	371
16	692	886	604	340	296	533	1,790	509	406	342	326	322
17	448	1,270	500	378	512	593	1,980	367	459	378	350	303
18	445	978	540	341	431	607	1,180	360	893	311	319	334
19	526	1,010	505	385	660	590	908	338	964	313	321	343
20	523	1,090	438	367	657	530	929	318	675	353	334	287
21	516	946	459	367	699	572	823	364	494	329	371	319
22	509	1,010	455	331	731	572	763	350	452	338	326	315
23	565	1,230	590	327	777	410	936	392	424	314	295	333
24	622	1,210	385	516	961	385	840	336	452	311	315	385
25	494	1,250	335	413	749	544	1,120	315	399	406	302	350
26	523	1,230	480	403	727	410	1,250	302	385	343	344	315
27	512	812	388	413	735	509	805	403	364	378	333	327
28	537	752	410	338	989	509	657	367	334	381	288	351
29	579		402	347	735	791	671	341	316	530	272	300
30	554		346	385	692	696	685	445	299	347	306	307
31	491		308		809		699	311		519		313
Sum	16,353	27,453	19,684	10,065	18,192	18,877	25,911	13,604	12,662	11,436	10,929	10,515

Month	Current Year 1951: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1945-1951: Acre-Feet Average	Acre-Feet Maximum	Acre-Feet Minimum
Jan.	3.87	2.53	15	964	1	353	528	32,440	43,525	55,810	32,440
Feb.	4.95	2.72	17	1,670	1	452	980	54,450	47,173	62,420	35,130
Mar.	4.46	2.26	2	1,320	30	287	635	39,040	41,310	49,780	32,280
Apr.	3.22	2.03	24	643	12	210	335	19,960	17,027	29,110	8,420
May	5.28	2.33	12	1,880	16	285	587	36,080	18,545	36,080	9,540
June	4.10	2.53	6	1,080	24	340	629	37,440	24,148	44,030	13,990
July	5.87	2.53	16	2,330	12	364	836	51,390	70,067	178,500	11,570
Aug.	4.99	2.23	11	1,590	25	278	439	26,980	59,637	142,100	19,830
Sept.	4.63	2.13	18	1,470	8	237	422	25,110	91,791	213,300	7,150
Oct.	3.41	2.26	17	731	5	270	369	22,680	79,335	180,200	22,680
Nov.	3.25	2.20	11	675	29	263	364	21,680	47,880	62,870	21,680
Dec.	2.89	2.13	4	491	10	237	339	20,860	33,953	45,570	19,610
Yearly	5.87	2.03		2,330		210	536	388,110	574,391	703,660	358,630

RIO CONCHOS NEAR OJINAGA, CHIHUAHUA

DESCRIPTION: The Río Conchos enters the Rio Grande 3.7 miles above the international highway bridge between Presidio, Texas and Ojinaga, Chihuahua, 2.0 miles above the Lower Presidio gaging station on the Rio Grande, 7.8 miles below the Upper Presidio gaging station on the Rio Grande, and 293.5 river miles below the American Dam at El Paso, Texas.

RECORDS: Based on discharge records of the Rio Grande at Upper Presidio and Lower Presidio stations and estimated irrigation diversions and arroyo inflow between these two stations. Records available: May 1900 to March 1914 and August 1923 through December 1951.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. La Colina Reservoir, with 19,500 acre-feet capacity and a maximum surface area of 1,160 acres, located about 10.5 miles downstream from La Boquilla Dam, and La Rosetilla Reservoir, located about 52.7 miles farther downstream, with a capacity of 15,400 acre-feet and a maximum surface area of 840 acres, are used for power development. Francisco I. Madero Reservoir, located on the Río San Pedro, a tributary to the Río Conchos, has a capacity of about 344,550 acre-feet. Power generation facilities: La Boquilla 14,647 kw., La Colina 3,620 kw., La Rosetilla 5,150 kw., Francisco I. Madero none.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 162,000 second-feet on September 11, 1904. Min. 3.0 second-feet on May 14, 1904.

Average Flow in Second-Feet

Daily:	Max.	148,900	Sept. 11, 1904	Min.	5.0	May 14, 1904
Monthly:	Max.	24,540	Sept. 1904	Min.	11.0	May 1902
Yearly:	Max.	3,710	1906	Min.	502	1951

Month	Current Year 1951						Period 1924-1951			Acre-Feet	
	Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			Average 1942-1951	# Average 1945-1951
	High		Low				Normal	Maximum	Minimum		
	Day		Day								
Jan.	16	855	5	366	509	31,300	58,097	147,000	20,300	49,460	44,386
Feb.	18	1,510	2	446	952	52,900	51,053	87,700	29,100	46,970	47,271
Mar.	5	1,170	31	294	637	39,200	45,793	80,800	20,800	44,320	41,657
Apr.	25	474	14	176	278	16,600	31,074	79,700	5,000	18,380	16,028
May	12	1,330	7	259	514	31,600	37,317	148,000	3,950	19,912	17,617
June	4	* 4,750	25	328	629	37,400	42,358	91,900	8,720	27,190	22,685
July	24	2,320	13	262	792	48,700	89,461	502,000	8,890	78,469	72,499
Aug.	28	4,310	‡21	229	403	24,800	125,568	601,000	11,300	85,280	59,585
Sept.	19	1,190	9	151	346	20,600	255,918	1,173,000	6,770	227,437	93,239
Oct.	18	524	6	235	327	20,100	158,039	798,000	20,100	109,290	86,128
Nov.	12	548	30	254	348	20,700	61,225	110,000	20,700	52,840	49,243
Dec.	15	402	11	253	317	19,500	52,996	97,700	19,500	41,890	35,800
Yearly		* 4,750		151	502	363,400	1,008,899	2,431,850	363,400	801,438	586,138

* Partly estimated ‡ And other days # Cuchillo Parado Station began operating January 1, 1945

RIO GRANDE AT LOWER PRESIDIO STATION

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights, located about 1.7 miles above the international highway bridge between Presidio, Texas and Ojinaga, Chihuahua, 2.0 miles below the confluence of the Río Conchos with the Rio Grande, and 295.5 river miles below the American Dam at El Paso, Texas. The zero of the gage is 2,556.42 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 131 meter measurements during the year, 115 by the United States and 16 by the Mexican Section of this Commission, and a continuous record of gage heights. Computations by shifting channel methods. Records available: May 1900 to July 1915 and August 1923 through December 1951.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 162,000 second-feet on September 11, 1904. Min. 3.0 second-feet on May 14, 1904.

Average Flow in Second-Feet

Daily:	Max.	149,200	Sept. 11, 1904	Min.	5.0	May 14, 1904
Monthly:	Max.	24,870	Sept. 1904	Min.	11.0	May 1902
Yearly:	Max.	4,870	1906	Min.	523	1951

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	520	527	777	287	322	758	533	562	294	267	461	276
2	467	622	708	280	324	607	680	660	836	279	358	330
3	506	838	956	367	402	1,090	638	493	447	278	437	319
4	467	930	963	298	472	1,920	681	426	339	266	364	319
5	429	1,030	999	239	355	837	778	407	403	245	385	371
6	543	974	958	220	292	766	548	342	278	248	477	337
7	502	818	705	275	264	815	524	370	222	277	361	362
8	623	855	880	268	328	793	431	295	189	299	318	343
9	553	792	754	249	289	716	416	294	160	371	386	328
10	518	731	822	220	303	651	394	270	270	342	408	305
11	473	1,010	848	219	352	585	350	329	823	366	381	271
12	570	1,050	824	206	834	622	330	648	1,000	407	471	291
13	576	1,070	786	191	618	621	380	472	840	363	405	321
14	705	1,050	713	199	446	637	685	472	609	337	343	336
15	741	1,170	660	224	356	625	1,270	345	371	328	340	359
16	804	1,070	617	252	302	555	1,380	304	358	333	322	350
17	678	900	586	231	261	503	2,020	387	362	324	309	316
18	511	1,290	510	256	413	528	1,570	286	333	378	320	286
19	496	974	544	253	506	525	1,060	279	873	309	314	306
20	537	1,010	515	291	563	492	820	271	653	303	312	325
21	541	1,090	444	286	612	442	843	255	488	322	311	283
22	541	925	451	297	637	460	705	269	376	312	330	302
23	543	996	449	297	644	470	646	257	356	315	310	304
24	620	1,210	530	288	750	368	1,520	291	346	301	287	314
25	616	1,170	391	410	981	348	1,940	258	363	300	289	349
26	545	1,180	482	352	643	436	1,590	252	325	370	296	334
27	558	1,180	440	332	661	346	1,360	287	325	336	310	292
28	546	711	367	325	709	408	653	1,620	323	349	304	294
29	565		382	294	951	405	714	720	298	375	264	320
30	590		373	280	629	675	601	480	286	452	263	294
31	588		321		708		595	551		358		285
Sum	17,472	27,173	19,755	8,186	15,927	19,004	26,655	13,152	13,146	10,110	10,436	9,822

Month	Current Year 1951: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1924-1951: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Average 1942-1951
Jan.	2.74	1.88	16	909	5	420	564	34,700	70,347	164,000	30,400	64,360
Feb.	3.51	2.04	18	1,520	2	487	970	53,900	62,307	99,700	33,900	59,540
Mar.	3.09	1.63	5	1,170	31	295	637	39,200	54,689	89,400	21,200	54,180
Apr.	1.99	1.36	25	474	25	176	273	16,200	37,814	84,100	4,460	25,271
May	3.30	1.52	12	1,330	7	259	514	31,600	54,553	270,000	3,660	46,940
June	* 6.33	1.67	4	* 5,110	25	328	633	37,700	59,048	267,000	9,250	53,440
July	4.39	1.63	24	2,320	13	263	860	52,900	111,896	564,000	8,910	107,181
Aug.	6.15	1.45	28	4,750	‡21	229	424	26,100	155,172	675,000	18,400	106,420
Sept.	3.37	1.42	12	1,240	9	151	438	26,100	290,292	1,324,000	7,370	256,077
Oct.	2.14	1.48	18	524	6	235	326	20,100	187,286	864,000	20,100	135,530
Nov.	2.20	1.55	12	548	30	254	348	20,700	75,392	141,000	20,700	64,450
Dec.	1.87	1.53	15	402	11	253	317	19,500	66,743	116,000	19,500	54,960
Yearly	* 6.33	1.36		* 5,110		151	523	378,700	1,225,539	3,466,700	378,700	1,028,349

* Partly estimated ‡ And other days

ALAMITO CREEK NEAR PRESIDIO, TEXAS

DESCRIPTION: Water-stage recorder about 1,800 feet above the confluence with the Rio Grande and 6 miles below Presidio, Texas and Ojinaga, Chihuahua. This creek enters the Rio Grande near the lower end of Presidio Valley and 306.9 river miles below the American Dam at El Paso, Texas. The zero of the gage is 2,541.61 feet above mean sea level, U.S.C. & G.S. datum, determined by levels run in January 1950 and tied to a U.S.C. & G.S. bench mark elevation established in 1943. Previously published elevations are erroneous.

RECORDS: Based on 39 meter measurements of low and medium flows, a high flow rating curve determined by slope-area calculations, and a continuous record of gage heights. Computations by shifting channel methods. Records available: January 1932 through December 1951.

REMARKS: A small irrigation reservoir (San Estaban) 10.5 miles south of Marfa, Texas and irrigation diversions below the reservoir modify the flow of this spring-fed creek. On October 2, 1932, backwater from the Rio Grande reached a gage height of 8.33 feet at this station. This is the highest recorded gage height.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 9,670 second-feet on July 20, 1937, with a gage height of 5.33 feet. Min. .4 second-foot in June, July, and September 1951.

Average Flow in Second-Feet

Daily:	Max.	3,290	Oct. 24, 1941	Min.	.4	several days 1951
Monthly:	Max.	329	Sept. 1936	Min.	.9	June 1951
Yearly:	Max.	55.9	1941	Min.	* 4.3	1951

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.2	1.3	1.4	1.3	1.1	1.4	.7	.7	* 10.3	.8	1.0	1.0
2	1.2	1.3	1.3	1.3	1.1	1.4	15.4	.7	.7	.8	1.0	1.0
3	1.2	1.3	1.3	1.3	1.1	2.1	8.5	.7	.6	.8	1.0	1.0
4	1.2	1.3	1.3	1.3	1.1	1.6	13.3	* 120	.5	.8	1.0	1.0
5	1.2	1.3	1.3	1.3	1.1	1.5	6.2	1.1	.5	.7	1.0	1.1
6	1.2	1.4	1.3	1.3	1.1	1.3	.7	1.1	.4	.7	1.0	1.1
7	1.2	1.4	1.3	1.3	1.1	1.2	.6	1.0	* 47.9	.7	1.1	1.1
8	1.2	1.4	1.3	1.3	1.1	1.0	.6	.9	* 10.5	.7	1.1	1.1
9	1.2	1.5	1.3	1.3	1.0	.9	.6	.9	.8	.7	1.1	1.2
10	1.2	1.5	1.3	1.2	1.0	.9	.5	.8	* 423	.8	1.1	1.2
11	1.2	1.5	* 1.3	1.2	1.0	.8	.5	* 52.4	* 348	.8	1.1	1.2
12	1.3	1.5	1.4	1.2	2.4	.8	.5	* 45.7	* 37.5	.8	1.1	1.2
13	1.3	1.5	1.4	1.2	* 1.3	.8	.5	9.2	* 6.2	.8	1.1	1.2
14	1.3	1.5	1.4	1.2	1.1	.8	.4	5.5	* 1.1	.8	1.0	1.2
15	1.3	1.5	1.4	1.2	1.0	.7	.4	3.5	* 1.0	.8	1.0	1.3
16	1.3	1.5	1.4	1.2	.8	.7	.5	2.2	* 1.0	.8	1.0	1.3
17	1.3	1.5	1.4	1.2	.7	.7	.5	1.6	1.0	* 17.2	1.0	1.3
18	1.3	1.5	1.4	1.2	.5	.7	.6	1.1	1.0	1.0	1.0	1.3
19	1.3	1.5	1.4	1.2	* .5	.6	.6	.8	1.0	1.0	1.0	1.3
20	1.3	1.5	1.4	1.2	* .5	.6	.7	.8	1.0	1.0	1.0	1.3
21	1.3	1.5	1.4	1.2	* .5	.6	.7	.8	1.0	1.0	1.0	1.3
22	1.3	1.5	1.4	1.2	* .5	.5	.8	.9	1.0	1.0	1.1	1.4
23	1.3	1.4	1.4	1.2	* .5	.5	.8	.9	.9	1.0	1.1	1.4
24	1.3	1.4	1.4	1.2	13.9	.4	1.3	.9	.9	1.0	1.1	1.4
25	1.3	1.4	1.4	1.2	1.3	.4	.8	.8	.9	1.0	1.1	1.4
26	1.3	1.4	1.3	1.2	1.2	.4	.8	.8	.9	1.0	1.1	1.4
27	1.3	1.4	1.3	1.1	1.1	.5	.8	.8	.9	1.0	1.1	1.4
28	1.4	1.4	1.3	1.1	1.2	.6	.8	.7	.9	1.0	1.1	1.4
29	1.4		1.3	1.1	1.2	.6	.8	.8	.9	1.0	1.0	1.3
30	1.4		1.3	1.1	1.2	.6	.8	.7	.8	1.0	1.0	1.3
31	1.4		1.3		1.3		.8	* 3.3		1.0		1.3
Sum	39.6	40.1	41.8	36.5	44.5	25.6	61.5	* 262.1	* 903.1	* 43.5	31.4	38.4

Month	Current Year 1951: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1932-1951: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Average 1942-1951
Jan.	3.06	3.02	‡28	1.4	‡ 1	1.2	1.3	78.5	199	* 273	78.5	197
Feb.	3.09	3.06	‡ 9	1.5	‡ 1	1.3	1.4	79.5	183	234	79.5	176
Mar.	3.20	3.05	25	1.8	‡ 2	1.3	1.3	82.9	196	270	82.9	192
Apr.	3.10	3.03	‡ 1	1.3	‡27	1.1	1.2	72.4	240	743	72.4	209
May	4.15	2.80	24	* 120	‡18	.5	1.4	88.3	1,255	8,520	88.3	584
June	3.08	2.82	3	4.7	‡24	.4	.9	50.8	1,674	* 6,360	50.8	971
July	4.53	2.83	4	* 430	‡14	.4	2.0	122	2,632	6,650	122	2,126
Aug.	5.30	2.66	4	*3,000	‡ 1	.7	* 8.5	* 520	3,162	* 16,330	216	1,663
Sept.	6.69	2.37	10	*9,600	6	.4	* 30.1	* 1,790	3,580	19,600	* 179	2,525
Oct.	4.15	2.36	17	* 465	‡ 5	.7	* 1.4	* 86.3	2,293	19,200	* 86.3	1,383
Nov.	2.56	2.51	‡ 7	1.1	‡ 1	1.0	1.0	62.3	236	807	62.3	176
Dec.	2.57	2.52	‡22	1.4	‡ 1	1.0	1.2	76.2	212	408	76.2	204
Yearly	6.69	2.36		*9,600		.4	* 4.3	* 3,109.2	15,862	40,444	* 3,109.2	10,406

* Partly estimated ‡ And other days

TERLINGUA CREEK NEAR TERLINGUA, TEXAS

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights, located 2.7 river miles above the confluence with the Rio Grande. This creek enters the Rio Grande at the lower end of Santa Helena Canyon, 371.6 river miles below the American Dam at El Paso, Texas. Prior to completion of the new gage well and cableway on October 8, 1951, records of stage were obtained from the water-stage recorder located .3 mile downstream. The zeros of the gages at the old and new gage wells are 2,195.99 feet and 2,203.52 feet, respectively, above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 54 meter measurements of low and medium flows, a continuous record of gage heights for medium and high flows, and a high water rating curve determined by slope-area calculations. Computations by shifting channel methods. Records available: January 1, 1932 through December 1951.

REMARKS: Irrigation diversions modify the flow of this spring-fed creek at this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 34,900 second-feet on May 24, 1935, with a gage height of 17.59 feet. Min. no flow on September 29-30, 1937.

Average Flow in Second-Feet

Daily:	Max.	17,200	June 1, 1937	Min.	¤ 0	Sept. 29-30, 1937
Monthly:	Max.	921	June 1937	Min.	.83	Oct. 1934
Yearly:	Max.	146	1937	Min.	5.5	1943

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.2	3.0	2.8	2.7	2.6	* 176	2.0	* 2.4	2.7	2.8	2.6	2.4
2	3.1	3.0	2.8	2.6	2.6	9.6	2.1	¤ 2.3	¤ 2.7	* 2.7	2.5	2.5
3	3.1	* 3.0	2.8	2.9	2.6	* 276	* 122	¤ 2.3	¤ 2.7	* 2.7	2.5	2.7
4	3.1	2.9	2.8	2.9	2.5	* 536	* 1,180	¤ 2.2	¤ 2.7	* 2.6	2.4	2.8
5	3.1	2.9	3.0	2.9	5.3	* 28.4	* 1,050	¤ 2.1	¤ 2.7	* 2.6	2.4	2.7
6	2.8	2.9	3.2	2.9	2.6	12.2	* 112	¤ 2.0	¤ 2.7	* 2.5	2.3	2.6
7	3.1	3.0	3.4	2.8	2.5	3.8	* 11.3	* 2.0	* 33.9	* 2.5	2.3	2.6
8	3.1	3.0	3.7	2.8	2.7	2.5	¤ 5.4	¤ 2.0	¤ 2.7	2.4	2.3	2.5
9	3.1	3.0	* 311	2.8	2.8	2.7	* 2.3	¤ 4.9	¤ 2.7	* 2.4	2.3	2.4
10	3.2	3.0	* 316	2.7	2.8	14.0	2.1	* 50.9	* 136	* 2.5	2.3	2.3
11	3.4	3.1	* 18.6	2.7	3.0	15.9	2.1	* 134	* 1,260	* 2.6	2.3	2.3
12	3.2	3.1	7.5	2.6	3.3	8.5	2.0	* 370	* 189	* 2.6	2.3	2.2
13	3.2	3.1	6.0	2.5	* 255	3.8	* 389	* 115	* 184	* 2.6	2.3	2.1
14	3.0	3.0	4.8	2.4	17.6	3.3	* 462	20.9	* 118	* 2.7	2.3	2.6
15	3.3	3.0	4.4	2.4	5.1	3.2	* 142	* 12.5	* 80.0	* 2.8	2.2	2.2
16	3.3	2.9	3.9	2.3	3.7	2.9	* 236	¤ 10.4	¤ 3.2	2.8	2.2	2.2
17	3.0	2.9	3.7	2.4	3.6	2.6	* 7.8	¤ 8.4	¤ 3.2	* 2.8	2.1	2.2
18	3.0	2.8	3.3	2.3	3.1	2.5	¤ 5.4	¤ 6.3	¤ 3.2	* 2.8	2.0	2.2
19	3.4	2.8	3.3	2.3	3.1	2.5	¤ 4.2	¤ 4.3	3.2	* 2.8	2.0	2.2
20	3.1	2.8	3.4	2.5	3.3	2.2	¤ 3.7	* 2.2	* 3.2	* 2.8	1.9	2.2
21	3.1	2.8	3.5	2.5	3.5	2.4	* 3.0	¤ 2.2	* 3.2	* 2.8	1.9	2.2
22	3.1	2.8	3.6	2.4	3.0	2.1	2.8	¤ 2.1	* 3.2	2.8	1.9	2.2
23	3.1	2.7	3.7	2.4	3.3	2.4	* 953	¤ 2.1	* 3.1	¤ 2.8	1.9	2.2
24	3.2	2.7	3.6	2.5	*1,020	2.4	* 418	¤ 2.1	* 3.1	¤ 2.8	1.8	2.1
25	3.2	2.7	* 174	2.8	* 567	3.6	* 1,380	¤ 2.0	3.1	¤ 2.8	1.8	2.1
26	3.2	2.7	* 170	2.8	46.8	3.5	* 171	* 2.0	* 3.0	¤ 2.8	1.8	2.1
27	3.2	2.7	* 128	2.6	6.1	2.3	¤ 25.0	* 40.2	* 3.0	¤ 2.8	1.8	2.1
28	3.3	2.7	9.8	2.5	3.0	2.2	¤ 20.0	* 229	* 3.0	* 144	1.9	2.1
29	3.1		4.3	2.5	2.0	2.2	¤ 35.0	¤ 45.3	* 2.9	¤ 2.6	2.1	2.1
30	3.2		3.3	2.9	2.5	2.2	¤ 15.0	¤ 7.1	* 2.8	¤ 2.6	2.2	2.1
31	3.2		2.8		* 363		¤ 3.0	¤ 4.6		¤ 2.6		2.2
Sum	97.7	81.0	*1,217.0	78.3	*2,350.0	*1,133.9	* 6,769.2	*1,095.8	* 2,068.9	* 224.4	64.6	71.4

Month	Current Year 1951: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1932-1951: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Average 1942-1951
Jan.	1.95	1.85	1	5.7	6	2.4	3.2	194	* 201	743	82.7	195
Feb.	1.90	1.84	‡11	3.1	‡23	2.7	2.9	161	* 142	267	73.4	153
Mar.	3.75	1.85	9	* 1,270	‡ 2	2.6	* 39.3	* 2,410	* 289	* 2,410	72.4	384
Apr.	2.00	1.87	24	4.3	22	2.1	2.6	155	* 1,084	15,500	55.1	323
May	4.87	1.86	31	* 2,610	31	1.5	* 75.8	* 4,660	* 4,554	* 26,000	117	1,388
June	8.02	1.70	3	* 7,660	22	1.0	* 37.8	* 2,250	* 6,847	54,800	59.5	2,355
July	7.71	1.32	4	* 7,050	‡11	1.7	* 21.8	* 13,400	* 6,923	26,800	621	6,323
Aug.	4.40		28	* 1,970	‡ 6	ϕ¤ 2.0	* 35.3	* 2,170	* 4,364	* 26,680	123	3,104
Sept.	6.46		10	* 4,830	‡ 1	ϕ¤ 2.7	* 69.0	* 4,100	* 6,861	24,600	223	4,182
Oct.	3.36		28	* 938	‡ 8	ϕ 2.4	* 7.2	* 445	* 2,430	8,100	50.8	1,755
Nov.			1	2.6	‡24	1.8	2.2	128	* 355	¤ 2,980	64.9	175
Dec.	.81	.67	14	4.5	‡13	2.1	2.3	142	336	3,080	90.0	224
Yearly				* 7,660		1.0	* 41.7	* 30,215	*34,386	105,807	3,958.0	20,561

¤ Estimated * Partly estimated ‡ And other days ϕ Mean daily

RIO GRANDE AT JOHNSON RANCH, TEXAS

DESCRIPTION: Water-stage recorder and cable with stand-up cable car equipped for winch and heavy weights, located about 2 miles above Johnson Ranch, 14 miles below Castolon, Brewster County, Texas and Santa Elena Ranch, Chihuahua, and 392.9 river miles below the American Dam at El Paso, Texas. The zero of the gage is 2,045.30 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 129 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: April 1936 through December 1951.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 58,800 second-feet on September 23, 1938, with a gage height of 19.75 feet. Min. 23.1 second-feet on June 6, 1938, with a gage height of .84 foot.

Average Flow in Second-Feet

Daily:	Max.	56,900	Sept. 10, 1942	Min.	27.2	June 14, 1938
Monthly:	Max.	23,600	Sept. 1942	Min.	133	April 1947
Yearly:	Max.	4,780	1942	Min.	574	1948 and 1951

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	623	620	988	383	284	1,070	265	574	* 706	280	423	287
2	616	621	783	346	268	1,130	462	547	* 504	294	356	289
3	567	574	852	312	275	1,170	444	512	434	259	422	283
4	533	710	859	292	273	2,600	985	555	649	246	380	331
5	559	851	979	338	314	1,880	3,520	623	403	243	425	321
6	514	936	993	304	495	* 962	1,280	443	321	247	370	316
7	507	980	965	272	324	* 755	* 690	381	348	226	388	338
8	571	872	878	245	288	686	* 493	309	365	218	438	331
9	585	833	995	242	262	735	435	316	438	250	368	346
10	630	827	1,350	278	268	696	375	523	248	248	329	348
11	581	765	835	246	264	840	326	623	2,500	316	368	340
12	557	838	823	217	292	630	301	946	1,810	313	405	319
13	533	998	834	192	352	638	277	1,040	1,280	320	389	292
14	589	1,020	822	184	737	748	992	583	861	350	448	301
15	598	1,040	777	179	519	592	1,210	453	736	331	399	325
16	753	1,100	735	172	428	669	831	408	527	324	338	331
17	743	1,090	701	193	365	551	1,540	312	414	313	328	351
18	780	995	648	208	304	471	1,560	249	382	976	312	357
19	645	1,190	586	210	258	479	1,550	293	366	428	311	325
20	555	1,070	566	193	332	464	1,070	256	401	367	329	301
21	540	1,030	553	203	443	431	861	236	728	321	319	295
22	571	1,080	534	198	506	384	782	219	566	300	317	314
23	584	1,010	472	224	707	349	1,340	225	465	318	321	297
24	582	996	466	246	1,850	362	978	196	384	306	338	307
25	576	1,180	635	252	907	375	1,910	206	371	299	348	320
26	667	1,210	920	232	811	320	1,760	193	333	302	323	327
27	611	1,210	613	313	810	279	1,600	203	339	296	319	347
28	584	1,200	591	306	584	310	1,320	284	299	540	314	332
29	592		495	298	621	247	* 972	970	285	1,620	319	301
30	571		432	273	712	262	* 718	1,940	283	416	315	284
31	592		415		789		677	* 823		380		309
Sum	18,509	26,846	23,095	7,551	15,642	21,085	31,524	15,441	17,746	11,647	10,759	9,865

Month	Current Year 1951: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period April 1936-1951: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Average 1942-1951
Jan.	1.97	1.49	18	836	7	488	597	36,700	62,419	86,400	35,900	63,990
Feb.	2.51	1.59	19	1,340	3	554	959	53,200	58,420	80,900	44,600	59,610
Mar.	3.15	1.31	10	2,050	31	399	745	45,800	49,414	85,300	31,100	53,700
Apr.	1.34	.80	1	399	16	157	252	15,000	24,664	79,300	7,940	24,954
May	4.90	1.01	24	5,210	12	238	505	31,000	55,127	240,000	8,830	48,173
June	5.51	1.01	4	5,530	29	224	703	41,800	69,093	251,000	12,600	61,600
July	7.10	1.06	5	9,750	1	249	1,020	62,500	140,750	620,000	10,700	116,870
Aug.	4.58	.93	30	5,290	26	181	498	30,600	140,819	485,000	17,000	114,690
Sept.	4.40	1.06	11	3,940	10	212	592	35,200	335,894	1,404,000	20,000	278,570
Oct.	4.86	.99	29	4,850	8	206	376	23,100	194,194	929,000	23,100	152,420
Nov.	1.64	1.28	14	464	18	298	359	21,300	72,412	164,000	21,300	65,570
Dec.	1.47	1.24	17	381	3	274	318	19,600	61,544	110,000	19,600	56,830
Yearly	7.10	.80		9,750		157	574	415,800	1,264,750	3,461,400	415,800	1,096,977

* Partly estimated

RIO GRANDE AT LANGTRY, TEXAS

DESCRIPTION: Water-stage recorder and cable with stand-up cable car equipped for winch and heavy weights, located at Langtry, Texas, 24.1 river miles above the confluence with the Pecos River and 614.1 river miles below the American Dam at El Paso, Texas. The zero of the gage is 1,091.69 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 47 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: May 1900 to October 1914; December 1919 to March 1920; January 1924 through December 1951.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station.

EXTREME FLOWS FROM RECORDS: The highest known gage height was 56.9 feet, which occurred about 3:00 P.M. on June 17, 1922. The discharge for this stage was 204,000 second-feet, which was estimated by extension of the rating curve. The lowest recorded flow was 270 second-feet, which occurred in May 1904.

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,060	859	1,430	834	519	899	602	1,140	1,310	613	1,120	571
2	1,000	861	1,450	774	545	948	589	968	1,330	591	794	584
3	932	879	1,440	731	545	2,360	584	944	978	569	680	597
4	920	915	1,220	717	537	5,200	1,690	855	776	555	665	603
5	965	925	1,060	710	535	5,820	1,450	802	794	542	672	577
6	919	902	1,110	678	520	3,260	1,480	780	685	548	642	572
7	882	942	1,120	638	513	2,540	2,470	798	768	529	657	560
8	894	1,110	1,240	606	512	2,300	1,480	808	738	502	634	582
9	876	1,200	1,260	630	556	2,040	1,230	790	650	496	669	583
10	851	1,240	1,280	605	727	1,630	984	684	1,130	502	646	585
11	880	1,170	1,250	560	1,840	2,560	860	704	700	496	674	610
12	893	1,120	1,560	530	598	1,620	788	1,790	‡ 628	483	695	613
13	948	1,130	1,390	524	559	1,160	727	1,020	‡ 1,640	496	636	638
14	914	1,090	1,140	553	1,060	3,940	674	1,310	‡ 1,880	509	600	642
15	879	1,150	1,140	547	924	2,460	657	1,130	* 1,350	561	627	632
16	848	1,300	1,150	522	6,100	1,450	668	1,150	2,510	560	647	601
17	871	1,320	1,130	497	1,090	1,240	1,140	897	1,200	573	631	571
18	887	1,340	1,080	493	927	1,290	1,290	744	1,030	607	652	568
19	970	1,390	1,010	481	812	1,020	1,210	690	871	594	621	586
20	1,020	1,350	965	470	803	938	1,550	646	‡ 773	712	599	589
21	1,050	1,240	936	464	2,540	877	1,810	576	‡ 724	1,080	599	600
22	986	1,390	900	477	1,360	819	1,550	516	‡ 698	784	599	605
23	902	1,280	847	476	843	824	1,260	752	‡ 688	682	599	581
24	857	1,260	836	473	6,700	851	1,140	570	‡ 887	642	606	566
25	862	1,320	841	479	1,880	983	1,130	537	‡ 846	604	599	556
26	892	1,270	955	486	2,570	777	1,650	479	* 772	587	585	568
27	889	1,260	836	499	1,650	697	1,530	467	726	605	579	551
28	886	1,410	1,260	518	1,230	684	2,060	463	667	596	579	535
29	906		1,200	537	1,100	678	1,890	460	636	586	585	553
30	903		928	519	1,100	636	1,590	456	607	583	572	564
31	856		848		932		1,440	476		1,660		583
Sum	28,398	32,623	34,812	17,028	42,127	52,501	39,173	24,402	* 28,992	19,447	19,463	18,126

Month	Current Year 1951: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1924-1951: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Average 1942-1951
Jan.	1.30	.96	1	1,110	16	832	916	56,300	92,117	* 245,000	52,300	80,650
Feb.	1.70	1.00	28	1,480	1	843	1,170	64,700	80,381	* 117,000	48,900	76,430
Mar.	2.03	.96	12	1,820	25	802	1,120	69,000	76,911	118,000	48,100	74,440
Apr.	1.02	.45	1	865	24	454	568	33,800	60,439	105,000	28,500	49,620
May	10.44	.50	24	18,000	1	487	1,360	83,600	96,041	271,000	26,900	78,520
June	6.70	.67	4	9,610	30	630	1,750	104,000	101,070	299,000	25,400	97,090
July	3.63	.58	6	4,160	4	559	1,260	77,700	153,955	719,000	31,700	147,670
Aug.	2.80	.44	12	2,870	30	450	787	48,400	196,485	* 730,000	33,800	141,670
Sept.	4.46	.68	15	5,640	30	607	* 966	* 57,500	352,734	1,410,000	35,700	298,510
Oct.	2.35	.48	31	2,250	12	471	627	38,600	243,868	1,063,000	38,600	193,530
Nov.	1.64	.65	1	1,430	‡ 28	565	649	38,600	99,789	* 211,000	38,600	85,160
Dec.	.75	.60	14	656	28	529	585	36,000	87,898	135,000	36,000	74,790
Yearly	10.44	.44		18,000		450	978	708,200	1,641,688	3,851,500	633,900	1,398,080

‡ Estimated * Partly estimated ‡ And other days

PECOS RIVER NEAR COMSTOCK, TEXAS

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights, located at the Pecos High Bridge on the railroad 12 miles northwest of Comstock, Texas, 5.5 miles above the confluence with the Rio Grande. This river enters the Rio Grande 638.2 river miles below the American Dam at El Paso, Texas. The zero of the gage is 1,058.01 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 22 meter measurements during the year and a continuous record of gage heights. Water-stage recorder installed May 11, 1942. Computations by shifting channel methods. Records available: March 17, 1898 to December 3, 1898 and May 1900 through December 1951.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station.

EXTREME FLOWS FROM RECORDS: The greatest recorded flow was 116,000 second-feet, which occurred September 1, 1932, with a gage height of 38.25 feet. The lowest recorded flow was 91.7 second-feet, which occurred on several days in August 1951, with a gage height of -.01 foot.

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	246	252	258	215	170	156	116	121	131	125	138	178
2	247	249	253	207	195	152	117	131	128	126	132	182
3	245	249	249	204	183	262	115	134	122	126	132	182
4	244	249	242	195	174	373	116	134	116	124	133	176
5	249	250	237	191	169	187	114	132	114	119	135	170
6	251	247	238	188	160	172	115	130	112	120	139	166
7	244	248	236	182	158	159	116	129	110	116	140	164
8	243	246	234	178	156	154	115	127	108	116	143	162
9	245	250	223	179	156	169	112	121	106	116	146	159
10	247	255	228	181	161	182	113	118	106	116	147	159
11	246	256	226	180	1,790	166	112	114	153	118	150	160
12	245	257	213	180	305	154	110	114	127	115	151	159
13	247	255	208	181	203	149	111	114	119	113	152	159
14	246	259	213	182	* 190	156	118	112	112	113	153	160
15	245	260	218	179	# 180	179	117	111	112	113	154	158
16	244	264	217	173	# 170	184	116	108	185	113	151	155
17	244	269	214	171	# 161	156	121	117	177	113	145	153
18	248	270	206	168	# 158	147	130	114	121	115	146	152
19	248	265	201	169	323	138	124	108	121	121	152	154
20	248	263	200	168	238	136	120	102	114	123	157	153
21	245	261	200	166	375	139	119	97.1	127	121	160	152
22	246	259	200	164	274	137	114	95.4	155	118	165	151
23	246	263	200	164	202	131	112	93.5	153	118	169	150
24	246	268	196	163	2,460	129	112	206	149	119	174	151
25	247	266	201	164	302	127	113	342	140	119	174	152
26	247	264	241	169	229	126	111	262	135	123	172	151
27	250	262	247	170	200	122	111	213	136	127	173	148
28	250	257	227	172	183	118	113	178	132	128	173	146
29	248		216	171	171	119	118	158	127	132	173	150
30	248		216	172	162	119	119	144	125	139	175	152
31	251		221		161		118	135		145		151
Sum	7,646	7,213	6,879	5,346	10,119	4,798	3,588	4,315.0	3,873	3,750	4,604	4,915

Month	Current Year 1951								Period 1924-1951			Acre-Feet
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			Average 1942-1951
	High	Low	High	Day	Low	Day			Normal	Maximum	Minimum	
Jan.	.71	.63	27	256	‡ 3	242	247	15,200	23,706	78,200	12,900	25,350
Feb.	.71	.62	18	273	8	243	258	14,300	19,014	62,300	10,900	20,400
Mar.	.67	.35	‡ 26	282	‡ 24	193	222	13,600	18,090	40,700	11,100	17,960
Apr.	.45	.26	1	217	23	162	178	10,600	17,422	42,400	9,520	17,242
May	7.56	.20	24	8,180	‡ 8	154	326	20,100	33,514	156,000	10,800	22,190
June	1.79	.10	4	758	30	115	160	9,520	32,991	197,000	8,840	16,780
July	.13	- .01	18	137	12	108	116	7,120	25,731	84,200	7,120	25,832
Aug.	1.25	- .01	24	466	‡ 22	91.7	139	8,560	19,428	50,400	7,620	16,872
Sept.	1.15	.04	16	425	10	100	129	7,680	40,268	324,420	6,190	20,508
Oct.	.23	.08	31	147	14	111	121	7,440	49,932	486,000	7,440	29,864
Nov.	.29	.15	30	178	‡ 2	130	153	9,130	27,561	209,000	9,130	18,573
Dec.	.38	.26	2	185	28	146	159	9,750	23,114	91,800	9,750	18,265
Yearly	7.56	- .01		8,180		91.7	184	133,000	330,771	1,330,900	133,000	249,836

Estimated * Partly estimated ‡ And other days

GOODENOUGH SPRING NEAR COMSTOCK, TEXAS

DESCRIPTION: Staff gage located 4,000 feet above the confluence with the Rio Grande and 11.75 miles southwest of Comstock, Val Verde County, Texas. The stream from this spring enters the Rio Grande 664.9 river miles below the American Dam at El Paso, Texas. The zero of the gage is 968.42 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 28 meter measurements during the year with the discharge estimated between measurements. Records available: February 23, 1929 through December 1951.

REMARKS: The flow of this spring is very uniform and not modified by diversions or storage. Backwater reaches the station when the Rio Grande reaches a discharge of about 35,000 second-feet near this spring. A maximum gage height of 17.30 feet was reached by backwater on September 1, 1932.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 846 second-feet on September 18, 1941, with a gage height of 4.57 feet. Min. 72.1 second-feet on December 26-28, 1951.

Average Flow in Second-Feet

Daily:	Max.	¤ 455	Oct. 1, 1932	Min.	72.1	Dec. 26-28, 1951
Monthly:	Max.	* 421	Oct. 1932	Min.	* 77.8	Dec. 1951
Yearly:	Max.	266	1933	Min.	* 94.5	1951

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	¤ 92.6	¤ 94.3	¤ 91.6	¤ 93.5	¤ 87.8	¤ 106	¤ 119	¤ 102	¤ 94.7	¤ 89.7	¤ 88.2	¤ 85.7
2	¤ 92.4	¤ 94.2	¤ 91.2	¤ 93.6	87.8	¤ 107	¤ 118	¤ 102	¤ 94.2	¤ 89.6	¤ 87.4	¤ 85.2
3	¤ 92.3	¤ 94.2	¤ 90.8	¤ 93.7	¤ 85.6	¤ 108	¤ 117	¤ 102	¤ 93.7	¤ 89.6	¤ 86.6	¤ 84.6
4	¤ 92.2	¤ 94.1	¤ 90.5	¤ 93.8	83.4	¤ 109	¤ 117	¤ 101	¤ 93.2	¤ 89.5	¤ 85.8	¤ 84.1
5	¤ 92.0	¤ 90.4	¤ 90.1	¤ 93.9	¤ 87.3	¤ 109	¤ 116	¤ 101	¤ 92.7	¤ 89.5	¤ 85.0	¤ 83.5
6	¤ 91.9	¤ 93.9	¤ 89.7	¤ 94.0	91.2	¤ 110	¤ 115	¤ 101	¤ 92.2	¤ 89.4	¤ 84.2	¤ 83.0
7	¤ 91.7	¤ 93.9	89.3	¤ 94.1	90.4	¤ 111	¤ 114	¤ 100	¤ 91.6	¤ 89.4	¤ 83.4	82.4
8	¤ 91.6	93.8	¤ 89.6	¤ 94.3	86.6	¤ 112	¤ 113	¤ 100	¤ 91.1	¤ 89.4	82.6	¤ 81.9
9	¤ 91.4	¤ 93.9	¤ 89.8	¤ 94.4	¤ 87.4	¤ 113	¤ 113	¤ 99.6	¤ 90.6	¤ 89.3	¤ 83.1	¤ 81.3
10	91.3	¤ 93.9	¤ 90.1	¤ 94.5	¤ 88.2	¤ 113	¤ 112	¤ 99.3	¤ 90.1	¤ 89.3	¤ 83.6	¤ 80.8
11	¤ 91.9	¤ 94.0	¤ 90.4	¤ 94.6	¤ 89.0	¤ 114	111	¤ 99.0	¤ 89.6	¤ 89.2	¤ 84.1	¤ 80.2
12	¤ 92.5	¤ 94.1	¤ 90.6	¤ 94.7	¤ 89.9	¤ 115	¤ 111	¤ 98.6	¤ 89.0	¤ 89.2	¤ 84.6	¤ 79.7
13	¤ 93.1	¤ 94.1	¤ 90.9	94.8	¤ 90.7	¤ 116	¤ 110	98.3	¤ 88.5	¤ 89.1	¤ 85.1	¤ 79.1
14	¤ 93.6	¤ 94.2	¤ 91.2	¤ 94.1	¤ 91.5	¤ 117	¤ 110	¤ 98.2	88.0	¤ 89.1	¤ 85.6	¤ 78.6
15	¤ 94.2	¤ 94.3	¤ 91.4	¤ 93.5	¤ 92.3	¤ 118	¤ 110	¤ 98.0	¤ 88.1	¤ 89.0	¤ 86.1	¤ 78.1
16	¤ 94.8	¤ 94.4	91.7	¤ 92.8	¤ 93.1	¤ 118	¤ 110	¤ 97.9	¤ 88.3	89.0	¤ 86.7	¤ 77.5
17	¤ 95.4	¤ 94.4	¤ 91.8	¤ 92.2	¤ 93.9	¤ 119	¤ 109	¤ 97.8	¤ 88.4	¤ 89.7	¤ 87.2	¤ 77.0
18	¤ 95.3	¤ 94.5	¤ 91.9	¤ 91.5	¤ 94.7	120	¤ 109	¤ 97.7	¤ 88.5	¤ 90.4	¤ 87.7	¤ 76.4
19	¤ 95.3	¤ 94.6	¤ 92.0	¤ 90.8	¤ 95.6	¤ 120	109	¤ 97.6	¤ 88.6	¤ 91.1	¤ 88.2	¤ 75.9
20	¤ 95.2	¤ 94.6	¤ 92.1	¤ 90.2	¤ 96.4	¤ 120	¤ 108	¤ 97.4	¤ 88.8	¤ 91.8	¤ 88.7	¤ 75.4
21	¤ 95.1	94.7	¤ 92.3	¤ 89.5	¤ 97.2	¤ 121	¤ 107	¤ 97.3	¤ 88.9	¤ 92.6	¤ 89.2	¤ 74.8
22	¤ 95.0	¤ 94.3	¤ 92.4	¤ 88.9	¤ 98.0	¤ 121	¤ 107	¤ 97.2	¤ 89.0	¤ 93.3	¤ 89.7	¤ 74.3
23	¤ 95.0	¤ 93.9	¤ 92.5	88.2	¤ 98.8	¤ 121	¤ 106	¤ 97.0	¤ 89.2	¤ 94.0	90.2	¤ 73.7
24	¤ 94.9	¤ 93.5	¤ 92.6	¤ 88.2	¤ 99.6	¤ 121	105	¤ 96.9	¤ 89.3	94.7	¤ 89.6	¤ 73.2
25	¤ 94.8	¤ 93.2	¤ 92.7	¤ 88.1	¤ 100	¤ 122	¤ 105	¤ 96.8	¤ 89.4	¤ 93.9	¤ 89.1	¤ 72.6
26	¤ 94.7	¤ 92.8	¤ 92.8	¤ 88.1	¤ 101	¤ 122	¤ 104	¤ 96.7	¤ 89.5	¤ 93.1	¤ 88.5	72.1
27	¤ 94.7	¤ 92.4	¤ 92.9	¤ 88.0	¤ 102	122	¤ 104	¤ 96.6	¤ 89.7	¤ 92.3	¤ 88.0	¤ 72.1
28	¤ 94.6	¤ 92.0	¤ 93.0	¤ 88.0	¤ 103	¤ 121	¤ 104	¤ 96.4	89.8	¤ 91.5	¤ 87.4	¤ 72.1
29	¤ 94.5		¤ 93.1	¤ 87.9	¤ 104	¤ 120	¤ 103	96.3	¤ 89.8	¤ 90.7	¤ 86.9	¤ 72.2
30	¤ 94.5		¤ 93.3	¤ 87.9	¤ 105	¤ 120	¤ 103	¤ 95.8	¤ 89.7	¤ 89.9	¤ 86.3	¤ 72.2
31	¤ 94.4		¤ 93.4		¤ 105		¤ 103	¤ 95.3		¤ 89.1		¤ 72.2
Sum	*2,630.2	*2,902.9	*2,837.7	*2,751.8	*2,916.4	*3,486	*3,402	*3,050.7	*2,704.2	*2,807.4	*2,598.8	*2,411.9

Month	Current Year 1951: Extreme Gage Feet High	Low	ϕ Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period Mar. 1929-1951: Acre-Feet Normal	Maximum	Minimum	Average Acre-Feet 1942-1951
Jan.			17	¤ 95.4	10	91.3	* 93.6	* 5,760	8,404	19,620	* 5,760	7,630
Feb.			21	94.7	28	¤ 92.0	* 93.9	* 5,220	7,456	17,030	* 5,220	6,707
Mar.			31	¤ 93.4	7	89.3	* 91.5	* 5,630	8,087	17,770	* 5,630	7,456
Apr.			13	94.8	‡29	¤ 87.9	* 91.7	* 5,460	7,751	16,580	* 5,460	7,180
May			‡30	¤ 105	4	83.4	* 94.1	* 5,780	8,419	16,840	* 5,780	7,819
June			‡25	¤ 122	1	¤ 106	* 116	* 6,910	8,456	16,040	5,330	7,776
July			1	¤ 119	‡29	¤ 103	* 110	* 6,750	8,998	16,460	5,930	8,562
Aug.			‡ 1	¤ 102	31	¤ 95.3	* 98.4	* 6,050	8,617	15,840	5,450	7,940
Sept.			1	¤ 94.7	14	88.0	* 90.1	* 5,360	9,268	¤ 25,000	* 5,360	7,767
Oct.			24	94.7	‡15	¤ 89.0	* 90.6	* 5,570	9,567	* 25,870	* 5,570	8,423
Nov.			23	90.2	8	82.6	* 86.6	* 5,150	8,809	21,850	* 5,150	7,708
Dec.			1	¤ 85.7	‡26	72.1	* 77.8	* 4,780	8,651	20,470	* 4,780	7,528
Yearly				¤ 122		72.1	* 94.5	* 68,420	102,483	192,840	* 68,420	92,496

¤ Estimated * Partly estimated ‡ And other days ϕ Mean daily

DEVILS RIVER NEAR DEL RIO, TEXAS

DESCRIPTION: Water-stage recorder on the main highway bridge 12 miles northwest of Del Rio, Texas and 4.5 miles above the confluence with the Rio Grande. Devils River enters the Rio Grande 680.1 river miles below the American Dam at El Paso, Texas. The zero of the gage is 951.80 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 12 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: September 2, 1932 through December 1951. Records are also available from May 1900 to March 1914 for a point 2.8 miles below the highway bridge and from December 1923 to September 1, 1932 for a point 1.8 miles below the highway bridge.

REMARKS: The monthly flow of this spring-fed river is not modified, but the daily flow is modified by two power dams with a combined hydroelectric generating capacity of 3,100 kva, the operation of which began in 1929.

EXTREME FLOWS FROM RECORDS: The greatest recorded flow was 597,000 second-feet, which occurred September 1, 1932, with a gage height of 41.0 feet at the present station. Zero flow sometimes occurs for a few hours.

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	290	245	190	217	200	226	167	161	131	150	198	148
2	328	238	243	203	167	220	166	148	125	169	192	178
3	265	231	222	210	178	259	162	147	126	157	161	147
4	251	244	208	203	179	232	161	140	133	151	155	155
5	250	249	215	203	185	225	161	139	140	158	178	127
6	299	235	214	217	179	212	162	145	140	159	170	150
7	258	234	214	204	179	211	162	150	147	146	160	155
8	258	234	221	204	179	211	163	150	148	147	154	115
9	251	233	207	204	179	211	163	149	148	155	166	119
10	257	233	214	198	178	210	164	148	149	155	159	125
11	257	227	200	198	184	210	164	147	143	156	174	137
12	249	227	234	182	178	211	165	147	131	156	208	137
13	269	252	215	187	177	180	165	146	120	148	158	149
14	268	239	201	198	177	442	168	145	132	155	157	194
15	255	232	195	193	183	288	173	145	133	155	157	174
16	254	226	190	194	193	220	167	144	140	154	185	150
17	247	225	184	194	187	226	166	143	147	154	156	151
18	246	225	208	188	182	198	165	142	168	154	149	159
19	259	231	208	188	186	189	185	141	169	166	155	160
20	252	237	195	194	192	179	177	141	178	159	154	196
21	251	230	209	194	210	179	163	134	191	159	148	169
22	251	230	216	194	216	180	162	139	196	165	147	169
23	250	230	223	183	255	174	161	139	144	171	153	135
24	250	229	202	165	1,520	181	155	144	145	164	192	128
25	249	236	229	189	676	186	173	137	146	158	214	155
26	249	229	307	206	525	187	180	142	146	157	151	169
27	248	222	256	189	298	182	164	142	141	178	145	164
28	248	222	243	195	167	183	171	141	154	288	149	164
29	260		223	184	178	171	170	136	135	288	149	131
30	253		210	200	221	167	156	136	120	236	156	138
31	253		217		221		162	137		231		158
Sum	8,025	6,525	6,713	5,878	8,129	6,350	5,143	4,445	4,366	5,299	4,950	4,706

Month	Current Year 1951: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1924-1951: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Average 1942-1951
Jan.	1.46	.83	1	564	5	92.0	259	15,900	22,484	45,250	12,700	18,670
Feb.	1.37	1.03	‡24	405	11	166	233	12,900	21,304	54,500	12,000	20,080
Mar.	1.47	.99	1	561	11	137	217	13,300	21,676	43,300	11,100	19,340
Apr.	1.42	.74	10	476	24	42.8	196	11,700	24,057	67,800	9,910	20,531
May	2.76	.67	24	2,790	15	23.3	262	16,100	41,166	356,900	10,500	25,330
June	1.46	.97	15	539	13	125	212	12,600	48,803	380,000	11,100	57,330
July	1.32	.87	3	365	24	68.0	166	10,200	49,985	377,000	10,200	50,400
Aug.	1.30	.62	19	382	19	13.5	143	8,820	26,302	107,000	8,820	27,512
Sept.	1.27	.79	22	367	27	52.9	146	8,660	75,321	895,990	8,660	26,136
Oct.	1.39	.91	29	480	1	97.1	171	10,500	46,231	349,000	10,500	36,780
Nov.	1.35	.69	28	428	28	23.5	165	9,820	24,649	60,300	9,820	22,182
Dec.	1.30	.98	20	379	‡ 7	115	152	9,330	22,882	49,520	9,330	17,993
Yearly	2.76	.62		2,790		13.5	193	139,830	424,860	1,284,080	139,830	342,284

‡ And other days

ARROYO LAS VACAS NEAR CD. ACUNA, COAHUILA

DESCRIPTION: Water-stage recorder and cable with sit-down cable car, located 1.5 miles upstream from Cd. Acuña, Coahuila and 1.8 miles upstream from the confluence of Arroyo las Vacas with the Rio Grande at a point just above the Del Rio-Cd. Acuña International Bridge. This confluence is 693.5 river miles below the American Dam at El Paso, Texas. The zero of the gage is 884.15 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 162 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: Occasional estimates from June 1935 to March 19, 1938; continuous record March 20, 1938 through December 1951.

REMARKS: The low flow of this stream is from springs. Backwater from the Rio Grande reaches this station when the stage at the Del Rio Station reaches about 21.0 feet, or a flow of about 110,000 second-feet.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 25,640 second-feet on October 3, 1944, with a gage height of 17.45 feet. Min. .4 second-foot on various days in September 1951 and on November 27, 1951, with gage heights of 1.25 and 1.28 feet, respectively.

Average Flow in Second-Feet

Daily:	Max.	3,530	Oct. 3, 1944	Min.	.4	Sept. 10 & Nov. 27, 1951
Monthly:	Max.	153	Oct. 1944	Min.	.7	Dec. 1951
Yearly:	Max.	25.9	1944	Min.	5.8	1950

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.4	1.8	1.8	2.1	1.8	2.8	1.8	1.4	.7	1.1	.7	.8
2	1.4	1.8	1.8	2.1	1.8	2.8	1.8	1.4	.7	1.1	.7	.8
3	1.4	1.8	1.8	2.1	1.8	2.5	1.8	1.4	.7	1.1	.7	.8
4	1.4	1.8	1.8	2.5	1.8	2.1	1.8	1.4	.7	1.1	.7	.8
5	1.4	1.8	1.8	2.5	1.8	3.2	1.8	1.4	.7	1.1	.7	.7
6	1.4	1.8	1.8	1.8	1.8	2.8	1.4	1.4	.7	1.1	.7	.7
7	1.4	1.8	1.8	1.8	1.8	2.5	1.4	1.4	.7	1.1	.7	.7
8	1.4	1.8	1.8	2.1	1.4	2.5	1.4	1.4	.7	1.1	.7	.7
9	1.4	1.8	1.8	2.1	1.4	2.5	1.4	1.4	.7	1.1	.7	.7
10	1.8	1.8	1.8	2.5	1.4	2.5	1.1	1.1	.4	1.1	.7	.7
11	1.4	2.1	1.7	2.8	1.8	2.5	1.1	1.1	.7	1.1	1.0	.7
12	1.4	2.1	1.7	2.1	1.8	2.5	1.4	1.1	.7	1.0	1.0	.7
13	1.4	1.8	1.7	1.8	1.4	3.9	1.4	1.1	.7	1.0	.7	.7
14	1.4	2.1	1.7	1.8	1.4	4.2	1.4	1.1	.7	.7	.7	.7
15	1.4	1.8	1.7	1.8	1.8	2.8	1.8	1.1	.7	.7	.7	.7
16	1.4	1.8	1.7	1.8	1.8	2.8	1.7	1.1	291	.7	.7	.7
17	1.4	1.8	1.7	2.5	1.8	1.8	1.8	1.1	4.0	.7	.7	.7
18	1.4	1.8	1.7	2.5	1.8	1.8	2.1	1.0	2.5	.7	.7	.7
19	1.4	1.8	1.7	1.8	1.8	1.8	1.8	1.0	1.4	.7	1.1	.7
20	1.4	1.4	1.7	1.8	1.8	1.8	1.8	1.0	1.4	.7	1.1	.7
21	1.4	1.4	1.8	1.8	1.8	1.4	1.4	1.0	1.4	.7	1.1	.7
22	1.4	2.4	1.8	1.4	1.8	1.4	1.4	1.0	1.4	.7	.7	.7
23	1.4	2.4	1.8	1.4	4.6	1.8	1.4	1.0	1.4	.7	.7	.7
24	1.4	2.5	1.8	2.1	2,480	1.8	1.4	1.0	1.4	.7	.7	.7
25	1.4	2.5	2.5	2.1	19.4	3.2	1.4	1.0	1.4	.7	.7	.7
26	1.4	1.8	2.5	2.1	6.4	2.1	1.4	1.1	1.4	1.0	.7	.7
27	1.8	1.8	1.8	2.1	3.9	2.1	1.4	1.1	1.1	1.0	.4	.7
28	1.8	1.8	1.8	2.1	2.8	2.1	1.4	1.1	1.1	1.0	.7	.7
29	1.8		1.8	2.5	3.2	1.8	1.4	1.1	1.1	2.1	.7	.7
30	1.8		1.8	1.8	3.2	1.8	1.4	1.1	1.1	.7	.7	.7
31	1.8		1.8		3.2		1.4	1.1		.7		.7
Sum	45.8	53.1	56.2	61.7	2,564.3	71.6	47.4	36.0	323.3	29.0	22.5	22.1

Month	Current Year 1951: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period April 1938-1951: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Average 1942-1951
Jan.	1.05	1.05	#	1.8	#	1.4	1.5	90.8	397	910	‡ 79.4	477
Feb.	1.12	1.05	15	2.8	#	1.4	1.9	105	787	5,950	105	1,024
Mar.	1.18	1.05	26	60.7	#	1.7	1.8	111	812	2,600	111	747
Apr.	1.08	1.02	11	2.8	#	1.4	2.1	122	1,049	4,580	122	900
May	10.01	1.02	24	13,420	1	1.1	82.7	5,090	1,467	5,090	156	1,881
June	1.71	1.31	25	56.5	#	1.4	2.4	142	854	3,900	118	1,042
July	1.31	1.28	18	2.1	#	1.1	1.5	94.0	1,695	8,230	94.0	1,839
Aug.	1.31	1.28	12	1.8	#	1.0	1.2	71.4	920	3,850	71.4	848
Sept.	4.99	1.25	16	2,670	#	.4	10.8	641	1,430	6,850	95.6	1,188
Oct.	1.54	1.25	29	14.1	#	.7	.9	57.5	1,023	9,390	57.5	1,304
Nov.	1.31	1.28	#	1.1	27	.4	.8	44.6	376	‡ 1,670	44.6	416
Dec.	1.31	1.28	#	.8	#	.7	.7	43.8	328	704	43.8	339
Yearly	10.01	1.02		13,420		.4	9.1	6,613.1	11,138	18,808	4,235	12,005

‡ Estimated # Various days of the month

RIO GRANDE NEAR DEL RIO, TEXAS

DESCRIPTION: Water-stage recorder located on the downstream side of a pier of the international highway bridge between Del Rio, Texas and Cd. Acuña, Coahuila and 693.6 river miles below the American Dam at El Paso, Texas. Measurements from highway bridge. The zero of the gage is 864.30 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 45 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: July 2, 1941 through December 1951. Records are also available from May 1900 to April 1915 for a station 11 miles upstream, from December 1919 to March 1920 for a station 7.5 miles upstream at McKee's Switch, and from December 1923 to July 2, 1941 for a station 900 feet above the international highway bridge.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station.

EXTREME FLOWS FROM RECORDS: The greatest recorded flow was 605,000 second-feet, which occurred September 1, 1932, with a gage height of 34.5 feet. This is the greatest rate of discharge recorded at any point on the Rio Grande. The lowest recorded flow was 732 second-feet, which occurred May 8, 1948, with a gage height of .40 foot.

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,940	1,570	2,060	1,560	1,080	1,560	1,150	1,860	960	1,110	1,900	1,050
2	1,870	1,560	2,170	1,520	1,020	1,530	1,120	1,630	1,470	1,160	1,610	1,050
3	1,800	1,680	2,160	1,440	1,100	1,690	1,110	1,450	1,730	1,120	1,360	1,080
4	*1,680	1,590	2,150	1,400	1,120	3,050	1,080	1,420	1,460	1,070	1,250	1,060
5	*1,660	1,660	1,960	1,390	1,110	7,030	1,840	1,350	1,270	1,050	1,240	1,060
6	1,740	1,670	1,800	1,380	1,100	5,250	1,950	1,290	1,250	1,040	1,260	1,030
7	1,680	1,650	1,820	1,350	1,080	3,450	1,980	1,260	1,190	1,020	1,250	1,020
8	1,630	1,690	1,810	1,320	1,060	3,010	2,610	1,260	1,190	997	1,270	1,000
9	1,630	1,870	1,890	1,280	1,070	2,760	1,970	1,260	1,220	986	1,280	973
10	1,630	1,960	1,920	1,290	1,070	2,600	1,740	1,310	1,130	984	1,310	1,010
11	1,590	2,010	1,930	1,280	2,600	2,270	1,530	1,200	1,560	982	1,270	1,020
12	1,600	1,970	1,880	1,230	2,310	2,950	1,390	1,160	1,280	971	1,290	1,040
13	1,620	1,920	2,100	1,200	1,300	2,210	1,290	1,980	1,140	960	1,310	1,080
14	1,650	1,910	2,030	1,200	1,140	6,390	1,230	1,900	1,820	968	1,230	1,100
15	1,600	1,850	1,780	1,200	1,260	4,620	1,180	1,740	2,410	984	1,200	1,120
16	1,560	1,860	1,780	1,220	3,730	2,920	1,160	1,570	3,200	1,010	1,160	1,100
17	1,550	2,050	1,760	1,160	3,780	2,170	1,150	1,590	2,600	1,040	1,170	1,090
18	1,540	2,090	1,740	1,140	1,650	1,880	1,550	1,410	1,670	1,050	1,160	1,060
19	1,570	2,110	1,680	1,120	1,470	1,910	1,790	1,220	1,530	1,070	1,190	1,060
20	1,650	2,130	1,640	1,100	1,460	1,580	1,690	1,210	1,390	1,100	1,150	1,080
21	1,690	2,110	1,590	1,090	1,360	1,490	1,960	1,120	1,280	1,100	1,130	1,080
22	1,750	2,030	1,580	1,070	2,910	1,400	2,160	1,050	1,240	1,500	1,110	1,070
23	1,690	2,160	1,570	1,060	1,980	1,330	1,960	1,010	1,230	1,300	1,100	1,080
24	1,620	2,080	1,510	1,030	9,400	1,330	1,690	1,140	1,190	1,180	1,070	1,050
25	1,590	2,020	1,540	1,030	7,170	1,410	1,550	1,190	1,300	1,120	1,090	1,040
26	1,580	2,050	1,670	1,050	3,080	1,450	1,500	1,230	1,380	1,090	1,160	1,020
27	1,610	2,020	1,700	1,060	3,160	1,340	1,960	1,130	1,320	1,080	1,020	1,030
28	1,600	1,970	1,610	1,070	2,290	1,200	1,840	1,060	1,270	1,180	984	1,020
29	1,600		1,840	1,070	1,890	1,190	2,360	1,030	1,190	1,230	1,020	1,020
30	1,580		1,880	1,070	1,720	1,180	2,230	995	1,140	1,170	1,030	1,040
31	1,630		1,550		1,710		1,990	972		1,150		1,070
Sum	51,130	53,240	56,100	36,380	68,180	74,150	51,710	40,997	44,010	33,772	36,574	32,603

Month	Current Year 1951: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1924-1951: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Average 1942-1951
Jan.	1.83	1.45	1	2,080	17	1,480	1,650	101,000	159,641	344,000	98,200	143,420
Feb.	1.94	1.47	24	2,300	‡ 1	1,500	1,900	106,000	142,981	261,000	96,200	142,300
Mar.	2.00	1.35	13	2,350	24	1,430	1,810	111,000	138,452	224,670	94,700	131,920
Apr.	1.50	1.00	1	1,660	28	973	1,210	72,200	125,569	222,000	* 70,200	111,530
May	7.88	1.00	24	18,600	1	984	2,200	135,000	195,591	* 742,000	68,200	150,350
June	6.06	1.10	14	12,600	30	1,140	2,470	147,000	214,987	704,000	61,700	206,360
July	2.48	1.00	7	3,280	5	1,040	1,670	103,000	250,522	* 1,228,000	* 82,400	246,120
Aug.	2.04	.87	13	2,450	31	963	1,320	81,300	262,298	865,000	* 74,700	203,000
Sept.	3.97	.86	16	6,850	1	951	1,470	87,300	506,967	2,754,590	72,600	368,300
Oct.	1.50	.85	22	1,600	13	942	1,090	67,000	375,606	1,634,000	67,000	283,700
Nov.	1.91	.90	1	2,230	28	890	1,220	72,500	175,579	467,000	72,500	144,250
Dec.	1.16	.95	15	1,170	9	954	1,050	64,700	157,494	295,180	64,700	130,570
Yearly	7.88	.85		18,600		890	1,590	1,148,000	2,705,687	6,041,720	1,148,000	2,261,820

* Partly estimated ‡ And other days

SAN FELIPE CREEK NEAR DEL RIO, TEXAS

DESCRIPTION: Water-stage recorder at Silos farm road bridge 1.75 miles south of Del Rio, Texas, 2 miles above the confluence with the Rio Grande, which is 1.6 river miles below the Del Rio gaging station on the Rio Grande. This stream enters the Rio Grande 695.2 river miles below the American Dam at El Paso, Texas. The zero of the gage is 875.05 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 18 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Rating curves based on low and medium-flow measurements by wading or from bridge and high-flow measurements by slope-area computations. Records available: September 1, 1931 through December 1951.

REMARKS: Municipal diversions at Del Rio and irrigation diversions greatly modify the flow of this spring-fed creek at this station. Backwater from the Rio Grande reaches this station when the Rio Grande near Del Rio reaches a stage of 15 feet or a flow of about 60,000 second-feet.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 45,000 second-feet on June 14, 1935, with a gage height of 23.20 feet. Min. 2.2 second-feet on December 2, 1934.

Average Flow in Second-Feet

Daily:	Max.	# 16,200	June 14,	1935	Min.	2.4	Dec. 1-2,	1934
Monthly:	Max.	* 805	June	1935	Min.	8.8	Feb.	1935
Yearly:	Max.	* 136		1935	Min.	28.5		1951

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	51.3	52.2	37.4	50.5	21.2	27.6	14.9	14.5	15.9	14.2	39.7	20.7
2	61.8	52.1	31.8	29.2	15.4	24.3	14.4	14.5	15.9	13.8	38.4	20.6
3	60.9	51.9	31.7	28.6	17.6	24.3	14.5	14.5	16.3	13.8	29.0	20.0
4	61.1	52.7	30.8	30.6	15.2	23.4	17.0	14.8	16.3	13.9	27.9	20.0
5	60.1	51.5	32.6	30.0	15.8	23.5	15.7	14.1	17.4	13.4	28.0	19.9
6	61.4	52.3	34.9	33.0	15.6	21.9	15.2	14.4	16.3	14.0	27.8	19.9
7	57.3	57.8	37.2	37.9	21.9	22.1	15.1	14.8	16.3	14.6	27.1	19.2
8	60.6	57.1	40.5	41.0	31.3	21.6	15.8	15.6	16.7	15.2	25.6	21.1
9	62.8	56.4	41.9	35.5	25.9	19.3	15.7	14.4	17.4	14.8	26.8	21.7
10	61.6	54.7	41.4	31.3	23.5	19.5	16.0	13.7	16.7	13.7	23.9	22.9
11	62.4	40.9	44.6	30.7	30.5	19.7	16.3	13.2	16.7	14.4	25.9	21.6
12	62.2	35.5	44.0	33.6	33.2	21.7	16.6	13.6	16.7	15.6	25.1	21.5
13	61.0	33.0	35.9	36.6	37.0	21.0	15.4	13.6	16.3	15.7	23.6	21.4
14	59.8	32.4	31.8	36.0	37.0	21.2	15.7	12.8	18.0	16.5	22.1	20.7
15	59.6	32.7	25.2	33.5	39.0	17.5	16.0	14.0	18.6	15.5	22.0	19.9
16	59.4	33.0	25.7	30.2	38.1	16.4	15.5	14.7	625	15.7	22.6	19.8
17	60.3	32.1	24.5	22.5	38.1	16.6	15.9	14.3	30.2	15.9	21.9	19.8
18	59.0	24.9	22.4	22.4	32.5	14.5	15.4	15.9	23.4	18.1	22.5	19.7
19	58.8	26.6	23.7	21.3	29.0	14.7	14.9	17.4	20.1	21.1	21.8	20.3
20	57.6	27.5	30.9	15.1	29.9	14.3	14.8	16.7	15.6	20.1	21.1	18.4
21	58.4	30.2	27.9	16.4	45.9	14.5	14.8	15.9	15.6	20.2	21.7	18.9
22	55.1	31.1	28.4	17.0	32.7	15.3	15.5	14.7	15.6	21.0	22.4	18.8
23	55.0	30.1	37.1	16.8	24.7	15.4	15.8	14.7	16.3	20.5	22.4	18.2
24	53.8	31.9	38.6	16.8	100	16.2	14.6	14.7	15.6	20.7	21.6	18.1
25	53.6	42.3	43.1	17.3	38.4	24.3	14.6	15.1	14.0	20.9	21.6	18.0
26	52.3	31.9	46.8	18.7	36.5	20.3	13.9	16.3	14.0	21.6	20.9	17.3
27	52.1	31.8	48.2	17.0	33.8	18.2	13.4	16.3	13.2	21.8	20.2	17.2
28	53.0	32.7	47.9	17.6	32.0	16.0	13.4	15.9	12.9	31.0	20.8	17.1
29	52.8		53.4	17.4	32.9	16.8	14.5	16.3	14.0	32.8	20.7	17.1
30	52.6		55.1	15.8	31.2	14.7	13.8	15.9	14.6	41.6	20.7	17.0
31	52.4		52.8		31.2		13.4	15.5		39.5		16.3
Sum	1,790.1	1,119.3	1,148.2	800.3	987.0	576.8	468.5	462.8	1,111.6	601.6	735.8	603.1

Month	Current Year 1951: Extreme Gage Feet High	Low	Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period Sept. 1931-1951: Acre-Feet Normal	Maximum	Minimum	Average 1942-1951
Jan.	.80	.62	9	64.9	1	45.4	57.7	3,550	3,992	7,070	934	3,741
Feb.	.80	.35	7	59.9	‡19	19.8	40.0	2,220	3,141	8,630	487	3,411
Mar.	.95	.25	26	82.4	17	16.7	37.0	2,280	2,654	5,030	798	2,525
Apr.	.75	.18	1	58.6	30	9.2	26.7	1,590	2,956	* 8,120	566	2,975
May	3.88	.19	24	560	1	9.8	31.8	1,960	3,686	6,700	1,400	3,507
June	1.32	.18	25	128	20	12.2	19.2	1,140	5,957	* 47,900	1,110	4,130
July	.49	.17	4	28.3	31	11.0	15.1	929	3,411	* 8,800	929	3,358
Aug.	.52	.25	29	23.1	‡13	10.0	14.9	918	3,060	6,060	838	2,710
Sept.	11.38	.20	16	5,450	‡26	11.8	37.1	2,200	4,351	19,100	872	3,522
Oct.	1.02	.34	28	59.4	10	10.4	19.4	1,190	3,885	8,470	1,190	4,045
Nov.	.80	.45	1	41.9	27	17.7	24.5	1,460	3,096	5,570	526	3,058
Dec.	.59	.42	10	26.3	31	13.8	19.5	1,200	3,106	5,870	496	2,957
Yearly	11.38	.17		5,450		9.2	28.5	20,637	43,295	* 98,137	20,637	39,939

Estimated * Partly estimated ‡ And other days

PINTO CREEK NEAR DEL RIO, TEXAS

DESCRIPTION: Water-stage recorder and concrete control dam, .6 mile below the Del Rio-Eagle Pass highway and 5.5 miles above the confluence with the Rio Grande. This creek enters the Rio Grande 717.7 river miles below the American Dam at El Paso, Texas. The zero of the gage is 854.61 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 1 meter measurement during the year by wading and a continuous record of gage heights. During periods of low flow, which occurred most of the year, the only flow at this station was leakage through the control dam, and the discharge is based on hydrographer's estimates. The station has a stable rating curve defined by low-flow measurements by wading, medium-flow measurements made from the cable prior to its destruction in 1948, and high-flow measurements by slope-area computations. Records available: November 22, 1928 through December 1951.

REMARKS: Small irrigation diversions modify the flow of this spring-fed creek at this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 186,000 second-feet on June 24, 1948, with a gage height of 32.0 feet. Min. occasionally no flow.

Average Flow in Second-Feet

Daily:	Max.	* 28,200	June 24, 1948	Min.	0	occasionally
Monthly:	Max.	* 953	June 1948	Min.	0	occasionally
Yearly:	Max.	105	1932	Min.	1.8	1945

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	# 1.0	0	# .5	0	0	0	0	2.2	0
2	0	0	0	# 1.0	0	# .5	0	0	0	0	2.1	0
3	0	0	0	# 1.0	0	# 1.0	0	0	0	0	1.9	0
4	0	0	0	# 1.0	0	# .9	0	0	0	0	1.8	0
5	0	0	0	# .9	0	# .6	0	0	0	0	1.7	0
6	0	0	0	# .8	0	# .4	0	0	0	0	1.5	0
7	0	0	0	# .7	0	# .2	0	0	0	0	1.4	0
8	0	0	0	# .6	0	# .1	0	0	0	0	1.2	0
9	0	0	0	# .5	0	0	0	0	0	0	1.1	0
10	0	0	0	# .4	0	0	0	0	0	0	1.0	0
11	0	0	0	# .3	0	0	0	0	0	0	.8	0
12	0	0	0	# .2	0	0	0	0	0	0	.7	0
13	0	0	0	# .1	0	0	0	0	0	0	.6	0
14	0	0	0	0	0	0	0	0	0	0	.4	0
15	0	0	0	0	0	0	0	0	0	0	.3	0
16	0	0	0	0	0	0	0	0	14.5	0	.3	0
17	0	0	0	0	0	0	0	0	* 1.5	0	.2	0
18	0	0	0	0	0	0	0	0	* 1.0	0	.2	0
19	0	0	0	0	0	0	0	0	# .5	0	.1	0
20	0	0	0	0	0	0	0	0	# .3	0	.1	0
21	0	0	0	0	0	0	0	0	# .2	0	.1	0
22	0	0	0	0	0	0	0	0	# .1	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	278	0	0	0	0	0	0	0
25	0	0	47.0	0	20.1	0	0	0	0	0	0	0
26	0	0	25.1	0	* 2.0	0	0	0	0	0	0	0
27	0	0	* 3.8	0	* .7	0	0	0	0	0	0	0
28	0	0	* 1.4	0	* .6	0	0	0	0	953	0	0
29	0		* 1.1	0	# .5	0	0	0	0	59.6	0	0
30	0		# 1.0	0	# .5	0	0	0	0	23.0	0	0
31	0		# 1.0	0	# .5		0	0		6.7		0
Sum	0	0	80.4	# 8.5	302.9	# 4.2	0	0	* 18.1	1,042.3	19.7	0

Month	Current Year 1951: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period Dec. 1928-1951: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Average 1942-1951
Jan.				0		0	0	0	397	2,110	0	200
Feb.				0		0	0	0	619	5,760	0	803
Mar.	4.53		25	214	‡ 1	0	2.6	159	496	2,500	0	259
Apr.			‡ 1	# 1.0	‡14	0	# .3	# 16.9	706	3,600	# 16.9	533
May	7.25		24	2,510	‡ 1	0	9.8	601	2,150	20,500	28.0	1,516
June	2.98		3	# 1.1	‡ 9	0	# .1	# 8.3	* 4,449	* 56,700	0	6,583
July				0		0	0	0	2,658	30,000	0	694
Aug.				0		0	0	0	2,424	48,700	0	196
Sept.	3.92		16	64.0	‡ 1	0	* .6	* 35.9	1,556	17,300	0	409
Oct.	8.53		28	4,100	‡ 1	0	33.6	2,070	795	4,000	0	463
Nov.	3.29		1	3.7	‡22	0	.7	39.1	334	2,150	0	121
Dec.				0		0	0	0	413	2,180	0	146
Yearly	8.53			4,100		0	4.0	2,930.2	*16,997	76,259.3	1,325.2	11,923

Estimated * Partly estimated ‡ And other days

RIO SAN DIEGO AT JIMENEZ, COAHUILA

DESCRIPTION: Water-stage recorder and cable with sit-down cable car and masonry and concrete Cipoletti weir control for measuring flows up to 700 second-feet, located 4.4 miles west of Jiménez, Coahuila and 5.0 miles above the confluence with the Rio Grande. This stream enters the Rio Grande 722.4 river miles below the American Dam at El Paso, Texas. The zero of the gage is 828.90 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 1 meter measurement made at high flow during the year, the weir discharge table, and a continuous record of gage heights. The discharge did not exceed the capacity of the weir except on May 16, 23, and 24, June 3, and October 28. Records available: 1922 through December 1951. The records from 1922 to September 1932 are considered doubtful.

REMARKS: Reservoirs and irrigation diversions modify the flow of this spring-fed stream at this station.

EXTREME FLOWS FROM RECORDS: ⊕ Momentary: Max. about 75,200 second-feet on September 18, 1941, with a gage height of 20.96 feet. Min. no flow on several occasions from April to June 1939.

Average Flow in Second-Feet

Daily:	Max.	* 23,200	Sept. 18, 1941	Min.	0	occasionally	
Monthly:	Max.	2,380	Oct. 1932	Min.	18.7	April	1939
Yearly:	Max.	527	1935	Min.	37.9		1939

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	52.3	52.3	52.3	63.2	32.8	245	100	42.0	42.0	52.2	74.9	52.3
2	63.2	52.3	42.0	63.2	32.8	245	100	42.0	42.0	42.0	63.2	52.3
3	74.9	52.3	42.0	63.2	24.0	304	87.2	52.3	42.0	42.0	63.2	52.3
4	87.2	52.3	42.0	52.3	24.0	245	87.2	42.0	42.0	42.0	63.2	52.3
5	74.9	52.3	42.0	52.3	24.0	227	74.9	52.3	32.8	42.0	63.2	52.3
6	74.9	52.3	42.0	52.3	24.0	209	74.9	52.3	32.8	42.0	63.2	52.3
7	63.2	42.0	32.8	52.3	32.8	209	87.2	42.0	32.8	52.2	63.2	52.3
8	52.3	42.0	32.8	52.3	32.8	192	87.2	42.0	32.8	42.0	63.2	52.3
9	52.3	42.0	42.0	42.0	32.8	175	87.2	32.8	42.0	42.0	63.2	52.3
10	52.3	42.0	42.0	42.0	32.8	175	87.2	24.0	42.0	42.0	63.2	52.3
11	52.3	42.0	42.0	42.0	32.8	175	42.0	24.0	32.8	42.0	63.2	42.0
12	52.3	42.0	42.0	42.0	32.8	175	52.3	32.8	42.0	42.0	63.2	42.0
13	52.3	42.0	42.0	42.0	32.8	175	63.2	52.3	42.0	42.0	63.2	42.0
14	52.3	42.0	42.0	42.0	32.8	175	63.2	52.3	42.0	52.2	63.2	42.0
15	52.3	42.0	42.0	42.0	42.0	159	74.9	52.3	52.3	42.0	63.2	42.0
16	52.3	52.3	42.0	42.0	1,330	159	63.2	42.0	114	42.0	63.2	42.0
17	52.3	52.3	42.0	32.8	346	143	63.2	42.0	74.9	42.0	63.2	42.0
18	52.3	52.3	42.0	32.8	208	129	63.2	32.8	74.9	42.0	63.2	42.0
19	63.2	52.3	63.2	32.8	208	114	63.2	32.8	74.9	42.0	52.3	42.0
20	52.3	42.0	63.2	32.8	192	143	63.2	42.0	63.2	42.0	52.3	42.0
21	63.2	52.3	52.3	32.8	175	114	52.3	42.0	63.2	42.0	42.0	52.3
22	63.2	52.3	42.0	32.8	175	129	52.3	42.0	63.2	42.0	42.0	42.0
23	52.3	52.3	42.0	32.8	410	129	52.3	42.0	63.2	42.0	52.3	52.3
24	52.3	42.0	42.0	32.8	1,750	129	52.3	42.0	63.2	42.0	63.2	52.3
25	52.3	52.3	137	32.8	484	129	42.0	42.0	63.2	42.0	63.2	42.0
26	52.3	52.3	114	32.8	367	129	42.0	42.0	63.2	42.0	63.2	42.0
27	52.3	52.3	87.2	32.8	367	114	42.0	42.0	63.2	42.0	63.2	42.0
28	52.3	42.0	74.9	32.8	325	87.2	42.0	42.0	63.2	413	52.3	42.0
29	52.3		63.2	32.8	304	100	52.3	42.0	63.2	209	63.2	42.0
30	52.3		63.2	32.8	284	100	52.3	42.0	63.2	129	63.2	42.0
31	52.3		63.2		264		42.0	42.0		74.9		42.0
Sum	1,778.5	1,340.8	1,655.3	1,246.3	7,655.0	4,933.2	2,008.4	1,291.0	1,628.2	1,990.5	1,821.7	1,435.9

Month	Current Year 1951: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period Oct. 1932-1951: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Average 1942-1951
Jan.	2.95	2.82	4	87.2	9	42.0	57.4	3,530	7,534	36,430	2,910	6,358
Feb.	2.85	2.82	#	52.3	#	42.0	47.9	2,660	6,000	25,760	1,970	6,037
Mar.	3.54	2.79	25	413	#	32.8	53.4	3,280	5,826	27,040	2,140	6,055
Apr.	2.92	2.76	#	74.9	#	24.0	41.5	2,470	5,798	21,650	1,110	5,699
May	6.86	2.76	24	4,450	#	24.0	247	15,180	* 14,904	* 120,200	1,290	11,512
June	4.36	2.95	3	1,030	28	87.2	164	9,790	10,973	62,240	1,420	9,903
July	2.99	2.79	1	100	27	32.8	64.8	3,980	9,927	34,430	1,210	10,885
Aug.	2.85	2.76	#	52.3	#	24.0	41.6	2,560	8,430	32,180	2,030	8,408
Sept.	3.22	2.79	16	209	#	32.8	54.3	3,230	* 15,602	* 84,620	2,120	9,438
Oct.	4.72	2.82	28	1,360	#	42.0	64.2	3,950	20,090	146,640	1,950	11,902
Nov.	2.92	2.82	1	74.9	#	42.0	60.7	3,610	12,571	68,290	1,960	9,269
Dec.	2.85	2.82	#	52.3	#	42.0	46.3	2,850	8,276	45,160	2,060	6,247
Yearly	6.86	2.76		4,450		24.0	78.9	57,090	125,931	* 381,720	* 27,460	101,713

* Partly estimated # Various days of the month ⊕ Period October 1932-1951

RIO SAN RODRIGO NEAR EL MORAL, COAHUILA

DESCRIPTION: Water-stage recorder and cable with sit-down cable car and reinforced concrete control weir for measuring flows up to 177 second-feet. This station is located 10.6 miles west of the town of El Moral, Coahuila, 19.3 miles northwest from Piedras Negras, Coahuila, and 11.2 river miles above the confluence with the Rio Grande. This stream enters the Rio Grande 735.4 river miles below the American Dam at El Paso, Texas. The zero of the gage is 879.95 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 3 meter measurements at high flow, the weir discharge table, and a continuous record of gage heights. The discharge did not exceed the capacity of the weir, except on April 24, May 16-22 and 24-30, and June 7. Records available: 1922 through December 1951. The records from 1922 to 1931 are considered doubtful.

REMARKS: The flow of this spring-fed stream is modified by irrigation diversions above this station.

EXTREME FLOWS FROM RECORDS ⊕: Momentary: Max. * 81,200 second-feet on September 7, 1932, with a gage height of 16.08 feet on the original gage (See Water Bulletin No. 16). Min. frequently no flow, which occurs at a gage height of 0.0 feet.

Average Flow in Second-Feet

Daily:	Max.	* 27,900	Sept. 7, 1932	Min.	0	frequently
Monthly:	Max.	4,270	Sept. 1932	Min.	0	during July 1939
Yearly:	Max.	571	1932	Min.	10.3	1939

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	21.2	12.0	8.1	21.2	12.0	105	105	79.5	50.1	31.4	43.8	37.4
2	16.3	12.0	8.1	16.2	8.1	87.6	105	79.5	43.8	31.4	43.8	31.4
3	16.3	16.2	8.1	8.1	8.1	87.6	113	79.5	43.8	31.4	43.8	31.4
4	16.3	12.0	8.1	8.1	8.1	87.6	113	79.5	43.8	31.4	43.8	31.4
5	16.3	12.0	8.1	8.1	4.9	79.5	113	71.7	43.8	31.4	43.8	31.4
6	16.3	12.0	8.1	5.0	4.9	71.7	113	71.7	43.8	31.4	37.4	26.1
7	16.3	12.0	8.1	5.0	4.9	162	113	71.7	43.8	31.4	37.4	26.1
8	16.3	12.0	8.1	8.1	4.9	105	113	71.7	43.8	31.4	31.4	31.4
9	16.3	12.0	8.1	5.0	4.9	87.6	113	71.7	43.8	31.4	31.4	31.4
10	21.2	12.0	8.1	8.1	4.9	87.6	105	71.7	43.8	31.4	37.4	31.4
11	21.2	12.0	8.1	5.0	4.9	87.6	105	64.3	43.8	31.4	43.8	31.4
12	21.2	12.0	8.1	5.0	4.9	87.6	105	64.3	43.8	31.4	37.4	31.4
13	21.2	12.0	8.1	5.0	4.9	96.1	105	64.3	43.8	31.4	37.4	31.4
14	16.2	12.0	8.1	5.0	2.1	105	113	57.2	43.8	31.4	37.4	31.4
15	16.2	12.0	8.1	2.1	2.1	96.1	105	57.2	50.1	31.4	37.4	26.1
16	16.2	12.0	8.1	2.1	1,420	105	105	57.2	50.1	31.4	37.4	31.4
17	12.0	12.0	8.1	4.9	1,500	105	105	57.2	50.1	31.4	37.4	31.4
18	16.2	12.0	8.1	4.9	798	105	105	57.2	43.8	31.4	43.8	31.4
19	16.2	12.0	8.1	4.9	406	87.6	105	57.2	43.8	31.4	43.8	31.4
20	12.0	8.1	8.1	4.9	266	87.6	105	57.2	43.8	31.4	43.8	31.4
21	12.0	12.0	8.1	4.9	162	87.6	96.1	57.2	43.8	31.4	43.8	26.1
22	12.0	12.0	8.1	4.9	205	87.6	96.1	57.2	37.4	31.4	43.8	26.1
23	12.0	12.0	8.1	8.1	105	87.6	96.1	57.2	37.4	31.4	43.8	26.1
24	12.0	12.0	8.1	79.5	173	87.6	104	57.2	43.8	31.4	37.4	26.1
25	12.0	12.0	12.0	12.0	227	96.1	96.1	57.2	43.8	31.4	37.4	31.4
26	12.0	12.0	21.2	8.1	484	105	87.6	57.2	37.4	31.4	43.8	26.1
27	12.0	12.0	26.2	4.9	452	104	87.6	57.2	37.4	31.4	37.4	26.1
28	12.0	12.0	21.2	4.9	360	104	87.6	57.2	37.4	79.5	37.4	26.1
29	12.0		21.2	8.1	267	104	87.6	57.2	37.4	113	43.8	31.4
30	12.0		21.2	12.0	195	104	87.6	57.2	37.4	64.3	43.8	31.4
31	12.0		21.2		142		87.6	57.2		50.1		31.4
Sum	473.4	336.3	338.6	284.1	7,246.6	2,891.3	3,178.0	1,970.7	1,294.4	1,154.7	1,206.0	926.4

Month	Current Year 1951: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1932-1951: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Average 1942-1951
Jan.	.20	.13	#	21.2	#	12.0	15.3	939	3,495	14,850	171	3,279
Feb.	.16	.10	#	16.2	#	8.1	12.0	667	2,861	11,580	555	3,027
Mar.	.26	.07	26	31.4	#	4.9	10.9	672	2,600	9,900	576	2,521
Apr.	.98	.03	24	227	#	2.1	9.5	564	2,979	21,160	382	3,778
May	3.67	.03	16	1,870	#	2.1	234	14,370	5,905	42,330	57.6	5,361
June	1.08	.46	7	267	#	71.7	96.4	5,730	6,519	41,660	30.0	7,459
July	.62	.49	#	113	31	79.5	103	6,300	3,961	12,170	0	3,714
Aug.	.49	.36	#	79.5	#	50.1	63.6	3,910	4,857	23,580	38.9	5,742
Sept.	.39	.26	17	57.2	30	31.4	43.1	2,570	* 20,136	* 253,960	383	6,575
Oct.	.95	.23	28	216	16	26.1	37.2	2,290	10,140	81,360	815	8,086
Nov.	.33	.26	#	43.8	#	31.4	40.2	2,390	5,061	24,450	535	4,562
Dec.	.33	.23	1	43.8	#	26.1	29.9	1,840	4,189	19,060	131	3,818
Yearly	3.67	.03		1,870		2.1	58.3	42,242	* 72,703	* 414,310	7,436	57,922

* Partly estimated # Various days of the month ⊕ Period 1932-1951

RETURN FLOW TO THE RIO GRANDE AT MAVERICK POWER PLANT

Near Eagle Pass, Texas

DESCRIPTION: A part of the water diverted from the river into the Maverick Canal is returned to the Rio Grande through the hydroelectric power plant near Eagle Pass, Texas, at a point about 32.2 canal miles below the point of diversion, and about 744.9 river miles below the American Dam at El Paso, Texas.

RECORDS: Based on records furnished by the Maverick County Water Control and Improvement District No. 1, showing hourly manometer readings of discharge, in cubic feet per second, through each turbine at the Central Power and Light Company hydroelectric power plant. The mean daily discharges computed from the manometer readings have been multiplied by a factor to make them agree with periodic check measurements of flow made by current meter by hydrographers of this Commission under stable flow conditions. Records available: January 1949 through December 1951.

REMARKS: This power plant began operating April 16, 1932. Because the September 1932 flood washed out the upper end of the Maverick Canal, this plant did not operate from September 2, 1932 until March 17, 1937. Since then, however, it has operated continuously. This plant contains 3 vertical turbine generators of 4,000 kw. capacity each, operating under a normal head of about 84 feet.

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,000	1,030	990	1,210	633	1,330	646	1,030	527	748	1,020	775
2	1,010	1,080	1,010	1,160	630	1,290	613	1,030	543	753	1,180	757
3	1,000	1,050	1,040	1,040	568	1,270	527	1,060	903	782	1,200	769
4	979	1,060	1,050	986	588	1,280	498	1,030	1,070	755	1,140	777
5	988	1,040	1,050	978	769	1,250	512	1,010	1,040	743	1,010	766
6	982	1,060	1,030	958	594	1,280	812	910	901	729	935	757
7	986	982	967	956	598	1,280	852	855	890	699	917	738
8	991	989	1,000	949	448	1,320	899	799	816	657	836	730
9	986	1,020	995	919	598	1,300	899	820	809	615	832	725
10	982	1,030	988	872	577	1,290	909	802	822	628	830	768
11	981	1,010	1,040	822	605	1,270	911	830	771	617	855	844
12	1,000	1,010	1,050	847	869	1,240	855	763	997	595	844	852
13	994	1,030	1,060	762	973	1,160	802	715	900	596	840	856
14	1,010	1,100	1,060	699	843	1,210	675	1,030	811	582	843	877
15	1,000	1,100	1,030	726	792	1,160	648	1,110	1,030	589	768	889
16	987	1,030	1,040	728	921	1,040	597	1,110	1,240	595	741	889
17	943	1,060	1,030	722	1,080	1,070	577	1,100	1,230	607	732	866
18	952	1,050	1,020	640	1,210	1,050	580	1,120	1,250	640	776	842
19	980	1,050	1,020	626	1,260	1,040	869	1,030	1,260	702	770	757
20	963	1,010	998	576	1,210	957	939	862	1,170	792	797	732
21	1,010	1,040	993	541	1,200	921	965	793	1,150	722	779	769
22	1,000	1,010	980	544	1,190	899	1,060	766	1,060	803	754	793
23	996	993	995	523	1,240	841	1,020	771	1,000	1,020	745	794
24	965	997	995	485	1,320	787	994	692	949	932	743	838
25	998	1,000	1,110	517	1,250	781	976	702	898	838	769	802
26	990	1,020	1,240	513	* 1,340	881	988	807	1,030	805	810	806
27	1,020	1,010	1,290	532	1,390	859	959	843	1,040	786	799	761
28	1,030	999	1,270	608	1,320	769	944	728	976	851	764	757
29	886		1,210	600	1,330	655	985	643	889	1,110	723	761
30	1,040		1,210	607	1,350	615	978	611	825	1,080	746	770
31	1,040		1,230		* 1,340		952	583		1,020		731
Sum	30,689	28,860	32,991	22,646	30,036	32,095	25,441	26,955	28,797	23,391	25,498	24,548

Month	Current Year 1951: Extreme Gage Feet High	Extreme Gage Feet Low	ϕ Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1949-1951: Acre-Feet Average	Maximum	Minimum
Jan.			‡30	1,040	29	886	990	60,900	* 58,700	64,700	‡ 50,500
Feb.			‡14	1,100	7	982	1,030	57,200	* 54,333	57,200	* 48,700
Mar.			27	1,290	7	967	1,060	65,400	61,300	65,400	58,200
Apr.			1	1,210	24	485	755	44,900	* 52,633	58,600	44,900
May			27	1,390	8	448	969	59,600	62,067	64,900	59,600
June			1	1,330	30	615	1,070	63,700	62,833	68,900	55,900
July			22	1,060	4	498	821	50,500	* 55,600	63,000	50,500
Aug.			18	1,120	31	583	870	53,500	63,300	68,900	53,500
Sept.			19	1,260	1	527	960	57,100	62,800	67,500	57,100
Oct.			29	1,110	14	582	755	46,400	59,733	69,000	46,400
Nov.			3	1,200	29	723	850	50,600	55,533	63,500	50,600
Dec.			‡15	889	9	725	792	48,700	57,067	65,500	48,700
Yearly				1,390		448	910	658,500	* 705,899	740,000	658,500

‡ Estimated * Partly estimated ‡ And other days ϕ Mean daily

RIO GRANDE AT EAGLE PASS, TEXAS

DESCRIPTION: Water-stage recorder and cable with stand-up cable car and winch, located .5 mile above the international highway bridge between Eagle Pass, Texas and Piedras Negras, Coahuila and 754.6 river miles below the American Dam at El Paso, Texas. The zero of the gage is 682.91 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 158 meter measurements during the year, 153 by the Mexican and 5 by the United States Section of this Commission, and a continuous record of gage heights. Computations by shifting channel methods. Records available: May 1900 to March 1914; August 1914 to April 1916; September 1916; September and October 1917; October 1918; September and October 1919; August and September 1920; June 1922; September, November, and December 1923; January 1924 through December 1951.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station.

EXTREME FLOWS FROM RECORDS: The greatest recorded flow was 569,000 second-feet, which occurred September 2, 1932, with a gage height of 49.00 feet. The lowest recorded flow was 551 second-feet, which occurred June 22, 1948, with a gage height of 1.08 feet.

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,700	1,480	1,650	1,680	749	2,310	932	1,900	752	992	1,260	964
2	1,710	1,460	1,710	1,530	791	2,130	929	1,610	741	985	1,610	915
3	1,670	1,470	1,820	1,560	724	2,380	816	1,440	974	982	1,890	936
4	1,640	1,470	1,880	1,450	752	2,200	777	1,260	1,460	961	1,510	922
5	1,520	1,420	1,880	1,210	777	4,520	788	1,240	1,420	943	1,300	872
6	1,480	1,440	1,820	1,150	766	6,890	1,160	1,130	1,170	943	1,180	886
7	1,540	1,350	1,580	1,150	756	5,260	1,780	1,040	1,060	911	1,110	826
8	1,540	1,360	1,530	1,180	791	3,920	1,600	1,020	989	872	1,080	833
9	1,480	1,320	1,490	1,170	756	3,400	2,190	936	914	826	1,070	809
10	1,430	1,460	1,550	1,130	756	3,020	1,650	954	989	819	1,080	851
11	1,420	1,620	1,680	1,060	759	2,850	1,400	1,030	886	809	1,100	971
12	1,400	1,680	1,700	1,100	2,100	2,490	1,190	968	1,050	763	1,120	978
13	1,420	1,660	1,680	1,030	2,190	3,140	1,040	869	1,320	731	1,110	943
14	1,480	1,630	1,840	950	1,370	3,990	897	1,320	1,030	727	1,100	989
15	1,500	1,610	1,980	943	1,200	5,970	826	1,810	1,410	724	989	985
16	1,490	1,540	1,670	939	1,520	4,200	759	1,520	4,200	759	953	1,020
17	1,430	1,560	1,680	953	6,530	2,970	763	1,420	4,310	763	928	978
18	1,460	1,690	1,460	893	4,030	2,130	727	1,380	2,890	819	978	943
19	1,350	1,810	1,420	837	2,640	1,690	946	1,300	2,100	802	989	904
20	1,400	1,750	1,430	784	2,130	1,640	1,180	1,180	1,760	929	1,010	869
21	1,460	1,800	1,400	752	1,880	1,370	1,320	1,080	1,560	819	957	908
22	1,510	1,800	1,360	756	1,800	1,270	1,540	996	1,360	844	922	946
23	1,380	1,740	1,310	727	3,240	1,200	1,850	1,060	1,210	1,180	925	946
24	1,460	1,760	1,300	689	13,240	1,170	1,790	957	1,140	1,130	925	985
25	1,410	1,830	1,450	682	13,910	1,130	1,450	943	1,060	1,090	929	945
26	1,370	1,790	2,520	724	4,980	1,210	1,320	1,010	1,130	1,050	971	946
27	1,340	1,780	1,930	763	4,240	1,200	1,290	1,070	1,230	982	971	950
28	1,360	1,720	1,850	901	3,960	1,150	1,510	947	1,150	2,580	936	911
29	1,440		1,610	858	3,080	1,020	1,210	827	1,120	3,280	900	915
30	1,470		1,600	816	2,630	975	2,230	813	1,060	1,650	904	915
31	1,450		1,880		2,360		2,060	799		1,350		918
Sum	45,710	45,000	51,660	30,367	87,407	78,795	39,920	35,829	43,445	33,015	32,707	28,679

Month	Current Year 1951: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High	Day	Extreme Second-Feet Low	Day	Average Second-Feet	Total Acre-Feet	Period 1924-1951: Acre-Feet Normal	Maximum	Minimum	Average 1942-1951
Jan.	2.23	1.74	1,990	1	1,190	27	1,470	90,660	173,437	365,000	90,660	149,162
Feb.	2.33	1.77	2,090	24	1,260	10	1,610	89,260	155,033	398,200	89,260	154,897
Mar.	2.89	1.77	2,970	26	1,260	23	1,670	102,500	145,503	247,440	93,510	132,421
Apr.	2.30	1.25	2,040	3	682	25	1,010	60,230	134,404	270,700	60,230	116,405
May	9.25	1.25	22,600	24	692	3	2,820	173,400	229,443	* 918,000	70,210	172,345
June	5.91	1.44	10,310	14	936	30	2,630	156,300	263,794	1,005,000	48,710	266,951
July	2.82	1.25	2,880	8	671	18	1,290	79,180	266,546	*1,225,000	79,180	257,951
Aug.	2.33	1.31	2,080	14	773	30	1,160	71,070	275,392	* 947,000	71,070	208,851
Sept.	4.69	1.25	7,310	16	696	3	1,450	86,170	543,383	3,079,000	69,920	379,029
Oct.	5.54	1.25	8,830	28	696	15	1,060	65,490	412,443	1,680,300	65,490	297,699
Nov.	2.36	1.44	2,200	2	865	29	1,090	64,870	198,304	512,800	64,870	155,187
Dec.	1.71	1.38	1,190	15	752	7	925	56,880	171,190	369,760	56,800	132,688
Yearly	9.25	1.25	22,600		671		1,510	1,096,010	2,968,872	6,946,510	1,096,010	2,423,586

* Partly estimated

RIO ESCONDIDO AT VILLA DE FUENTE, COAHUILA

DESCRIPTION: Water-stage recorder and cable with sit-down cable car, located 3.1 miles southwest of Piedras Negras, Coahuila, on the outskirts of Villa de Fuente, 5 miles above the confluence with the Rio Grande. This stream enters the Rio Grande 758.2 river miles below the American Dam at El Paso, Texas. The zero of the gage is 717.78 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 51 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: 1922 through December 1951. The records from 1922 to September 1932 are considered doubtful.

REMARKS: Diversions and drainage returns modify the flow of this spring-fed stream at this station. Backwater reaches this station when the flow of the Rio Grande at Eagle Pass reaches approximately 380,000 second-feet.

EXTREME FLOWS FROM RECORDS: ⊕ Momentary: Max. 24,000 second-feet on June 29, 1936, with a gage height of 19.13 feet. Min. .35 second-foot on November 4, 1934, with a gage height of .75 foot.

Average Flow in Second-Feet

Daily:	Max.	6,710	June 29, 1936	Min.	.7	1934, 1945 & 1946 δ
Monthly:	Max.	647	Oct. 1932	Min.	1.0	Sept. 1945
Yearly:	Max.	83.2	1935	Min.	11.0	1943

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	19.4	10.6	7.8	26.8	8.8	34.6	9.9	3.9	2.5	4.2	13.8	8.1
2	51.2	12.3	7.8	27.5	8.8	32.1	9.9	3.6	2.5	3.5	14.8	8.1
3	55.1	12.7	7.8	25.8	8.5	340	9.5	2.9	2.8	3.5	15.9	7.8
4	59.3	13.1	7.8	24.4	8.5	54.7	11.0	2.9	2.8	3.5	17.0	10.6
5	69.9	11.6	8.1	22.6	8.1	35.7	11.0	2.1	2.8	2.5	18.0	10.2
6	104	12.0	8.1	18.7	8.1	30.4	11.3	2.1	2.8	2.5	13.1	8.5
7	71.3	12.4	8.1	19.1	13.4	26.1	11.3	2.1	2.8	2.5	7.4	9.9
8	35.0	12.4	8.1	13.8	22.6	26.1	11.3	2.1	3.2	2.5	6.4	9.5
9	43.1	12.4	8.1	9.5	12.7	26.1	11.3	2.1	3.2	2.5	6.4	9.2
10	43.4	12.4	12.0	14.1	9.9	24.0	10.2	2.5	3.2	2.5	4.9	9.2
11	50.8	10.6	9.2	11.7	9.9	24.0	10.2	2.5	3.2	2.5	6.4	8.8
12	43.8	10.6	9.2	9.5	9.9	24.0	10.2	44.5	3.2	2.5	5.3	8.5
13	51.2	10.6	10.6	10.2	8.8	17.0	10.2	2.5	15.9	2.5	5.3	8.8
14	89.3	10.6	9.2	10.6	8.8	15.5	10.6	2.5	21.9	2.5	5.3	8.8
15	143	9.2	10.2	9.9	622	14.5	10.6	2.5	3.9	3.2	6.4	7.4
16	90.1	12.7	10.2	11.7	593	14.8	10.6	2.5	72.4	3.2	7.8	7.8
17	37.8	12.7	10.2	11.7	141	14.8	9.9	2.1	15.2	3.2	11.3	7.8
18	42.0	9.5	10.2	11.7	91.8	9.5	9.9	2.1	7.4	3.2	9.2	7.8
19	39.6	8.5	9.9	10.6	71.0	9.5	9.5	2.1	7.1	3.2	10.9	9.2
20	37.1	8.8	9.9	10.6	62.2	9.5	13.8	2.1	6.7	3.5	10.9	9.2
21	21.5	11.3	10.2	10.6	84.0	9.9	9.9	2.1	5.3	3.5	10.9	9.2
22	19.8	12.4	10.6	10.9	1,500	9.9	9.2	2.5	4.9	3.5	10.6	9.2
23	18.4	13.4	10.9	10.9	81.2	10.2	8.8	2.1	4.9	46.6	10.6	9.2
24	14.1	9.9	10.9	12.4	161	10.2	8.8	2.1	4.6	13.4	10.6	9.2
25	13.1	9.5	11.3	14.1	196	11.3	8.5	2.1	4.2	10.6	12.4	9.2
26	9.9	9.2	13.1	12.7	88.3	11.3	7.8	2.1	5.7	7.1	9.2	9.2
27	9.9	7.4	12.0	12.7	65.0	10.9	7.1	2.1	5.7	6.7	6.4	9.2
28	26.5	7.4	23.3	11.3	59.7	10.9	6.4	2.5	6.0	11.3	6.7	9.2
29	26.5		28.3	11.7	56.9	10.6	5.3	2.5	6.0	13.4	7.1	9.2
30	26.5		29.3	10.2	47.0	10.2	4.6	2.5	6.4	12.7	7.4	9.2
31	13.8		25.8		47.0		3.9	2.5		12.7		9.2
Sum	1,376.4	306.2	368.2	428.0	4,113.9	888.3	292.5	116.8	239.2	200.7	288.4	276.4

Month	Current Year 1951: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period Oct. 1932-1951: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Average 1942-1951
Jan.	2.46	1.97	15	143	#	9.9	44.4	2,730	2,526	15,990	375	1,587
Feb.	2.49	1.87	22	104	#	7.4	10.9	607	1,660	9,990	179	1,372
Mar.	2.17	1.90	30	29.3	#	7.8	11.9	730	1,425	6,910	206	1,111
Apr.	2.13	1.90	2	27.5	30	8.8	14.3	849	1,706	7,510	195	1,457
May	11.88	1.90	22	6,220	#	8.1	133	8,160	3,879	23,850	494	2,719
June	8.20	1.77	3	2,410	#	9.5	29.6	1,760	3,035	19,730	270	1,674
July	1.94	1.77	20	15.2	31	3.9	9.4	580	2,036	9,740	106	1,376
Aug.	4.46	1.71	12	487	#	2.1	3.8	232	* 2,478	* 20,830	77.8	2,592
Sept.	4.33	1.77	16	378	#	2.5	8.0	474	2,602	16,000	57.5	3,085
Oct.	2.89	1.84	23	108	#	2.5	6.5	398	3,613	39,790	117	1,679
Nov.	2.17	1.94	5	18.0	10	4.9	9.6	572	2,273	25,590	101	1,003
Dec.	2.03	1.97	4	10.6	15	7.4	8.9	548	2,320	20,720	260	1,035
Yearly	11.88	1.71		6,220		2.1	24.4	17,640	29,553	60,241	7,969	20,690

* Partly estimated # Various days of the month δ Various days of the year ⊕ Period October 1932-1951

RIO GRANDE AT LAREDO, TEXAS

DESCRIPTION: Water-stage recorder and cable with stand-up cable car. The recorder is located on the downstream side of the first pier from the Mexican end of the railroad bridge between Laredo, Texas and Nuevo Laredo, Tamaulipas, 884.3 river miles below the American Dam at El Paso, Texas. The cable is located 1.4 miles upstream from the railroad bridge. The zeros of the gages at the recorder and at the cable are 351.51 feet and 352.89 feet, respectively, above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 169 meter measurements during the year, 153 by the Mexican and 16 by the United States Section of this Commission, and a continuous record of gage heights. Computations by shifting channel methods. Records available: May 1900 through December 1913; May, June, and October 1914; September 1916; September and October 1917; October 1918; September and October 1919; August and September 1920; June, November, and December 1922; January 1923 through December 1951. Gage-height records are available for January, February, and March 1914.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station.

EXTREME FLOWS FROM RECORDS: The greatest recorded flow at this station was 335,000 second-feet, which occurred September 3, 1932, with a gage height of 52.20 feet. The lowest recorded flow was 533 second-feet, which occurred June 23, 1948, with a gage height of 3.38 feet.

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,600	1,590	1,740	1,600	964	2,490	1,030	2,100	812	1,200	1,950	1,020
2	1,700	1,650	1,650	1,900	918	2,310	876	1,950	809	1,090	1,570	1,010
3	1,800	1,690	1,630	1,700	862	4,590	851	1,840	773	1,080	1,340	1,040
4	1,820	1,640	1,680	1,490	862	7,100	862	1,670	713	1,020	1,510	1,100
5	1,820	1,530	1,720	1,350	893	3,150	812	1,560	742	961	2,000	1,120
6	1,780	1,510	1,910	1,220	865	2,460	731	1,350	1,140	989	1,670	1,050
7	1,670	1,450	1,910	1,200	2,040	6,640	692	1,230	1,350	1,110	1,380	996
8	1,550	1,450	1,810	1,170	1,120	5,720	749	1,120	1,190	1,050	1,190	1,010
9	1,580	1,440	1,560	1,180	1,080	4,060	1,370	1,070	1,030	957	1,210	985
10	1,570	1,390	1,510	1,190	982	3,500	1,490	989	992	943	1,160	996
11	1,530	1,370	1,460	1,150	3,990	3,220	2,040	915	939	862	1,100	1,010
12	1,540	1,400	1,550	1,070	6,280	2,810	1,610	964	961	784	1,130	1,050
13	1,550	1,580	1,670	1,050	2,500	2,920	1,300	1,150	2,110	798	1,140	1,110
14	1,510	1,720	1,790	1,070	1,950	2,570	1,180	1,140	6,250	812	1,120	1,130
15	1,510	1,770	1,690	1,110	2,050	3,040	1,030	932	3,370	763	1,110	1,090
16	1,530	1,790	1,780	1,050	27,900	5,760	883	1,020	3,080	759	1,090	1,050
17	1,550	1,730	1,870	939	15,080	4,870	858	1,650	5,400	752	1,030	1,090
18	1,690	1,670	1,670	893	4,840	3,450	886	1,590	5,330	749	1,000	1,120
19	1,510	1,610	1,570	900	5,510	2,670	809	1,480	3,440	745	1,010	1,120
20	1,530	1,700	1,540	908	3,250	2,100	766	1,320	2,630	830	1,030	1,080
21	1,470	1,840	1,540	833	2,550	1,710	763	1,290	2,050	953	1,030	1,010
22	1,450	1,780	1,500	826	2,250	1,620	1,040	1,150	1,720	946	1,050	971
23	1,520	1,800	1,460	756	3,960	1,340	1,180	1,120	1,560	1,020	1,060	971
24	1,590	1,810	1,420	731	2,850	1,260	1,300	1,020	1,460	989	1,070	1,040
25	1,590	1,720	1,480	706	13,380	1,400	1,720	1,020	1,390	1,250	1,040	1,090
26	1,680	1,820	1,590	699	14,550	1,230	1,740	932	1,300	1,340	1,090	1,100
27	1,590	1,820	1,920	692	7,030	1,130	1,350	841	1,250	1,300	1,090	1,130
28	1,550	1,830	2,440	717	4,030	1,090	1,300	897	1,200	1,170	1,110	1,130
29	1,500		1,880	844	4,270	1,060	1,250	985	1,300	1,090	1,120	1,080
30	1,550		1,720	840	3,410	1,100	1,340	964	1,250	3,370	1,060	1,070
31	1,590		1,670		2,900		1,590	848		2,630		1,030
Sum	49,420	46,100	52,330	31,784	145,116	88,370	35,398	38,107	57,501	34,312	36,460	32,799

Month	Current Year 1951: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1924-1951: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Average 1942-1951
Jan.	4.95	4.69	4	1,880	22	1,410	1,590	98,020	174,840	351,700	98,020	160,412
Feb.	4.99	4.66	27	1,940	11	1,330	1,650	91,440	156,456	423,700	91,440	165,734
Mar.	5.35	4.56	28	2,860	24	1,380	1,690	103,800	145,930	223,400	95,700	139,330
Apr.	4.86	3.97	2	1,900	27	660	1,060	63,040	142,718	316,300	59,530	136,866
May	18.24	3.94	16	55,800	6	802	4,680	287,800	263,282	856,000	68,300	216,444
June	8.04	4.40	3	11,230	30	1,010	2,950	175,300	300,177	1,357,000	46,850	297,475
July	5.12	4.10	10	2,320	7	692	1,140	70,210	277,990	1,250,000	70,210	271,606
Aug.	5.02	4.13	1	2,170	27	812	1,230	75,590	283,981	883,000	75,590	241,213
Sept.	7.05	4.04	14	8,120	‡ 3	713	1,920	114,100	561,787	2,943,000	65,840	403,004
Oct.	6.23	4.07	30	5,330	19	745	1,110	68,060	446,748	1,951,000	68,060	334,906
Nov.	5.02	4.23	1	2,270	‡17	961	1,220	72,320	204,846	570,800	72,320	163,132
Dec.	4.43	4.23	19	1,150	22	943	1,060	65,060	175,502	352,700	65,060	144,936
Yearly	18.24	3.94		55,800		660	1,770	1,284,740	3,134,257	7,017,110	1,284,740	2,675,058

‡ And other days

RIO SALADO AT CD. GUERRERO, TAMAULIPAS

DESCRIPTION: Water-stage recorder and cable with sit-down cable car and two reinforced concrete Cipoletti weirs, with a combined capacity of 636 second-feet, located at a place called "El Cable," about 6.2 miles above the confluence of the Río Salado with the Rio Grande and 2 miles southwest of Cd. Guerrero, Tamaulipas. This stream enters the Rio Grande 946.1 river miles below the American Dam at El Paso, Texas. The zero of the gage is 265.75 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 41 meter measurements during the year, the weir discharge curve, and a continuous record of gage heights. Computations by shifting channel methods for flows greater than 636 second-feet. Records available: 1900-1913 and 1923 through December 1951.

REMARKS: Reservoirs and irrigation diversions modify the river flow at this station.

EXTREME FLOWS FROM RECORDS: Momentary: 43,800 second-feet on September 7, 1933, with a gage height of 18.86 feet. Min. occasionally no flow.

Average Flow in Second-Feet

Daily:	Max.	35,070	Sept. 7, 1933	Min.	0	occasionally
Monthly:	Max.	10,950	Oct. 1932	Min.	0	Jan. & Feb. 1940
Yearly:	Max.	1,850	1932	Min.	138	1950

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	11.3	6.7	9.9	28.6	75.6	28.6	51.6	0	28.6	97.8	136	18.4
2	11.3	6.7	8.5	22.2	38.1	18.4	43.1	0	22.2	84.1	124	16.2
3	12.7	5.3	6.7	69.2	22.2	14.5	28.6	0	14.5	72.1	108	16.2
4	12.7	5.3	6.7	51.6	14.5	11.3	20.5	0	11.3	60.0	103	18.4
5	12.7	3.9	6.7	33.2	9.9	97.5	14.5	0	8.5	51.6	97.8	20.5
6	12.7	3.9	9.9	22.2	12.7	113	11.3	0	6.7	43.1	92.9	18.4
7	12.7	3.9	9.9	16.2	16.2	51.6	8.5	0	3.9	1,180	88.3	18.4
8	11.3	3.9	9.9	12.7	12.7	35.7	8.5	0	3.9	11,120	84.0	18.4
9	11.3	3.9	8.5	11.3	60.0	28.6	8.5	0	3.9	8,050	79.8	16.2
10	11.3	3.9	6.7	9.9	88.3	18.4	6.7	0	2.8	837	66.0	14.5
11	9.9	8.5	8.5	8.5	1,680	12.7	6.7	0	2.8	389	63.2	12.7
12	9.9	9.9	26.5	5.3	4,100	9.9	6.7	0	2.8	228	57.2	12.7
13	9.9	9.9	682	3.9	1,660	9,250	5.3	0	2.8	149	51.6	11.3
14	9.9	9.9	270	2.8	611	5,790	3.9	0	1,190	108	45.9	12.7
15	9.9	6.7	277	2.8	313	2,130	2.8	0	18,750	84.1	43.1	14.5
16	9.9	6.7	143	1.4	431	759	1.4	0	9,460	66.0	40.3	16.2
17	8.4	6.7	88.3	1.4	260	313	1.4	0	7,310	57.2	31.1	16.2
18	8.4	6.7	57.2	.7	108	169	0	0	6,070	51.6	26.5	18.4
19	6.7	5.3	40.3	0	66.0	97.8	0	0	2,370	1,580	22.2	18.4
20	8.4	5.3	31.1	0	48.7	197	0	0	1,190	3,040	22.2	20.5
21	8.5	5.3	22.2	0	35.7	156	0	0	611	1,650	22.2	20.5
22	8.5	6.7	16.2	0	26.5	88.3	0	0	442	710	20.5	18.4
23	8.5	6.7	14.5	0	22.2	57.2	0	0	350	371	20.5	18.4
24	8.5	5.3	11.3	0	1,920	38.1	0	185	295	244	22.2	16.2
25	6.7	8.5	31.1	0	1,520	26.5	0	484	228	197	22.2	16.2
26	9.9	11.3	424	0	304	4,100	0	244	204	197	22.2	16.2
27	11.3	9.9	235	0	313	1,690	0	108	175	441	22.2	16.2
28	9.9	9.9	136	107	183	322	0	66.0	143	295	20.5	14.5
29	9.9		79.8	957	97.8	136	0	60.0	124	220	20.5	12.7
30	8.5		51.6	235	62.9	72.0	0	57.2	108	205	20.5	12.7
31	6.7		38.1		40.3		0	40.3		156		12.7
Sum	308.2	186.6	2,767.1	1,602.9	14,153.3	25,832.1	230.0	1,244.5	49,134.7	32,034.6	1,596.6	503.9

Month	Current Year 1951: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1924-1951: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Average 1942-1951
Jan.	1.64	1.51	#	12.7	#	6.7	9.9	† 611	13,499	144,110	0	2,469
Feb.	1.61	1.44	#	11.3	#	3.9	6.7	370	9,473	98,520	0	1,578
Mar.	5.25	1.51	13	1,020	#	6.7	89.3	5,490	10,034	95,740	52.0	2,618
Apr.	6.23	1.31	29	1,880	#	0	53.4	3,180	13,713	82,660	56.4	13,419
May	8.20	1.54	12	4,730	#	8.5	456	28,070	41,940	* 253,000	3,200	33,008
June	12.07	1.54	13	11,580	12	8.5	861	51,240	37,281	192,000	1,620	24,811
July	2.26	1.31	1	57.2	#	0	7.4	456	18,290	100,000	228	12,373
Aug.	4.30	1.31	25	530	#	0	40.1	2,470	29,741	260,180	81.0	49,131
Sept.	15.94	1.41	15	22,140	#	2.8	1,640	97,460	88,185	600,000	3,310	65,243
Oct.	13.22	2.10	8	14,580	6	43.1	1,030	63,540	63,915	673,070	1,490	30,392
Nov.	2.85	1.74	1	136	30	18.4	53.2	3,170	21,163	248,590	246	4,002
Dec.	1.80	1.61	20	22.2	#	11.3	16.3	1,000	14,947	198,160	46.0	2,575
Yearly	15.94	1.31		22,140		0	355	257,057	362,181	1,350,300	99,932	241,619

* Partly estimated # Various days of the month

RIO GRANDE NEAR ZAPATA, TEXAS

DESCRIPTION: Water-stage recorder and cable with stand-up cable car equipped for winch and heavy weights, located about 3 miles below the town of Zapata, Texas, 7.5 miles northeast of Guerrero, Tamaulipas, 1.4 river miles below the confluence of the Río Salado with the Rio Grande, and 947.5 river miles below the American Dam at El Paso, Texas. The zero of the gage is at mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 61 meter measurements during the year, 59 by the United States and 2 by the Mexican Section of this Commission, and a continuous record of gage heights. Computations by shifting channel methods. Records available: January 1932 through December 1951.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station.

EXTREME FLOWS FROM RECORDS: The greatest recorded flow was 261,000 second-feet, which occurred September 4, 1932, with a gage height of 262.07 feet. The lowest recorded flow was 491 second-feet, which occurred June 23, 1948, with a gage height of 219.12 feet.

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,660	1,650	1,790	1,710	* 1,010	2,750	1,190	1,450	889	1,320	2,390	1,120
2	1,650	1,700	1,780	1,700	977	2,380	1,120	1,780	789	1,240	1,750	1,070
3	1,680	1,720	1,730	1,860	950	2,200	973	1,680	762	1,180	1,490	1,040
4	1,770	1,730	1,670	1,660	916	7,830	873	1,570	733	1,120	1,470	1,070
5	1,830	1,740	1,650	1,460	870	5,770	844	1,510	‡ 619	1,040	1,540	1,120
6	1,790	1,630	1,740	1,270	862	3,490	829	1,440	* 631	1,000	1,920	1,090
7	1,730	1,570	1,810	1,210	1,400	3,470	755	1,300	869	2,900	1,650	1,090
8	1,650	1,540	1,820	1,180	2,040	6,570	719	1,140	1,310	11,900	1,480	1,060
9	1,580	1,540	1,710	1,180	1,120	5,190	734	1,050	1,170	11,200	1,320	1,030
10	1,580	1,510	1,500	1,150	1,120	3,910	1,120	974	1,010	2,060	1,260	1,030
11	1,600	1,490	2,910	1,130	2,190	3,450	1,340	880	921	1,340	1,230	992
12	1,580	1,450	2,920	1,120	13,400	3,140	1,760	846	863	1,120	1,180	976
13	1,570	1,480	* 2,140	1,090	7,730	16,300	1,460	858	8,400	987	1,150	971
14	1,560	1,660	* 1,900	1,050	3,200	14,400	1,320	985	24,100	905	1,150	1,070
15	1,540	1,820	2,000	1,040	2,230	5,710	1,220	1,140	51,500	834	1,150	1,070
16	1,530	1,840	1,810	1,070	4,380	4,370	1,130	929	23,600	806	1,140	1,040
17	1,540	1,830	1,800	1,020	36,200	5,640	1,020	846	* 15,200	742	1,090	1,000
18	1,600	1,810	1,950	984	5,890	* 4,540	953	1,450	12,800	751	1,060	1,020
19	1,580	1,760	1,710	970	5,860	3,180	900	1,540	‡ 8,030	1,700	1,020	1,050
20	1,530	1,710	1,590	951	4,480	2,660	854	1,470	‡ 4,440	3,730	1,010	1,070
21	1,490	1,720	1,520	951	3,110	2,140	809	1,340	* 3,100	2,600	1,020	1,050
22	1,490	1,800	1,490	* 918	2,450	1,690	772	1,330	2,540	1,720	1,080	1,000
23	1,500	1,780	1,490	* 887	2,200	1,560	952	1,220	2,130	1,360	1,080	979
24	1,510	1,820	1,500	* 849	5,000	1,410	1,160	1,170	1,890	1,320	1,120	977
25	1,600	1,820	1,980	‡ 821	7,280	1,370	1,270	1,440	1,670	1,220	1,100	1,050
26	1,630	1,780	1,980	‡ 807	17,900	5,530	1,460	1,230	1,540	1,310	1,090	1,120
27	1,640	1,810	2,030	‡ 767	12,900	3,550	1,510	1,090	1,420	1,620	1,090	1,110
28	1,620	1,840	2,220	‡ 879	5,500	1,490	1,370	904	1,360	1,510	1,100	1,110
29	1,600		2,620	‡ 2,320	4,050	1,270	1,290	858	1,280	* 1,330	1,110	1,100
30	1,560		2,020	‡ 1,580	3,990	1,210	1,270	950	1,340	* 1,260	1,110	1,090
31	1,590		1,830		3,260		1,270	1,000		* 3,480		1,090
Sum	49,780	47,550	58,610	*35,584	164,465	128,170	34,247	37,370	176,906	66,605	38,350	32,655

Month	Current Year 1951: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1932-1951: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Average 1942-1951
Jan.	220.44	220.16	‡ 5	1,850	22	1,450	1,610	98,700	184,023	* 484,450	98,700	137,570
Feb.	220.48	220.06	28	1,960	12	1,400	1,700	94,300	166,974	399,000	94,300	166,330
Mar.	223.32	220.12	11	11,800	11	1,400	1,890	116,000	163,404	292,000	106,000	147,600
Apr.	221.64	219.27	‡29	4,720	‡27	736	* 1,190	* 70,600	167,804	662,000	65,200	180,590
May	231.09	219.47	17	50,900	6	843	5,310	326,000	304,582	682,000	81,800	282,570
June	225.44	219.82	13	20,500	30	1,170	4,270	254,000	354,873	1,517,000	59,000	326,100
July	220.49	219.19	12	1,920	8	690	1,100	67,900	329,945	1,238,000	67,900	297,420
Aug.	220.44	219.52	2	1,850	13	821	1,210	74,100	308,123	* 721,000	74,100	301,110
Sept.	234.30	219.26	15	61,300	5	588	5,900	351,000	717,629	2,895,330	76,400	502,740
Oct.	224.44	219.48	9	16,300	17	725	2,150	132,000	548,937	2,396,440	132,000	387,100
Nov.	220.93	219.74	1	2,880	21	999	1,280	76,100	223,182	748,020	76,100	171,810
Dec.	219.90	219.71	5	1,150	13	951	1,050	64,800	188,298	591,380	64,800	150,180
Yearly	234.30	219.19		61,300		588	2,380	1,725,500	3,657,774	8,038,070	1,725,500	3,051,120

‡ Estimated * Partly estimated ‡ And other days

RIO ALAMO AT CD. MIER, TAMAULIPAS

DESCRIPTION: Water-stage recorder and cable with sit-down cable car and reinforced concrete weir for measuring flows up to 177 second-feet, located 3.1 miles above the confluence of the Río Alamo with the Rio Grande and .6 mile west of Cd. Mier, Tamaulipas, at a point called "El Paso del Cántaro." This stream enters the Rio Grande 984.6 river miles below the American Dam at El Paso, Texas. The zero of the gage is 187.04 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 6 meter measurements at high flows during the year, the weir discharge table at low flows, and a continuous record of gage heights. High-flow computations by shifting channel methods. Records available: July 1, 1923 through December 1951.

REMARKS: Small reservoirs and irrigation diversions modify the flow of this spring-fed stream at this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 144,800 second-feet on September 11, 1948, with a gage height of 33.56 feet. Periods of no flow have occurred at times during all years of record except 1934 and 1935.

Average Flow in Second-Feet

Daily:	Max.	87,230	Sept. 11, 1948	Min.	0	frequently
Monthly:	Max.	5,170	Sept. 1948	Min.	0	frequently
Yearly:	Max.	505	1944	Min.	16.4	1929

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.2	4.2	2.5	4.2	99.6	10.6	10.6	241	1.1	80.5	21.5	6.0
2	4.2	4.2	2.5	30.7	40.6	10.6	6.0	80.5	1.1	24.7	15.9	6.0
3	4.2	4.2	2.5	142	27.9	10.6	4.2	43.7	0	15.8	13.1	6.0
4	6.0	6.0	2.5	33.9	18.7	15.9	2.5	18.7	0	10.6	13.1	6.0
5	6.0	6.0	2.5	13.1	15.9	89.7	2.5	8.1	0	8.1	13.0	6.0
6	6.0	6.0	6.0	8.1	13.1	75.9	2.5	6.0	0	8.1	10.6	6.0
7	6.0	6.0	6.0	6.0	10.6	33.9	2.5	2.4	0	526	10.6	6.0
8	6.0	6.0	4.2	2.5	10.6	18.7	1.1	2.4	0	603	10.6	6.0
9	6.0	6.0	2.5	2.5	8.1	13.1	1.1	1.1	0	54.7	10.6	6.0
10	6.0	6.0	2.5	2.5	6.0	10.6	0	0	0	27.8	8.1	6.0
11	4.2	6.0	2.5	1.0	1,090	6.0	0	0	0	18.7	4.2	6.0
12	4.2	6.0	1.1	1.0	1,120	6.0	0	0	0	13.0	2.5	6.0
13	4.2	4.3	0	1.0	247	11,470	0	0	2.5	10.5	2.5	6.0
14	4.2	2.5	0	1.0	166	1,780	0	0	282	6.0	2.5	6.0
15	2.5	2.5	1.1	1.0	256	626	0	0	10,200	6.0	2.5	4.2
16	2.5	4.2	2.5	1.0	198	75.9	0	0	6,500	6.0	1.1	4.2
17	2.5	4.2	2.5	0	194	33.9	0	0	1,900	6.0	1.1	4.2
18	2.5	4.2	1.1	0	71.3	24.7	0	0	946	6.0	1.1	4.2
19	2.5	4.2	0	0	33.9	21.5	0	0	153	1,770	1.0	4.3
20	2.5	2.5	0	0	21.5	15.9	0	0	75.9	3,090	4.2	6.0
21	2.5	2.5	0	0	15.9	15.9	0	0	43.8	254	4.2	4.2
22	2.5	4.2	0	0	10.6	10.6	0	31.8	30.7	114	6.0	4.2
23	2.5	4.2	0	0	10.6	10.6	0	27.9	43.8	67.0	8.1	4.3
24	2.5	4.2	0	0	1,590	8.1	0	448	30.7	47.3	8.1	6.0
25	2.5	2.5	0	0	1,060	1,780	0	267	15.9	47.3	8.1	4.2
26	2.5	2.5	4.2	0	115	1,040	0	63.2	13.1	51.2	8.1	4.2
27	2.5	2.5	15.9	1,370	54.7	202	0	24.7	10.6	30.7	6.0	4.3
28	2.5	2.5	8.1	1,550	33.9	51.2	0	13.1	10.6	24.7	10.6	4.2
29	2.5		6.0	3,470	21.5	21.5	0	6.0	10.6	99.5	10.6	4.2
30	4.2		6.0	530	15.9	13.1	0	2.5	211	141	10.5	4.2
31	6.0		4.2		13.1		43.8	2.5		33.9		2.5
Sum	119.1	120.3	88.9	7,171.5	6,590.0	17,502.5	76.8	1,290.6	20,482.4	7,202.1	230.1	157.6

Month	Current Year 1951: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High	Day	Extreme Second-Feet Low	Day	Average Second-Feet	Total Acre-Feet	Period 1924-1951: Acre-Feet Normal	Maximum	Minimum	Average 1942-1951
Jan.	1.44	1.38	6.0	#	2.5	#	3.8	236	4,489	34,920	0	1,814
Feb.	1.44	1.38	6.0	#	2.5	#	4.3	239	3,177	25,550	67.2	1,074
Mar.	1.64	1.31	21.5	28	0	#	2.9	176	3,207	19,830	14.5	1,924
Apr.	9.61	1.31	5,860	29	0	#	239	14,220	6,962	33,990	86.0	6,345
May	6.53	1.44	2,640	24	6.0	#	213	13,070	15,541	* 137,000	209	10,586
June	15.16	1.44	14,270	13	6.0	#	583	34,720	14,702	83,240	0	10,613
July	3.08	1.31	279	31	0	#	2.5	152	7,681	37,590	152	4,941
Aug.	4.30	1.31	971	7	0	#	41.6	2,560	15,691	194,200	0	27,490
Sept.	‡15.75	1.31	‡17,660	15	0	#	683	40,630	38,992	307,900	* 135	55,927
Oct.	7.78	1.41	4,520	20	4.2	#	232	14,280	14,526	51,620	0	13,945
Nov.	1.67	1.31	24.7	1	0	#	7.7	456	3,737	21,940	0	2,014
Dec.	1.44	1.38	7.1	#	2.5	31	5.1	313	3,744	15,000	124	1,674
Yearly	‡15.75	1.31	‡17,660		0		167	121,052	132,449	366,826	11,908.7	138,347

‡ Estimated * Partly estimated # Various days of the month

RIO GRANDE AT ROMA, TEXAS

DESCRIPTION: Water-stage recorder at the international bridge between Roma, Texas and Cd. Miguel Alemán (formerly San Pedro), Tamaulipas, 14.9 river miles above the confluence of the Río San Juan from Mexico, and 992.0 river miles below the American Dam at El Paso, Texas. Measurements are made from the bridge. The zero of the gage was lowered 3.28 feet on January 1, 1952 and is now 142.65 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 179 meter measurements during the year, 168 by the Mexican and 11 by the United States Section of this Commission, and a continuous record of gage heights. Computations by shifting channel methods. Records available: May 1900 and September 1900 through December 1913; October 1914; September and October 1917; September and October 1919; August and September 1920; June 1922 and November 1922 through December 1951.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. Backwater from the Río San Juan sometimes reaches this station.

EXTREME FLOWS FROM RECORDS: The greatest recorded flow was 203,000 second-feet, which occurred September 5, 1932, with a gage height of 35.4 feet. The lowest recorded flow was 477 second-feet, which occurred July 9, 1951, with a gage height of 1.97 feet.

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,570	1,460	1,660	1,570	1,240	2,840	1,030	1,710	925	1,530	3,280	1,060
2	1,650	1,480	1,650	1,450	922	2,390	978	1,520	837	1,300	2,260	1,070
3	1,610	1,480	1,600	1,840	915	2,120	858	1,820	738	1,240	1,820	1,030
4	1,650	1,550	1,540	1,690	833	2,510	682	1,680	696	1,190	1,500	1,020
5	1,770	1,580	1,490	1,500	756	7,350	611	1,550	682	1,160	1,330	1,070
6	1,820	1,590	1,540	1,340	706	3,990	586	1,480	636	1,120	1,500	1,110
7	1,690	1,430	1,620	1,190	699	2,900	572	1,390	590	1,390	1,810	1,100
8	1,650	1,370	1,640	1,110	1,510	4,770	537	1,240	773	7,130	1,580	1,100
9	1,570	1,320	1,610	1,050	1,880	5,440	477	1,100	1,230	15,040	1,420	1,080
10	1,490	1,300	1,500	1,060	978	4,170	484	1,050	1,160	4,910	1,260	1,050
11	1,530	1,300	1,350	996	2,050	3,270	844	968	996	1,960	1,250	1,040
12	1,530	1,310	4,100	978	8,300	2,850	1,260	890	872	1,370	1,230	1,010
13	1,490	1,240	2,080	946	10,450	31,640	1,560	865	9,390	1,150	1,180	997
14	1,490	1,220	2,040	865	5,050	20,240	1,300	865	29,910	999	1,160	1,010
15	1,490	1,380	1,650	848	2,460	8,090	1,160	943	60,030	894	1,130	1,070
16	1,460	1,600	1,690	830	2,500	5,080	1,120	1,090	47,320	837	1,110	1,130
17	1,420	1,600	1,570	890	26,700	4,870	946	915	19,600	844	1,090	1,130
18	1,460	1,610	1,730	840	13,630	4,800	823	816	15,570	840	1,110	1,110
19	1,490	1,590	1,830	784	4,170	3,530	699	1,390	10,810	1,810	1,080	1,140
20	1,490	1,570	1,550	756	5,830	2,610	622	1,490	5,930	5,580	1,020	1,150
21	1,420	1,490	1,410	727	3,710	2,250	561	1,420	4,200	4,030	1,040	1,120
22	1,380	1,550	1,320	720	2,680	1,720	519	1,300	3,080	2,490	1,020	1,080
23	1,380	1,610	1,240	667	2,180	1,460	498	1,310	2,570	1,740	1,070	1,040
24	1,380	1,600	1,240	646	4,660	1,410	600	1,460	2,190	1,450	1,060	1,000
25	1,420	1,660	1,370	600	6,850	2,420	886	1,640	1,910	1,360	1,100	1,030
26	1,490	1,650	1,760	572	15,610	3,920	1,030	1,470	1,760	1,270	1,100	1,090
27	1,530	1,540	1,790	1,190	14,940	5,440	1,360	1,180	1,600	1,400	1,080	1,110
28	1,530	1,550	1,660	1,710	7,840	2,420	1,360	1,030	1,490	1,750	1,090	1,090
29	1,490		2,190	5,010	4,590	1,410	1,150	865	1,410	1,650	1,040	1,120
30	1,460		2,170	3,240	4,030	1,090	1,050	805	1,480	1,650	1,040	1,090
31	1,420		1,720		3,530		1,070	883		1,490		1,090
Sum	47,220	41,630	53,310	37,615	162,199	149,000	27,233	38,135	230,385	72,574	39,760	33,337

Month	Current Year 1951: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High	Day	Extreme Second-Feet Low	Day	Average Second-Feet	Total Acre-Feet	Period 1924-1951: Acre-Feet Normal	Maximum	Minimum	Average 1942-1951
Jan.	3.35	2.95	1,820	5	1,360	22	1,520	93,660	199,305	467,400	93,660	163,086
Feb.	3.28	2.85	1,660	25	1,190	14	1,490	82,570	174,853	402,000	82,570	164,837
Mar.	5.97	2.89	5,930	12	1,240	24	1,720	105,700	171,202	325,500	99,000	148,050
Apr.	5.94	1.94	5,760	29	547	27	1,250	74,610	185,379	855,700	64,250	202,867
May	17.13	2.10	42,380	17	678	7	5,230	321,700	345,178	706,300	91,320	300,882
June	17.91	2.76	44,500	13	1,060	30	4,970	295,500	378,622	1,586,000	53,990	335,749
July	3.41	1.97	1,720	13	477	9	878	54,020	324,744	1,217,000	54,020	304,182
Aug.	3.74	2.23	2,230	1	784	18	1,230	75,640	336,305	E 904,000	75,640	325,494
Sept.	25.82	1.97	78,750	15	590	7	7,680	457,000	706,784	3,048,000	69,900	576,270
Oct.	9.78	2.33	16,100	9	837	16	2,340	144,000	545,174	3,372,000	137,700	403,550
Nov.	4.92	2.49	3,780	1	992	22	1,330	78,860	234,479	736,000	78,860	172,026
Dec.	2.66	2.46	1,150	20	996	13	1,080	66,120	199,168	565,100	66,120	149,412
Yearly	25.82	1.94	78,750		477		2,550	1,849,380	3,801,193	8,098,000	1,849,380	3,246,405

E Estimated

RIO GRANDE NEAR RIO GRANDE CITY, TEXAS

DESCRIPTION: Water-stage recorder and cable with stand-up cable car equipped for winch and heavy weights, located about 4 river miles below Rio Grande City, Texas, 3.7 miles northeast of Camargo, Tamaulipas, 7.9 river miles below the confluence of the Río San Juan with the Rio Grande, and 1,015.3 river miles below the American Dam at El Paso, Texas. The zero of the gage is at mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 148 meter measurements during the year, 138 by the United States and 10 by the Mexican Section of this Commission, and a continuous record of gage heights. Computations by shifting channel methods. Records available: May, June, and October 1914; September 1916; September and October 1917; October 1918; September and October 1919; August and September 1920; June 1922; September 1923; January 1924 through December 1951.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station.

EXTREME FLOWS FROM RECORDS: The greatest recorded flow was 198,800 second-feet, which occurred September 5, 1932, with a gage height of 157.4 feet. The lowest recorded flow was 470 second-feet, which occurred July 10, 1951, with a gage height of 122.60 feet.

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,690	1,600	1,850	1,810	2,100	3,300	1,270	1,520	894	1,690	2,680	1,120
2	1,730	1,620	1,760	1,700	1,080	2,790	1,120	1,520	895	1,490	2,440	1,120
3	1,710	1,640	1,730	1,800	981	2,480	1,030	1,780	834	1,370	1,910	1,100
4	1,740	1,680	1,710	1,900	1,280	2,390	901	1,770	747	1,300	1,630	1,040
5	1,850	1,700	1,650	1,730	978	7,560	778	1,630	726	1,220	1,450	1,010
6	1,920	1,710	1,630	1,620	827	5,880	663	1,490	679	1,160	1,430	1,070
7	1,890	1,620	1,670	1,430	728	3,420	694	1,430	618	1,100	1,820	1,100
8	1,820	1,540	1,710	1,320	998	3,480	625	1,310	635	4,050	1,700	1,080
9	1,710	1,480	1,730	1,240	1,990	6,870	516	1,140	1,060	13,400	1,490	1,030
10	1,710	1,490	1,690	1,230	1,400	5,470	512	1,080	1,160	8,740	1,360	988
11	1,660	1,490	1,540	1,140	1,850	3,840	608	1,010	1,060	2,830	1,280	972
12	1,660	1,470	2,670	1,090	6,070	3,190	1,170	932	964	1,580	1,260	956
13	1,650	1,350	3,300	1,060	10,600	22,000	1,660	856	3,900	1,230	1,220	954
14	1,630	1,370	2,080	1,040	6,780	27,200	1,580	838	* 19,600	1,060	1,180	960
15	1,640	1,530	2,000	994	4,110	11,100	1,440	860	* 38,400	967	1,170	1,010
16	1,610	1,800	1,960	982	2,620	5,990	1,370	1,010	60,900	928	1,150	1,080
17	1,580	1,840	1,880	958	16,200	4,660	1,120	954	31,700	906	1,120	1,100
18	1,560	1,820	1,800	923	24,000	5,390	949	858	* 16,000	839	1,090	1,080
19	1,620	1,800	2,010	886	5,070	4,370	842	1,210	* 11,000	849	1,080	1,070
20	1,610	1,740	1,820	857	5,770	3,190	752	1,940	* 7,390	4,500	1,030	1,090
21	1,580	1,680	1,620	830	4,800	2,550	673	1,510	5,200	5,430	1,010	1,100
22	1,530	1,630	1,540	831	3,320	2,010	622	1,510	3,670	2,950	1,000	1,100
23	1,540	1,760	1,480	809	2,530	1,600	598	1,440	2,940	1,970	1,040	1,090
24	1,570	1,790	1,470	749	2,940	1,470	588	1,610	2,580	1,780	1,060	1,070
25	1,570	1,840	1,620	734	7,150	1,860	894	2,100	2,210	1,510	1,080	1,050
26	1,610	1,900	1,890	655	12,400	4,480	1,060	1,630	1,960	1,360	1,100	1,070
27	1,650	1,840	1,900	594	15,000	5,540	1,260	1,370	* 1,820	* 1,390	1,050	1,080
28	1,670	1,780	1,970	1,800	9,650	3,690	1,470	1,140	* 1,690	* 1,650	1,050	1,080
29	1,650		1,910	3,590	5,880	1,980	1,360	975	* 1,620	* 1,690	1,070	1,080
30	1,640		2,490	4,820	4,540	1,460	1,230	855	* 1,710	* 1,750	1,100	1,080
31	1,600		2,000		4,230		1,190	831		* 1,500		1,080
Sum	51,600	46,510	58,080	41,122	167,872	161,210	30,545	40,109	* 224,562	74,189	40,050	32,810

Month	Current Year 1951: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1924-1951: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Average 1942-1951
Jan.	124.54	124.00	6	1,940	22	1,510	1,660	102,000	233,752	521,000	102,000	186,000
Feb.	124.41	123.74	26	1,920	14	1,320	1,660	92,300	197,261	410,000	92,300	178,030
Mar.	126.82	123.79	12	4,690	24	1,450	1,870	115,000	191,206	401,000	108,000	157,400
Apr.	127.71	122.30	30	5,390	27	564	1,370	81,600	201,986	* 850,000	61,500	211,090
May	137.93	122.65	18	40,000	7	698	5,420	333,000	396,714	833,000	98,900	319,890
June	138.88	124.08	13	38,000	30	1,360	5,370	320,000	477,225	1,737,000	74,500	369,350
July	124.68	122.60	13	1,760	10	470	985	60,600	396,932	1,240,000	60,600	330,060
Aug.	125.26	123.03	20	2,490	18	796	1,290	79,600	399,841	1,280,000	79,600	377,260
Sept.	146.78	122.65	16	65,600	7	595	*7,490	* 445,000	923,667	3,723,800	79,400	691,840
Oct.	132.28	123.29	9	15,200	19	802	2,390	147,000	697,543	2,852,270	142,000	514,400
Nov.	126.35	123.15	1	3,440	22	968	1,340	79,400	283,568	829,260	79,400	197,240
Dec.	123.37	123.08	‡ 1	1,120	13	949	1,060	65,100	235,720	625,260	65,100	160,810
Yearly	146.78	122.30		65,600		470	2,650	1,920,600	4,635,415	9,554,530	1,920,600	3,693,370

* Partly estimated ‡ And other days

CONTRIBUTIONS FROM RIO SAN JUAN

DESCRIPTION: The discharges reported below entered the Rio Grande between the gaging stations at Roma and Hidalgo via various irrigation canals and the Río San Juan channel. The confluence of the Río San Juan and the Rio Grande is 1,006.4 river miles below the American Dam at El Paso, Texas and 12.4 river miles below Marte Gómez Reservoir on the Río San Juan.

RECORDS: Based on meter measurements and weir discharges. Records furnished by the Ministry of Hydraulic Resources of Mexico. Records available: March 10, 1943 through December 1951.

REMARKS: When water is released from Marte Gómez Reservoir for use on the United States side of the Lower Rio Grande Valley, the amounts are included in the tabulation of contributions below Rio Grande City Station. In 1951, however, no releases were made for this purpose. The zero of the reservoir gage is 7.64 feet above mean sea level, U.S.C. & G.S. datum. No water passed over the reservoir spillway in 1951. Under this reservoir in the Lower San Juan Irrigation District in Mexico, 162,950 acre-feet of water were used in 1951 to irrigate 116,140 acres of land, of which 64,250 acres were irrigated twice and 51,890 acres were irrigated once. Neither the water used for irrigation nor the water which reached the Rio Grande through drains is included in these tables.

Above Rio Grande City Station

These amounts of water consist of small seepage through the bank near the reservoir dam and waste from canals of the first unit of the Irrigation District.

Month	Current Year 1951								Period 1946-1951 ##		
	Extreme Gage Feet ⊕		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	222.70	222.18					3.5	217	5,967	33,680	217
Feb.	222.11	220.47					3.5	196	3,898	20,920	196
Mar.	220.31	214.40					3.5	217	1,505	7,390	217
Apr.							* 3.5	* 210	1,723	6,320	* 210
May	221.75	215.42					3.5	217	19,185	112,700	217
June	224.93	220.27					3.5	210	560	859	210
July	222.31	210.37					3.5	217	492	722	217
Aug	221.75	209.12					3.5	217	14,820	86,850	217
Sept.	245.14	221.78					3.5	210	38,052	203,800	210
Oct.	249.21	245.24					3.5	217	32,419	192,600	217
Nov.	249.57	249.24					3.5	210	12,234	71,940	210
Dec.	249.74	249.51					3.5	217	1,226	5,910	217
Yearly							3.5	2,555	132,081	478,965	2,555

Below Rio Grande City Station

The amounts of water shown below for 1951 reached the Rio Grande through Canals of the second unit of the Irrigation District. The period figures include water released from Marte Gómez Reservoir for use in the United States. No such releases were made in 1951.

Month	Current Year 1951								Period 1946-1951		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.							0	0	4,348	15,960	0
Feb.							0	0	1,095	2,130	0
Mar.							0	0	1,422	2,560	0
Apr.							0	0	13,085	37,140	0
May							0	0	6,835	18,500	0
June							5.3	314	4,706	11,870	0
July							0	0	4,460	18,050	0
Aug							0	0	5,162	15,470	0
Sept.							0	0	1,522	7,620	0
Oct.							0	0	1,136	4,090	0
Nov.							0	0	1,117	3,360	0
Dec.							0	0	471	1,950	0
Yearly							.4	314	45,359	85,680	314

* Partly estimated ⊕ Water-surface elevations in Marte Gómez Reservoir ## Records began March 10, 1943, but the period considered is 1946-1951 to make it comparable to the period of contributions from the Río San Juan below Rio Grande City.

RIO GRANDE AT HIDALGO, TEXAS

DESCRIPTION: Water-stage recorder on the downstream side of the United States end of the international highway bridge between Hidalgo, Texas and Reynosa, Tamaulipas, 1,084.8 river miles below the American Dam at El Paso, Texas, and 150.4 river miles from the Gulf of Mexico. Zero of the gage is mean sea level, U.S.C. & G.S. datum.

RECORDS: The peak discharges shown below are based on rating curve supported by 7 meter measurements during the year. Records available: July 1928 to December 1931; September and October 1932; peak flows in September 1933 and in 1934, also January to July and September 1935; peak flows May and October, and full record July and September 1936; full record April 26 to December 31, 1938, and January to November 1939. Mean daily gage-height record and discharges during peaks, 1940 to November 16, 1948. Mean daily gage-heights and peak discharges during periods of high flow since November 16, 1948.

REMARKS: When the river at this station reaches a stage of about 100.5 feet, or a flow of about 60,000 second-feet, water begins to flow into two floodway inlets on the United States side, viz: Hackney Lake Inlet about 4 miles upstream and Mission Inlet about 15 miles upstream from this station, but the river may begin to overflow at Granjeño and Jardín de Flores at stages about 3.5 feet lower.

EXTREME FLOWS FROM RECORDS: In September 1932, the peak stage was 104.88 feet, with a flow of 83,870 second-feet.

Mean Daily Gage Height in Feet — 1951

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14					87.12	91.88						
15						91.72			93.20			
16									96.82			
17									98.41			
18					90.14				97.80			
19					89.52				93.53			
20												
21												
22												
23												
24												
25												
26												
27					89.48							
28					89.21							
29												
30												
31												
Sum												

Month	Current Year 1951								Period			Acre-Feet
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			Normal
			High		Low				Normal	Maximum	Minimum	
	High	Low	Day		Day							
Jan.												
Feb.												
Mar.												
Apr.												
May	92.50		18	24,300								
June	93.50		14	27,300								
July												
Aug.												
Sept.	98.71		18	40,300								
Oct.												
Nov.												
Dec.												
Yearly												

RIO GRANDE FLOODWAY DISCHARGES IN THE LOWER RIO GRANDE VALLEY

On the United States Side

During floods, water is diverted from the Rio Grande to the United States floodway system at Mission Inlet and Hackney Lake Inlet, approximately 15 and 4 miles, respectively, above the Hidalgo gaging station. Water diverted at Mission Inlet flows through the North Floodway branch and that entering the Hackney Lake Inlet flows through the South Floodway branch. They join about 5 miles northeast of Hidalgo to flow eastward in the Main Floodway to a point approximately 3 miles southwest of Mercedes. Here, the floodwaters may divide, part going northeastward through the Arroyo Colorado Floodway to the Gulf of Mexico, the remainder going to the Gulf via the North Floodway, traveling first northward and then eastward. Mission Inlet flows are measured at the North Floodway Station south of McAllen, Hackney Lake Inlet flows are measured at the South Floodway Station south of McAllen, and North Floodway flows are measured near Sebastian. Arroyo Colorado Floodway flows are measured near La Feria.

In 1951, there was no flow from the Rio Grande through these floodways. For 1951 discharges of North Floodway near Sebastian, Texas, see the following page.

On the Mexican Side

There are several regular floodways on the Mexican side which divert excess Rio Grande floodwater to the Gulf of Mexico. During 1951, no flow was diverted from the Rio Grande into these regular floodways, but in September, two small breaks developed in the levees above and below Matamoros, Tamaulipas, which resulted in the flooding of some farm lands in Mexico.

Records of flows through Retamal Canal, which serves as a floodway during periods of high flow, are shown on page 56.

NORTH FLOODWAY NEAR SEBASTIAN, TEXAS

DESCRIPTION: Water-stage recorder located on the downstream side of the bridge on U. S. Highway 77 about 2.5 miles south of Sebastian, Texas. High flow measurements are made from the highway bridge and low flow measurements are made from a low timber bridge just upstream from the highway bridge. The zero of the gage is at mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 55 current meter measurements made during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: October 1940 through December 1951.

REMARKS: The channel of this floodway in the vicinity of Sebastian serves as a drainage channel as well as a floodway.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 10,500 second-feet on September 4, 1944, with a gage height of 42.95 feet. Min. occasionally no flow.

Average Flow in Second-Feet

Daily:	Max.	10,000	Sept. 4, 1944	Min.	0	occasionally
Monthly:	Max.	2,110	Sept. 1944	Min.	2.2	Oct. 1940
Yearly:	Max.	218	1944	Min.	39.2	1945

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	28.4	65.7	20.8	69.0	30.1	49.5	450	21.0	28.6	100	67.0	43.9
2	19.9	49.4	27.1	67.6	26.0	45.3	278	55.1	26.5	82.8	72.4	44.0
3	14.8	34.2	21.8	58.0	28.0	50.0	135	69.9	23.4	79.6	77.6	40.3
4	14.3	30.5	14.1	55.5	37.6	123	106	41.8	21.3	77.4	71.9	36.3
5	18.1	23.0	9.2	58.5	36.6	187	78.6	30.7	22.0	81.0	71.0	32.4
6	21.8	12.1	8.9	65.4	36.6	146	57.9	28.9	26.5	85.9	67.6	32.8
7	49.0	8.1	9.2	67.9	26.8	91.2	51.6	33.9	31.9	88.8	72.2	32.0
8	48.2	5.9	5.6	70.3	18.5	64.3	44.6	37.0	25.3	86.8	74.0	37.6
9	34.2	2.6	9.7	70.3	13.5	45.8	31.4	33.3	21.0	80.8	75.8	31.2
10	23.2	2.9	10.1	71.9	12.9	60.1	20.4	27.7	15.1	75.2	78.9	22.8
11	15.6	6.6	8.4	75.6	333	58.2	17.8	27.8	11.9	77.1	78.3	22.7
12	25.0	5.8	9.6	68.2	357	64.5	40.8	36.1	15.0	90.8	81.4	25.9
13	24.8	18.7	21.3	59.9	165	62.8	32.3	35.3	20.6	91.0	87.1	32.1
14	20.5	141	16.3	55.0	176	55.6	25.6	28.0	44.1	91.8	75.9	38.0
15	22.4	143	10.7	62.4	192	31.4	36.8	27.5	1,150	97.2	82.6	38.8
16	11.6	39.6	10.1	57.4	153	18.1	73.9	35.7	1,270	91.2	96.8	36.9
17	9.7	14.5	6.4	58.5	113	21.6	63.2	36.4	1,280	90.4	87.4	32.1
18	6.8	11.0	41.2	59.7	87.3	26.7	49.3	34.7	1,160	92.2	88.5	30.7
19	7.7	15.3	83.4	45.9	80.9	18.0	52.3	35.0	938	98.6	75.3	31.6
20	4.6	17.0	60.8	28.1	77.8	11.5	48.1	33.8	712	122	47.3	21.0
21	11.2	15.9	37.2	27.0	67.0	5.9	52.7	33.1	522	115	43.8	17.0
22	7.7	10.1	43.5	22.2	60.3	5.9	42.3	33.2	268	88.4	42.9	18.8
23	3.9	13.9	39.4	7.7	64.7	5.9	28.4	44.3	150	90.6	37.8	26.8
24	3.5	12.2	25.0	6.4	62.2	5.8	25.5	45.4	129	132	36.4	22.6
25	2.9	12.8	39.3	8.2	78.4	6.0	25.3	39.5	99.4	144	39.5	30.3
26	5.4	10.0	70.5	4.6	101	326	23.7	37.9	87.7	108	42.8	22.6
27	2.9	6.0	69.8	4.7	99.4	816	19.2	34.7	86.4	90.2	55.5	17.3
28	2.2	14.9	75.9	3.9	81.9	870	20.0	31.7	77.8	85.8	51.9	19.4
29	5.6		63.9	17.7	65.2	738	25.8	30.4	76.6	80.4	43.8	25.8
30	32.2		65.1	32.4	63.1	585	22.4	34.9	83.9	70.4	42.0	34.9
31	56.6		77.3		60.4		20.2	33.6		68.4		26.2
Sum	554.7	742.7	1,011.6	1,359.9	2,805.2	4,595.1	1,999.1	1,108.3	8,424.0	2,853.8	1,965.4	924.8

Month	Current Year 1951: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period Oct. 1940-1951 Acre-Feet *Normal	Maximum	Minimum	Acre-Feet Average 1942-1951
Jan.	28.24	26.46	31	67.6	28	2.2	17.9	1,100	3,461	‡ 7,450	1,100	3,063
Feb.	30.03	26.42	14	235	11	1.5	26.5	1,470	3,343	‡ 6,010	1,470	3,076
Mar.	28.87	26.62	31	110	17	4.2	32.6	2,010	3,798	6,900	‡ 1,880	3,640
Apr.	28.54	26.36	1	83.1	28	2.4	45.3	2,700	4,716	22,000	‡ 1,380	4,598
May	32.36	26.62	11	613	‡ 9	5.1	90.5	5,560	6,933	‡ 24,200	‡ 2,290	5,206
June	34.11	26.60	28	906	‡20	5.5	153	9,110	4,755	9,110	* 602	4,321
July	32.58	26.78	1	520	11	12.8	64.5	3,970	3,648	11,000	‡ 865	3,296
Aug.	28.42	27.08	2	81.3	1	17.5	35.7	2,200	2,606	‡ 7,400	‡ 605	2,676
Sept.	36.31	26.93	15	1,450	11	10.5	281	16,700	20,914	‡ 125,700	‡ 1,400	22,531
Oct.	29.27	28.05	25	157	31	67.2	92.1	5,660	4,170	10,200	‡ 136	4,758
Nov.	28.70	27.47	16	105	23	31.0	65.5	3,900	3,077	6,200	‡ 861	3,467
Dec.	27.91	27.15	8	47.4	21	14.4	29.8	1,830	3,485	6,100	1,830	3,514
Yearly	36.31	26.36		1,450		1.5	77.6	56,210	64,906	‡ 158,550	‡ 28,412	64,146

‡ Estimated * Partly estimated ‡ And other days

RIO GRANDE AT MATAMOROS, TAMAULIPAS

DESCRIPTION: Water-stage recorder with sit-down cable car and winch. The recorder is attached to the left pier on the downstream side of the railroad bridge between Matamoros, Tamaulipas and Brownsville, Texas, 57.6 miles upstream from the Gulf of Mexico and 1,183.8 river miles below the American Dam at El Paso, Texas. The cable is located .3 mile upstream from the bridge. The zero of the gage is 12.11 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 276 meter measurements during the year, 251 by the Mexican and 25 by the United States Section of this Commission, and a continuous record of gage heights. The river bottom shifts greatly at this station. Computations by shifting channel methods. Records available: 1901 to 1913; 1923 through December 1951.

REMARKS: Reservoirs, irrigation and flood flow diversions, and drainage returns greatly modify the flow at this station.

EXTREME FLOWS FROM RECORDS: The greatest recorded flow was 36,320 second-feet on June 22, 1903. The greatest flow since 1923 was 32,950 second-feet, which occurred April 30, 1949, with a gage height of 24.89 feet on the present gage. There was no flow at this station on a few occasions in March and April 1930 and January and February 1951.

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	* April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.6	173	71.0	42.0	* 56.9	2,390	1,590	55.1	103	1,340	911	312
2	4.6	79.1	11.7	23.7	* 55.1	1,400	833	52.6	17.7	1,370	731	229
3	4.9	57.9	22.6	90.4	* 64.3	847	334	25.8	31.8	1,150	713	213
4	28.3	40.3	124	130	* 37.1	671	33.9	23.0	112	1,040	946	122
5	51.6	36.7	80.2	85.8	* 29.7	477	42.4	101	7.4	932	1,730	188
6	37.8	22.2	62.2	92.5	* 21.9	459	54.7	228	10.6	657	1,770	153
7	24.0	17.0	17.0	63.9	* 14.1	441	125	104	9.5	463	1,200	109
8	9.9	9.9	2.8	80.9	* 25.4	1,320	56.8	36.4	24.0	576	862	50.9
9	6.7	8.1	17.3	97.8	* 19.1	1,280	31.8	120	39.2	586	‡ 742	27.9
10	3.5	6.4	5.3	50.1	* 15.5	681	14.1	84.8	8.5	245	487	98.9
11	3.9	69.2	15.5	87.6	* 27.9	150	17.0	47.3	26.5	4,380	484	97.1
12	4.2	65.3	137	37.1	* 59.3	310	14.8	21.2	16.6	4,910	657	81.2
13	3.9	22.2	* 32.5	9.5	117	519	27.5	12.0	15.9	2,980	600	44.5
14	3.5	30.7	43.1	13.1	752	278	37.8	69.2	87.6	1,800	438	35.7
15	3.2	56.1	22.2	12.7	4,200	10,450	8.5	33.5	1,330	1,220	280	52.3
16	3.5	29.3	14.8	11.3	4,130	13,950	12.0	6.4	12,680	713	148	41.7
17	2.8	2.8	58.6	5.7	2,580	5,650	54.7	4.6	22,780	470	107	62.9
18	.4	84.0	85.1	7.8	2,280	2,190	106	12.4	23,590	191	140	145
19	.4	85.5	69.9	14.1	10,350	763	136	28.6	25,460	191	156	38.1
20	.4	65.7	33.5	64.3	12,500	242	60.7	19.4	20,170	351	140	47.0
21	.4	33.5	24.0	26.1	4,660	113	13.4	54.4	13,210	410	125	40.6
22	50.9	.4	17.0	45.2	2,460	* 13.4	6.4	154	6,500	470	144	18.0
23	4.6	.4	39.2	63.9	2,370	* 10.2	7.4	129	4,590	954	124	31.1
24	4.9	.4	38.1	25.4	1,840	* 11.3	23.3	269	3,600	2,680	130	29.3
25	7.1	21.2	87.2	27.2	1,260	* 12.7	13.1	277	2,850	2,960	160	60.4
26	1.4	48.5	129	27.2	1,010	* 22.6	8.8	305	2,150	2,730	195	45.9
27	.7	16.2	128	17.0	3,010	286	45.9	294	1,630	2,520	162	37.1
28	0	7.8	45.9	9.5	9,780	494	47.0	225	1,430	2,160	396	47.0
29	27.9		14.8	33.9	9,960	1,390	10.9	367	1,290	1,730	‡ 565	32.1
30	56.5		69.6	58.6	5,790	2,180	43.1	236	1,160	1,230	‡ 600	26.1
31	68.2		50.5		3,710		39.2	188		925		42.7
Sum	424.7	1,089.8	1,569.6	*1,354.3	83,185.3	49,001.2	3,849.2	3,583.7	144,930.3	44,334	15,843	2,559.5

Month	Current Year 1951: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1924-1951: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Average 1942-1951
Jan.	3.94		31	90.4	‡28	0	13.7	842	187,157	490,800	842	119,857
Feb.	4.30		1	212	‡22	0	38.8	2,160	134,817	328,300	2,160	90,552
Mar.	3.87	2.56	27	171	8	2.1	50.6	3,110	112,205	313,600	3,110	77,253
Apr.	3.81	2.56	4	* 130	17	* 5.7	* 45.1	* 2,690	110,013	425,800	2,410	82,917
May	17.32	2.62	20	15,680	7	14.1	2,680	165,000	266,356	721,000	34,630	173,269
June	17.26	3.15	16	15,540	23	* 10.2	1,630	97,190	337,708	1,180,500	2,580	199,827
July	7.48	2.95	1	1,810	22	3.5	124	7,630	288,032	756,600	7,630	199,648
Aug.	4.99	2.66	29	385	17	4.6	116	7,110	266,505	833,700	7,110	182,183
Sept.	22.44	2.76	19	25,460	10	6.7	4,830	287,500	566,168	1,363,200	24,740	456,916
Oct.	11.55	3.97	12	5,510	18	148	1,430	87,940	528,249	1,408,500	28,150	395,879
Nov.	7.58	3.28	6	2,050	17	88.3	528	31,420	239,060	827,500	4,790	120,998
Dec.	4.49	2.39	1	367	22	14.1	82.6	5,080	182,227	594,200	5,080	84,722
Yearly	22.44			25,460		0	964	697,672	3,218,497	6,579,500	697,672	2,184,021

‡ Estimated * Partly estimated ‡ And other days

RIO GRANDE AT LOWER BROWNSVILLE, TEXAS

DESCRIPTION: Water-stage recorder and cable with stand-up cable car equipped for winch and heavy weights, located about 1,000 feet below the El Jardin pumping plant, about 6.6 river miles below Brownsville, Texas and Matamoros, Tamaulipas, 50.4 river miles upstream from the Gulf of Mexico, and 1,191.0 river miles below the American Dam at El Paso, Texas. The zero of the gage is at mean sea level, U.S.C. & G.S. datum. An auxiliary water-stage recorder located at the El Jardin pumping plant was used during periods of low flow.

RECORDS: Based on 48 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: January 1934 through December 1951.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. During floods, a portion of the upstream river flow finds outlet to the Gulf of Mexico through flood channels in both countries, which divert from the Rio Grande within 124.6 miles above this station.

EXTREME FLOWS FROM RECORDS: The greatest recorded flow was 31,700 second-feet, which occurred October 8, 1945, with a gage height of 31.48 feet. Zero flow occurs frequently.

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	180	0	8.9	.2	2,390	1,240	52.4	217	1,260	946	327
2	1.1	78.5	0	1.3	3.1	1,410	783	128	64.8	1,300	825	210
3	‡ 15.0	0	0	46.6	0	824	228	48.1	11.1	1,150	792	196
4	1.3	0	8.0	87.5	.8	682	.2	5.6	84.5	985	917	113
5	0	0	0	24.7	1.2	455	18.2	130	25.3	916	1,640	136
6	0	0	3.9	25.2	9.7	340	25.0	163	7.3	604	1,690	147
7	0	0	0	17.3	2.2	261	84.2	102	2.4	376	1,240	84.0
8	0	0	0	53.5	1.4	945	51.9	21.8	18.2	380	923	22.7
9	0	0	2.8	88.0	.2	1,080	6.4	86.8	108	416	718	23.0
10	0	0	0	43.9	5.5	632	30.6	146	14.2	192	494	27.5
11	0	.3	.6	28.8	24.9	161	15.9	93.7	3.5	2,710	450	60.3
12	0	.6	4.0	17.2	26.1	190	19.1	55.8	.8	4,690	659	32.9
13	0	0	38.2	6.3	30.4	386	17.7	31.8	6.5	3,250	715	20.8
14	0	1.8	0	1.3	333	137	63.9	57.7	174	1,990	515	6.1
15	0	7.3	0	3.9	3,620	7,230	23.7	53.6	1,220	1,380	279	13.0
16	0	0	2.8	3.4	3,620	11,600	25.6	17.8	12,300	730	129	35.9
17	0	0	0	3.3	2,470	5,830	19.3	8.1	20,100	286	40.2	5.9
18	0	2.2	.2	0	2,020	2,300	35.7	3.1	20,500	97.3	90.6	86.4
19	0	0	3.1	3.3	7,510	921	100	10.9	20,800	116	99.3	30.9
20	0	0	0	26.5	11,100	381	2.8	29.4	18,000	200	125	5.4
21	0	.1	0	11.9	4,640	40.2	13.5	79.0	11,600	223	77.1	20.7
22	0	.1	18.1	3.3	2,530	0	9.2	269	6,890	228	136	5.6
23	0	0	40.7	5.2	2,200	5.2	26.4	249	4,850	557	124	14.7
24	0	0	0	0	1,840	3.0	32.5	340	3,680	2,110	116	15.5
25	0	0	12.4	3.6	1,320	31.0	16.5	404	2,930	2,600	178	17.4
26	0	7.1	59.4	9.2	1,070	39.3	21.9	432	2,340	2,470	229	7.1
27	0	0	66.2	9.6	2,470	140	32.4	447	1,730	2,310	147	1.4
28	0	.1	16.7	16.0	8,070	138	27.9	369	1,460	2,040	341	8.3
29	0		.2	7.3	9,010	874	17.3	432	1,350	1,640	545	5.0
30	0		10.3	8.7	5,880	1,390	26.6	370	1,230	1,240	596	0
31	10.8		17.6		3,640		32.2	280		953		7.2
Sum	‡ 28.2	278.1	305.2	565.7	73,448.7	40,815.7	3,047.6	4,916.6	131,717.6	39,399.3	15,776.2	1,686.7

Month	Current Year 1951								Period 1934-1951			
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			Acre-Feet Average 1942-1951
				High		Low						
	High	Low	Day		Day				Normal	Maximum	Minimum	
Jan.	10.60		3	ϕ‡ 15.0	‡ 1	0	‡ .9	‡ 55.9	147,415	299,000	‡ 55.9	113,126
Feb.	11.30		1	257	‡ 2	0	9.9	552	109,455	237,000	552	83,890
Mar.	10.60		13	115	‡ 1	0	9.8	605	98,961	311,000	605	73,700
Apr.	10.65		4	123	‡ 1	0	18.9	1,120	91,425	* 372,000	1,120	73,825
May	25.27		20	12,800	‡ 1	0	2,370	146,000	247,878	717,000	29,900	159,580
June	25.20		16	12,600	‡14	0	1,360	81,000	296,910	* 1,161,000	1,380	193,938
July	14.10		1	1,390	‡ 4	0	98.3	6,040	263,936	759,000	6,040	191,794
Aug.	11.81		29	483	‡ 1	0	159	9,750	217,348	679,000	6,000	165,635
Sept.	30.20		19	21,000	‡ 2	0	4,390	261,000	505,517	1,337,000	21,300	434,630
Oct.	19.31	10.76	12	5,010	18	48.9	1,270	78,100	447,988	* 1,427,000	21,700	380,980
Nov.	14.70	9.88	6	1,830	17	19.8	526	31,300	167,655	614,000	3,590	115,359
Dec.	11.38		1	397	‡ 8	0	54.4	3,350	130,146	341,000	2,670	79,102
Yearly	30.20			21,000		0	855	618,872.9	2,724,634	* 6,526,000	618,872.9	2,065,559

‡ Estimated * Partly estimated ‡ And other days ϕ Mean daily

OUTFALLS FROM WELLS AND SEWERS INTO THE RIO GRANDE

In Acre-Feet

EL PASO ELECTRIC COMPANY SANTA FE STREET PLANT COOLING WATER WASTE

This outfall enters the Rio Grande 3.3 miles below the American Dam. The 1951 record of outfall was obtained from records of water pumped from the company's wells and use of such water by the City of El Paso.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
1951	0	0	0	0	0	0	184	101	30	0	0	0	315

EL PASO SEWAGE OUTFALL

This sewage outfall enters the Rio Grande 6.6 river miles below the American Dam. The 1951 record of outfall consists of flows measured by a Parshall meter and estimates by the Department of Water and Sewerage of the City of El Paso of amounts which by-passed the meter, minus estimated diversions between the Sewage Plant and the Rio Grande for irrigation use on 120 acres of land.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
1951	979	908	1,007	865	973	954	1,130	1,163	1,169	1,142	1,028	1,074	12,392
⊕ Normal	724	678	734	714	774	817	884	864	815	827	774	762	9,367

EL PASO COUNTY WATER CONTROL AND IMPROVEMENT DISTRICT NO. 1 SEWAGE OUTFALLS

This water enters the Rio Grande through the sewer system of the El Paso County Water Control and Improvement District No. 1 between Ascarate and Ysleta, Texas, 9 and 15 miles respectively, below the American Dam. The tabulation includes the outfalls from Disposal Plant No. 1 at Ascarate, Texas and Disposal Plant No. 2 a few miles downstream. Records were furnished by the El Paso County Water Control and Improvement District No. 1.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
1951	66.4	60.5	2.5	1.7	1.4	.5	.2	.2	.2	.2	2.4	8.4	144.6

LAREDO SEWAGE OUTFALL

This sewage outfall enters the Rio Grande 885.7 river miles below the American Dam at El Paso, Texas and 1.4 river miles below the Laredo gaging station. The record is based on estimates by the Texas State Health Department.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
1951	162	166	179	179	166	167	188	176	148	137	151	159	1,978

⊕ Period 1936-1951

STORED WATER IN LARGE RESERVOIRS OF THE RIO GRANDE BASIN

In Thousands of Acre-Feet

Data are presented below for all storage reservoirs in the Rio Grande Basin that exceed 15,000 acre-feet in capacity. The monthly figures represent the water in storage on the last day of each month, in thousands of acre-feet. The capacities indicated are at spillway level. Storage figures greater than the capacity indicate that the water surface was above spillway level.

The reservoirs and the sources of the data are: Rio Grande, Continental, Santa Maria, Terrace, and Mountain Home from the Colorado State Engineer; Sanchez and Costilla from the San Luis Power and Water Company; El Vado from the Middle Rio Grande Conservancy District; Elephant Butte, Caballo, Alamogordo, McMillan, and Avalon from the United States Bureau of Reclamation; Red Bluff from the Red Bluff Water Power Control District; Willacy from the Willacy County Water Control and Improvement District No. 1; Boquilla, Colina, and Rosetilla from the Río Conchos Agriculture and the Electric Power Company of Mexico; Francisco I. Madero from the Ministry of Hydraulic Resources of Mexico; Centenario and San Miguel, Venustiano Carranza, Marte Gómez, Culebrón, Villa Cárdenas, and Palito Blanco from the Department of Agriculture and Livestock of Mexico.

NOTE: According to an estimate and partial silt survey completed in 1951, the capacity of Elephant Butte Reservoir at spillway level was 2,185,400 acre-feet, which is 12,200 acre-feet less than the capacity determined in 1947.

In the United States

Month	Rio Grande (Capacity 51.1)		Continental (Capacity 26.7)		Santa Maria (Capacity 43.6)		Terrace (Capacity 17.7)		Mountain Home (Capacity 20.1)		Sanchez (Capacity 103.2)	
	1951	# Normal 1927-1951	1951	# Normal 1928-1951	1951	# Normal 1928-1951	1951	# Normal 1925-1951	1951	# Normal 1924-1951	1951	# Normal 1927-1951
Jan.	2.8	14.3	2.8	5.5	2.2	8.2	1.3	2.7	.6	4.2	2.8	11.6
Feb.	4.3	15.5	3.8	5.7	2.6	8.8	1.4	3.1	.9	4.7	3.4	11.7
Mar.	5.1	16.9	5.0	5.8	2.9	9.9	1.8	3.5	.9	5.0	4.0	12.4
Apr.	5.1	16.5	5.0	6.3	2.9	11.6	1.8	4.1	1.3	5.7	4.4	14.2
May	3.6	24.5	5.0	8.8	1.9	16.3	1.8	7.2	1.6	8.0	5.4	19.6
June	0	25.9	3.0	9.4	.5	18.9	1.8	8.9	.9	7.9	2.7	18.5
July	0	15.6	1.7	7.0	0	13.2	1.8	5.6	0	5.7	.8	13.0
Aug.	0	6.8	1.7	4.9	0	6.1	1.8	2.9	0	3.5	.3	9.6
Sept.	0	6.5	1.6	5.1	0	5.6	1.7	2.3	0	3.1	.3	10.0
Oct.	0	7.9	1.6	4.8	0	6.0	1.8	2.5	0	3.2	.7	10.7
Nov.	1.4	11.0	1.8	4.9	.4	6.7	1.7	2.1	.5	3.5	1.4	10.7
Dec.	3.4	12.6	2.1	5.3	1.4	7.3	1.8	2.5	.7	3.8	2.1	11.0
Avg.	2.1	14.5	2.9	6.1	1.2	9.9	1.7	4.0	.6	4.9	2.4	12.8
Max.	5.1	51.8	5.0	26.7	2.9	42.1	1.8	17.7	1.6	16.4	5.4	62.4
Min.	0	0	1.6	0	0	0	1.3	0	0	0	.3	0

Month	Costilla (Capacity 15.7)		El Vado (Capacity 200.3)		Bluewater (Capacity 43.5)		Elephant Butte (Capacity 2,185.4)		Caballo (Capacity 346.0)	
	1951	# Normal 1922-1951	1951	Normal 1935-1951	1951	# Normal 1927-1951	1951	Normal 1915-1951	1951	# Normal 1938-1951
Jan.	2.5	4.0	30.7	63.0	1951 Data Not Available		303.9	982.5	114.1	193.0
Feb.	2.7	4.3	4.9	55.7			293.2	984.0	159.5	203.4
Mar.	3.2	4.9	5.5	51.7			248.8	971.9	149.9	182.6
Apr.	3.9	6.0	29.6	108.4			192.2	974.9	140.5	150.5
May	4.7	8.6	60.5	166.2			166.4	1,103.4	142.4	138.5
June	3.2	7.7	35.5	155.0			106.6	1,154.1	124.9	112.2
July	1.5	4.6	11.0	127.6			53.2	1,095.2	77.7	78.8
Aug.	1.1	3.0	0	95.4			27.7	1,021.9	13.5	41.9
Sept.	.5	2.5	0	76.8			19.4	979.7	6.9	37.1
Oct.	.5	2.8	0	70.1			22.9	970.0	10.0	68.3
Nov.	.8	3.2	0	62.4			26.7	969.3	12.8	102.6
Dec.	1.2	3.5	0	60.2			36.5	973.3	15.3	138.0
Avg.	2.2	4.6	14.8	91.0			124.8	1,015.0	80.6	120.6
Max.	4.7	15.1	60.5	203.5			ϕ 330.1	ϕ2,302.8	ϕ 172.0	ϕ 346.6
Min.	.5	0	0	0			ϕ 17.6	3.3	ϕ 4.2	ϕ .1

Some months missing ϕ Daily extreme

STORED WATER IN LARGE RESERVOIRS OF THE RIO GRANDE BASIN

In Thousands of Acre-Feet

In the United States

Month	Alamogordo (Capacity 132.2)		McMillan and Avalon (Capacity 43.5)		Red Bluff (Capacity 310.0)		Willacy (Capacity 25.0)		⊕ Total in United States Reservoirs (Capacity 3,520.5)	
	1951	# Normal 1937-1951	1951	# Normal 1908-1951	1951	# Normal 1936-1951	1951	# Normal 1939-1951	1951	Estimated Normal
Jan.	103.3	65.6	9.3	29.9	102.2	129.7	3.8	14.8	682.3	1,529.0
Feb.	107.0	69.6	7.6	30.1	101.0	133.4	0	14.0	692.3	1,544.0
Mar.	81.8	59.7	10.9	28.2	103.2	130.7	0	13.2	623.0	1,496.4
Apr.	74.5	48.6	1.3	19.7	81.6	108.6	0	11.9	544.1	1,487.0
May	65.5	60.6	7.9	23.1	62.4	120.0	13.4	13.5	542.5	1,718.3
June	36.0	54.5	2.6	22.2	55.0	130.4	12.6	13.6	385.3	1,739.2
July	.4	55.4	14.4	19.3	28.5	114.2	3.5	13.4	194.5	1,568.6
Aug.	12.5	55.9	1.7	17.1	25.2	98.1	4.3	12.9	89.8	1,380.0
Sept.	13.2	54.0	1.7	19.5	28.6	100.5	17.1	14.8	91.0	1,317.5
Oct.	13.0	56.8	1.3	22.1	31.2	106.2	21.0	15.2	104.0	1,346.6
Nov.	18.0	55.1	4.1	23.5	34.4	111.0	19.9	14.1	123.9	1,380.1
Dec.	22.0	59.1	6.0	27.4	37.1	117.6	18.0	15.4	147.6	1,437.0
Avg.	45.6	57.9	5.7	23.5	57.5	116.7	9.5	13.9	351.7	1,495.3
Max.	107.0	156.3	14.4	85.5	103.2	327.5	21.0	22.0	692.3	
Min.	.4	.4	1.3	0	25.2	10.0	0	0	89.8	

In Mexico

Month	Boquilla (Capacity 2,014.6)		La Colina (Capacity 19.5)		Rosetilla (Capacity 15.4)		Madero (Capacity 344.6)		Centenario and San Miguel (Capacity 19.9)	
	1951	# Normal 1914-1951	1951	Normal 1940-1951	1951	Normal 1940-1951	1951	# Average 1948-1951	1951	Normal 1934-1951
Jan.	742.4	1,483.3	18.2	17.8	15.2	13.5	230.6	173.6	3.9	13.0
Feb.	688.5	1,450.8	18.6	18.0	15.6	14.7	234.5	175.4	4.3	12.9
Mar.	617.4	1,398.7	18.3	17.7	14.0	14.0	226.3	169.3	2.4	9.7
Apr.	529.0	1,333.0	19.0	18.5	15.6	13.4	200.2	152.9	1.5	7.9
May	424.7	1,266.9	20.4	18.7	15.0	11.8	175.1	137.8	5.0	9.4
June	325.2	1,178.7	20.4	18.3	15.5	13.6	143.4	122.9	6.5	8.5
July	259.7	1,216.8	18.5	18.5	15.2	13.1	111.6	100.4	6.0	8.2
Aug.	192.6	1,380.9	18.6	18.0	15.2	13.4	72.3	98.9	6.3	9.1
Sept.	157.3	1,534.3	18.6	18.2	15.2	15.1	56.3	138.3	7.6	11.6
Oct.	131.9	1,525.7	18.8	17.8	14.8	14.4	52.2	144.1	9.1	13.1
Nov.	117.0	1,486.7	18.2	17.9	15.6	13.2	50.6	144.2	9.1	12.1
Dec.	108.9	1,468.6	18.6	17.6	15.5	14.2	50.6	143.5	7.3	12.0
Avg.	357.9	1,393.7	18.8	18.1	15.2	13.7	133.6	141.8	5.8	10.6
Max.	742.4	2,224.5	20.4	20.4	15.6	19.4	230.6	268.5	9.1	20.7
Min.	108.9	37.6	18.2	13.5	14.0	.4	50.6	1.4	1.5	.6

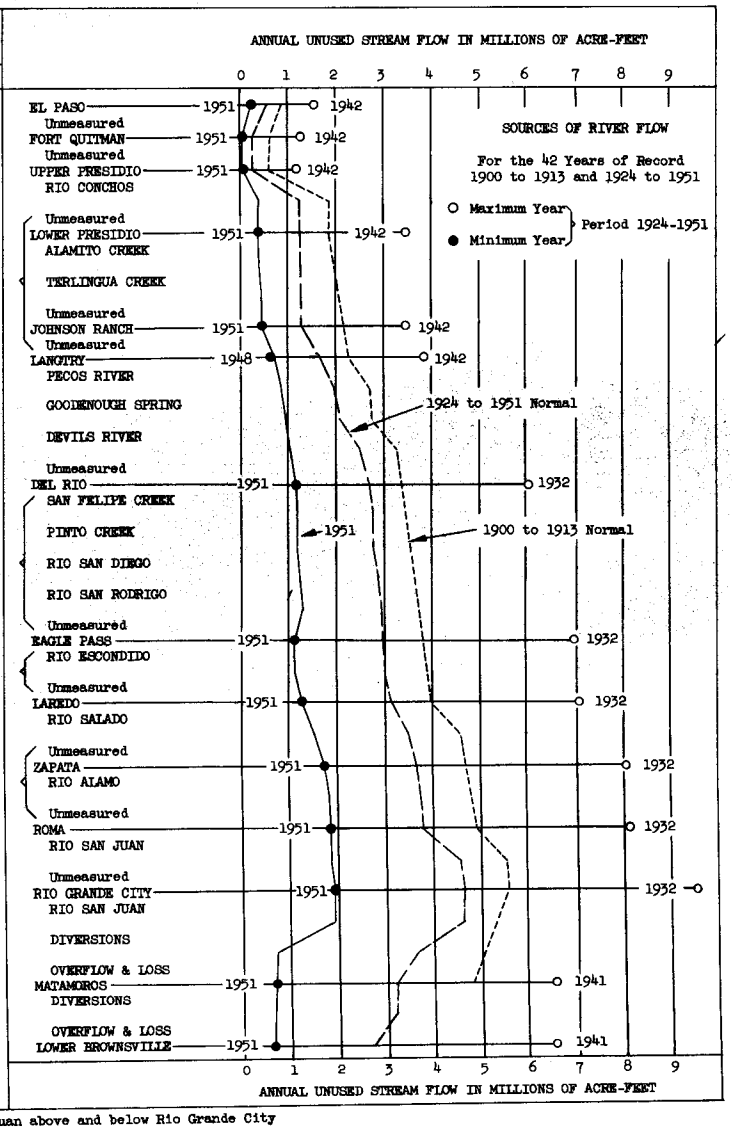
Month	Venustiano Carranza (Capacity 1,123.0)		Marte Gómez (Capacity 876.4)		θ Culebrón (Capacity 73.0)		Palito Blanco (Capacity 178.4)		Total in Mexican Reservoirs (Capacity 4,664.8)	
	1951	Normal 1930-1951	1951	# Average 1943-1951	1951	# Normal 1939-1951	1951	Average 1942-1951	1951	Estimated Normal
Jan.	280.0	420.0	159.4	472.3	10.5	50.9	‼ 0	43.0	1,460.2	2,687.4
Feb.	228.5	402.9	139.1	440.2	4.5	45.2	‼ 0	33.0	1,333.6	2,593.1
Mar.	223.2	380.7	82.9	370.2	4.1	36.0	‼ 0	33.7	1,188.6	2,430.0
Apr.	207.5	368.5	90.2	364.1	0	33.6	‼ 0	22.7	1,063.0	2,314.6
May	191.5	356.2	150.8	368.6	52.9	41.6	‼ 0	18.9	1,035.4	2,229.9
June	136.2	348.7	162.9	344.4	44.3	52.6	4.5	22.4	858.9	2,110.1
July	99.7	339.3	56.7	313.4	15.5	45.4	2.6	29.5	585.5	2,084.6
Aug.	84.1	340.0	153.5	368.3	9.4	46.5	2.6	32.9	554.6	2,308.0
Sept.	86.1	391.6	687.5	483.3	58.5	60.8	18.6	40.4	1,105.7	2,693.6
Oct.	85.4	414.1	826.9	531.3	41.2	65.4	25.6	58.5	1,205.9	2,784.4
Nov.	83.2	424.7	840.7	526.3	23.9	55.1	30.0	57.4	1,188.3	2,737.6
Dec.	78.0	425.8	838.3	530.5	13.9	53.6	21.3	51.8	1,152.4	2,717.6
Avg.	148.6	384.4	349.1	426.1	23.2	48.9	8.8	37.0	1,061.0	2,474.2
Max.	280.0	1,163.4	840.7	914.5	58.5	116.8	30.0	140.1		
Min.	78.0	.7	56.7	ϕ 2.1	0	0	0	0		

‼ Estimated # Some months missing ϕ Daily extreme θ Includes Villa Cárdenas ⊕ Excludes Bluewater Reservoir

SOURCES OF RIVER FLOW

The graph and the column of figures on this page represent data on the annual yield of drainage areas tributary to various stream gaging stations in the Rio Grande Watershed. The graphic values are for the entire tributary area, while the column figures are reduced to the yield from one average square mile of the tributary area. Because there were no reservoirs of consequence on the area from 1900 to 1913, the figures in the first column are the same as those in the graph for that period, except that the column figures have been reduced to a per-square-mile basis. Because some large reservoirs began storing water between 1913 and 1924, large volumes of unused runoff were not permitted to pass on downstream as unused stream flow until later years, when the impounded water was released and added to the stream flow. Elephant Butte and La Boquilla reservoirs illustrate this. Reservoirs which began storing water after January 1, 1924 were, on December 31, 1951, retaining large volumes of runoff water which had not yet passed downstream as stream flow. Caballo and Marte Gómez reservoirs illustrate this. The column figures below, for the period 1924 to 1951, differ from the corresponding graphic values because of such adjustments between unused runoff and unused stream flow incident to changes of reservoir storage.

AVERAGE ANNUAL UNUSED RUNOFF A.F. per Sq.Mi.		
1900-1913	1924-1951	
29.7	17.9	EL PASO
		Unmeasured
19.6	5.8	FORT QUITMAN
		Unmeasured
16.4	4.9	UPPER PRESIDIO
51.0	38.0	RIO CONCHOS
		Unmeasured
		LOWER PRESIDIO
		ALAMITO CREEK
20.7	21.1	TERLINGUA CREEK
		Unmeasured
		JOHNSON RANCH
		Unmeasured
28.2	19.2	LANGTRY
12.4	9.4	PECOS RIVER
		GOODENOUGH SPRING
106.1	101.5	DEVILS RIVER
55.7	67.1	Unmeasured
28.0	21.2	DEL RIO
		SAN FELIPE CREEK
		PINTO CREEK
112.6	73.6	RIO SAN DIEGO
		RIO SAN RODRIGO
		Unmeasured
30.4	22.7	EAGLE PASS
		RIO ESCONDIDO
32.7	30.9	
		Unmeasured
30.5	23.1	LAREDO
27.2	17.0	RIO SALADO
		Unmeasured
		ZAPATA
65.1	60.0	RIO ALAMO
		Unmeasured
31.1	23.4	ROMA
52.8	* 65.7	RIO SAN JUAN
		Unmeasured
		RIO GRANDE CITY
		RIO SAN JUAN
		DIVERSIONS
		OVERFLOW & LOSS
		MATAMOROS
		DIVERSIONS
		OVERFLOW & LOSS
		LOWER BROWNSVILLE



* Includes Río San Juan above and below Rio Grande City

DIVERSIONS FROM THE RIO GRANDE INTO THE AMERICAN CANAL

At El Paso, Texas

DESCRIPTION: An open channel rating station in a concrete-lined canal with a water-stage recorder located 2,350 feet below the head gates at the American Dam near El Paso, Texas. Measurements are made at the downstream end of the first covered section of this canal, 835 feet below the recorder. Another water-stage recorder, 396 feet below the head gates of the canal was removed November 1, 1951. The zero of the gage is 3,712.09 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 44 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: June 2, 1938 through December 1951.

REMARKS: This canal diverts water from the Rio Grande at the American Dam near El Paso, Texas, 2.1 river miles above the International Dam near Juárez, Chihuahua. Water from this canal discharges into the Franklin Canal from which water is frequently returned to the Rio Grande at spillways 2.2, 2.7, and 3.6 river miles below the American Dam.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 1,840 second-feet on March 27, 1944. Min. occasionally no flow.

Average Flow in Second-Feet

Daily:	Max.	1,510	Aug. 13, 1945	Min.	0	occasionally
Monthly:	Max.	1,210	Aug. 1943	Min.	.1	Jan. 1946
Yearly:	Max.	748	1943	Min.	277	1951

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	46.8	122	0	514	380	180	601	602	372	128	87.4	86.6
2	0	127	0	482	406	191	596	561	318	121	82.5	86.8
3	0	128	0	421	370	239	541	583	309	117	84.8	84.2
4	0	126	0	434	338	270	546	511	277	112	91.5	83.4
5	0	125	0	439	313	237	570	567	256	117	91.1	80.4
6	0	120	0	433	228	245	477	678	251	116	89.9	80.5
7	0	119	0	354	193	237	351	510	247	113	89.2	78.2
8	0	117	0	389	199	227	348	426	224	109	88.5	86.4
9	0	116	0	468	189	210	342	423	276	102	87.8	84.0
10	0	117	0	527	181	239	336	364	438	104	88.9	81.6
11	0	58.7	235	547	162	273	325	305	577	101	96.3	83.3
12	0	0	316	590	141	386	330	293	525	94.6	94.7	82.7
13	0	0	394	681	130	365	519	539	553	93.0	89.5	82.1
14	0	0	450	682	112	394	574	579	512	97.1	86.4	81.6
15	0	0	548	733	103	467	662	552	409	95.3	88.7	77.0
16	0	0	575	661	167	512	718	558	281	92.4	84.0	79.5
17	0	0	544	556	114	544	733	633	233	92.4	85.4	80.5
18	0	0	546	527	128	573	692	615	221	91.1	91.1	78.4
19	0	0	581	601	150	639	638	658	202	91.2	95.1	77.5
20	0	0	590	605	155	638	588	782	208	95.0	90.3	76.6
21	0	0	629	600	150	615	527	785	183	93.8	91.3	76.5
22	0	0	557	578	154	602	578	860	169	98.9	92.2	76.4
23	0	0	463	572	179	571	829	878	169	91.3	90.5	76.4
24	0	0	461	524	193	657	849	978	160	92.7	89.6	77.1
25	0	0	502	476	185	666	863	867	152	108	89.8	77.8
26	0	0	764	480	192	631	823	882	142	102	89.8	76.1
27	0	0	685	366	182	624	819	794	129	88.0	89.8	76.0
28	0	0	783	264	186	621	816	711	122	91.7	90.8	76.8
29	37.2		687	284	190	601	751	475	124	90.7	90.0	77.6
30	118		558	359	208	567	588	438	130	95.7	87.5	78.3
31	126		547		197		587	399		107		51.5
Sum	328.0	1,275.7	11,415	15,147	6,175	13,221	18,517	18,806	8,169	3,141.9	2,684.4	2,451.8

Month	Current Year 1951								Period June 1938-1951			Acre-Feet
	#Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			Average 1942-1951
			High		Low				Normal	Maximum	Minimum	
	High	Low	Day		Day							
Jan.	4.53		31	155	‡ 1	0	10.6	651	2,045	8,110	8.5	2,634
Feb.	4.41		2	145	‡11	0	45.6	2,530	10,009	19,500	2,530	10,265
Mar.	10.64		26	1,650	‡ 1	0	368	22,600	36,189	50,100	20,300	37,840
Apr.	7.83	5.14	15	756	28	247	505	30,000	53,600	70,900	30,000	54,650
May	7.32		7	633	7	0	199	12,200	45,630	69,000	12,200	46,160
June	7.67	4.35	24	700	2	166	441	26,200	51,257	65,700	26,200	50,580
July	8.43	5.50	25	939	11	308	597	36,700	58,893	70,700	36,700	58,660
Aug.	8.94	5.29	24	1,050	12	267	607	37,300	59,214	74,600	37,300	59,510
Sept.	7.26	3.98	11	599	29	114	272	16,200	40,814	63,100	16,200	40,230
Oct.	4.38	3.20	25	156	21	27.5	101	6,230	21,452	39,100	6,230	21,673
Nov.	4.10	3.40	19	130	16	64.7	89.5	5,320	12,480	21,000	5,320	13,593
Dec.	3.70		2	91.0	31	0	79.1	4,860	12,973	25,500	4,860	13,905
Yearly	10.64			1,650		0	277	200,791	404,556	541,610	200,791	409,700

‡ And other days # Downstream gage

DIVERSIONS FROM THE RIO GRANDE INTO THE ACEQUIA MADRE

Near Juárez, Chihuahua

DESCRIPTION: Water-stage recorder and bridge for meter measurements located about 260 feet below the canal intake at the International Dam at Juárez, Chihuahua, which is 2.1 river miles below the American Dam at El Paso, Texas.

RECORDS: Based on 92 meter measurements during the year, 67 by the Mexican and 25 by the United States Section of this Commission, and a continuous record of gage heights. Computations by shifting channel methods. Records available: 1938 through December 1951.

REMARKS: In 1951, 32,500 acre-feet were distributed to lands irrigated in the first unit under the canal. The remainder of the water from this canal was used, together with drainage water which entered the canal at the lower end of the first unit, to irrigate lands farther down the canal.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 480 second-feet on July 21, 1944, with a gage height of 6.00 feet. Min. no flow through winter months.

Average Flow in Second-Feet

Daily:	Max.	339	May 10, 1942	Min.	0	several months each year
Monthly:	Max.	283	May 1938	Min.	0	several months each year
Yearly:	Max.	116	1942	Min.	45.7	1951

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	19.1	46.6	87.2	124	164	9.4	0	0	0
2	0	0	0	36.7	61.8	90.1	99.2	163	0	0	0	0
3	0	0	0	34.3	61.8	91.1	101	155	0	0	0	0
4	0	0	0	32.8	93.2	83.3	96.4	158	0	0	0	0
5	0	0	0	32.8	91.1	77.0	94.6	160	0	0	0	0
6	0	0	0	34.3	86.5	83.0	89.0	161	0	0	0	0
7	0	0	0	34.3	91.1	83.7	83.0	154	0	0	0	0
8	0	0	0	32.8	75.6	89.0	86.2	161	0	0	0	0
9	0	0	0	31.8	72.0	96.8	86.2	168	0	0	0	0
10	0	0	0	33.9	76.6	97.1	84.0	165	0	0	0	0
11	0	0	0	31.1	83.3	93.9	87.6	167	0	0	0	0
12	0	0	0	33.2	91.5	91.8	92.5	163	0	0	0	0
13	0	0	0	32.1	92.2	83.3	90.8	170	0	0	0	0
14	0	0	0	31.4	90.4	79.8	102	165	0	0	0	0
15	0	0	0	31.1	93.6	125	156	168	0	0	0	0
16	0	0	0	30.0	95.3	174	178	165	0	0	0	0
17	0	0	0	33.5	102	171	171	162	0	0	0	0
18	0	0	0	32.1	109	166	166	160	0	0	0	0
19	0	0	0	36.0	109	149	166	171	0	0	0	0
20	0	0	0	33.9	111	154	162	167	0	0	0	0
21	0	0	0	32.5	111	152	157	166	0	0	0	0
22	0	0	0	31.4	90.1	160	162	162	0	0	0	0
23	0	0	0	33.5	95.3	147	162	154	0	0	0	0
24	0	0	0	34.3	91.8	150	168	162	0	0	0	0
25	0	0	0	37.8	87.9	150	185	163	0	0	0	0
26	0	0	0	39.2	84.0	150	188	168	0	0	0	0
27	0	0	0	42.0	79.5	155	203	165	0	0	0	0
28	0	0	0	43.8	75.2	154	191	155	0	0	0	0
29	0		0	42.7	83.0	153	173	150	0	0	0	0
30	0		0	39.6	63.9	147	194	154	0	0	0	0
31	0		0		56.9		189	145		0		0
Sum	0	0	0	1,024.0	2,652.2	3,684.1	4,287.5	5,011	9.4	0	0	0

Month	1938-1951 Average Rainfall Inches **	Current Year 1951 Rainfall Inches **	Extreme Second-Feet High Day	High	Extreme Second-Feet Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1938-1951 Acre-Feet Normal	Maximum	Minimum	Average 1942-1951
Jan.	.49	.14		0		0		0	0	0	0	0
Feb.	.26	.26		0		0		0	0	0	0	0
Mar.	.28	.47		0		0		0	1,691	5,540	0	990
Apr.	.18	.19	26	49.1	1	0	34.1	2,030	6,892	11,720	2,030	6,357
May	.41	.08	4	141	1	40.3	85.6	5,260	12,887	17,380	5,260	12,665
June	.76	.04	16	189	5	67.5	123	7,310	10,389	15,700	7,310	10,139
July	1.39	1.14	27	218	7	77.3	138	8,500	10,083	15,170	7,910	10,440
Aug.	1.26	1.91	22	197	31	124	162	9,940	9,813	12,410	5,200	10,632
Sept.	1.14	.16	1	122	#	0	.3	18.6	7,799	12,380	18.6	8,765
Oct.	.88	.28		0		0		0	110	328	0	92.6
Nov.	.28	.03		0		0		0	0	0	0	0
Dec.	.59	.35		0		0		0	0	0	0	0
Yearly	7.92	5.05		218		0	45.7	33,058.6	59,664	83,930	33,058.6	60,080.6

Various days of the month ** Average for Valley floor from El Paso to Island Station

DIVERSIONS FROM THE RIO GRANDE INTO THE MAVERICK CANAL AT LAS MORAS CREEK

Near Quemado, Texas

DESCRIPTION: For power generation and irrigation use, water is diverted into the Maverick Canal from the Rio Grande at a point 17.4 river miles below the international bridge between Del Rio, Texas and Cd. Acuña, Coahuila, and 711.0 river miles below the American Dam at El Paso, Texas. The water-stage recorder is located about 400 feet above the Las Moras Creek siphon. Meter measurements are made from a gate structure about 550 feet above the siphon and 15.4 canal miles below the diversion point. The zero of the gage is 796.82 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 18 meter measurements and a continuous record of gage heights. Computations by shifting channel methods. Records available: June 21, 1949 through December 1951.

REMARKS: About 1,282 acres of land were irrigated from this canal above this gaging station and 10,581 acres were irrigated from this canal between this station and the Maverick Power Plant, 16.4 canal miles downstream, where a part of the water returns to the Rio Grande. Some irrigation water is returned to the river above the power plant.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 1,560 second-feet on July 22, 1951. Min. 811 second-feet on October 9, 1951.

Average Flow in Second-Feet

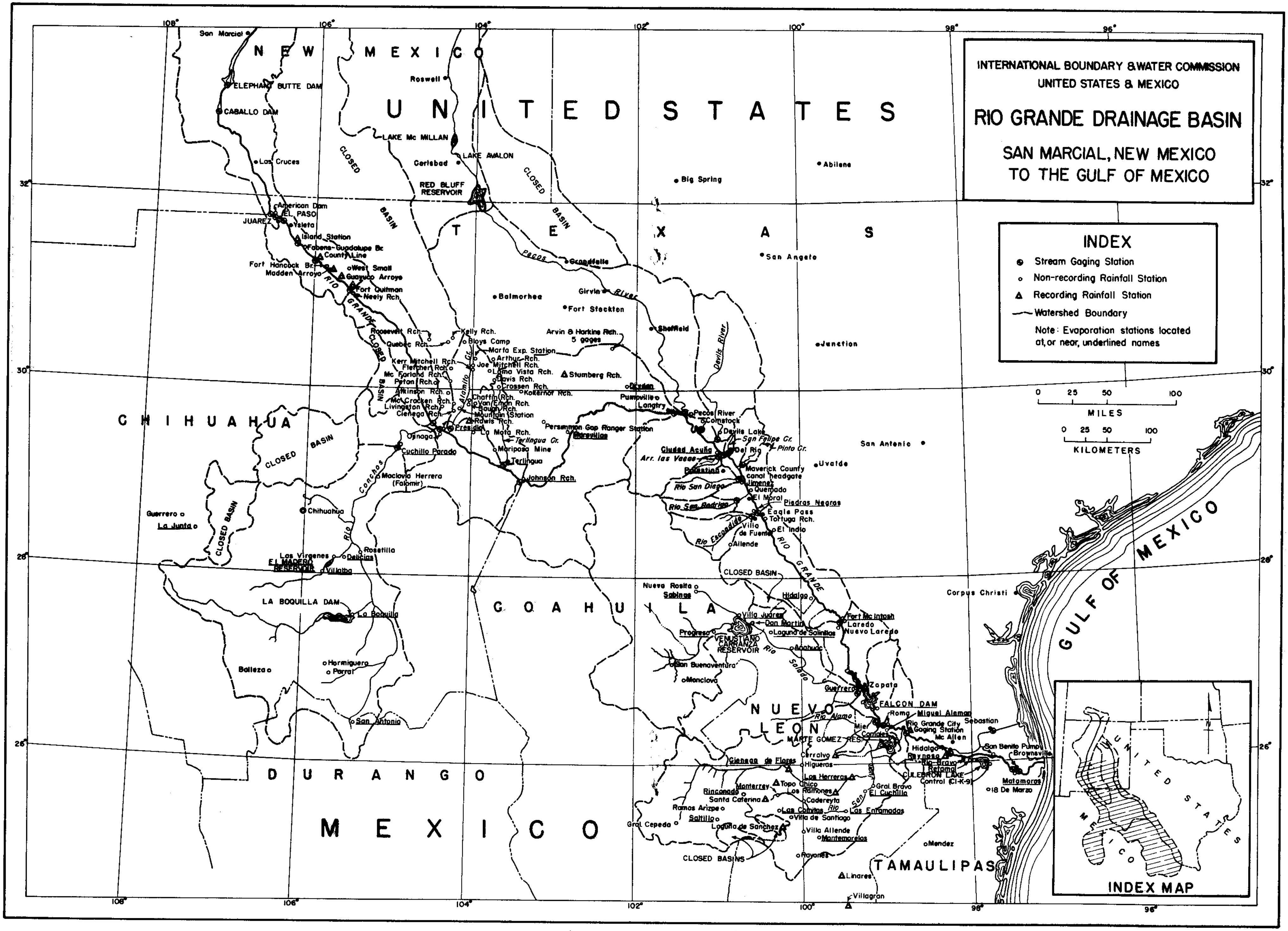
Daily:	Max.	1,550	July 22, 1951	Min.	987	Oct. 14, 1951
Monthly:	Max.	1,490	Feb. 1951	Min.	1,100	Oct. 1951
Yearly:	Max.	1,390	1950	Min.	1,320	1951

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,490	1,440	1,500	1,460	1,130	1,470	1,230	1,490	1,010	1,140	1,220	1,180
2	1,490	1,460	1,500	1,440	1,120	1,480	1,190	‡ 1,490	1,030	1,140	1,340	1,170
3	1,480	1,450	1,500	1,390	1,080	1,480	1,150	‡ 1,450	1,400	1,150	1,350	1,190
4	1,470	1,460	1,510	1,340	1,130	1,490	1,140	‡ 1,420	1,450	1,120	1,280	1,170
5	1,450	1,460	1,490	1,310	1,080	1,470	1,170	‡ 1,380	1,400	1,090	1,210	1,170
6	1,460	1,460	1,460	1,320	1,100	1,500	1,500	‡ 1,350	1,280	1,080	1,210	1,160
7	1,470	1,430	1,450	1,320	1,090	1,480	1,470	1,310	1,260	1,060	1,200	1,140
8	1,460	1,470	1,470	1,290	1,080	1,490	1,480	1,270	1,190	1,050	1,180	1,130
9	1,450	1,500	1,470	1,280	1,080	1,500	1,500	1,290	1,240	1,010	1,200	1,110
10	1,450	1,490	1,470	1,260	1,080	1,520	1,500	1,300	1,200	1,020	1,190	1,140
11	1,440	1,490	1,500	1,250	1,130	1,520	1,490	1,280	1,150	1,010	1,220	1,170
12	1,440	1,490	1,490	1,240	1,320	1,520	‡ 1,440	1,200	1,390	996	1,220	1,160
13	1,450	1,480	1,490	1,190	1,390	1,510	‡ 1,370	1,240	1,280	991	1,250	1,180
14	1,450	1,490	1,490	1,140	1,280	1,500	‡ 1,280	1,480	1,210	987	1,240	1,200
15	1,450	1,510	1,480	1,170	1,220	1,480	‡ 1,220	1,520	1,410	990	1,220	1,220
16	1,430	1,490	1,490	1,180	1,310	1,500	‡ 1,200	1,500	1,440	990	1,190	1,200
17	1,410	1,510	1,480	1,170	1,340	* 1,500	‡ 1,160	1,480	* 1,360	1,020	1,210	1,200
18	1,400	1,500	1,470	1,120	1,400	1,500	1,230	1,470	* 1,480	1,020	1,210	1,180
19	1,410	1,500	1,460	1,120	1,430	1,500	1,510	1,390	1,500	1,110	1,210	1,150
20	1,440	1,490	1,460	1,090	1,390	1,480	1,520	1,260	1,480	1,120	1,220	1,150
21	1,480	1,490	1,450	1,080	1,380	1,460	1,520	1,210	1,440	1,070	1,200	1,170
22	1,470	1,500	1,450	1,070	1,400	1,450	1,550	1,160	1,350	1,200	1,200	1,170
23	1,440	1,490	1,440	1,050	1,400	1,420	1,520	1,100	1,300	1,310	1,190	1,200
24	1,440	1,510	1,440	1,030	1,400	1,380	1,500	1,070	1,280	1,210	1,190	1,180
25	1,470	1,510	1,460	1,030	1,330	1,400	1,510	1,210	1,240	1,130	1,210	1,170
26	1,460	1,520	1,490	1,030	1,260	1,440	1,490	1,250	1,370	1,080	1,240	1,160
27	1,470	1,510	1,490	1,060	1,480	1,470	1,480	1,230	1,370	1,060	1,200	1,150
28	1,460	1,500	1,470	1,100	1,480	1,340	1,500	1,140	1,300	1,160	1,180	1,170
29	1,470		1,450	1,130	1,480	1,260	1,500	1,080	1,240	1,310	1,160	1,170
30	1,470		1,480	1,110	1,480	1,230	1,480	1,050	1,180	1,230	1,180	1,160
31	1,480		1,490		1,480		1,480	1,030		1,180		1,160
Sum	45,100	41,600	45,740	35,770	39,750	43,740	43,280	40,100	39,230	34,034	36,520	36,230

Month	Current Year 1951: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period July 1949-1951: Acre-Feet Average	Acre-Feet Maximum	Acre-Feet Minimum
Jan.	10.10	9.55	‡ 2	1,500	‡17	1,400	1,450	89,500	86,250	89,500	83,000
Feb.	10.16	9.57	‡15	1,530	1	1,390	1,490	82,500	79,650	82,500	76,800
Mar.	10.15	9.64	4	1,520	‡23	1,420	1,480	90,700	86,950	90,700	83,200
Apr.	10.06	7.44	1	1,470	14	986	1,190	70,900	75,950	81,000	70,900
May	9.95	7.60	27	1,500	5	1,040	1,280	78,800	80,500	82,200	78,800
June	9.93	7.80	‡10	1,530	28	1,160	1,460	86,800	86,450	86,800	86,100
July	10.05	7.52	22	1,560	5	1,100	1,400	85,800	* 83,767	87,800	* 77,700
Aug.	10.04	7.45	‡14	1,520	31	1,020	1,290	79,500	* 83,800	88,500	79,500
Sept.	10.02	7.36	18	1,520	1	1,010	1,310	77,800	* 81,600	* 84,500	77,800
Oct.	9.64	6.45	22	1,350	9	811	1,100	67,500	* 80,267	* 87,200	67,500
Nov.	9.72	8.08	3	1,360	29	1,120	1,220	72,400	77,833	82,800	72,400
Dec.	8.71	8.00	15	1,230	8	1,100	1,170	71,900	80,800	85,600	71,900
Yearly	10.16	6.45		1,560		811	1,320	954,100	* 983,817	1,004,200	954,100

‡ Estimated * Partly estimated ‡ And other days


INTERNATIONAL BOUNDARY & WATER COMMISSION
UNITED STATES & MEXICO
RIO GRANDE DRAINAGE BASIN
SAN MARCIAL, NEW MEXICO
TO THE GULF OF MEXICO
INDEX
Stream Gaging Station
Non-recording Rainfall Station
Recording Rainfall Station
Watershed Boundary
Note: Evaporation stations located at, or near, underlined names
0 25 50 100
MILES
0 25 50 100
KILOMETERS
INDEX MAP
UNITED STATES
MEXICO
NEW MEXICO
TEXAS
CHIHUAHUA
COAHUILA
NUEVO LEON
TAMAULIPAS
DURANGO
GULF OF MEXICO
San Marcial
ELEPHANT BUTTE DAM
CABALLO DAM
Las Cruces
American Dam
EL PASO
JUAREZ
Ysleta
Island Station
Fabens-Guadalupe Br.
County Line
Fort Hancock Br.
Madden Arroyo
West Small
Guayuco Arroyo
Fort Quitman
Neely Rch.
RIO GRANDE
Roswell
LAKE Mc MILLAN
Carlsbad
LAKE AVALON
RED BLUFF RESERVOIR
CLOSED BASIN
Pecos River
Grandfalls
Girvin
Balmorhea
Fort Stockton
Big Spring
Abilene
San Angelo
Junction
Sheffield
Devils River
Arvin & Harkins Rch. 5 gages
Stumberg Rch.
Kelly Rch.
Bloys Camp
Marfa Exp. Station
Arthur Rch.
Joe Mitchell Rch.
Loma Vista Rch.
Davis Rch.
Crossen Rch.
Kokernot Rch.
Roosevelt Rch.
Quebec Rch.
Kerr Mitchell Rch.
Fletcher Rch.
Mc Farland Rch.
Peton Rch.
Atkinson Rch.
Mc Cracken Rch.
Livingston Rch.
Cienega Rch.
Chaffin Rch.
Van Eman Rch.
Baugh Rch.
Mountain Station
Rawls Rch.
Alamito Cr.
Presidio
Ojinaga
La Mota Rch.
Terlingua Cr.
Mariposa Mine
Terlingua
Johnson Rch.
Persimmon Gap Ranger Station
Boquillas
Dryden
Pumpville
Langtry
Pecos River
Comstock
Devils Lake
San Felipe Cr.
Pinto Cr.
Del Rio
Ciudad Acuña
Arr. las Vacas
Maverick County canal headgate
Jimenez
Quemado
El Moral
Piedras Negras
Eagle Pass
Tortuga Rch.
El Indio
Villa de Fuente
Allende
Rio San Diego
Rio San Rodrigo
Rio Escondido
Uvalde
San Antonio
Corpus Christi
Cuchillo Parado
Conchos
Maclovio Herrera (Falomir)
Chihuahua
Guerrero
La Junta
Rio Conchos
Rosetilla
Las Virgenes
Delicias
EL MADERO RESERVOIR
Villalba
LA BOQUILLA DAM
La Boquilla
Hormiguero
Parral
Balleza
San Antonio
Nueva Rosita
Sabinas
Hidalgo
Villa Juarez
Don Martin
Laguna de Salinillas
Progreso
VENUSTIANO CARRANZA RESERVOIR
Anahuac
Rio Salado
San Buenaventura
Monclova
Fort Mc Intosh
Laredo
Nuevo Laredo
Zapata
Guerrero
FALCON DAM
Romo
Miguel Aleman
Mier
Camargo
Rio Grande City Gaging Station
Sebastian
Mc Allen
Rio Alamo
MARTE GOMEZ RES.
Hidalgo
Reynosa
Rio Bravo
Retamal
CULEBRON LAKE Control (Cl-K-9)
San Benito Pump
Brownsville
Matamoros
18 De Marzo
Cienega de Flores
Cerralvo
Higueras
Los Herreras
Monterrey
Topo Chico
Los Ramones
Rinconada
Santa Caterina
Cadereyta
Gral. Bravo
El Cuchillo
Ramos Arizpe
Los Cavazos
Rio San Juan
Las Enramadas
Saltillo
Villa de Santiago
Gral. Cepeda
Laguna de Sanchez
Villa Allende
Montemorelos
Rayones
Mendez
CLOSED BASINS
Linares
Villagran
108°
106°
104°
102°
100°
98°
96°
32°
30°
28°
26°

DIVERSIONS FROM THE RIO GRANDE INTO THE MAVERICK CANAL EXTENSION BELOW THE POWER PLANT

Near Eagle Pass, Texas

DESCRIPTION: The main Maverick Canal divides into two branches at a point about 31.8 canal miles below the point at which water from the Rio Grande is diverted. One branch leads to the Maverick Power Plant and back to the Rio Grande. The other branch forms the Maverick Canal Extension which is used to transmit irrigation water. The water-stage recorder is located at a wood pile bridge about 1 mile below the heading of this canal extension. Meter measurements are made from the bridge.

RECORDS: Based on 23 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: April 1, 1939 through December 1951.

REMARKS: Irrigation from this canal extension began in June 1938, and in 1951, 24,140 acres of land were irrigated north and south of Eagle Pass. Some water from this canal extension returns to the river below the power plant.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 472 second-feet on July 6, 1951. Min. occasionally no flow.

Average Flow in Second-Feet

Daily:	Max.	430	July 4, 1951	Min.	0	occasionally	
Monthly:	Max.	394	July 1951	Min.	" 18.7	March	1939
Yearly:	Max.	298	1951	Min.	62.1		1939

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	345	303	341	228	369	130	396	396	277	270	208	322
2	332	322	342	251	364	143	394	393	280	258	211	328
3	319	308	336	296	362	174	413	381	284	264	205	327
4	315	298	319	293	365	170	430	371	281	268	203	324
5	315	306	314	278	340	169	400	352	272	270	226	320
6	321	295	308	285	342	169	428	350	269	261	249	316
7	323	323	328	286	324	169	417	332	271	261	251	312
8	328	335	350	283	294	168	418	326	265	267	256	306
9	314	344	354	273	308	170	418	330	280	263	276	309
10	331	342	364	294	307	180	417	329	269	263	272	298
11	304	342	368	313	320	198	406	325	271	258	281	281
12	313	338	345	303	291	209	392	322	280	268	276	278
13	311	353	338	313	286	237	391	332	267	278	283	282
14	303	274	336	312	279	230	387	326	281	276	286	282
15	304	298	350	326	263	253	402	307	265	276	310	282
16	302	319	352	323	220	286	382	302	* 205	277	307	274
17	313	329	355	318	172	292	377	302	* 165	284	311	274
18	318	330	358	320	135	295	386	299	* 165	283	* 308	277
19	307	324	346	331	135	323	402	290	168	293	* 303	287
20	324	348	354	344	134	349	378	288	190	284	* 299	308
21	336	329	348	352	133	383	381	289	209	285	296	* 304
22	335	335	347	372	135	373	381	273	207	292	310	" 292
23	327	342	345	360	136	380	378	232	216	276	322	" 287
24	335	352	347	355	128	388	371	253	220	256	323	" 287
25	327	358	275	366	119	387	381	296	220	252	324	" 286
26	329	343	166	352	128	385	370	298	230	249	326	" 286
27	336	337	165	353	128	398	383	275	239	248	314	* 286
28	335	346	157	356	121	383	396	256	257	255	313	302
29	334		177	363	135	386	388	262	256	233	317	300
30	316		223	364	132	388	375	262	263	203	324	300
31	325		226		124		392	268		204		300
Sum	9,977	9,173	9,634	9,563	7,029	8,165	12,230	9,617	7,322	8,175	8,490	9,217

Month	1939-1951 Average Rainfall Inches **		Current Year 1951 Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1939-1951 Acre-Feet Normal	Maximum	Minimum	Acre-Feet Average 1942-1951
Jan.	1.08	T	1	375	14	193	322	19,800	9,377	19,800	" 2,140	11,070
Feb.	1.13	.13	13	391	14	215	328	18,200	8,538	18,200	" 2,120	10,247
Mar.	.87	1.72	11	390	‡25	125	311	19,100	9,470	19,100	" 1,150	11,266
Apr.	1.53	.06	23	384	1	163	319	19,000	9,348	19,000	3,430	10,911
May	3.43	4.15	2	380	25	103	227	13,900	7,603	13,900	2,840	8,996
June	2.05	.35	23	432	1	116	272	16,200	8,299	16,200	3,750	9,467
July	1.37	.14	6	472	17	281	394	24,300	10,466	24,300	4,510	12,026
Aug.	2.41	.32	1	421	22	207	310	19,100	9,326	19,100	3,480	10,730
Sept.	2.67	2.23	3	293	19	158	244	14,500	8,611	14,500	4,600	9,701
Oct.	1.69	1.12	22	308	29	188	264	16,200	9,963	16,900	5,130	11,051
Nov.	.65	.02	25	343	4	191	283	16,800	10,519	17,900	4,170	11,678
Dec.	.77	.30	4	339	16	236	297	18,300	11,154	20,200	4,280	12,409
Yearly	19.65	10.54		472		103	298	215,400	112,674	215,400	44,950	129,552

" Estimated * Partly estimated ‡ And other days ** On the U.S. side from Quemado to El Indio, Texas

DIVERSIONS FROM THE RIO GRANDE ON THE UNITED STATES SIDE

Below Rio Grande City, Texas

The total diversion of 1,059,600 acre-feet to this area was made almost entirely by pumping from the river to irrigate 615,665 acres. Diversions were actually measured for 90% of the acreage. Diversions to the remainder were estimated. Measurements in general were made by Venturi meters, by open channel rating stations, and deflection meters developed by this Commission, although a small part was measured by plant efficiency and power input. There is some re-use of drainage water within the area. Drainage water which escapes from the area does not return to the Rio Grande. In addition to the irrigated area, there were 49,514 acres of dry-farmed land within the area. More than one crop per year is often grown on some of the land.

Average Flow in Second-Feet

Daily ⊕:	Max.	5,400	June 15, 1951	Min.	0	Sept. 25, 1949, Oct. 25, 1951
Monthly:	Max.	3,660	June 1949	Min.	25.2	June 1930
Yearly:	Max.	2,060	1950	Min.	653	1941

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,300	1,210	178	1,730	2,750	3,230	2,270	1,450	943	653	1,000	1,100
2	1,620	1,530	192	2,060	3,660	3,230	2,340	655	465	1,020	560	801
3	1,690	1,570	882	1,980	2,220	3,250	1,820	811	939	1,100	555	1,470
4	1,640	1,700	1,710	1,920	1,330	2,410	1,360	1,800	1,380	989	602	1,320
5	1,710	2,430	3,020	1,770	1,010	2,680	1,340	1,690	1,260	1,320	1,220	1,200
6	1,600	2,250	2,360	1,750	985	2,900	1,310	1,400	658	1,310	1,400	1,360
7	1,420	1,700	1,630	1,710	1,000	3,550	778	1,770	136	873	1,240	1,610
8	1,560	263	104	1,580	934	3,570	607	1,810	843	1,650	1,450	1,050
9	1,640	322	268	1,830	829	3,450	914	1,570	866	1,840	1,490	863
10	1,820	835	706	1,570	314	3,700	1,040	1,430	883	2,170	1,270	1,470
11	1,920	1,360	1,340	1,330	401	4,320	595	877	575	1,850	639	1,430
12	1,700	2,330	2,890	1,210	1,200	4,620	436	958	812	1,940	1,520	1,230
13	1,440	1,810	2,270	1,180	1,890	4,280	805	1,480	1,210	1,790	1,500	1,230
14	1,420	1,030	1,950	1,130	2,320	4,650	1,490	1,260	692	1,230	1,660	1,120
15	1,710	263	1,140	1,150	2,580	5,400	1,250	836	1,100	2,240	1,660	918
16	1,750	257	1,260	1,370	2,210	5,340	998	799	987	2,100	1,340	833
17	1,750	790	1,760	1,380	1,370	4,830	1,090	1,230	925	1,700	1,130	1,060
18	1,160	1,690	2,090	1,110	1,070	4,790	2,120	1,040	923	1,330	1,110	1,560
19	846	3,050	2,770	179	1,230	5,060	1,770	694	1,160	708	1,290	1,580
20	444	2,600	2,120	101	1,530	4,960	928	940	997	832	1,720	1,430
21	1,600	1,950	1,500	355	2,620	4,470	561	1,120	842	846	1,450	1,160
22	2,630	428	507	662	2,720	3,820	878	759	732	1,870	869	1,020
23	2,200	187	633	1,400	2,770	2,710	1,320	859	659	915	1,450	1,020
24	1,880	926	924	1,330	2,120	2,050	786	1,080	833	104	1,070	1,180
25	515	1,870	1,540	956	1,740	1,120	404	940	1,190	0	778	998
26	72	2,990	2,250	151	744	939	854	730	1,170	179	995	1,630
27	735	2,230	1,800	24	782	1,940	1,290	1,360	924	350	662	1,460
28	1,400	1,740	1,460	221	2,190	2,430	603	1,710	1,320	165	1,040	1,230
29	1,960		1,430	424	2,680	2,470	234	1,430	1,060	800	987	1,060
30	1,150		1,700	1,480	2,090	2,360	1,300	1,290	649	1,320	1,150	905
31	943		1,760		2,530		2,120	951		1,180		1,320
Sum	45,225	41,311	46,144	35,043	53,819	104,529	35,611	36,729	27,133	36,374	34,807	37,618

Month	1922-1951 Average Rainfall Inches **		Current Year 1951 ϕ Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1922-1951 Acre-Feet Normal	Maximum	Minimum	Acre-Feet Average 1942-1951
Jan.	1.46	.20	22	2,630	26	72	1,460	89,700	45,850	117,000	7,700	62,320
Feb.	1.04	.41	19	3,050	23	187	1,480	81,900	64,444	134,000	6,960	72,260
Mar.	1.19	1.49	5	3,020	8	104	1,490	91,500	85,987	156,000	14,100	101,980
Apr.	1.30	.51	2	2,060	27	24	1,170	69,500	75,738	125,000	29,300	97,060
May	3.39	3.29	2	3,660	10	314	1,740	107,000	71,527	135,000	4,510	101,910
June	2.69	2.99	15	5,400	26	939	3,480	207,000	75,157	218,000	1,500	118,540
July	1.82	.82	2	2,340	29	234	1,150	70,600	75,812	161,000	10,000	124,810
Aug.	2.15	2.27	8	1,810	2	655	1,180	72,900	80,935	157,000	19,100	106,390
Sept.	4.62	5.85	4	1,380	7	136	904	53,800	59,303	133,000	8,020	84,850
Oct.	2.20	2.61	15	2,240	25	0	1,170	72,100	62,590	131,000	21,400	77,140
Nov.	1.19	.40	20	1,720	3	555	1,160	69,000	63,348	128,000	11,500	95,420
Dec.	1.63	.10	26	1,630	2	801	1,210	74,600	49,870	124,000	10,400	81,690
Yearly	24.68	20.94		5,400		0	1,470	1,059,600	810,561	1,489,800	472,500	1,124,370

ϕ Mean daily ** Lower Rio Grande area on U.S. side from Rio Grande City to the Gulf of Mexico
⊕ Period 1938-1951

DIVERSIONS FROM THE RIO GRANDE INTO THE RETAMAL CANAL

Near Río Bravo, Tamaulipas

DESCRIPTION: Water-stage recorder and cable with car located .87 mile below head gate, which is about 1,000 feet from the Rio Grande. This canal has a capacity of about 7,000 second-feet. It diverts from the Rio Grande at a point 24 river miles below the Hidalgo-Reynosa Bridge near Hidalgo, Texas, and 1,108.8 river miles below the American Dam at El Paso, Texas. The zero of the gage is .85 foot above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 116 meter measurements during the year. Computations by shifting channel methods. Records available: September 1939 through December 1951.

REMARKS: Retamal Canal empties into Culebrón Reservoir, which in turn discharges into Villa Cárdenas Reservoir, from which a canal leads to Palito Blanco Reservoir. These reservoirs are used for irrigation purposes. During Rio Grande floods, floodwater may escape from Villa Cárdenas via Floodway No. 1 to the Gulf of Mexico. No use was made of this floodway in 1951. In 1951, 123,552 acres with irrigation facilities were cultivated under Retamal Canal, of which 31,086 acres were irrigated with 13,323 acre-feet of water.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 6,990 second-feet on September 12, 1944, with a gage height of 76.31 feet. Min. occasionally no flow.

Average Flow in Second-Feet

Daily:	Max.	6,920	Sept. 12, 1944	Min.	0	occasionally
Monthly:	Max.	3,280	Sept. 1944	Min.	0	occasionally
Yearly:	Max.	769	1949	Min.	212	1950

Mean Daily Discharge in Second-Feet 1951 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	35.0	78.4	0	0	251	470	210	56.5	0	28.3	0	0
2	31.1	77.3	55.4	0	170	333	28.6	65.3	0	20.5	1.4	0
3	44.5	75.9	138	0	85.1	253	0	112	0	0	62.9	0
4	30.0	66.0	112	0	0	200	0	97.8	0	0	133	0
5	18.4	25.4	17.3	0	0	275	0	119	0	0	90.1	0
6	17.0	3.5	1.4	0	0	650	0	70.3	0	0	0	0
7	26.5	2.8	0	0	0	985	0	58.3	0	0	0	0
8	53.7	2.8	0	0	0	523	0	46.3	0	0	0	0
9	49.8	62.2	59.7	0	0	297	0	0	0	0	0	0
10	30.4	119	123	0	0	381	0	0	0	1,420	0	0
11	11.7	102	115	0	132	611	0	0	0	1,190	0	0
12	9.5	19.8	33.2	0	183	396	0	0	31.8	480	0	0
13	10.6	2.8	5.7	0	752	185	0	0	38.8	72.7	0	0
14	21.9	0	48.4	0	1,710	2,670	0	0	326	50.9	0	0
15	32.8	2.1	304	0	1,080	3,570	0	0	3,140	0	0	0
16	11.3	54.0	124	0	720	1,590	0	0	5,090	0	0	0
17	5.7	110	117	0	519	632	0	0	5,580	0	0	0
18	4.9	109	89.3	0	1,930	367	0	0	5,650	0	0	0
19	16.6	24.7	33.5	0	3,050	327	0	0	4,480	0	0	0
20	65.3	1.8	1.4	* 81.2	1,180	294	0	0	2,760	0	0	0
21	83.7	0	0	* 61.8	862	233	0	0	1,610	2.8	0	0
22	21.2	0	6.7	* 33.2	756	35.0	0	0	1,040	438	0	0
23	2.1	43.1	60.0	* 35.3	501	7.8	0	0	720	392	0	0
24	0	136	126	* 50.9	339	0	0	119	505	266	0	0
25	0	117	103	* 31.1	280	6.7	0	131	344	194	0	0
26	* 30.7	13.8	26.5	* 23.7	929	18.4	0	143	214	159	0	0
27	* 61.4	0	27.2	* 43.1	2,540	625	0	155	135	47.7	0	0
28	* 71.0	0	49.8	* 62.2	2,380	922	0	86.2	85.8	11.3	0	0
29	37.4		71.0	* 74.2	1,550	823	0	17.3	68.5	6.0	0	0
30	25.1		77.3	* 120	908	537	111	8.5	60.7	1.8	0	0
31	61.4		109		632		92.5	0		.7		0
Sum	920.7	1,249.4	2,034.8	* 616.7	23,439.1	18,216.9	442.1	1,285.5	31,879.6	4,781.7	287.4	0

Month	1940-1951 Average Rainfall Inches **		Current Year 1951 Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period Sept. 1939-1951 Acre-Feet Normal	Maximum	Minimum	Average 1942-1951 Acre-Feet
Jan.	1.52	.09	21	89.3	#	0	29.7	1,830	13,458	25,790	1,830	15,303
Feb.	1.02	.55	24	153	#	0	44.6	2,480	10,779	38,200	85.1	12,888
Mar.	1.35	1.93	15	340	#	0	65.6	4,040	11,573	54,110	0	11,878
Apr.	1.29	.28	30	* 196	#	0	* 20.6	* 1,220	15,090	98,580	0	16,937
May	3.58	5.76	19	3,600	#	0	756	46,490	29,127	82,980	4,490	30,381
June	2.75	3.74	15	3,960	#	0	607	36,130	31,786	82,400	1,590	35,015
July	1.20	.23	1	292	#	0	14.3	877	25,368	110,700	360	30,183
Aug.	2.93	4.12	27	204	#	0	41.5	2,550	30,839	96,180	138	35,454
Sept.	3.80	6.36	18	5,760	#	0	1,060	63,230	63,190	195,100	0	69,466
Oct.	2.67	4.98	10	1,910	#	0	154	9,480	55,032	124,600	9,480	54,452
Nov.	.87	.35	#	133	#	0	9.6	570	15,559	32,300	570	15,061
Dec.	1.30	.03		0	#	0	0	0	11,945	21,080	0	11,849
Yearly	24.28	28.42		5,760		0	233	168,897	313,746	556,590	153,470	338,867

* Partly estimated # Various days of the month ** Mean Rainfall from Reynosa to Matamoros

MUNICIPAL WATER USES

In Acre-Feet

Tabulated below are yearly and monthly amounts of water pumped from the Rio Grande or tributaries into the municipal distribution systems of several towns along the border. The municipal and industrial water supply for the El Paso area in Texas, and Juárez in Chihuahua, came from wells prior to November 7, 1943, when the City of El Paso began diverting some water from the Rio Grande for municipal use as shown in the table below. The Del Rio water comes from San Felipe Springs, the Eagle Pass water comes from infiltration wells in or adjacent to the bed of the Rio Grande, the Guerrero water comes from the Río Salado, and the others from the Rio Grande. Because of changing conditions, the period records are limited here to the past ten years.

The population figures shown below are the 1950 census figures of both nations.

In the United States

Month	El Paso (Pop. 130,003)				Del Rio (Pop. 14,191)			
	1951	Period Nov. 1943-1951			1951	Period 1942-1951		
		Average	Maximum	Minimum		Normal	Maximum	Minimum
Jan.	963.2	156.9	963.2	0	194.9	117.6	194.9	72.0
Feb.	703.7	262.2	703.7	0	198.0	121.7	198.0	64.5
Mar.	214.7	376.4	812.8	63.4	195.6	165.6	211.9	89.7
Apr.	28.5	515.6	854.8	28.5	218.1	179.9	246.8	118.4
May	43.0	566.9	959.2	43.0	268.8	208.2	268.8	130.8
June	519.9	727.5	1,093.6	519.9	294.9	239.5	305.0	163.6
July	802.1	761.4	977.0	538.1	300.6	269.4	358.6	172.3
Aug.	643.9	737.7	1,128.5	514.4	271.9	260.7	356.9	180.3
Sept.	958.3	659.9	958.3	207.7	218.7	203.4	255.8	116.5
Oct.	917.9	594.6	917.9	193.4	189.0	155.2	232.9	84.8
Nov.	518.3	396.3	789.9	0	156.0	140.7	214.8	85.4
Dec.	733.3	462.7	952.8	0	174.3	126.3	184.2	78.5
Yearly	7,046.8	6,218.1	8,620.8	4,049.5	2,680.8	2,188.2	2,805.6	1,407.3

Month	Eagle Pass (Pop. 7,247)				Laredo (Pop. 51,694)			
	1951	Period 1942-1951			1951	Period 1942-1951		
		Normal	Maximum	Minimum		Normal	Maximum	Minimum
Jan.	73.9	57.6	73.9	44.9	416.3	328.2	416.3	148.2
Feb.	66.5	56.7	66.5	46.5	411.3	323.0	411.3	188.0
Mar.	95.0	75.7	95.0	54.5	479.2	425.2	479.2	162.4
Apr.	97.1	76.3	97.1	62.4	546.1	460.1	546.1	145.5
May	81.1	75.2	90.0	55.5	514.7	502.3	607.0	194.6
June	105.8	87.0	108.0	40.0	593.5	550.6	660.7	199.7
July	117.5	106.6	120.5	92.8	751.0	608.1	751.0	209.1
Aug.	‡ 95.1	97.8	131.3	75.4	727.0	605.8	727.0	285.3
Sept.	‡ 117.6	80.9	‡ 117.6	49.6	533.1	475.5	601.1	274.6
Oct.	82.4	64.2	92.1	41.0	472.4	441.9	582.9	207.6
Nov.	74.6	58.6	99.9	47.8	398.1	382.2	427.1	213.8
Dec.	76.3	59.6	76.3	46.2	406.4	347.4	406.4	197.7
Yearly	1,082.9	896.2	1,082.9	771.5	6,249.1	5,450.3	6,249.1	2,450.6

Month	Roma (Pop. 1,575) *				Rio Grande City (Pop. 3,900)				Brownsville (Pop. 36,176)			
	1951	Period 1942-1951			1951	Period 1942-1951			1951	Period 1942-1951		
		Normal	Maximum	Minimum		Normal	Maximum	Minimum		Normal	Maximum	Minimum
Jan.	12.3	5.8	14.3	2.4	35.1	26.3	40.8	14.7	493.1	276.4	493.1	112.1
Feb.	12.5	6.2	12.9	2.4	49.9	25.8	49.9	14.8	520.4	271.0	520.4	99.4
Mar.	14.0	8.2	14.0	2.0	55.9	31.8	55.9	19.9	535.5	297.6	535.5	111.4
Apr.	15.8	8.5	15.8	2.9	54.6	33.5	54.6	18.8	593.8	323.6	593.8	123.2
May	16.4	10.0	16.4	2.2	57.6	36.4	57.6	21.1	699.7	362.1	699.7	120.7
June	17.3	10.4	17.3	2.2	64.1	35.5	64.1	19.4	711.7	372.6	711.7	113.8
July	18.6	11.1	18.6	3.0	72.1	41.1	72.1	17.1	830.5	433.5	830.5	147.5
Aug.	17.8	10.4	17.8	3.5	62.2	42.2	70.4	18.5	693.9	401.3	693.9	162.3
Sept.	14.5	9.0	15.3	2.5	54.3	38.2	69.6	17.1	601.9	353.3	645.8	115.6
Oct.	13.9	8.3	13.9	3.0	52.4	35.2	58.3	19.0	531.8	331.1	569.2	118.6
Nov.	11.9	7.3	12.8	2.6	48.0	32.0	51.7	15.9	462.4	308.8	491.0	114.2
Dec.	13.0	6.9	13.0	2.3	49.0	31.8	67.9	13.9	506.1	305.8	509.9	108.2
Yearly	178.0	102.1	178.0	44.3	655.2	409.8	655.2	218.0	7,180.8	4,037.1	7,180.8	1,503.9

In Mexico

Month	Nuevo Laredo (Pop. 59,274)				Guerrero (Pop. 1,995)				Matamoros (Pop. 42,897)			
	1951	Period 1942-1951			1951	Period 1943-1951			1951	Period 1942-1951		
		Normal	Maximum	Minimum		Average	Maximum	Minimum		Normal	Maximum	Minimum
Jan.	329.4	192.0	329.4	101.0	5.0	4.9	5.5	4.3	123.1	89.5	123.1	‡ 68.4
Feb.	317.6	187.2	317.6	97.5	4.5	4.6	5.2	4.3	112.8	83.2	112.8	64.0
Mar.	370.5	241.2	370.5	108.6	5.4	5.5	6.3	5.0	123.2	93.6	123.2	‡ 68.5
Apr.	397.3	255.6	397.3	132.7	5.4	6.2	7.3	5.3	119.7	92.0	119.7	‡ 68.4
May	398.9	279.4	398.9	122.8	5.8	7.1	8.0	5.8	127.4	97.9	127.4	‡ 68.4
June	419.8	287.2	419.8	134.2	6.6	7.8	8.5	6.6	123.8	96.8	123.8	‡ 68.5
July	477.3	317.4	477.3	115.2	7.5	8.8	10.1	7.5	124.3	100.1	124.8	‡ 68.4
Aug.	485.0	324.8	485.0	157.2	9.1	10.1	11.3	9.1	125.8	101.5	128.5	‡ 68.4
Sept.	436.3	278.8	436.3	123.1	9.0	8.6	9.2	7.3	130.8	97.2	131.5	‡ 68.5
Oct.	426.2	267.1	426.2	133.7	8.3	8.2	8.9	6.5	131.7	101.8	139.0	‡ 68.4
Nov.	370.0	235.6	370.0	121.5	7.3	6.7	7.3	4.9	124.4	94.1	136.9	66.8
Dec.	386.4	222.8	386.4	99.7	6.0	5.6	6.3	5.0	127.5	93.8	138.6	70.0
Yearly	4,814.7	3,089.1	4,814.7	1,504.7	79.9	84.1	87.5	79.9	1,494.5	1,141.5	1,520.8	‡ 821.1

‡ Estimated * Population figure includes Los Saenz. In addition to Roma and Los Saenz, Escobares (pop. 250) and Cd. Miguel Alemán in Mexico (formerly San Pedro de Roma, pop. 2,032) are served by this system.

SUSPENDED SILT IN THE RIO GRANDE AND SOME TRIBUTARIES AND DIVERSIONS

At each station, several water samples were taken each month by one of four methods:

A. By lowering an open small-necked bottle in one or more verticals in the stream cross section, being careful to approach but not to strike bottom, thus securing an integrated sample at all depths. A monthly composite sample was later made by using, from each sample, a quantity proportional to the river flow volume represented by each sample. The gravimetric percentage of silt in this composite represented that in the monthly river flow.

B. By obtaining one depth integrated sample with a U.S.-D43 sampler at each of three verticals, spaced at 1/6, 1/2, and 5/6 of the stream width. The gravimetric percentage of silt for each measurement was computed by weighting the percentage of silt represented by each of the three samples by the partial flow in its section of the stream. These measurements were plotted on the station gage-height hydrograph from which a silt concentration graph was then drawn between plotted points. From this graph, mean daily silt concentrations were then determined.

C. By sampling at the stream surface with a separate bottle at each of three points, spaced 1/6, 1/2, and 5/6 of the stream width. A coefficient of 1.10 was then applied to the average gravimetric percentage of silt in the three bottles and this product was applied to the volume of stream flow represented by that set of samples.

D. By dipping near the surface with a small-necked bottle in turbulent water at the head gate of the Maverick Canal. The gravimetric percentage of silt in each weekly sample was then applied to the volume of canal flow represented by that sample. The flows represented by each sample were determined on the basis of Rio Grande stages at Del Rio.

For ease of comparison, the assumption is made that one cubic foot of silt weighs 66.7 pounds, or one acre-foot of silt will weigh 1,452 tons.

Month	1951							Period of Record		
	Tons		Number of Samples	Gravimetric Percentages			Acre-Feet at 1,452 Tons Per Acre-Foot			
	Water	Silt		Average	Maximum Sample	Minimum Sample		Average	Maximum	Minimum
Rio Grande at El Paso, Texas										Period September 1947-1951
Jan.	11,492,000	171	31	.001485			.12	.58	1.4	.12
Feb.	8,932,000	115	28	.001293			.08	.86	2.2	.08
Mar.	33,454,000	31,400	31	.09385			21.6	18.5	33.7	4.9
Apr.	43,864,000	13,100	30	.02984			9.0	24.1	33.5	9.0
May	24,331,000	2,740	31	.01127			1.9	24.7	63.3	1.9
June	46,104,000	16,300	30	.03534			11.2	56.4	152	11.2
July	61,828,000	27,300	30	.04421			18.8	57.2	124	18.8
Aug.	64,898,000	17,300	31	.02673			11.9	35.0	56.8	11.9
Sept.	23,272,000	2,530	30	.01086			1.7	30.8	92.3	1.7
Oct.	9,424,000	380	31	.004032			.26	3.6	11.8	.26
Nov.	7,666,000	303	30	.003956			.21	.82	1.5	.21
Dec.	7,207,000	247	31	.003425			.17	.73	2.1	.12
Yearly	342,472,000	111,886	364	.03267			76.94	253.29	436.87	76.94
Río Conchos at Cuchillo Parado, Chihuahua										Period 1945-1951
Jan.	44,082,000	0	14	0	0	0	0	0	0	0
Feb.	74,005,000	1,630	12	.0022	.0118	0	1.1	.73	4.0	0
Mar.	53,062,000	4,350	13	.0082	.1093	0	3.0	.43	3.0	0
Apr.	27,132,000	0	58	0	0	0	0	0	0	0
May	49,040,000	196	41	.0004	.0061	0	.13	7.3	28.2	0
June	50,886,000	0	13	0	0	0	0	26.3	126	0
July	69,848,000	130,000	14	.1868	.7416	0	89.5	391	890	0
Aug.	36,672,000	80,100	15	.2184	3.7962	0	55.2	288	948	4.8
Sept.	34,133,000	10,500	12	.0308	.1674	0	7.2	431	1,190	.32
Oct.	30,888,000	0	14	0	0	0	0	258	997	0
Nov.	29,461,000	0	13	0	0	0	0	.54	3.6	0
Dec.	28,345,000	0	0	0			0	.12	.83	0
Yearly	527,494,000	226,776	199	.04299	3.7962	0	156.13	1,403.42	2,590.4	156.13
Rio Grande at Lower Presidio Station										Period October 1949-1951
Jan.	47,099,000	6,410	5	.0136	.0150	.0113	4.4	7.4	10.3	4.4
Feb.	73,250,000	18,900	4	.0258	.0374	.0116	13.0	11.2	13.0	9.4
Mar.	53,253,000	9,590	5	.0180	.0343	.0050	6.6	10.6	14.6	6.6
Apr.	22,067,000	3,380	4	.0153	.0191	.0129	2.3	1.8	2.3	1.2
May	42,934,000	21,900	10	.0509	.2979	.0091	15.1	8.4	15.1	1.7
June	51,229,000	11,400	11	.0223	1.6103	.0056	7.9	63.0	118	7.9
July	71,853,000	280,000	13	.389	1.0802	.0101	193	672	1,150	193
Aug.	35,454,000	124,000	13	.350	1.2754	.0131	85.4	296	506	85.4
Sept.	35,437,000	169,000	12	.476	1.4447	.0180	116	778	1,440	116
Oct.	27,253,000	4,690	14	.0172	.0338	.0113	3.2	204	509	3.2
Nov.	28,132,000	1,410	11	.0050	.0117	.0008	.97	8.5	13.1	.97
Dec.	26,477,000	2,120	13	.0080	.0150	.0047	1.5	4.5	7.6	1.5
Yearly	514,438,000	652,800	115	.1267	1.6103	.0008	449.37	2,065.4	3,780.9	449.37

Samples and Analyses by U. S. Section, Method A.

Samples and Analyses by Mexican Section, Method C.

Samples and Analyses by U. S. Section, Method B.

SUSPENDED SILT IN THE RIO GRANDE AND SOME TRIBUTARIES AND DIVERSIONS

Month	1951							Period of Record		
	Tons		Number of Samples	Gravimetric Percentages			Acre-Feet at 1,452 Tons Per Acre-Foot			
	Water	Silt		Average	Maximum Sample	Minimum Sample		Average	Maximum	Minimum
Rio Grande at Lower Presidio Station										
Jan.										
Feb.										
Mar.										
Apr.										
May										
June										
July										
Aug.										
Sept.										
Oct.	27,253,000	4,880	14	.0179			3.4			
Nov.	28,132,000	2,500	11	.0089			1.7			
Dec.	26,477,000	1,300	13	.0049			.90			
Yearly										
Samples and Analyses by U. S. Section, Method A.										
Rio Grande at Johnson Ranch, Texas										
Jan.	49,894,000	8,380	4	.0168	.0201	.0117	5.8			
Feb.	72,368,000	22,600	4	.0312	.0575	.0174	15.6			
Mar.	62,257,000	29,500	4	.0474	.4762	.0270	20.3			
Apr.	20,355,000	2,770	4	.0136	.0155	.0117	1.9			
May	42,166,000	117,000	11	.2777	.6573	.0130	80.6			
June	56,838,000	450,000	14	.7910	3.0583	.0080	310			
July	84,979,000	1,038,000	14	1.2216	2.3556	.0080	715			
Aug.	41,624,000	439,000	15	1.0547	2.2963	.0066	302			
Sept.	47,838,000	599,000	15	1.2525	3.2138	.0057	413			
Oct.	31,397,000	69,000	15	.2198	2.1797	.0080	47.5			
Nov.	29,003,000	6,840	11	.0236	.0421	.0101	4.7			
Dec.	26,593,000	2,420	13	.0091	.0121	.0059	1.7			
Yearly	565,312,000	2,784,510	124	.4926	3.2138	.0057	1,918.1			
Samples and Analyses by U. S. Section, Method B.										
Rio Grande at Johnson Ranch, Texas										
Jan.										
Feb.										
Mar.										
Apr.										
May										
June										
July										
Aug.										
Sept.										
Oct.	31,397,000	88,900	15	.2831			61.2			
Nov.	29,003,000	2,350	11	.0081			1.6			
Dec.	26,593,000	5,640	13	.0212			3.9			
Yearly										
Samples and Analyses by U. S. Section, Method A.										
Rio Grande at Langtry, Texas								Period April 1944-1951		
Jan.	76,552,000	1,660	8	.002162			1.1	7.5	11.4	1.1
Feb.	87,941,000	4,370	6	.004964			3.0	9.9	36.9	3.0
Mar.	93,842,000	21,900	9	.02337			15.1	10.2	27.0	2.7
Apr.	45,902,000	10,700	7	.02333			7.4	19.5	66.4	1.1
May	113,561,000	223,000	10	.1965			154	132	448	3.7
June	141,526,000	851,000	10	.6012			586	476	1,220	2.8
July	105,598,000	824,000	8	.7805			567	1,304	4,483	60.9
Aug.	65,780,000	194,000	7	.2949			134	991	3,130	4.7
Sept.	78,153,000	1,166,000	7	1.4920			803	1,673	3,280	82.6
Oct.	52,423,000	31,300	9	.05969			21.6	981	3,261	21.6
Nov.	52,466,000	128,000	7	.2444			88.2	35.1	88.2	7.6
Dec.	48,862,000	4,430	6	.009074			3.1	12.2	46.8	3.1
Yearly	962,606,000	3,460,360	94	.3595			2,383.5	5,651.4	8,747.7	1,347.2
Samples and Analyses by U S. Section, Method A.										
Pecos River near Comstock, Texas								Period June 1943-1951		
Jan.	20,611,000	418	15	.002030			.29	.49	.96	.15
Feb.	19,444,000	339	14	.001741			.23	.74	2.1	.13
Mar.	18,544,000	492	15	.002655			.34	.66	1.4	.29
Apr.	14,411,000	740	15	.005138			.51	5.7	41.7	.19
May	27,278,000	19,000	17	.06966			13.1	6.3	21.7	.54
June	12,934,000	253	15	.001956			.17	3.8	15.7	.17
July	9,672,000	287	15	.002963			.20	19.1	67.1	.19
Aug.	11,632,000	84.1	15	.0007234			.06	2.6	20.0	.06
Sept.	10,440,000	450	14	.004314			.31	2.6	9.4	.15
Oct.	10,109,000	337	16	.003333			.23	26.8	176	.22
Nov.	12,411,000	985	15	.007940			.68	.39	1.2	.05
Dec.	13,249,000	423	15	.003194			.29	.51	1.3	.01
Yearly	180,735,000	23,808.1	181	.01317			16.41	69.69	199.36	16.41
Samples and Analyses by U. S. Section, Method A.										

SUSPENDED SILT IN THE RIO GRANDE AND SOME TRIBUTARIES AND DIVERSIONS

Month	1951						Period of Record			
	Tons		Number of Samples	Gravimetric Percentages			Acre-Feet at 1,452 Tons Per Acre-Foot			
	Water	Silt		Average	Maximum Sample	Minimum Sample		Average	Maximum	Minimum
Maverick Canal at Headgate										# Period 1950-1951
Jan.	121,575,000	7,290	3	.006	.010	.002	5.0			
Feb.	112,140,000	6,730	4	.006	.011	.004	4.6			
Mar.	123,300,000	8,630	4	.007	.012	.004	5.9	5.7	5.9	5.5
Apr.										
May										
June										
July	116,669,000	464,000	3	.398	1.207	.031	320	437	554	320
Aug.	108,097,000	257,000	4	.219	.465	.062	163	382	600	163
Sept.	105,752,000	290,000	5	.274	.725	.023	200	276	353	200
Oct.	91,745,000	14,700	1	.016			10.1	159	308	10.1
Nov.										
Dec.	97,664,000	8,790	4	.009	.015	.004	6.1	8.2	10.4	6.1
Yearly										

Samples and Analyses by Division of Irrigation, Soil Conservation Service, Method D.

Rio Grande at Eagle Pass, Texas										Period 1934-1951
Jan.	123,220,000	16,800	27	.01365			11.6	22.6	124	.07
Feb.	121,306,000	13,100	24	.01080			9.0	57.0	768	2.6
Mar.	139,259,000	35,500	27	.02552			24.4	27.8	188	3.8
Apr.	81,860,000	25,700	24	.03145			17.7	70.8	466	5.0
May	255,621,000	558,000	26	.2367			384	554	4,220	17.7
June	212,406,000	618,000	26	.2911			426	1,041	4,340	4.3
July	107,612,000	132,000	26	.1224			90.9	1,282	7,840	12.0
Aug.	96,584,000	105,000	26	.1090			72.3	1,118	5,310	14.8
Sept.	117,114,000	701,000	25	.5989			485	2,703	10,800	13.0
Oct.	88,998,000	55,600	27	.06246			38.3	1,078	5,820	24.0
Nov.	88,168,000	98,300	26	.1115			67.7	113	562	12.3
Dec.	77,309,000	12,100	27	.01564			8.3	23.4	84.1	1.1
Yearly	1,489,457,000	2,371,100	311	.1592			1,633.2	8,090.6	20,842.8	1,633.2

Samples by Mexican Section and Analyses by U. S. Section, Method A.

Río Alamo at Cd. Mier, Tamaulipas										Period 1934-1951
Jan.	321,000	0	7	0	0	0	0	2.6	21.8	0
Feb.	324,000	0	7	0	0	0	0	.40	6.6	0
Mar.	240,000	0	6	0	0	0	0	9.1	91.6	0
Apr.	19,332,000	101,000	7	.5247	.7240	0	69.6	27.5	227	0
May	17,765,000	56,200	7	.3161	.5090	0	38.7	47.1	230	2.2
June	47,181,000	417,000	9	.8845		0	287	73.3	471	0
July	207,000	0	0	0			0	20.0	92.8	0
Aug.	3,479,000	0	7	0	0	0	0	169	1,610	0
Sept.	55,214,000	‡ 392,000	5	‡ .7100		0	‡ 270	278	2,920	1.5
Oct.	19,415,000	60,200	8	.3103	.5630	0	41.5	86.6	558	0
Nov.	620,000	0	0	0			0	.87	5.2	0
Dec.	425,000	0	0	0			0	1.2	16.1	0
Yearly	164,523,000	1,026,400	63	.6239	.7240	0	706.8	715.67	3,156.57	154.5

Samples and Analyses by Mexican Section, Method C. ‡ Estimated

Rio Grande at Roma, Texas										Period March 1929-1951
Jan.	127,290,000	21,100	31	.01658			14.5	37.0	169	.41
Feb.	112,221,000	14,200	28	.01269			9.8	68.5	1,010	.83
Mar.	143,707,000	60,900	31	.04238			41.9	123	1,830	1.3
Apr.	101,398,000	166,000	30	.1641			114	345	2,780	.76
May	437,237,000	1,811,000	31	.4141			1,230	1,207	5,230	15.4
June	401,656,000	1,735,000	30	.4320			1,190	1,298	7,220	10.6
July	73,411,000	6,820	31	.009286			4.7	1,896	9,070	4.7
Aug.	102,800,000	13,500	31	.01313			9.3	1,361	3,720	9.3
Sept.	621,044,000	2,600,000	30	.4186			1,790	3,534	18,000	13.4
Oct.	195,636,000	411,000	31	.2102			283	1,976	9,240	89.2
Nov.	107,180,000	24,200	30	.02260			16.7	143	660	4.8
Dec.	89,866,000	4,940	31	.005494			3.4	50.7	319	1.0
Yearly	2,513,446,000	6,868,660	365	.2733			4,727.3	11,439.2	30,839	2,314.0

Samples by Mexican Section and Analyses by U. S. Section, Method A.

Retamal Canal Near Río Bravo, Tamaulipas										# Period 1943-1951
Jan.	2,482,000	402	13	.0162	.0215	.0080	.28	3.6	10.1	.28
Feb.	3,368,000	589	8	.0157	.0280	.0110	.36	23.3	198	.21
Mar.	5,485,000	2,580	9	.0470	.0900	.0060	1.8	20.1	167	.14
Apr.	* 1,662,000	* 590	4	.0355	.0430	.0230	.41	144	1,140	0
May	63,184,000	559,000	23	.8844	1.2265	.0175	385	164	396	1.1
June	49,107,000	357,000	13	.7267	1.3946	.0837	246	189	400	.25
July	1,192,000	1,260	2	.1057		.0540	.87	149	661	.87
Aug.	3,465,000	2,870	6	.0828	.1410	.0390	2.0	194	615	2.0
Sept.	85,957,000		0					324	946	0
Oct.	12,890,000	73,900	10	.5731	.7539	.0120	50.9	305	1,530	6.5
Nov.	775,000	54.2	1	.0070			.04	10.8	40.8	.04
Dec.	0	0	0	0			0	3.2	8.4	0
Yearly	229,547,000		89					1,530.0	3,122.8	326.54

Samples and Analyses by Mexican Section, Method C. # Some months missing * Partly estimated

CHEMICAL ANALYSES OF WATER SAMPLES FROM RIO GRANDE AND TRIBUTARIES — 1951

The following chemical analyses are from composites made up periodically from independent water samples composed by taking from each sample an amount of water proportional to the volume of river flow represented by that sample. This compositing and the determination of the electrical conductivity of the individual water samples were done by the United States Section of the International Boundary and Water Commission. The chemical analyses were made by the Rubidoux Laboratory of the U. S. Department of Agriculture at Riverside, California.

To convert "Milligram Equivalents" to parts per million by weight, multiply each ion by its appropriate conversion factor. These facters are (HCO_3 plus CO_3), 30.5; Cl, 35.5; SO_4, 48; Ca, 20; Mg, 12.16; Na, 23; NO_3, 62. To convert tons per acre-foot to parts per million, multiply tons per acre-foot by 735.5.

Electrical conductivity, reported in the following tables as ECx10^6 at 25°C, is a relative measure of the total salt concentration in the water samples.

Month	No. of Samples	Dissolved Solids: Tons Per Acre-Foot	Dissolved Solids: Total Tons	Mean ECx10^6 @25°C	Boron p.p.m.	pH	% Na **	% Cl ***	Mean Milligram Equivalents per Liter: Ca	Mg	Na	CO_3 + HCO_3	SO_4	Cl	NO_3
Rio Grande at El Paso, Texas															
Sampling by U. S. Section															
Jan.	31	1.76	14,900	1,970	.33	8.0	64	37	4.46	2.35	12.60	3.55	8.80	7.35	.01
Feb.	28	1.80	11,800	2,010	.35	8.1	66	38	4.54	2.30	13.28	3.61	9.05	7.60	0
Mar.	31	1.12	27,600	1,240	.18	7.6	55	31	3.78	1.57	6.47	2.85	5.33	3.78	.07
Apr.	30	1.10	35,500	1,250	.19	7.9	57	33	3.57	1.62	6.97	2.87	5.46	4.02	T
May	31	1.35	24,200	1,520	.24	7.7	61	34	4.08	1.81	9.12	3.00	6.91	5.20	.01
June	30	1.08	36,600	1,190	.18	8.1	54	31	4.06	1.62	6.54	3.00	5.34	3.70	.04
July	30	1.03	46,900	1,160	.17	7.7	53	30	3.46	1.77	6.26	2.88	5.25	3.50	.03
Aug.	31	1.14	54,500	1,260	.23	8.0	55	32	3.88	1.82	6.89	3.21	5.47	4.00	.01
Sept.	30	1.49	25,500	1,680	.23	8.1	59	35	4.75	2.15	10.08	3.75	7.23	6.00	T
Oct.	31	1.90	13,200	2,020	.32	8.1	67	37	4.49	2.44	13.85	4.35	8.77	7.65	T
Nov.	30	1.85	10,400	2,040	.35	7.8	63	35	5.61	2.26	13.45	5.05	8.75	7.50	.01
Dec.	31	1.87	9,910	2,070	.37	7.8	62	35	5.67	2.59	13.20	5.05	9.12	7.50	.01
Mean @	ϕ364	1.23	ϕ 311,010	1,380	.22	7.9	58	33	3.98	1.83	7.90	3.20	6.07	4.53	.021
Period Average		1.11	613,000	1,220			53	30	4.37	1.62	6.64	3.47	5.47	3.78	
Tons of Constituents, 1951									27,300	7,630	62,300	33,400	99,900	55,000	
Average Tons Period 1930-1951									66,000	14,800	115,000	79,800	198,000	101,000	
Rio Grande at Fort Quitman, Texas															
Sampling Jointly by Both Sections															
Jan.	5	3.92	20,800	4,430	.48	7.9	65	61	10.50	5.19	29.18	3.30	14.27	27.80	.01
Feb.	7	4.64	13,600	5,190	.50	7.9	65	65	12.05	6.34	34.72	2.99	15.90	34.51	.01
Mar.	5	3.55	9,490	6,140	.59	7.8	67	68	12.85	7.96	42.58	1.54	18.87	43.24	.05
Apr.	4	7.01	3,350	7,650	.73	7.8	66	70	17.28	10.26	52.96	2.86	25.57	56.32	.01
May	3	3.59	66.8	4,130	.35	7.8	59	68	11.72	5.37	24.96	2.16	11.11	28.22	.03
June	2	5.10	103	5,640	.53	7.8	61	68	15.65	7.35	36.13	3.90	15.23	39.84	.04
July	2	3.74	3,640	3,860	.17	7.8	49	67	15.15	4.99	19.30	2.70	10.38	26.40	.05
Aug.	1	.69	5,450	802	.12	7.9	44	46	3.29	.98	3.35	2.12	1.93	3.55	.04
Sept.	6	6.85	8,770	7,510	.72	7.9	64	69	18.57	9.85	51.46	3.20	21.75	55.20	.01
Oct.	6	6.76	9,190	7,280	.65	7.9	65	68	18.30	9.29	50.38	3.34	21.67	52.84	T
Nov.	5	6.13	9,990	6,690	.60	7.8	64	65	17.47	8.27	45.74	4.40	20.39	47.00	.01
Dec.	3	5.20	10,800	5,720	.56	7.7	63	63	14.95	7.48	37.64	4.32	17.84	38.35	.02
Mean @	ϕ49	3.71	ϕ 95,249.8	4,110	.407	7.9	63	64	10.54	5.13	26.80	2.90	12.40	27.39	.024
Period Average		2.36	519,000	2,670			61	55	7.57	3.08	16.71	3.55	8.70	15.18	
Tons of Constituents, 1951									7,380	2,180	21,500	3,090	20,800	33,900	
Average Tons Period 1930-1951									45,400	11,200	115,000	32,400	25,000	161,000	
Rio Grande at Upper Presidio Station															
Sampling by U. S. Section															
Jan.	5	4.54	15,200	5,050	.56	7.9	63	63	12.79	6.09	32.91	2.86	16.68	32.80	T
Feb.	5	5.30	5,350	5,730	.62	7.8	60	63	16.51	7.31	36.40	2.88	19.39	38.74	.01
Mar.	2	6.65	606	6,960	.59	7.7	55	62	24.84	9.58	41.54	3.52	25.59	47.28	.01
Apr.	0	0	δ 0												
May	2	.95	281	1,000	.08	8.1	60	32	2.95	1.13	6.08	3.23	3.36	3.15	.02
June	2	.90	517	889	.05	7.9	43	21	2.62	1.01	2.74	1.83	2.98	1.28	.02
July	6	.50	2,300	583	.08	8.0	47	20	2.30	.55	2.69	2.59	1.96	1.12	.06
Aug.	2	.48	816	507	.10	7.8	47	9	2.24	.51	2.43	2.57	2.15	.48	.04
Sept.	5	.51	2,860	566	.16	7.9	43	18	2.65	.54	2.43	2.25	2.34	1.05	.05
Oct.	0	0	δ 0												
Nov.	0	0	0												
Dec.	0	0	0												
Mean @	ϕ29	1.62	ϕ 27,930	1,790	.23	7.9	59	52	5.42	2.09	10.68	2.53	6.16	9.64	.038
Period Average		1.96	419,000	2,210			59	51	6.58	2.46	13.21	3.10	7.87	11.43	
Tons of Constituents, 1951									2,550	596	5,760	1,810	6,940	8,020	
Average Tons Period 1935-1951									38,400	8,710	88,400	27,500	110,000	118,000	

ϕ Total @ Weighted mean ** Percent of total cations *** Percent of total anions T Trace δ Flow inappreciable

CHEMICAL ANALYSES OF WATER SAMPLES FROM RIO GRANDE AND TRIBUTARIES — 1951

Month	No. of Samples	Dissolved Solids: Tons Per Acre-Foot	Dissolved Solids: Total Tons	Mean ECx10⁶ @25°C	Boron p.p.m.	pH	% Na **	% Cl ***	Mean Milligram Equivalents per Liter: Ca	Mg	Na	CO_3 + HCO_3	SO_4	Cl	NO_3
Río Conchos at Cuchillo Parado, Chihuahua															
Sampling by Mexican Section															
Jan.	13	.92	29,800	975	.20	8.1	46	14	3.90	1.38	4.64	2.79	5.54	1.38	.04
Feb.	10	.73	39,700	768	.16	8.1	43	13	3.40	1.02	3.34	2.63	4.12	1.00	.04
Mar.	13	.72	28,100	744	.15	8.0	47	15	2.95	.92	3.45	2.40	3.88	1.10	.04
Apr.	12	.92	18,400	981	.17	7.9	51	18	3.61	1.20	5.03	2.41	5.63	1.72	.05
May	13	.86	31,000	865	.21	7.8	48	14	3.43	1.06	4.15	2.78	4.91	1.22	.02
June	12	.71	26,600	726	.22	8.0	48	15	2.99	.93	3.62	2.37	3.85	1.08	.02
July	14	.69	35,500	728	.17	7.8	44	13	3.09	1.01	3.30	2.60	3.86	1.00	.03
Aug.	14	.83	22,400	849	.22	7.7	48	16	3.49	.92	4.06	2.45	4.76	1.35	.03
Sept.	11	.90	22,600	951	.24	8.1	51	16	3.61	1.18	4.90	2.78	5.36	1.50	.03
Oct.	13	.99	22,500	1,030	.30	7.9	50	16	3.80	1.39	5.20	2.50	6.32	1.70	.03
Nov.	11	1.00	21,700	1,050	.24	7.8	48	16	4.30	1.34	5.25	2.90	6.35	1.75	.03
Dec.	10	1.06	22,100	1,110	.25	8.0	48	16	4.62	1.39	5.50	3.30	6.52	1.85	.03
Mean ⊕	ϕ146	.826	ϕ 320,400	860	.201	7.9	47	15	3.49	1.11	4.13	2.63	4.81	1.29	.032
Period Average		.748	422,000	778			41	12	3.75	.915	3.20	2.56	4.40	.971	
Tons of Constituents, 1951									36,900	7,120	50,100	42,300	122,000	24,100	
Average Tons Period 1935-1951									57,700	8,530	56,400	59,800	162,000	26,400	
Río Conchos near Ojinaga, Chihuahua															
Sampling by U. S. Section															
Jan.	5	.95	29,700	991	.21	8.0	46	17	4.14	1.32	4.70	2.90	5.56	1.70	.03
Feb.	5	.78	41,300	839	.19	8.0	40	12	4.14	1.05	3.53	3.33	4.32	1.08	.03
Mar.	5	.76	29,800	787	.16	7.9	47	17	3.03	1.04	3.66	2.51	3.89	1.35	.03
Apr.	5	1.03	17,100	1,070	.28	7.9	51	18	4.08	1.31	5.50	3.01	5.92	2.00	.02
May	6	.85	26,900	902	.17	7.9	49	16	3.58	1.11	4.49	2.61	5.01	1.44	.02
June	8	.81	30,300	840	.23	8.0	40	13	4.41	.92	3.57	2.31	5.23	1.14	.03
July	6	.78	38,000	819	.16	7.9	43	15	3.54	1.08	3.71	2.40	4.71	1.22	.03
Aug.	6	.78	19,300	801	.18	7.7	43	17	3.59	.96	3.50	2.65	4.30	1.40	.03
Sept.	5	.94	19,400	985	.26	8.1	50	18	3.85	1.28	5.06	2.90	5.43	1.80	.03
Oct.	6	.97	19,500	1,060	.29	8.0	50	18	3.99	1.40	5.36	2.70	6.24	2.00	.02
Nov.	6	1.03	21,300	1,070	.26	7.7	49	16	4.30	1.34	5.48	3.05	6.33	1.85	.02
Dec.	6	1.09	21,300	1,140	.25	7.8	48	18	4.71	1.42	5.63	3.27	6.55	2.10	.03
Mean ⊕	ϕ69	.864	ϕ 313,900	907	.207	7.9	46	16	3.89	1.14	4.26	2.77	5.06	1.47	.028
Period Average		.609	564,000	651			38	14	3.33	.797	2.56	2.56	3.19	.920	
Tons of Constituents, 1951									38,500	6,850	48,400	41,800	120,000	25,800	
Average Tons Period 1935-1951									84,100	12,200	74,100	98,200	193,000	41,100	
Rio Grande at Johnson Ranch, Texas															
Sampling by U. S. Section															
Jan.	5	1.35	49,500	1,470	.26	8.0	51	31	5.26	1.87	7.58	3.33	7.03	4.58	.01
Feb.	5	.95	50,500	1,010	.23	8.0	46	22	4.18	1.31	4.74	2.91	5.13	2.25	.03
Mar.	6	.81	37,100	839	.17	7.8	44	15	3.88	.91	3.74	2.70	4.52	1.28	.04
Apr.	4	1.16	17,400	1,240	.26	7.9	54	23	4.26	1.47	6.67	2.48	7.10	2.88	.02
May	7	.92	28,500	937	.22	7.7	49	17	3.80	.99	4.63	2.85	5.04	1.62	.03
June	5	.70	29,300	748	.16	7.9	47	15	3.50	.73	3.69	2.73	3.77	1.16	.03
July	9	.84	52,500	861	.19	7.9	45	12	3.88	.86	4.09	2.80	5.08	1.10	.04
Aug.	8	.82	25,100	844	.21	8.0	44	14	3.94	.93	3.76	2.85	4.61	1.20	.04
Sept.	6	.76	26,800	811	.12	8.2	48	15	3.45	.79	3.97	2.80	4.13	1.25	.04
Oct.	6	.86	19,900	897	.19	8.2	51	17	3.44	.95	4.53	2.45	5.05	1.50	.03
Nov.	10	1.09	23,200	1,160	.25	8.0	50	18	4.52	1.39	6.02	3.00	6.87	2.15	.01
Dec.	5	1.13	22,100	1,180	.25	8.0	50	19	4.61	1.46	6.05	2.95	7.00	2.30	.03
Mean ⊕	ϕ76	.918	ϕ 381,900	966	.202	8.0	48	19	4.02	1.09	4.72	2.84	5.20	1.84	.031
Period Average		.950	633,000	1,020			46	22	4.41	1.07	4.73	2.66	5.38	2.25	
Tons of Constituents, 1951									45,600	7,500	61,400	49,000	141,000	36,900	
Average Tons Period 1948-1951									80,100	11,800	98,600	73,600	234,000	72,400	
Rio Grande at Langtry, Texas															
Sampling by U. S. Section															
Jan.	8	1.05	59,100	1,170	.24	8.1	46	29	4.31	1.89	5.50	2.85	5.46	3.35	.03
Feb.	6	.95	61,500	1,030	.25	7.8	48	24	3.88	1.55	4.99	2.75	5.09	2.52	.03
Mar.	9	.75	51,800	785	.16	7.9	45	18	3.01	1.31	3.56	2.47	3.89	1.44	.04
Apr.	7	.76	25,700	839	.19	8.0	45	20	3.02	1.52	3.71	2.61	4.08	1.65	.04
May	10	.59	49,300	635	.08	7.9	41	17	2.82	.92	2.57	2.51	2.76	1.10	.06
June	10	.61	63,400	659	.14	7.9	38	14	3.52	.76	2.63	2.69	3.09	.92	.06
July	8	.73	56,700	773	.06	8.0	41	15	3.59	.92	3.26	2.60	4.12	1.16	.04
Aug.	7	.74	35,800	772	.17	7.8	39	16	3.55	1.36	3.20	2.90	3.86	1.28	.05
Sept.	7	.73	42,000	774	.10	8.1	41	14	3.74	1.05	3.32	3.15	3.73	1.10	.07
Oct.	9	.82	31,700	880	.22	7.9	43	17	3.59	1.51	3.92	3.05	4.50	1.60	.04
Nov.	7	.84	32,400	894	.18	8.0	42	16	3.99	1.39	3.95	3.20	4.63	1.50	.03
Dec.	6	.85	30,600	931	.16	8.0	42	18	3.85	1.67	4.08	3.25	4.73	1.75	.04
Mean ⊕	ϕ 94	.762	ϕ 540,000	820	.153	7.9	43	18	3.53	1.23	3.59	2.78	4.01	1.54	.046
Period Average		.795	847,000	803			45	23	3.65	1.13	3.90	2.56	4.16	2.02	
Tons of Constituents, 1951									68,100	14,400	79,500	81,700	186,000	52,600	
Average Tons Period 1945-1951									106,000	20,000	130,000	113,000	290,000	104,000	

ϕ Total ⊕ Weighted mean ** Percent of total cations *** Percent of total anions

CHEMICAL ANALYSES OF WATER SAMPLES FROM RIO GRANDE AND TRIBUTARIES — 1951

Month	No. of Samples	Dissolved Solids: Tons Per Acre-Foot	Dissolved Solids: Total Tons	Mean ECx10⁶ @25°C	Boron p.p.m.	pH	% Na **	% Cl ***	Mean Milligram Equivalents per Liter: Ca	Mg	Na	CO_3 + HCO_3	SO_4	Cl	NO_3
Pecos River near Comstock, Texas															
Sampling by U. S. Section															
Jan.	15	4.50	68,400	5,040	.33	7.8	60	64	10.85	9.67	31.70	2.32	16.63	33.40	.03
Feb.	14	4.63	66,200	5,190	.32	7.8	61	64	11.40	9.83	32.86	2.52	17.23	34.60	.04
Mar.	15	4.26	57,900	4,730	.30	7.8	61	64	9.89	8.78	29.47	2.22	15.08	31.00	.06
Apr.	15	4.12	43,700	4,660	.26	7.8	61	64	10.15	8.80	29.22	2.18	15.23	30.44	.04
May	17	1.67	33,600	2,000	.14	7.7	58	60	4.85	3.38	11.20	2.05	5.83	11.76	.04
June	15	2.75	26,200	3,140	.22	8.0	60	62	6.93	5.82	18.76	2.17	9.62	19.55	.04
July	15	2.46	17,500	2,840	.24	7.9	58	61	6.38	5.45	16.72	2.37	8.60	17.40	.04
Aug.	15	3.29	28,200	3,710	.32	7.8	59	62	8.47	6.99	22.38	2.55	11.90	23.40	.03
Sept.	14	2.54	19,500	2,940	.25	7.9	58	61	6.95	5.53	17.24	2.60	9.02	18.10	.04
Oct.	16	2.93	21,800	3,290	.28	7.7	58	61	7.62	6.54	19.85	2.55	10.50	20.90	.04
Nov.	15	2.83	25,800	3,200	.23	7.8	58	61	7.77	6.22	19.10	2.80	10.19	20.05	.02
Dec.	15	3.33	32,500	3,800	.25	7.8	58	62	8.92	7.21	22.67	2.85	12.05	24.00	.03
Mean ⊕	ϕ181	3.32	ϕ 441,300	3,760	.258	7.8	60	63	8.42	7.07	22.95	2.39	12.00	24.10	.038
Period Average		3.96	1,346,000	4,190			55	56	12.30	7.84	24.45	2.48	17.38	24.82	
Tons of Constituents,			1951						30,500	15,600	95,500	13,200	104,000	155,000	
Average Tons Period			1935-1951						114,000	44,100	260,000	35,000	386,000	407,000	
Río San Diego at Jiménez, Coahuila															
Sampling by Mexican Section															
Jan.	4	.36	1,270	422	.05	7.9	20	17	2.59	.82	.85	2.25	1.19	.70	.05
Feb.	3	.38	1,010	425	.10	8.0	20	16	2.67	.75	.86	2.27	1.26	.70	.05
Mar.	4	.46	1,510	466	.16	8.1	20	15	2.91	.92	.96	2.75	1.25	.72	.04
Apr.	4	.47	1,160	478	.11	8.0	23	16	2.92	.84	1.10	2.83	1.27	.78	.03
May	6	.39	5,920	429	.07	7.8	15	13	3.28	.55	.68	2.60	1.21	.58	.04
June	4	.30	2,940	329	.06	8.1	13	12	2.66	.60	.48	2.41	.59	.42	.11
July	4	.33	1,310	367	.07	8.1	18	15	2.31	.74	.67	2.35	.77	.55	.05
Aug.	4	.32	819	328	.07	8.3	20	21	1.94	.82	.69	1.88	.88	.72	.02
Sept.	4	.40	1,290	444	.03	8.2	15	15	3.30	.78	.71	3.20	.91	.72	.04
Oct.	3	.37	1,460	425	.09	8.1	19	19	2.75	.98	.86	2.75	.93	.85	.04
Nov.	4	.39	1,410	431	.09	8.2	16	14	3.06	.75	.73	2.90	1.02	.65	.04
Dec.	4	.37	1,050	414	.07	8.0	15	14	2.81	.81	.64	2.70	.96	.60	.04
Mean ⊕	ϕ 48	.370	ϕ 21,149	407	.076	8.0	17	15	2.87	.712	.714	2.57	1.00	.618	.052
Period Average		.400	21,100	443			19	16	2.97	.757	.848	2.60	1.16	.742	
Tons of Constituents,			1951						4,470	672	1,270	6,090	3,730	1,700	
Average Tons Period			1950-1951						4,280	661	1,400	5,700	4,000	1,890	
Río San Rodrigo near El Moral. Coahuila															
Sampling by Mexican Section															
Jan.	4	.44	413	507	.05	7.8	24	21	2.72	1.10	1.20	2.03	1.75	1.05	.18
Feb.	2	.31	207	351	.05	7.8	12	6	2.68	.62	.43	2.93	.50	.24	.03
Mar.	4	.45	302	471	.07	8.1	17	13	3.19	.84	.81	3.05	1.11	.66	.11
Apr.	4	.44	248	459	.12	7.9	23	17	2.68	.86	1.05	2.33	1.38	.80	.09
May	3	.39	5,600	425	.11	7.8	18	16	2.89	.72	.78	2.65	1.04	.72	.06
June	4	.40	2,290	438	.08	8.0	15	11	3.39	.71	.75	3.15	.95	.54	.11
July	4	.40	2,520	432	.08	8.0	18	13	2.85	.81	.80	2.91	.97	.60	.11
Aug.	4	.32	1,250	343	.09	8.1	11	11	2.59	.73	.43	2.75	.50	.40	.04
Sept.	4	.31	797	347	.08	8.0	10	9	2.69	.78	.39	2.82	.47	.34	.04
Oct.	4	.35	802	405	.06	7.9	16	15	2.60	.87	.64	2.68	.81	.65	.06
Nov.	4	.46	1,100	494	.07	8.1	16	13	3.52	.84	.82	3.45	1.06	.70	.10
Dec.	4	.39	718	453	.07	8.0	14	12	3.02	.79	.63	3.05	.84	.55	.03
Mean ⊕	ϕ45	.385	ϕ 16,247	421	.088	7.9	16	14	2.93	.765	.719	2.83	.926	.612	.076
Period Average		.375	11,400	413			16	14	2.84	.760	.700	2.75	.906	.598	
Tons of Constituents,			1951						3,370	534	950	4,960	2,560	1,250	
Average Tons Period			1950-1951						2,350	382	666	3,470	1,800	876	
Rio Grande at Eagle Pass, Texas															
Sampling by Mexican Section															
Jan.	27	1.14	103,000	1,350	.10	8.0	53	45	3.74	2.41	6.99	2.16	4.99	5.88	.05
Feb.	24	1.15	103,000	1,340	.17	7.8	51	41	4.16	2.34	6.65	2.60	5.21	5.42	.07
Mar.	27	.95	97,400	1,100	.17	7.9	51	40	3.18	1.98	5.41	2.17	4.14	4.24	.06
Apr.	24	1.02	61,400	1,240	.13	7.9	51	43	3.56	2.24	6.07	2.21	4.36	5.01	.07
May	9	.62	108,000	688	.09	7.7	38	30	3.13	1.04	2.58	2.63	2.15	2.04	.04
June	26	.61	95,300	712	.10	8.0	36	26	3.74	.95	2.62	2.87	2.39	1.90	.03
July	26	.76	60,200	843	.15	7.9	43	27	3.44	1.35	3.67	2.71	3.58	2.30	.06
Aug.	26	.72	51,200	810	.16	8.2	43	28	3.31	1.25	3.47	2.63	3.14	2.26	.06
Sept.	25	.82	70,700	931	.10	8.0	44	32	3.74	1.45	4.11	2.85	3.46	3.00	.06
Oct.	27	.73	47,800	849	.13	7.8	43	33	3.15	1.62	3.67	2.63	3.00	2.75	.05
Nov.	26	.85	55,100	968	.16	8.2	42	31	3.99	1.73	4.13	3.30	3.57	3.05	.06
Dec.	27	.96	54,600	1,090	.14	8.0	45	36	4.04	2.02	4.87	3.15	3.99	4.00	.05
Mean ⊕	ϕ294	.828	ϕ 907,700	953	.127	7.9	45	35	3.56	1.59	4.27	2.65	3.48	3.29	.052
Period Average		1.02	2,758,000	1,150			47	39	4.32	1.80	5.37	2.41	4.56	4.46	
Tons of Constituents,			1951						106,000	28,800	146,000	120,000	249,000	174,000	
Average Tons Period			1938-1951						318,000	80,400	454,000	270,000	805,000	581,000	

ϕ Total ⊕ Weighted mean ** Percent of total cations *** Percent of total anions

CHEMICAL ANALYSES OF WATER SAMPLES FROM RIO GRANDE AND TRIBUTARIES — 1951

Month	No. of Samples	Dissolved Solids: Tons Per Acre-Foot	Dissolved Solids: Total Tons	Mean ECx10⁶ @25°C	Boron p.p.m.	pH	% Na **	% Cl ***	Mean Milligram Equivalents per Liter: Ca	Mg	Na	CO_3 + HCO_3	SO_4	Cl	NO_3
Río Salado at Cd. Guerrero, Tamaulipas															
Sampling by Mexican Section															
Jan.	12	.79	483	881	.10	7.8	37	22	3.60	1.80	3.28	2.27	4.56	1.95	.03
Feb.	5	1.85	684	1,990	.39	7.7	41	28	7.88	4.71	8.86	1.81	13.76	5.95	.06
Mar.	5	5.16	28,300	4,620	1.45	7.8	44	29	17.77	13.35	24.38	2.25	37.26	15.92	.05
Apr.	5	1.46	4,640	1,560	.53	8.0	46	33	5.79	2.82	7.36	2.05	8.57	5.20	.03
May	7	.59	16,600	675	.13	7.7	37	25	3.17	.93	2.45	2.18	2.76	1.70	.06
June	9	.45	23,100	506	.16	8.0	32	22	2.81	.70	1.63	2.11	1.80	1.10	.10
July	3	.69	315	751	.17	7.7	33	22	3.80	1.14	2.48	1.65	4.13	1.70	.11
Aug. ‡	0	.86	2,120	920	0	0	46	33	3.41	1.66	4.34	1.21	5.05	3.07	.03
Sept.	4	.41	40,000	434	T	8.0	26	16	2.51	.64	1.13	1.90	1.69	.70	.04
Oct.	4	.30	19,100	344	.10	7.9	30	21	1.74	.56	.98	1.60	.98	.70	.11
Nov.	3	.80	2,540	868	.19	8.0	36	24	3.96	1.64	3.21	2.49	4.10	2.15	.21
Dec.	3	1.11	1,110	1,210	.29	8.2	41	30	4.85	2.46	5.06	1.80	6.72	3.70	.17
Mean ⊕	ϕ 60	.541	ϕ 138,992	573			34	22	2.87	1.00	2.00	1.91	2.61	1.33	.074
Period Average		.899	223,000	942			40	27	4.25	1.70	3.89	1.92	3.27	2.64	
Tons of Constituents, 1951									20,100	4,250	16,100	20,400	43,800	16,500	
Average Tons Period 1935-1951									28,700	6,980	30,200	19,800	85,400	31,600	
Rio Grande at Roma, Texas															
Sampling by Mexican Section															
Jan.	31	1.15	108,000	1,350	.19	8.0	51	44	4.00	2.43	6.90	2.43	4.95	5.86	.04
Feb.	28	1.19	98,300	1,400	.18	7.9	53	44	3.96	2.48	7.18	2.20	5.43	6.08	.04
Mar.	31	1.18	125,000	1,350	.21	7.8	49	37	4.35	2.40	6.59	2.52	5.76	4.94	.06
Apr.	30	.94	70,100	1,110	.17	7.9	48	39	3.69	1.86	5.07	2.37	4.13	4.28	.14
May	10	.58	187,000	680	.10	7.7	38	29	3.23	.89	2.50	2.57	2.27	1.98	.04
June	30	.54	160,000	578	.09	7.8	31	23	2.95	1.08	1.83	2.35	2.05	1.35	.11
July	31	.78	42,100	891	.20	7.7	47	33	2.96	1.51	4.14	2.21	3.63	2.90	.04
Aug.	31	.78	59,000	870	.18	7.9	44	28	3.44	1.37	3.90	2.45	3.86	2.42	.04
Sept.	30	.60	274,000	642	.10	7.5	42	24	2.95	.72	2.63	2.40	2.37	1.55	.03
Oct.	30	.60	86,400	689	.13	7.8	41	29	2.99	.98	2.73	2.33	2.47	2.00	.06
Nov.	30	.81	65,900	919	.15	8.0	44	33	3.54	1.59	4.05	2.70	3.53	3.05	.05
Dec.	31	.90	59,500	1,060	.17	8.1	50	38	3.22	1.99	5.12	2.20	4.23	3.90	T
Mean ⊕	ϕ343	.721	ϕ1,333,300	814	.129	7.7	43	32	3.27	1.27	3.48	2.42	3.06	2.58	.054
Period Average		.741	2,212,000	857			46	35	3.23	1.28	3.83	2.22	3.22	2.96	
Tons of Constituents, 1951									165,000	38,800	201,000	186,000	370,000	230,000	
Average Tons Period 1944-1951									263,000	63,100	358,000	275,000	627,000	426,000	
North Floodway near Sebastian, Texas															
Sampling by U. S. Section															
Jan.	5	3.84	4,220	4,290	2.50	7.9	62	59	9.33	7.30	27.52	2.52	15.30	26.04	.06
Feb.	5	3.86	5,670	4,280	2.27	7.8	61	59	10.18	6.94	26.68	3.58	14.69	26.10	.05
Mar.	4	4.35	8,740	4,790	2.52	8.1	62	60	10.58	8.25	30.44	2.54	17.14	29.80	.06
Apr.	5	5.43	14,700	5,890	3.67	7.8	62	61	14.00	10.13	38.84	2.80	21.47	38.62	.18
May	4	4.38	24,400	4,800	2.82	7.8	63	61	10.74	7.82	30.99	2.38	16.85	30.76	.06
June	5	2.64	24,100	2,950	1.25	7.7	60	59	7.70	4.27	17.81	2.47	9.69	17.55	.04
July	5	4.01	15,900	4,380	2.63	7.8	59	61	11.35	6.99	26.94	3.30	14.65	27.80	.04
Aug.	5	3.73	8,210	4,070	2.40	8.1	63	60	8.87	6.72	26.04	2.20	14.66	24.80	.02
Sept.	3	1.90	31,700	2,210	.80	8.0	57	57	6.14	3.42	12.44	2.45	6.97	12.60	.03
Oct.	5	4.32	24,500	4,690	2.79	7.9	59	60	12.30	8.00	29.34	4.35	15.30	30.00	.04
Nov.	4	3.95	15,400	4,340	2.28	8.0	58	59	11.72	7.42	26.77	4.50	14.59	27.00	.03
Dec.	5	4.09	7,480	4,540	1.94	8.0	57	59	11.87	8.70	27.52	4.90	14.81	28.70	T
Mean ⊕	ϕ55	3.29	ϕ 185,020	3,650	1.88	7.9	60	60	9.22	5.95	22.47	2.96	12.28	22.51	.044
Period Average		2.20	144,000	2,470			58	56	6.51	4.02	14.42	2.61	8.47	13.98	
Tons of Constituents, 1951									14,100	5,530	39,500	6,900	45,100	61,000	
Average Tons Period 1941-1951									11,600	4,350	29,500	7,090	36,200	44,100	

‡ Estimated T Trace ϕ Total ⊕ Weighted mean ** Percent of total cations *** Percent of total anions

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1951

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C

Rio Grande at El Paso, Texas

Date	ECx10⁶ @25°C
January	
1	2,020
2	2,030
3	2,020
4	1,950
5	2,020
6	2,020
7	1,950
8	2,030
9	2,030
10	1,900
11	2,090
12	1,920
13	1,950
14	1,910
15	1,910
16	1,950
17	1,970
18	1,950
19	1,940
20	1,990
21	2,090
22	1,950
23	1,980
24	2,010
25	2,010
26	2,030
27	1,980
28	2,020
29	1,970
30	2,000
31	2,050
February	
1	2,020
2	1,810
3	1,860
4	1,880
5	2,040
6	2,030
7	1,990
8	1,990
9	2,080
10	2,020
11	2,060
12	2,080
13	1,960
14	1,980
15	2,010
16	2,150
17	2,100
18	2,020
19	2,110
20	2,000
21	1,990
22	1,990
23	2,050
24	2,020
25	2,100
26	2,080
27	2,070
28	2,100
March	
6	1,320
7	1,210
8	1,360
9	1,220
10	1,250
11	1,280
12	1,160
13	1,250
14	1,120
15	1,080
16	1,120
17	1,280
18	1,360
19	1,160
20	1,240
21	1,130
22	1,090
23	1,160
24	1,270
25	1,230
26	1,270
27	1,280
28	1,560
29	1,490
30	1,450
May	
1	1,300
2	1,340
3	1,280
4	1,310
5	1,260
6	1,410
7	1,430
8	1,520
9	1,560
10	1,610
11	1,680
12	1,640
13	1,590
14	1,620
15	1,870
16	1,550
17	1,660
18	1,640
19	1,520
20	1,540
21	1,540
22	1,660
23	1,630
24	1,500
25	1,530
26	1,590
27	1,530
28	1,590
29	1,550
30	1,510
31	1,530
June	
1	1,550
2	1,450
3	1,440
4	1,370
5	1,420
6	1,370
7	1,470
8	1,490
9	1,530
10	1,470
11	1,440
12	1,350
13	1,270
14	1,260
15	1,230
16	1,200
17	1,160
18	1,070
19	1,080
20	1,140
21	1,040
22	1,130
23	1,070
24	1,080
25	1,100
26	1,140
27	1,130
28	1,040
29	1,070
30	1,130
July	
1	1,170
3	1,110
4	1,210
5	1,110
6	1,100
7	1,340
8	1,280
9	1,360
10	1,270
11	1,270
12	1,330
13	1,290
14	1,180
15	1,070
16	1,140
17	1,120
18	1,060
19	1,170
20	1,190
21	1,100
22	1,120
23	1,160
24	1,130
25	1,100
26	1,110
27	1,030
28	1,160
29	1,180
30	1,100
31	1,150
August	
1	1,150
2	1,160
3	1,210
4	1,270
5	1,230
6	1,230
7	1,230
8	1,310
9	1,310
10	1,320
11	1,350
12	1,300
13	1,410
14	1,210
15	1,200
16	1,260
17	1,190
18	1,150
19	1,230
20	1,200
21	1,200
22	1,190
23	1,200
24	1,230
25	1,200
26	1,220
27	1,260
28	1,260
29	1,310
30	1,370
31	1,390
September	
1	1,330
2	1,650
3	1,650
4	1,720
5	1,730
6	1,640
7	1,680
8	1,690
9	1,640
10	1,570
11	1,480
12	1,520
13	1,520
14	1,550
15	1,530
16	1,680
17	1,770
18	1,750
19	1,750
20	1,770
21	1,800
22	1,810
23	1,820
24	1,840
25	1,880
26	1,910
27	1,930
28	1,950
29	1,940
30	1,930
October	
1	1,950
2	1,970
3	1,980
4	1,970
5	1,970
6	1,940
7	1,940
8	1,950
9	2,000
10	2,000
11	2,030
12	2,060
13	2,080
14	2,080
15	2,080
16	2,000
17	2,080
18	2,100
19	2,110
20	2,110
21	2,140
22	2,110
23	2,100
24	2,110
25	2,100
26	2,080
27	2,100
28	2,100
29	2,120
30	2,060
31	1,980
November	
30	2,040
December	
1	2,030
2	2,090
3	2,050
4	2,060
5	2,070
6	2,100
7	2,100
8	2,020
9	2,020
10	2,060
11	2,050
12	2,070
13	2,060
14	2,080
15	2,050
16	2,060
17	2,090
18	2,080
19	2,090
20	2,120
21	2,080
22	2,080
23	2,070
24	2,090
25	2,080
26	2,060
27	2,080
28	2,070
29	2,070
30	2,070
31	2,090

Rio Grande at Fort Quitman, Texas

Date	ECx10⁶ @25°C
January	
3	4,250
10	4,360
17	4,310
20	4,420
24	4,900
February	
1	4,990
3	4,600
8	4,780
15	5,550
17	5,460
21	5,780
February	
28	6,020
March	
7	6,130
10	6,020
14	6,020
21	6,410
28	6,670
April	
4	7,890
7	7,830
11	7,770
18	6,430
25	4,110
May	
2	4,110
9	4,110
16	4,210
June	
6	7,100
13	3,740
30	781
July	
5	843
18	4,070
August	
30	787
30	801
30	781
September	
4	6,310
5	8,050
12	8,610
18	6,730
19	7,500
26	7,860
October	
3	7,610
9	7,440
10	7,730
17	6,650
17	7,440
24	7,680
October	
31	6,910
November	
13	6,850
14	7,360
21	6,850
28	5,870
November	
29	6,160
December	
5	6,330
12	6,450
26	5,110

Rio Grande at Upper Presidio Station

Date	ECx10⁶ @25°C
January	
6	5,160
14	5,000
20	5,050
26	4,980
January	
30	5,050
February	
3	5,290
9	5,710
15	6,060
February	
23	6,410
27	6,760
March	
3	6,900
9	7,000
May	
25	991
27	1,250
June	
4	820
June	
6	1,090
July	
3	332
6	375
15	500
15	459
25	566
25	566
July	
25	565
26	599
26	579
28	719
August	
30	497
30	502
30	502
30	501
September	
1	760
1	752
2	699
2	694
September	
6	715
15	470
16	476
22	701

Río Conchos at Cuchillo Parado, Chihuahua

Date	ECx10⁶ @25°C
January	
1	1,010
3	998
5	1,010
8	1,030
10	988
12	997
15	928
17	966
19	994
22	1,030
24	911
29	959
31	1,000
February	
2	906
7	803
9	864
12	811
14	790
16	760
19	787
21	744
26	627
28	688
March	
2	694
5	704
7	647
9	801
12	638
14	745
16	731
19	816
21	868
23	854
26	840
28	826
30	940
April	
2	941
4	1,040
6	1,070
9	973
13	1,030
16	1,020
18	934
20	914
23	900
25	920
27	938
30	885
May	
2	934
4	891
7	920
9	941
11	915
14	934
16	956
18	891
21	781
23	848
25	843
28	818
30	741
June	
1	705
4	691
6	716
8	671
11	723
13	712
15	707
18	672
20	699
22	717
27	803
29	733
July	
2	778
4	739
6	769
9	807
11	791
13	793
16	603
16	606
17	642
18	648
20	748
23	746
25	741
27	686
30	812
August	
1	795
3	721
6	825
8	844
11	834
11	866
13	828
15	900
17	798
20	877
22	915
24	880
27	835
29	927
31	924
September	
3	925
5	904
7	996
12	877
14	1,060
17	999
19	899
19	904
21	974
24	893
26	912
28	894
October	
1	980
3	999
5	1,030
8	1,010
10	1,050
12	1,030
15	1,070
17	1,010
22	1,040
24	1,040
26	1,020
29	994
31	995
November	
2	955
5	1,020
7	1,070
9	1,010
14	1,030
16	1,020
21	1,060
23	1,070
26	1,060
28	1,070
30	1,070
December	
3	1,040
5	1,070
7	1,080
10	1,170
17	1,130
19	1,090
21	1,100
24	1,120
28	1,130
31	1,100

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES
1951

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C

Río Conchos near Ojinaga, Chihuahua

Date	ECx10⁶ @25°C
January	
3	1,050
12	1,060
22	885
25	924
30	958
February	
2	1,030
8	864
16	789
22	755
28	719
March	
3	724
8	686
15	684
22	852
29	936
April	
5	1,120
12	1,130
19	1,090
26	923
30	1,040
May	
3	990
11	975
14	808
17	912
21	925
28	823
June	
1	775
4	1,180
8	714
11	685
15	787
20	709
25	848
29	849
July	
2	768
7	821
10	795
14	928
23	771
27	737
August	
3	802
7	884
13	881
17	944
22	952
29	442
September	
7	977
12	893
17	1,060
24	939
28	994
October	
1	1,020
5	1,020
10	1,050
15	1,040
20	1,080
29	1,060
November	
3	1,110
7	1,110
12	1,160
19	1,160
24	1,150
28	1,130
28	1,100
December	

Rio Grande at Johnson Ranch, Texas

Date	ECx10⁶ @25°C
January	
1	1,440
12	1,470
15	1,580
16	1,460
24	1,450
February	
2	1,400
13	1,120
15	952
21	826
27	807
March	
5	849
10	867
11	793
18	830
26	791
27	804
April	
1	1,120
10	1,170
17	1,250
24	1,340
May	
6	1,260
8	1,150
13	957
15	1,110
21	1,090
24	548
27	864
June	
2	557
4	508
11	825
19	854
25	943
29	722
July	
1	1,020
4	1,250
8	817
11	831
13	560
15	662
23	1,052
29	1,074
30	766
August	
2	865
6	947
11	831
13	560
15	662
23	1,052
29	1,074
30	766
September	
4	874
8	902
12	483
16	866
24	975
30	1,050
October	
7	1,180
15	1,150
18	407
19	952
25	1,080
29	540
November	
4	1,150
5	1,110
6	1,130
9	1,110
13	1,130
16	1,090
19	1,140
23	1,160
27	1,140
30	1,150
December	
3	1,150
10	1,180
17	1,200
24	1,200
31	1,200

Rio Grande at Langtry, Texas

Date	ECx10⁶ @25°C
January	
2	1,180
5	986
8	1,070
12	1,170
15	1,160
19	1,170
22	1,310
29	1,160
February	
3	1,160
5	1,110
10	1,190
12	1,140
26	987
23	908
23	871
March	
1	871
2	762
9	747
12	756
15	779
21	816
23	746
27	810
29	797
April	
5	761
10	871
12	866
17	870
19	777
24	808
25	804
May	
1	927
3	959
7	980
9	967
11	675
12	778
16	914
16	295
22	430
26	683
29	611
June	
2	846
4	748
4	671
5	695
6	694
8	674
12	360
19	715
21	730
26	825
30	772
July	
2	730
6	392
10	927
13	794
17	709
20	1,070
25	674
28	805
August	
2	739
3	703
8	790
9	705
17	620
20	1,023
27	776
September	
1	945
7	809
8	658
15	702
21	771
26	773
28	831
October	
4	828
7	821
13	840
19	927
22	1,040
25	737
27	752
30	879
31	926
November	
3	746
7	637
10	958
14	942
17	931
20	929
25	911
December	
2	912
10	906
13	942
20	932
23	950
29	944

Pecos River near Comstock, Texas

Date	ECx10⁶ @25°C
January	
1	4,950
3	4,980
5	5,060
7	5,090
9	5,170
11	5,140
13	5,010
15	5,060
17	5,010
19	5,040
21	5,040
23	4,980
25	5,010
27	5,010
31	5,090
February	
2	5,120
4	5,140
6	5,090
8	5,120
10	5,170
12	5,120
14	5,200
16	5,170
18	5,120
20	5,220
22	5,310
24	5,370
26	5,090
28	5,340
March	
2	5,050
4	4,970
6	4,880
8	4,850
10	4,780
12	4,810
14	4,540
16	4,560
18	4,540
20	4,580
22	4,480
24	4,500
26	4,600
28	4,670
30	4,190
April	
1	4,510
3	4,450
5	4,590
7	4,810
9	4,810
11	4,900
13	4,770
15	4,880
17	4,880
19	4,510
21	4,550
23	4,590
25	4,770
27	4,590
29	4,030
May	
1	4,010
3	4,210
5	4,180
7	4,340
9	4,060
11	647
11	837
13	1,900
15	1,230
17	2,710
19	3,280
21	3,340
23	1,740
24	852
24	787
25	691
27	1,020
29	3,240
31	3,220
June	
2	2,520
4	3,080
6	1,790
8	3,070
10	2,890
12	3,180
14	3,530
16	3,530
18	3,810
20	3,770
22	3,520
24	3,290
26	3,280
28	3,260
30	3,230
July	
2	3,170
4	3,150
6	2,930
8	2,740
10	2,860
12	2,790
14	2,710
16	2,920
18	2,860
20	2,970
22	2,670
24	2,650
26	2,790
28	2,700
30	2,920
August	
1	2,850
3	2,520
5	2,780
7	2,750
9	2,690
11	2,560
13	2,820
15	2,590
19	2,720
21	2,590
23	2,610
25	2,590
27	3,930
29	9,540
31	7,150
September	
2	3,580
4	3,550
6	3,340
8	3,230
10	3,070
12	3,040
14	3,040
16	3,000
18	2,790
20	1,800
22	1,780
24	2,750
26	2,840
28	3,050
October	
1	3,200
3	3,400
5	3,650
7	3,860
9	3,640
11	3,500
13	3,500
15	3,410
17	3,410
19	3,390
21	3,150
23	3,190
25	2,950
27	2,890
29	3,180
31	3,210
November	
2	3,220
4	3,170
6	3,070
8	3,080
10	3,170
12	3,060
14	3,020
16	3,160
18	3,090
20	3,150
22	3,140
24	3,140
26	3,390
28	3,460
30	3,520
December	
2	3,550
4	3,680
6	3,600
8	3,590
10	3,740
12	3,740
14	3,620
16	3,840
18	3,890
20	3,890
22	3,860
24	4,000
26	4,080
28	3,980
30	4,000

Río San Diego at Jiménez, Coahuila

Date	ECx10⁶ @25°C
January	
3	514
9	435
16	470
24	682
February	
1	348
16	330
March	
1	321
8	319
16	615
23	575
3	275
10	653
17	313
23	484
May	
2	280
9	555
14	413
June	
2	230
11	309
15	594
23	529
July	
2	320
10	398
17	305
24	650
2	209
8	543
17	283
24	283
1	287
8	549
14	275
22	298
2	290
9	455
16	285
24	547
2	310
9	620
16	539
24	453
1	301
8	606
15	337
25	574

Río San Rodrigo near El Moral, Coahuila

Date	ECx10⁶ @25°C
January	
3	514
9	435
16	470
24	682
February	
1	348
16	330
March	
1	321
8	319
16	615
23	575
3	275
10	653
17	313
23	484
May	
2	280
9	555
14	413
June	
2	230
11	309
15	594
23	529
July	
2	320
10	398
17	305
24	650
2	209
8	543
17	283
24	283
1	287
8	549
14	275
22	298
2	290
9	455
16	285
24	547
2	310
9	620
16	539
24	453
1	301
8	606
15	337
25	574

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES
1951

Rio Grande at Eagle Pass, Texas

Date	ECx10⁶ @25°C
January	
1	1,430
2	1,430
3	1,440
4	1,320
5	1,310
6	1,290
8	1,300
9	1,370
9	1,260
10	1,260
11	1,230
12	1,260
13	1,290
15	1,300
16	1,390
17	1,330
18	1,290
19	1,290
20	1,380
22	1,360
23	1,430
24	1,410
25	1,350
26	1,450
27	1,330
29	1,410
30	1,330
31	1,420
February	
1	1,420
2	1,320
3	1,400
5	1,400
February	
6	1,260
7	1,390
8	1,330
9	1,430
10	1,300
12	1,430
13	1,340
14	1,340
15	1,450
16	1,350
17	1,310
19	1,400
20	1,240
21	1,330
22	1,310
23	1,250
24	1,270
26	1,270
27	1,160
28	1,220
March	
1	1,130
2	1,210
3	1,200
5	1,200
6	1,190
7	1,170
8	1,090
9	1,170
10	1,140
12	1,140
13	1,090
14	1,140
March	
15	1,070
16	1,070
17	1,020
19	1,120
20	1,000
21	1,050
22	1,130
23	1,040
24	1,030
26	1,000
27	954
28	997
29	993
30	1,140
31	1,130
April	
2	1,010
3	1,010
4	1,100
6	1,130
7	1,200
9	1,220
10	1,250
11	1,250
12	1,220
13	1,320
14	1,200
16	1,300
17	1,300
18	1,250
19	1,250
20	1,250
21	1,310
April	
23	1,330
24	1,230
25	1,310
26	1,220
27	1,290
28	1,110
30	1,120
May	
1	1,230
2	1,270
3	1,260
4	1,230
5	1,210
7	1,220
8	1,230
9	1,240
10	1,230
11	1,180
12	1,200
14	2,310
15	967
16	974
17	525
18	763
19	518
21	569
22	642
24	422
25	661
26	447
28	442
29	563
30	769
May	
31	692
June	
1	702
2	736
4	720
5	820
6	926
7	516
8	580
9	557
11	737
12	743
13	772
14	716
15	491
16	557
18	709
19	719
20	715
21	818
22	819
23	883
25	896
26	895
27	833
28	739
29	736
30	805
July	
2	844
3	869
4	798
5	811
July	
6	842
7	823
9	915
10	787
11	783
12	842
13	845
14	1,120
16	1,120
17	1,020
18	883
19	953
20	907
21	836
23	764
24	903
25	844
26	844
27	912
28	686
30	755
31	719
August	
1	699
2	718
3	750
4	773
6	804
8	794
9	789
10	786
11	797
13	735
August	
14	796
15	811
16	814
17	806
18	725
20	676
21	732
22	748
23	740
24	760
25	903
27	789
28	1,100
29	1,270
30	1,090
31	1,050
September	
1	1,090
3	1,690
4	1,910
5	1,050
6	1,200
7	1,260
8	1,250
10	1,050
11	1,000
12	941
13	1,030
14	850
15	856
17	652
18	716
19	713
September	
20	796
21	793
22	793
24	784
25	753
26	749
27	875
28	871
29	895
October	
1	864
2	895
3	913
4	956
5	965
6	964
8	946
9	966
10	970
11	968
12	984
13	1,010
15	1,010
16	999
17	995
18	989
19	968
20	968
21	896
22	974
23	1,060
25	989
26	976
October	
27	433
29	435
30	592
31	875
November	
1	802
2	809
3	944
5	977
6	1,040
7	958
8	997
9	998
10	939
12	883
13	882
14	933
15	984
16	952
17	916
19	978
20	985
21	961
22	964
23	978
24	991
26	996
27	981
28	1,000
29	1,010
30	1,020
December	
1	1,060
December	
3	1,030
4	988
5	1,000
6	1,050
7	1,050
8	1,010
9	1,080
10	1,060
11	1,090
12	1,080
13	1,090
14	1,080
15	1,080
17	1,070
18	1,100
19	1,100
20	1,120
21	1,120
22	1,120
24	1,120
25	1,120
26	1,110
27	1,120
28	1,120
29	1,110
31	1,120

Río Salado at Cd. Guerrero, Tamaulipas

Date	ECx10⁶ @25°C
January	
1	673
3	672
5	670
8	759
10	765
12	777
15	870
17	869
January	
19	910
22	964
25	1,080
28	1,230
February	
1	1,480
6	1,540
10	1,700
February	
16	2,070
24	2,630
March	
1	3,020
9	4,000
13	6,170
22	1,160
28	4,250
April	
1	4,160
9	3,830
18	3,640
28	3,150
29	626
May	
1	671
11	549
May	
11	498
12	735
13	929
14	917
17	615
25	479
June	
1	372
11	397
13	384
14	368
15	307
16	2,040
22	689
26	598
June	
27	286
July	
1	688
11	809
16	831
28	927
September	
14	798
15	382
15	394
17	361
25	654
October	
7	270
8	330
8	285
8	304
9	390
19	659
20	381
November	
1	619
13	1,090
19	907
December	
1	1,110
15	1,200
28	1,340

Rio Grande at Roma, Texas

Date	ECx10⁶ @25°C
January	
1	1,190
2	1,240
3	1,260
4	1,310
5	1,240
6	1,280
7	1,260
8	1,290
9	1,350
10	1,350
11	1,350
12	1,330
13	1,370
14	1,420
15	1,350
16	1,350
17	1,380
18	1,350
19	1,360
20	1,350
21	1,320
22	1,380
23	1,390
24	1,360
25	1,390
26	1,410
27	1,430
28	1,440
29	1,420
30	1,410
31	1,430
February	
1	1,430
2	1,420
3	1,460
4	1,420
5	1,420
6	1,430
February	
7	1,440
8	1,470
9	1,400
10	1,370
11	1,360
12	1,330
13	1,340
14	1,350
15	1,330
16	1,390
17	1,390
18	1,390
19	1,380
20	1,360
21	1,390
22	1,380
23	1,390
March	
1	1,400
2	1,380
3	1,360
4	1,340
5	1,340
6	1,320
7	1,350
8	1,310
9	1,270
10	1,270
11	1,250
12	1,240
13	1,050
14	932
15	1,710
March	
16	2,070
17	1,720
18	1,680
19	1,520
20	1,380
21	1,310
22	1,310
23	1,260
24	1,220
25	1,160
26	1,160
27	1,150
28	1,200
29	1,360
30	1,180
31	1,160
April	
1	1,100
2	1,120
3	1,370
4	1,140
5	1,140
6	1,060
7	1,090
8	1,120
9	1,120
10	1,160
11	1,210
12	1,280
13	1,280
14	1,220
15	1,200
16	1,190
17	1,200
18	1,230
19	1,260
20	1,250
21	1,250
April	
22	1,220
23	1,230
24	1,240
25	1,280
26	1,310
27	1,290
28	742
29	524
30	1,180
May	
1	1,570
2	826
3	912
4	1,050
5	1,160
6	1,300
7	1,360
8	1,380
9	1,360
10	1,050
11	1,260
12	683
13	887
14	744
15	729
16	628
17	747
18	411
19	432
20	368
21	439
22	868
23	688
24	637
25	745
26	654
27	692
28	482
May	
29	539
30	516
31	653
June	
1	587
2	560
3	562
4	522
5	481
6	483
7	469
8	559
9	688
10	726
11	820
12	890
13	474
14	542
15	502
16	444
17	577
18	736
19	766
20	785
21	795
22	630
23	553
24	476
25	463
26	340
27	718
28	755
29	467
30	583
July	
1	678
2	662
3	668
July	
4	745
5	798
6	816
7	816
8	860
9	907
10	949
11	965
12	979
13	911
14	895
15	922
16	873
17	897
18	887
19	892
20	899
21	922
22	955
23	952
24	942
25	876
26	828
27	870
28	921
29	985
30	1,130
31	1,030
August	
1	913
2	872
3	863
4	898
5	940
6	914
7	938
8	890
9	848
August	
10	839
11	801
12	811
13	796
14	807
15	797
16	798
17	839
18	814
19	868
20	874
21	857
22	850
23	829
24	835
25	768
26	794
27	837
28	864
29	911
30	916
31	907
September	
1	965
2	1,040
3	988
4	976
5	952
6	915
7	923
8	938
9	934
10	916
11	954
12	905
13	728
14	835
15	519
September	
16	545
17	439
18	460
19	519
20	596
21	683
22	705
23	821
24	782
25	687
26	716
27	660
28	650
29	745
30	862
October	
1	779
2	769
3	800
4	840
5	845
6	800
8	715
9	352
10	392
11	617
12	683
13	747
14	822
15	829
16	837
17	789
18	806
19	884
20	488
21	659
22	538
23	579
October	
24	847
25	741
26	922
27	932
28	1,050
29	1,180
30	1,050
31	1,020
November	
1	945
2	959
3	1,020
4	978
5	994
6	1,010
7	671
8	549
9	592
10	695
11	772
12	864
13	897
14	887
15	858
16	909
17	945
18	988
19	1,020
20	1,050
21	1,040
22	1,030
23	1,040
24	1,030
25	991
26	945
27	938
28	948
29	998
November	
30	1,030
December	
1	1,030
2	1,010
3	999
4	991
5	990
6	995
7	999
8	1,010
9	1,020
10	1,030
11	1,030
12	1,040
13	1,050
14	1,060
15	1,060
16	1,060
17	1,070
18	1,070
19	1,080
20	1,090
21	1,110
22	1,110
23	1,110
24	1,110
25	1,110
26	1,110
27	1,120
28	1,130
29	1,140
30	1,140
31	1,140

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1951

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C

Rio Grande at Mercedes, Texas, Pumps

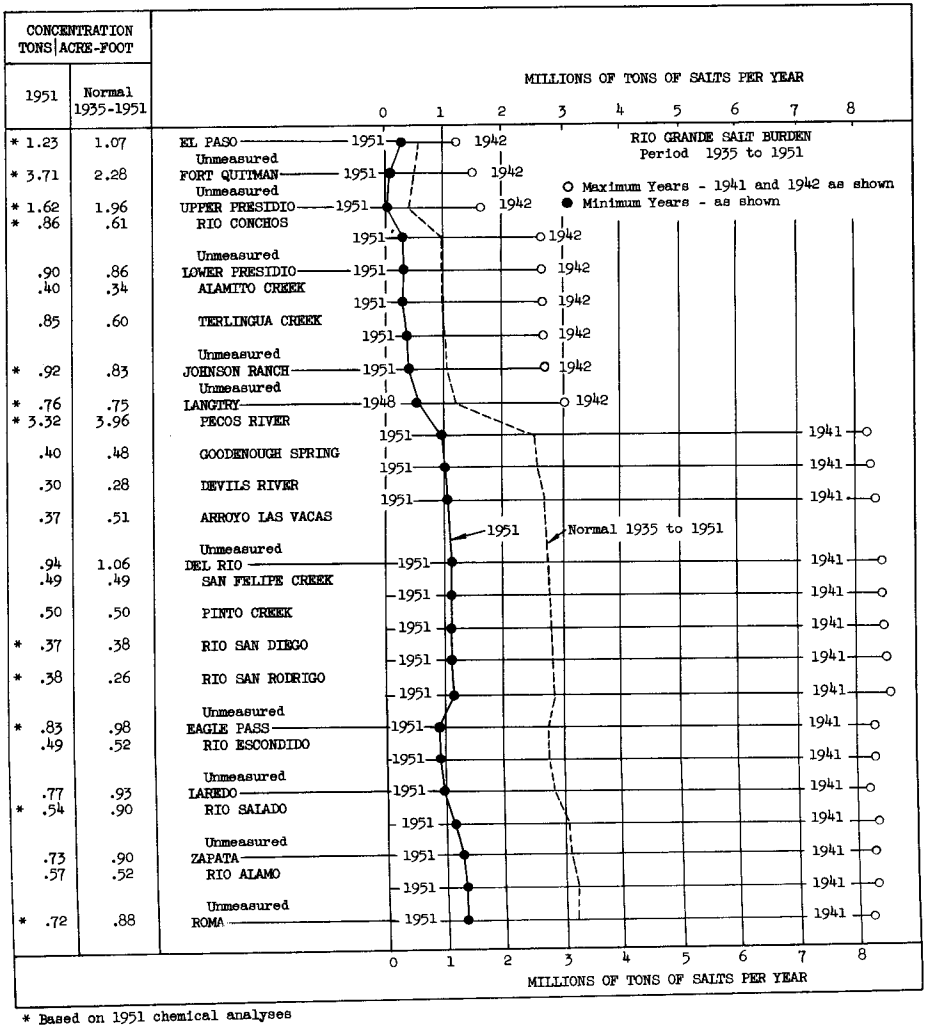
Date	ECx10⁶ @25°C
January	
1	1,410
2	1,470
3	1,470
4	1,380
5	1,460
6	1,440
7	1,480
8	1,410
9	1,440
10	1,420
11	1,480
12	1,390
13	1,560
14	1,510
15	1,530
16	1,650
18	1,610
19	1,580
20	1,630
21	1,610
22	1,620
23	1,540
24	1,580
25	1,610
26	1,510
27	1,650
28	1,600
29	1,590
30	1,570
31	1,660
February	
1	1,670
2	1,640
3	1,570
4	1,670
5	1,560
February	
6	1,580
7	1,690
8	1,700
9	1,620
10	1,640
11	1,620
12	1,630
13	1,660
14	1,560
15	1,650
16	1,700
17	1,740
18	1,650
19	1,590
20	1,560
21	1,540
22	1,620
23	1,530
24	1,650
25	1,590
26	1,600
28	1,610
March	
1	1,560
2	1,630
3	1,570
4	1,600
5	1,590
6	1,580
8	1,660
9	1,540
10	1,620
12	1,500
14	1,560
15	1,780
16	1,350
March	
17	1,440
18	1,160
19	1,160
20	1,200
21	1,810
22	2,140
23	1,960
24	1,920
25	1,640
26	1,650
28	1,640
29	1,640
30	1,620
31	1,470
April	
1	1,410
2	1,250
3	1,440
4	1,400
5	1,440
6	1,370
8	1,320
9	1,410
10	1,380
11	1,430
12	1,430
13	1,460
14	1,460
15	1,580
16	1,540
17	1,600
18	1,580
19	1,640
20	1,570
21	1,740
22	1,760
April	
23	1,670
24	1,710
25	1,710
26	1,690
27	1,730
28	1,850
29	1,980
30	1,900
May	
1	1,930
2	1,080
3	742
4	841
5	1,210
6	1,360
7	1,430
8	1,980
9	1,560
10	1,380
11	1,450
12	1,490
13	1,530
14	1,080
15	998
16	1,130
17	811
18	826
19	797
20	535
21	512
22	508
23	470
24	432
25	458
26	587
27	928
May	
28	655
29	609
30	781
31	566
June	
1	572
2	705
3	629
4	696
5	810
6	743
7	730
8	596
9	631
10	667
11	587
12	681
13	774
14	869
21	824
22	884
23	885
24	939
25	983
26	880
27	1,020
28	703
29	666
30	498
July	
1	787
2	907
3	829
4	1,040
5	1,040
6	1,000
July	
7	1,070
8	1,200
9	1,230
10	1,310
11	1,350
12	1,410
13	1,410
14	1,480
15	1,480
16	1,780
17	1,690
18	1,500
19	1,440
20	1,420
21	1,410
22	1,400
23	1,670
24	1,700
25	1,670
26	1,720
27	1,630
28	1,690
29	1,730
30	1,940
31	1,890
August	
1	1,520
2	1,350
3	1,290
4	1,540
5	1,460
6	1,490
7	1,380
8	1,270
9	1,230
10	1,270
August	
11	1,310
12	1,370
13	1,360
14	1,470
15	1,500
16	1,500
17	1,480
18	1,540
19	1,490
20	1,470
21	1,500
22	1,470
23	1,410
24	1,250
25	1,430
26	1,490
27	1,490
28	1,130
29	1,090
30	1,000
31	1,080
September	
1	1,060
2	1,110
3	1,230
4	1,430
5	1,490
6	1,510
7	1,520
8	1,520
9	1,640
10	1,700
11	1,740
12	1,690
13	1,810
14	1,460
September	
15	1,130
16	647
17	534
18	530
19	494
20	485
21	485
22	486
23	641
24	640
25	622
26	730
27	779
28	852
29	950
30	1,020
October	
1	1,000
2	997
3	1,170
4	983
5	1,080
6	1,030
7	1,160
8	1,140
10	1,110
11	781
12	463
13	399
14	493
15	458
16	602
17	680
18	763
19	833
20	931
October	
21	1,120
22	1,210
23	1,370
24	570
25	726
26	840
27	729
28	671
29	707
30	902
31	1,090
November	
1	1,060
2	1,120
3	1,220
4	1,380
5	1,240
6	1,110
7	1,160
8	1,210
9	1,240
10	1,290
11	1,270
12	1,250
13	1,250
14	1,100
15	982
16	1,030
17	1,080
18	1,160
19	1,230
20	1,300
21	1,310
22	1,310
23	1,310
24	1,350
November	
25	1,380
26	1,440
27	1,480
28	1,500
29	1,500
30	1,490
December	
1	1,470
2	1,490
3	1,460
4	1,420
5	1,410
6	1,380
7	1,420
8	1,390
9	1,470
10	1,490
11	1,490
12	1,470
13	1,470
14	1,440
15	1,460
17	1,500
18	1,530
19	1,510
20	1,490
21	1,480
22	1,470
23	1,470
24	1,510
25	1,480
26	1,450
27	1,470
28	1,510
29	1,510
30	1,530
31	1,520

North Floodway near Sebastian, Texas

Date	ECx10⁶ @25°C
January	
2	4,080
8	3,980
15	5,530
22	4,460
29	3,500
February	
5	5,610
12	4,460
19	3,750
26	5,530
March	
5	4,810
15	3,000
19	4,460
26	4,930
April	
2	5,570
9	5,510
16	5,960
23	5,930
April	
30	8,230
May	
7	6,240
14	3,950
21	5,940
28	4,410
June	
4	3,060
11	4,900
18	2,320
25	2,820
27	2,690
27	2,690
27	2,690
July	
2	3,660
2	3,710
9	5,430
16	3,300
23	5,580
30	5,640
August	
6	4,900
August	
13	4,010
20	3,690
27	4,060
31	3,150
September	
10	3,390
17	1,500
17	1,500
September	
17	1,500
17	1,500
24	4,580
24	4,580
October	
1	4,960
8	4,940
15	4,590
October	
22	4,510
29	4,700
November	
5	4,780
14	4,460
19	3,960
26	4,040
December	
3	4,250
10	4,810
17	3,980
21	5,010
28	4,790

RIO GRANDE SALT BURDEN

The term "salt," as used herein, means total dissolved solids. The 1951 concentrations in tons per acre-foot, which are marked by an asterisk (*), are based on the chemical analyses shown on preceding pages of this bulletin. Those not asterisked are based either on chemical analyses reported in previous Water Bulletins or have been arrived at by deduction. The normal concentrations shown for the period 1935 to 1951 are the weighted means of the values determined for the 17-year period indicated.



* Based on 1951 chemical analyses

SANITARY ASPECTS OF WATER QUALITY

The United States and Mexican Sections of this Commission and the Texas State Department of Health co-operate in the joint sanitary water-sampling program along the Rio Grande. All analyses below have been made under the "Rules of Laboratory Procedure," as approved by the participating agencies, and which conform with the procedures set out in the manual "Standard Methods for the Examination of Water and Sewage," Ninth Edition (1946), prepared by the American Public Health Association and the American Water Works Association. These analyses were made in the laboratories of the El Paso Water Plant, the Laredo Water Plant, the Cameron County Health Unit, and the International Boundary and Water Commission. The percentages of Dissolved Oxygen (D.O.) shown below are the percent saturation at the elevation of the sampling station.

Date 1951	D. O. Percent Saturation	B. O. D. Parts Per Million	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)	Date 1951	D. O. Percent Saturation	B. O. D. Parts Per Million	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)
Rio Grande at El Paso, Texas, Water Plant									
Jan. 2	93.3	2.8			Feb. 20	110	3.0	3,600	3,750
9	101	2.2	5,500	2,000	27	95.1	3.1	2,300	1,950
16	101	2.8	6,200	1,300	Mar. 6	112	4.6	70,000	3,250
23	97.2	2.9	38,000	1,750					
30	98.0	3.4	6,200	1,200					
Feb. 6	91.8	1.8	620	3,000	Total	984.7	34.8	170,420	35,800
13	85.3	>8.2	38,000	17,600	Average	98.5	3.5	18,900	3,980
Franklin Canal at El Paso, Texas, Water Plant									
Mar. 13	99.2	5.6	11,000	18,800	Aug. 21	95.0	2.1	3,600	10,650
20	97.1	3.6	3,600	8,550	28	91.7	1.4	5,500	11,750
27	82.2	3.5	70,000	12,550	Sept. 4	107	1.7	11,000	9,400
Apr. 3	87.4	2.2	140,000	6,850	11	107	4.2	16,000	93,200
10	97.8	1.4	2,300	2,200	18	92.9	1.4	70,000	18,900
17		2.0	16,000	2,700	25	91.9	1.1	140,000	44,050
24	97.8	1.5	5,500	4,000	Oct. 2	93.1	1.1	36,000	20,300
May 1	99.2	2.7	2,300	6,150	9	99.4	1.1	24,000	30,900
8	97.8	1.4	9,400	3,800	16	95.4		24,000	31,500
15	101	.6	16,000	3,900	23	95.7	1.0	9,400	10,350
22	107	1.5	3,600	2,700	30	93.2	1.1	22,000	19,150
29	108	.9	9,400	7,050	Nov. 6	106	1.5	3,600	
June 5	99.3	1.8	24,000	14,700	13	114	1.1	11,000	2,400
12		3.2	24,000	10,600	20	98.3	1.6	9,400	6,200
19	93.1	2.4	5,500	7,100	27	96.0	1.6	9,400	2,050
26	96.4	1.7	8,100	9,050	Dec. 4	91.7	.7	2,300	7,150
July 3	95.0		11,000	7,600	11	90.5	1.2	2,300	2,200
10	96.9	2.5	2,300	7,650	18	88.4	1.8	3,600	2,250
17	94.0	1.0	5,500	10,500	26	92.9	1.9	2,300	3,750
24	90.8	1.4	11,000	9,850					
31	108	1.4	3,600	6,450					
Aug. 7	96.1	1.9	3,600	12,550	Total	3,877.8	73.7	799,300	510,900
14	93.6	1.9	6,200	9,450	Average	96.9	1.8	19,000	12,500
Rio Grande at Ysleta, Texas–Zaragoza, Chih. Bridge									
Jan. 2	61.1	12.3	1,100,000	345,000	July 17	59.9	6.6	620,000	670,000
9	59.5	14.2	3,800,000	330,000	24	67.0	5.2	940,000	455,000
16	64.5	12.9	1,100,000	210,000	31	74.0	7.6	550,000	930,000
23	40.7	12.3	2,400,000	210,000	Aug. 7	71.0	4.9	360,000	720,000
30	61.4	13.8	2,400,000	205,000	14	59.9	6.3	2,400,000	890,000
Feb. 6	39.7	27.8	2,300,000	635,000	21	74.1	6.7	360,000	660,000
13	44.7	21.0	7,000,000	600,000	28	74.1	6.2	2,400,000	79,500
20	60.5	20.7	7,000,000	420,000	Sept. 4	53.3	6.0	3,600,000	73,000
27	24.4	18.8	14,000,000	1,075,000	11	59.0	7.5	6,200,000	10,205,000
Mar. 6	1.11	33.1	38,000,000	1,640,000	18	2.64	9.8	140,000,000	9,870,000
13	50.6	20.7	3,800,000	350,000	25	49.4	8.7	>240,000	1,570,000
20	73.1	10.6	230,000	90,000	Oct. 2	90.0	5.9	2,100,000	1,090,000
27	64.0	9.6	1,100,000	350,000	9	0	>30.0	38,000,000	3,270,000
Apr. 3	82.4	5.4	620,000	675,000	16	64.5		2,300,000	1,118,000
10	77.5	6.3	360,000	194,000	23	92.1	6.8	1,600,000	755,000
17	76.3	6.7	620,000	1,625,000	30	0	43.7	38,000,000	2,960,000
24	72.6	5.9	620,000	360,000	Nov. 6	82.1	14.2	2,300,000	
May 1	69.6	8.9	2,400,000	470,000	13	18.1	1.8	16,000,000	315,000
8	79.6	5.5	620,000	300,000	20	20.3	>72.0	70,000,000	2,375,000
15	74.2	22.9	24,000,000	2,140,000	27	5.53	153.0	38,000,000	3,450,000
22	20.3	32.7	24,000,000	3,310,000	Dec. 4	66.8	14.7	3,600,000	1,750,000
29	84.2		2,400,000	675,000	11	35.9	49.0	38,000,000	1,060,000
June 5	102	6.0	2,300,000	890,000	18	0	102.0	38,000,000	3,520,000
12	74.1	11.5	1,600,000	1,280,000	26		9.0	9,400,000	795,000
19	45.3	6.2	1,100,000	630,000					
26	56.2	7.6	2,300,000	760,000					
July 3	54.3		1,600,000	1,095,000	Total	2,785.88	937.3	617,740,000	70,709,500
10	52.3	6.3	14,000,000	1,265,000	Average	54.6	19.1	11,900,000	1,390,000

> Greater than

SANITARY ASPECTS OF WATER QUALITY

Rio Grande at Laredo, Texas, Water Plant

Date 1951	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)	Date 1951	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)	Date 1951	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)
Jan. 2	620	1,230	May 7	3,600	7,000	Sept. 24	2,300	4,000
8	28	710	14	6,200	42,500	Oct. 1	1,100	400
15	2,300	700	21	1,600	7,000	8	1,600	900
23	62	370	28	2,100	17,000	15	160	200
Feb. 5	230	410	June 18	2,300	32,000	22	360	300
12	620	440	25	16,000	6,250	29	230	250
19	62	580	July 2	230	400	Nov. 5	2,300	400
26	360	550	9	230	500	13	360	350
Mar. 6	160	650	16	110	360	19	2,300	500
13	270	1,750	23	360	600	26	2,300	300
19	1,600	1,200	30	940	650	Dec. 3	360	200
26	540	2,200	Aug. 6	2,400	575	10	36	250
Apr. 2	1,600	2,000	20	620	130	17	62	500
9	230	1,500	27	360	340	26	160	1,000
16	160	450	Sept. 4	93	80			
23	62	250	10	160	70	Total	130,195	153,895
30	360	400	17	70,000	13,500	Average	2,710	3,200

Rio Grande 9.1 Miles Below Laredo, Texas, R. R. Bridge

Jan. 2	16,000	6,500	Apr. 30	23,000	13,000	Oct. 8	13,000	5,500
8	6,200	3,000	May 7	240,000	24,000	15	3,400	12,000
15	3,600	4,900	21	240,000	40,000	22	6,200	15,000
23	16,000	2,700	28	110,000	15,000	29	36,000	4,000
Feb. 19	36,000	5,000	June 18	36,000	17,000	Nov. 5	62,000	2,400
26	11,000	3,700	25	240,000	25,000	13	110,000	10,000
Mar. 6	23,000	3,250	July 9	23,000	6,000	19	62,000	5,000
13	11,000	8,000	16	21,000	1,600	26	62,000	7,000
19	36,000	6,000	23	36,000	2,900	Dec. 10	62,000	4,000
26	62,000	8,000	30	12,000	1,000	17	9,300	6,000
Apr. 2	11,000	8,000	Aug. 6	110,000	2,000	26	35,000	14,000
9	380,000	2,750	Sept. 10	16,000	1,500			
16	62,000	5,700	24	36,000	8,000	Total	2,304,700	318,400
23	11,000	4,000	Oct. 1	16,000	5,000	Average	59,100	8,160

Rio Grande near Zapata, Texas

Mar. 28	24,000	3,900	July 16	62	120	Oct. 29	3,600	500
Apr. 3	16,000	450	23	360	200	Nov. 5	22,000	1,200
9	2,300	450	30	62	60	13	11,000	500
16	620	300	Aug. 6	2,400	340	19	70,000	3,200
24	1,100	700	20	620	165	26	70,000	3,550
May 1	2,300	5,500	27	230	125	Dec. 3	3,600	400
8	12,000	1,600	Sept. 4	110	30	10	24,000	1,400
14	23,000	70,000	10	110	80	17	38,000	10,000
22	6,200	10,000	17	24,000	11,500	26	600	1,100
29	9,400	22,000	24	11,000	2,500			
June 18	23,000	13,000	Oct. 1	1,600	1,100			
26	62,000	30,000	8	240,000	15,000			
July 2	260	1,000	15	230	550	Total	707,224	214,020
9	360	700	22	1,100	800	Average	19,100	5,780

Rio Grande at Falcón, Texas

Jan. 2	910	1,000	Mar. 5	360		May 1	3,600	14,500
8	3,600	6,400	13	140,000	41,350	8	6,200	16,000
15	16,000	12,800	19	1,100	1,700	14	36,000	70,000
23	3,600	1,600	28	24,000	4,500	22	2,300	2,000
Feb. 5	160		Apr. 3	24,000	1,200	29	3,600	23,000
12	110	700	9	1,100	1,300			
19	2,400	1,250	16	1,100	1,000	Total	272,100	202,700
26	1,600	1,600	24	360	800	Average	13,000	10,700

Rio Grande at Mercedes, Texas, Pumps

Jan. 2	620		May 7	2,300		Sept. 17	16,000	
8	93		14	11,000		24	6,200	
15	620		21	3,400		Oct. 1	3,600	
22	280		28	16,000		8	230	
29	620		June 4	3,600		15	3,600	
Feb. 5	210		11	8,100		22	270	
12	270		18	2,300		29	280	
26	160		July 2	3,600		Nov. 15	160	
Mar. 5	110		9	110		19	130	
12	930		16	270		26	260	
19	3,400		23	93		Dec. 3	160	
26	340		30	6,200		10	230	
Apr. 2	6,200		Aug. 6	230		17	540	
9	1,300		13	620				
16	8,100		20	540				
23	2,100		27	1,100		Total	117,436	
30	340		Sept. 10	620		Average	2,500	

RAINFALL ON THE UNITED STATES SIDE OF RIO GRANDE WATERSHED

INCHES—1951

The daily rainfall records tabulated below have not been published elsewhere. For each station there are indicated the source of the record and the type of rain gage in use. The general location of each station is shown on the map of the watershed, pages 52 and 53 of this bulletin.

American Dam Near El Paso, Texas

Recording gage Jan. 1 - Oct. 31, 1951
Standard gage Nov. 1 - Dec. 31, 1951

I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.	.01											.02													.27					.16		.19	.52
Feb.													.12	.08	.02																	.51	.55
Mar.									.15																	.08	.06	.20				.49	.34
Apr.						.09														.16								.01		.06		.52	.24
May																																0	.32
June																																0	.80
July		.10			.02						.04				T																.08	.65	1.43
Aug.			.02	T																		.36	.33	.06		.02		.12				.52	1.07
Sept.							.02	T																								.02	.94
Oct.																									.15					.41	.10	.66	.72
Nov.											.09																					.09	.23
Dec.						T	.28						.06							.02											T	.36	.49

Latitude 31° 47' Longitude 106° 32' Elevation 3,730 Feet — Period 1938-1951 — Total 1951 3.81 — 7.43

Island Station

Recording gage — I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.	.01											.10	.02																	.05		.18	.40
Feb.													.02												.17							.19	.27
Mar.									.09	.04																		.26				.39	.29
Apr.						.10													.06	.03										.04		.25	.17
May																							.04								.05	.09	.43
June				.18																												.18	.43
July				.01									.02									.06	.03								.35	.47	.97
Aug.	.07				T																					.16		.59	.12	.16		1.10	1.18
Sept.								.06																								.06	1.09
Oct.																														.16		.16	.90
Nov.											.02																					.02	.26
Dec.							.02	.27					.07							.01												.37	.48

Latitude 31° 32' Longitude 106° 14' Elevation 3,630 Feet — Period 1939-1951 — Total 1951 3.44 — 6.87

Fabens-Guadalupe Bridge, Texas

Standard gage — I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
---	---	---	---	---	---	---	---	---	---	---	---	.10	T	---	---	---	---	---	---	---	---	---	---	.15	.04	---	---	---	---	.06	---	.16	.47
Feb.																																.19	.20
Mar.					.10																					.05	.02	.26				.43	.36
Apr.						.06	.05												.13											.06		.30	.27
May											.30												.06									.36	.44
June																																0	.58
July			.06	.03								.06		.10	.05	.15						T			.96	.07	.55	.68	.12		.04	.40	.73
Aug.																																2.47	1.53
Sept.																									.05				.02	.20		.27	1.13
Oct.																																0	.23
Nov.																																	
Dec.							.26					.05	.03																			.34	.55

Latitude 31°26' Longitude 106° 08' Elevation 3,610 Feet — Period April 1940-1951 — Total 1951 4.92 — 7.82

County Line

Recording gage — I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.	.02												.06																		.01	.09	.50
Feb.																									.14							.14	.20
Mar.									.34	.02																.06		.30				.72	.34
Apr.						.10													.01											.02		.13	.28
May											.03												.09									.12	.29
June																																0	.62
July													.01	.02		.12				.02	T		.07	T								.24	1.01
Aug.	.07	.02	.20	.04							.58											.31	1.16						.16			2.34	1.45
Sept.						.82																								.13		.82	1.17
Oct.																																.13	.93
Nov.											.02																					.02	.24
Dec.						.14							.06							.01												.21	.49

Latitude 31° 25' Longitude 105° 59' Elevation 3,550 Feet — Period 1938-1951 — Total 1951 5.16 — 7.52

Fort Hancock Bridge, Texas

Standard gage — I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
---	---	---	---	---	---	---	---	---	---	---	---	---	.03	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	.01	.19	.53
Feb.	.35												T				T								.04							.04	.28
Mar.										.11																T	.03	.07	.20			.41	.28
Apr.			.03			.10														.07										.14		.34	.28
May																							T								.02	.02	.52
June					.03																											.03	.99
July				.02						.01						T	.28						.04	.03					T			.38	1.02
Aug.				.02	.12				.56		.02	.08										.35	.61	T		.14	.02	T		.16		1.50	1.11
Sept.																																.58	1.25
Oct.								.06														.08									.04	.18	1.10
Nov.																																0	.19
Dec.								.09					.03	.04																	T	.16	.59

Latitude 31° 16' Longitude 105° 51' Elevation 3,500 Feet — Period April 1940-1951 — Total 1951 3.83 — 8.14

Madden Arroyo Highway (U. S. 80) Bridge, Texas

Recording gage — I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
---	---	---	---	---	---	---	---	---	---	---	---	---	.04	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	.02	.06	.41
Jan.																	.05									.06						.11	.13
Feb.																												.22				.33	.17
Mar.						.14			.09	.02									.02	.02										.16		.54	.38
Apr.																							.05									.05	.55
May																																0	.63
June																																	
July									.05	.05			.25	.12		.43							.82									1.72	1.11
Aug.	.10							.02		.23												.18	.70		.20	.16			.18	.18		1.95	1.26
Sept.								.14																								.14	1.26
Oct.								.09														.12				.04						.25	1.33
Nov.											.01																					.01	.15
Dec.							.05						.03																			.08	.57

Latitude 31° 13' Longitude 105° 46' Elevation 3,500 Feet — Period September 1941-1951 — Total 1951 5.04 — 7.75

West Small, Texas

Standard gage — C. E. Chandler

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	.10								0	.51
Jan.																								.20								.10	.29
Feb.																												.45				.65	.23
Mar.																														.30		.30	.42
Apr.																																0	.63
May																																0	.95
June																																	
July				.60										.10		.60								.25								1.55	1.62
Aug.																										1.50			1.35			2.85	1.78
Sept.																																0	1.59
Oct.																																0	1.46
Nov.																																0	.84
Dec.																																0	.71

Latitude 31° 16' Longitude 105° 33' Elevation 4,070 Feet — # Period May 1940-1951 — Total 1951 5.45 — 10.43

Some months missing

RAINFALL ON THE UNITED STATES SIDE OF RIO GRANDE WATERSHED

INCHES—1951

Recording gage — **Guayuco Arroyo Highway (U. S. 80) Bridge, Texas** — I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.													.05																		.05	.08	.45
Feb.																	.02								.06							.08	.15
Mar.									.10	.03																		.28				.41	.18
Apr.						.15													.01											.31		.47	.22
May																				.02			.05								.11	.18	.40
June																																0	.58
July		.02		.22									.13	.04		.50	.02	.02			.01		.02	.01				.08				1.07	1.52
Aug.	.02	.04			.23						.92											.37			.25	.20				1.46		3.49	1.34
Sept.							.05	.02																								.07	1.52
Oct.								.06													.22					.11						.39	1.30
Nov.											.03																					.03	.19
Dec.							.02						.18																			.20	.56

Latitude 31° 10' Longitude 105° 40' Elevation 3,600 Feet # Period May 1940-1951 Total 1951 6.47 8.61

Recording gage — **Fort Quitman, Texas** — I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.													.05																		.05	.10	.56
Feb.																	.04								.06							.10	.24
Mar.									.07	.01															.08	.01		.23				.34	.26
Apr.						.02													.09											.22		.33	.31
May											.01																				.05	.04	.48
June				.02																												.02	.85
July													.05			.34					.06		.12	.01				.01				.59	1.40
Aug.			.02								1.04												1.00			.30			.67	.12		3.15	1.30
Sept.								.07																								.07	1.19
Oct.								.04													.02					.17						.23	.80
Nov.											.06																					.06	.24
Dec.									.02				.11																			.13	.46

Latitude 31° 06' Longitude 105° 36' Elevation 3,430 Feet # Period 1937-1951 Total 1951 5.16 8.09

Standard gage — **Neely Ranch, Texas** — Mrs. Tom Neeley

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	.48
Feb.																																0	.13
Mar.										.09																		.15				.24	.18
Apr.																			.20													.20	.12
May	.21										.46																					.67	.52
June				.20																												.20	.82
July																							.21									.21	1.54
Aug.											.86												.98			.35				.95		3.12	1.43
Sept.																	.60															.60	1.76
Oct.																																0	.94
Nov.																																0	.13
Dec.																																0	.51

Latitude 30° 59' Longitude 105° 32' Elevation 3,350 Feet Period August 1941-1951 Total 1951 5.24 8.56

Visual gage — **Al Roosevelt Ranch** — Al Roosevelt

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	
Feb.																																0	
Mar.															.31								.75									1.06	
Apr.																																0	
May																																0	
June																																0	
July		.25		.90									.85									T										2.00	
Aug.																																0	
Sept.		1.00							.50			.25																				1.75	
Oct.																																0	
Nov.																																0	
Dec.															.20																	.20	

Latitude 30° 32' Longitude 104° 33' Elevation 4,330 Feet Total 1951 5.01

Visual gage — **Quebec Ranch 1949** — George Jones

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	
Feb.																																0	
Mar.																																0	
Apr.																						.40	.40									.80	
May										.20	1.10																					1.30	
June																																0	
July															.60		1.10		.40	.20						.30						0	
Aug.																																2.60	
Sept.	1.00	.30					.40			.30																						2.00	
Oct.																			.80													.80	
Nov.																																0	
Dec.																													.50			.50	

Latitude 30° 31' Longitude 104° 24' Elevation 4,600 Feet Total 1949 8.00

Visual gage — **Quebec Ranch 1950** — George Jones

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.	.30	*.25											*.25																	.40		.90	
Feb.																																.30	
Mar.																																0	
Apr.																																0	
May																																0	
June		.70		.20						.20				.20								.20										1.50	
July		.40		.30	.40	.70				.20						.50							.20	.30							.25	3.25	
Aug.		.75																									1.30					2.05	
Sept.				.35	1.20														1.20		.35			.10	.30					.30		3.80	
Oct.	.40																															.40	
Nov.																																0	
Dec.																																0	

Total 1950 12.20

Visual gage — **Quebec Ranch 1951** — George Jones

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																.40	.45
Feb.																																0	.10
Mar.									.45																.60			.50				1.55	.52
Apr.																											.20	.20				.80	.53
May																											.80					.40	.37
June	.20										1.50												.50	.50					.40			3.90	1.80
July					.60								.70	.10		.10				.15	.15		2.00		.10							3.90	2.38
Aug.											.10		.20													.10	.60					1.00	1.88
Sept.								.60				.40																				1.00	2.27
Oct.																																0	.40
Nov.																																0	0
Dec.																																0	.17

Period 1949-1951 Total 1951 12.95 11.05

Visual gage — **Kelly Ranch 1949** — George Jones

Record began April 1, 1949

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																	
Feb.																																	
Mar.																							.90							.45		1.35	
Apr.			.80						.30			.10													.70							1.90	
May				.20							.85																					1.05	
June																					.08											1.08	
July					1.00							.22							.15													.52	
Aug.						.15																										.20	
Sept.		.15								.05									.80		.30		.60									1.70	
Oct.																																0	
Nov.																																.40	
Dec.										.40																							

Latitude 30° 32' Longitude 104° 16' Elevation 5,320 Feet

* Estimated daily precipitation # Some months missing

RAINFALL ON THE UNITED STATES SIDE OF RIO GRANDE WATERSHED

INCHES — 1951

Kelly Ranch 1950

Visual gage — George Jones

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.		.50											.30																	.60		1.40	
Feb.		.30																														.30	
Mar.																																0	
Apr.																																0.	
May																																0	
June	1.20									.95		.35								.15	.18		.30									3.13	
July					1.20		.10		.50		.75	.20	.30			.75		.90												.10	.80	5.40	
Aug.									.50																	.40		.50				1.20	
Sept.				.80	.40	.45			.40										1.20	.20	.90	.50	.40	.10						1.90		7.25	
Oct.	.40																															.40	
Nov.																																0	
Dec.																																0	
																															Total 1950	19.08	

Kelly Ranch 1951

Visual gage — George Jones

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.		.25																												.12		.37	.88
Feb.																																0	.15
Mar.									.70																.65					.25		1.60	.80
Apr.																																0	.45
May											.75																				.18	.93	.94
June																																0	1.59
July			1.70									.90	.40							.50		1.50										4.80	3.76
Aug.																						.20				.15	.60					.95	.89
Sept.							.30				.35																					.65	2.70
Oct.																																0	.70
Nov.																																0	0
Dec.													.40																			.40	.27
																									Period April 1949-1951						Total 1951	9.70	12.93

Petan Ranch 1950

Standard gage — Mr. Harrington

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	
Feb.																																.25	
Mar.																																0	
Apr.																																0	
May											.70										.60						2.00					3.30	
June	2.00		.20							.10	.50	.10			.50				1.20			1.10	.20									5.90	
July						.50						.30						.75		.30							.45	.10		.20	.90	3.50	
Aug.	1.10															.70										.35		.45		.10		2.70	
Sept.						.10						.25								.70				.80						1.50		3.15	
Oct.	.80	.45																														1.25	
Nov.																																0	
Dec.																																0	
	Latitude 30° 04' Longitude 104° 29' Elevation 5,400 Feet																														Total 1950	20.05	

Petan Ranch 1951

Standard gage — Mr. Harrington

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	0
Feb.																																0	.12
Mar.									.60																.45							1.05	.52
Apr.																												.30				.50	.15
May											1.00														.10							1.10	2.20
June																																0	2.95
July		.60		.50	.70																				.85							2.65	3.08
Aug.											.60	.10				.70											.30			.10		1.80	2.25
Sept.									.29	3.10	.30																					3.69	3.42
Oct.																		.30														.30	.78
Nov.																																0	0
Dec.													.40																			.40	.20
																									Period 1950-1951						Total 1951	11.29	15.67

Livingston Ranch

Standard gage — J. S. Livingston

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.													.25																			.25	
Feb.								.11																								0	
Mar.																									.24							.35	
Apr.																																0	
May																		.15														.15	
June																				1.00												1.00	
July															.30																.19	.49	
Aug.	.02																	.45								.35		.40				1.22	
Sept.						.48															.40	.70						.03				1.61	
Oct.	1.55															1.15																3.25	
Nov.																																0	
Dec.																																0	
	Latitude 29° 49' Longitude 104° 22' Elevation 4,150 Feet																														Total 1951	8.32	

Presidio, Texas

Standard gage — I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.		.10																												.04		.14	.16
Feb.																		.03														.03	.12
Mar.									.33																.19	.17						.69	.34
Apr.																																0	.06
May						.11					.13									.15	.05										.07	.49	.32
June	.06			.85																												.91	1.08
July				.33							.44		.27			.20	.12							.03				.02				1.41	1.82
Aug.											.07	.05															.05	.35	.06			.56	.43
Sept.										.05		.04																				.09	1.18
Oct.																										T						T	.60
Nov.																																0	0
Dec.													.16	.05																		.21	.22
	Latitude 29° 34' Longitude 104° 23' Elevation 2,550 Feet																								Period November 1949-1951						Total 1951	4.53	6.33

Bloys Camp 1950

Visual gage — J. H. McMichael

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																1.50	
Feb.																																0	
Mar.																																.41	
Apr.																											.40					.50	
May																																.40	
June																																4.70	
	No daily records available except for May and October																																
July																																0	
Aug.																																4.25	
Sept.																																5.20	
Oct.	2.00																															2.00	
Nov.																																0	
Dec.																																0	
	Latitude 30° 35' Longitude 104° 07' Elevation 5,650 Feet																															18.96	

Bloys Camp 1951

Visual gage — J. H. McMichael

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.													.10				.12															.25	.64
Feb.									.30																							.22	.51
Mar.						.30													.10						1.00			.25	.20			1.75	.58
Apr.											1.10					.10								.20				T			.20	.40	.58
May					T																											1.60	1.79
June		.20			.50								.10											.20								1.00	2.35
July	.40	.10	.30	.15							T	.70	.10			.25						.15	.10	.40							.40	2.95	2.88
Aug.									.60	.50	.40											T				T		.80		1.25	.20	3.85	3.48
Sept.						.30	.60			.10	.50													T								2.10	3.32
Oct.															.12													T				.12	1.87
Nov.										T	.10													T			.25					.35	.40
Dec.										T						.60																.60	.65
																									‡ Period 1941-1951						Total 1951	14.59	18.65

‡ Some months missing

RAINFALL ON THE UNITED STATES SIDE OF RIO GRANDE WATERSHED

INCHES — 1951

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Marfa Experiment Station 1950 — Standard gage — P. H. Vardiman																																	
Jan.												.05																		.18		.23	
Feb.																				.08												.08	
Mar.																																0	
Apr.												.57		.26																		.83	
May																					.05						.26					.31	
June	1.05			.12				.12				.07							.12			.97										2.45	
July			.45			.06				.05	.31	.08	.13			.40	.03		.50						.10					1.31	.40	3.82	
Aug.		.69																							.41	.27		.09				1.46	
Sept.			.05	.11						.14		.29		.94					.10	.63		.33	.04	.21						.67		3.51	
Oct.																																.23	
Nov.																																0	
Dec.																																0	
Latitude 30° 20' Longitude 103° 59' Elevation 4,800 Feet — Total 1950																																12.92	
Marfa Experiment Station 1951 — Standard gage — P. H. Vardiman																																	
Jan.		.05																												.05		.10	.16
Feb.													.05				.15															.20	.14
Mar.								.40	.37																.39							1.16	.98
Apr.																																0	.42
May											.61									.48			1.93								.29	3.31	1.81
June		.32											.56																			.88	1.66
July						.05				.24	.33	.02				.05						.39	.19	.71								1.34	2.58
Aug.							1.65	.23		.16	.12																.88		.18			1.70	1.58
Sept.																																2.16	2.84
Oct.																			.11													.11	.17
Nov.																										T						T	T
Dec.													.19																			.19	.10
Period 1950-1951 — Total 1951																																11.15	12.04
Joe C. Mitchell Ranch 1950 — Standard gage — Joe C. Mitchell																																	
Jan.																																0	
Feb.																																0	
Mar.																																0	
Apr.																																1.00	
May																																0	
June	1.45											.18										1.25										2.88	
July										.80			.15			.80	.30		1.50						.30					.98	.40	5.17	
Aug.		1.70															.73									.55						2.98	
Sept.				.15	.10				.36			.20		.36						.20	.65	.50		.70						.70		3.92	
Oct.	.25																															.25	
Nov.																																0	
Dec.																																0	
Latitude 30° 16' Longitude 104° 00' Elevation 4,710 Feet — Total 1950																																16.20	
Joe C. Mitchell Ranch 1951 — Standard gage — Joe C. Mitchell																																	
Jan.																																T	T
Feb.																																0	0
Mar.									.50																.43							.93	.46
Apr.																																0	.50
May											.65									.47			1.15								.60	2.87	1.44
June		.75											.50	.80																		2.05	2.46
July		.40	.45																					.60				.80				1.45	3.31
Aug.																																.80	1.89
Sept.							1.45		.20	.47	.24																					2.36	3.14
Oct.																																0	.12
Nov.																																0	0
Dec.													.20																			.20	.10
Period 1950-1951 — Total 1951																																10.66	13.42
Kerr Mitchell Ranch 1949 — Standard gage — Mrs. Kerr Mitchell																																	
Jan.											.96			.15								.31								.25		1.67	
Feb.												.10																				.10	
Mar.																																0	
Apr.				.45																		.50	.55									1.50	
May			.73						.15																			.22				1.10	
June					.48					.73	.85	.68						.43			.20				.35							3.72	
July									.26														.58		.50							1.14	
Aug.								.40	.33							1.03																1.80	
Sept.								.55	.45	1.17		.16																				2.33	
Oct.																	.96						1.00									1.96	
Nov.																																0	
Dec.																														.36		.36	
Latitude 30° 13' Longitude 104° 00' Elevation 4,450 Feet — Total 1949																																15.68	
Kerr Mitchell Ranch 1950 — Standard gage — Mrs. Kerr Mitchell																																	
Jan.												.40																	.16			.56	
Feb.																																0	
Mar.																																0	
Apr.															No record for April and May																		
May																																	
June	1.01						.19					.40	.20						.11			1.13	.13									3.40	
July						.21					.42	.20				.65			.52						.69				1.59			4.28	
Aug.		.26																														.26	
Sept.					.87	.13														.46	.38	.36	.27	.22					.96			3.67	
Oct.	.59																															.59	
Nov.																																0	
Dec.																																0	
Kerr Mitchell Ranch 1951 — Standard gage — Mrs. Kerr Mitchell																																	
Jan.																																0	.60
Feb.																	.13															.13	.05
Mar.									.17	.28															.11	.20						.76	.19
Apr.																																0	.78
May											.80									.45			.40								.41	2.06	1.31
June		.75										.19																				.94	1.78
July	.09			.36										.70	.17									.84		.10						2.26	2.18
Aug.										.22										.40	.64											1.26	2.14
Sept.										.30	.13	.26																				.69	2.13
Oct.																																T	1.55
Nov.																							T									T	.18
Dec.													.21																			.21	.56
♯ Period 1941-1951 — Total 1951																																8.33	13.45
Loma Vista Ranch 1950 — Standard gage — Victor Chávez																																	
Jan.															.51																.33	.84	
Feb.																																0	
Mar.																																0	
Apr.												.43	.50	.42																		1.35	
May																												.20				.20	
June	.87						.11						.29		.36				.44	.18		.36										2.41	
July											.17		.48				.79										.42					1.86	
Aug.	.47																.37									.20						1.04	
Sept.						.45					.28			1.18							.43		.13	.10								2.57	
Oct.		.98																														.98	
Nov.																																0	
Dec.																																0	
Latitude 30° 13' Longitude 103° 47' Elevation 5,450 Feet — Total 1950																																11.25	

♯ Some months missing

RAINFALL ON THE UNITED STATES SIDE OF RIO GRANDE WATERSHED

INCHES — 1951

H. T. Fletcher Ranch 1949

Standard gage — H. T. Fletcher

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.							T	.18	.35	.55	.33	.05	.15			T	.12					.33		.22		.05	T		.10			2.39	
Feb.											.14										T	.01	.08	.25				.07				.55	
Mar.	.02						T													T												.02	
Apr.	T		.21	.18																	.12	.40	.07	.02								.94	
May			.19	.35						T	.52	T														T		.02				1.08	
June					.04					.59	.48					.56		T			.08		T	.13		T	T	T				1.63	
July					.12	T	T	T	.04		T	.22	.30								.72	T	.07	.30	.15		T	.34		T	T	2.26	
Aug.				T	.07	.10	.68	.48		T						1.52	.80			T	.08			.06		.06	T					3.89	
Sept.			T	.10	.11				T	1.05	1.36	.09	T	.07	T				T													2.78	
Oct.					.05										T		1.17	T			T	.07	.83									2.10	
Nov.																																0	
Dec.										.02																		.05	.07	.07		.21	
Total 1949																																17.86	

Latitude 30° 12' Longitude 104° 16' Elevation 5,100 Feet

H. T. Fletcher Ranch 1950

Standard gage — H. T. Fletcher

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.								T				.22																		.31	T	.53	
Feb.													.01							T												.01	
Mar.																																0	
Apr.												.09											T									.09	
May											.07						.15				.05						.84					1.11	
June	.55		T	.05			T			.05		.15	.16						T	.03	.06	T	.29	.34				T		T		1.68	
July			T	T		.32	T	T	.41	.20	.26	.06	.25	T		.03	1.12		.21	.10				.02	T	T	T			1.44		4.42	
Aug.		.02						.15									.06									.05	T	T	T			.26	
Sept.			.05	T	.12	.15	T						T			.02		.02	.58		.68	.17	.59	.05						.18		2.37	
Oct.	.24	.18		.08																.01												.51	
Nov.																																0	
Dec.																																0	
Total 1950																																11.20	

H. T. Fletcher Ranch 1951

Standard gage — H. T. Fletcher

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.	T	.10											T															T				.10	.93
Feb.	T												T				.09					T										.09	.13
Mar.								.22	.59																.77		.04	.06				1.68	.35
Apr.						T														T								T				T	.55
May					.26						.99									.32			.80								.24	2.61	1.42
June			.02										.06								.17	T										.25	1.52
July	.11	.05											T									T	1.20	.87		T	.65	.11	T		T	2.23	2.56
Aug.	T									.15									.02			1.02										1.99	3.38
Sept.							.88		.35	.23	.17												T									1.63	1.80
Oct.																	.09															.09	1.61
Nov.											.01												.02									.03	.30
Dec.										.02			.08	.02																		.12	.42
♯ Period 1939-1951																																Total 1951 10.78	14.97

McFarland Ranch 1949

Standard gage — M. E. Romer

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
---	---	---	---	---	---	---	---	---	---	.46	---	1.25	---	.21	---	---	---	---	---	.50	.43	---	.52	.16	---	---	---	---	---	---	3.01	---
Feb.																																.52	
Mar.																																0	
Apr.			.20																			.43	.35									.98	
May			1.21									.47															.17					1.85	
June											2.08												.20				.65					2.95	
July						.62	.85		.52					.35									.84	.25				.80				4.21	
Aug.								.50									.80															1.30	
Sept.		.48											.78						.80													1.50	
Oct.																	1.05						1.10									2.06	
Nov.																																2.15	
Dec.																																0	
Total 1949																														.27		.27	

Latitude 30° 04' Longitude 104° 16' Elevation 3,350 Feet

McFarland Ranch 1950

Standard gage — M. E. Romer

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
---	---	---	---	---	---	---	---	---	---	---	---	.25	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	.46	---	.71	
Feb.																																0	
Mar.																																0	
Apr.													.21																			.21	
May											.17										.70						.60					1.47	
June	.30											.15	.50									.16										1.09	
July										.75						.53	.82		1.24						.51					1.05		4.90	
Aug.																	.58															.58	
Sept.					.48														1.50	1.10		.45	.30									3.83	
Oct.	1.11	.13																		.05												1.29	
Nov.																																0	
Dec.																																0	
Total 1950																																14.08	

McFarland Ranch 1951

Standard gage — M. E. Romer

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	1.06
Feb.									.86	.33							.11															.11	.23
Mar.																								.70								1.89	.43
Apr.								.20																								0	.76
May																		.75					.50								.70	2.15	1.66
June		.23																														.23	1.12
July			.38																			.60	.70									1.68	3.10
Aug.																																1.43	2.57
Sept.			.27							.40	.32																					.99	2.43
Oct.																	.38															.38	1.74
Nov.																								.18		.04						.22	.56
Dec.													.25																			.25	.78
♯ Period 1941-1951																																Total 1951 9.33	16.20

N. B. Chaffin Ranch 1947

Standard gage — N. B. Chaffin

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	.40	---	---	---	---	---	.57	---	---	---	.44	---	---	---	---	.97	
Feb.							.12																									.44	
Mar.							.42										.23															.35	
Apr.																																.42	
May				.29						1.35													.11		.23							1.71	
June																							.18						.27	.04		.78	
July																								.18								.18	
Aug.									.90	.34		.64	.42		2.00										.34	.60					3.34	
Sept.																																1.88	
Oct.			.06																													.06	
Nov.													.23				.25															.48	
Dec.		1.05																														1.05	
Total 1947																																11.66	

Latitude 29° 54' Longitude 104° 02' Elevation 3,800 Feet

N. B. Chaffin Ranch 1948

Standard gage — N. B. Chaffin

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
---	---	---	---	---	---	---	---	---	---	.18	.40	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	.58	
Feb.												No record for February, April, August, and December																					
Mar.																					.55											.55	
Apr.																																	
May															.50										.58							1.08	
June																				.34		.88	.15	.05	.20		.12					1.74	
July																												.40				.40	
Aug.																																	
Sept.																				1.05												1.05	
Oct.							.20									.40	.22															.82	
Nov.													.15																			.15	
Dec.																																	

♯ Some months missing

RAINFALL ON THE UNITED STATES SIDE OF RIO GRANDE WATERSHED

INCHES—1951

N. B. Chaffin Ranch 1949

Standard gage — N. B. Chaffin

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.									.08			.12								.09		.45			.05					.10		.77	
Feb.																								.08								.20	
Mar.																							.41									0	
Apr.																								.08								.49	
May						.14	.31			.75		.43								.15						.42	.08					.30	
June																																1.78	
July							.31	.05			.09	*.05								.20	.16	.15			.51				.72	.40		2.62	
Aug.			.08				1.00			.14		.11			.22												.22					1.77	
Sept.		.40																.15	.28			.90										1.73	
Oct.																																0	
Nov.																																0	
Dec.																																.50	
																															Total 1949	10.36	

N. B. Chaffin Ranch 1950

Standard gage — N. B. Chaffin

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.													Daily distribution incomplete for January																	.47		.99	
Feb.																																	
Mar.																																.52	
Apr.						.18		.34																				.95				.95	
May																																4.05	
June								.20				1.00	.65	.48								.40	.60							.72			
July													.25						.70							.25	.50			2.43	.07	4.20	
Aug.																	.50	.40			1.00	1.60	1.00	.50	1.30							6.30	
Sept.																																	
Oct.																																	
Nov.																																	
Dec.																																	

N. B. Chaffin Ranch 1951

Standard gage — N. B. Chaffin

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																T	.66
Feb.									.41																.61							0	.21
Mar.																																1.02	.48
Apr.												.30																				0	.36
May																							.11									.41	.93
June		.46																														.46	1.76
July		.85		.75								.45								.10												1.10	1.70
Aug.			.55					.12		1.85			.30															.15				1.15	2.09
Sept.																																2.27	2.64
Oct.																																0	.22
Nov.																																0	.16
Dec.													.38																			.38	.64
																																# Period 1947-1951 Total 1951 6.79	11.85

Van Eman Ranch (Formerly Milton Baugh) 1947

Standard gage — L. T. Van Eman

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	
Feb.																																0	
Mar.																		.39														.39	
Apr.																																0	
May										T																						T	
June																												.50		.20		.70	
July																																.41	
Aug.									1.50	.35			.70	2.00	.55								.26	.15	1.70							4.95	
Sept.											.10	.20										.17										1.85	
Oct.																																.47	
Nov.																	.30															.30	
Dec.			.90																													.90	
																																Total 1947 9.97	

Latitude 29° 52' Longitude 103° 59' Elevation 3,900 Feet

Van Eman Ranch (Formerly Milton Baugh) 1949

Standard gage — L. T. Van Eman

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
---	---	---	---	---	---	---	---	---	---	.92	---	---	---	---	---	---	---	---	---	---	---	.65	.20	.10	---	---	---	---	---	---	---	1.67	---
Jan.											.10																					.30	
Feb.																																0	
Mar.			.45																			.15	.69	.35				.18				1.60	
Apr.												.25																				.41	
May								.25		1.05	.40																					1.70	
June																																.48	
July					.21										.42						.62	.26	.10	.92	.45			.16				2.93	
Aug.										.55	1.10	.17		.12	.45	.70																1.65	
Sept.												.25				.40			.20	.60												3.08	
Oct.																.30			.55			.17										1.00	
Nov.																												.66				0	
Dec.																																.66	
																																Total 1949 15.00	

Van Eman Ranch (Formerly Milton Baugh) 1951

Standard gage — L. T. Van Eman

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	.36
Feb.															.15																	.15	.15
Mar.								.56																	.40							.96	.45
Apr.												.20									.07			.30							.60	0	.53
May																						.33	.15									1.17	.53
June																																.48	.96
July		.25		1.50										.45																		2.20	1.85
Aug.			.16				.47				.10	.10																				.73	2.44
Sept.							1.00		.10	.45	.80																					1.75	2.23
Oct.																																0	.40
Nov.																																0	.10
Dec.														.35							T											.35	.64
																																# Period 1947-1951 Total 1951 7.79	*10.93

A. L. Baugh Ranch 1949

Standard gage — A. L. Baugh

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
---	---	---	---	---	---	---	---	---	---	---	---	.81	---	.05	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	.86	---
Jan.																																0	
Feb.																																0	
Mar.				.50																		.15	.85	.35								1.85	
Apr.																																	
May								.55		.98	.38																					1.91	
June																																	
July																						.39	.10	.14	.22	.55		.46				1.86	
Aug.				.14		.18		.08				.46				.65																1.51	
Sept.					.18									.35																		.53	
Oct.																																0	
Nov.																														.60		.60	
Dec.																																	

Latitude 29° 52' Longitude 104° 02' Elevation 3,820 Feet

A. L. Baugh Ranch 1951

Standard gage — A. L. Baugh

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	.90
Feb.																																0	0
Mar.										.65																						1.03	.32
Apr.																																0	.46
May																															.32	.32	.92
June								.30		.27																						.57	1.33
July																																0	1.91
Aug.										1.20																						1.20	2.31
Sept.										.60		1.40																				2.00	1.82
Oct.																																0	1.16
Nov.																	.38															0	.28
Dec.																																.38	.73
																																# Period 1942-1951 Total 1951 5.50	12.16

Some months missing * Average for 1947, 1949, and 1951

RAINFALL ON THE UNITED STATES SIDE OF RIO GRANDE WATERSHED

INCHES — 1951

McCracken Ranch 1949

Standard gage — J. M. Humphreys

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.									.07	.81	.05	.02		.23			.02					.50		.06	.02				.04			1.82	
Feb.												.13											.05	.03				.03				.24	
Mar.																																0	
Apr.			.28																			.05	.30	.53								1.16	
May			.12								.12															.08		.24				.56	
June					.09	.57	.43														.04			.19				.41				1.73	
July						.47			.16			.18			.04					.07	.05		.12	.41	.09			.34	.05			1.96	
Aug.					.20	.16		.16			.30		.44				.52		.12													1.90	
Sept.				.34	.33					.10		.59		.06					.08													1.50	
Oct.																	.49				.21											.70	
Nov.																																0	
Dec.																														.47		.47	
Total 1949																																12.04	

Latitude 29° 51' Longitude 104° 14' Elevation 4,250 Feet

McCracken Ranch 1950

Standard gage — J. M. Humphreys

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.												.28																		.54		.82	
Feb.													.14							.03												.17	
Mar.																																0	
Apr.												.36											.04									.40	
May											.13										.10						.03				.06	.32	
June	.03		.28					.08											.20			.03	.23	.28								1.15	
July						.03				.08	.05				.05		.28						.08		.06	.11			.23	1.85		2.82	
Aug.																.07	.71								.27		.27	.04				1.36	
Sept.					.08	.07	.07														.54	.55	.27	.76						.93		3.25	
Oct.	.03	.34																														.37	
Nov.																																0	
Dec.																																0	
Total 1950																																10.64	

McCracken Ranch 1951

Standard gage — J. M. Humphreys

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																.15	.72
Feb.																	.12															.12	.15
Mar.								.17	.19																.42							.78	.17
Apr.																																0	.63
May						.06					.27												.04								.13	.50	.95
June		.34																				.07										.41	1.26
July		.41											.22			.26				.05		.03						.76				1.73	2.44
Aug.			.30																									.91				1.21	2.19
Sept.	.30						.08	.03	.04	.23	.23																					.91	2.04
Oct.																																.09	1.43
Nov.																																.06	.27
Dec.																																.42	.64
∮ Period 1941-1951 — Total 1951																																6.38	12.89

H. M. Greenwood (Cienega Ranch) 1949

Standard gage — H. M. Greenwood

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.										.45	.55	.09		.23			.03					.15							.03			1.53	
Feb.												.15																				.15	
Mar.																																0	
Apr.			.22																			.08	.28	.10								.68	
May			.12									.08														.08	.07					.35	
June					.23					.63	.38					.08											.15					1.47	
July							.08		.06			.47									.16	.07		.52				.71	.13	.11		2.31	
Aug.					.19	.12			.48		.27	.17	.05		.26																	1.54	
Sept.				.31	.31						.46	.16							.19													1.43	
Oct.																	.44	.05														.49	
Nov.																																0	
Dec.																													.43			.43	
Total 1949																																10.38	

Latitude 29° 47' Longitude 104° 13' Elevation 4,000 Feet

H. M. Greenwood (Cienega Ranch) 1950

Standard gage — H. M. Greenwood

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.													.26																	.25		.51	
Feb.												.13								.13												.26	
Mar.																																0	
Apr.												.90											.10									1.00	
May										.07																					.07	.14	
June	.39		.27					.21											.17			.16	.08									1.28	
July										.07						.36										.09			.07	1.10	.04	1.73	
Aug.																									.42	.21	.08					.71	
Sept.							.17														.58	.45	.25	.11						.91		2.47	
Oct.	.40																															.40	
Nov.																																0	
Dec.																																0	
Total 1950																																8.50	

H. M. Greenwood (Cienega Ranch) 1951

Standard gage — H. M. Greenwood

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.		.08											.04																		.04	.16	.66
Feb.													T				.06															.06	.11
Mar.								.22	.28																.42							.92	.17
Apr.																			.04													.04	.79
May					.02						.08																			.08		.18	1.01
June		.12													.30	.13																.55	1.59
July																																0	2.00
Aug.			.50									.10															.65					1.25	1.95
Sept.	.06						.10			.57	.16																					.89	2.86
Oct.																		.37														.37	1.43
Nov.																							.06									.06	.23
Dec.													.44																			.44	.70
∮ Period 1941-1951 — Total 1951																																4.92	13.50

Cienega Mountain 1950

Visual gage — H. M. Greenwood

Record began August 25, 1950

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																	
Feb.																																	
Mar.																																	
Apr.																																	
May																																	
June																																	
July																																	
Aug.																							1.45	.90	1.00		1.20					2.65	
Sept.							.50																									0	
Oct.																																0	
Nov.																																0	
Dec.																																	

Latitude 29° 47' Longitude 104° 11' Elevation 4,100 Feet

Cienega Mountain 1951

Visual gage — H. M. Greenwood

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	
Feb.																																0	
Mar.								.70	.40																							1.10	
Apr.																																0	
May																																0	
June																																0	
July																																0	
Aug.																																0	
Sept.										1.00	.50																					1.50	2.08
Oct.																																0	0
Nov.																							.06									.06	.03
Dec.													.44																			.44	.22
Period August 1950-1951 — Total 1951																																3.10	

∮ Some months missing

RAINFALL ON THE UNITED STATES SIDE OF RIO GRANDE WATERSHED

INCHES— 1951

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average

Rawls Ranch 1946

Recording gage — Jack Rawls

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.				.08		.56	1.32						.10	.22					.06													2.34	
Feb.																																0	
Mar.																																0	
Apr.																			.20													.20	
May				.03			.20	.31											.54													.54	
June	.31																		.76			.66					.32					2.05	
July					.38	.63								.14																		1.15	
Aug.				.42			.27		.18					.02														.04			.07	1.00	
Sept.															.75		.10		.52		.02				.02	.26						1.67	
Oct.		1.34																														1.34	
Nov.																																0	
Dec.										.37	.04																				.10	.51	

Latitude 29° 40' Longitude 104° 02' Elevation 3,830 Feet — Total 1946: 10.80

Rawls Ranch 1947

Recording gage — Jack Rawls

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.								.04	.07	.11							.40															.62	
Feb.																																0	
Mar.						.05	.05																									.10	
Apr.																																0	
May								.02	.10	.58														.11						.12		.93	
June											.10					.04												.12				.26	
July																								.20								.20	
Aug.		.03	.07										.16	3.18																		3.44	
Sept.								.52	.84		.04	.35																				1.75	
Oct.											.25		.06																			.31	
Nov.																	.18															.18	
Dec.			.94			.10																										1.04	

Total 1947: 8.89

Rawls Ranch 1948

Recording gage — Jack Rawls

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	
Feb.																																0	
Mar.																																0	
Apr.																				1.00	.08	.24										1.32	
May															.10							.10						.06		.08	.30	.64	
June												.12									.54					.33						.99	
July															.08								.20				.26			2.23		2.77	
Aug.									.03				.22																			.27	
Sept.								.10	.04	.13														.08								.35	
Oct.															.23	.14	.95				.18	.08										1.58	
Nov.														No record for November and December																			
Dec.																																	

La Mota Ranch

Visual gage — Mrs. A. I. Mills

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.	.10																															.10	.90
Feb.																																0	.14
Mar.																										.80						.80	.41
Apr.																																0	.18
May											.25									.50											.30	1.60	1.52
June			.10		.55																											.10	2.00
July		1.25											.20																			1.45	1.00
Aug.			.10							2.50	.15																.10	.15				.35	1.14
Sept.																											.20					2.85	2.42
Oct.																																.80	.07
Nov.																																0	.36
Dec.																																0	.21

Latitude 30° 35' Longitude 105° 29' Elevation 3,750 Feet — ♯ Period 1943-1947 and 1951 — Total 1951: 7.25 — 10.35

Mariposa Mine

Visual gage — Frank Duncan

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	
Feb.						1.60																										1.60	
Mar.	.20																															.20	
Apr.																																0	
May																																0	
June																																0	
July				.40			.50			.10			.20	T						.50									T			1.50	
Aug.																																0	
Sept.										.50															.20		T	.20				.50	
Oct.																																.40	
Nov.																																0	
Dec.														.40																		.40	

Latitude 29° 20' Longitude 103° 43' Elevation 3,500 Feet — Total 1951: 4.60

B. H. Davis Ranch 1949

Standard gage — B. H. Davis

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																1.21	
Feb.																																.11	
Mar.		.12																														.12	
Apr.			.37																			.33	.06									.76	
May			.22						.48																	1.40	.38					2.48	
June				1.04						.97	.82																		.22			3.05	
July																																1.12	
Aug.							1.22						.22										.22		.68							1.77	
Sept.										.50					.55																	.82	
Oct.																	.14	.18														1.19	
Nov.																																0	
Dec.																																.48	

Latitude 30° 07' Longitude 103° 44' Elevation 5,000 Feet — Total 1949: 13.11

B. H. Davis Ranch 1950

Standard gage — B. H. Davis

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.														No daily records available in 1950																		.81	
Feb.																																0	
Mar.																																0	
Apr.																																.42	
May																																.80	
June																																1.90	
July																																1.65	
Aug.																																1.20	
Sept.																																2.96	
Oct.																																2.25	
Nov.																																0	
Dec.																																0	

Total 1950: 11.99

B. H. Davis Ranch 1951

Standard gage — B. H. Davis

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	.66
Feb.																	.22															.28	.20
Mar.									.74	.19															.27							1.20	.35
Apr.																																0	.49
May											1.13										.34			.38							.55	2.40	1.61
June			.33																													.33	2.11
July														No daily record available July through December 1951																		3.09	2.58
Aug.																																0	2.22
Sept.																																1.19	2.10
Oct.																																0	1.08
Nov.																																0	.28
Dec.																															.30	.30	.79

♯ Period 1940-1951 — Total 1951: 8.73 — 14.27

♯ Some months missing

RAINFALL ON THE UNITED STATES SIDE OF RIO GRANDE WATERSHED

INCHES — 1951

Crosson Ranch 1949

Standard gage — B. H. Davis

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																2.18	
Feb.																																.08	
Mar.																																.18	
Apr.			.38																			.31	.31	1.00								2.00	
May			.18																							.60	.72					1.50	
June			.36	.12	.10				.30	.44																						1.32	
July																					.48	.50		.12	.93					.48		2.66	
Aug.						.20					.35																					.95	
Sept.								1.18	.35	.14		.26																				4.19	
Oct.											.69		.52																			1.50	
Nov.																																0	
Dec.																														1.06		1.06	
Total 1949																																17.62	

Latitude 30° 03' Longitude 103° 41' Elevation 4,760 Feet

Crosson Ranch 1950

Standard gage — B. H. Davis

No daily records available in 1950

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																.51	
Feb.																																0	
Mar.																																0	
Apr.																																.09	
May																																1.41	
June																																1.94	
July																																2.42	
Aug.																																2.01	
Sept.																																2.54	
Oct.																																1.79	
Nov.																																0	
Dec.																																0	
Total 1950																																12.71	

Crosson Ranch 1951

Standard gage — B. H. Davis

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	.66
Feb.																																.22	.25
Mar.									.55	.28								.22							.35		.15					1.33	.28
Apr.											1.18										.19			.38								0	.51
May																															.29	2.04	1.45
June	.40																															.40	2.11
July																																1.43	2.94
Aug.																																.62	2.49
Sept.																																1.17	2.66
Oct.																																0	1.20
Nov.																																0	.54
Dec.																																1.15	.75
♯ Period 1933-1951 / Total 1951																																8.36	15.84

Johnson Ranch, Texas

Standard gage — I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																T	.54
Feb.	T																															T	.14
Mar.			T							.01	.04											.52	.49	T						T		1.06	.17
Apr.												.18									.78											T	.48
May																																.96	.97
June			T	.10			.13								T																	.23	1.19
July			.40	1.17	.99													.18			.16	.09										2.99	1.40
Aug.									.13		.02	T														.18						.20	.76
Sept.												.18																				.31	1.56
Oct.																						.08				.09						.17	.68
Nov.															.04																	0	.85
Dec.																																.04	.38
♯ Period 1933-1951 / Total 1951																																5.96	8.92

Latitude 29° 01' Longitude 103° 25' Elevation 2,050 Feet

Kokernot Ranch No. 2 1949

Visual gage — David Kokernot

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.											.50																					1.69	
Feb.												.10				.11							.70		.18		.10			.10		.20	
Mar.																									.10							0	
Apr.			.45																				.70		.20							1.35	
May			.35																										.20			.55	
June			.18									.40	.10	.10			.25										.15					1.18	
July												.25									.25			.70						.70	.40	2.30	
Aug.	.30				.20			.50						.30								.85										2.15	
Sept.								.30		.25	.30	.20	.75		.30	.08		.40	.60													3.18	
Oct.																	.50				.10	.30	.50									1.40	
Nov.																															.85	0	
Dec.																																.85	
Total 1949																																14.85	

Latitude 29° 59' Longitude 103° 35' Elevation 4,170 Feet

Kokernot Ranch No. 2 1950

Visual gage — David Kokernot

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	
Feb.																																0	
Mar.												.20																				0	
Apr.											.15	.20																				.20	
May																.10					1.00	.10										.35	
June			.50																													1.70	
July												.60	.65	.10			.10										.15					1.60	
Aug.																		.18								.30	1.15					1.65	
Sept.						.52			1.20			.50								.20		.95	2.70		.50							6.57	
Oct.	.80	.70																														1.50	
Nov.																																0	
Dec.																																0	
Total 1950																																13.55	

Kokernot Ranch No. 2 1951

Visual gage — David Kokernot

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	.56
Feb.																																0	.07
Mar.									.68		.10															.45						1.23	.41
Apr.												.75									.12											0	.52
May																														.30		1.17	.69
June			.38																													.38	1.09
July																						.55	.05		.52							.57	1.49
Aug.										.27		.70																				1.52	1.77
Sept.									.27		.30		.17																			.74	3.50
Oct.																																0	.97
Nov.															.25																	0	0
Dec.																																.25	.57
Period 1949-1951 / Total 1951																																5.86	11.44

Persimmon Gap Ranger Station (Formerly Cooper's Store) 1950

Standard gage — Park Ranger

No record for January-May and October

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																	
Feb.																																	
Mar.																																	
Apr.																																	
May																						.93	.03									2.39	
June			1.00						.43															.03								2.28	
July															1.78	.04			.43								.02		.30			.98	
Aug.	.37																.16	.15				.08	.47	.37								1.57	
Sept.					.03						.03					.10	.11		.18														
Oct.																																0	
Nov.																																0	
Dec.																																	

Latitude 29° 39' Longitude 103° 10' Elevation 2,840 Feet

♯ Some months missing

RAINFALL ON THE UNITED STATES SIDE OF RIO GRANDE WATERSHED

INCHES — 1951

Persimmon Gap Ranger Station (Formerly Cooper's Store) 1951

Standard gage — Park Ranger

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	1.18
Feb.								.20	.08																							0	.32
Mar.																								.46								.74	.20
Apr.																																0	.68
May											.38									.54										.33	.63	1.88	1.06
June		.06	.66		.01																1.10											1.85	1.44
July		.41												.46																		.87	1.24
Aug.										.27		.10																				.37	.54
Sept.																.01																.01	1.81
Oct.																																	1.06
Nov.																																	.53
Dec.																																.31	.45

No record for October and November

Period 1943-1946 and 1950-1951 Total 1951 10.51

Maravillas

Standard gage — I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.		T											T																		T	T	.18
Feb.															.14		T															.14	.10
Mar.					T		T			.12															.19	.55						.86	.43
Apr.																									.20							.20	.77
May																				1.05			.40								.35	1.80	1.28
June			1.22	.42		.10								.75																		2.49	2.28
July																	T						.52	T	.14	T	T					.66	1.86
Aug.	T		T							.81	1.56										T		T				T					2.37	2.66
Sept.							T			T	T					.35																.35	1.25
Oct.																T	T		.01					T	T			T	.52		.35	.70
Nov.																								T								T	0
Dec.	T												T	.22					T													.22	.24

Latitude 29° 34' Longitude 102° 47' Elevation 1,810 Feet — Period October 1949-1951 Total 1951 9.42 11.35

Steve Stumberg Ranch 1949

Recording gage — S. C. S.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.										.45				.08								1.10					.10		.30			2.03	1.05
Feb.																						.10	.25									.35	.24
Mar.																																0	.16
Apr.			.69	.04															.89			.04	.03	.03	.48							2.20	.58
May				.41									.05														.05	.05		.10	.24	.90	2.28
June		.08			.05						.38		.08									.03		.03	.97							1.60	1.16
July												.82		.02							.21	.12	.30		1.15							2.41	2.55
Aug.					.33		1.16		.02	.08																						1.80	1.46
Sept.				2.10					.58	.97					1.80				.09													5.54	2.49
Oct.					.47												.15					.85	.27	.20								1.94	1.36
Nov.																																0	.55
Dec.																													.13	.70		.83	1.02

Latitude 30° 11' Longitude 102° 33' Elevation 4,300 Feet — # Period 1943-1949 Total 1949 19.58 14.90

Dryden, Texas

Standard gage — I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	.68
Feb.	.04														.08																	.12	.43
Mar.										.24															.44	.48	T					1.16	.44
Apr.																								.11					.35			.46	.91
May															.58		T				1.44		.57	.63	.03							3.25	2.19
June	T		.57	.62	T						.41	T		1.13																		2.73	1.09
July																	T															T	1.26
Aug.											1.32																					1.32	1.51
Sept.										.11						.10																.21	1.79
Oct.																			.03						.02		T	T	.07	.01		.13	1.20
Nov.																																0	.40
Dec.														.32																		.32	.62

Latitude 30° 03' Longitude 102° 08' Elevation 2,160 Feet — # Period 1951-1951 Total 1951 9.70 12.52

Pumpville, Texas

Standard gage — C. Osah

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																															T	T	.90
Feb.													.45																			.45	.48
Mar.									.50																	1.10	.15					1.75	.68
Apr.																			T									T				T	.83
May										1.40					1.37					.87			1.07									4.71	2.20
June		.93	.20							T	T		.57																			1.70	1.20
July																.10																.10	.36
Aug.																																0	.76
Sept.										T					1.45																	1.45	2.14
Oct.																	T	.25	.10									.20				.55	1.81
Nov.																																0	.06
Dec.													.12																			.12	.72

Latitude 29° 57' Longitude 101° 44' Elevation 1,800 Feet — Period October 1946-1951 Total 1951 10.83 12.14

Arvin and Harkins Ranch – Header 1948

Visual gage — Sid Harkins

Record began November 1, 1948

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																	
Feb.																																	
Mar.																																	
Apr.																																	
May																																	
June																																	
July																																	
Aug.																																	
Sept.																																	
Oct.																																	
Nov.														1.4																		1.4	
Dec.																									.3							.3	

Latitude 30° 27' Longitude 102° 26' Elevation 3,400 Feet

Arvin and Harkins Ranch – Header 1949

Visual gage — Sid Harkins

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.										.4				.1			.2					1.1						‡.1		.4		2.3	
Feb.																							.1									.1	
Mar.																																0	
Apr.		1.0																			‡1.3		.2				.4					2.9	
May				.4																								‡.7				1.1	
June								‡.7			.1	1.6									.2											2.6	
July																																0	
Aug.					3.8		5.2						.7		.5												.3					9.3	
Sept.																		.3			‡1.8											1.2	
Oct.				.8																												2.9	
Nov.																														.6		0	
Dec.																																.6	

Total 1949 23.0

Arvin and Harkins Ranch – Header 1950

Visual gage — Sid Harkins

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.												.3								.2												.3	
Feb.																																.2	
Mar.												1.1				.1																0	
Apr.											1.5																					1.2	
May																																1.5	
June																																0	
July											.4			‡3.0			.2			1.9	.4		.6						.3			3.4	
Aug.														.4																		.5	
Sept.																																3.3	
Oct.			.3																													.3	
Nov.																																0	
Dec.																																0	

Total 1950 10.7

Some months missing ‡ Cumulative amount for two or more days

RAINFALL ON THE UNITED STATES SIDE OF RIO GRANDE WATERSHED

INCHES—1951

Arvin and Harkins Ranch – Header 1951

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
	Visual gage																															Sid Harkins	
Jan.																																0	.9
Feb.									.5																1.1			.3				0	.1
Mar.																												.5		.9		1.9	.6
Apr.																				1.7	.2		1.2									.5	1.5
May										.5			2.0																			4.0	2.2
June		.2														.3																2.7	1.8
July																					.2											.3	1.2
Aug.									.1																							.2	3.3
Sept.																																.1	1.5
Oct.																																0	1.1
Nov.																																0	.4
Dec.																																0	.2
																									Period November 1948-1951						Total 1951	9.7	14.8

Arvin and Harkins Ranch – Headquarters 1948

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
	Visual gage																															Sid Harkins	
Jan.															Record began November 1948																		
Feb.																																	
Mar.																																	
Apr.																																	
May																																	
June																																	
July																																	
Aug.																																	
Sept.																																.5	
Oct.															.5										.3							.5	
Nov.																																	
Dec.																																	

Latitude 30° 27' Longitude 102° 19' Elevation 2,930 Feet

Arvin and Harkins Ranch – Headquarters 1949

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
	Visual gage																															Sid Harkins	
Jan.										.5				.1			.2					1.5				.1			‡.3	‡.4		2.7	
Feb.																							.1									.1	
Mar.		‡.5																					.6				.1					0	
Apr.				1.7																		‡1.4						‡1.9				2.6	
May						.2						.2										.3										5.6	
June									‡.5																							1.2	
July																																0	
Aug.					2.0		3.2							.4		.8			.3			‡1.6					.5					5.7	
Sept.				.8																												1.2	
Oct.																															.5	2.7	
Nov.																																0	
Dec.																																.5	
																															Total 1949	20.3	

Arvin and Harkins Ranch – Headquarters 1950

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
	Visual gage																															Sid Harkins	
Jan.												.3																				.3	
Feb.																				.5												.5	
Mar.												.5																				0	
Apr.											1.7						.2		.2													.7	
May																																1.9	
June																																0	
July											.2			‡3.2				.9												.5		3.4	
Aug.														.2							.2	.2		.4								1.4	
Sept.																																1.0	
Oct.			.5																													.5	
Nov.																																0	
Dec.																																0	
																															Total 1950	9.7	

Arvin and Harkins Ranch – Headquarters 1951

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
	Visual gage																															Sid Harkins	
Jan.																																0	1.0
Feb.									.4																1.0			.3				0	.2
Mar.																												.5				1.7	.6
Apr.																		1.0			.5	.9		.8						.1		.5	1.3
May		.2								.5			1.4																			3.3	2.9
June																	.7					.5										1.9	1.0
July									.6																							.7	1.4
Aug.									.5	.6							.3															1.1	2.7
Sept.																																1.4	1.2
Oct.																																0	1.1
Nov.																																0	.1
Dec.																																0	.2
																									Period November 1948-1951						Total 1951	10.6	13.7

Arvin and Harkins Ranch – Monty Corder 1948

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
	Visual gage																															Sid Harkins	
Jan.															Record began November 1948																		
Feb.																																	
Mar.																																	
Apr.																																	
May																																	
June																																	
July																																	
Aug.																																	
Sept.																																.3	
Oct.																.3										.2						.2	
Nov.																																	
Dec.																																	

Latitude 30° 27' Longitude 102° 14' Elevation 2,850 Feet

Arvin and Harkins Ranch – Monty Corder 1949

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
	Visual gage																															Sid Harkins	
Jan.										.5				.1			.2					1.2				.1				.4		2.5	
Feb.																								.1								.1	
Mar.		.4																			1.9			.5				.5				0	
Apr.				.5									.2		.3							.2						.9				3.3	
May								1.0																								1.4	
June																																1.7	
July																												.1				0	
Aug.					1.8		1.6							.2		2.1			.3			.5										3.5	
Sept.				1.2																												2.3	
Oct.																																2.0	
Nov.																															.6	0	
Dec.																																.6	
																															Total 1949	17.2	

Arvin and Harkins Ranch – Monty Corder 1950

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
	Visual gage																															Sid Harkins	
Jan.													.3								.3											.3	
Feb.																																.5	
Mar.													1.0				.3															0	
Apr.												2.1							.3													1.3	
May																																2.4	
June																																0	
July														2.7																.6		2.7	
Aug.																		.3				.3			.3							.9	
Sept.																																.6	
Oct.				.2																												.2	
Nov.																																0	
Dec.																																0	
																															Total 1950	8.7	

‡ Cumulative amount for two or more days

RAINFALL ON THE UNITED STATES SIDE OF RIO GRANDE WATERSHED

INCHES— 1951

Arvin and Harkins Ranch – Monty Corder 1951

Sid Harkins

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Visual gage																																	
Jan.																																0	.9
Feb.									.7																1.0							0	.1
Mar.																												.4				2.1	.7
Apr.																												.4				.4	1.7
May													1.3				.7			.7	.5		.3									2.2	2.0
June																																1.3	1.0
July																.7																.7	1.1
Aug.									.4							1.1																0	1.5
Sept.																																1.5	1.5
Oct.																																0	.7
Nov.																																0	.1
Dec.																																0	.2
																									Period November 1948-1951						Total 1951	8.2	11.5

Arvin and Harkins Ranch – Bean 1948

Sid Harkins

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Visual gage																																	
Jan.																																	
Feb.																																	
Mar.																																	
Apr.																																	
May																																	
June																																	
July																																	
Aug.																																	
Sept.																																	
Oct.																.6																.6	
Nov.																									.3							.3	
Dec.																																	

Record began November 1, 1948

Latitude 30° 26' Longitude 102° 25' Elevation 3,100 Feet

Arvin and Harkins Ranch – Bean 1949

Sid Harkins

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Visual gage																																	
Jan.										.4				.1			.2					1.2					‡.1			‡.4		2.4	
Feb.																							.1									.1	
Mar.		.7		.6																												0	
Apr.					.4																‡1.2		.3					.5				2.7	
May								‡.7				1.2		.3														‡.7				1.1	
June																					.2											2.8	
July																																0	
Aug.				4.0		5.1																						.2				9.3	
Sept.													.7		.5																	1.2	
Oct.			1.5															.3			‡1.6											3.4	
Nov.																																0	
Dec.																														.6		.6	
																																Total 1949	23.8

Arvin and Harkins Ranch – Bean 1950

Sid Harkins

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Visual gage																																	
Jan.												.3																				.3	
Feb.																																0	
Mar.																																0	
Apr.											1.5	.9					.2															1.1	
May																		.1														1.6	
June																																0	
July													3.2																			3.2	
Aug.														.2			.7													.4		1.1	
Sept.																				.5	.4		.4									1.5	
Oct.			.2																													.2	
Nov.																																0	
Dec.																																0	
																																Total 1950	9.0

Arvin and Harkins Ranch – Bean 1951

Sid Harkins

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Visual gage																																	
Jan.																																0	.9
Feb.																																0	.03
Mar.									.5																.9			.3				1.7	.6
Apr.																												.4				.4	1.4
May																					.7	.1		1.0						.4		2.2	1.7
June		.3								.5			1.4																			2.2	1.7
July									.5							.1						.2										.8	1.3
Aug.																.7																0	3.5
Sept.																																.7	1.1
Oct.																																0	1.2
Nov.																																0	.15
Dec.																																0	.2
																									Period November 1948-1951						Total 1951	8.0	13.78

Arvin and Harkins Ranch – Camel 1948

Sid Harkins

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Visual gage																																	
Jan.																																	
Feb.																																	
Mar.																																	
Apr.																																	
May																																	
June																																	
July																																	
Aug.																																	
Sept.																																	
Oct.																.3																.3	
Nov.																									.2							.2	
Dec.																																	

Record began November 1948

Latitude 30° 25' Longitude 102° 20' Elevation 2,890 Feet

Arvin and Harkins Ranch – Camel 1949

Sid Harkins

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Visual gage																																	
Jan.										.3				.1			.2						.2		.1					.4		1.3	
Feb.																							.1									.1	
Mar.		.4																														0	
Apr.				.3																	1.5		.2					.3	.8			2.4	
May									.2			.4																				1.1	
June																					.2											.8	
July																																0	
Aug.					2.4		2.8						.4		1.1													.2				5.4	
Sept.																		.3						1.1								1.3	
Oct.				.8																												2.2	
Nov.																															.5	0	
Dec.																																.5	
																																Total 1949	15.3

Arvin and Harkins Ranch – Camel 1950

Sid Harkins

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Visual gage																																	
Jan.												.3																				.3	
Feb.																																.1	
Mar.												.6																				0	
Apr.																	.3															.9	
May											1.6							.3														1.9	
June																																0	
July															3.5																	3.5	
Aug.															.1			.8												.5		1.5	
Sept.																					.3	.3		.2								.9	
Oct.			.8																													.8	
Nov.																																0	
Dec.																																0	
																																Total 1950	9.7

‡ Cumulative amount for two or more days

RAINFALL ON THE UNITED STATES SIDE OF RIO GRANDE WATERSHED

INCHES — 1951

Arvin and Harkins Ranch – Camel 1951

Visual gage — Sid Harkins

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total or Inches	Normal or Average
Jan.																																0	.5
Feb.									.5																1.0							0	.1
Mar.																												.3				1.8	.6
Apr.																												.5				.5	1.5
May																	.5			.6	.3		.7							.2		2.1	1.7
June		.2								.2			1.3																			1.7	.8
July																.4																.4	1.5
Aug.									.3	.4						.7					.3											.3	2.3
Sept.																																1.4	1.3
Oct.																																0	1.0
Nov.																																0	.1
Dec.																																0	.2
	Period November 1948-1951																														Total 1951	8.2	11.2

C. L. Arthur Ranch 1949

Standard gage — C. L. Arthur

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.		.10							1.50																							1.40	
Feb.																																.86	
Mar.																																0	
Apr.			.90																			.80										1.70	
May			.40		.80																							.52				1.72	
June						.31					.21	.49				.50																1.51	
July							.20																									.20	
Aug.						.43		1.01				.30			.08		.35				.20						.20					2.57	
Sept.				.38				.97		.57		.29				.12			.49			.48	.54									2.82	
Oct.					.38													1.13														2.33	
Nov.																																0	
Dec.																																0	
	Latitude 30° 23' Longitude 103° 45' Elevation 4,900 Feet																														Total 1949	14.73	

C. L. Arthur Ranch 1950

Standard gage — C. L. Arthur

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.			.43																											.25		.68	
Feb.																																0	
Mar.																																0	
Apr.												.25																.28				.25	
May	.90			.17								.56			.05										.35							.28	
June																																2.03	
July						.71					.54	.70	.41				.60								.76							3.72	
Aug.		1.01																							.48							1.49	
Sept.			.26		.18				.20					.25					.10	.45				.45	.41							2.30	
Oct.	.96	.20																														1.16	
Nov.																																0	
Dec.																																0	
																															Total 1950	11.89	

C. L. Arthur Ranch 1951

Standard gage — C. L. Arthur

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.										.20																						0	1.16
Feb.									.90																							.20	.12
Mar.																																1.20	.33
Apr.					.33						.60									.30				.60								0	.68
May													.58	.37																	2.15	3.98	2.18
June		.20																														1.15	2.66
July				.60					.60					.20																		2.90	2.30
Aug.								.85	.15	.15	.10	.25															.45			.15		1.10	1.62
Sept.											.20																					1.20	1.96
Oct.																																0	1.33
Nov.																																0	.10
Dec.													.11																			.11	.26
	# Period 1946-1951																														Total 1951	11.84	13.70

Pecos River

Standard gage — I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	.99
Feb.										.24	.10		.30														.01	.02				.33	.77
Mar.																									.84	.38	.05					1.61	.74
Apr.				.01						.25					.01	.05	.07				.64			.35			.10					.10	1.39
May		1.20	.09			.08							.48																			1.36	1.98
June																																1.85	1.79
July													.01			.06												.32				.39	1.68
Aug.										.20				.13		.38																0	1.83
Sept.																		.10				.05			.07	.10		.30		.02		.71	1.99
Oct.																																.62	1.16
Nov.		.03																														.05	.45
Dec.		.02								.15			.07																			.22	.82
	Latitude 29° 45' Longitude 101° 21' Elevation 1,060 Feet																														Period March 1938-1951 Total 1951	7.22	15.55

Comstock, Texas

Standard gage — George Humphreys

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																															T	T	.84
Feb.										.20															1.18	.12						0	.92
Mar.																												T				1.50	.89
Apr.													.15				.13				.48		1.17									T	1.60
May													2.10																			1.93	1.95
June		.26																														2.36	1.74
July																															T	T	1.10
Aug.																			.33													.33	2.72
Sept.																.51												.47				.51	1.90
Oct.																		.08														.55	1.34
Nov.																																0	.48
Dec.										.12			.01																			.13	1.02
	Latitude 29° 41' Longitude 101° 11' Elevation 1,550 Feet																														Period May 1939-1951 Total 1951	7.31	16.69

Devils Lake, Texas

Standard gage — Central Power and Light Co.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	.84
Feb.																										1.05	.15					0	.79
Mar.																																1.20	.75
Apr.																.20																0	1.62
May															1.60						.26	.09		1.05			.15					1.60	1.61
June			.17	.05																												1.97	2.02
July																											.08		.08		.29	.45	.95
Aug.																			.47													.47	1.36
Sept.																	.25															.25	1.66
Oct.																			.13									1.12	.12			1.37	1.47
Nov.																																0	.64
Dec.										.17																						.17	.87
	Latitude 29° 34' Longitude 100° 59' Elevation 1,080 Feet																														Period May 1939-1951 Total 1951	7.46	14.78

Maverick County Canal Headgate

Standard gage — Gate Tender

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	.06	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0	.51
Jan.																											.08					.14	2.07
Feb.																									2.35	.05						2.40	.73
Mar.																																0	1.23
Apr.										.10					.05	.22	.12							.32	2.77							3.58	1.65
May																											.57					.72	1.66
June				.15																													
July															.01																	.01	3.35
Aug.																			.07	.09												.16	1.27
Sept.																.39	1.20															1.59	2.78
Oct.																								.10				2.35				2.45	1.51
Nov.																												.10				.10	.15
Dec.			.11							.53																						.64	.65
	Latitude 29° 10' Longitude 100° 46' Elevation 870 Feet																														Period March 1948-1951 Total 1951	11.79	17.56

Some months missing

RAINFALL ON THE UNITED STATES SIDE OF RIO GRANDE WATERSHED

INCHES—1951

Quemado, Texas

Standard gage — Walter P. Cox

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.	T	T			T	T		T	T															.02	T			T			T	T	.91
Feb.																								.02	1.96	.10						.24	1.60
Mar.						T		T	.01		.63	T	.22	T		T	T	T	T				T					.25				2.72	.77
Apr.																									T							.25	1.69
May		T								.20			T	T	.12			T			T	.08		2.78	.20	.10	T					3.18	2.88
June			.47	T		T	.24							.02																		1.03	1.84
July												T	T															T				T	1.27
Aug.													.06						.09													.15	1.55
Sept.														T	.71	2.04									T				.73			3.48	3.21
Oct.					T													.15	.08			.20		T	.90	T	T	.90				1.33	1.35
Nov.	T											T									T				.06			.01	T			.07	.57
Dec.		.01	T						.20	T														T	T						T	.21	.66

Latitude 28° 56' Longitude 100° 37' Elevation 765 Feet — Period November 1941-1951 — Total 1951 12.66 — 18.50

Tortuga Ranch, Texas

Standard gage — W. H. Brown

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	
Feb.														.10																		.10	
Mar.																								.90								.90	
Apr.															.80	.02					1.60	.05		1.40								0	
May																																3.87	4.03
June																																0	.69
July																																0	.28
Aug.											.50																					.50	2.29
Sept.																						1.50										1.50	2.58
Oct.						.60													.28								.25					1.13	.56
Nov.																	.25															0	0
Dec.																																.25	.12

Latitude 26° 39' Longitude 100° 26' Elevation 780 Feet — Period May 1950-1951 — Total 1951 8.23

El Indio, Texas

Standard gage — W. C. Smith

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	.92
Feb.																								.37	1.38							0	.78
Mar.																																1.75	.71
Apr.																																0	.96
May						.75		.05							3.20									1.85								5.85	3.93
June																																0	1.93
July																																0	.82
Aug.																																0	2.24
Sept.															.39	1.12																1.51	2.86
Oct.																																0	1.05
Nov.																																0	.47
Dec.										.40																						.40	.71

Latitude 28° 31' Longitude 100° 19' Elevation 725 Feet — Period June 1941-1951 — Total 1951 9.51 — 17.50

Laredo Water Plant

Standard gage — Laredo Water Plant

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	.94
Feb.																																0	.72
Mar.													.06					.02							.55	.22	.03					.86	.74
Apr.																												.21				.21	1.18
May			.05			.82	.05				1.57																					2.49	2.56
June													1.25												1.27							2.52	2.28
July																																0	1.34
Aug.													2.14	3.04	.05	.70		.10				.02	.01									.15	1.38
Sept.																								.12	.07							5.93	3.17
Oct.																														.01		.19	1.56
Nov.	.02																															.05	.74
Dec.														.08																		.08	1.09

Latitude 27° 33' Longitude 99° 31' Elevation 410 Feet — Period 1950-1951 — Total 1951 12.44 — 17.70

Fort McIntosh, Laredo, Texas

Standard gage — I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																													.02			.04	
Feb.		.02												.25																		.25	.32
Mar.													.08						.02						.34	.46		.01				.91	.82
Apr.																													.30			.30	.47
May			.04				1.14				1.09			.02										.01	.06							2.36	3.56
June				1.19									1.19												1.17		.34					3.89	2.98
July																																0	.16
Aug.													1.88	3.65			.65				.16		.03	.01				T				.20	.81
Sept.								.05											.02					.03	.04	.15						6.18	3.47
Oct.																											.26					.29	.14
Nov.	.01																													.07		.34	.60
Dec.														.06																		.06	.05

Latitude 27° 30' Longitude 99° 31' Elevation 410 Feet — Period February 1950-1951 — Total 1951 14.82

Laredo, Texas, International Bridge

Standard gage — U. S. Weather Bureau

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	.71
Feb.													.14		.14										.22	.52						.14	.68
Mar.																			.03										.27			.91	.72
Apr.				.02																												.27	1.88
May				1.46			.85				.86				.02											.06						1.81	1.93
June														.57												1.19						3.22	2.19
July																																0	1.51
Aug.																			.29													.29	1.37
Sept.													1.14	3.55	1.15	.76													.37			6.97	3.38
Oct.							.04																	.02		.20						.26	1.24
Nov.		.03													.05												.34				.05	.42	.43
Dec.	.04																															.09	.62

Latitude 27° 30' Longitude 99° 29' Elevation 420 Feet — Period 1941-1951 — Total 1951 18.38 — 16.68

Falcón Dam, Texas

Standard gage — I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																													.03	.01		.04	
Feb.																																0	
Mar.													.09						.23							.66	.04					1.02	
Apr.		.11								T																	.14					.60	1.18
May			T	T				.09			.79				.19										.69	.20				.55		1.96	2.74
June				.22										2.60												.64	.26					3.72	2.54
July																	T				T	.12	T	.21	.20						.10	.10	.14
Aug.	.26	T												2.70	.14																	.93	.52
Sept.															1.85	2.21	.68								.42	.55						7.42	4.12
Oct.																			.18								.02			T		1.15	.58
Nov.		.04																														.06	.09
Dec.			T															.14														.14	.07

Latitude 26° 34' Longitude 99° 08' Elevation 323 Feet — Period April 1950-1951 — Total 1951 17.14

Roma, Texas

Standard gage — I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																															.07	.07	.91
Feb.												.58		T											.66	.12						T	.90
Mar.																			.35	.02							.18		1.16			1.67	1.07
Apr.												.43	.20												1.35								1.34	1.40
May					.76								1.72													.62						1.98	1.73
June														.43																		3.10	2.65
July														1.00							T	T	.75		.25							.43	1.09
Aug.													6.00	.90	1.85	1.32									.65	.66						1.00	2.07
Sept.																			.33													10.07	3.89
Oct.															.27																	1.64	2.21
Nov.																																0	.08
Dec.																																.27	.44

Latitude 26° 24' Longitude 99° 01' Elevation 230 Feet — Period 1941-1951 — Total 1951 21.57 — 18.66

RAINFALL ON THE UNITED STATES SIDE OF RIO GRANDE WATERSHED

INCHES — 1951

Rio Grande City Gaging Station

Standard gage — I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	.77
Feb.												.65							.13							.52						1.30	1.01
Mar.											.17																		.50			.67	.98
Apr.											.19													.30	1.30							1.79	1.43
May																									.92							1.19	2.44
June					.27																										.05	1.13	.70
July															1.08				.17					.30								.47	1.72
Aug.														3.85	1.37																	5.22	2.82
Sept.																							1.02									1.02	1.60
Oct.																																0	.39
Nov.																																0	.75
Dec.																																	
	Latitude 26° 20' Longitude 98° 47' Elevation 150 Feet																								Period July 1939-1951						Total 1951	12.79	15.31

San Benito Pump

Standard gage — I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	1.39
Feb.																	.56															.36	.70
Mar.															.40										1.16	.40						1.96	1.22
Apr.																													.36			.36	1.15
May												1.58												.32		.61						2.51	2.75
June				.52																					.12							.64	2.55
July	.69													.12		.26							.59									.58	1.74
Aug.													.76								.20		.08							.28		2.24	1.97
Sept.												.29	.36		3.20	.18							4.05	.35						.13		4.39	3.80
Oct.	1.27																		.17	.10												6.05	2.02
Nov.																																0	.71
Dec.																																0	1.62
	Latitude 26° 03' Longitude 97° 45' Elevation 50 Feet																								Period October 1933-1951						Total 1951	18.89	21.62

RAINFALL ON THE MEXICAN SIDE OF RIO GRANDE WATERSHED

INCHES — 1951

The daily rainfall records tabulated below have not been published elsewhere. For each station there are indicated the source of the record and the type of rain gage in use. The general location of each station is shown on the map of the watershed, pages 52 and 53 of this bulletin.

San Antonio, Durango

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	.44
Feb.														T	.04			.10	.05						T							0	.05
Mar.																																.19	.05
Apr.																															.37	0	.25
May				T						T					T											.53	.04			T		.37	.37
June																																.57	2.10
July	T	.53								T	.06	.57	.79	.06	.53	.75					T		.06	1.07	T	.18		.04	.12	T		4.76	4.71
Aug.	T							.14	T	.39		.06													T				.47			1.82	3.50
Sept.	T		.06			T	T			T	T	.06	.87		.57	T								T			.10					1.54	4.10
Oct.			.04													T	.33							T	T		.06	.05	T			.44	1.24
Nov.			T																								.49	.06	.47	T		1.02	.84
Dec.									.17	.06	T	.10	.04																			.37	.30
	Latitude 26° 25' Longitude 105° 21' Elevation 5,430 Feet																								Period 1943-1951						Total 1951	10.48	17.15

Parral, Chih.

Standard gage — Meteor. Serv. of Mex.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	.15
Feb.																																0	.19
Mar.							T							T				T						.47								.47	.13
Apr.																		.12															.35
May																																	1.65
June	No record from April 23 to July 31																																4.31
July	.33		.16	T					T	.20	.41	.39															.44	T				1.93	3.96
Aug.																																	4.26
Sept.	No record from September 1 to December 31																																1.22
Oct.																																	.64
Nov.																																	.49
Dec.																																	
	Latitude 26° 56' Longitude 105° 39' Elevation 5,740 Feet																								# Period 1903-1951							17.48	

Hormiguero, Chih.

Standard gage — Meteor. Serv. of Mex.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	.47
Feb.																																0	.25
Mar.																									T	.10						.10	.11
Apr.																												T				T	.16
May														T																		T	.44
June															.28											.06	1.04	.14					1.52	1.99
July	.79	1.55	T							1.26	.04	.24	1.47	.77		.10								.22					.94	T	T	7.38	5.64
Aug.	.33		.16	T					T	.20	.41	.39															.44	T				1.93	5.32
Sept.					T	T	.43	T		T	T	.28	.91	.16	1.45	T								T	.65							5.35	5.24
Oct.																.20											.10	.35				1.28	1.85
Nov.																											.27	T	.12			.39	.52
Dec.									.78	.18				.28																		1.24	.72
	Latitude 27° 02' Longitude 105° 42' Elevation 5,580 Feet																								# Period 1925-1951						Total 1951	17.19	23.17

Balleza, Chih.

Standard gage — Meteor. Serv. of Mex.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.	.04																													.04		.08	.32
Feb.						T			T					T			T															T	.44
Mar.															.20	.39								T	T	.08			T			.67	.08
Apr.				T		T																										T	.22
May											T				T						T						.08					T	.18
June										T																						.08	1.19
July		.18	.15						T	.33	T	T	.58	.51	.08	.20	.08				T	.20	T	.20	.35	.20		T	.50	.12	T	3.08	4.51
Aug.	T	.55	T	.68				.04	.55	.04		.55		T		.08						T	.50			.31			.12	.10	.08	2.80	4.52
Sept.	.08		T				.45	T	T	.14		.14	T		T																	.81	3.68
Oct.						T	T									T					T		T	T	.49		T	T	T			.49	.73
Nov.																											.04		.33	T		.37	.63
Dec.									.55	.10				.47																		1.12	.45
	Latitude 26° 57' Longitude 106° 21' Elevation 5,870 Feet																								# Period 1903-1951						Total 1951	9.50	16.95

Some months missing

RAINFALL ON THE MEXICAN SIDE OF RIO GRANDE WATERSHED

INCHES — 1951

La Boquilla, Chih.

Standard gage — Río Conchos Hydroelectric Co.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.								T																							T	T	.52
Feb.													T				T					T										T	.13
Mar.				T	T			T	T					.02					T					.26	T			T				.28	.19
Apr.																																T	.18
May					T														.02	.02												.04	.64
June				T								T	T	T								T			T	T						T	1.44
July	T	.21								.25	.06	.52	.32			.04					.02	.06	.17	T					T	T	T	1.63	2.95
Aug.		T	.02					.02	.02	.15	.15	T							T								.35					.71	2.93
Sept.	T				.01				T		T	.31	T		T																	.32	3.06
Oct.					.06																			1.03		T	.03	.03	T			1.15	1.00
Nov.																											.15		T			.15	.40
Dec.									.39	.17		T	.04																			.60	.41

Latitude 27° 32' Longitude 105° 25' Elevation 4,320 Feet — ♯ Period 1910-1951 Total 1951 4.88 13.67

Rosetilla, Chih.

Standard gage — Río Conchos Hydroelectric Co.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.													T																			T	.60
Feb.														T			.09															.09	.06
Mar.																									.58							.58	.22
Apr.																												.03				.03	.13
May																			.04													.04	.19
June																																0	1.43
July											.16	.20	1.10	.14		.17						1.18	1.00			.15	.02					4.12	2.52
Aug.			.09						.10	.18		.18																				.55	2.58
Sept.								.05	.05	.35		.28	1.30	.25																		2.28	2.56
Oct.																								.05								.05	1.01
Nov.																																0	.22
Dec.	.05								T	.15			.12																			.30	.37

Intitude 28° 14' Longitude 105° 19' Elevation 3,780 Feet — Period 1940-1951 Total 1951 8.04 11.49

Villalba, Chih.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																														.01		.01	.46
Feb.														.01																		.01	.10
Mar.								.01	.02															.02	.14							.19	.04
Apr.																			.02									.02				.04	.06
May																									.10							0	.12
June																																.10	.82
July		.22										.01	.67	.70		.02						.10	.50	.37			.02					2.41	3.36
Aug.			.45						.06	.14	.16														.02		.01		1.04			1.88	2.49
Sept.												.14	.35										.02					.04				.49	2.93
Oct.																								.04								.10	1.33
Nov.																																0	.22
Dec.	.19								.04	.06	T		.12																			.41	.45

Latitude 28° 01' Longitude 105° 46' Elevation 3,940 Feet — Period October 1940-1951 Total 1951 5.64 12.38

Las Vírgenes, Chih.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	.32
Feb.														.01	T																	.01	.05
Mar.					T				T															.15	.02							.17	.07
Apr.																			T													T	.11
May				T	.03														T	T											.02	.05	.11
June		T	T												T							T			.63							.63	.98
July									T	.03	T		.63	.43	.10		T					.18	.30				.02		.16			1.64	2.28
Aug.			.03	T				T	.03	T		T													T							.24	1.91
Sept.	T						.02	.01	T		.02	.01	.08									T		.01			T					.14	1.66
Oct.																																.01	.75
Nov.																																0	.17
Dec.	.04								.08	T			T	.10																		.22	.50

Latitude 28° 10' Longitude 105° 38' Elevation 4,068 — ♯ Period 1943-1951 Total 1951 3.11 8.89

Delicias, Chih.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.													T																			T	.46
Feb.																	T															T	.12
Mar.								.04																.16	.25							.45	.14
Apr.																			T									.04				.04	.20
May				T															.10												.10	.20	.21
June																									T							T	1.09
July		T										.14	.16	.06								.20	.33					T				.89	2.29
Aug.	T		.09					.03	.10	.18																	.08		.32			.80	2.20
Sept.	T						T		.19			.12	.10									T						T				.41	2.20
Oct.																	T															T	.91
Nov.																																0	.28
Dec.	.06									.04		T	.08																			.18	.43

Latitude 28° 11' Longitude 105° 31' Elevation 3,710 Feet — ♯ Period 1933-1951 Total 1951 2.97 10.53

Guerrero, Chih.

Standard gage — Meteor. Serv. of Mex.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.	.24											.55																		.14		.75	.58
Feb.														T																		T	.40
Mar.								.08																.13	T			.02				.23	.21
Apr.																														.01		.01	.17
May															No record from May 1 to May 31																		.26
June																								.28		.26						.54	1.54
July	.16	.18	.20	.33				T		T	T	.04	.02	.02		.13	.06	.05		T	T	.11	.10	.14		T	T	.79	.74			3.07	4.42
Aug.	.31	.15	.16	.21	T			.35	.65	.98	.20					1.57	T	T			.01	.28			.14	.79			.19		.18	6.15	4.92
Sept.					.21		.55	.11	.07	.73																		.04				1.67	3.39
Oct.																T				T	T				.65	T			.05		.02	.76	1.25
Nov.										.06	.03																					.09	.55
Dec.							.02						.39	.15																		.56	.76

Latitude 28° 33' Longitude 107° 30' Elevation 6,560 Feet — ♯ Period 1903-1951 18.43

La Junta, Chih.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.	.38											.15																		.49		1.02	1.04
Feb.													.10			T	T					T		.26								.36	.46
Mar.								T	.08															.15	.20		.07					.50	.28
Apr.																			.02	.09										.01	.22	.34	.11
May																										T				T		T	.30
June																									T	.61	.09			.07		.77	1.98
July	.54	.12	.19	.56	.02			.14	T	.76		.03	.05	T	.09	.01	.65	.39	T	.61	.77	.18		.06	T		.24	.22			T	5.61	5.18
Aug.	.01	.24	.13	.12	.13			.11	.20	.04	.01	.02	.01			.01	T	.06		.02	T	.19			.63	.17			.20			2.30	4.96
Sept.	1.01			.19	.08	.08	.83	.07		.84		T													.02		.08		.05	T		3.10	2.43
Oct.								.02												.16	T			.32								.69	1.40
Nov.										.04	.14										.04											.22	.37
Dec.							.26					.48	.15	.01					.24												.46	1.60	.90

Latitude 28° 26' Longitude 107° 20' Elevation 6,730 Feet — ♯ Period 1925-1951 Total 1951 16.47 19.01

Chihuahua, Chih.

Standard gage — Meteor. Serv. of Mex.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	.51
Feb.														T	.02		T															.02	.22
Mar.									.20										.08					T	.21			T				.41	.25
Apr.					T																		T							T	.04	.08	.18
May																						T	T									.04	.36
June		T	T																						.06	T	T					.06	1.45
July	.04	T		.11					T	T		.16	.20	.23			T	T			T	T	.28	.49		T	T					1.51	3.51
Aug.	T	.24	.08	T				.12	.50	.12	.12	T														T	.12		.16			1.46	3.41
Sept.						T	.20	.55	.71	.04	.04					T	T							T						T		1.54	3.28
Oct.												T																				T	.92
Nov.													.21											T								T	.51
Dec.		.16																														.37	.42

Latitude 28° 38' Longitude 106° 04' Elevation 4,690 Feet — ♯ Period 1900-1951 Total 1951 5.29 13.82

♯ Some months missing

RAINFALL ON THE MEXICAN SIDE OF RIO GRANDE WATERSHED

INCHES — 1951

Maclovio Herrera (Falomir), Chih.

Standard gage — Meteor. Serv. of Mex.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																														.04		.04	.42
Feb.														.04																		.04	.13
Mar.									.40																.47							.87	.28
Apr.																																0	.28
May											.59																					.59	.73
June																																0	1.66
July				.16							.51				.82			.08				.26										1.83	3.27
Aug.	.18									.13																						.31	3.60
Sept.											.04																					.04	4.74
Oct.																																0	.76
Nov.																																0	.11
Dec.												.09	.08																			.17	1.28
# Period 1924-1951; Total 1951																																3.89	17.26

Latitude 29° 03' Longitude 105° 08' Elevation 3,380 Feet

Cuchillo Parado, Chihuahua

Standard gage — Mexican Section I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.		.11															T														.02	.13	
Feb.																						.01										.01	
Mar.									.21																.77		.02	T				1.00	
Apr.																			.01									T				.01	
May					T						.19	T											.08			T					.01	.28	
June		T	T																			.04										.04	
July				T							.04					T						.56	.70	T		.04		T	T			1.34	
Aug.	.01	.07	.06	T				T	T	T			.26							.17						.06	.01					.64	
Sept.		T	.04	T				.18	T	T	.04					T	T					T		T			T					.26	
Oct.																							T		T							T	
Nov.										T																						T	
Dec.												.12	.14																			.26	
Total 1951																																3.97	

Latitude 29° 26' Longitude 104° 53' Elevation 2,982 Feet

Ojinaga, Chih.

Standard gage — Meteor. Serv. of Mex.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																														.02		.02	.26
Feb.													T																			T	.17
Mar.								.31																	.40							.71	.20
Apr.																																0	.23
May				T						.20									.39												.79	1.38	.56
June	.08		.71																													.79	.78
July				T							T	.38				.16						.20	.16				.20					1.10	1.07
Aug.																																	1.36
Sept.									T	T															T		T					T	1.22
Oct.																																T	.97
Nov.										T																						T	.41
Dec.												.02																				.02	.42
# Period 1906-1951																																	7.65

No record from August 1 to August 31

Latitude 29° 34' Longitude 104° 25' Elevation 2,620 Feet

Cd. Acuña, Coah.

Standard gage — Mexican Section I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	
Feb.																																0	
Mar.										.06															1.18		.55					1.79	
Apr.																					T							.24				.24	
May													T	.20	T	T	T				.08		2.20	T								2.48	
June	.08					T						.16	.35												.79							1.38	
July																															T	T	
Aug.											.22							.08														.30	
Sept.			.08											.10	1.91																	2.09	
Oct.																		T				T			T		.30	.47				.77	
Nov.																											.04					.04	
Dec.		T							.29				.04																			.33	
Total 1951																																9.42	

Latitude 29° 20' Longitude 100° 53' Elevation 919 Feet

Jiménez, Coahuila

Standard gage — Mexican Section I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	
Feb.														.18	.08				T													.26	
Mar.											.18														2.22							2.40	
Apr.																				T							.57					.57	
May									T	.14		T		.14	.16						.06		4.13									4.63	
June		1.10	.16																						.43							1.69	
July																												.12				.12	
Aug.																			.10													.10	
Sept.													T	.10	3.60	T																3.70	
Oct.																	T					.16			.04	T	1.71	.28	T			2.19	
Nov.					T							T																				T	
Dec.									.51	T			.04																			.55	
Total 1951																																16.21	

Latitude 29° 04' Longitude 100° 40' Elevation 814 Feet

Piedras Negras, Coah.

Standard gage — Mexican Section I. B. & W. C.

Record began January 1, 1951

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	
Feb.													.10	.07	.03																	.20	
Mar.												.45														1.28	.01					1.74	
Apr.																												T				T	
May						.34				.12			.03	.01	1.39		T				1.17		.85	T		T						3.91	
June		.12	.23	T	T									T																		.35	
July													.07			.07												.39				.53	
Aug.											.51																					.51	
Sept.												T	.23	1.33	1.63								T	T	T							3.19	
Oct.																		1.36	T			.83			T	T	T	.70				2.89	
Nov.													T	T	T																	T	
Dec.									.35	T																						.35	
Total 1951																																13.67	

Latitude 28° 43' Longitude 100° 40' Elevation 715 Feet

Allende, Coah.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																												T				T	.70
Feb.														.12																		.12	2.16
Mar.								T	.10		.18												T	T	.99	T	T	T				1.27	.55
Apr.																																0	.96
May															1.19					T	T	T	3.55	T								4.74	2.91
June		2.17										T												.51								2.68	2.90
July															.23	.12																.35	1.46
Aug.											.14													.17								.31	1.84
Sept.												.44	1.00																			1.44	3.39
Oct.																						.87	.20					1.08				2.15	1.50
Nov.																																0	.26
Dec.								.24																								.24	.35
# Period 1947-1951; Total 1951																																13.30	18.98

Latitude 28° 21' Longitude 100° 51' Elevation 1,170 Feet

Hidalgo, Coah.

Standard gage — Mexican Section I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.									T			T					T		T		T		T	T		T			T	T	T	T	
Feb.													T	.03				.01														.04	
Mar.										T	.55													.16		.51	.08					1.30	
Apr.									T	T												T	T	T	T				.59			.59	
May						.95	T			T		T	.47				.04								.04	.67						2.17	
June	T		.79	.04							.39																		T			1.22	
July																						T						T				T	
Aug.																			.24		.16		.25									.65	
Sept.												.98	1.10	.94	T	.56									T						T	3.58	
Oct.					.55											T	T	T	T			T	T	.06		T	T	.04		T		.65	
Nov.																									.16			T	.15	T		.31	
Dec.	T	T							T				T	T																		T	
Total 1951																																10.51	

Latitude 27° 47' Longitude 99° 52' Elevation 499 Feet

Some months missing

RAINFALL ON THE MEXICAN SIDE OF RIO GRANDE WATERSHED

INCHES — 1951

Nuevo Laredo, Tamps.

Standard gage — Meteor. Serv. of Mex.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.	.47																													T	T	.47	.78
Feb.													.22																			.22	.73
Mar.											.26						.07															.98	.85
Apr.																								.25	.40							1.25	1.19
May										1.38		T										.35			.08			1.23				3.09	2.56
June			1.91	T		1.28						.79														.58						3.28	1.96
July																																0	1.34
Aug.																		.08						.07				.20				.15	1.08
Sept.											T	1.08	3.05	1.77	T	1.23						.09	T	T	.08						T	7.33	2.83
Oct.						.09																			.32				T	.07		.26	1.28
Nov.													T	T																		.39	.81
Dec.																																T	1.07

Latitude 27° 29' Longitude 99° 31' Elevation 420 Feet — ∮ Period 1909-1951 — Total 1951 17.40 — 16.28

Monclova, Coah.

Standard gage — Meteor. Serv. of Mex.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	.47
Feb.										T		T	.02		T				T						.14	T						.02	.45
Mar.																										T						.14	.31
Apr.											T			T	T		.05				.02		.07		1.33			T				T	.56
May	T		T										T												.04	.10						1.47	1.55
June																																.14	1.19
July		T	.25								T	.05	.01		.19	T						T	T									.48	1.65
Aug.												.05											.24	.04					T			.31	1.64
Sept.												T	1.69	1.04	.32	.09						.06						T	.24			3.20	3.01
Oct.						T											.42	.07	.35	.06		.01	.06	.21	.01			.40				1.83	1.24
Nov.										.05	.02			.16	.04																		.58
Dec.																																.27	.60

No record November 1 thru November 30

Latitude 26° 54' Longitude 101° 25' Elevation 1,920 Feet — ∮ Period 1897-1951 — 13.25

San Buenaventura, Coah.

Standard gage — Meteor. Serv. of Mex.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	.69
Feb.										T		.11							T													0	.44
Mar.																								.02	.32			.04				.43	.85
Apr.			T		T	T					1.41			T	T	.07				.05		.32	.84	.09								.06	.56
May										T	.26	T			T	.26									.23	T						2.78	1.50
June			.08																													.85	1.70
July			.10									T	.01		.06	T																.17	1.80
Aug.												T								.25			.07	.02								.34	1.88
Sept.										.10			2.35	.68	.26	.02						T					.67	.22				3.41	2.19
Oct.						T										T	.56	.08	T			.06	.19	.18					.18	T		1.76	1.56
Nov.	.08	T										T																				.26	.52
Dec.										.05	.02			.29																		.36	.77

Latitude 27° 05' Longitude 101° 33' Elevation 2,300 Feet — ∮ Period 1926-1951 — Total 1951 10.42 — 15.64

Progreso, Coah.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																												.01	.01			.02	.61
Feb.										T		.22		T					T				.02	.01	.33							T	.35
Mar.										.01														T								.58	.19
Apr.						T					.68	.12			T	.08						.02	.01	.54				.40				.41	1.64
May												T	.01		T										T							1.25	2.61
June		T	.06																													.07	1.79
July																.04												T			T	.04	.55
Aug.												T							T			T	.11	.02								.13	2.04
Sept.												T	T	3.05	1.26	.04	.05					.04										4.44	3.36
Oct.						.24												.06	.41				.30	.01	T		T	.48			T	1.50	2.29
Nov.	T																												.01			.01	.22
Dec.									T	T		T		.16																		.16	.70

Latitude 27° 28' Longitude 101° 03' Elevation 1,200 Feet — ∮ Period 1943-1951 — Total 1951 8.61 — 16.33

Nueva Rosita, Coah.

Standard gage — Meteor. Serv. of Mex.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																							T									0	.77
Feb.										T	T																					T	.50
Mar.																T								T	T							T	.37
Apr.						T					T	.16	T		T	.27	.91	T	T				T	T		T		.16				.16	1.22
May						T							T													T						1.34	2.82
June		T	.35																													.35	2.07
July										T		T					T											T				T	1.59
Aug.														.35	.83	.31						T	.94									.94	1.83
Sept.						T											.57	T	1.26			.08	T				2.29	.51				1.77	2.44
Oct.	T										T																		T			2.43	1.61
Nov.														T	T			T														T	.52
Dec.										T																						T	.74

Latitude 27° 55' Longitude 101° 17' Elevation 1,410 Feet — ∮ Period 1925-1951 — Total 1951 9.99 — 16.48

Sabinas, Coah.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.															.08													T				T	.85
Feb.										T	T	.04																				.08	.96
Mar.																								.39								.43	.65
Apr.											T	.14	T	T	T	.14	.05	T	.05	.06	T	.21	.03	T	.06			.21				.27	1.31
May											T		1.04				.05									.12						.64	3.10
June			.18			.22																										1.61	2.47
July										T		.06					.04															.04	1.37
Aug.														.08	.64	.04	.15					T	1.42									1.48	2.62
Sept.																		.33	.04	.03					.08			.57	.26			.91	3.97
Oct.						T	T																						.02			1.31	1.83
Nov.										.11	.04		T	T	.10																	.02	.41
Dec.																																.24	.60

Latitude 27° 54' Longitude 101° 17' Elevation 1,430 Feet — ∮ Period 1922-1951 — Total 1951 7.05 — 20.12

Villa Juárez, Coah.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.														T														T	T			T	.79
Feb.										T		.06																				T	.57
Mar.																							T	.22	.29			.20				.37	.24
Apr.			T			.06					.06	.06			.04	T							.04	T								.20	.98
May			T									T	1.40											.13								.39	1.17
June																									.49							1.89	1.47
July																	.04											.04		.18		.26	.56
Aug.														1.97	.39	.35	.08		.47			.47	.08									1.02	1.81
Sept.																		.04	.39			.20										2.99	3.80
Oct.						.08	T																T	.04				.04				.39	2.29
Nov.	T																												T			T	.38
Dec.														T	.16																	.16	.37

Latitude 27° 36' Longitude 100° 46' Elevation 900 Feet — ∮ Period 1943-1951 — Total 1951 8.07 — 14.79

Don Martín, Coah.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.						T											T											T	.22	T		T	.86
Feb.									.34			.25		.13										.05	.31	.70	T					.35	.68
Mar.																													.09			1.63	.62
Apr.				.70		.24				T		.02		T	.06	T	T					T		.05	.19							.09	1.27
May				T								.07	1.75													.79						1.26	2.28
June																	T															2.61	1.95
July												.75											T	.49	.08					T		T	1.10
Aug.														1.72	1.69	T	T	T	T				T	T								1.32	1.94
Sept.																		.02	.57	.02			T	T	.10	T			.25			3.41	3.04
Oct.						.16	.02															T							T	.06	T	1.14	1.66
Nov.														T	.08																	.06	.56
Dec.																																.08	.82

Latitude 27° 30' Longitude 100° 36' Elevation 790 Feet — ∮ Period 1927-1951 — Total 1951 11.95 — 16.78

∮ Some months missing

RAINFALL ON THE MEXICAN SIDE OF RIO GRANDE WATERSHED

INCHES — 1951

Lag. de Salinillas, N. L.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	.76
Feb.										T	.12		.25				.08															.31	.73
Mar.																		T					.71	.20	.24	.01			.12			1.28	.67
Apr.			.08			.08						.04	T		T	.08							.04	.25								.12	.97
May																									.39	T						.97	2.99
June																																.39	1.53
July																.04														.06		.10	.65
Aug.													1.18	1.63	.12	.08		.02						.87								.89	3.96
Sept.																	.12	.04					.27					.12				3.01	2.57
Oct.				T		.39																							.12			.24	1.60
Nov.													T								T											.12	.41
Dec.																																T	.51
	Latitude 27° 26' Longitude 100° 22' Elevation 750 Feet																								# Period 1940-1951						Total 1951	7.75	16.53

Anáhuac, N. L.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																													.02	T		.02	.82
Feb.											.16		.04										.04	.43	.35							.04	.49
Mar.																																.98	.70
Apr.						.77						.85													.59							0	1.16
May																																.77	2.68
June																																1.44	1.66
July																	.37					.14	.04	.20								0	1.32
Aug.													.86	.79																		.75	1.89
Sept.																		.12						.02				.16				1.65	3.02
Oct.						1.57	.57																							.06		2.44	1.48
Nov.								T													.02											.06	.46
Dec.																																.02	.86
	Latitude 27° 15' Longitude 100° 07' Elevation 650 Feet																								# Period June 1933-1951						Total 1951	8.17	16.54

Guerrero, Tamps.

Standard gage — Mexican Section I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.														T															T	T		T	.72
Feb.												T							T	T												T	.66
Mar.										.08															.06	.03						.09	.92
Apr.		T									.12		T													T		.53				.61	1.54
May		.06	T	T								.07	2.74		T									.27								.58	2.83
June			.14	.14	T																				.35	.39						3.76	1.58
July									•	T		T																				T	1.30
Aug.																			T				.26	.53								.79	2.31
Sept.										T		.26	1.41	6.29	.28	.79							.26	.20								9.49	3.31
Oct.						.45	.10											.04						.08	.43						.05	1.13	1.53
Nov.	.07	.11												.04																T		.24	.51
Dec.	T																															.04	1.07
	Latitude 26° 47' Longitude 99° 20' Elevation 295 Feet																								# Period 1936-1951						Total 1951	16.67	18.28

Cd. Miguel Alemán, Tamps.

Standard gage — Mexican Section I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.	T													T	T														T	T	T	T	
Feb.													.39						.39													1.97	
Mar.																									.79	.20	.20					1.18	
Apr.												.28	T	T													T	1.18	T	T		1.65	
May		T	T			T							2.36											1.37	T							4.33	
June				1.18																				T	.79								
July										T				.27																	.08	.35	
Aug.	T																		T			T	.43	T	.39							.82	
Sept.												T	5.91	1.18	2.38	1.59								T					T			11.06	
Oct.																		.20	.10					.69	.78							1.77	
Nov.																										T	T			T	T	T	
Dec.															T																	T	
	Latitude 26° 24' Longitude 99° 02' Elevation 180 Feet																															Total 1951	23.13

Rayones, N. L.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	.45
Feb.														T	T	T		T	T	T												0	.45
Mar.																									.40							.40	.36
Apr.														T	.86	T		T				T	T				.72	.25	T			.95	.72
May							.75								T									T	2.49	2.52	T					1.61	1.40
June																																3.01	2.45
July												T		T						T												T	1.14
Aug.														1.07	T	1.06	.68		.35		T		.40	T	2.62	T			T	T		3.37	3.37
Sept.																			.65									.55				2.81	2.87
Oct.																														T		1.20	1.80
Nov.																																T	.35
Dec.																																0	.28
	Latitude 25° 01' Longitude 100° 05' Elevation 1,970 Feet																								# Period 1926-1951						Total 1951	15.35	15.62

Montemorelos, N. L.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																												T	.08	.08	.12	.08	.87
Feb.	.08											.31		.06																		.14	
Mar.		T														.05		T	.09	T				T	.54	.55	.04					1.38	1.11
Apr.				1.63	T		.17	.24					.45	2.44	T	.59			.04					.35	T	T	.79	T	.06			.85	2.16
May				.87	.08																				1.71	1.29	.16					5.06	2.81
June																																4.54	3.94
July											.50	.16	.05																		.12	.83	2.19
Aug.												1.02		.06					.41	.23	.98	.29	2.28	3.16	.14							8.37	4.01
Sept.														1.57	T	5.08	.92	T							T				T			7.57	5.21
Oct.						2.73	.10												1.65	.63	T			.46	.64	.08	.04					6.35	3.39
Nov.	.07	.10								T																						.17	1.57
Dec.															.39																	.39	1.07
	Latitude 25° 12' Longitude 99° 50' Elevation 1,420 Feet																								# Period 1904-1951						Total 1951	36.11	29.20

Laguna de Sánchez, N. L.

Recording gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	.65
Feb.																.26			.90	T	.18				.31	.30						0	.50
Mar.				T				T																		.16	.43	.08	.27			1.95	.64
Apr.				1.26			.16	.47				T			.27	.26			T					T	T	T				T	.18	.94	1.23
May	.49	T											T				.10								1.59	3.15	T					2.60	1.80
June																																3.33	3.73
July												.22	.25				T								.14					.20		.81	3.05
Aug.												T	T	.18				.22				.24	2.71	2.12	.18							5.65	3.98
Sept.												T	.61	2.30	1.10	1.79	1.79							.14	T				.18			7.91	3.99
Oct.						1.36	T											.39	.75				.10	1.14	.47							4.21	2.98
Nov.																														.14	T	.14	.34
Dec.																																0	.33
	Latitude 25° 21' Longitude 100° 16'																								Period April 1941-1951						Total 1951	29.54	26.84

Villa Allende, N. L.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																													.08	.16		.24	.98
Feb.																						T							T			T	1.04
Mar.								T				1.13				.08			.29	T	T			T	2.29	.16					.37	4.34	1.37
Apr.								.24		.12				2.40	T										.13		1.30						1.42	2.12
May		T	.83			.16				.48	.13		.88											.24	1.65	4.08	.47					4.61	3.29
June			.35																													7.43	5.56
July												.20	.45	.08											.44						.26	.24	1.67	2.58
Aug.	T		T									.61		.43				1.18			2.33	1.06	.87	2.83	T				.08				9.31	5.15
Sept.								1.94	.50					2.09	.91	3.66	.94		2.09	.87				1.68	.59						T		7.88	6.98
Oct.																															.06		7.47	5.73
Nov.	T	.18													.65																	.24	1.10
Dec.																																.63	1.20
	Latitude 25° 17' Longitude 100° 01' Elevation 2,210 Feet																								# Period 1938-1951						Total 1951	45.04	37.10

Some months missing

RAINFALL ON THE MEXICAN SIDE OF RIO GRANDE WATERSHED

INCHES — 1951

Santa Catarina, N. L.

Recording gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	1.20
Feb.																																0	.46
Mar.												.07						.33	.06					.57	.12		.04	.10				.95	.38
Apr.																																.14	.73
May										.04				.18	.18								.04	.66	.73							1.85	.70
June	T		.26									.05												1.57	1.30	T						3.18	2.56
July												.09					.04			.13	.78	.82	.08								.04	.04	1.48
Aug.												.04	1.58	T	3.15	.43							.36					T				1.94	3.59
Sept.					.28	.04											T	.20	.40			.05		.35								5.20	3.40
Oct.																												T	.12	.04		1.68	1.83
Nov.																																.16	.40
Dec.														.14																		.14	.82

Latitude 25° 41' Longitude 100° 26' Elevation 1,970 Feet — Period October 1937-1951 — Total 1951 15.28 — 17.55

Monterrey, N. L.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																												.04	.07	.01		.12	.68
Feb.																							T									.01	.62
Mar.											.15	.02	.01					.44	.02				.14	.86	.13							1.76	.76
Apr.																.08									.01	.05	.01					.13	1.20
May			.02								.39			.06	.15	T	T						.04	.47	.59							1.72	1.64
June			.57									.69												1.06	1.75	.06						4.13	2.93
July											.05		.20		.02			.26		.04	.22	1.07	.64	.02	.01					.02	.04	.21	2.56
Aug.											.05		4.28	.04	4.19	T						.03	.06				.19					2.50	3.17
Sept.																1.38																10.20	5.83
Oct.						.70	.11										.06	.54	.24			.08	.37	.40	.03	.02	T					2.55	3.68
Nov.	.13	.06																							.02				.20	.05		.46	1.33
Dec.														.23																		.23	.83

Latitude 25° 40' Longitude 100° 18' Elevation 1,730 Feet — Period 1896-1951 — Total 1951 24.02 — 24.83

Las Comitas, N. L.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	.40
Feb.																	.54															0	.31
Mar.																							.14	.27								.95	.42
Apr.																									.23	.23		.13				.59	.95
May			.16	.11	.16	.16	.16	.01						.10	.43	.01		.04					.02	.86	.60						.10	2.92	.92
June	.22	.01																						.71	2.03							2.97	3.05
July													.33		.09									.08							.06	.56	1.58
Aug.										.46	.01							.02				.51	1.12	1.56								3.68	4.03
Sept.				.01	.35						.24	.94	.55	.24	4.05	1.38								.33	.02			.26				8.57	5.04
Oct.					.54	.12											1.35	.39				.22	.67	.36								3.65	2.13
Nov.																													.19	.05		.24	.35
Dec.														.33																		.33	.56

Latitude 25° 26' Longitude 99° 07' Elevation 1,670 Feet — Period 1940-1951 — Total 1951 24.46 — 19.74

Villa de Santiago, N. L.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																												.08	.12	.11	.08	.39	.91
Feb.		.04	.06																													.10	.96
Mar.										T	.39			T	.04		T	.43	T	T			T	1.54	.16	T					2.56	1.68
Apr.															No record for April																		1.72
May			.35			.04	.17			.19	T	T	.24	.24	.08		T	T			T		T	.44	.16							1.91	2.84
June			.02									.18												1.86	4.06	.37						6.49	5.33
July										T			.12										T						.25	.47	.77	1.49	3.31
Aug.											1.22					T		2.52	.55	.77	.81	1.97	1.88	T								9.84	5.36
Sept.			T		T							T	4.57	.31	2.95	1.46					T	T						.18	T			9.47	8.94
Oct.						1.18	.22										.12	2.17	.75			T	.67	.40	.04	T						5.30	5.11
Nov.	.12	.02																							T					T		.14	1.36
Dec.														.31																		.31	1.08

Latitude 25° 25' Longitude 100° 07' Elevation 1,460 Feet — # Period 1923-1951 — 38.14

Cadereyta, N. L.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																												.06	T	T	T	.06	.86
Feb.	T																															T	.94
Mar.			.02								.38							.86						.12	.02		.02					1.40	1.30
Apr.	.06	.40																										T				.48	2.06
May		.20	.10			.02				.06	2.62	.06	.53	T	T								T	1.80	.14							5.53	2.39
June			.06	.09	.02							1.84												.14	2.29			T				4.44	3.87
July													.43											.22							1.92	2.57	2.63
Aug.		T				T					.47		.05					.39	.08	.12	.09	1.87	1.82									4.89	3.46
Sept.			.01									1.48	.27	6.62	.77									.01	.01			.77				9.94	4.69
Oct.					4.98	.35	.30										.59					1.07	.37	.60	.04							8.30	3.07
Nov.	.10																													.04		.14	1.28
Dec.														.41																		.41	.83

Latitude 25° 36' Longitude 99° 59' Elevation 1,180 Feet — # Period 1904-1951 — Total 1951 38.16 — 27.38

Las Enramadas, N. L.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																	T												.06	T	T	.06	1.07
Feb.											.17							T					T	.22	.12		.14					0	.65
Mar.	T	1.79																	T				T									.51	.66
Apr.											.18	T	.26	T	.38								T	.34						.24		1.93	1.64
May			.94									4.33												.65	.69							1.40	3.18
June																																6.61	3.67
July											T	T	T	T	T																.96	.96	2.37
Aug.		T											T						.22	.10	.61	.93	1.41									3.27	3.11
Sept.													1.77	T	7.28	1.42						.97	T					.38	.07			11.89	5.42
Oct.						.33													1.75				.24	.40								2.72	2.45
Nov.		T																														T	.61
Dec.																																0	.77

Latitude 25° 48' Longitude 99° 16' Elevation 730 Feet — # Period 1926-1951 — Total 1951 29.35 — 25.56

El Cuchillo, N. L.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	.97
Feb.											T							T	.01					.10	.01							0	.58
Mar.	.01	.05																								.05		T				.12	.41
Apr.		T									.03		.36	.04									.54	.06	T							.11	1.79
May			.02									.41												1.18	.50							1.05	1.99
June			.03																													2.12	2.58
July												.01	.19							.02	.07	.11	.73	.06								0	1.56
Aug.													4.58	.59	2.19	2.00								.03				.40	.02			1.19	2.56
Sept.						.19												.66	.10					.32	.64	T						9.81	4.27
Oct.																														.02		1.91	2.16
Nov.	.01																															.05	.28
Dec.														T																		T	.51

Latitude 25° 43' Longitude 99° 16' Elevation 590 Feet — Period June 1938-1951 — Total 1951 16.34 — 19.66

Gral. Bravo, N. L.

Standard gage — Meteor. Serv. of Mex.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.														T														T	T	T	T	T	.81
Feb.										T						T	T															0	.42
Mar.																		T		T				.20	.21	T	T					.41	.58
Apr.	T																							T							T	1.59	1.59
May					T					.89	T	T											T	T								.89	2.68
June												.79	T											1.04								1.83	2.68
July											T																			.28	.36	.64	2.56
Aug.	T									T	T	T								.13	.21	.26	.29									.89	2.19
Sept.														5.36		1.77																7.13	3.65
Oct.					T													1.27				.31	.34	.38								2.30	1.65
Nov.	T	T	T																							T						T	.82
Dec.																																0	.86

Latitude 25° 48' Longitude 99° 09' Elevation 390 Feet — # Period 1906-1951 — Total 1951 14.09 — 20.47

Some months missing

RAINFALL ON THE MEXICAN SIDE OF RIO GRANDE WATERSHED

INCHES — 1951

Gral. Cepeda, Coah.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan. Feb. Mar. Apr. May June	T		T .02				.03 .02		T			T	.42	T .07	.15 T .06			.46	.21	.14	.04	T	.51	.26	.15 T .02	T .25	.07	.04	.25			0 0 1.23 .11 .72 1.11	.56 .44 .32 .37 .82 2.37
July Aug. Sept. Oct. Nov. Dec.	T .24	T .58	.02	.02	T	.60	T			T	.31 T	.21 T .20	.09 .87	T T .03 .05	.10 .83 T	.37		.60	.13		T	T .59 T	.04 T .58	T T .13	T .03			T	.37	.04	.06	.48 .62 4.09 1.44 .41 .05	3.85 3.08 3.28 1.35 .53 .60
	Latitude 25° 24'			Longitude 101° 29'			Elevation 4,920 Feet																Period August 1926-1951						Total 1951			10.26	17.57

Saltillo, Coah.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan. Feb. Mar. Apr. May June		.75	.06						T	.14	.12		.39	.39 .12	.10			.27	.39		.16	T	.06	.01 .10	.30 .12	.27 .08		.02		.05		0 0 1.21 .29 .77 1.63	.61 .50 .39 .73 1.03 2.08
July Aug. Sept. Oct. Nov. Dec.	T	.25 .02	.25 .04		1.44	.08	.08	.08			.39 .59	.11 .02 1.52	1.08 .15	.37 .39 .01	.14 1.16	.04 .14 .45	T	.20	.12			.09 .36 .04	.12 .07 .78	.30	.07		T			.22		1.11 1.08 7.06 1.52 .24 .16	2.75 2.40 2.61 1.27 .95 .65
	Latitude 25° 26'			Longitude 101° 00'			Elevation 5,280 Feet																∮ Period 1886-1951						Total 1951			15.07	15.97

Ramos Arizpe, Coah.

Standard gage — Meteor. Serv. of Mex.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan. Feb. Mar. Apr. May June	T			.08				.08	T		.04	T		.08 .04		T		.51	.24	T	T		.15	.12	.27 T .43	.20 .06	T	T		T		0 0 1.14 .20 .31 .65	.48 .33 .35 .46 .74 1.15
July Aug. Sept. Oct. Nov. Dec.	.08	T	.24 T				.12				.39 .08	T .24	T T 1.50	.14	T 2.53	T		.22	.20		.22	.04 .27 .47	T .11 .14 .34	.10 T	T T	T			.23	T	.08	.81 .31 4.82 1.57 .23 0	1.50 1.41 1.86 .66 .47 .57
	Latitude 25° 32'			Longitude 100° 58'			Elevation 4,590 Feet																∮ Period 1907-1951						Total 1951			10.04	9.98

Rinconada, N. L.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan. Feb. Mar. Apr. May June	.08						.04				.14			.10	.02 .02			.46	.20		T		T .04	T .08 .86 .08	.16 .06 .16	.08	T	.45				.08 T 1.06 .53 1.12 .24	.33 .49 .29 .80 .50 1.07
July Aug. Sept. Oct. Nov. Dec.	.04						.08				.04	.04 .12	2.05	.06 .04	3.02 .02	.20	.22	.24	.04			.10 .04 .27	.17 .43	.04 .33 .04					.08	.15		.08 .31 5.49 1.61 .31 .06	.54 2.08 2.31 1.03 .24 .23
	Latitude 25° 32'			Longitude 100° 42'			Elevation 6,890 Feet																∮ Period April 1944-1951						Total 1951			10.89	9.91

Ciénaga de Flores, N. L.

Recording gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan. Feb. Mar. Apr. May June			.62	.14	-	T T	.18				T	.15 .16	.13	T	T	T T		.14	.11				T 2.39	.33 T .35	.27 T .13 .97	.06 T		.10 .06		.14	.12	.36 T .91 .06 3.31 1.89	1.48 .59 .74 1.08 2.20 2.92
July Aug. Sept. Oct. Nov. Dec.						3.18	.29				.20	T	T .09 4.25	.26 .49	4.64 .11	.61 .10 .39	.73	.42 .42	.20 .37	.11	.13	.14 .33 .21	1.56 1.21	.21 .72	.06	.06		.11	.38 .18	.18 .23	.08	1.46 2.95 10.04 7.19 .41 .60	2.27 3.89 5.23 2.16 .74 .81
	Latitude 25° 58'			Longitude 100° 10'			Elevation 1,760 Feet																Period April 1938-1951						Total 1951			29.18	24.11

Topo Chico, N. L.

Recording gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan. Feb. Mar. Apr. May June		.05	.12	T						T		1.10					T	.35	.07				T .08 1.18	1.10 2.22 .14	.47 .91 1.07			T	.01	.01		.02 T 2.07 0 4.36 2.43	.67 .90 .78 1.34 1.28 2.63
July Aug. Sept. Oct. Nov. Dec.											.18	.61	.11	1.99 .25	1.24	3.30	.81 .83		.14	.21	.10	2.01	.05 .05	.18 T			.12				.09	.88 3.61 7.53 .25	1.64 3.32 5.02 2.31 .88 .81
	Latitude 25° 49'			Longitude 100° 20'			Elevation 1,640 Feet																∮ Period 1939-1951										21.58

No Record October 1 through November 31

Higueras, N. L.

Standard gage — Meteor. Serv. of Mex.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan. Feb. Mar. Apr. May June		.01 .01	.40			.01	T			T	.26 .02	.06 .13	.25	.03	T	T	T .26	.12	.02				2.32	.45 .09 .79	.16 T .44	.01 T		T T	.10	.08	T	.18 0 1.02 .01 2.77 2.02	.85 .57 .62 1.19 1.81 2.76
July Aug. Sept. Oct. Nov. Dec.	T .04					1.62	.20				1.38	.49 T	.10 .24 1.27	.02 .09 .09	4.88	.12 .46	.23	.57	.25	T	T .18	.43 2.08	.35 .65 .16	.10 T .57	.52	.04		.45	.01 .03 .17	1.25 .12	.51	2.46 2.53 10.09 4.16 .33 .09	2.27 3.04 4.40 1.67 .84 .76
	Latitude 25° 59'			Longitude 100° 01'			Elevation 1,640 Feet																∮ Period 1906-1951						Total 1951			25.66	20.78

Los Ramones, N. L.

Recording gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan. Feb. Mar. Apr. May June		.08 .12	.10 .13				T				.12	1.42	T .53	.72	.20		T	.14						.21 .51 .51	.08 .35	T		T T	.02	T .04	T	.02 T .55 .08 2.22 2.41	.75 .67 .64 2.34 1.98 3.20
July Aug. Sept. Oct. Nov. Dec.	T					1.89						.02 .39	.81	.25 T	6.89	.79	.14	.59	T .10		.28	.90 T	.59 1.06	.29 .57	.06			.10	T	.04	.63	.94 1.77 9.25 4.35 .10 T	2.30 3.44 4.50 2.37 .29 .30
	Latitude 25° 42'			Longitude 99° 13'			Elevation 270 Feet																∮ Period 1939-1951						Total 1951			21.67	22.78

∮ Some months missing

RAINFALL ON THE MEXICAN SIDE OF RIO GRANDE WATERSHED

INCHES — 1961

Los Herreras, N. L.

Recording gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.				T								T						T	T									T	.01	T	T		.01	.75
Feb.					T							T	T					.20														.01	.55
Mar.							T	T			.01					T					T	T	T	.29	.16	T						.65	.72
Apr.	.01	T																								.94		.10				1.05	1.67
May		.06	.71								.33		.68	.09	.30								.71	.04								2.92	3.04
June			.15	T								.41												.32	.44							1.32	3.38
July																															T	T	1.14
Aug.												T	.01						.04	.05		.31	.43									.84	2.60
Sept.												T	.26	.55	4.13	1.69		T	T	T		T						.05	T	T		6.66	4.30
Oct.	T	T			T	.33	T	T	T	T	T	T			T		.01	.22	.25		T	T	.24	.55	T	.02		.20	T	T	T	1.82	2.18
Nov.	.02		T	T		T	T	T					T								T	T	T	T	T					.20		.22	.37
Dec.	T	T												.04					T					T	T			T	T	T	T	.04	.54

Latitude 25° 55' Longitude 99° 24' Elevation 820 Feet — Period September 1939-1951 — Total 1951: 15.54 — 21.24

Cerralvo, N. L.

Recording gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																												.01	.02	.01		.04	.81
Feb.												.06						.21														0	.58
Mar.	T														.01									.43	.09							.79	.73
Apr.		.02	.83								1.98		T	.89	.19									.22		1.80						1.81	1.68
May			.34	T										.28										T	.73							4.76	3.43
June																															.52	1.35	3.05
July												.01								.14		.09	.65									.52	1.41
Aug.													.37	.84	3.73	.35								T				.39	.62			.89	3.06
Sept.						1.52											.02	.67	.22			T	.30	.54								6.30	5.62
Oct.																									T				T	.12		3.27	2.31
Nov.	.04																															.16	.38
Dec.													.22																			.22	.45

Latitude 26° 06' Longitude 99° 37' Elevation 1,130 Feet — # Period 1938-1951 — Total 1951: 20.11 — 23.51

Comales, Tamps.

Recording gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																												.07	.05	.02		.14	.82
Feb.												.42		T	T			.30														T	.67
Mar.	T																							.30	.10	.05						1.17	.55
Apr.			1.17			.17						.44	.33	.02										.04		.21		.62				.87	1.48
May				.09									.66										.18		.15							2.46	2.07
June																								.10	1.91							2.76	2.19
July																															.98	.98	1.02
Aug.	T	.11										.10	.27	4.14	2.70	1.21	.19			.46	.08	.53	.46	.89					.10			2.53	2.78
Sept.				.08																				.06								8.85	3.28
Oct.																		.09	.14					.57	.38							1.18	1.73
Nov.	.02																									.04		T				.06	.40
Dec.	.04														.04																	.08	.83

Latitude 26° 14' Longitude 98° 58' Elevation 270 Feet — Period March 1938-1951 — Total 1951: 21.08 — 18.12

Reynosa, Tamps.

Recording gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																												.12				.12	1.26
Feb.												.28						T					.27	.39	.30							0	.42
Mar.										T																T		T				1.24	.62
Apr.												1.61	.06	.12		T								.18	.80							T	.89
May			.10										.08											.37	1.85							2.87	2.91
June			.65	T																												2.95	2.06
July											.12										T		.73	.25							.31	.43	1.36
Aug.	.63										T	T	T											T				T	.86	.43		1.61	1.70
Sept.											.14		T	2.13	1.69	.18								.38	.12							5.43	2.87
Oct.																		.06			T									.08		.56	1.60
Nov.	.13														T										T		.12	T				.33	.34
Dec.																																T	.71

Latitude 26° 06' Longitude 98° 17' Elevation 130 Feet — # Period 1941-1951 — Total 1951: 15.52 — 16.94

Retamal, Tamps.

Standard gage — Mexican Section I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.	.03													T															.18	.18		.39	.34
Feb.														.14																		.16	.11
Mar.				T											T		.12	.02						T	T							.66	1.14
Apr.							T			.04	T	T	T						T	.06	T				T	.32	.16	T				.32	.85
May		T	.04								T	3.21												.43	.05	.36	.02		.26			4.11	2.60
June		T	.67										T	T	T	T	T								.41	3.95	T		T			3.03	3.08
July																																.09	.28
Aug.	1.06	T					T	T			T	.01	T	.08	T			.14			T	.14	.58	.03	.13							2.08	1.56
Sept.													T	.06	1.73	3.10	.30	.73					.08						T	.10	T	6.40	3.81
Oct.								T				.28							T	T				.51	.15				.04			.70	.78
Nov.	.08	T				.06										T			T	T	.10				T	.16	.39			.04		.83	.28
Dec.								T										T							.05	T						.05	.32

Latitude 26° 02' Longitude 98° 02' Elevation 82 Feet — Period October 1949-1951 — Total 1951: 20.82 — 14.55

Control (C 1-K-9), Tampa.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.					T									.91														.01				.01	1.56
Feb.																1.10	T															.91	.73
Mar.				T								T						T	T					T	1.57	.18	T					2.85	1.07
Apr.										T	T		T																.30			.50	.73
May				T							.06	2.13		T										.43	.29	.79						3.70	3.37
June																No record for June																	2.40
July	.02										.03		.01	.05																		.11	.89
Aug.		.69	T								T	.35	.22	.06	4.21	.16	T	.85	T	.06	.67	1.57	.26	.35								4.85	5.00
Sept.													.37	1.06								.22					T		.30	T		6.69	4.48
Oct.					T													1.65	.16				2.30	.32				.02				4.45	2.10
Nov.	T									T								T	.06	.04			.10		.37							.57	.92
Dec.															T								T		T							T	.66

Latitude 25° 58' Longitude 97° 49' Elevation 59 Feet — # Period 1942-1951 — 21.91

Matamoros, Tamps.

Standard gage — Meteor. Serv. of Mex.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.	.01													.79																		.01	1.54
Feb.																																.79	1.00
Mar.							T			.29	T														.79	.55			.28			1.34	1.10
Apr.											T	2.14	T	T	T									.47	.79							.57	1.46
May			3.05	T																				.19	1.02							3.40	2.93
June																																4.26	3.44
July											.04	.12	.10				.14				1.67	.83	.87									.26	2.15
Aug.	1.34											.32	.38	1.57	2.07							1.06							.55			4.85	2.13
Sept.						.27												2.30	.89				1.36	.14				.02				5.73	5.20
Oct.											T								T	.12		.06								T		4.98	2.85
Nov.	1.08				.06					T					.04	T		.04						.02	.06	.04						1.42	1.46
Dec.				.04																												.14	1.84

Latitude 25° 52' Longitude 97° 30' Elevation 40 Feet — # Period 1912-1951 — Total 1951: 27.77 — 27.10

18 de Marzo, Tamps.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.						T								T															T	T	T	T	.18
Feb.													T					T	T		T			T	1.18	.39						T	
Mar.			T	T																												1.57	.82
Apr.											7.68														2.09	4.17						0	
May																								1.26	6.50							13.94	7.68
June																																7.76	3.97
July																No record for August																0	1.13
Aug.												1.18		T	3.94	T													3.94				1.26
Sept.																			1.57	1.10				1.22	.12							9.06	7.15
Oct.							.24							T											T	T						4.25	3.55
Nov.	T	T						T	T						T	T									T							T	.69
Dec.																																T	.07

Latitude 25° 41' Longitude 97° 48' Elevation 56 Feet — # Period June 1949-1951

RAINFALL ON THE MEXICAN SIDE OF RIO GRANDE WATERSHED

INCHES—1951

Méndez, Tamps. 1950

Standard gage / Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																										.24						.24	
Feb.		.35	T																			T										.35	
Mar.	.45	.10	1.24	.85	T							T					.59															3.23	
Apr.				T										.25	.19				.16	.64					T		T					1.24	
May											2.21			1.38																		3.59	
June	.63	T	T																													.63	
July																		T	T	T			T									T	
Aug.																																T	
Sept.					T																											3.86	
Oct.			3.00	2.26																				3.07	.79							5.26	
Nov.												T	T																			T	
Dec.																																0	

Latitude 25° 07' Longitude 98° 33' Elevation 420 Feet — Total 1950 18.40

Méndez, Tamps. 1951

Standard gage / Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	1.10
Feb.											.15																					0	.63
Mar.																								.10	.79							1.04	.94
Apr.																										T	.26					.26	1.39
May				T					.50			T											T	T	1.25						1.75	3.58
June			.12	.23	T							T												1.70	1.23							3.28	2.85
July																																0	.86
Aug.	T											T						T		7.87	9.69											17.52	4.50
Sept.													2.53	.33	2.88	T								.15								6.14	3.88
Oct.																		1.25	.58				.22	.21				.23	T			2.26	2.00
Nov.		T																														T	.28
Dec.																																0	.51

Period 1939-1951 — Total 1951 32.25 — 22.52

Linares, N. L.

Recording gage / Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																				.51	T							.10	.09	T	T	.70	1.00
Feb.														.04	T																	.04	.85
Mar.										1.68		.01			.05		T	.06		.06				.13	.68	T						2.67	1.20
Apr.		.22																								.39	.02	.06				.69	2.45
May		.01	2.96			.60	.86			.01	.02	.18	5.51	.02									.07	.06					.27		10.57	3.61
June		.12	.01									.05					.14	T						.75	2.24	.02		.07				3.38	3.86
July															.11														T			.11	3.05
Aug.										.02	T	.06	.12						T	.74	.55	1.69	2.91	.03								6.12	3.24
Sept.				T							.02		1.24	.67	6.18	.54					T							.48				9.13	6.49
Oct.						1.46	1.27											1.38	.20				.52	.55	.03							5.41	3.19
Nov.																										.07			T			.07	1.25
Dec.														.23	T																	.23	1.06

Latitude 24° 52' Longitude 99° 34' Elevation 1,180 Feet — # Period 1900-1951 — Total 1951 39.12 — 31.25

Villagrán, Tamps.

Recording gage / Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																				.20									.04	.04	T	.28	.38
Feb.														.02	T																	.02	.81
Mar.											1.26	T			.08			.08	.20	T				.04	.51	T						2.17	1.04
Apr.		.10															T								T	.76	.06	.16				1.12	2.82
May		T	.93			.20	.04				.39	.08	3.66	T	.12								1.26	.20	.33					.33		7.95	5.25
June			.10	.16			.45																	1.08	3.51							6.79	4.70
July												.04	.12		.06																	.22	2.42
Aug.												.31	.16						.20	.08	T	3.54	5.35	.75								10.39	6.78
Sept.				.29						.10	T		3.78	.16	4.65	1.42	T				.41	.35	T					.18				11.34	6.88
Oct.						.76	.20											1.38	.06				.27	.24	.08							2.99	3.61
Nov.	T	.06																								T						.06	.79
Dec.														.06																		.06	.30

Latitude 24° 29' Longitude 99° 29' Elevation 1,260 Feet — # Period 1939-1951 — Total 1951 43.39 — 33.78

Some months missing

AVERAGE RAINFALL ON SUBDIVISIONS OF THE RIO GRANDE WATERSHED

INCHES — 1951

Watershed Subdivision	Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
El Paso to Fort Quitman	1951	.17	.32	.57	.25	.10	.05	1.39	2.33	.19	.34	.04	.43	6.16
	Total	38.31	30.37	27.37	23.73	32.84	65.80	192.84	158.97	116.36	73.03	37.08	52.25	851.55
	Normal	.47	.37	.35	.29	.41	.81	2.38	1.96	1.44	.93	.46	.65	10.52
	Totals and Normals for the 81 Years 1871-1951, Inclusive													
Fort Quitman to Upper Presidio	1951	.10	.06	.65	.25	.53	.42	1.52	2.07	.48	.08	.04	.23	6.43
	Total	31.96	20.53	21.59	30.95	30.19	98.79	265.18	203.54	163.15	79.64	33.01	47.70	1,046.23
	Normal	.39	.25	.27	.38	.62	1.22	3.27	2.51	2.01	.98	.41	.59	12.90
	Totals and Normals for the 81 Years 1871-1951, Inclusive													
Pecos River Sheffield to Pecos River Station	1951	.03	.32	1.54	.75	1.57	3.11	.49	.77	.64	.50	.04	.21	9.93
	Total	59.63	72.46	68.45	162.87	142.63	200.59	159.98	172.02	199.48	147.96	79.42	66.69	1,332.20
	Normal	.74	.89	.85	2.01	1.76	2.48	1.98	2.12	2.46	1.83	.98	.82	18.92
	Totals and Normals for the 81 Years 1871-1951, Inclusive													
Devils River	1951	T	.17	1.59	.82	1.37	2.17	.40	.47	.66	.82	.08	.21	8.56
	Total	56.23	51.97	94.91	147.22	211.86	219.46	147.73	175.00	243.09	174.37	137.90	90.04	1,749.78
	Normal	.69	.64	1.17	1.82	2.62	2.71	1.82	2.16	3.00	2.15	1.70	1.11	21.59
	Totals and Normals for the 81 Years 1871-1951, Inclusive													
United States Side Below Rio Grande City	1951	.20	.41	1.49	.51	3.29	2.99	.82	2.27	5.85	2.61	.40	.10	20.94
	Total	100.72	83.42	94.07	106.19	236.76	199.08	147.20	185.52	352.76	194.06	112.51	106.59	1,918.88
	Normal	1.24	1.03	1.16	1.31	2.92	2.46	1.82	2.29	4.36	2.40	1.39	1.32	23.70
	Totals and Normals for the 81 Years 1871-1951, Inclusive													

EVAPORATION IN THE RIO GRANDE BASIN IN INCHES

In the United States

Evaporation is observed at seven stations operated and maintained by the United States Section of this Commission from Presidio, Texas to Falcón Dam near Roma, Texas. At all stations, the exposure to wind is uniform and relatively unimpeded. The sites are kept cleared of all high brush and trees within 150 feet and of all brush and tall weeds within 100 feet of the fenced enclosures. Within the enclosures, all vegetation either has been eradicated or is kept trimmed to within 3 inches of the ground surface. No water barrels, tanks, or objects of similar size are stored within 100 feet of the enclosures.

Three types of pans are in use at these stations:

1. U. S. Weather Bureau Standard pan. A circular pan, 4 feet in diameter and 10 inches deep, made of 22-gage galvanized iron, is set on a wooden platform with the rim of the pan 16 inches above the ground. The water level is maintained between 2 and 3 inches below the rim of the pan. Monthly summations are made of the volumes of water which were required to maintain the water level within the above limits throughout the month and to bring the water level to the point of a fixed gage at the end of the month. These volumes, together with the measured rainfall, are converted to inches of evaporation. This type of pan is in operation at Dryden and Fort McIntosh (Laredo), Texas.

2. A circular pan, 2 feet in diameter and 36 inches deep, made of 22-gage galvanized iron, is set in the ground with the rim of the pan 3 inches above the ground surface and the top covered with a circular screen of No. 4 (1/4" mesh) galvanized hardware cloth. The water level is maintained between 2.5 and 3.5 inches below the rim of the pan. Measurements of evaporation are made in the same manner as for the 4-foot diameter pan. This type of pan is in operation at Presidio, Johnson Ranch, Maravillas Creek, Dryden, Fort McIntosh (Laredo), and Falcón Dam, Texas.

3. A circular pan, 12 feet in diameter and 36 inches deep, made of 20-gage galvanized iron, is set in the ground with the rim of the pan 3 inches above the ground surface. The water level is maintained between 2.5 and 3.5 inches below the rim of the pan. Measurements are made by a micrometer hook gage. This type of pan is in operation at Dryden and Fort McIntosh (Laredo), Texas.

Month	Presidio, Texas		Johnson Ranch, Texas		Maravillas, Texas		Dryden, Texas			
							2-Foot Pan		4-Foot Pan	
	1951	Average Nov. 1949 -1951	1951	Average Oct. 1949 -1951	1951	Average Nov. 1949 -1951	1951	Average Sept. 1949 -1951	1951	Average Oct. 1944 -1951
Jan.	4.68	4.12	5.00	4.26	5.31	4.55	4.98	3.50	6.51	4.01
Feb.	4.62	4.78	5.26	5.36	3.90	4.24	4.40	3.87	5.85	5.50
Mar.	8.45	8.96	8.76	9.14	7.16	7.58	7.32	8.06	9.78	10.26
Apr.	10.79	10.85	11.41	11.38	10.86	10.32	9.61	8.44	13.91	12.51
May	13.65	13.14	13.78	13.48	9.79	10.13	9.78	9.90	15.45	14.08
June	15.18	13.88	15.36	14.70	11.40	12.21	9.24	10.61	14.21	15.69
July	14.10	12.65	14.12	13.72	11.00	11.19	13.95	12.81	19.50	16.20
Aug.	15.90	14.58	15.79	14.78	13.35	12.02	13.32	11.80	18.53	15.42
Sept.	12.63	10.98	13.13	11.76	11.04	9.52	10.40	8.45	13.79	11.77
Oct.	9.48	8.96	10.30	9.44	7.92	7.93	7.78	6.22	9.83	7.47
Nov.	5.67	5.53	6.08	5.79	6.28	5.74	5.10	5.31	5.87	5.90
Dec.	4.75	4.09	5.30	4.80	3.92	4.37	4.56	4.34	5.78	4.75
Total	119.90	112.52	124.29	118.61	101.93	99.80	100.44	93.31	139.01	123.56

Month	Dryden, Texas 12-Foot Pan		Fort McIntosh, Texas						Falcón Dam, Texas	
			2-Foot Pan		4-Foot Pan		12-Foot Pan			
	1951	Average Oct. 1949 -1951	1951	Average Feb. 1950 -1951	1951	Average Feb. 1950 -1951	1951	Average Feb. 1950 -1951	1951	Average Apr. 1950 -1951
Jan.	4.70	3.59	4.59		5.45		3.88		5.24	
Feb.	3.51	3.64	4.48	4.13	6.18	5.80	3.97	3.80	6.21	
Mar.	7.12	7.20	7.93	7.22	9.54	8.90	7.38	6.98	10.31	
Apr.	9.88	9.44	8.75	8.48	11.41	10.66	7.52	7.23	9.26	9.10
May	9.79	10.50	8.98	8.95	12.36	12.83	8.52	8.70	11.14	11.64
June	10.25	11.70	11.40	11.15	14.09	13.89	9.72	9.78	13.58	13.50
July	13.25	12.46	14.59	14.21	17.95	17.56	12.82	12.56	14.31	15.15
Aug.	13.12	11.74	12.08	12.56	14.89	15.68	10.49	11.06	12.00	13.02
Sept.	9.75	8.92	9.26	9.12	12.32	11.58	8.52	9.09	8.36	9.67
Oct.	6.94	6.03	7.57	7.79	7.44	8.39	5.80	6.40	6.82	7.53
Nov.	4.73	4.95	¤ 4.44	* 5.05	5.10	5.54	4.27	4.50	5.32	6.58
Dec.	4.17	3.82	* 4.62	* 4.32	5.44	4.94	3.78	3.60	4.60	5.17
Total	97.21	93.99	98.69		122.17		86.67		107.15	

¤ Estimated * Partly estimated

EVAPORATION IN THE RIO GRANDE BASIN IN INCHES

In Mexico

Evaporation is observed at nine stations, which are operated and maintained by the Mexican Section of this Commission, on the Río Conchos at Cuchillo Parado and along the Rio Grande at Cd. Acuña, Jiménez, Piedras Negras, and Villa Hidalgo in the state of Coahuila and Cd. Guerrero, Cd. Miguel Alemán, Retamal, and Matamoros in the state of Tamaulipas. Records of evaporation in the Rio Grande Basin in Mexico are furnished by the Meteorological Service of Mexico, the Ministry of Hydraulic Resources, and the Cía. Agrícola y de Fuerza Eléctrica del Río Conchos, S.A.

At all stations operated by the Mexican Section, the sites are kept cleared of all high brush and trees within 150 feet and of all brush and tall weeds within 100 feet of the fenced enclosure. Within the enclosures, all vegetation either has been eradicated or is kept trimmed to within 3 inches of the ground surface. Except for a water barrel and a thermometer shelter in the northeast and northwest corners of the enclosures, the exposure to wind is uniform and relatively unimpeded.

Three types of pans are in use at the stations listed below:

1. A U. S. Weather Bureau standard pan, 4 feet in diameter and 10 inches deep, made of 22-gage galvanized iron, is set on a wooden platform with the rim of the pan 16 inches above the ground. The water level is maintained between 2 and 3 inches below the rim of the pan and is measured with a micrometer gage. This type of pan is used at all stations except Palestina and La Boquilla.
2. A circular pan, 4 feet in diameter and 10 inches deep, made of 22-gage galvanized iron, is set on a wooden platform with the rim of the pan 3 feet above the ground. The water level is maintained between 1 and 6 inches below the rim of the pan and is measured with a micrometer gage. This type of pan is used at Palestina.
3. A circular pan, 4 feet in diameter and 10 inches deep, made of copper, is set on concrete piers with the rim of the pan 18 inches above the ground. The water level is maintained between 2 and 6 inches below the rim of the pan and is measured with a micrometer gage. This type of pan is used at La Boquilla.

Month	San Antonio, Durango		La Boquilla Dam, Chih.		Villalba, Chih.		F. I. Madero Dam, Chih.		Delicias, Chih.	
	1951	Average 1943-51	1951	Normal 1938-51	1951	# Normal 1940-51	1951	Average 1949-51	1951	#Average 1950-51
Jan.	6.13	4.83	6.14	4.29	6.83	5.48	6.52	4.42	3.95	3.64
Feb.	7.76	6.74	6.65	6.08	7.59	7.31	7.46	5.52	4.73	5.21
Mar.	9.50	10.26	9.27	9.78	10.56	11.62	9.93	9.01	7.66	8.56
Apr.	11.62	11.01	12.99	11.84	14.20	13.52	14.05	12.15	9.83	9.96
May	12.63	11.98	15.20	14.09	15.58	15.39	15.83	14.74	12.05	11.90
June	12.92	10.96	16.38	13.96	15.48	14.30	16.15	14.71	12.35	11.90
July	8.91	8.32	12.78	11.25	12.65	11.19	13.80	11.64	11.81	10.41
Aug.	8.81	8.03	11.83	9.84	12.46	10.02	12.60	11.17	11.26	9.02
Sept.	7.78	6.30	10.30	7.78	10.13	7.96	11.12	9.38	8.50	7.71
Oct.	6.85	5.79	8.06	6.67	8.91	7.19	9.70	7.95	6.85	6.11
Nov.	6.22	5.10	5.71	4.97		5.82	6.77	4.92	4.59	4.34
Dec.	6.17	4.39	5.27	3.86	6.61	4.93	6.42	4.87	4.45	3.51
Total	105.30	93.71	120.58	104.41		114.73	130.35	110.48	98.03	92.27

Month	La Junta, Chih.		Cuchillo Parado, Chih.		Cd. Acuña, Coah.		Palestina, Coah.		Jiménez, Coah.	
	1951	# Normal 1936-51	1951		1951		1951	# Normal 1931-51	1951	
Jan.	3.20	2.72	5.13		5.16		5.26	5.48	3.68	
Feb.	3.82	3.79	5.64		5.03		4.92	4.76	4.89	
Mar.	5.81	6.41	10.13		9.93		6.25	7.03	9.39	
Apr.	8.13	8.91	13.52		11.67		7.31	8.13	9.79	
May	10.75	10.81	16.41		10.52		6.61	9.12	8.65	
June	11.54	10.35	17.85		12.41		10.43	10.47	10.14	
July	7.12	7.25	15.98		15.20		8.32	11.02	13.38	
Aug.	6.32	6.29	16.02		14.36			11.20	12.92	
Sept.	6.24	5.42	12.73		10.32			9.27	8.37	
Oct.	4.96	4.75	9.98		6.80		8.27	8.15	5.91	
Nov.	2.97	3.35	5.12		4.29			6.77	3.60	
Dec.	2.69	2.50	5.15		3.63			5.72	3.06	
Total	73.55	72.55	133.66		109.32			97.12	93.78	

Some months missing

EVAPORATION IN THE RIO GRANDE BASIN IN INCHES

In Mexico

Month	Piedras Negras, Coah.		Hidalgo, Coah.		Progreso, Coah.		Sabinas, Coah.		Villa Juárez, Coah.		Don Martín, Coah.	
	1951		1951		1951	Average 1950-51	1951	#Average 1941-51	1951	Average 1949-51	1951	# Normal 1927-51
Jan.	4.33				4.35	3.84	4.63	3.15	4.20	3.47	3.10	3.42
Feb.	4.92		4.61		4.36	4.22	5.21	3.83	4.57	3.89	3.72	4.15
Mar.	8.02		7.50		7.71	7.46	7.61	6.96	7.64	7.32	5.92	7.13
Apr.	10.67		11.20		9.03	7.92	8.76	9.73	10.56	8.20	8.71	8.79
May	9.76		12.33		9.33	9.09	9.00	10.35	9.67	9.16	9.06	10.15
June	11.39		13.42		11.74	10.22	10.60	11.70	12.29	11.23	12.37	11.72
July	14.22		18.81		13.80	12.63	13.02	11.94	14.20	12.72	14.65	12.39
Aug.	13.39		17.11		12.50	11.54	12.29	11.83	13.43	11.89	15.29	11.98
Sept.	10.89		12.82		8.59	8.44	8.49	7.89	10.24	9.09	10.43	8.37
Oct.	6.80		8.01		5.04	5.70	5.94	5.98	5.80	5.96	6.73	6.23
Nov.	3.66		5.48		3.67	4.16	3.95	3.92	3.70	4.29	4.63	4.28
Dec.	3.94		5.16		4.01	3.91	4.23	2.71	3.71	3.14	4.84	3.27
Total	101.99				94.13	89.13	93.73	89.99	100.01	90.36	99.45	91.88

Month	Lag. de Salinillas, N. L.		Cd. Anáhuac, N. L.		Cd. Guerrero, Tamps.		Cd. Miguel Alemán, Tamps.		Montemorelos, N. L.		Monterrey, N. L.	
	1951	# Normal 1936-51	1951	# Normal 1933-51	1951		1951		1951	# Normal 1941-51	1951	# Normal 1921-51
Jan.	4.43	3.73	3.85	2.67	5.89		6.26		4.02	2.78	7.30	4.07
Feb.	4.67	4.76	3.83	3.48	6.80		8.74		5.39	3.34	6.84	4.91
Mar.	6.93	7.89	7.74	6.29	8.65		9.70		5.76	5.47	6.47	6.66
Apr.	9.01	9.53	9.39	7.79	11.64		11.36		7.24	5.83	7.55	7.68
May	9.00	10.28	9.22	8.89	11.76		11.32		6.09	6.42	7.24	8.46
June	11.94	10.93	10.96	10.21	14.99		13.93		8.00	7.72	7.69	9.28
July	12.52	11.80	12.27	11.04	17.14		15.92		9.63	9.11	9.79	10.13
Aug.	11.74	11.00	12.11	10.76	15.99		15.07		8.28	8.60	9.01	9.36
Sept.	8.94	8.11	8.13	7.32	10.70		10.11		5.47	5.77	5.71	5.90
Oct.	6.72	6.27	5.13	5.41	7.81		6.97		3.78	3.90	5.37	4.92
Nov.	4.16	4.69	3.49	3.58	5.11		4.89		2.84	2.94	5.14	4.03
Dec.	4.43	3.57	3.58	2.60	5.33		4.79		3.11	2.59	5.08	3.69
Total	94.49	92.56	89.70	80.04	121.81		119.06		69.61	64.47	83.19	79.09

Month	Las Comitas, N. L.		Las Enramadas, N. L.		El Cuchillo, N. L.		Saltillo, Coah.		Rinconada, N. L.		Ciénaga de Flores, N. L.	
	1951	Average 1950-51	1951	Average 1950-51	1951	# Normal 1940-51	1951	# Normal 1929-51	1951	Average 1950-51	1951	# Normal 1941-51
Jan.	4.33		4.33		5.82	4.35	6.24	5.05	5.03		4.35	3.89
Feb.	4.98		4.81		6.94	5.39	5.93	5.36	4.93		4.02	4.33
Mar.	6.45		6.41		8.74	8.48	6.98	7.72	6.44		6.52	6.89
Apr.	8.04		7.94		10.79	9.76	8.60	9.15	8.34		7.51	7.79
May	7.92		8.61		11.15	10.95	8.22	9.31	8.13		7.74	8.63
June	8.93		10.02		14.29	12.42	7.40	9.50	9.05		8.28	9.21
July	10.02				15.34	14.39	9.53	8.81	9.18		9.21	10.16
Aug.					12.70	13.19	9.57	8.46	9.70		8.59	9.75
Sept.	8.16	8.64	7.54		9.55	9.47	6.52	6.66			7.11	7.16
Oct.	4.39	5.09	4.43	4.98	6.16	6.77	5.57	5.98	4.96		5.57	5.24
Nov.	2.43	3.34	3.16	3.78	4.70	5.11	6.24	5.13	3.25	4.53	4.15	4.49
Dec.	2.87	3.34	3.39	3.56	5.19	4.48	6.39	5.26	3.72	3.92	3.98	3.49
Total					111.37	104.76	87.19	86.39			77.03	81.03

Month	Los Herreras, N. L.		Comales, Tamps.		Reynosa, Tamps.		Río Bravo, Tamps.		Retamal, Tamps.		Matamoros, Tamps.	
	1951	# Normal 1941-51	1951	# Normal 1938-51	1951	#Average 1950-51	1951		1951		1951	
Jan.	5.40	4.01	6.04	4.39	4.67		7.94		5.64		4.11	
Feb.	6.46	4.72	6.49	5.65	4.60		8.26		5.78		4.68	
Mar.	7.90	7.74	8.10	8.59	6.87		9.69		7.33		3.81	
Apr.	9.51	8.63	9.99	10.57	8.26	7.77	11.57		8.70		5.22	
May	9.33	9.39	11.12	12.05	7.95		10.88		9.51		7.52	
June	12.33	10.33	13.51	13.81	9.76		12.26		11.00		9.04	
July	13.46	12.05	16.04	15.52	11.06		13.70		11.53		11.44	
Aug.	10.85	11.33	13.32	13.91	9.11		10.35		9.74		14.11	
Sept.	8.29	7.99	9.55	9.94	7.84	8.30	8.19		7.93		12.47	
Oct.	5.58	6.00	7.24	7.88	4.42	5.20	7.26		6.19		10.30	
Nov.	4.58	4.72	5.59	5.88	3.87	4.40	5.29		4.00		4.41	
Dec.	5.09	4.31	5.69	4.56	3.68	3.73	7.57		4.59		3.84	
Total	98.78	91.22	112.68	112.75	82.09		112.96		91.94		90.95	

Some months missing

TEMPERATURE, HUMIDITY, AND WIND

The mean monthly temperatures shown for Johnson Ranch in the United States and all stations in Mexico are averages of daily maximum and minimum thermometer observations.

The mean monthly temperatures and relative humidities at the Dryden, Fort McIntosh, and Falcón Dam evaporation stations were integrated from continuous records of hygrothermographs, housed in louvered shelters, with the sensing elements of the instruments 16 inches above the ground and 9 feet southwest of either a 2 or 4-foot diameter evaporation pan.

Monthly mean wind velocities are based on the total miles of wind movement indicated by a standard 3-cup anemometer, installed and operated according to specifications for a Class A Weather Bureau evaporation station.

Mean Temperature – Degrees Fahrenheit
In the United States

Month	Johnson Ranch, Texas		Dryden, Texas		Fort McIntosh, Texas		Falcón Dam, Texas	
	1951	Average Aug. 1945-1951	1951	Average July 1947-1951	1951	Average Feb. 1950-1951	1951	Average July 1950-1951
Jan.	48.2	51.5	46.4	45.4	56.1		60.6	
Feb.	53.6	59.0	51.6	# 52.9	61.6	62.6	63.5	
Mar.	64.5	67.3	60.3	60.0	68.5	68.0	69.6	
Apr.	73.9	76.2	68.8	68.5	76.7	75.9	77.4	
May	83.3	83.9	76.2	76.7	81.2	81.8	82.9	
June	90.0	89.2	82.8	82.0	85.4	85.2	88.3	
July	90.3	89.0	87.5	83.9	88.9	88.5	89.6	89.5
Aug.	91.0	88.8	86.9	82.5	88.5	87.8	88.2	88.6
Sept.	85.0	83.5	79.7	77.2	83.1	84.0	83.4	85.4
Oct.	76.8	75.4	71.2	69.7	77.0	78.1	77.5	79.0
Nov.	* 62.0	62.2	54.4	55.8	62.6	63.8	65.7	66.4
Dec.	58.4	55.7	51.5	50.4	61.3	58.7	64.0	62.0
Yearly	73.1	73.5	68.1	67.1	74.2		75.9	

In Mexico — 1951

Month	Cuchillo Parado, Chih.	Cd. Acuña, Coah.	Jiménez, Coah.	Piedras Negras, Coah.	Villa Hidalgo, Coah.	Cd. Guerrero, Tamps.	Cd. Miguel Alemán, Tamps.	Retamal, Tamps.	Matamoros, Tamps.
Jan.	52.5					59.4	59.0	62.6	
Feb.	55.8					63.0	61.9	62.1	
Mar.	61.5		65.5			68.2	70.2	70.5	
Apr.	67.3	72.3	72.0	71.2		75.9	76.6	76.6	73.0
May	77.0	79.3	77.7	77.4		80.4	81.3	81.7	79.5
June	85.6	85.8	84.6	85.6		84.2	87.8	86.7	82.4
July	86.4	91.4	88.9	89.6		85.5	89.6	88.9	84.9
Aug.	85.8	91.0	88.2	88.9	88.7	83.5	88.9	87.6	85.6
Sept.	79.7	84.9	82.4	82.4	83.8	82.8	84.4	84.6	82.4
Oct.	72.3	75.9	75.2	74.3	77.2	77.9	77.9	79.2	77.2
Nov.	56.3	59.2	60.3	58.1	60.8	64.4	65.7	66.6	66.2
Dec.	53.8	55.4	55.8	54.1	58.6	63.9	65.7	65.8	62.8
Yearly	69.5					74.1	75.6	76.1	

Mean Relative Humidity – Percent
In the United States

Month	Dryden, Texas		Fort McIntosh, Texas		Falcón Dam, Texas	
	1951	Average July 1947-1951	1951	Average Feb. 1950-1951	1951	Average July 1950-1951
Jan.	34.9	53.1	50.4		51.6	
Feb.	48.2	# 54.1	54.6	58.6	55.7	
Mar.	43.7	39.6	48.9	49.7	57.3	
Apr.	37.8	43.8	49.3	53.3	56.2	
May	59.4	52.7	48.1	57.6	65.0	
June	60.7	50.4	55.5	55.5	62.7	
July	48.0	47.5	50.3	51.1	57.4	56.0
Aug.	47.9	48.5	53.3	52.2	59.6	57.0
Sept.	53.3	52.4	60.2	56.4	66.0	61.0
Oct.	56.3	55.7	60.3	55.2	69.5	61.8
Nov.	53.1	46.5	59.5	54.0	62.1	56.6
Dec.	46.4	51.2	53.4	51.5	54.9	53.0
Yearly	49.1	49.6	54.5		59.8	

Mean Wind Speed – Miles Per Hour
In the United States

Month	Dryden, Texas		Fort McIntosh, Texas		Falcón Dam, Texas	
	1951	Average July 1947-1951	1951	Average Feb. 1950-1951	1951	Average July 1950-1951
Jan.	4.7	4.6	3.3		4.3	
Feb.	5.1	# 4.8	4.3	3.8	5.9	
Mar.	5.3	5.7	5.0	4.3	5.8	
Apr.	5.9	6.0	4.8	4.6	6.5	
May	7.3	6.6	5.0	4.8	7.4	
June	6.5	6.6	5.1	4.8	8.4	
July	6.3	5.6	4.8	4.9	7.8	8.0
Aug.	5.5	4.8	4.3	4.1	6.1	6.0
Sept.	5.4	4.3	4.0	3.6	5.5	5.6
Oct.	4.5	4.0	3.1	3.0	3.5	3.8
Nov.	4.0	4.0	3.3	3.2	3.9	4.6
Dec.	3.7	3.7	2.8	2.6	3.3	3.6
Yearly	5.4	5.1	4.2		5.7	

* Partly estimated # One month missing

DRAINAGE BASIN AND IRRIGATED AREAS

Along the Rio Grande and Tributaries—1951

The total area within the outer rim of the Rio Grande Basin is about 335,500 square miles; however, in many places, particularly along the southwestern boundary of the basin, large areas contribute no surface runoff to the Rio Grande. Such non-contributive areas constitute about 48.8% of the total area, leaving 171,887 square miles of productive watershed. Only the productive part of the watershed is included in the list below.

The irrigated areas shown below are listed according to the downstream sequence of the points of diversion of their irrigation water and, consequently, they may or may not be wholly within the indicated main river or tributary reach. They are all within the Rio Grande Basin, except in the Lower Rio Grande Valley below the Rio Grande City gaging station where water is diverted at numerous points to irrigate lands which are adjacent to, but do not contribute surface runoff to the Rio Grande. All of the areas listed are equipped with irrigation facilities. In the United States, all areas were irrigated in 1951; in Mexico, the areas classed as "Secondary" are those for which water is available only after the water requirements of the "Primary" areas have been satisfied.

DESIGNATIONS OF AREAS AND GAGING STATIONS	Drainage Basin Square Miles			Irrigated Areas—Acres			
	United States	Mexico	Total	United States	Mexico Primary	Mexico Secondary	Total
Above Elephant Butte Dam	25,923	0	25,923	a726,000	0	0	726,000
Elephant Butte Dam to Caballo Dam	1,295	0	1,295	82	0	0	82
Above Caballo Dam	27,218	0	27,218	726,082	0	0	726,082
Caballo Dam to El Paso Station	2,049	0	2,049	101,803	0	0	101,803
Above El Paso Gaging Station	29,267	0	29,267	827,885	0	0	827,885
El Paso Station to American Dam	4	0	4	16,524	0	0	16,524
Above American Dam	29,271	0	29,271	844,409	0	0	844,409
American Dam to Juárez Station	41	47	88	0	9,637	0	9,637
Above Juárez Gaging Station	29,312	47	29,359	844,409	9,637	0	854,046
Juárez Station to Island Station	146	472	618	39,490	b 0	0	39,490
Above Island Gaging Station	29,458	519	29,977	883,899	9,637	0	893,536
Island Station to County Line Station	485	186	671	0	c 0	0	0
American Dam to County Line - Total	672	705	1,377	56,014	9,637	0	65,651
Above County Line Gaging Station	29,943	705	30,648	883,899	9,637	0	893,536
County Line Station to Fort Quitman	663	679	1,342	18,767	d 0	0	18,767
Above Fort Quitman Gaging Station	30,606	1,384	31,990	902,666	9,637	0	912,303
Fort Quitman Station to La Nutria	1,041	886	1,927	e 1,843	6,424	0	8,267
Above La Nutria Gaging Station (Inactive)	31,647	2,270	33,917	904,509	16,061	0	920,570
La Nutria to Upper Presidio Station	580	503	1,083	f 723	9,143	0	9,866
Above Upper Presidio Gaging Station	32,227	2,773	35,000	905,232	25,204	0	930,436
Río Conchos above Boquilla Dam	0	7,322	7,322	0	2,965	0	2,965
Río Conchos below Boquilla Dam	0	17,419	17,419	0	188,047	12,108	200,155
Río Conchos - Total	0	24,741	24,741	0	191,012	12,108	203,120
Upper to Lower Presidio Station - excluding Río Conchos	21	5	26	1,279	0	0	1,279
Upper to Lower Presidio Station - Total	21	24,746	24,767	1,279	191,012	12,108	204,399
Above Lower Presidio Gaging Station	32,248	27,519	59,767	906,511	216,216	12,108	1,134,835
Alamito Creek above gaging station	1,504	0	1,504	g 521	0	0	521
Terlingua Creek above gaging station	1,070	0	1,070	0	0	0	0
Lower Presidio to Johnson Ranch Station - excluding Alamito and Terlingua Creeks	1,439	2,671	4,110	h 3,787	3,460	1,977	9,224
Lower Presidio to Johnson Ranch - Total	4,013	2,671	6,684	4,308	3,460	1,977	9,745
Above Johnson Ranch Gaging Station	36,261	30,190	66,451	910,819	219,676	14,085	1,144,580
Johnson Ranch to Langtry Station	6,594	6,330	12,924	i 4,040	0	0	4,040
Above Langtry Gaging Station	42,855	36,520	79,375	914,859	219,676	14,085	1,148,620

a 1951 acreage not known; latest available data from Water Bulletin No. 20. b Excludes 4,942 acres irrigated from wells. c Excludes 9,760 acres irrigated from wells. d Excludes 5,980 acres irrigated from wells. e Excludes 317 acres irrigated from wells. f Excludes 446 acres irrigated from wells. g Excludes 183 acres irrigated from wells and 22 acres from springs. h Excludes 777 acres irrigated from wells. i Includes 3,435 acres irrigated by spreader dams and excludes 10 acres irrigated from wells.

DRAINAGE BASIN AND IRRIGATED AREAS
Along the Rio Grande and Tributaries — 1951

DESIGNATIONS OF AREAS AND GAGING STATIONS	Drainage Basin Square Miles			Irrigated Areas—Acres			
	United States	Mexico	Total	United States	Mexico Primary	Mexico Secondary	Total
Pecos River above Girvin	29,562	0	29,562	j 116,860	0	0	116,860
Pecos River, Girvin to IBWC Gaging Station	5,731	0	5,731	k 352	0	0	352
Pecos River above IBWC Gaging Station	35,293	0	35,293	117,212	0	0	117,212
Goodenough Spring above Gaging Station	1	0	1	0	0	0	0
Devils River above IBWC Gaging Station	4,185	0	4,185	m 0	0	0	0
Arroyo las Vacas above Gaging Station	0	160	160	0	741	494	1,235
Langtry to Del Rio - excluding above tributaries	416	2,495	2,911	n 462	0	0	462
Langtry to Del Rio - Total	39,895	2,655	42,550	117,674	741	494	118,909
Above Del Rio Gaging Station	82,750	39,175	121,925	1,032,533	220,417	14,579	1,267,529
San Felipe Creek above Gaging Station	46	0	46	1,138	0	0	1,138
Pinto Creek above Gaging Station	236	0	236	p 50	0	0	50
Río San Diego above Gaging Station	0	916	916	0	12,850	0	12,850
Río San Diego - Total	0	926	926	0	13,838	741	14,579
Río San Rodrigo above Gaging Station	0	591	591	0	3,707	3,212	6,919
Río San Rodrigo - Total	0	842	842	0	6,178	3,954	10,132
Del Rio to Eagle Pass - excluding above tributaries	1,213	314	1,527	q 36,537	4,942	0	41,479
Del Rio to Eagle Pass - Total	1,495	2,082	3,577	37,725	24,958	4,695	67,378
Above Eagle Pass Gaging Station	84,245	41,257	125,502	1,070,258	245,375	19,274	1,334,907
Río Escondido above Gaging Station	0	1,279	1,279	0	6,177	8,649	14,826
Río Escondido - Total	0	1,320	1,320	0	6,177	8,649	14,826
Eagle Pass to El Jardín - excluding Río Escondido - Total	736	1,485	2,221	180	r 0	0	180
Eagle Pass to El Jardín - Total	736	2,805	3,541	180	6,177	8,649	15,006
Above El Jardín Dam Site	84,981	44,062	129,043	1,070,438	251,552	27,923	1,349,913
El Jardín to Laredo - Total	737	1,079	1,816	6,300	7,413	0	13,713
Above Laredo Gaging Station	85,718	45,141	130,859	1,076,738	258,965	27,923	1,363,626
Río Salado above Venustiano Carranza Dam	0	13,819	13,819	0	54,363	8,896	63,259
Río Salado above Gaging Station	0	21,503	21,503	0	106,008	19,027	125,035
Laredo to Zapata - excluding Río Salado	1,097	967	2,064	s 12,746	2,718	0	15,464
Laredo to Zapata - Total	1,097	22,470	23,567	12,746	108,726	19,027	140,499
Above Zapata Gaging Station	86,815	67,611	154,426	1,089,484	367,691	46,950	1,504,125
Zapata to Falcón Dam Site	945	169	1,114	2,724	247	0	2,971
Above Falcón Dam Site	87,760	67,780	155,540	1,092,208	367,938	46,950	1,507,096
Río Alamo above Gaging Station	0	1,663	1,663	0	4,942	5,436	10,378
Falcón Dam Site to Roma - excluding Río Alamo	87	158	245	2,778	1,730	0	4,508
Falcón Dam Site to Roma - Total	87	1,821	1,908	2,778	6,672	5,436	14,886
Above Roma Gaging Station	87,847	69,601	157,448	1,094,986	374,610	52,386	1,521,982
Río San Juan above Marte Gómez Dam	0	12,473	12,473	0	102,548	67,212	169,760
Río San Juan - Total	0	12,679	12,679	0	218,440	67,212	285,652
Roma to Rio Grande City - excluding Río San Juan	678	181	859	3,461	1,236	0	4,697
Roma to Rio Grande City - Total	678	12,860	13,538	3,461	219,676	67,212	290,349
Above Rio Grande City Gaging Station	88,525	82,461	170,986	1,098,447	594,286	119,598	1,812,331
Rio Grande City to Anzaldúas Dam Site	409	415	824	119,697	2,471	0	122,168
Above Anzaldúas Dam Site	88,934	82,876	171,810	1,218,144	596,757	119,598	1,934,499
Anzaldúas Dam Site to Hidalgo	6	15	21	8,808	0	0	8,808
Above Hidalgo Gaging Station	88,940	82,891	171,831	1,226,952	596,757	119,598	1,943,307
Hidalgo to Matamoros	26	26	52	464,998	50,656	0	515,654
Above Matamoros Gaging Station	88,966	82,917	171,883	1,691,950	647,413	119,598	2,458,961
Matamoros to Lower Brownsville	2	2	4	18,465	0	0	18,465
Rio Grande City to Lower Brownsville	443	458	901	611,968	53,127	0	665,095
Above Lower Brownsville Gaging Station	88,968	82,919	171,887	1,710,415	647,413	119,598	2,477,426
Lower Brownsville to the Gulf of Mexico				3,697			
Above Gulf of Mexico				1,714,112			

j Excludes 111,500 acres irrigated chiefly from wells, 1949 data. k Excludes 9,103 acres irrigated from wells and 230 acres from springs. m Excludes 395 acres irrigated from wells. n Excludes 71 acres irrigated from wells. p Excludes 297 acres irrigated from wells. q Excludes 85 acres irrigated from wells. r Excludes 247 acres irrigated from wells. s Includes 535 acres irrigated from tanks.

CORRECTIONS TO PREVIOUS WATER BULLETINS

ALAMITO CREEK NEAR PRESIDIO, TEXAS: The zero of the gage is 2,541.61 feet above mean sea level, U.S.C. & G.S. datum, determined by levels run in January 1950 and tied to a U.S.C. & G.S. bench mark elevation established in 1943. Previously published elevations are erroneous.

DIVERSIONS FROM THE RIO GRANDE ON THE UNITED STATES SIDE BELOW RIO GRANDE CITY: In Water Bulletin No. 18, the total irrigated acreage should be 588,720 acres. In Water Bulletin No. 19, the total irrigated acreage should be 612,521 acres.

DRAINAGE BASIN AND IRRIGATED AREAS ALONG THE RIO GRANDE AND TRIBUTARIES: The following data are the correct irrigated areas for Water Bulletins Nos. 18 and 19:

WATER BULLETIN NUMBER 18				
DESIGNATIONS OF AREAS AND GAGING STATIONS	United States	Mexico		Total
		Primary	Secondary	
Rio Grande City to Lower Brownsville Station	585,220	63,753	0	648,973
Above Lower Brownsville Gaging Station	1,777,832	617,019	123,058	2,517,909
Lower Brownsville Station to the Gulf of Mexico	3,500			
Above Gulf of Mexico	1,781,332			

WATER BULLETIN NUMBER 19				
DESIGNATIONS OF AREAS AND GAGING STATIONS	United States	Mexico		Total
		Primary	Secondary	
Rio Grande City to Lower Brownsville Station	608,021	93,653	0	701,674
Above Lower Brownsville Gaging Station	1,821,384	704,740	123,058	2,649,182
Lower Brownsville Station to the Gulf of Mexico	4,500			
Above Gulf of Mexico	1,825,884			

RAINFALL ON THE UNITED STATES SIDE OF THE RIO GRANDE BASIN IN INCHES: According to a recent study of original rainfall records, the records for the station and years listed below, published in previous issues of this Bulletin, were incomplete or erroneous. The monthly and yearly normals for these stations have been recomputed on the basis of these corrected figures.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
H. M. Greenwood (Cienega Ranch) 1941 — Standard gage — H. M. Greenwood																																	
Jan.														.07	Record begun March 1, 1941																	.07	
Feb.																																3.30	
Mar.		.31										.05				.64	1.25	.31					2.43		.60	2.20		.50				5.60	
Apr.														.39						.53					.26	.13	.22		1.99	1.50		4.77	
May	.35																										.21						
June																																	
July	.06						.25			.42					.41									1.93	.10		.45				.50	3.61	
Aug.										.73	.25			.29		.61	.62				.42	1.49	.28				.52	.58		.75		5.03	
Sept.											1.13						.31					2.07	1.25		1.11							4.13	
Oct.																																3.56	
Nov.							.25			.50	.06																					0	
Dec.																																.81	
Latitude 29° 48' Longitude 104° 13' Elevation 4,000																																	
H. M. Greenwood (Cienega Ranch) 1942 — Standard gage — H. M. Greenwood																																	
Jan.																																0	
Feb.										.10														.16								.26	
Mar.																																0	
Apr.																	.17															.17	
May																															.75	.75	
June				.82				.15																								.97	
July		.35	.26					.70							.31						.31		.20		.48							.66	
Aug.				.98		1.91											.18	.42	.17		.26	.21										2.98	
Sept.											.30								.09													3.70	
Oct.																																.39	
Nov.			.60																													.60	
Dec.						.18															.46					.10						.74	
Total 1942																																10.62	
H. M. Greenwood (Cienega Ranch) 1943 — Standard gage — H. M. Greenwood																																	
Jan.								.40																								.40	
Feb.																								.12								0	
Mar.																																.12	
Apr.																				.20	.50							.60	.11			0	
May					.19										.73													.41				1.21	
June																																1.33	
July	1.27	.26								.32				.32	.42			.25		.30				.25								3.39	
Aug.				.26																			.73	2.42	.42				.37			.26	
Sept.				.16																												4.10	
Oct.																										.41	.43					0	
Nov.				.55				.67	.10															.50								.84	
Dec.																																1.82	
Total 1943																																13.47	

CORRECTIONS TO PREVIOUS WATER BULLETINS

RAINFALL ON THE UNITED STATES SIDE OF THE RIO GRANDE BASIN IN INCHES

H. M. Greenwood (Cienega Ranch) 1944

Standard gage — H. M. Greenwood

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.	.84																															.84	
Feb.								.21																				.12				.33	
Mar.																		.10	.11													.21	
Apr.																																0	
May																										.36						.36	
June	.08						.25			.49													.96	.75	.56			.07				3.16	
July			.10						.14												.12		.64									1.00	
Aug.						1.29			.35	.09								.29						4.00					.09			6.11	
Sept.			2.51	1.78	.13	.12											.13											.90				3.57	
Oct.	.04								.07											.05												.16	
Nov.																	.54															.54	
Dec.																										1.37		.03				1.40	
	Total 1944																															19.68	

H. M. Greenwood (Cienega Ranch) 1945

Standard gage — H. M. Greenwood

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																	.28															.28	
Feb.																																0	
Mar.																														.12		.12	
Apr.																			.16	.50									.06			.72	
May																				.16												0	
June																																.16	
July		2.84	2.44		.85	.81			.26																							7.20	
Aug.											.11											.33	.18				1.27	.02				1.91	
Sept.																					.95				.14		.12					1.19	
Oct.	.37	.04		1.23		1.09	1.10																									3.83	
Nov.																																0	
Dec.																																0	
	Total 1945																															15.41	

H. M. Greenwood (Cienega Ranch) 1946

Standard gage — H. M. Greenwood

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.							1.32							.48			.10															1.90	
Feb.																						.07										.07	
Mar.																																0	
Apr.																					.82	.20										1.02	
May				.15				.15																								.50	
June	.58							.28	.12													.33		.35			.51					2.17	
July						.26											.41				.15											.82	
Aug.					.54		.35		.36																				.12			1.37	
Sept.	.94	.62													1.65			.04	1.60	1.15	.12					.26						6.36	
Oct.				.88		.91		.42	.16							.06																2.43	
Nov.										.40																						0	
Dec.																														.29		.69	
	Total 1946																															17.13	

H. M. Greenwood (Cienega Ranch) 1947

Standard gage — H. M. Greenwood

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.										.15					.39		.24															.78	
Feb.																																0	
Mar.						.18	.08												.20													.46	
Apr.																																0	
May								.15	.71	.29											.11			.35								1.61	
June																		.25												.12		.37	
July																																0	
Aug.			.22											1.43									1.23									2.88	
Sept.									.58	.37	.15																					1.10	
Oct.										.16		.25																				.41	
Nov.																	.30															.30	
Dec.			.93			.15					.03																					1.11	
	Total 1947																															9.02	

H. M. Greenwood (Cienega Ranch) 1948

Standard gage — H. M. Greenwood

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	.15	---	---	---	---	---	---	---	---	---	---	---	.15	---
Jan.																																0	
Feb.																																0	
Mar.																				1.33		.43										1.76	
Apr.																						.17								.29	.20	.66	
May			.14																.14		.30			.55	.17							1.30	
June																																	
July														.21	.16													.30		.57		1.24	
Aug.																																0	
Sept.								.48																								.48	
Oct.								.16							.11		.64				.19	.58										1.68	
Nov.													.11	.11																		.22	
Dec.													.11												.10							.21	
	Total 1948																															7.70	

B. H. Davis Ranch 1947

Standard gage — B. H. Davis

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																.65	
Feb.						.10											.53															0	
Mar.																																.63	
Apr.						.15		.95						.10																		0	
May																		.23										.50	.48	.10		1.20	
June																																1.31	
July																																.32	
Aug.		.22												.52										.30								1.04	
Sept.									.50																							.50	
Oct.																																.10	
Nov.																																.60	
Dec.			.82																.15													.97	
	Total 1947																															7.32	

Latitude 30° 07' Longitude 103° 44' Elevation 5,000 Feet

B. H. Davis Ranch 1948

Standard gage — B. H. Davis

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																.15	
Feb.																																0	
Mar.																						.67										0	
Apr.															.74							.60	.18		.42						.74	.67	
May			1.12							.38										.34					.25							2.68	
June																																2.09	
July						.15								.48	.80											1.36						2.79	
Aug.	.52													.85																		1.37	
Sept.																							.20									.20	
Oct.							.17			.21					.38		.68				.71											2.15	
Nov.																																0	
Dec.																																.18	
	Total 1948																															12.28	

Crosson Ranch 1945

Standard gage — B. H. Davis

No daily records available for 1945

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																.04	
Feb.																																0	
Mar.																																1.05	
Apr.																																.36	
May																																0	
June																																1.52	
July																																10.26	
Aug.																																.56	
Sept.																																1.04	
Oct.																																4.89	
Nov.																																0	
Dec.																																0	
	Total 1945																															19.72	

Latitude 30° 03' Longitude 103° 41' Elevation 4,760

CORRECTIONS TO PREVIOUS WATER BULLETINS

RAINFALL ON THE UNITED STATES SIDE OF THE RIO GRANDE BASIN IN INCHES

Crosson Ranch 1946

Standard gage — B. H. Davis

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.													No daily records available for 1946																			2.20	
Feb.																																0	
Mar.																																0	
Apr.																																.85	
May																																.18	
June																																2.05	
July																																3.58	
Aug.																																.55	
Sept.																																3.96	
Oct.																																1.98	
Nov.																																0	
Dec.																																.72	
																															Total 1946	16.05	

Crosson Ranch 1947

Standard gage — B. H. Davis

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																1.11	
Feb.																																0	
Mar.						.17											.56															.73	
Apr.																																0	
May						.15		2.55					.15					1.48					.51					.18	2.60	.40		3.36	
June																																4.66	
July																																.13	
Aug.		.70											2.76	2.96									.68	.24								7.34	
Sept.									.69																							.69	
Oct.																																.06	
Nov.																																.52	
Dec.			1.42																.72													2.14	
																															Total 1947	20.74	

Crosson Ranch 1948

Standard gage — B. H. Davis

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																.27	
Feb.																																0	
Mar.																						.69										0	
Apr.															.62							.30	.42									.69	
May																			.31	.52	.48			.34	.47						.73	2.34	
June			.18																						.18							2.01	
July						.33								.48												.58	1.69	.24	.30			3.62	
Aug.	.82													.74												1.68	.20				.52	3.96	
Sept.																								.48	.27							.75	
Oct.							.21				.35		.22		1.57						.42											2.55	
Nov.														.84																		1.06	
Dec.																																.48	
																															Total 1948	17.93	

Steve Stumberg Ranch 1947

Recording gage — S. C. S.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.			.30														*.48															.78	
Feb.																																0	
Mar.					?											.60																.60	
Apr.																																0	
May									.50	.85	.07																				.13	2.25	
June																			.27			.10	.70						.66			1.03	
July											.30												.30									.60	
Aug.		.90	.40																				1.02									2.32	
Sept.								.87		.14																						1.01	
Oct.			.82																									.26				1.08	
Nov.																.06	.15								.02							.23	
Dec.			.75									.20																			.04	.99	
																															Total 1947	10.89	

Latitude 30° 11' Longitude 102° 53' Elevation 4,300 Feet

Steve Stumberg Ranch 1948

Recording gage — S. C. S.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																				.28												.28	
Feb.																										.40						.40	
Mar.																																0	
Apr.																					.13			.10								.23	
May																							1.20		2.46						.05	3.69	
June																						.06			.25							.31	
July						.28	.20															.10				.42	.12	.16				1.28	
Aug.																													2.17			2.17	
Sept.	.06									.05										1.02	.07											1.20	
Oct.								.10									.20			.13		.55	.07									1.05	
Nov.										.20														.05	.10		.05					.20	
Dec.														.05																		.25	
																															Total 1948	11.06	

C. L. Arthur Ranch 1948

Standard gage — C. L. Arthur

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																				.30						.34						.64	
Feb.																																0	
Mar.																																0	
Apr.																					.80											.80	
May																								.28	1.10						.70	2.08	
June																			.43				.15	.30		.05						.95	
July		.65							.20																						.95	1.80	
Aug.									.60			.40														.36			.15			1.51	
Sept.																					1.05											1.05	
Oct.									.22								.87						.75									1.64	
Nov.																																0	
Dec.																									.30							.30	
																															Total 1948	10.75	

Latitude 30° 25' Longitude 103° 45' Elevation 4,900 Feet

* Cumulative amount for two or more days