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WESTERN WATER BULLETIN 1980

Flow of The Colorado River and other Western Boundary Streams and Related Data

COLORADO RIVER

TIJUANA RIVER

SANTA CRUZ RIVER

SAN PEDRO RIVER

WHITEWATER DRAW

1980

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FOREWORD

This bulletin is the twenty-first annual compilation of stream discharges and other hydrographic data relating to international aspects of the Colorado River below Imperial Dam, the Tijuana River, and other streams crossing the western land boundary of the United States and Mexico. The compilation was prepared jointly by the United States and Mexican Sections of the International Boundary and Water Commission, solely for the purpose of presenting statistical data relating to stream flow and kindred subjects for the Colorado River from Imperial Dam to the Gulf of California, the Tijuana River and its important tributaries in the United States and Mexico, and other streams, including the Alamo and New Rivers which cross the California-Baja California boundary, and the Santa Cruz River and Whitewater Draw which cross the Arizona-Sonora boundary. This volume contains information for the year 1980.

Stream gaging on the Colorado River below Imperial Dam began in 1902 when the station at Yuma, Arizona was established. Stage records were obtained at this station from January 1878 until December 1973, when it was discontinued. Continuous stream gaging on the Tijuana River and its important tributaries in the United States and in Mexico began in 1936. Each government operates the gaging stations located within its own country.

Colorado River below Imperial Dam

Below Imperial Dam, the Colorado River flows southward 10 miles to the mouth of the Gila River, thence westward 11 miles to Pilot Knob Mountain, and south 1 mile to the point where the northerly international land boundary, between California and Baja California, intersects the river. From this point the river continues to flow southward and forms the boundary between the United States and Mexico for a distance of about 22 miles to the point where the southerly international land boundary between Arizona and Sonora intersects the river. From this point the river continues to flow southward about 90 miles to discharge into the Gulf of California.

The ordinary flows of Colorado River below Imperial Dam are largely controlled by releases at Hoover Dam, completed in 1935. The releases are further regulated at Davis Dam, completed in 1950, and by Parker and Imperial Dams, completed in 1938. Small amounts of runoff may occasionally be contributed to the flow in the lower river from the usually dry arroyos draining the 10,900 square miles along the river from Hoover Dam to the mouth of the Gila River. In addition, flows ranging from usually minor amounts to infrequent torrential floods may enter the lower Colorado River from the Bill Williams River, draining about 717 square miles below Alamo Dam and Lake, completed in 1963; and from the Gila River, draining about 7,300 square miles below Painted Rock Dam and Reservoir, completed in January 1960.

At Imperial Dam, diversions are made to Gila Gravity Main Canal and All-American Canal for irrigation projects in Arizona, including the Yuma Valley, Gila and Wellton-Mohawk projects; and in California, including the Imperial Valley, Coachella Valley and Reservation Division of Yuma Project. Also, under the provisions of the 1944 Water Treaty, there may be diverted to the All-American Canal at Imperial Dam for delivery to Mexico in the Alamo Canal, or substitute canal, at the northerly boundary, a portion of Mexico's guaranteed annual allotment of waters of the Colorado River. No such diversions were made in 1980.

Below Laguna Dam, measured and unmeasured flows are returned to the river principally as waste and drainage water from the irrigation projects in the United States. Waste and drainage waters from irrigation projects in the United States also cross the boundary into Mexico near San Luis, Arizona without returning to the river in the United States.

In the limitrophe section of the river, 1.1 miles downstream from the northerly boundary, Morelos Dam, the principal diversion structure for Mexico, was completed and placed in operation on November 8, 1950. Since that date almost all the Colorado River flows that cross the northerly boundary (except emergency deliveries to Tijuana beginning in August 1972) have been diverted to the Alamo Canal at Morelos Dam.

Tijuana River Basin

The total drainage area of the Tijuana River basin is 1,731 square miles, of which 27 percent lies in the United States and 73 percent in Mexico. This river is formed by the principal tributaries, Cottonwood Creek, which rises in the United States and Rio de las Palmas, which rises in Mexico. Cottonwood Creek crosses the international land boundary 21 miles from the Pacific Ocean to join the Rio de las Palmas in Mexico. From the confluence of these tributaries, the Tijuana River flows northwesterly 5 miles to cross the land boundary into the United States near San Ysidro, California and Tijuana, Baja California, and then flows westerly 6 miles to discharge into the Pacific Ocean 2 miles north of the boundary. The flow of Cottonwood Creek is partially controlled by Barrett and Morena Reservoirs in the United States, and the flow of the Rio de las Palmas is partially controlled by Rodriguez Reservoir in Mexico.

Whitewater Draw near Douglas, Arizona

Whitewater Draw rises in the United States and flows south into Mexico, crossing the international boundary near Douglas, Arizona, eventually discharging into the Gulf of California through the Yaqui River in Mexico. The total drainage area above the Douglas Gaging Station is 1,023 square miles. A number of mountain streams in the upper reaches of the basin are diverted for irrigation, but they would normally sink or go to ground water before reaching the main water course.

FOREWORD

San Pedro River at Palominas, Arizona

The San Pedro River rises in Mexico and flows north into the United States, crossing the boundary near Palominas, Arizona and thence northwesterly into the Gila River. The river in the vicinity of the international boundary drains an area of 741 square miles, of which 649 square miles are in Mexico.

Santa Cruz River near Nogales and Lochiel, Arizona

The Santa Cruz River rises in the United States and flows south into Mexico, crossing the international boundary near Lochiel, Arizona and returning to the United States near Nogales, Arizona, eventually discharging into the Gila River southwest of Phoenix, Arizona. The drainage area of the Santa Cruz River above Nogales station is 533 square miles. Of this amount, 348 square miles lie in Mexico. There are a few ground water irrigation diversions above the Lochiel station in Arizona and an unknown amount of water diverted for irrigation in Mexico.

Acknowledgments

Other agencies which have contributed to the data published herein include the Bureau of Reclamation and the Geological Survey of the U. S. Department of the Interior; the National Weather Service, Department of Commerce; the Yuma County Water Users' Association; the Imperial Irrigation District; the city of San Diego, California; the Otay Municipal Water District; and the Ministry of Agriculture and Hydraulic Resources of Mexico. Specific notation is made of each of the above named agencies, where the data appear. The courtesy and cooperation of those who have made these contributions are acknowledged with appreciation.

Units of Measure

Data collected by the Mexican Section are computed and published in a Spanish version of the water bulletin in metric units. The Mexican data are converted and reported in this bulletin in English units. Conversion factors conform generally to those in the National Bureau of Standards Miscellaneous Publication 286 "Units of Weight and Measure (United States Customary and Metric) - Definitions and Tables of Equivalents." However, for convenience some of the factors have been shortened and modified to facilitate conversion, reconversion to the original units when necessary, and checking of data. Conversion of the mean daily discharges, the monthly average discharge, and the monthly and annual volumes from metric to English units is direct. For this reason the monthly average discharge in cubic feet per second and monthly volumes in acre-feet shown for gaging stations operated by the Mexican Section cannot necessarily be obtained in the usual manner from the total monthly flow in second-foot days. For the same reason, evaporation and rainfall data, when totaled, may not be equivalent to the direct conversion from metric to English units. The following factors have been used for data in this bulletin:

METRIC UNITS	ENGLISH UNITS
LENGTHS	
1 Centimeter	0.393701 Inch
1 Meter	3.28084 Feet
1 Kilometer	0.621371 Mile
AREAS	
1 Square Meter	10.76391 Square Feet
1 Hectare	2.471054 Acres
1 Square Kilometer	0.386102 Square Mile
VOLUMES	
1 Cubic Meter	61023.74 Cubic Inches
1 Cubic Meter	35.31467 Cubic Feet
1 Cubic Meter	1.30795 Cubic Yards
1000 Cubic Meters	0.81071 Acre-Foot
1 Liter	0.264172 U.S. Gallon
WEIGHTS	
1 Kilogram	2.204623 Pounds
1 Metric Ton	2204.623 Pounds
1 Metric Ton	1.102311 Short Tons (2000 lbs)

GENERAL HYDROLOGIC CONDITIONS FOR 1980

Colorado River

Normally, there is no measurable amount of runoff from the portion of the Colorado River basin in the United States and Mexico below Hoover Dam, not including Bill Williams and Gila Rivers. There was no significant amount in 1980. In the lower basin of the Colorado River in Mexico, from Morelos Diversion Dam to the Gulf of California, the average precipitation during 1980 measured at 5 index stations was 2.01 inches, compared to an average of 2.83 inches during the last 22 years (1959 to 1980).

The flow of the Colorado River reaching Imperial Dam was 9,438,800 acre-feet, about 119% of the 46-year average (1935-1980) of 7,947,128 acre-feet. At the northerly international boundary the total flow of the river during 1980 was 6,933,857 acre-feet, about 196% of the 1935-1980 average of 3,532,688 acre-feet. At the southerly international boundary, the flow during 1980 was 4,038,491 acre-feet, or about 156% of the 1935-1980 average of 2,580,880 acre-feet. The total flow of the Colorado River reaching the M. C. Rodriguez gaging station, 24.5 miles downstream from the southerly international boundary and 4.5 miles upstream from the Sonora-Baja California railroad bridge, was 4,377,679 acre-feet in 1980, about 425% of the 1951-1980 average of 1,029,658 acre-feet.

The total of all flows of the Colorado River entering Mexico in 1980 amounted to 7,195,198 acre-feet, 175% of the 1935-1980 average of 4,102,338 acre-feet, as measured 1) in the Colorado River at the northerly international boundary, 2) in the Wellton-Mohawk Main Outlet Drain Extension near Morelos Dam, 3) in the wasteways that discharge into the limitrophe section of the river from the United States bank, 4) in the canal which discharges waste and drainage waters from the Yuma Project across the southerly land boundary into Mexico near San Luis, Arizona, 5) emergency delivery of Colorado River water for use in Tijuana, Baja California, 6) in the Wellton-Mohawk Bypass Drain at southerly land boundary near San Luis, Arizona, and 7) the 242 Well Field near San Luis, Arizona.

No flood peaks of importance occurred in streams of the lower Colorado River basin during 1980. A maximum instantaneous flow of 13,800 second-feet occurred in the Colorado River at the northerly boundary station on May 2, 1980.

Stored waters at the end of the year in the three major reservoirs on the Colorado River below Lee's Ferry amounted to 25,483,700 acre-feet, 89% of the usable capacity of 28,588,400 acre-feet. The greater part (23,336,000 acre-feet) of the storage was contained in Lake Mead (Hoover Dam). There were no reported shortages of Colorado River for irrigation during 1980 due to drought or accident to the irrigation system.

The total reported acreage irrigated from waters of the Colorado River below Imperial Dam in 1980 was 1,287,532 acres; 685,512 acres in the United States and 602,020 acres in Mexico. An estimated 34% of acreage in Mexico is served by pumping from ground water.

The suspended sediment load passing the northerly boundary station in 1980 was 504.2 acre-feet, about 214% of the 1956-1980 average of 235.9 acre-feet.

Tijuana River Basin

During 1980, the temperatures at Barrett Dam, California (elevation 1,750 feet) in the upper portion of the basin in the United States averaged 62.8 degrees, 1.5 degrees above the 50-year mean. In the extreme upper portion of the basin in Mexico at San Juan de Dios, Baja California (elevation 3,280 feet), the recorded temperatures during the year averaged 55 degrees, equal to the long-term average; and at Rodriguez Dam, Baja California (elevation 459 feet), the recorded temperatures averaged 64 degrees, 2 degrees above the normal for many years.

At Barrett Dam in the upper portion of the basin in the United States, the 1980 recorded precipitation was 34.65 inches, 197% of normal; and at Chula Vista near the lower end of the basin, 11.75 inches, or 123% of normal. The recorded precipitation at San Juan de Dios in the upper portion of the basin in Mexico, was 29.88 inches, approximately 181% of the normal during the 25-year period; and at Rodriguez Dam in the lower portion of the basin in Mexico, 14.02 inches, 164% of the 43-year average.

Runoff in the basin during 1980 averaged more than 1,397% of normal. Above Morena Reservoir the runoff was 100,518 acre-feet, or about 1,272% of the 44-year 1937-1980 mean of 7,905 acre-feet. At Rodriguez Reservoir, the runoff was 307,930 acre-feet, or about 1,444% of the 43-year mean of 21,324 acre-feet.

The flow of the Tijuana River at the international boundary was 595,739 acre-feet during 1980, and the flow in the Tijuana River near Nestor was 588,088 acre-feet.

Whitewater Draw

During 1980, the average annual temperature over the watershed was 1.1 degrees above normal, while the annual precipitation was below normal. Runoff for the year at the gaging station near Douglas, Arizona of 235 acre-feet was about 4% of average.

GENERAL HYDROLOGIC CONDITIONS FOR 1980

San Pedro River

During 1980, the average annual temperature was 1.4 degrees above normal. The annual precipitation, as measured at Coronado National Monument Headquarters, was 58% of the 1961-1980 mean of 19.52 inches. The stream flow at the international boundary was 5,123 acre-feet, 22% of the 1951-1980 normal.

Santa Cruz River

During 1980, the average annual temperature over the watershed was somewhat above normal, and the annual precipitation was about 69% of the 42-year 1939-1980 mean. Runoff measured at the Nogales gaging station, where the stream re-enters the United States, was 2,234 acre-feet. The total runoff for the year measured at the gaging station near Lochiel, Arizona, where the stream enters Mexico from the United States, was 326 acre-feet. Therefore, neglecting stream flow depletions in Mexico, the records indicate a contribution of about 1,908 acre-feet from the loop of the river lying in Mexico, or approximately 85% of the flow reaching the Nogales station.

Alamo and New Rivers

During 1980, the average annual temperature over the drainage area of the Alamo River, as recorded at El Centro, California, was 72.5 degrees, 0.3 degree above normal; and over the drainage area of the New River, as recorded at Mexicali, Baja California, it was 77.0 degrees, 5 degrees above the 55-year average.

At El Centro, the precipitation was 4.06 inches, about 159% of the 50-year average; and in Mexicali the annual precipitation was 4.21 inches, 135% of the 55-year average. The total flow of the New River at the international boundary in 1980 was 156,317 acre-feet, which was about 185% of the 1943-1980 normal.

Salton Sea

During 1980, the average annual temperature around the Salton Sea was about 100% of the long-term average, while the annual precipitation recorded at Brawley, California, was approximately 190% of the long-term mean of 2.59 inches. The water surface of the Salton Sea remained more or less the same during the year. The maximum stage, 227.2 feet below mean sea level, was recorded on April 20, 27-29, May 1-9, 17 to 21, inclusive. The minimum stage, 228.4 feet below mean sea level, was recorded on January 1-10 and 18th.

EMERGENCY DELIVERIES OF COLORADO RIVER WATERS FOR USE IN TIJUANA, BAJA CALIFORNIA

DESCRIPTION: Delivery of water is measured at a metering station located adjacent to the international boundary near Tijuana, and approximately 2.5 miles (4.0 km) east of the International Boundary Monument #253. The metering station consists of two venturi tubes, 20 inches (50.8 cm) and 18 inches (45.7 cm) and two BIF recorders.

RECORDS: Based on totalizer readings read at approximately 8:00 a.m. each day and on continuous chart readings furnished by the Otay Municipal Water District. Records available since August 13, 1972. These records reflect a 12% loss incurred in conveying the water from the point of diversion above Parker Dam to the international boundary.

REMARKS: Emergency deliveries of Colorado River waters for use in Tijuana began August 13, 1972 pursuant to Minute No. 240 of this Commission. The deliveries are conveyed approximately 323 miles (520 km) using the following conveyance works: The diversion works from Lake Havasu above Parker Dam and the Colorado River Aqueduct, the San Diego Aqueducts, the Otay Reservoir and facilities of the Otay Municipal Water District. Furthermore, the following additional facilities were constructed as provided in Minute 240; new pumps at the Otay Pumping Station, approximately 5,800 feet (1,768 m) of 24-inch (61.0 cm) pipe and various valves, meters and accessories near the international boundary. The facilities were developed to circumvent serious water shortages predicted for Tijuana.

Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	3.0	13.0	8.8	8.6	8.4	8.6	8.6	0	0	0	0
2	0	7.4	13.1	8.8	8.9	8.1	8.7	8.8	0	0	0	0
3	0	7.7	14.4	8.8	8.6	8.3	9.0	9.0	0	0	0	0
4	0	7.5	16.1	8.7	8.4	8.5	8.6	9.0	0	0	0	0
5	0	7.8	16.5	8.7	7.8	8.5	8.6	7.7	0	0	0	0
6	0	8.7	14.2	8.8	7.6	8.4	8.5	6.0	0	0	0	0
7	0	10.6	16.4	8.8	7.8	8.2	8.4	5.6	0	0	0	0
8	0	9.4	16.0	8.7	8.3	8.2	8.0	5.6	0	0	0	0
9	0	9.7	15.5	8.4	7.5	8.3	7.3	6.3	0	0	0	0
10	0	10.2	16.9	8.3	6.8	8.5	8.0	6.5	0	0	0	0
11	0	11.2	10.5	8.5	7.4	8.6	7.3	6.5	0	0	0	0
12	0	7.3	10.0	9.7	7.1	8.5	7.6	5.7	0	0	0	0
13	0	6.6	10.1	10.9	7.8	8.4	7.2	5.6	0	0	0	0
14	0	8.7	10.5	10.8	7.6	8.6	7.1	5.8	0	0	0	0
15	0	6.7	10.4	10.6	8.2	8.7	7.3	5.1	0	0	0	0
16	0	7.4	10.2	10.6	8.5	8.6	7.1	5.5	0	0	0	0
17	0	7.5	10.2	10.6	8.5	8.5	6.9	5.4	0	0	0	0
18	0	7.4	9.9	10.5	8.1	8.4	7.5	5.3	0	0	0	0
19	0	9.2	10.9	10.4	8.0	8.4	7.8	5.5	0	0	0	0
20	0	8.9	10.5	10.2	7.5	8.5	7.8	1.9	0	0	0	0
21	0	7.6	10.4	10.3	8.1	8.5	7.7	0	0	0	0	0
22	0	9.0	10.5	10.6	8.1	8.5	6.9	0	0	0	0	0
23	0	10.4	10.8	10.5	7.7	8.2	6.6	0	0	0	0	0
24	0	6.7	10.2	10.5	8.1	8.5	7.3	0	0	0	0	0
25	0	6.4	8.2	9.9	7.8	8.5	7.6	0	0	0	0	0
26	0	10.4	8.0	10.1	7.8	8.5	7.5	0	0	0	0	0
27	0	13.0	8.7	10.5	8.4	8.5	6.5	0	0	0	0	0
28	0	12.7	8.8	11.0	8.7	8.5	6.9	0	0	0	0	0
29	0	12.8	8.8	9.7	8.3	8.5	6.9	0	0	0	0	0
30	0		8.8	9.0	8.2	8.6	7.2	0	0	0	0	0
31	0		8.8		8.2		7.2	0		0		0
Sum	0	251.9	357.3	291.7	248.4	253.4	235.6	125.4	0	0	0	0

Month	Extreme Gage Feet		* Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period 1973-1980 Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
				Current Year 1980							
Jan.				0		0	0	0	593	902	0
Feb.			27	13.0	1	3.0	8.7	500	595	813	119
Mar.			10	16.9	26	8.0	11.5	709	631	849	0
Apr.			28	11.0	10	8.3	9.7	579	613	857	0
May			2	8.9	10	6.8	8.0	493	646	887	0
June			15	8.7	2	8.1	8.4	503	648	986	0
July			3	9.0	27	6.5	7.6	467	656	1,021	0
Aug.			! 3	9.0	!21	0	4.0	249	624	918	0
Sept.				0		0	0	0	514	904	0
Oct.				0		0	0	0	536	905	0
Nov.				0		0	0	0	505	902	0
Dec.				0		0	0	0	505	993	0
Yearly				16.9		0	4.8	3,500	7,066	10,258	251
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				0.48		0	0.14	4,317	8,716	12,653	310

* Includes 12% losses Ø Mean daily ! And other days

RESERVATION MAIN DRAIN NO. 4 (CALIFORNIA DRAIN)

DESCRIPTION: Water-stage recorder (digital) located 500 feet (152 m) upstream from railroad culvert and one mile (1.6 km) northwest of Yuma, Arizona. Discharge measurements are made from a footbridge immediately below the gage. The drainage canal discharges into the outfall channel of the Yuma Main Canal Wasteway 200 feet (61.0 m) downstream from the spillway structure, and thence into the Colorado River on the right bank, 1,000 feet (305 m) upstream from Colorado River below Yuma Main Canal Wasteway, and 6.5 miles (10.5 km) upstream from the northerly international boundary. Prior to October 1955, published as "California Drainage Canal near Yuma, Arizona."

RECORDS: Based on current meter measurements and a continuous record of gage heights. Records are computed and furnished by the U. S. Geological Survey. Records available: Monthly discharge, January 1913 to April 1920, October 1921 to March 1925, and January 1934 to September 1947; daily and monthly discharge, October 1947 through 1980.

REMARKS: Reservation Main Drain No. 4 collects drainage and wastewater from the area east of the Yuma Main Canal on the Reservation Division of the Yuma Project, located in California. Since 1939, collection of seepage from the All-American Canal has caused large increases in drainage flows. Average annual flow prior to 1937 was 12,800 acre-feet (15,789,000 m^3). Monthly and annual averages since 1937 are shown in the table below.

EXTREMES: Prior to 1937: Maximum annual flow 20,190 acre-feet (24,904,000 m^3), 1916; minimum annual flow 8,920 acre-feet (11,003,000 m^3), 1913.

Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	42	42	44	64	57	70	77	86	72	58	70	59
2	40	41	47	60	52	69	76	86	72	55	71	61
3	41	42	50	59	59	68	77	86	73	58	70	60
4	41	44	51	56	66	68	80	87	72	58	70	64
5	40	44	53	56	64	68	79	78	73	59	69	61
6	40	45	55	55	62	70	80	82	73	59	70	60
7	40	50	59	55	62	71	76	81	72	60	69	60
8	41	50	59	57	62	71	74	83	73	59	68	62
9	41	49	62	57	60	71	74	80	70	63	67	60
10	41	45	65	57	64	72	75	78	69	59	64	57
11	44	46	64	56	61	68	78	79	68	61	62	55
12	44	49	66	56	62	70	76	80	67	63	62	59
13	43	45	70	57	60	73	78	81	66	64	61	61
14	43	48	71	60	58	75	80	80	66	63	59	60
15	45	46	73	57	57	73	80	79	66	64	61	59
16	43	43	75	46	60	72	81	78	63	66	63	59
17	44	44	75	56	59	73	83	79	59	67	61	60
18	45	42	73	55	60	73	84	78	61	65	61	59
19	45	41	73	55	60	76	86	76	60	68	60	60
20	46	41	72	47	61	76	86	76	58	68	58	63
21	46	40	72	45	62	75	88	75	59	70	60	64
22	50	40	73	44	60	75	88	73	57	69	64	61
23	50	42	73	45	60	75	86	74	59	69	60	62
24	44	43	76	46	62	77	84	73	58	69	59	62
25	43	42	75	50	61	78	85	67	57	69	59	61
26	42	42	70	51	64	77	83	66	56	70	60	62
27	41	43	69	51	66	78	85	67	57	71	62	61
28	42	43	66	55	67	78	85	64	59	69	62	60
29	42	44	65	58	67	77	83	68	61	67	63	60
30	47		64	56	68	78	85	66	60	70	63	61
31	46		66		69		88	73		72		59
Sum	1,342	1,276	2,026	1,622	1,912	2,195	2,520	2,379	1,936	2,002	1,908	1,872

Current Year 1980									Period 1937-1980		
Month	Extreme Gage Feet		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.			!22	50	! 2	40	43.3	2,662	3,139	4,780	877
Feb.			! 7	50	!21	40	44.0	2,531	2,970	4,320	563
Mar.			24	76	1	44	65.4	4,019	3,649	5,240	1,240
Apr.			1	64	22	44	54.1	3,217	3,675	5,250	1,160
May			31	69	2	52	61.7	3,792	3,815	5,590	992
June			!25	78	! 3	68	73.2	4,354	3,698	5,580	885
July			!21	88	! 8	74	81.3	4,998	3,977	6,550	816
Aug.			4	87	28	64	76.7	4,719	3,948	6,810	861
Sept.			! 3	73	26	56	64.5	3,840	3,720	6,220	889
Oct.			31	72	2	55	64.6	3,971	3,734	5,740	1,040
Nov.			2	71	20	58	63.6	3,784	3,489	5,490	994
Dec.			! 4	64	11	55	60.4	3,713	3,370	4,960	966
Yearly				88		40	62.8	45,600	43,184	63,700	12,840
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				2.49		1.13	1.78	56,247	53,267	78,573	15,838

Ø Mean daily ! And other days

YUMA MAIN CANAL WASTEWAY TO COLORADO RIVER AT YUMA, ARIZONA

DESCRIPTION: The wasteway receives water from the Yuma Main Canal at the check structure on the canal, 1,645 feet (501 m) upstream from the intake of the Colorado River siphon, and 3.2 miles (5.1 km) downstream from the Siphon Drop Power Plant. This wasteway discharges into the Colorado River on the California side, 1,000 feet (305 m) upstream from Colorado River below Yuma Main Canal Wasteway, and 6.5 miles (10.5 km) upstream from the northerly international land boundary.

RECORDS: Discharge is computed as the difference between the measured discharge of the Yuma Main Canal at the Siphon Drop Power Plant upstream and that of the same canal below the Colorado River siphon, with deductions for small irrigation diversions from the canal between the two gaging stations. Records obtained and furnished by U. S. Geological Survey. Records available: April 1913 through 1980.

REMARKS: The wasteway discharges to the river the flow in excess of irrigation water in the Yuma Main Canal.

EXTREMES: Prior to 1935, when storage began in Lake Mead: Average annual flow, 297,800 acre-feet. (367,333,000 m^3); maximum annual flow, 913,700 acre-feet (1,127,040,000 m^3), 1932; minimum annual flow, (114,900 acre-feet (141,728,000 m^3), 1917. Since 1935: Maximum mean daily discharge, 2,020 second-feet (57.2 m^3/sec), December 24-25, 1948; minimum mean daily discharge, no flow on numerous occasions.

Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	10	17	20	20	21	19	21	20	17	8.5	16	8.7
2	11	17	20	19	23	19	20	21	17	8.5	125	11
3	11	17	19	18	19	19	20	21	17	13	23	11
4	11	17	19	18	19	19	20	20	17	8.5	22	11
5	12	24	19	18	20	19	21	21	20	8.5	21	11
6	11	20	19	18	17	18	24	22	19	10	21	10
7	12	20	17	18	16	18	21	22	18	10	13	10
8	12	20	17	18	17	18	20	29	18	9.4	8.4	11
9	11	20	17	18	17	19	21	20	21	9.3	8.4	10
10	12	19	17	18	17	19	21	20	14	9.3	8.5	10
11	12	19	17	17	22	19	20	20	10	9.3	8.3	10
12	11	20	18	16	20	20	20	19	9.1	9.3	8.1	10
13	24	20	18	18	20	20	21	19	8.6	9.3	7.9	10
14	26	20	17	19	20	20	20	19	8.5	10	7.7	10
15	17	20	18	17	20	20	20	19	8.7	10	7.8	10
16	17	20	19	16	20	22	20	19	8.8	9.3	10	11
17	18	20	19	17	19	21	20	18	14	9.4	10	9.3
18	18	19	20	17	25	21	20	19	9.0	9.4	9.3	9.3
19	17	20	19	16	22	21	20	19	9.0	9.3	9.2	9.3
20	17	20	20	16	22	21	19	18	8.5	8.5	9.1	9.3
21	17	20	20	17	20	21	20	18	8.7	8.5	12	9.8
22	17	20	20	17	20	21	20	18	9.1	8.5	9.3	9.8
23	18	19	19	17	20	21	22	18	9.8	8.5	8.5	10
24	16	19	19	17	20	21	21	16	10	8.5	8.8	10
25	16	20	19	16	20	21	21	17	11	8.5	8.7	11
26	16	20	19	16	20	21	19	17	11	10	8.6	14
27	16	20	19	17	22	21	22	17	12	9.9	9.4	11
28	16	20	20	19	20	20	21	17	9.3	9.3	9.2	11
29	16	20	19	19	19	21	21	17	9.1	8.5	9.3	11
30	19		19	19	20	21	21	18	8.9	8.5	8.8	10
31	17		20		19		21	17		8.5		11
Sum	474	567	582	526	616	601	638	595	371.1	286.0	446.3	320.5

Current Year 1980 — Period 1935-1980

Month	Extreme Gage Feet		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.			14	26	1	10	15.3	940	52,341	110,700	940
Feb.			5	24	! 1	17	19.6	1,125	45,411	89,140	1,099
Mar.			! 1	20	! 7	17	18.8	1,154	45,575	90,190	469
Apr.			1	20	!12	16	17.5	1,043	46,106	86,580	873
May			18	25	7	16	19.9	1,222	54,701	88,280	1,142
June			16	22	! 6	18	20.0	1,192	47,859	86,960	1,109
July			6	24	!20	19	20.6	1,265	45,091	91,220	452
Aug.			8	29	24	16	19.2	1,180	45,603	89,890	456
Sept.			9	21	!14	8.5	12.4	736	48,827	83,660	736
Oct.			3	13	! 1	8.5	9.23	567	45,949	90,050	567
Nov.			2	125	14	7.7	14.9	885	45,957	101,500	841
Dec.			26	14	1	8.7	10.3	636	50,314	108,800	598
Yearly				125		7.7	16.5	11,945	573,734	1,042,850	11,945
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				3.54		0.22	0.47	14,734	707,695	1,286,345	14,734

Ø Mean daily ! And other days

COLORADO RIVER BELOW YUMA MAIN CANAL WASTEWAY AT YUMA, ARIZONA - DISCHARGES

DESCRIPTION: Water-stage recorder located in California on the right bank of the river, 1,000 feet (305 m) downstream from the mouth of the Yuma Main Canal Wasteway, 0.6 mile (1.0 km) downstream from the abandoned gaging station on the Colorado River at Yuma, 5.2 miles (8.4 km) downstream from the mouth of the Gila River, 19.6 miles (31.5 km) downstream from Imperial Dam, and 6.4 miles (10.3 km) upstream from the northerly international boundary. Zero of the gage is 101.99 feet (31.09 m) above mean sea level, U. S. C. & G. S. datum.
RECORDS: Based on current meter measurements and a continuous record of gage heights. Computations by shifting control methods. Records obtained and furnished by U. S. Geological Survey. Records available: October 1963 through 1980. Records from January 1951 through September 1963 deduced from "Colorado River at Yuma" plus flows from "Reservation Main Drain No. 4" and "Yuma Main Canal Wasteway."
REMARKS: Reservoirs on the Colorado River, power developments, transmountain diversions, reservoirs on the Gila River, irrigation diversions, and return flows modify the river flow at this station.

Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,530	2,440	2,720	3,600	6,060	4,830	3,530	4,700	5,080	5,530	4,820	3,530
2	2,540	1,880	2,750	3,520	6,570	4,770	3,640	4,750	5,050	5,570	4,930	3,430
3	2,660	1,590	2,900	3,780	5,980	4,710	3,600	4,730	5,060	5,530	4,930	3,330
4	2,560	1,730	2,830	3,930	5,120	4,770	3,310	4,750	5,020	5,540	4,860	3,300
5	2,560	1,750	2,780	4,230	4,920	4,820	3,120	4,710	5,100	5,530	4,820	3,350
6	2,560	1,660	2,740	4,320	4,840	4,790	3,170	4,790	5,110	5,510	4,790	3,350
7	2,570	1,800	2,760	4,500	4,780	4,740	3,170	4,800	5,020	5,480	4,810	3,300
8	2,570	1,680	2,820	4,170	4,600	4,720	3,180	4,920	5,030	5,530	4,790	3,290
9	2,550	1,130	2,870	4,160	4,670	4,670	3,210	4,980	5,140	5,570	4,770	3,260
10	2,680	1,020	2,940	4,270	4,400	4,990	3,150	4,870	5,270	5,510	4,700	3,220
11	2,810	1,020	3,000	4,380	3,910	5,550.	3,420	4,800	5,240	5,580	4,470	3,070
12	2,840	1,080	3,070	4,560	4,410	5,420	4,000	4,870	5,200	5,480	4,360	2,990
13	2,750	1,190	3,170	4,460	4,770	4,910	4,320	4,970	5,190	5,430	4,150	3,080
14	2,750	1,260	3,280	3,830	4,850	4,710	4,230	5,010	5,180	5,430	3,820	3,140
15	2,820	1,370	3,370	3,620	4,840	4,690	3,960	4,980	4,980	5,360	3,560	3,130
16	2,740	1,490	3,480	4,280	4,820	4,700	3,990	4,950	5,240	5,300	3,560	3,110
17	2,730	1,580	3,840	4,900	4,820	4,700	4,030	4,920	5,390	5,330	3,580	3,120
18	2,890	1,580	4,210	4,970	4,850	4,710	4,250	5,000	5,360	5,350	3,520	3,080
19	2,880	1,620	4,430	5,240	4,950	4,740	4,230	4,950	5,450	5,230	3,380	3,030
20	2,760	1,660	4,490	5,940	4,540	4,750	4,530	5,000	5,400	5,160	3,250	3,070
21	2,660	1,730	4,620	6,170	4,400	4,750	5,100	5,030	5,320	5,150	3,130	3,100
22	2,620	1,960	4,600	6,360	4,880	4,720	4,920	5,050	5,240	5,180	3,410	3,070
23	2,610	2,120	4,660	6,380	4,870	4,680	5,110	5,100	5,300	5,190	3,590	3,070
24	2,610	2,290	4,700	6,230	4,850	3,970	5,090	5,230	5,590	5,180	3,600	3,060
25	2,610	2,430	4,570	6,020	4,830	3,150	5,090	5,870	5,650	4,950	3,580	3,070
26	2,500	2,550	4,660	6,060	4,800	3,190	5,230	5,860	5,650	4,900	3,520	3,050
27	2,480	2,630	4,750	6,210	4,790	3,360	5,110	5,840	5,550	4,980	3,500	3,030
28	2,510	2,640	4,790	5,840	4,800	3,500	4,840	6,100	5,290	4,980	3,490	3,030
29	2,580	2,710	4,970	5,560	4,780	4,140	4,490	5,670	5,160	4,940	3,570	3,000
30	2,640		5,100	5,720	4,760	4,160	4,620	5,150	5,390	4,850	3,610	2,920
31	2,630		4,380		4,800		4,640	5,110		4,870		2,900
Sum	82,200	51,590	116,250	147,210	151,260	136,310	128,280	157,460	157,650	164,120	120,870	97,480

Month	Current Year 1980 Extreme Gage Feet High	Extreme Gage Feet Low	Ø Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1951-1980 Acre-Feet Average	Maximum	Minimum
Jan.	14.04	13.42	18	2,890	27	2,480	2,650	163,041	192,353	979,890	29,857
Feb.	13.71	* 11.25	29	2,710	110	1,020	1,780	102,327	144,373	826,600	33,790
Mar.	17.21	13.73	30	5,100	1	2,720	3,750	230,579	162,123	1,073,270	34,604
Apr.	18.37	15.22	23	6,380	2	3,520	4,910	291,987	156,847	843,010	33,687
May	18.43	15.16	2	6,570	11	3,910	4,880	300,020	157,077	863,860	56,493
June	17.17	14.14	11	5,550	25	3,150	4,540	270,367	144,476	833,970	33,856
July	16.69	14.04	26	5,230	5	3,120	4,140	254,440	150,240	649,820	34,413
Aug.	17.49	16.03	28	6,100	1	4,700	5,080	312,317	158,107	670,050	33,610
Sept.	16.99	16.23	!25	5,650	15	4,980	5,260	312,694	142,145	775,930	43,182
Oct.	16.92	16.07	11	5,580	30	4,850	5,290	325,527	118,679	802,210	34,965
Nov.	16.16	13.90	! 2	4,930	21	3,130	4,030	239,742	131,380	911,370	34,832
Dec.	14.49	13.79	1	3,530	31	2,900	3,140	193,349	159,794	1,114,550	33,023
Yearly	18.43	* 11.25		6,570		1,020	4,130	2,996,390	1,817,594	10,220,870	513,755
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	5.62	3.43		186		28.9	117	3,696,017	2,241,984	12,607,341	633,712

Ø Mean daily ! And other days * Lowest gage height listed; 3 days of record missing

COLORADO RIVER BELOW YUMA MAIN CANAL WASTEWAY AT YUMA, ARIZONA - STAGES

(See Preceding Page For Description)

Mean Daily Gage Height in Feet 1980

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	13.46	13.36	13.73	15.33	17.89	16.33	14.60	16.04	16.35	16.86	16.03	14.49
2	13.49	12.52	13.81	15.22	18.43	16.27	14.74	16.08	16.31	16.89	16.16	14.37
3	13.67	12.10	14.06	15.54	17.76	16.20	14.70	16.07	16.32	16.86	16.16	14.25
4	13.52	12.35	13.99	15.72	16.79	16.27	14.31	16.08	16.28	16.87	16.08	14.21
5	13.51	12.40	13.93	16.08	16.53	16.33	14.04	16.03	16.37	16.86	16.03	14.29
6	13.53	12.29	13.89	16.20	16.41	16.30	14.12	16.11	16.39	16.84	15.99	14.28
7	13.53	12.51	13.94	16.42	16.31	16.23	14.11	16.13	16.28	16.81	16.01	14.23
8	13.55	12.33	14.05	16.00	16.07	16.20	14.12	16.27	16.29	16.86	15.98	14.21
9	13.51	11.41	14.17	15.99	16.15	16.14	14.15	16.34	16.42	16.91	15.96	14.19
10	13.72	11.26	14.30	16.12	15.79	16.52	14.06	16.20	16.57	16.84	15.87	14.14
11	13.92	11.25	14.40	16.24	15.16	17.17	14.43	16.10	16.54	16.92	15.58	13.93
12	13.97		14.54	16.45	15.77	17.02	15.16	16.18	16.49	16.80	15.45	13.81
13	13.83		14.72	16.31	16.21	16.42	15.56	16.31	16.48	16.75	15.19	13.95
14	13.83		14.89	15.51	16.30	16.16	15.45	16.35	16.47	16.75	14.78	14.05
15	13.93	11.78	15.03	15.23	16.27	16.13	15.11	16.31	16.23	16.67	14.45	14.03
16	13.81	11.96	15.21	16.04	16.25	16.13	15.15	16.26	16.54	16.60	14.46	14.02
17	13.80	12.10	15.69	16.79	16.25	16.13	15.20	16.22	16.70	16.64	14.48	14.03
18	14.04	12.10	16.15	16.86	16.29	16.15	15.47	16.32	16.67	16.66	14.41	13.98
19	14.03	12.14	16.43	17.17	16.42	16.18	15.44	16.24	16.77	16.53	14.24	13.90
20	13.85	12.20	16.49	17.93	15.92	16.19	15.82	16.31	16.71	16.44	14.07	13.98
21	13.69	12.30	16.66	18.17	15.73	16.18	16.54	16.33	16.63	16.43	13.90	14.02
22	13.62	12.54	16.62	18.37	16.35	16.14	16.31	16.35	16.53	16.46	14.29	14.00
23	13.61	12.88	16.70	18.37	16.34	16.08	16.54	16.41	16.60	16.48	14.53	13.99
24	13.62	13.14	16.73	18.19	16.32	15.18	16.53	16.54	16.93	16.46	14.54	13.99
25	13.62	13.33	16.57	17.95	16.31	14.14	16.53	17.26	16.99	16.19	14.52	14.00
26	13.45	13.50	16.68	17.98	16.27	14.18	16.69	17.23	16.99	16.12	14.46	13.99
27	13.42	13.61	16.79	18.12	16.27	14.41	16.54	17.22	16.88	16.22	14.44	13.97
28	13.46	13.61	16.83	17.68	16.29	14.59	16.21	17.49	16.59	16.23	14.42	13.96
29	13.57	13.71	17.05	17.37	16.26	15.38	15.77	17.01	16.44	16.18	14.53	13.93
30	13.65		17.21	17.52	16.25	15.40	15.93	16.44	16.70	16.07	14.59	13.81
31	13.65		16.31		16.30		15.95	16.39		16.09		13.79
Avg.	13.67		15.41	16.76	16.38	15.94	15.33	16.41	16.55	16.59	15.05	14.06

YUMA MESA OUTLET DRAIN
TO COLORADO RIVER NEAR YUMA, ARIZONA

DESCRIPTION: Venturi meter with recorder 0.3 mile (0.5 km) from outlet to Colorado River, 0.5 mile (0.8 km) west of Joe Henry Memorial Park in Yuma, Arizona. Outlet is 1.7 miles (2.7 km) downstream from the mouth of Yuma Main Canal Wasteway.
RECORDS: Records are furnished by U. S. Geological Survey. Monthly discharge July 1970 through 1980. Prior to July 21, 1972, records furnished by U. S. Bureau of Reclamation.
REMARKS: Records show watpr pumped from wells on the Yuma Mesa and conveyed by underground conduit to Colorado River.

Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	39	38	37	34	33	24	19	19	32	32	32	32
2	39	38	37	34	30	24	19	19	32	32	32	32
3	39	38	37	34	33	24	19	18	32	28	32	32
4	39	38	37	34	30	27	19	19	28	27	32	31
5	39	38	34	34	27	25	19	19	32	27	32	31
6	39	33	35	34	30	24	19	19	32	24	32	31
7	41	23	37	34	25	24	19	12	32	20	32	31
8	51	32	37	34	24	24	19	18	32	22	32	34
9	44	32	36	34	26	24	19	19	32	21	32	37
10	40	32	36	34	28	24	19	19	32	22	32	37
11	40	32	36	27	25	24	19	19	32	22	32	37
12	40	35	36	31	26	24	19	19	32	22	32	37
13	40	37	33	32	25	23	19	19	32	22	32	37
14	39	17	31	32	25	24	19	23	32	22	32	37
15	39	0	31	31	25	22	19	27	32	25	32	37
16	39	0	31	31	25	20	19	27	32	30	32	37
17	39	0	31	32	25	22	19	27	32	32	32	37
18	39	0	31	33	25	22	19	27	32	32	32	37
19	39	15	30	33	21	23	19	30	32	32	32	37
20	39	36	32	33	20	18	19	32	32	32	32	37
21	39	36	31	33	22	24	19	32	32	31	32	37
22	39	37	32	33	25	23	19	32	32	32	32	37
23	39	37	32	34	25	18	19	32	32	32	30	37
24	39	37	32	34	24	24	17	32	32	32	29	35
25	38	37	34	34	24	24	19	32	32	32	32	32
26	38	37	35	34	24	22	19	32	32	32	32	32
27	38	37	35	31	24	19	19	32	32	32	32	32
28	38	37	34	31	24	19	19	32	32	32	32	32
29	38	37	34	33	24	19	19	32	32	32	32	32
30	38		34	33	25	16	19	32	32	32	32	32
31	38		34		24		19	32		32		32
Sum	1,225	846	1,052	985	793	674	587	783	956	877	955	1,068

Month	Extreme Gage Feet		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
			Current Year 1980						**Period 1971-1980**		
Jan.			8	51	!25	38	39.5	2,430	2,800	5,840	0
Feb.			! 1	38	!15	0	29.2	1,678	2,580	4,830	0
Mar.			! 1	37	19	30	33.9	2,087	3,024	5,430	4
Apr.			! 1	34	11	27	32.8	1,954	2,792	5,120	242
May			! 1	33	20	20	25.6	1,573	2,669	4,933	0
June			4	27	30	16	22.5	1,337	2,813	4,828	0
July			! 1	19	24	17	18.9	1,164	3,216	5,510	692
Aug.			!20	32	7	12	25.3	1,553	3,355	6,000	180
Sept.			! 1	32	4	28	31.9	1,896	3,264	5,880	0
Oct.			! 1	32	7	20	28.3	1,740	3,246	5,360	157
Nov.			! 1	32	24	29	31.8	1,894	3,341	5,290	313
Dec.			! 9	37	! 4	31	34.5	2,118	3,521	5,970	0
Yearly				51		0	29.5	21,424	36,621	58,680	1,753
	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
				1.44		0	0.84	26,426	45,172	72,381	2,162

Ø Mean daily ! And other days

DRAIN NO. 8-B (ARAZ DRAIN)

DESCRIPTION: This drain discharges into the Colorado River 4.0 miles (6.4 km) downstream from Colorado River below Yuma Main Canal Wasteway, and 2.5 miles (4.0 km) upstream from the northerly international boundary. Prior to October 1955, published as "Araz Drain".
RECORDS: Records are furnished by the U. S. Geological Survey from current meter measurements during the year. Records available: May 1948 through 1980.
REMARKS: Drain 8-B, which was constructed in February 1948, collects seepage water in the westerly section of the Reservation Division of the Yuma Project which lies in California. Flow in the drain between the mouth and the U. S. Highway No. 80 culvert, about 3,200 feet (975 m) upstream, is affected by backwater from the river during ordinary high stages.
EXTREMES: Mean daily discharge: Maximum, 24 second-feet (0.68 m^3/sec) on September 1, 1953; minimum, 0.1 second-foot (0.003 m^3/sec) several days in February 1966.

Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.9	2.8	2.6	3.7	4.7	5.8	6.7	6.8	8.2	7.2	7.6	7.0
2	2.9	2.8	2.6	3.7	4.8	5.9	6.7	6.8	8.2	7.3	7.6	7.0
3	2.9	2.7	2.6	3.7	4.8	5.9	6.7	6.8	8.2	7.3	7.5	7.0
4	2.9	2.7	2.7	3.8	4.9	5.9	6.7	6.9	8.2	7.4	7.5	7.0
5	2.9	2.7	2.7	3.8	4.9	6.0	6.7	6.9	8.2	7.5	7.4	7.0
6	2.9	2.7	2.8	3.9	4.9	6.0	6.7	7.0	8.2	7.5	7.4	7.0
7	2.9	2.7	2.8	3.9	5.0	6.0	6.7	7.0	8.2	7.6	7.3	7.0
8	2.9	2.7	2.8	3.9	5.0	6.1	6.7	7.0	8.2	7.6	7.3	7.0
9	2.9	2.7	2.9	4.0	5.0	6.1	6.7	7.1	8.2	7.6	7.2	7.0
10	2.9	2.6	2.9	4.0	5.1	6.2	6.7	7.1	8.2	7.6	7.2	7.0
11	2.9	2.6	2.9	4.1	5.1	6.2	6.7	7.2	8.1	7.5	7.1	7.0
12	2.9	2.6	3.0	4.1	5.1	6.2	6.7	7.2	8.1	7.5	7.0	7.0
13	2.9	2.6	3.0	4.1	5.2	6.3	6.7	7.2	8.1	7.5	7.0	7.0
14	2.9	2.6	3.0	4.1	5.2	6.3	6.7	7.3	8.1	7.4	7.0	7.0
15	2.9	2.6	3.1	4.2	5.2	6.3	6.7	7.3	8.1	7.4	7.0	7.0
16	2.8	2.6	3.1	4.2	5.3	6.4	6.7	7.4	8.0	7.4	7.0	5.5
17	2.8	2.5	3.1	4.2	5.3	6.4	6.7	7.4	8.0	7.3	7.0	5.5
18	2.8	2.5	3.2	4.3	5.3	6.5	6.7	7.4	8.0	7.3	7.0	5.5
19	2.8	2.5	3.3	4.3	5.4	6.5	6.7	7.5	7.9	7.3	7.0	5.5
20	2.8	2.5	3.3	4.3	5.4	6.5	6.7	7.5	7.9	7.3	7.0	5.5
21	2.8	2.5	3.3	4.4	5.5	6.5	6.8	7.6	7.9	7.4	7.0	5.5
22	2.8	2.5	3.4	4.4	5.5	6.6	6.8	7.6	7.9	7.5	7.0	5.5
23	2.8	2.5	3.4	4.5	5.5	6.6	6.8	7.7	7.4	7.6	7.0	5.5
24	2.8	2.5	3.4	4.5	5.6	6.6	6.8	7.7	7.0	7.7	7.0	5.5
25	2.8	2.4	3.4	4.5	5.6	6.6	6.8	7.7	7.0	7.8	7.0	5.5
26	2.8	2.5	3.5	4.6	5.6	6.6	6.8	7.8	7.0	7.8	7.0	5.5
27	2.8	2.5	3.5	4.6	5.7	6.6	6.8	7.8	7.0	7.8	7.0	5.5
28	2.8	2.5	3.5	4.6	5.7	6.7	6.8	7.8	7.0	7.8	7.0	5.5
29	2.8	2.5	3.6	4.6	5.7	6.7	6.8	7.9	7.0	7.8	7.0	5.5
30	2.8		3.6	4.7	5.8	6.7	6.8	7.9	7.0	7.8	7.0	5.5
31	2.8		3.6		5.8		6.8	8.0		7.8		5.5
Sum	88.3	75.1	96.6	125.7	163.6	189.7	208.8	228.3	234.5	233.3	214.1	193.0

Month	Extreme Gage Feet		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
			Current Year 1980						**Period 1948-1980**		
Jan.			! 1	2.9	!16	2.8	2.85	175	305	899	39.3
Feb.			! 1	2.8	25	2.4	2.59	149	264	746	40.5
Mar.			!29	3.6	! 1	2.6	3.12	192	323	853	62.7
Apr.			30	4.7	! 1	3.7	4.19	249	342	1,000	66.8
May			!30	5.8	1	4.7	5.28	324	348	966	58.3
June			!28	6.7	1	5.8	6.32	376	364	1,030	67.4
July			!21	6.8	! 1	6.7	6.74	414	416	1,260	72.8
Aug.			31	8.0	! 1	6.8	7.36	453	464	1,350	73.8
Sept.			! 1	8.2	!24	7.0	7.82	465	446	1,370	53.6
Oct.			!25	7.8	1	7.2	7.53	463	454	1,220	55.3
Nov.			! 1	7.6	!12	7.0	7.14	425	410	1,240	57.7
Dec.			! 1	7.0	!16	5.5	6.23	383	368	1,050	42.2
Yearly				8.2		2.4	5.60	4,068	4,504	12,429	774
	Meters		Cubic Meters per Second						Thousands of Cubic Meters		
				0.23		0.07	0.16	5,018	5,556	15,331	955

Ø Mean daily ! And other days

PILOT KNOB POWER PLANT AND WASTEWAY NEAR PILOT KNOB, CALIFORNIA

DESCRIPTION: The Pilot Knob Power Plant and Wasteway is located on the All-American Canal, 20.8 miles (33.5 km) downstream from the intake at Imperial Dam, 6 miles (9.7 km) west of Yuma, about one mile (1.6 km) north of the northerly international boundary and empties into the old Alamo Canal in the United States and thence into the Colorado River through Rockwood gates, about one mile (1.6 km) upstream from the northerly international boundary. Water-stage recorder is located in forebay on right bank of the All-American Canal, 550 feet (168 m) upstream from wasteway gates and 1,800 feet (549 m) from entrance to the power plant. Datum of gage is 150.00 feet (45.72 m) above mean sea level. Tailrace gage is on left bank, 680 feet (207 m) downstream from power plant with automatic recording equipment in control house. All bypass gates are equipped with calibrated openings which are read on all gate changes. Datum of tailrace gage is at mean sea level; elevation of sill of wasteway gates is 147.88 feet (45.07 m), U. S. C. & G. S datum. Prior to October 1956, this station was published as "Pilot Knob Wasteway near Pilot Knob, California".

RECORDS: Daily discharge is computed from flowmeter equipment and head and openings on wasteway gates or from head and gate opening on wicket and wasteway gates. Records furnished by the U. S. Geological Survey. Records available: July 1944 through 1980. The wasteway was operated for the purpose of diverting Colorado River water to the Alamo Canal for use in Mexico from July 1944 to November 8, 1950 in accordance with arrangements between the United States and Mexico for emergency use of the All-American Canal facilities. Records since 1950 show water released through Pilot Knob Power Plant and Wasteway from the All-American Canal and returned to the Colorado River through Rockwood gates.

REMARKS: Pilot Knob Wasteway was completed in 1938, and the first flow occurred on February 5, 1939. Pilot Knob Power Plant was completed in January 1957, and the first flow occurred on January 14, 1957.

EXTREMES: Maximum mean daily discharge, 8,350 second-feet (236 m^3/sec) on January 26, 1958; minimum daily discharge, no flow during long periods.

Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,680	2,280	3,900	6,400	7,390	5,600	6,800	4,940	6,160	5,070	6,220	7,670
2	1,890	2,460	4,480	6,660	6,950	5,610	6,800	4,790	6,030	5,270	6,180	7,660
3	1,440	2,320	5,160	6,540	6,820	5,630	6,660	5,430	5,380	5,390	5,890	7,380
4	1,290	1,980	5,270	6,370	6,410	5,700	6,780	4,320	5,550	4,830	5,780	6,950
5	998	1,350	4,480	6,150	5,560	5,550	6,370	3,540	6,100	5,300	5,970	7,100
6	1,000	1,440	3,080	6,110	5,400	5,320	6,750	3,240	6,670	5,260	5,770	6,670
7	1,000	1,500	3,860	5,840	5,300	5,460	6,180	3,280	6,380	4,980	6,390	5,860
8	1,000	1,500	5,150	6,030	4,830	5,670	6,000	3,790	5,810	4,960	6,790	5,410
9	1,490	1,260	5,380	6,200	4,650	5,350	6,000	4,300	4,910	5,660	6,580	5,380
10	2,300	1,070	5,270	6,110	5,010	5,540	5,890	5,080	4,700	5,790	6,760	4,720
11	2,600	1,130	5,950	6,010	5,480	6,000	6,560	5,160	4,980	5,980	6,510	4,470
12	1,510	1,270	7,610	5,630	5,780	5,490	7,000	4,830	5,280	6,440	6,650	4,240
13	1,230	1,610	7,900	6,160	5,700	5,140	6,720	4,790	5,340	6,620	6,750	4,390
14	1,200	3,440	7,800	5,650	6,250	5,800	6,120	4,340	5,780	6,440	6,580	4,950
15	1,200	4,430	7,700	6,100	5,970	6,590	6,400	5,000	5,360	6,370	6,630	4,700
16	1,200	3,070	7,820	6,010	5,960	6,480	6,440	5,780	5,010	6,380	7,100	4,870
17	1,200	2,190	8,060	5,820	5,980	6,140	6,400	6,620	4,720	6,570	6,640	4,670
18	1,200	2,050	7,970	6,080	5,750	6,360	6,400	6,540	4,170	6,720	6,210	4,280
19	1,200	2,820	7,700	5,820	5,400	5,740	6,400	6,570	5,030	6,940	6,160	4,540
20	1,200	3,160	7,490	5,890	5,410	6,280	6,460	5,750	5,040	7,250	5,850	4,860
21	1,060	3,980	7,120	5,710	5,660	6,640	6,500	5,510	5,650	7,120	5,960	4,880
22	1,000	4,000	6,720	5,600	5,520	7,150	6,500	5,780	5,040	7,140	6,410	4,640
23	1,000	4,000	6,420	5,500	5,600	7,080	6,500	6,610	4,810	7,090	6,440	4,960
24	998	3,690	6,030	5,790	5,600	6,680	6,220	6,900	4,670	7,750	6,070	6,290
25	1,000	2,870	6,000	6,000	5,600	6,800	6,200	6,710	4,800	7,320	6,040	6,960
26	1,000	2,920	6,970	6,060	5,600	6,800	6,020	6,520	5,010	7,300	5,960	5,860
27	1,050	2,500	7,640	6,640	5,630	6,980	6,100	6,500	5,580	6,650	6,670	5,430
28	1,230	2,840	7,430	6,280	5,700	7,000	5,770	6,780	5,980	6,210	6,940	5,550
29	1,580	3,870	7,760	6,490	5,700	6,990	5,460	6,400	5,780	6,000	7,500	4,850
30	4,000		7,620	7,060	5,700	6,820	4,930	5,930	5,170	5,830	7,710	4,490
31	3,920		6,960		5,680		4,840	6,680		5,780		4,920
Sum	45,666	73,000	198,700	182,710	177,990	184,390	194,170	168,410	160,890	192,410	193,110	169,600

Current Year 1980 — **Period** 1944-1980

Month	Extreme Gage Feet		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	High Day	High	Low Day	Low			Average	Maximum	Minimum
Jan.			30	4,000	! 5	998	1,470	90,577	38,860	400,200	0
Feb.			15	4,430	10	1,070	2,520	144,793	25,875	149,500	0
Mar.			17	8,060	6	3,080	6,410	394,116	86,307	394,116	0
Apr.			30	7,060	23	5,500	6,090	362,400	110,621	362,400	0
May			1	7,390	9	4,650	5,740	353,038	30,144	353,038	0
June			22	7,150	13	5,140	6,150	365,732	71,136	365,732	0
July			12	7,000	31	4,840	6,260	385,131	124,445	385,131	0
Aug.			24	6,900	6	3,240	5,430	334,036	124,709	334,036	0
Sept.			6	6,670	18	4,170	5,360	319,121	57,124	319,121	0
Oct.			24	7,750	4	4,830	6,210	381,640	22,404	381,640	0
Nov.			30	7,710	6	5,770	6,440	383,028	25,243	383,028	0
Dec.			1	7,670	12	4,240	5,470	336,397	51,763	336,397	0
Yearly				8,060		998	5,300	3,850,009	768,631	3,850,009	0
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				228		28.3	150	4,748,948	948,099	4,748,948	0

Ø Mean daily ! And other days

COLORADO RIVER AT NORTHERLY INTERNATIONAL BOUNDARY - DISCHARGES

DESCRIPTION: Water-stage recorder on the left (Arizona) bank and cableway at the point where the northerly international land boundary (California-Baja California) intersects the Colorado River, about 6.4 miles (10.3 km) downstream from Colorado River below Yuma Main Canal Wasteway, 5 miles (8.0 km) west of Yuma, Arizona, 1.1 miles (1.8 km) upstream from Morelos Diversion Structure, and about one mile (1.6 km) downstream from Rockwood Gate. Zero of the gage is at mean sea level, U. S. C. & G. S. datum. Station is operated by the United States Section of the Commission.

RECORDS: Based on 274 current meter measurements during the year, 209 by the United States Section, 53 by the Mexican Section of the Commission, 12 by the U. S. Geological Survey, and a continuous record of gage heights. Discharges are computed on the basis of a water-stage recorder 1,680 feet (512 m) upstream from the northerly international boundary where the remains of an old weir serve as a partial controlling section. A continuous gage height record is available November 15, 1948 through 1980; daily discharge records available January 1, 1950 through 1980.

REMARKS: Reservoirs on the Colorado River, including Lake Mead above Hoover Dam, where storage began in 1935, reservoirs on the Gila River, and many irrigation diversions and return flows regulate the river flow at this station except for infrequent flood flows. During 1980, the flow at this point, and the emergency deliveries for Tijuana, Baja California shown on page 8, represented the total amount of the Colorado River water which crossed the northerly international boundary.

EXTREMES: Prior to January 1935: Maximum instantaneous discharge estimated about 250,000 second-feet, (7,080 m^3/sec), January 22, 1916; minimum discharge, no flow several days during August and September 1934; average annual flow 13,443,000 acre-feet (16,581,806,000 m^3); maximum annual flow 25,480,000 acre-feet (31,429,325,000 m^3), 1907; minimum annual flow 1,174,000 acre-feet (1,448,117,000 m^3), 1934. Since January 1935: Maximum mean daily discharge, about 33,000 second-feet (934 m^3/sec), February 7, 1942; minimum discharge, no flow during April 1935.

Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	4,310	5,260	6,600	10,400	13,500	10,700	10,500	9,790	11,400	10,800	11,200	11,300
2	4,550	4,420	6,980	10,500	13,600	10,600	10,400	9,640	11,300	10,900	11,300	11,300
3	4,260	4,140	8,170	10,600	12,400	10,600	10,200	10,400	10,600	11,000	11,100	10,900
4	4,100	3,800	8,170	10,600	11,600	10,600	9,810	9,300	10,700	10,400	10,800	10,500
5	3,610	3,220	7,270	10,600	10,800	10,500	9,000	8,420	11,400	10,900	10,900	10,600
6	3,590	3,220	5,850	10,700	10,400	10,200	9,350	8,160	12,200	10,900	10,800	10,300
7	3,580	3,410	6,630	10,700	10,300	10,300	9,180	8,040	11,900	10,500	11,300	9,450
8	3,540	3,340	7,810	10,500	9,620	10,400	8,970	8,840	11,100	10,500	11,600	8,960
9	4,100	2,570	8,610	10,700	9,380	10,200	9,360	9,310	10,300	11,300	11,400	8,880
10	5,100	2,140	8,430	10,600	9,590	10,500	9,160	9,920	10,200	11,400	11,600	8,230
11	5,640	2,260	9,030	10,400	9,370	11,600	9,820	9,960	10,500	11,800	11,100	7,750
12	4,510	2,460	11,000	10,200	10,100	11,200	10,600	9,740	10,700	12,200	11,000	7,420
13	4,010	2,930	11,600	10,700	10,500	10,200	10,600	9,840	10,800	12,400	11,000	7,580
14	3,970	4,610	11,500	9,730	11,100	10,500	10,400	9,530	11,300	12,200	10,500	8,190
15	4,070	5,760	11,500	9,800	10,900	11,300	10,400	9,970	10,500	12,000	10,200	8,010
16	3,990	4,940	11,700	10,000	10,800	11,200	10,500	10,700	10,300	11,900	10,600	8,080
17	3,920	3,880	12,200	10,800	10,800	11,000	10,400	11,600	10,300	12,000	10,300	8,010
18	4,130	3,690	12,400	11,100	10,600	11,100	10,800	11,700	9,770	12,000	9,790	7,540
19	4,160	4,570	12,300	11,100	10,400	10,600	10,700	11,600	10,700	12,100	9,610	7,630
20	3,980	4,930	12,100	11,800	10,100	11,000	11,000	10,800	10,600	12,600	9,250	8,000
21	3,690	5,840	11,900	11,900	9,900	11,400	11,900	10,500	11,200	12,500	9,190	8,060
22	3,560	6,040	11,600	12,200	10,400	11,900	11,700	10,800	10,500	12,500	9,730	7,870
23	3,560	6,130	11,300	12,200	10,500	11,800	12,000	11,800	10,200	12,400	10,000	8,080
24	3,580	6,070	11,000	12,300	10,500	10,800	11,900	12,300	10,400	13,200	9,670	9,360
25	3,640	5,520	10,700	12,400	10,500	9,890	11,800	12,800	10,600	12,500	9,600	10,200
26	3,520	5,700	11,500	12,500	10,400	9,890	11,600	12,700	10,900	12,300	9,450	9,190
27	3,490	5,170	12,500	13,200	10,400	10,300	11,600	12,500	11,400	11,900	10,000	8,660
28	3,730	5,200	12,400	12,600	10,600	10,300	10,900	13,200	11,600	11,500	10,300	8,640
29	4,060	6,610	12,900	12,400	10,600	11,000	9,990	12,500	11,200	11,100	11,100	8,100
30	6,800		13,200	13,000	10,600	11,200	9,600	11,100	10,800	10,800	11,200	7,520
31	7,190		11,900		10,600		9,530	11,900		10,800		7,830
Sum	129,940	127,830	320,750	336,230	330,860	322,780	323,670	329,360	325,370	361,300	315,590	272,140

Current Year 1980 — Period 1935-1980

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.			31	7,260	26	3,450	4,190	257,732	377,469	1,644,000	31,900
Feb.			29	6,950	10	2,060	4,410	253,547	319,779	1,378,000	60,400
Mar.			29	13,400	6	5,590	10,300	636,198	340,669	1,120,000	19,400
Apr.			27	13,300	14	8,950	11,200	666,902	278,920	823,850	0
May			2	13,800	11	8,940	10,700	656,251	270,924	1,151,000	71,405
June			22	12,100	9	9,750	10,800	640,225	259,779	1,175,000	8,500
July			24	12,300	10	8,760	10,400	641,990	261,501	763,800	24,400
Aug.			28	13,400	7	7,830	10,600	653,276	275,928	791,600	43,800
Sept.			6	12,300	18	9,650	10,800	645,362	241,219	1,029,000	53,851
Oct.	111.13	109.22	24	13,300	! 4	10,400	11,700	716,628	240,363	1,186,000	42,956
Nov.	110.32	108.44	8	11,900	21	9,040	10,500	625,964	291,392	1,422,000	41,403
Dec.	110.08	107.03	2	11,500	12	7,290	8,780	539,782	374,745	1,832,000	42,000
Yearly				13,800		2,060	9,550	6,933,857	3,532,688	10,596,900	722,100
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				391		58.3	270	8,552,843	4,357,535	13,071,170	890,703

! And other days

COLORADO RIVER AT NORTHERLY INTERNATIONAL BOUNDARY - STAGES

(See Preceding Page For Description)

Mean Daily Gage Height in Feet 1980

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	106.70	107.30	108.15	110.14	112.29	110.38	109.50	108.06	109.45	109.31	109.63	109.82
2	106.35	106.28	107.96	110.13	112.41	110.33	109.45	107.97	109.37	109.52	109.67	109.63
3	105.68	106.13	108.67	110.21	112.07	110.28	109.37	108.42	108.99	109.67	109.59	109.65
4	105.54	105.64	109.05	110.21	111.41	110.34	109.18	107.84	109.04	109.33	109.39	*109.44
5	105.06	104.88	108.43	110.20	110.70	110.27	108.73	107.47	109.46	109.61	109.46	109.46
6	105.04	104.78	107.14	110.28	110.38	110.05	108.91	107.40	109.93	109.61	109.39	109.43
7	105.03	104.95	107.48	110.26	109.99	110.11	108.58	107.42	109.74	109.38	109.84	108.85
8	105.01	104.93	108.22	110.15	109.71	110.21	108.31	107.61	109.27	109.38	110.13	108.52
9	105.59	104.46	108.78	110.26	109.70	110.09	108.29	107.84	108.74	109.86	110.24	108.48
10	107.02	104.27	108.66	110.23	109.85	110.25	108.15	108.26	108.71	109.89	110.69	108.06
11	107.82	104.31	109.05	110.08	109.68	110.99	108.61	108.30	108.90	110.14	109.94	107.51
12	106.65	104.39	110.42	109.96	110.18	110.68	109.40	108.13	109.05	110.33	109.89	107.14
13	106.02	104.59	110.91	110.24	110.49	110.04	109.41	108.23	109.07	110.43	109.87	107.25
14	105.88	106.41	110.85	109.62	110.95	110.25	109.02	108.02	109.39	110.31	109.54	107.70
15	105.98	107.96	110.91	109.56	110.79	110.71	108.92	108.45	109.07	110.26	109.39	107.57
16	105.92	107.11	110.99	*109.52	110.70	110.69	108.98	109.02	109.03	110.19	109.63	107.62
17	105.83	105.75	111.33	110.13	110.75	110.41	108.92	109.57	109.05	110.28	109.46	107.57
18	106.02	105.55	*111.26	110.35	110.57	110.50	109.11	109.59	108.68	110.39	109.07	107.21
19	106.06	106.72	111.45	110.33	110.40	110.14	109.08	109.57	109.25	110.44	108.94	107.28
20	105.89	107.25	111.31	110.79	110.22	110.30	109.23	109.07	109.24	110.66	108.63	107.55
21	105.53	108.39	111.19	110.90	110.06	110.55	109.73	108.89	109.54	110.64	108.56	107.60
22	105.32	108.63	110.99	111.17	110.45	110.77	109.61	109.06	109.14	110.64	108.99	107.45
23	105.31	108.75	110.77	111.29	110.51	110.73	109.66	109.64	108.95	110.61	109.24	*107.33
24	105.34	108.68	110.55	111.40	110.49	110.13	109.59	109.97	109.05	111.03	108.97	108.52
25	105.38	107.80	110.40	111.44	110.46	109.51	109.51	110.26	109.22	110.64	108.83	*108.97
26	105.13	107.68	110.95	111.52	110.40	109.46	109.41	110.19	109.37	110.54	108.79	108.43
27	105.01	107.19	*111.44	112.04	110.38	109.64	109.37	110.08	109.67	110.24	109.21	108.04
28	105.26	107.12	111.59	111.65	110.44	109.66	108.96	110.44	109.78	109.81	109.42	*107.87
29	105.69	107.72	111.80	111.50	110.44	110.00	108.39	110.02	109.54	109.55	109.86	107.62
30	108.41		111.88	111.92	110.40	110.00	108.09	109.21	109.36	109.35	109.18	107.19
31	109.01		111.12		110.44		107.98	109.70		109.37		107.43
Avg.	105.95	106.40	110.12	110.58	110.57	110.25	109.01	108.83	109.24	110.05	109.45	108.14

* Partly estimated

COOPER WASTEWAY (VALLEY DIVISION, YUMA PROJECT)

DESCRIPTION: Water-stage recorder and control weir on wasteway for discharging regulatory waste water from the Cooper Canal to the Colorado River. This wasteway is located 0.5 mile (0.8 km) downstream from the northerly international boundary and 0.6 mile (1.0 km) upstream from Morelos Diversion Dam. Prior to July 14, 1971, the wasteway was located 0.4 mile (0.6 km) downstream from Morelos Diversion Dam. This wasteway discharges waste water from the Valley Division of the Yuma Project in the United States into the Colorado River. Since July 14, 1971, zero of the gage is 117.64 feet (35.86 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Flow is computed from head on the weir measured by the water-stage recorder and weir rating determined by current meter measurements. Station operated by the United States Section of the Commission. Records available: Daily discharge, March 1950 through 1980 obtained by the United States Section; monthly discharge, January 1934 through March 1950 by the Bureau of Reclamation.

EXTREMES: Prior to March 1950, maximum monthly discharge 914 acre-feet (1,127,000 m^3) in January 1940; minimum monthly discharge, zero for various months. Since March 1950, maximum instantaneous discharge, 79.3 second-feet (2.25 m^3/sec) on June 19, 1965, at a maximum gage height of 114.13 feet (34.79 m) (old datum): minimum instantaneous discharge, zero during parts of each month.

Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.2	0.1	3.2	1.0	0.9	3.8	0	0	1.3	0.1	7.9	0.1
2	.1	4.0	4.5	0	.2	.1	0	0	.1	.1	9.4	0
3	5.7	.1	.3	.6	.1	0	0	0	0	.1	.2	0
4	.2	0	.1	.3	1.8	0	.1	0	1.9	1.5	.1	1.8
5	.9	0	.1	3.7	5.9	0	4.0	0	1.8	12.6	0	1.8
6	5.3	0	0	.2	3.1	2.0	.3	0	.2	1.4	0	.1
7	.8	0	1.4	.1	1.3	1.1	.7	1.0	5.9	.3	0	.9
8	.1	3.3	.8	0	1.0	.6	.4	3.5	2.7	.1	1.2	1.9
9	4.4	.2	3.0	0	4.8	.2	3.0	3.9	1.1	6.2	2.3	2.2
10	1.1	.6	1.3	0	1.3	0	.9	.2	4.4	3.4	2.8	.4
11	.7	2.1	.1	0	6.2	6.4	4.0	.1	4.8	1.8	.3	0
12	.2	.1	2.8	0	1.2	.2	1.9	0	.2	.2	9.7	0
13	.2	.1	1.5	0	.3	0	5.7	0	.1	1.2	9.3	0
14	.1	7.4	.1	0	.1	1.8	3.8	0	3.0	.3	4.0	1.2
15	.1	2.2	1.4	0	0	.3	.5	0	3.5	.4	7.8	1.6
16	0	1.2	6.9	4.8	0	.3	.1	0	.7	.3	1.2	.2
17	.5	1.0	.1	2.8	.5	4.3	1.2	0	1.9	2.5	.7	.1
18	.2	.5	.7	4.5	.1	.2	.2	0	.6	4.0	.1	0
19	.1	.3	1.0	2.3	0	1.1	6.1	2.0	.1	.8	1.7	6.9
20	.1	.2	1.2	.3	3.3	.6	.2	.5	1.6	.5	.2	1.8
21	0	.1	.2	.1	.1	1.0	.1	.2	2.8	.3	1.2	.4
22	.4	.1	.9	0	0	2.3	0	3.8	.1	4.1	1.8	.1
23	3.0	.1	2.3	0	1.4	0	.2	.6	.1	2.7	1.4	2.3
24	.9	.1	0	2.4	0	3.9	3.0	.2	4.1	3.6	.2	0
25	2.5	5.4	0	.4	1.0	.2	.3	.1	5.5	.9	.2	3.8
26	5.0	0	0	2.4	.1	.2	.1	3.2	.1	1.3	2.9	.4
27	.4	0	0	4.4	0	.2	.4	0	.1	5.0	3.6	1.3
28	0	5.4	0	.2	0	.2	.2	0	4.2	1.2	3.8	.5
29	7.1	1.8	.9	.1	1.4	.1	.2	.2	.1	.3	2.1	.1
30	4.7		1.8	0	0	.1	0	0	4.1	1.5	.2	3.3
31	2.5		.8		0		0	.6		8.0		2.0
Sum	47.5	36.4	37.4	30.6	36.1	31.2	37.6	20.1	57.1	66.7	76.3	35.2

Current Year 1980 — Period 1935-1980

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	2.17	0	29	39.2	!16	0	1.5	94.2	164	914	0
Feb.	1.70	0	28	28.8	! 1	0	1.3	72.2	145	400	6.0
Mar.	1.53	0	16	25.1	!12	0	1.2	74.2	156	517	0
Apr.	1.46	0	16	23.7	! 1	0	1.0	60.7	164	425	27.8
May	1.38	0	17	22.0	! 1	0	1.2	71.6	161	440	40.3
June	1.62	0	22	27.0	! 1	0	1.0	61.9	149	595	40.9
July	1.35	0	24	21.4	! 1	0	1.2	74.6	140	516	0
Aug.	1.72	0	7	29.2	! 1	0	.6	39.9	106	617	0
Sept.	1.46	0	28	23.7	! 4	0	1.9	113	106	462	0
Oct.	1.20	0	31	18.2	! 8	0	2.2	132	133	490	0
Nov.	1.41	0	2	22.6	! 5	0	2.5	151	155	462	9.0
Dec.	1.02	0	! 9	14.6	! 2	0	1.1	69.8	176	592	13.7
Yearly	2.17	0		39.2		0	1.4	1,015.1	1,755	4,500	638
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	0.66	0		1.11		0	0.04	1,252	2,165	5,551	787

! And other days

COLORADO RIVER IMMEDIATELY ABOVE MORELOS DAM - STAGES

DESCRIPTION: Water-stage recorder located on the right bank of the Colorado River in Mexico attached to the upstream abutment of the gates of the Intake Canal at Morelos Dam, 1.1 miles (1.8 km) downstream from the northerly international boundary, and about 7.5 miles (12.1 km) downstream from the Colorado River below Yuma Main Canal Wasteway. Since April 17, 1969, zero of the gage is at mean sea level, U. S. C. & G. S. datum; prior to that date, zero of the gage was 0.16 foot (0.05 m) below mean sea level.

RECORDS: Records obtained and furnished by the Mexican Section of the Commission. Records available: Staff gage height records November 8, 1950 to June 3, 1951; a continuous record of gage heights June 4, 1951 through 1980.

REMARKS: Prior to June 4, 1951, when a continuous water-stage recorder was installed, mean daily gage height records were determined from hourly readings of a staff gage.

EXTREMES: Since November 8, 1950: Maximum mean daily elevation above mean sea level, 113.48 feet (34.59 m) on August 18, 1977; minimum mean daily elevation above mean sea level, 101.51 feet (30.94 m) on February 17, 1957.

Mean Daily Gage Height in Feet 1980

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	104.72	106.59	106.53	108.99	111.35	109.51	108.37	106.82	108.40	108.50	108.76	109.22
2	105.28	105.38	106.76	108.96	111.45	109.45	108.33	106.76	108.33	108.69	108.83	109.22
3	104.69	105.31	107.74	109.02	111.15	109.38	108.23	107.22	108.01	108.83	108.76	108.92
4	104.56	104.76	107.74	109.06	110.53	109.45	108.04	106.79	108.04	108.50	108.53	108.66
5	103.97	103.87	107.02	109.06	109.84	109.38	107.61	106.56	108.43	108.76	108.63	108.69
6	103.97	103.67	105.58	109.15	109.58	109.19	107.78	106.50	108.92	108.79	108.60	108.60
7	104.00	103.77	105.64	109.19	109.48	109.22	107.48	106.53	108.76	108.60	109.02	107.97
8	104.00	103.81	106.56	109.09	109.06	109.28	107.12	106.50	108.23	108.56	109.32	107.64
9	104.69	103.71	107.35	109.19	108.89	109.28	107.05	106.59	107.71	108.99	109.25	107.58
10	106.40	103.48	107.22	109.15	109.02	109.42	106.92	107.05	107.68	109.02	109.42	107.15
11	107.19	103.61	107.64	108.92	108.86	110.10	107.35	107.15	107.87	109.28	109.19	106.76
12	106.04	103.67	109.19	108.83	109.32	109.78	108.23	106.99	108.07	109.48	109.12	106.50
13	105.35	103.77	109.74	109.12	109.68	109.19	108.27	107.09	108.10	109.61	109.12	106.59
14	105.18	105.45	109.68	108.53	110.10	109.35	107.87	106.92	108.43	109.45	108.83	107.05
15	105.28	107.22	109.74	108.43	109.97	109.78	107.74	107.38	108.14	109.42	108.69	106.92
16	105.18	106.36	109.78	108.60	109.91	109.78	107.84	107.94	108.14	109.32	108.89	106.96
17	105.09	104.89	110.14	108.99	109.94	109.48	107.78	108.53	108.17	109.42	108.76	106.92
18	105.31	104.72	110.30	109.22	109.74	109.55	107.94	108.53	107.84	109.51	108.40	106.59
19	105.35	106.00	110.30	109.22	109.58	109.55	107.91	108.50	108.37	109.55	108.27	106.66
20	105.12	106.63	110.17	109.68	109.42	109.35	108.04	108.04	108.33	109.81	107.97	106.89
21	104.69	107.78	110.04	109.81	109.28	109.55	108.60	107.81	108.63	109.81	107.91	106.96
22	104.46	108.01	109.78	110.14	109.65	109.74	108.43	107.97	108.23	109.81	108.27	106.86
23	104.43	108.14	109.58	110.30	109.68	109.71	108.46	108.53	108.04	109.74	108.53	106.99
24	104.46	108.04	109.38	110.40	109.68	109.09	108.43	108.89	108.17	110.17	108.27	107.84
25	104.53	107.12	109.15	110.47	109.61	108.50	108.37	109.19	108.33	109.84	108.20	108.43
26	104.04	106.86	109.74	110.56	109.55	108.43	108.23	109.12	108.50	109.71	108.10	107.78
27	103.74	106.23	110.53	111.09	109.55	108.56	108.17	109.02	108.83	109.42	108.50	107.38
28	103.97	105.84	110.47	110.76	109.58	108.53	107.74	109.38	108.92	108.99	108.69	107.35
29	104.46	106.79	110.60	110.60	109.58	108.83	107.15	109.02	108.69	108.69	109.12	107.02
30	107.48		110.73	111.02	109.55	108.86	106.82	108.10	108.53	108.50	109.28	106.56
31	108.30		109.97		109.58		106.76	108.56		108.53		106.79
Avg.	105.02	105.58	108.86	109.51	109.74	109.28	107.84	107.74	108.30	109.22	108.69	107.48

INTAKE CANAL AT MORELOS DIVERSION STRUCTURE - DISCHARGES

DESCRIPTION: Water-stage recorder and staff gage on left bank of Intake Canal, 200 feet (61.0 m) downstream from the intake at Morelos Dam, 1,350 feet (410 m) upstream from the point where it joins the old Alamo Canal, 2.2 miles (3.5 km) upstream from Matamoros Check, and about one mile (1.6 km) south of the northerly international boundary. The zero of the gage is 0.16 foot (0.05 m) below mean sea level, U. S. C. & G. S. datum.

RECORDS: The records are deduced from the flows arriving in the limitrophe section of the Colorado River at the northerly international boundary, the flows that pass downstream from the structure, and leakage through the structure. Records available: November 8, 1950 through 1980. Records obtained and furnished by the Mexican Section of the Commission.

REMARKS: The canal is operated with a minimum hydraulic slope to permit the maximum retention of silt above Matamoros Check, and the lower velocities in the canal do not permit measuring the flow with a current meter. Records for this station show the amounts of Colorado River water diverted at Morelos Diversion Dam to the Intake Canal and thence to the Alamo Canal for use in Mexico. Water for use in Mexico may also be diverted to the Alamo Canal in the United States directly from the river at Rockwood Heading or by means of Imperial Dam, the All-American Canal, and certain facilities of the Imperial Irrigation District under conditions set forth in the 1944 Water Treaty. No diversions of the above nature have been made during the years 1951 through 1980, and consequently the records reported below show the total water diverted from the Colorado River to the Alamo Canal during those years.

EXTREMES: Maximum mean daily discharge, 6,540 second-feet (185 m^3/sec), August 3, 1958; maximum mean daily gage height 107.05 feet (32.63 m) November 8, 1950. Minimum daily discharge, no flow on various occasions.

Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,710	2,250	3,570	4,480	3,200	3,490	4,700	5,900	4,980	4,240	3,670	2,890
2	2,590	2,400	3,780	4,560	3,100	3,450	4,730	5,860	4,940	3,920	3,670	2,860
3	2,690	2,170	4,030	4,560	2,500	3,530	4,630	6,000	4,730	3,780	3,570	2,970
4	2,600	2,190	4,030	4,520	2,800	3,440	4,590	5,580	4,840	3,670	3,600	2,940
5	2,420	2,080	3,740	4,520	3,050	3,450	4,380	5,580	4,910	3,780	3,570	2,980
6	2,400	2,160	4,060	4,450	3,090	3,480	4,520	5,580	4,940	3,780	3,570	2,870
7	2,380	2,310	4,480	4,480	3,140	3,500	4,660	5,510	4,940	3,740	3,270	2,920
8	2,350	2,370	4,840	4,410	3,020	3,470	4,840	5,720	4,870	3,740	3,030	2,900
9	2,560	2,290	4,870	4,450	3,040	3,330	5,260	5,760	4,800	3,780	2,960	2,900
10	2,360	2,120	4,870	4,410	3,040	3,450	5,190	5,720	4,700	3,850	2,870	2,710
11	2,240	2,250	5,050	4,480	3,050	3,480	5,330	5,620	4,730	3,780	2,830	2,620
12	2,010	2,370	5,160	4,450	3,130	3,570	4,980	5,620	4,700	3,850	2,800	2,540
13	2,050	2,620	4,980	4,560	3,050	3,490	4,940	5,540	4,770	3,850	2,800	2,620
14	2,130	2,650	4,980	4,340	2,910	3,530	5,260	5,470	4,770	3,880	2,810	2,750
15	2,150	2,250	4,870	4,590	2,980	3,670	5,440	5,330	4,410	3,780	2,770	2,690
16	2,110	2,100	5,010	4,590	3,010	3,600	5,400	5,230	4,200	3,810	2,790	2,720
17	2,120	2,200	4,910	4,800	2,950	3,810	5,400	5,330	4,130	3,780	2,720	2,670
18	2,190	2,100	4,870	4,770	3,050	3,780	5,510	5,370	4,130	3,570	2,820	2,570
19	2,190	2,070	4,840	4,800	3,120	3,710	5,470	5,260	4,240	3,600	2,820	2,610
20	2,150	1,920	4,870	4,800	3,040	3,880	5,540	5,120	4,170	3,670	2,860	2,680
21	2,080	1,780	4,870	4,730	3,090	3,880	5,760	5,090	4,310	3,570	2,900	2,680
22	2,090	1,760	5,010	4,480	3,020	4,100	5,720	5,190	4,200	3,600	2,860	2,640
23	2,100	1,750	5,050	4,200	3,030	3,990	5,930	5,370	4,170	3,570	2,730	2,710
24	2,100	1,790	5,120	4,100	3,060	3,880	5,930	5,330	4,240	3,640	2,800	2,790
25	2,150	2,070	5,090	4,100	3,140	3,850	5,970	5,370	4,200	3,260	2,810	2,710
26	2,270	2,400	4,870	4,030	3,130	3,960	5,930	5,370	4,270	3,220	2,830	2,690
27	2,410	2,370	4,200	3,740	3,160	4,170	5,970	5,370	4,270	3,270	2,770	2,680
28	2,550	2,800	4,200	3,810	3,280	4,240	5,830	5,510	4,310	3,670	2,730	2,710
29	2,640	3,360	4,240	3,880	3,270	4,480	5,690	5,370	4,310	3,710	2,800	2,640
30	3,100		4,170	3,570	3,320	4,700	5,620	5,300	4,130	3,740	2,660	2,590
31	2,680		4,340		3,280		5,760	5,370		3,670		2,650
Sum	72,625	64,958	143,024	131,688	95,085	112,368	164,884	169,722	135,326	114,780	89,728	84,911

Month	Current Year 1980 Extreme Gage Feet High	Extreme Gage Feet Low	Ø Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1950-1980 Acre-Feet Average	Maximum	Minimum
Jan.	103.61	103.48	30	3,100	12	2,010	2,340	144,049	67,684	144,049	966
Feb.	104.20	102.85	29	3,360	23	1,750	2,240	128,841	68,312	128,841	9,232
Mar.	105.31	104.10	12	5,160	1	3,570	4,630	283,684	172,407	283,684	97,902
Apr.	105.48	104.23	!17	4,800	30	3,570	4,380	261,199	197,726	264,127	153,792
May	104.36	103.81	30	3,320	3	2,500	3,070	188,597	98,641	188,597	66,207
June	105.38	102.26	30	4,700	9	3,330	3,740	222,877	156,682	269,632	95,177
July	106.43	105.31	!25	5,970	5	4,380	5,330	327,042	222,257	327,042	135,153
Aug.	106.59	105.77	3	6,000	21	5,090	5,470	336,638	218,707	341,044	130,298
Sept.	105.81	105.12	1	4,980	!17	4,130	4,520	268,414	126,424	268,414	53,633
Oct.	105.22	104.59	1	4,240	26	3,220	3,710	227,661	58,614	227,661	10,453
Nov.	104.82	104.10	! 1	3,670	30	2,660	2,990	177,971	48,195	177,971	7,516
Dec.	102.92	104.07	5	2,980	12	2,540	2,740	168,417	79,001	168,417	8,825
Yearly	106.59	102.26		6,000		1,750	3,760	2,735,390	1,517,530	2,735,390	1,272,332
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	32.49	31.17		170		49.6	106.6	3,374,067	1,871,853	3,374,067	1,569,404

Ø Mean daily

! And other days

INTAKE CANAL AT MORELOS DIVERSION STRUCTURE - STAGES

(See Preceding Page For Description)

Mean Daily Gage Height in Feet 1980

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	103.54	103.31	104.43	105.02	104.27	104.13	105.41	106.40	105.77	105.18	104.76	104.20
2	103.51	103.35	104.49	105.05	104.23	104.17	105.51	106.40	105.71	105.15	104.69	104.20
3	103.51	103.28	104.66	104.99	104.17	104.20	105.51	106.50	105.58	104.95	104.66	104.20
4	103.41	103.22	104.72	104.95	104.17	104.17	105.68	106.30	105.58	104.89	104.66	104.17
5	103.35	103.18	104.79	104.99	104.17	104.23	105.74	106.27	105.61	104.92	104.69	104.20
6	103.35	103.22	104.99	104.99	104.17	104.30	105.77	106.27	105.58	104.92	104.63	104.17
7	103.35	103.31	105.12	104.95	104.13	104.33	105.81	106.30	105.58	104.92	104.53	104.17
8	103.35	103.48	105.18	104.89	104.20	104.33	105.94	106.30	105.61	104.92	104.49	104.13
9	103.31	103.51	105.15	104.95	104.20	104.17	106.00	106.30	105.54	104.92	104.43	104.17
10	103.18	103.28	105.18	105.02	104.17	104.20	106.04	106.27	105.51	104.92	104.30	104.17
11	103.22	103.44	105.22	105.15	104.17	104.27	106.10	106.27	105.48	104.89	104.27	104.17
12	103.18	103.48	105.12	105.18	104.17	104.33	106.10	106.20	105.51	104.86	104.27	104.17
13	103.18	103.61	105.09	105.18	104.10	104.33	106.10	106.17	105.51	104.86	104.27	104.17
14	103.18	103.48	105.12	105.15	103.90	104.40	106.10	106.07	105.48	104.86	104.27	104.20
15	103.18	103.35	105.02	105.22	103.84	104.43	106.14	106.00	105.41	104.82	104.27	104.17
16	103.18	103.35	104.99	105.18	103.87	104.43	106.10	106.00	105.31	104.82	104.23	104.17
17	103.18	103.28	105.05	105.31	103.87	104.49	106.07	106.04	105.18	104.86	104.20	104.17
18	103.22	103.22	105.09	105.35	103.97	104.56	106.10	106.04	105.18	104.86	104.20	104.17
19	103.18	103.08	105.09	105.35	103.97	104.63	106.10	105.97	105.18	104.86	104.17	104.17
20	103.18	102.92	105.02	105.41	103.97	104.76	106.10	105.91	105.18	104.79	104.17	104.17
21	103.18	102.92	104.99	105.41	103.97	104.89	106.14	105.91	105.18	104.66	104.17	104.17
22	103.22	103.02	104.95	105.12	103.97	104.99	106.20	105.91	105.18	104.69	104.20	104.17
23	103.18	103.08	104.95	104.92	103.97	104.95	106.20	105.94	105.22	104.69	104.20	104.20
24	103.18	103.15	105.02	104.86	104.00	104.95	106.17	105.91	105.22	104.63	104.20	104.17
25	103.18	103.25	105.09	104.76	104.07	104.95	106.20	105.94	105.18	104.66	104.17	104.20
26	103.28	103.44	105.05	104.59	104.10	104.99	106.27	105.91	105.18	104.69	104.17	104.20
27	103.35	103.67	104.92	104.49	104.10	105.05	106.33	105.91	105.18	104.63	104.23	104.23
28	103.44	103.97	104.89	104.40	104.10	105.28	106.36	105.94	105.18	104.69	104.20	104.17
29	103.54	104.10	104.92	104.40	104.10	105.31	106.40	105.91	105.18	104.79	104.20	104.17
30	103.41		104.99	104.30	104.10	105.35	106.36	105.91	105.18	104.79	104.20	104.17
31	103.35		104.99		104.10		106.40	105.87		104.76		104.17
Avg.	103.28	103.35	104.99	104.99	104.07	104.59	106.04	106.10	105.38	104.82	104.33	104.17

COLORADO RIVER IMMEDIATELY BELOW MORELOS DAM - STAGES

DESCRIPTION: Water-stage recorder located on the right bank of the Colorado River in Mexico immediately downstream from Morelos Dam, 1.1 miles (1.8 km) downstream from the northerly international boundary, and about 7.5 miles (12.1 km) downstream from the Colorado River below Yuma Main Canal Wasteway. Since April 17, 1969, zero of the gage is at mean sea level, U. S. C. & G. S. datum; prior to that date, zero of the gage was 0.16 foot (0.05 m) below mean sea level.
RECORDS: Records obtained and furnished by the Mexican Section of the Commission. Records available: Staff gage heights, February 20, 1951 to June 6, 1966; continuous record of gage heights June 7, 1966 through 1980.
REMARKS: On June 7, 1966 a continuous water-stage recorder was installed; prior to this date, mean daily gage heights were determined from hourly readings of staff gage.
EXTREMES: Maximum mean daily gage height, 113.42 feet (34.57 m) on August 18, 1977; minimum mean gage height, 98.13 feet (29.91 m) several days during March and April 1967.

Mean Daily Gage Height in Feet 1980

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	104.66	106.53	106.46	108.96	111.32	109.51	108.33	106.79	108.40	108.43	108.76	109.15
2	105.22	105.31	106.69	108.92	111.45	109.45	108.27	106.73	108.30	108.66	108.79	109.19
3	104.63	105.22	107.68	109.02	111.12	109.38	108.17	107.22	108.01	108.83	108.73	108.92
4	104.49	104.69	107.68	109.06	110.53	109.45	107.97	106.53	108.01	108.50	108.53	108.63
5	103.90	103.81	106.96	109.06	109.84	109.35	107.55	105.74	108.43	108.76	108.60	108.66
6	103.90	103.64	104.86	109.15	109.55	109.12	107.74	105.64	108.89	108.76	108.56	108.53
7	103.94	103.71	105.45	109.15	109.45	109.19	107.41	105.68	108.69	108.56	109.02	107.94
8	103.94	103.31	106.46	109.09	109.02	109.28	107.05	106.20	108.23	108.56	109.32	107.58
9	104.63	101.54	107.28	109.15	108.89	109.25	107.02	106.53	107.68	108.99	109.22	107.55
10	106.33	100.69	107.15	109.12	108.96	109.42	106.92	107.05	107.68	109.02	109.42	107.12
11	107.12	100.72	107.58	108.92	108.86	110.10	107.35	107.12	107.87	109.25	109.15	106.76
12	105.97	100.98	109.09	108.83	109.32	109.74	108.20	106.96	108.01	109.45	109.12	106.50
13	105.28	101.77	109.65	109.09	109.65	109.15	108.23	107.09	108.04	109.55	109.09	106.59
14	105.12	105.25	109.58	108.53	110.10	109.35	107.84	106.86	108.37	109.42	108.79	107.02
15	105.22	107.15	109.65	108.40	109.94	109.74	107.71	107.35	108.10	109.38	108.63	106.89
16	105.15	106.30	109.71	108.56	109.88	109.71	107.78	107.94	108.10	109.28	108.86	106.92
17	105.02	104.82	110.07	108.96	109.91	109.48	107.78	108.50	108.14	109.38	108.69	106.89
18	105.22	104.66	110.27	109.22	109.71	109.55	107.94	108.50	107.78	109.48	108.33	106.56
19	105.28	105.91	110.30	109.19	109.58	109.19	107.91	108.46	108.33	109.55	108.20	106.63
20	105.09	106.56	110.17	109.65	109.42	109.35	108.04	108.01	108.33	109.74	107.94	106.89
21	104.63	107.71	110.04	109.78	109.25	109.55	108.53	107.81	108.63	109.74	107.91	106.96
22	104.40	107.94	109.78	110.14	109.61	109.74	108.43	107.94	108.20	109.78	108.27	106.79
23	104.36	108.07	109.58	110.30	109.65	109.68	108.46	108.53	108.04	109.74	108.53	106.92
24	104.40	107.97	109.35	110.40	109.65	109.09	108.40	108.89	108.14	110.17	108.27	107.81
25	104.46	107.05	109.15	110.43	109.58	108.50	108.30	109.15	108.30	109.81	108.20	108.40
26	103.97	106.82	109.74	110.56	109.51	108.40	108.23	109.09	108.46	109.65	108.10	107.74
27	103.67	106.20	110.53	111.09	109.51	108.56	108.17	108.99	108.76	109.38	108.46	107.35
28	103.90	105.77	110.47	110.70	109.58	108.50	107.71	109.35	108.86	108.92	108.69	107.32
29	104.40	106.73	110.60	110.56	109.58	108.83	107.12	108.99	108.63	108.66	109.09	106.99
30	107.35		110.73	110.99	109.51	108.83	106.82	108.10	108.50	108.46	109.25	106.53
31	108.20		109.97		109.55		106.73	108.53		108.50		106.76
Avg.	104.95	105.05	108.79	109.51	109.38	109.28	107.81	107.61	108.27	109.19	108.69	107.45

WELLTON-MOHAWK DRAINAGE WATER DISCHARGED TO COLORADO RIVER BELOW MORELOS DAM

DESCRIPTION: Water-stage recorder located on downstream end of the Wellton-Mohawk Drainage Extension Channel on the Arizona bank of the Colorado River at the east end of the weir section of Morelos Dam, 1.1 miles (1.8 km) downstream from the northerly international boundary. The elevation of the zero of the gage has not been determined.

RECORDS: Based on discharge measurements and a continuous record of gage heights. Station is operated by the United States Section of the Commission. Records available: November 16, 1965 through 1980.

REMARKS: Pursuant to Minute 218 of the Commission, an extension to the Wellton-Mohawk Drainage Conveyance Channel was constructed along the left bank of the Colorado River to a point immediately below Morelos Dam, a distance of about 12 miles (19.3 km), and placed in operation on November 16, 1965. Drainage flows may be discharged on an emergency basis to the Gila River and thence to the Colorado River at the diversion structure, Main Outlet Drain Extension No. 1, at the upstream end of the extension; directly to the Colorado River at Main Outlet Drain Extension No. 2, 1.9 miles (3.1 km) upstream from Morelos Dam; and directly to the Colorado River immediately below Morelos Dam at this station, Main Outlet Drain Extension No. 3. On July 14, 1972, Minute No. 241 of the Commission became effective. The Minute called for discharge of all Wellton-Mohawk drainage waters to be made below Morelos Dam. On August 30, 1973, Minute No. 242 of the Commission became effective. The Minute called for construction of a concrete-lined bypass drain from Morelos Dam to the Santa Clara Slough in Mexico. On June 23, 1977, the first flow was recorded in the bypass drain. Drainage flows through Main Outlet Extension No. 3 will be only on an emergency basis.

Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0
30	0		0	0	0	0	0	0	0	0	0	0
31	0		0		0		0	0		0		0
Sum	0	0	0	0	0	0	0	0	0	0	0	0

Current Year 1980 — Period 1966–1980

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.	0	0		0		0	0	0	12,941	18,718	0
Feb.	0	0		0		0	0	0	10,071	16,992	0
Mar.	0	0		0		0	0	0	7,031	18,506	0
Apr.	0	0		0		0	0	0	5,854	18,061	0
May	0	0		0		0	0	0	9,587	19,091	0
June	0	0		0		0	0	0	7,442	18,756	0
July	0	0		0		0	0	0	6,818	18,946	0
Aug.	0	0		0		0	0	0	7,045	19,188	0
Sept.	0	0		0		0	0	0	9,841	18,474	0
Oct.	0	0		0		0	0	0	13,562	19,200	0
Nov.	0	0		0		0	0	0	13,217	18,478	0
Dec.	0	0		0		0	0	0	12,006	19,121	0
Yearly	0	0		0		0	0	0	115,415	214,781	0
	Meters		Cubic Meters per Second						Thousands of Cubic Meters		
	0	0		0		0	0	0	142,363	264,930	0

COLORADO RIVER AT MORELOS GAGING STATION - DISCHARGES

DESCRIPTION: Water-stage recorder on the left (Arizona) bank of the river, and cableway 1.8 miles (2.9 km) downstream from the northerly international boundary, 0.7 mile (1.1 km) downstream from Morelos Diversion Dam, and about 9 miles (14.5 km) downstream from Yuma, Arizona, along the river levee. Zero of gage is at mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on current meter measurements and a continuous record of gage heights. Computations by shifting control methods. Records available: Daily discharges, January 1, 1954 though 1980; continuous record of gage heights, July 20, 1952 through 1980.

REMARKS: Reservoirs, diversions in the United States and Mexico, drainage returns, and waste flows modify the river flow at this station. The record at this station, less Main Outlet Drain Extension No. 3, represents the river flow passing Morelos Diversion Dam.

EXTREMES: Maximum instantaneous discharge, 22,240 second-feet (630 m^3/sec) on January 4, 1955; maximum gage height, 112.85 feet (34.40 m) on August 18, 1977. Minimum discharge, no flow on various occasions.

Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,600	3,010	3,020	5,920	10,300	7,220	5,800	3,910	6,420	6,580	7,540	8,410
2	1,960	2,020	3,220	5,930	10,500	7,150	5,670	3,790	6,340	6,970	7,630	8,440
3	1,570	1,970	4,130	6,060	9,900	7,070	5,570	4,400	5,870	7,230	7,540	7,930
4	1,500	1,610	4,150	6,080	8,800	7,160	5,220	3,720	5,880	6,730	7,210	7,560
5	1,190	1,140	3,520	6,080	7,750	7,050	4,620	2,830	6,480	7,120	7,320	7,620
6	1,190	1,060	1,800	6,240	7,310	6,720	4,820	2,590	7,240	7,130	7,230	7,430
7	1,200	1,100	2,150	6,230	7,160	6,800	4,520	2,530	6,950	6,770	8,030	6,530
8	1,190	974	2,990	6,100	6,600	6,930	4,130	3,110	6,240	6,770	8,570	6,060
9	1,540	278	3,740	6,260	6,340	6,870	4,090	3,570	5,510	7,520	8,440	5,980
10	2,740	24.4	3,570	6,190	6,550	7,050	3,960	4,210	5,500	7,570	8,730	5,520
11	3,400	17.4	3,980	5,910	6,330	8,130	4,500	4,330	5,790	8,010	8,270	5,130
12	2,500	86.5	5,860	5,760	6,970	7,630	5,630	4,130	6,000	8,350	8,210	4,880
13	1,960	314	6,610	6,140	7,450	6,710	5,660	4,310	6,050	8,540	8,210	4,960
14	1,840	1,970	6,520	5,370	8,190	6,960	5,140	4,070	6,530	8,310	7,690	5,440
15	1,920	3,510	6,590	5,210	7,920	7,620	4,980	4,650	6,100	8,220	7,440	5,320
16	1,880	2,840	6,700	5,420	7,790	7,600	5,100	5,470	6,100	8,090	7,810	5,360
17	1,800	1,680	7,280	5,990	7,850	7,190	5,000	6,280	6,170	8,240	7,580	5,340
18	1,940	1,590	7,530	6,340	7,550	7,330	5,290	6,340	5,640	8,440	6,970	4,970
19	1,970	2,500	7,470	6,290	7,280	6,880	5,250	6,330	6,450	8,510	6,790	5,030
20	1,830	3,010	7,230	6,990	7,060	7,120	5,450	5,690	6,440	8,940	6,390	5,320
21	1,610	4,060	7,010	7,170	6,810	7,530	6,160	5,400	6,890	8,950	6,290	5,380
22	1,470	4,280	6,600	7,720	7,380	7,820	5,990	5,600	6,310	8,910	6,870	5,230
23	1,460	4,380	6,240	8,000	7,470	7,800	6,060	6,440	6,040	8,850	7,270	5,370
24	1,480	4,280	5,880	8,200	7,440	6,910	5,970	6,970	6,170	9,570	6,870	6,570
25	1,490	3,460	5,630	8,300	7,360	6,050	5,830	7,420	6,420	9,240	6,790	7,500
26	1,250	3,300	6,630	8,490	7,270	5,950	5,680	7,330	6,630	9,080	6,620	6,500
27	1,080	2,800	8,310	9,460	7,240	6,130	5,620	7,120	7,110	8,630	7,230	5,980
28	1,180	2,400	8,210	8,780	7,320	6,080	5,060	7,680	7,280	7,840	7,570	5,930
29	1,430	3,250	8,660	8,500	7,330	6,500	4,290	7,120	6,900	7,380	8,300	5,460
30	3,700		9,040	9,450	7,280	6,510	3,970	5,810	6,660	7,070	8,540	4,940
31	4,510		7,560		7,320		3,790	6,520		7,130		5,180
Sum	57,380	62,914.3	177,830	204,580	235,820	210,470	158,820	159,670	190,110	246,690	225,950	187,270

Current Year 1980 — **Period** 1954-1980

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	107.85	103.10	31	4,560	27	1,040	1,850	113,812	126,132	969,540	949
Feb.	107.69	99.04	24	4,420	12	12.6	2,170	124,789	67,147	414,310	977
Mar.	110.08	103.00	30	9,310	6	1,080	5,740	352,721	54,926	630,230	659
Apr.	110.40	107.26	30	9,750	14	4,520	6,820	405,778	47,533	532,320	745
May	110.77	107.99	2	10,700	11	6,000	7,610	467,742	61,332	467,742	460
June	109.50	107.77	11	8,240	26	5,920	7,020	417,461	29,635	417,461	507
July	107.93	105.88	!21	6,250	31	3,740	5,120	315,015	26,520	315,015	584
Aug.	108.82	104.43	28	7,890	7	2,350	5,150	316,701	36,781	316,701	618
Sept.	108.37	106.95	28	7,420	9	5,340	6,340	377,078	36,400	377,078	113
Oct.	109.68	107.76	24	9,820	1	6,470	7,960	489,302	60,897	489,302	383
Nov.	108.93	107.22	! 8	8,850	!21	6,110	7,530	448,165	82,948	448,165	355
Dec.	108.79	105.83	2	8,610	12	4,790	6,040	371,445	101,304	643,850	1,111
	110.77	99.04		10,700		12.6	5,790	4,200,009	731,555	4,200,009	92,518
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	33.76	30.19		303		0.36	164	5,180,669	902,366	5,180,669	114,120

! And other days

COLORADO RIVER AT MORELOS GAGING STATION - STAGES

(See Preceding Page For Description)

Mean Daily Gage Height in Feet 1980

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	104.24	106.09	106.03	108.28	110.56	108.89	107.72	106.04	107.75	107.84	108.16	108.68
2	104.79	104.87	106.26	108.27	110.67	108.84	107.64	105.93	107.67	108.09	108.21	108.69
3	104.18	104.78	107.24	108.35	110.38	108.79	107.57	106.47	107.33	108.25	108.16	108.40
4	104.05	104.25	107.25	108.37	109.80	108.85	107.31	105.85	107.34	107.93	107.95	108.11
5	103.41	103.27	106.58	108.36	109.21	108.78	106.84	104.97	107.76	108.18	108.02	108.16
6	103.42	103.11	104.31	108.47	108.95	108.55	107.00	104.70	108.25	108.19	107.97	108.03
7	103.44	103.19	104.90	108.46	108.85	108.61	106.68	104.64	108.07	107.96	108.46	107.40
8	103.42	102.86	105.96	108.38	108.46	108.69	106.31	105.24	107.60	107.96	108.77	107.03
9	104.08	100.53	106.83	108.48	108.28	108.65	106.27	105.67	107.07	108.42	108.69	106.96
10	105.81	99.16	106.66	108.44	108.42	108.77	106.13	106.22	107.06	108.45	108.86	106.54
11	106.69	99.09	107.10	108.25	108.26	109.43	106.55	106.32	107.28	108.70	108.60	106.17
12	105.52	99.51	108.59	108.15	108.72	109.14	107.45	106.15	107.43	108.89	108.56	105.93
13	104.80	100.84	109.10	108.40	109.04	108.55	107.47	106.30	107.46	109.00	108.56	106.01
14	104.63	104.63	109.04	107.87	109.47	108.72	107.07	106.10	107.79	108.87	108.25	106.48
15	104.74	106.67	109.09	107.75	109.31	109.14	106.95	106.58	107.50	108.82	108.10	106.36
16	104.68	105.89	109.15	107.90	109.24	109.13	107.04	107.21	107.50	108.75	108.32	106.40
17	104.56	104.36	109.47	108.30	109.28	108.83	106.97	107.79	107.55	108.83	108.18	106.38
18	104.76	104.19	109.61	108.53	109.10	108.91	107.19	107.84	107.17	108.94	107.80	106.02
19	104.80	105.51	109.58	108.50	108.93	108.58	107.16	107.83	107.74	108.99	107.68	106.08
20	104.60	106.13	109.44	108.94	108.78	108.65	107.31	107.38	107.74	109.22	107.41	106.35
21	104.20	107.29	109.32	109.06	108.61	108.88	107.83	107.16	108.04	109.22	107.35	106.41
22	103.93	107.53	109.09	109.38	108.99	109.06	107.71	107.31	107.64	109.20	107.73	106.27
23	103.90	107.64	108.88	109.55	109.05	109.04	107.76	107.90	107.46	109.17	107.99	106.40
24	103.93	107.53	108.66	109.67	109.03	108.48	107.70	108.26	107.55	*109.55	107.74	107.28
25	103.96	106.62	108.48	109.72	108.98	107.86	107.59	108.54	107.72	*109.19	107.68	107.93
26	103.49	106.42	108.99	109.83	108.92	107.79	107.48	108.48	107.86	*109.06	107.57	107.22
27	103.18	105.81	109.76	110.31	108.90	107.94	107.44	108.35	108.18	*108.80	107.96	106.83
28	103.44	105.31	109.72	109.97	108.95	107.91	107.01	108.70	108.28	108.34	108.18	106.79
29	103.92	106.29	109.88	109.83	108.96	108.22	106.38	108.34	108.04	108.06	108.61	106.41
30	106.85		109.97	110.22	108.93	108.23	106.10	107.46	107.89	107.87	108.75	105.97
31	107.78		109.26		108.95		105.93	107.96		107.90		106.19
Avg.	104.49	104.46	108.20	108.80	109.10	108.66	107.08	106.89	107.66	108.60	108.14	106.90

* Partly estimated

ELEVEN MILE WASTEWAY (VALLEY DIVISION, YUMA PROJECT)

DESCRIPTION: Water-stage recorder and control weir on wasteway for discharging water from the West Main Canal to the Colorado River. This wasteway is located in Arizona, 4.3 miles (6.9 km) downstream from the northerly international boundary and 3.2 miles (5.1 km) downstream from Morelos Diversion Dam. It is the largest of three wasteways discharging waste water from the Valley Division of the Yuma Project in the United States into the limitrophe section of the Colorado River.

RECORDS: Flow is computed from head on the weir measured by the water-stage recorder and weir rating determined by current meter measurements. Station operated by the United States Section of the Commission. Records available: Daily discharge, January 1951 through 1980, obtained by the United States Section; monthly discharge, January 1924 through 1950, by Bureau of Reclamation.

EXTREMES: Prior to January 1951, maximum monthly discharge, 9,740 acre-feet (12,014,000 m^3) in August 1940; minimum monthly discharge, zero in April 1941. Since January 1, 1951, maximum instantaneous discharge, 800 second-feet (22.7 m^3/sec) on December 3, 1961, at a maximum gage height of 117.60 feet (35.84 m); minimum instantaneous discharge, zero during parts of most years.

Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.4	0.2	0.2	0.4	0.3	47.8	0.2	0.4	0.3	0.4	12.0	38.1
2	.3	.2	35.4	.5	.5	44.6	.1	.4	.3	.4	39.6	4.6
3	.4	26.9	18.8	.6	.4	3.4	.1	.4	.3	.4	54.4	1.4
4	.7	64.8	3.9	.6	.3	1.2	.2	.3	.3	.4	2.6	.3
5	.4	3.6	2.3	.6	.3	.2	.2	.3	.3	.4	.9	.4
6	.5	1.7	.2	39.9	.3	.2	.1	.3	.4	.4	.4	.4
7	.4	.2	.3	60.2	.3	.2	.1	.3	.5	.3	.1	.4
8	.3	.2	.2	3.6	.4	.2	.2	.3	.3	.3	.1	.3
9	.4	.2	.1	2.5	.4	.2	.3	.3	.5	.5	.5	.6
10	.6	.2	.1	.3	.4	.2	.3	23.0	.3	.4	.2	.4
11	.4	.2	.1	.4	.5	.2	.3	9.2	.3	.2	.3	.5
12	.4	.2	.1	.4	.4	.2	.3	3.1	.3	.2	.3	.6
13	.4	.2	.1	.4	.5	.2	.2	.9	.3	.8	.4	.9
14	.8	.2	.1	.4	.4	.2	.1	.2	.3	.4	.4	.4
15	.4	.2	.1	.3	.4	.2	.2	.3	.3	.6	.4	.4
16	.3	.2	.2	.2	.4	.2	.2	.3	.3	.3	.7	.3
17	.4	.2	.1	.2	.4	.1	.2	.2	.3	.2	1.0	.1
18	.3	.2	.1	.2	.4	.2	.2	.2	.3	.3	.3	.3
19	.2	.2	.2	.2	.4	.2	.2	.2	.3	.6	.6	.3
20	.2	.5	.4	.2	.5	.2	.2	.3	.4	.5	1.1	.3
21	.1	.4	.4	.3	.3	.1	.1	.3	.4	.3	.4	.5
22	.1	.4	.6	.2	.4	.1	.1	.3	.4	.8	.4	.3
23	.1	.4	.5	.2	.4	.1	.1	.3	.4	.3	.3	.7
24	.1	.4	.5	.3	.4	.2	.2	.2	.4	.4	.3	.4
25	.1	.4	.5	.3	.4	.2	.2	.2	.4	.4	.7	.4
26	.1	.2	.6	.4	.4	.2	.2	.2	.3	.4	.2	.4
27	.1	.2	.4	.4	.3	.3	.2	.3	.3	.3	5.3	.5
28	.2	.3	.5	.4	.3	.3	.3	.3	.3	.5	1.3	.4
29	.2	.3	.4	.2	.3	.2	.4	.4	.3	3.3	7.0	.3
30	.4		.4	.4	.3	.2	.3	.4	.3	.5	36.7	.2
31	.3		.4		.3		.4	.3		.5		.5
Sum	10.0	103.5	68.2	115.2	11.7	102.0	6.4	44.1	10.1	15.7	168.9	55.6

Month	Current Year 1980 Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period 1935-1980 Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	111.84	111.74	14	1.2	! 21	0.1	0.3	19.8	2,913	9,570	0
Feb.	115.50	111.75	4	241	! 1	.2	3.6	205	2,364	8,430	14.5
Mar.	115.53	111.73	2	244	! 11	.1	2.2	135	2,229	6,230	59.1
Apr.	115.19	111.73	7	209	17	.1	3.8	228	2,060	6,300	0
May	111.88	111.74	20	1.7	5	.1	.4	23.2	2,444	9,320	8.3
June	115.98	111.73	1	307	17	.1	3.4	202	2,338	7,440	71.2
July	111.78	111.74	29	.4	! 1	.1	.2	12.7	2,343	8,320	12.7
Aug.	114.65	111.75	10	168	! 4	.2	1.4	87.5	2,022	9,740	87.5
Sept.	111.83	111.75	! 7	1.0	! 2	.2	.3	20.0	1,463	6,140	6.0
Oct.	112.55	111.74	29	40.2	! 14	.1	.5	31.1	1,994	5,680	11.9
Nov.	115.48	111.72	2	239	! 7	0	5.6	335	2,397	8,220	18.8
Dec.	113.29	111.74	1	87.5	! 17	.1	1.8	110	3,161	9,430	61.9
Yearly	115.98	111.72		307		0	1.9	1,409.3	27,728	82,900	943
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	35.35	34.05		8.69		0	0.05	1,738	34,202	102,256	1,163

! And other days

COLORADO RIVER AT ELEVEN MILE GAGE - STAGES

DESCRIPTION: Water-stage recorder on the left (Arizona) bank of the river, 4.3 miles (6.9 km) downstream from northerly international boundary, 3.2 miles (5.1 km) downstream from Morelos Diversion Dam, about 50 feet (15 m) downstream from the mouth of Eleven Mile Wasteway of the Yuma Project, and 11 miles (17.7 km) downstream from Yuma, Arizona, along the river levee. The zero of the gage is at mean sea level, U. S. C. & G. S. datum.

RECORDS: Mean daily gage heights based on continuous water-stage records. Records available: Continuous record of gage heights, November 1947 through 1980; once weekly readings obtained by the U. S. Bureau of Reclamation, January 1940 through October 1947.

REMARKS: This station is maintained by the United States Section of the Commission as part of the continuing study of channel conditions in the limitrophe section of the river.

EXTREMES: Since November 1947, maximum mean daily gage height, 108.20 feet (32.98 m) on January 2, 1958; minimum mean daily gage height, 94.95 feet (28.94 m) on June 22, 1968.

Mean Daily Gage Height in Feet 1980

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	102.05	103.09	102.75	104.90	106.79	105.34	104.30	102.81	104.50	104.56	104.89	105.35
2	101.90	101.87	102.86	104.81	106.88	105.30	104.20	102.70	104.42	104.76	104.94	105.39
3	101.16	101.92	103.73	104.89	106.66	105.24	104.15	103.20	104.14	104.90	104.94	105.14
4	101.02	101.37	103.81	104.92	106.15	105.27	103.90	102.73	104.13	104.64	104.72	104.91
5	100.31	100.39	103.33	104.91	105.61	105.22	103.45	101.82	104.49	104.84	104.78	104.91
6	100.29	100.07	101.36	105.04	105.36	105.02	103.58	101.56	104.90	104.87	104.75	104.85
7	100.32	100.13	101.79	105.06	105.28	105.05	103.34	101.50	104.77	104.67	105.13	104.31
8	100.32	99.88	102.64	104.95	104.94	105.11	102.92	102.11	104.34	104.65	105.41	103.96
9	100.97	98.00	103.47	105.04	104.77	105.10	102.89	102.54	103.89	105.03	105.33	103.88
10	102.66	97.95	103.35	105.01	104.92	105.15	102.80	103.07	103.84	105.05	105.49	103.54
11	103.41	98.68	103.61	104.85	104.75	105.63	103.15	103.19	104.03	105.26	105.27	103.14
12	102.54	97.48	104.87	104.74	105.13	105.57	104.06	103.03	104.16	105.40	105.22	102.90
13	101.88	97.83	105.44	104.95	105.43	105.01	104.11	103.17	104.19	105.51	105.24	102.94
14	101.66	102.29	105.38	104.55	105.79	105.15	103.76	103.00	104.45	105.38	104.97	103.41
15	101.74	103.20	105.46	104.36	105.71	105.51	103.60	103.40	104.27	105.35	104.85	103.33
16	101.71	103.09	105.50	104.52	105.63	105.53	103.56	103.99	104.21	105.29	105.00	103.34
17	101.58	103.30	105.81	104.86	105.67	105.27	103.60	104.48	104.28	105.34	104.92	103.35
18	101.75	103.08	105.94	105.08	105.53	105.30	103.82	104.57	103.96	105.45	104.59	102.99
19	101.81	102.60	105.93	105.05	105.38	105.04	103.78	104.54	104.42	105.48	104.47	103.04
20	101.62	102.77	105.81	105.44	105.27	105.06	103.92	104.16	104.44	105.68	104.24	103.29
21	101.21	103.73	105.74	105.56	105.09	105.29	104.41	103.97	104.69	105.68	104.17	103.37
22	100.89	104.65	105.55	105.84	105.44	105.44	104.31	104.11	104.40	105.67	104.49	103.26
23	* 100.90	106.07	105.36	106.00	105.49	105.45	104.35	104.61	104.20	105.63	104.74	103.36
24	* 100.94	105.43	105.19	106.08	105.47	104.98	104.33	104.93	104.30	105.95	104.52	104.12
25	* 101.00	103.32	105.02	106.13	105.43	104.38	104.23	105.16	104.45	105.71	104.48	104.73
26	* 100.51	103.03	105.41	106.20	105.36	104.32	104.12	105.13	104.59	105.57	104.38	104.20
27	* 100.21	102.58	106.10	106.60	105.35	104.33	104.11	104.99	104.85	105.41	104.71	103.82
28	* 100.44	102.76	106.09	106.37	105.39	104.44	103.73	105.29	104.97	105.07	104.90	103.75
29	* 100.94	102.48	106.20	106.21	105.39	104.72	103.12	105.02	104.76	104.80	105.26	103.48
30	* 103.89		106.32	106.54	105.36	104.77	102.83	104.24	104.64	104.61	105.40	103.02
31	* 104.74		105.77		105.39		102.67	104.64		104.66		103.19
Avg.	101.50	101.83	104.70	105.32	105.51	105.10	103.71	103.67	104.39	105.19	104.87	103.82

* Partly estimated

TWENTY-ONE MILE WASTEWAY (VALLEY DIVISION, YUMA PROJECT)

DESCRIPTION: Water-stage recorder and control weir on wasteway for discharging water from the West Main Canal to the Colorado River. On September 27, 1977 recorder moved upstream to site used prior to May 1, 1971. The site used from May 1, 1971 to September 20, 1977 was located 200 feet (61 m) downstream on wasteway. This wasteway is located in Arizona, 18.5 miles (29.8 km) downstream from the northerly international boundary, 17.4 miles (28.0 km) downstream from Morelos Diversion Dam, and 2.2 miles (3.5 km) upstream from the southerly international boundary. It is the farthest downstream of the two wasteways discharging waste water from the Valley Division of the Yuma Project in the United States into the limitrophe section of the Colorado River. The elevation of the zero of the gage at the new location has not been determined.

RECORDS: Flow is computed from head on the weir measured by the water-stage recorder and weir rating determined by current meter measurements. Station operated by the United States Section of the Commission. Records available: Daily discharge, January 1951 through 1980, obtained by the United States Section; monthly discharge, March 1939 through 1950, by Bureau of Reclamation.

REMARKS: This wasteway was completed and flow began March 14, 1939. Since May 13, 1944, waste water from the West Main Canal which previously discharged across the southerly land boundary has been returned to the Colorado River through this wasteway. The West Main Canal Wasteway was completed in February of 1971, and the waste water from the West Main Canal is normally discharged across the southerly land boundary.

EXTREMES: Prior to January 1951, maximum monthly discharge 2,860 acre-feet (3,528,000 m^3) in January 1946; minimum monthly discharge, 122 acre-feet (150,000 m^3) in September 1950. Since January 1, 1951, maximum instantaneous discharge, 102 second-feet (2.89 m^3/sec) on January 24, 1954, at a maximum gage height of 95.46 feet (29.10 m) (old datum); minimum instantaneous discharge, zero during a part of most months.

Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0
30	0		0	0	0	0	0	0	0	0	0	0
31	0		0		0		0	0		0		0
Sum	0	0	0	0	0	0	0	0	0	0	0	0

Month	Current Year 1980								Period 1939-1980		
	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		0		0	0	0	718	2,860	0
Feb.	0	0		0		0	0	0	618	2,510	0
Mar.	0	0		0		0	0	0	570	1,660	0
Apr.	0	0		0		0	0	0	613	1,940	0
May	0	0		0		0	0	0	746	2,470	0
June	0	0		0		0	0	0	651	2,350	0
July	0	0		0		0	0	0	562	1,950	0
Aug.	0	0		0		0	0	0	590	2,530	0
Sept.	0	0		0		0	0	0	530	2,180	0
Oct.	0	0		0		0	0	0	643	2,100	0
Nov.	0	0		0		0	0	0	741	2,380	0
Dec.	0	0		0		0	0	0	818	2,680	0
Yearly	0	0		0		0	0	0	7,800	24,370	0
	Meters		Cubic Meters per Second						Thousands of Cubic Meters		
	0	0		0		0	0	0	9,621	30,060	0

EAST MAIN CANAL WASTEWAY (VALLEY DIVISION, YUMA PROJECT)

DESCRIPTION: Water-stage recorder and control weir located about 300 feet (91.4 m) north of the international boundary near San Luis, Arizona and 1.5 miles (2.4 km) east of the Colorado River. From September 28, 1977 to April 6, 1978, recorder moved west 100 feet (30.5 m) to a temporary bypass channel. On April 7, 1978 recorder was moved back to original site.

RECORDS: Wasteway discharges computed by United States Section of the Commission beginning November 1, 1953, from head on control weir as measured by water-stage recorder and weir ratings as determined by current meter measurements. Records available: October 1946 through 1980. Records of monthly discharges also are available for the periods January 1924 through June 1928, January 1932 through 1933, and April 1935 through September 1946.

REMARKS: Wasteway discharges from the East Main Canal comprise regulatory waste and drainage waters from the eastern half of the Valley Division of the Yuma Project and are considered as part of the volumes arriving at the limitrophe section of the Colorado River.

Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	10.3	3.2	6.5	0	14.4	2.0	12.5	0.2	0.9	7.6	5.3	0.8
2	4.3	1.2	1.8	2.9	7.3	10.6	11.3	1.5	.8	12.7	17.5	1.5
3	1.6	.1	2.9	1.8	8.1	3.2	3.4	1.4	.5	11.8	14.5	4.9
4	5.3	0	1.6	1.3	3.4	1.3	1.5	7.2	4.0	4.7	2.7	2.5
5	11.0	.8	1.9	1.6	3.3	10.4	4.9	7.1	3.7	2.5	.6	18.9
6	10.6	10.6	3.9	.2	1.7	9.8	2.2	7.8	4.0	5.4	0	12.6
7	2.8	2.2	1.2	.2	1.5	5.8	2.7	2.3	.5	9.4	0	12.0
8	.5	4.9	0	1.6	6.2	3.9	.8	.7	.8	2.8	0	8.2
9	3.7	2.9	3.0	.5	12.9	1.2	.4	1.1	.4	1.6	0	2.2
10	4.8	4.2	4.4	.3	1.1	6.3	.2	1.9	6.2	4.0	0	2.0
11	9.9	.5	2.0	.5	.1	4.0	7.9	2.5	10.7	2.5	0	12.1
12	7.3	.1	2.7	1.7	0	4.8	11.9	5.0	1.9	6.3	6.8	6.6
13	1.2	1.5	4.6	1.9	6.1	2.5	4.7	6.9	1.4	4.3	5.1	7.1
14	.3	10.3	* .6	1.5	2.7	3.3	2.2	1.7	5.0	1.5	13.5	21.2
15	.2	.8	¤ .5	4.3	.4	15.0	1.1	1.7	12.6	4.6	5.2	7.8
16	3.9	7.3	¤ 1.4	8.7	1.0	5.6	4.2	9.4	.6	8.7	3.1	1.1
17	2.6	4.2	¤ .8	4.7	4.3	.5	.7	7.1	4.6	8.0	2.8	1.0
18	8.1	3.6	* 0	4.6	2.5	.1	.9	1.5	2.9	7.1	3.5	.9
19	7.7	1.5	0	2.2	1.9	.8	.9	.4	21.4	6.1	1.2	1.5
20	6.7	.6	0	.6	1.5	9.5	1.3	.3	9.1	5.7	11.7	4.9
21	10.5	.2	0	1.3	2.5	1.1	1.2	3.6	5.8	4.7	12.6	4.0
22	4.2	0	0	.4	3.9	3.5	2.7	8.7	3.6	3.1	2.2	4.2
23	2.1	0	.9	.6	2.0	3.4	3.2	.8	5.8	.9	4.1	1.2
24	.3	0	3.3	.1	5.3	.4	12.2	5.0	8.3	.3	5.7	9.3
25	.1	0	.8	1.7	7.4	.2	5.5	18.2	5.3	7.0	11.1	6.8
26	1.1	0	4.8	10.1	8.1	1.2	6.8	2.5	1.5	2.3	4.6	5.9
27	4.7	0	10.5	3.0	3.8	1.4	8.0	.7	5.1	5.7	12.2	1.9
28	3.4	1.0	8.1	6.7	4.6	.7	7.1	.7	13.1	6.0	3.5	7.2
29	.5	5.3	8.6	9.5	1.9	4.1	1.3	2.0	7.3	4.5	1.8	7.7
30	.1		.5	13.7	9.4	4.0	.5	9.3	7.8	1.8	1.3	10.8
31	2.6		.1		4.4		.2	.9		1.1		9.2
Sum	132.4	67.0	77.4	88.2	133.7	120.6	124.4	120.1	155.6	154.7	152.6	198.0

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
				High		Low					
	High	Low	Day		Day				Average	Maximum	Minimum
				Current Year 1980					Period 1935-1980		
Jan.	0.90	0	23	28.7	! 15	0	4.3	263	1,084	3,360	90.0
Feb.	.85	0	18	26.1	! 3	0	2.3	133	908	3,170	133
Mar.	1.11	0	3	40.0	! 7	0	2.5	154	1,053	2,920	154
Apr.	.94	0	15	30.8	! 1	0	2.9	175	1,021	3,170	175
May	1.03	0	22	35.6	! 11	0	4.3	265	1,128	3,040	228
June	1.10	0	10	39.4	! 18	0	4.0	239	962	3,660	175
July	1.10	0	11	39.4	10	0	4.0	247	1,038	3,590	182
Aug.	1.14	0	22	41.6	1	0	3.9	238	1,057	3,960	169
Sept.	.86	.01	23	26.6	10	.1	5.2	309	992	3,170	159
Oct.	.63	.02	7	15.4	!23	.2	5.0	307	1,033	3,280	307
Nov.	.77	0	2	22.0	! 6	0	5.1	303	1,121	3,570	241
Dec.	1.28	.03	5	49.6	! 1	.3	6.4	393	1,095	3,080	247
	1.28	0		49.6		0	4.2	3,026	12,492	38,310	3,026
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	0.39	0		1.40		0	0.12	3,733	15,409	47,255	3,733

* Partly estimated ¤ Estimated ! And other days

YUMA MAIN DRAIN (VALLEY DIVISION, YUMA PROJECT)

DESCRIPTION: Water-stage recorders located in the forebay and afterbay, with flow meters in the four discharge pipes at the Boundary Pumping Plant on the Main Drain about 200 feet (61 m) north of the international boundary near San Luis, Arizona, 1.3 miles (2.1 km) east of the Colorado River.

RECORDS: Main Drain discharges are lifted 10 (3.05) to 12 feet (3.66 m) at the pumping plant. Prior to April 1, 1969, discharges were computed from pump ratings and the differential head measured by the two gages. Beginning April 1, 1969, discharges were computed from flow meter charts. Pump ratings and flow meter discharges are checked by current meter measurements. Records obtained and computed by the United States Section of the Commission. Records available: Monthly discharges, June 1919 through 1951; daily discharges January 1952 through 1980.

REMARKS: Flows in the Main Drain are principally drainage waters from the Valley Division of the Yuma Project. The Main Drain, the East Main Canal Wasteway, West Main Canal Wasteway, and 242 Lateral discharge into Mexico at the international land boundary near San Luis, Sonora. The water is used for irrigation in Mexico on the left (Sonora) bank of the Colorado River and is considered as part of the volumes arriving at the limitrophe section of the river.

Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	97.0	103	111	134	140	148	152	147	128	124	134	115
2	96.0	88.0	111	134	143	144	130	161	138	115	163	122
3	95.1	84.3	117	135	138	141	127	159	140	117	142	115
4	101	85.7	111	127	135	147	153	157	139	129	115	118
5	101	81.5	105	133	107	131	138	169	138	141	121	114
6	101	97.9	98.7	133	132	132	149	168	127	159	120	108
7	93.8	90.5	103	132	127	126	163	144	160	118	123	114
8	92.5	85.2	119	124	138	148	162	123	138	127	124	113
9	89.2	88.9	122	120	120	135	141	155	120	128	126	105
10	104	84.5	118	114	132	158	120	156	148	125	145	110
11	96.8	86.8	114	122	135	143	143	150	144	141	146	111
12	93.9	91.0	110	113	132	139	147	141	147	142	133	120
13	89.9	88.7	110	99.5	124	148	149	144	145	131	137	120
14	94.6	109	114	99.2	134	133	132	141	135	133	122	145
15	95.0	110	116	123	127	153	142	133	131	128	129	115
16	94.9	118	120	129	144	141	133	162	132	131	122	109
17	98.9	119	117	142	137	121	133	147	132	133	120	110
18	108	102	118	131	150	112	144	158	134	133	117	112
19	98.6	96.8	117	138	151	124	147	147	137	133	123	123
20	105	99.0	112	139	150	134	154	154	139	133	138	105
21	105	96.1	112	142	148	150	111	152	135	142	134	107
22	90.5	97.7	127	141	136	164	136	159	148	141	130	112
23	94.2	96.0	124	128	139	143	136	164	152	125	120	122
24	98.5	94.1	121	128	134	145	159	163	149	139	115	114
25	102	97.3	130	136	135	148	142	148	127	135	122	117
26	95.4	98.3	137	142	136	176	141	138	146	135	114	107
27	96.8	108	143	147	155	163	152	142	122	129	121	104
28	98.6	107	131	144	140	150	157	141	125	127	111	107
29	103	109	133	135	147	152	130	151	117	133	111	114
30	101		122	157	159	126	151	146	117	134	115	116
31	98.7		131		145		150	152		131		112
Sum	2,813.3		3,921.7		4,275		4,672		4,092		3,536	
	3,029.9		3,674.7		4,270		4,424		4,090		3,793	

	Current Year 1980								Period 1935-1980		
Month	Extreme Gage Feet		ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.			18	108	9	89.2	97.7	6,010	7,656	11,203	1,740
Feb.			17	119	5	81.5	97.0	5,580	7,537	11,988	1,640
Mar.			27	143	6	98.7	119	7,289	8,662	12,430	1,940
Apr.			30	157	14	99.2	131	7,779	8,498	11,890	1,920
May			30	159	5	107	138	8,469	8,712	13,140	1,950
June			26	176	18	112	142	8,479	8,104	12,040	2,290
July			7	163	21	111	143	8,775	8,008	11,830	2,530
Aug.			5	169	8	123	151	9,267	7,957	11,960	2,560
Sept.			7	160	!29	117	136	8,112	7,928	11,568	2,280
Oct.			6	159	2	115	132	8,116	8,826	12,385	2,940
Nov.			2	163	!28	111	126	7,523	8,433	12,010	2,800
Dec.			14	145	27	104	114	7,014	8,108	11,480	2,450
Yearly				176		81.5	127	92,413	98,429	139,380	27,040
	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
				4.98		2.31	3.60	113,991	121,411	171,924	33,354

ø Mean daily ! And other days

WEST MAIN CANAL WASTEWAY (VALLEY DIVISION, YUMA PROJECT)

DESCRIPTION: Water-stage recorder located about 0.3 mile (0.5 km) upstream from outlet to Yuma Main Drain, which is 175 feet (53.3 m) upstream from East Main Canal Wasteway and 0.4 mile (0.6 km) west of San Luis, Arizona. Prior to August 1, 1975, the recorder was located about 150 feet (45.7 m) upstream from outlet to Yuma Main Drain.
RECORDS: Wasteway discharges computed by United States Section of the Commission beginning February 23, 1971, from water-stage recorder and ratings as determined by current meter measurements.
REMARKS: Wasteway discharges from West Main Canal Wasteway comprise regulatory waste from the West Main Canal.

Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	6.4	6.1	13.2	0.2	0.8	10.4	6.2	2.2	3.4	1.3	13.4	20.5
2	7.3	1.8	11.4	10.4	8.4	14.7	2.6	3.7	7.5	1.2	21.8	2.8
3	4.1	12.1	27.1	3.2	5.0	2.6	1.2	.9	.7	2.0	27.1	.9
4	6.5	23.1	3.2	2.9	1.5	.7	1.7	.3	5.7	5.4	6.7	.5
5	10.2	5.8	1.0	10.7	.6	.2	6.7	4.7	9.4	3.2	1.0	.5
6	14.9	1.9	3.8	16.1	5.1	.7	1.3	7.2	13.3	1.2	.5	3.8
7	12.6	.4	6.5	23.2	5.6	1.9	.8	4.0	6.7	9.5	.3	.5
8	5.1	12.8	2.1	1.8	2.1	1.3	1.2	4.0	.7	3.1	.2	.3
9	2.3	9.2	16.3	.5	3.4	2.6	2.5	1.8	1.2	1.0	1.6	11.3
10	6.2	2.7	10.3	.5	2.6	4.4	9.1	1.3	.7	12.0	3.6	5.4
11	13.5	6.5	6.0	6.4	5.7	4.2	1.0	10.0	3.9	1.6	2.9	6.9
12	10.3	1.8	2.2	11.1	7.7	6.4	1.1	1.6	4.3	1.1	3.2	9.5
13	6.6	9.6	7.2	2.7	4.1	5.8	2.2	.7	4.7	8.5	1.6	5.3
14	7.2	4.6	5.2	.8	2.6	1.4	4.5	.4	.3	1.7	1.3	9.1
15	6.9	4.3	10.5	2.9	.4	.4	3.4	1.0	3.2	1.0	4.8	4.9
16	3.1	11.1	6.6	.4	.7	.3	1.3	6.6	1.9	.5	13.7	2.4
17	4.6	9.9	2.3	4.7	.9	.2	2.9	6.4	1.2	.4	5.0	2.0
18	7.6	9.5	1.5	1.4	2.6	1.8	3.1	3.0	4.2	10.7	3.4	3.1
19	.1	3.0	8.4	1.0	7.0	.4	5.9	1.4	3.2	5.5	11.4	7.7
20	2.6	.4	8.9	1.5	6.0	.3	4.9	1.1	2.8	5.6	9.9	2.3
21	10.9	.9	1.5	11.9	4.9	1.4	2.9	4.0	10.2	1.3	4.1	.8
22	3.8	1.0	.6	3.9	.7	2.4	3.3	1.9	9.8	1.5	1.4	3.9
23	6.4	.7	2.1	2.6	.4	1.9	1.9	8.2	4.7	.8	1.3	7.5
24	5.6	4.3	10.2	3.1	.3	4.6	1.3	3.3	.8	1.1	.4	2.8
25	3.8	6.8	6.9	3.7	1.6	5.2	1.7	1.5	10.7	2.0	.4	7.2
26	2.3	10.2	5.7	10.6	4.6	3.7	2.7	8.6	10.6	1.4	2.4	6.3
27	1.6	7.8	7.2	3.1	3.8	1.6	6.6	11.6	8.0	3.3	9.2	2.1
28	11.6	5.9	3.4	8.4	1.9	4.9	.9	8.6	3.7	4.5	14.4	3.2
29	18.7	5.2	6.3	2.0	6.0	.8	.3	1.9	7.8	6.0	2.7	.3
30	14.2		3.1	7.1	7.8	8.4	2.2	.6	10.0	1.3	6.6	2.5
31	26.2		1.2		7.0		4.1	1.2		5.5		10.1
Sum	243.2	179.4	201.9	158.8	111.8	95.6	91.5	113.7	155.3	105.2	176.3	146.4

Current Year 1980 — **Period** 1971-1980

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	2.15	0.01	31	37.4	! 19	0	7.8	482	378	565	187
Feb.	2.10	.03	4	35.8	! 7	.2	6.2	356	477	681	252
Mar.	2.28	.01	3	41.6	! 7	0	6.5	400	509	939	203
Apr.	2.02	.02	! 6	33.3	! 1	.1	5.3	315	388	664	164
May	1.68	.02	11	23.2	25	.1	3.6	222	289	434	148
June	1.64	0	2	22.1	! 5	0	3.2	190	304	480	107
July	1.95	0	27	31.2	3	0	3.0	181	295	556	93.2
Aug.	1.96	.04	17	31.5	! 2	.2	3.7	226	309	536	98.0
Sept.	1.98	0	6	32.1	17	0	5.2	308	400	768	190
Oct.	1.88	.03	10	29.1	15	.2	3.4	209	375	728	133
Nov.	2.41	.03	2	46.0	7	.2	5.9	350	400	541	175
Dec.	1.85	.03	1	28.2	12	.2	4.7	290	383	610	188
Yearly	2.41	0.00		46.0		0	4.9	3,529	4,507	6,229	2,869
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	0.73	0		1.30		0	0.14	4,353	5,559	7,683	3,539

! And other days

242 WELL FIELD NEAR SAN LUIS, ARIZONA

DESCRIPTION: Water-stage recorder and 12-foot (3.7 m) Parshall flume located 100 feet (30.5 m) upstream from confluence of East Main Canal Wasteway, 110 feet (33.5 m) north of the southerly land boundary, and 1.4 miles (2.3 km) east of the Colorado River.
RECORDS: Based on current meter measurements and a continuous record of gage heights. The station is operated by the United States Section of the Commission. Records available: October 18, 1978 through 1980.
REMARKS: Records show the pumping of ground water from the 242 well field east of San Luis, Arizona.

Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	7.5	16.7	10.8	0	0	0	0	0
2	0	0	0	0	6.7	16.7	16.0	0	0	0	0	0
3	0	0	0	0	7.5	16.7	13.3	0	0	0	0	0
4	0	0	0	0	7.5	16.7	8.3	0	0	0	0	0
5	0	0	0	0	6.6	16.7	8.3	0	0	0	0	0
6	0	0	0	0	7.5	16.7	8.3	0	0	0	0	0
7	0	0	0	0	6.1	16.7	8.0	0	0	0	0	0
8	0	0	0	0	7.5	16.7	7.0	0	0	0	0	0
9	0	0	0	0	7.5	16.7	6.7	0	0	0	0	0
10	0	0	0	0	7.5	16.4	1.4	0	0	0	0	0
11	0	0	0	0	8.3	16.7	.3	0	0	0	0	0
12	0	0	0	0	8.3	15.4	0	0	0	0	0	0
13	0	0	0	0	7.8	16.7	.1	0	0	0	0	0
14	0	0	0	0	7.5	16.7	.1	0	0	0	0	0
15	0	0	0	0	7.5	16.7	0	0	0	0	0	0
16	0	0	0	0	7.2	16.7	0	0	0	0	0	0
17	0	0	0	0	7.5	16.3	0	0	0	0	0	0
18	0	0	0	0	7.5	16.7	0	0	0	0	0	0
19	0	0	0	0	7.5	16.7	0	0	0	0	0	0
20	0	0	0	0	10.5	15.2	0	0	0	0	0	0
21	0	0	0	0	16.7	16.7	0	0	0	0	0	0
22	0	0	0	0	16.7	16.7	0	0	0	0	0	0
23	0	0	0	0	16.7	14.7	0	0	0	0	0	0
24	0	0	0	0	16.7	16.4	0	0	0	0	0	0
25	0	0	0	0	16.7	16.1	0	0	0	0	0	0
26	0	0	0	0	16.7	16.0	0	0	0	0	0	0
27	0	0	0	0	16.7	16.1	0	0	0	0	0	0
28	0	0	0	0	17.5	16.0	0	0	0	0	0	0
29	0	0	0	0	17.5	16.0	0	0	0	0	0	0
30	0		0	3.6	16.7	12.9	0	0	0	0	0	0
31	0		0		16.7		0	0		0		0
Sum	0	0	0	3.6	336.8	488.1	88.6	0	0	0	0	0

Month	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	0	0	6.4	12.7	0
Feb.				0		0	0	0	9.9	19.8	0
Mar.				0		0	0	0	2.4	4.8	0
Apr.			30	15.2	! 1	0	.1	7.1	3.6	7.1	0
May			23	21.4	7	1.9	10.9	668	340	668	11.3
June			! 1	16.7	30	3.4	16.3	968	495	968	21.4
July			! 1	16.0	!11	0	2.9	176	109	176	42.8
Aug.				0		0	0	0	0	0	0
Sept.				0		0	0	0	0	0	0
Oct.				0		0	0	0	24.9	49.8	0
Nov.				0		0	0	0	0	0	0
Dec.				0		0	0	0	0	0	0
Yearly				21.4		0	2.51	1,819	991	1,819	163
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				0.61		0	0.07	2,244	1,222	2,244	201

Current Year 1980 — Period 1979-1980

! And other days

TOTAL FLOWS CROSSING INTERNATIONAL BOUNDARY INTO MEXICO NEAR SAN LUIS, SONORA

DESCRIPTION: The tabulated data below are the combined flows of the East Main Canal Wasteway, West Main Canal Wasteway, 242 Lateral, and the Yuma Main Drain and represent the total water crossing the international land boundary into the Sanchez Mejorada Canal near San Luis, Arizona.

RECORDS: Records obtained and computed by the United States Section of the Commission. Records available: East Main Canal Wasteway and Yuma Main Drain from January 1935 through 1980; West Main Canal Wasteway from February 23, 1971 through 1980; 242 Lateral from November 1978 through 1980.

REMARKS: Descriptions and flows of the individual stations, East Main Canal Wasteway, West Main Canal Wasteway, the Yuma Main Drain, and 242 Lateral are published separately in this bulletin on pages 29, 31, 30 and 32.

Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	114	112	131	134	163	177	182	149	132	133	153	136
2	108	91.0	124	147	165	186	160	166	146	129	202	126
3	101	96.5	147	140	159	164	145	161	141	131	184	121
4	113	109	116	131	147	166	164	164	149	139	124	121
5	122	88.1	108	145	118	158	158	181	151	147	123	133
6	126	110	106	149	146	159	161	183	144	166	120	124
7	109	93.1	111	155	140	150	174	150	167	137	123	126
8	98.1	103	121	127	154	170	171	128	140	133	124	122
9	95.2	101	141	121	144	156	151	158	122	131	128	118
10	115	91.4	133	115	143	185	131	159	155	141	149	117
11	120	93.8	122	129	149	168	152	162	159	145	149	130
12	112	92.9	115	126	148	166	160	148	153	149	143	136
13	97.7	99.8	122	104	142	173	156	152	151	144	144	132
14	102	124	120	102	147	154	139	143	140	136	137	175
15	102	115	127	130	135	185	146	136	147	134	139	128
16	102	136	128	138	153	164	138	178	134	140	139	112
17	106	133	120	151	150	138	137	160	138	141	128	113
18	124	115	120	137	163	131	148	162	141	151	124	116
19	106	101	125	141	167	142	154	149	162	145	136	132
20	114	100	121	141	168	159	160	155	151	144	160	112
21	126	97.2	114	155	172	169	115	160	151	148	151	112
22	98.5	98.7	128	145	157	187	142	170	161	146	134	120
23	103	96.7	127	131	158	163	141	173	162	127	125	131
24	104	98.4	134	131	156	166	172	171	158	140	121	126
25	106	104	138	141	161	170	149	168	143	144	134	131
26	98.8	108	148	163	165	197	150	149	158	139	121	119
27	103	116	161	153	179	182	167	154	135	138	142	108
28	114	114	142	159	164	172	165	150	142	138	129	117
29	122	120	148	146	172	173	132	155	132	144	116	122
30	115		126	181	193	151	154	156	135	137	123	129
31	128		132		173		154	154		138		131
Sum	3,405.3	3,058.6	3,956	4,168	4,851	4,981	4,728	4,904	4,400	4,355	4,125	3,876

Current Year 1980 — **Period** 1935-1980

Month	Extreme Gage Feet		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.			31	128	9	95.2	110	6,755	9,124	12,131	* 2,123
Feb.			16	136	5	88.1	106	6,069	8,932	12,970	* 2,023
Mar.			27	161	6	106	128	7,843	10,226	13,704	* 2,322
Apr.			30	181	14	102	139	8,276	9,911	12,982	2,117
May			30	193	5	118	157	9,624	10,469	13,900	2,473
June			26	197	18	131	166	9,876	9,865	12,570	2,525
July			1	182	21	115	153	9,379	9,450	12,420	2,927
Aug.			6	183	8	128	158	9,731	9,323	12,657	2,989
Sept.			7	167	[illegible]	122	147	8,729	9,320	12,450	2,602
Oct.			6	166	[illegible]	127	140	8,632	10,259	13,898	3,444
Nov.			2	202	[illegible]	116	137	8,176	9,954	12,712	3,407
Dec.			14	175	27	108	125	7,697	9,586	12,050	2,888
Yearly				202		88.1	139	100,787	116,419	149,010	31,840
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				5.72		2.49	3.94	124,320	143,602	183,802	39,274

Ø Mean daily * Partly estimated

COLORADO RIVER AT SOUTHERLY INTERNATIONAL BOUNDARY - DISCHARGES

DESCRIPTION: Water-stage recorder located in Mexico on the right bank of the river about 1,000 feet (305 m) upstream from the southerly international boundary, 2 miles (3.2 km) west of San Luis, Arizona, and 21.9 miles (35.2 km) downstream from Morelos Dam. The zero of the gage is at mean sea level, U. S. C. & G. S. datum.

RECORDS: Records obtained and furnished by the United States Section of the Commission. Computations by shifting control methods. Records available: Daily discharges, January 1950 through 1980; continuous record of gage heights, January 1947 through 1980. Monthly flows for this station have been derived for the period January 1935 through 1949 based on the computed records of monthly flows of the Colorado River at the northerly international boundary combined with the measured monthly flows from the wasteways discharging into the boundary section of the river from the Yuma Project in Arizona.

REMARKS: Reservoirs, diversions in the United States and Mexico, drainage returns, and waste flows modify the river flow at this station.

EXTREMES: Since January 1950: Maximum instantaneous discharge, 28,610 second-feet (810 m^3/sec) on December 18, 1952; maximum gage height, 84.84 feet (25.86 m) on November 29, 1957. Minimum discharge, no flow on several occasions since September 1, 1956.

Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,570	3,850	2,920	6,450	9,020	6,980	6,050	3,760	6,620	6,320	7,420	7,740
2	1,690	2,320	2,730	5,600	9,480	7,000	5,560	3,780	6,240	6,510	7,600	7,280
3	* 1,730	2,180	3,330	5,660	9,480	6,860	5,600	3,890	6,130	6,730	7,740	7,110
4	* 1,570	1,820	3,810	5,730	8,870	6,860	5,340	4,220	5,790	6,760	7,550	7,020
5	* 1,410	1,560	3,670	5,660	8,060	6,890	4,940	3,180	6,110	6,450	7,700	6,900
6	* 1,140	1,130	2,540	5,730	7,210	6,720	4,520	2,750	6,670	6,820	7,790	6,860
7	* 1,150	1,140	1,780	5,880	7,030	6,550	4,890	2,610	7,120	6,680	7,790	6,470
8	1,150	1,140	2,220	5,720	6,760	6,590	4,090	2,880	6,460	6,510	8,110	6,260
9	1,190	747	3,100	5,700	6,190	6,720	3,960	3,260	5,660	6,680	8,160	6,060
10	1,820	198	3,270	5,730	6,240	6,490	3,910	3,700	5,100	7,290	8,100	5,850
11	2,560	90.1	3,270	5,620	6,100	7,130	3,780	4,130	5,220	7,440	8,070	5,410
12	2,750	* 75.8	4,100	5,380	6,280	7,630	4,800	4,090	5,450	7,680	7,920	5,280
13	2,110	* 200	5,780	5,360	6,950	6,960	5,350	4,110	5,700	8,030	7,860	5,200
14	1,820	812	6,130	5,590	7,290	6,530	5,270	4,120	5,820	8,090	7,600	5,500
15	1,780	2,400	6,270	4,730	7,690	7,020	4,740	4,100	6,200	7,980	7,430	5,620
16	1,820	3,010	6,200	4,930	7,400	7,920	4,790	4,890	5,660	7,930	7,490	5,370
17	1,730	2,130	6,550	5,260	7,440	7,740	4,760	5,620	5,980	7,890	7,440	5,360
18	1,740	1,770	6,950	5,710	7,370	7,400	4,830	6,270	5,790	8,050	7,110	5,140
19	1,850	* 1,880	7,100	5,950	7,130	7,410	4,940	6,120	5,620	8,290	7,100	5,110
20	1,810	¤ 2,750	7,060	6,070	6,990	6,860	4,920	6,000	6,320	8,710	7,040	5,220
21	1,670	¤ 3,280	6,980	6,660	6,600	7,250	5,400	5,380	6,330	8,930	6,890	5,280
22	1,420	¤ 3,930	6,820	6,940	6,840	7,340	5,750	5,290	6,560	8,830	6,950	5,210
23	1,360	¤ 4,120	6,560	7,480	7,080	7,610	5,620	* 5,730	5,880	8,950	7,240	5,090
24	1,360	¤ 4,210	6,360	7,760	7,080	7,370	5,730	¤ 6,640	5,890	9,150	7,120	5,400
25	1,380	¤ 3,410	5,990	7,960	7,060	6,360	5,580	¤ 7,020	6,020	9,260	7,060	5,870
26	1,320	* 2,850	5,920	7,980	7,010	5,940	5,440	* 7,270	6,280	8,570	7,100	5,680
27	1,100	2,800	7,060	8,420	6,950	5,970	5,380	7,000	6,580	8,440	7,180	5,250
28	1,110	2,330	7,710	8,980	6,920	6,060	5,230	7,040	6,970	7,820	7,470	5,210
29	1,240	2,450	7,650	8,180	6,990	6,060	4,430	7,500	6,950	7,240	7,620	5,390
30	1,890		7,930	8,320	6,980	6,440	3,970	6,530	6,610	6,920	7,890	5,060
31	3,810		7,700		6,990		3,740	6,110		6,870		5,110
Sum	52,050	60,582.9	165,460	191,140	225,480	206,660	153,310	154,990	183,730	237,820	225,540	179,310

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	82.03	77.88	31	4,270	28	1,050	1,680	103,240	338,048	1,672,000	1,821
Feb.	82.06	74.33	1 !	4,240	13	72.4	2,090	120,164	281,378	1,385,000	2,040
Mar.	84.03	78.54	30	8,010	7	1,490	5,340	328,185	231,639	1,127,000	798
Apr.	84.10	81.62	28	9,120	15	4,550	6,370	379,121	151,588	700,900	0
May	84.33	82.05	2	9,630	11	5,940	7,270	447,233	208,736	1,160,000	0
June	83.19	81.60	16	8,120	26	5,900	6,890	409,904	161,428	1,180,000	0
July	81.92	79.75	1	6,380	11	3,630	4,950	304,086	119,123	772,800	0
Aug.	82.30	78.26	29	7,600	7	2,550	5,000	307,418	133,967	796,000	0
Sept.	82.04	80.83	7	7,170	10	5,080	6,120	364,423	160,934	1,033,000	0
Oct.	82.47	80.70	25	9,460	1	6,270	7,670	471,709	205,021	1,192,000	0
Nov.	81.40	80.33	9	8,220	21	6,850	7,520	447,352	263,205	1,428,000	0
Dec.	81.20	79.58	1	7,960	31	4,910	5,780	355,656	325,813	1,839,000	2,320
Yearly	84.33	74.33		9,630		72.4	5,560	4,038,491	2,580,880	10,688,800	61,569
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	25.70	22.66		273		2.05	157	4,981,438	3,183,490	13,184,528	75,945

Current Year 1980 — Period 1935-1980

* Partly estimated ¤ Estimated ! And other days

COLORADO RIVER AT SOUTHERLY INTERNATIONAL BOUNDARY - STAGES

(See Preceding Page For Description)

Mean Daily Gage Height in Feet 1980

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	78.98	81.76	80.74	83.03	84.06	82.74	81.71	79.82	81.65	81.58	80.79	81.10
2	79.16	80.03	80.50	82.42	84.28	82.75	81.40	79.84	81.38	81.68	80.93	80.86
3	* 79.23	79.84	80.17	82.46	84.24	82.66	81.42	79.96	81.30	81.80	81.04	80.74
4	* 78.99	79.25	81.63	82.51	83.89	82.66	81.24	80.27	81.06	81.82	80.89	80.68
5	* 78.68	78.77	81.51	82.46	83.40	82.68	80.97	79.14	81.29	81.65	81.01	80.61
6	* 78.13	77.90	80.18	82.51	82.88	82.57	80.66	78.58	81.68	81.86	81.07	80.59
7	* 78.15	77.92	79.06	82.62	82.76	82.46	80.93	78.36	82.00	81.78	81.08	80.38
8	78.16	77.93	79.76	82.51	82.60	82.49	80.32	78.75	81.66	81.68	81.31	80.30
9	78.24	76.92	80.94	82.49	82.22	82.57	80.22	79.26	81.19	81.77	81.36	80.19
10	79.35	75.14	81.14	82.51	82.26	82.42	80.17	79.75	80.85	82.09	81.31	80.07
11	80.48	74.54	81.14	82.43	82.16	82.83	80.06	80.20	80.92	82.15	81.28	79.76
12	80.74	* 74.37	81.85	82.25	82.28	83.14	80.86	80.15	81.07	82.25	81.17	79.67
13	79.78	* 75.07	83.03	82.24	82.71	82.72	81.25	80.17	81.22	82.41	81.12	79.60
14	79.38	77.00	83.24	82.41	82.93	82.42	81.20	80.19	81.29	82.36	80.93	79.93
15	79.31	80.15	83.32	81.75	83.18	82.62	80.82	80.14	81.51	82.20	80.79	80.09
16	79.38	81.03	83.28	81.87	83.00	82.92	80.86	80.71	81.20	82.07	80.84	79.98
17	79.24	79.74	83.48	82.09	83.02	82.74	80.84	81.18	81.38	81.95	80.80	80.04
18	79.24	79.17	83.70	82.36	82.98	82.54	80.89	81.55	81.27	81.94	80.55	79.88
19	79.42	* 79.32	83.78	82.50	82.83	82.54	80.97	81.46	81.17	81.92	80.53	79.96
20	79.36	# 80.68	83.73	82.58	82.74	82.21	80.96	81.39	81.58	81.99	80.49	80.16
21	79.14	# 81.29	83.64	82.91	82.49	82.44	81.28	81.03	81.58	81.96	80.37	80.25
22	78.73	# 81.84	83.48	83.06	82.65	82.50	81.52	80.97	81.71	81.88	80.41	80.22
23	78.62	# 81.98	83.25	83.33	82.80	82.66	81.43	* 81.24	81.32	81.92	80.64	80.18
24	78.61	# 82.04	83.08	83.46	82.80	82.52	81.50	# 81.77	81.33	82.00	80.56	80.47
25	78.66	# 81.42	82.83	83.56	82.79	81.89	81.38	# 81.97	81.40	82.04	80.51	80.81
26	78.54	* 80.84	82.79	83.57	82.76	81.63	81.28	* 82.12	81.56	81.64	80.54	80.56
27	78.02	80.76	83.48	83.78	82.72	81.65	81.24	81.96	81.72	81.54	80.61	80.10
28	78.04	80.07	83.86	84.04	82.70	81.71	81.12	81.99	81.94	81.16	80.83	80.04
29	78.35	80.25	83.81	83.67	82.74	81.71	80.46	82.24	81.93	80.88	80.94	80.18
30	79.48		83.98	83.73	82.73	81.95	80.03	81.59	81.74	80.74	81.15	79.85
31	81.72		83.84		82.74		79.80	81.28		80.74		79.94
Avg.	79.07	79.21	82.39	82.77	82.91	82.44	80.93	80.61	81.43	81.79	80.86	80.23

* Partly estimated # Estimated

WELLTON-MOHAWK BYPASS DRAIN AT SOUTHERLY INTERNATIONAL BOUNDARY

DESCRIPTION: Water-stage recorder and Parshall flume located 80 feet (24.4 m) upstream from the southerly land boundary, 550 feet (168 m) east of the Colorado River and 1.8 miles (2.9 km) west of San Luis, Arizona. The zero of the gage has not been determined.
RECORDS: Based on current meter measurements and a continuous record of gage heights. Station is operated by United States Section of the Commission. Records available: June 23, 1977 through 1980.
REMARKS: Pursuant to Minute No. 242 of the Commission, a bypass drain of the Wellton-Mohawk extension channel was constructed from Morelos Dam to the Santa Clara Slough in Mexico along the left bank of the Colorado River.

Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	281	262	252	256	270	266	251	268	266	106	102	102
2	281	266	252	266	272	270	246	266	264	106	102	101
3	285	258	252	270	283	272	252	265	260	106	102	102
4	281	268	250	272	285	274	250	264	264	104	101	101
5	272	264	250	274	279	268	248	272	264	105	102	102
6	274	264	254	274	270	272	252	272	264	106	102	101
7	285	268	256	274	268	279	250	273	268	104	102	101
8	287	266	252	274	272	277	252	270	152	104	102	101
9	287	266	254	268	279	279	254	269	* 26.5	104	102	100
10	285	260	256	270	277	281	256	269	* 3.6	102	102	99.6
11	296	258	258	272	272	283	250	283	3.2	102	102	99.6
12	291	256	262	262	272	283	248	291	2.8	102	102	99.6
13	291	262	258	264	268	283	262	291	3.0	101	101	99.6
14	293	264	258	260	266	281	260	287	5.4	102	99.6	99.6
15	289	260	256	260	268	274	260	287	6.5	101	98.2	101
16	287	252	254	256	270	277	260	287	46.6	102	106	101
17	287	256	254	256	279	281	254	285	95.8	104	102	101
18	291	238	252	264	285	283	246	287	107	104	101	101
19	289	236	252	268	285	279	252	289	110	102	101	101
20	283	252	252	277	279	270	252	281	107	106	101	101
21	281	246	256	272	272	266	254	279	107	100	101	101
22	279	258	268	272	272	262	252	281	107	104	102	102
23	274	264	266	274	277	258	256	283	84.6	103	102	102
24	274	266	254	279	274	258	196	289	53.2	102	102	102
25	277	268	256	281	270	256	84.4	287	53.2	102	102	102
26	283	268	256	277	268	256	205	279	76.1	102	101	102
27	287	258	260	274	268	258	268	270	104	104	101	102
28	283	254	262	274	270	254	270	272	101	102	101	102
29	283	252	258	281	270	254	266	287	107	102	102	101
30	281		260	274	264	256	266	279	106	102	102	101
31	248		260		270		264	268		102		102
Sum	8,765	7,510	7,940	8,095	8,474	8,110	7,636.4	8,630	3,418.5	3,198	3,048.8	3,134.0

Month	Current Year 1980 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 1977-1980 Acre-Feet Average	Maximum	Minimum
Jan.	2.29	2.01	11	300	31	242	283	17,385	15,769	17,542	12,381
Feb.	2.17	1.95	2	274	!18	230	259	14,896	13,534	14,896	12,067
Mar.	2.15	2.03	!22	270	! 4	246	256	15,749	15,882	17,427	14,469
Apr.	2.27	2.01	11	296	1	242	270	16,056	15,700	16,711	14,333
May	2.24	2.10	18	289	!14	260	273	16,808	16,422	16,808	16,201
June	2.23	2.05	17	287	!25	250	270	16,086	15,279	16,086	14,713
July	2.17	1.08	28	274	25	81.8	246	15,147	15,280	17,022	13,989
Aug.	2.27	2.10	12	296	! 3	260	278	17,117	16,266	18,196	14,737
Sept.	2.16	.13	! 4	272	!11	2.8	114	6,780	13,090	17,423	6,780
Oct.	1.27	1.15	20	114	!21	96.8	103	6,343	13,840	18,543	6,343
Nov.	1.22	1.14	!16	107	15	95.4	102	6,047	13,244	16,980	6,047
Dec.	1.21	1.16	5	106	! 4	98.2	101	6,216	13,677	18,256	6,216
Yearly	2.29	0.13		300		2.8	213	154,630	177,983	180,374	154,630
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	0.70	0.04		8.50		0.08	6.03	190,735	219,540	222,490	190,735

* Partly estimated ! And other days

WASTEWAY TO COLORADO RIVER AT KILOMETER 27 IN MEXICO

DESCRIPTION: Water-stage recorder and cableway located on the left bank of the canal wasteway immediately upstream from where it discharges into the Colorado River, 0.6 mile (1.0 km) downstream from the wasteway gates on the Central Feeder Canal on the right bank of the Colorado River, 16.8 miles (27.0 km) downstream from Morelos Dam, and 820 feet (250 m) south of the junction of the Mexicali-San Luis and Algodones-Pescaderos highways.

RECORDS: Data obtained and computed by the Colorado River Irrigation District of the Ministry of Agriculture and Hydraulic Resources and furnished by the Mexican Section of the Commission. Records shown in table below are waste returns to the Colorado River. Records available: April 1956 through 1980.

REMARKS: The Colorado River Irrigation District transports water for irrigation of land on the left bank of the Colorado River by the Central Feeder Canal to a point called Kilometer 27. At this point, flows may be returned to the river through the wasteway or diverted to the Bacanora-Monumentos Canal system through the Sanchez Mejorada Siphon, which was placed in operation on June 28, 1963. As part of the rehabilitation works, started in 1968, of the Colorado River Irrigation District, the Canal de Conexion was enlarged and lined, and is now known as the Central Feeder Canal.

Monthly Discharge in Acre-Feet

Month	Current Year 1980	Period 1956-1980		
		Average	Maximum	Minimum
January	17,942	6,824	69,527	0
February	14,698	2,404	14,698	0
March	15,878	5,599	35,492	0
April	16,581	11,917	68,714	0
May	58,365	9,253	58,365	0
June	50,025	10,040	50,025	0
July	17,227	12,431	46,139	0
August	21,511	14,040	55,497	0
September	68,053	11,400	68,053	0
October	110,417	8,395	110,417	0
November	69,368	9,899	69,415	0
December	49,344	7,406	70,213	0
Yearly	509,407	102,703	509,407	0
	Thousands of Cubic Meters			
	628,347	126,683	628,347	0

COLORADO RIVER AT MIGUEL C. RODRIGUEZ IN MEXICO - DISCHARGES

DESCRIPTION: Water-stage recorder and cableway located in Mexico on the left bank of the Colorado River about 24.5 miles (39.4 km) downstream from the southerly international boundary, 44.5 miles (71.6 km) downstream from Morelos Dam and 4.5 miles (7.2 km) upstream from the Sonora-Baja California railroad bridge. The zero of the gage is at mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 39 double and 3 single current meter measurements made during the year and a continuous record of gage heights. Data obtained and furnished by the Mexican Section of the Commission. From June 1951 to July 1954, discharges were computed from gage height records based on daily gage readings at 8:00 a.m., Pacific Standard Time. A continuous record of gage heights obtained since July 21, 1954. Records available: June 1951 through 1980.

REMARKS: The flows at this gage show the seepage from canals that run parallel at higher elevations and adjacent to the river. On June 23, 1977 the drainage water discharged below Morelos Dam was diverted to the Santa Clara Estuary, also better utilization of irrigation waters has reduced the waste returns to a minimum. Normal flows are measured by wading at a section located 2,000 feet (600 m) below the gage. Occasionally there are high flows from excess water arriving at Morelos Dam; discharge-measurements are then made at the gage and the discharge-relationship curve extended for greater flows.

EXTREMES: Since January 1, 1952: Maximum mean daily gage height, 54.04 feet (16.47 m) on May 3, 1980, minimum mean daily gage height 37.73 feet (11.50 m) on July 18 and 19, 1970; maximum mean daily discharge, 20,200 second-feet (571 m^3/sec) on December 19, 1952; minimum mean daily discharge, no flow on various occasions.

Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,710	3,120	2,460	7,130	9,530	7,200	6,180	5,010	6,530	7,730	9,360	9,360
2	1,740	3,280	2,740	6,990	9,750	7,240	6,000	4,870	6,460	7,560	9,180	9,040
3	1,830	2,580	2,930	6,710	9,890	7,130	5,830	4,770	6,040	7,730	9,290	8,690
4	1,940	2,160	3,120	6,460	9,820	6,530	5,620	4,240	5,970	7,980	9,320	8,330
5	2,010	1,860	3,230	6,360	9,500	6,070	5,470	4,340	6,000	8,190	9,430	8,020
6	2,070	1,450	3,400	6,220	9,080	5,760	5,260	4,240	6,180	8,720	9,430	7,840
7	2,110	1,210	3,020	6,180	8,330	5,830	5,050	4,130	6,290	9,080	9,500	7,490
8	2,160	932	2,490	6,000	6,780	6,220	4,870	3,990	6,500	9,390	9,570	7,310
9	2,190	646	2,220	6,070	6,530	6,780	4,870	4,200	6,390	9,360	9,610	7,030
10	2,240	530	2,410	6,390	6,390	7,130	4,840	4,380	6,290	9,500	9,850	6,710
11	2,280	537	2,680	6,140	6,530	7,380	4,940	3,850	6,140	9,460	9,820	6,460
12	2,310	614	2,970	5,230	6,070	7,980	5,230	4,170	6,180	9,360	9,680	6,180
13	2,400	713	3,400	5,010	6,290	8,300	5,400	4,590	6,360	9,680	9,570	5,830
14	2,310	791	4,310	4,730	6,640	8,480	5,620	4,870	6,430	9,820	9,360	5,580
15	2,100	953	5,120	4,520	6,960	8,650	5,720	5,120	6,710	9,780	9,110	5,760
16	1,920	1,110	5,860	4,380	7,240	8,400	5,760	5,160	6,750	9,780	8,930	6,040
17	1,860	1,250	6,220	4,310	7,490	8,230	5,790	5,230	6,670	9,920	8,620	6,000
18	1,790	1,440	6,640	4,480	7,590	8,020	5,860	5,440	6,710	10,200	8,650	5,830
19	1,730	1,610	6,850	4,910	7,590	7,700	5,830	5,540	6,920	10,500	8,650	5,720
20	1,700	1,780	7,060	5,230	7,380	7,200	5,790	5,580	7,100	10,600	8,620	5,690
21	1,620	1,940	7,270	5,620	7,420	6,530	5,790	5,900	7,170	10,500	8,650	5,540
22	1,540	2,160	7,130	6,040	7,700	5,930	5,900	6,070	7,350	10,600	8,620	5,760
23	1,470	2,420	6,890	6,390	7,700	5,400	5,860	5,760	7,490	10,400	8,510	6,000
24	1,370	2,780	6,530	6,850	7,560	5,010	5,830	5,860	7,660	10,300	8,510	6,390
25	1,240	3,780	6,890	7,100	7,420	4,590	5,720	6,250	7,730	10,100	8,400	6,710
26	1,130	3,740	7,130	7,490	7,240	4,100	5,580	6,360	7,840	10,200	8,120	7,130
27	1,120	3,390	7,420	8,230	7,130	4,030	5,440	6,500	7,980	9,990	8,260	7,130
28	1,060	2,830	7,800	8,480	7,350	4,270	5,330	6,570	8,050	9,640	8,400	6,670
29	1,340	2,370	7,910	9,110	7,420	4,450	5,260	6,600	7,950	9,360	8,720	6,750
30	2,600		7,980	9,750	7,240	4,840	5,190	6,710	7,730	9,460	8,930	6,530
31	2,750		8,020		7,200		5,120	6,890		9,360		6,320
Sum	57,669	53,964	160,106	188,510	236,750	195,396	170,958	163,189	205,567	294,454	270,687	209,840

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
				High		Low					
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	48.88	45.28	31	2,750	28	1,060	1,860	114,384	172,619	1,047,732	426
Feb.	49.80	43.70	25	3,780	10	530	1,860	107,036	109,992	696,461	317
Mar.	52.95	47.24	31	8,020	9	2,170	5,160	317,565	85,947	807,342	0
Apr.	54.10	50.26	30	9,960	17	4,240	6,290	373,902	62,464	588,983	0
May	54.07	51.71	! 3	9,920	12	6,040	7,630	469,584	86,754	732,815	0
June	53.31	49.87	15	8,650	27	3,880	6,500	387,561	45,501	555,460	0
July	51.18	49.64	1	6,250	10	4,800	5,510	339,089	30,066	339,089	0
Aug.	51.44	48.29	31	6,890	11	3,780	5,260	323,679	39,795	323,679	0
Sept.	52.40	50.69	28	8,090	! 3	5,930	6,850	407,734	55,050	572,551	0
Oct.	53.71	51.97	!20	10,600	2	7,520	9,500	584,038	87,433	769,939	0
Nov.	52.92	51.97	10	9,850	26	8,120	9,040	536,898	124,848	909,399	173
Dec.	52.66	49.87	1	9,360	21	5,540	6,780	416,210	155,857	1,060,767	502
Yearly	54.10	43.70		10,600		530	6,020	4,377,679	1,029,658	7,923,600	25,036
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	16.49	13.32		301		15.0	170	5,399,809	1,270,069	9,773,655	30,882

Current Year 1980 — Period 1951-1980

! And other days

COLORADO RIVER AT MIGUEL C. RODRIGUEZ IN MEXICO - STAGES

(See Preceding Page For Description)

Mean Daily Gage Height in Feet 1980

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	46.88	49.31	47.77	52.40	53.84	52.43	51.12	49.90	51.12	52.13	52.85	52.66
2	46.95	49.41	48.23	52.30	53.97	52.46	50.95	49.70	51.05	52.00	52.76	52.46
3	47.11	48.59	48.56	52.10	54.04	52.40	50.79	49.57	50.79	52.13	52.69	52.26
4	47.34	47.77	48.85	51.97	54.00	52.00	50.56	48.92	50.72	52.30	52.72	52.03
5	47.47	47.18	49.02	51.90	53.81	51.74	50.43	49.11	50.75	52.43	52.79	51.84
6	47.57	46.36	49.25	51.84	53.54	51.48	50.20	48.92	50.92	52.66	52.79	51.71
7	47.67	45.77	48.69	51.80	53.15	51.54	49.97	48.79	51.02	52.89	52.82	51.44
8	47.77	45.05	47.80	51.67	52.13	51.84	49.74	48.62	51.21	53.08	52.85	51.35
9	47.83	44.16	47.34	51.74	52.00	52.13	49.70	48.88	51.35	53.05	52.89	51.15
10	47.93	43.77	47.67	51.94	51.94	52.40	49.67	49.15	51.25	53.15	52.92	50.89
11	48.00	43.80	48.13	51.77	52.00	52.56	49.84	48.39	51.11	53.12	52.89	50.69
12	48.06	44.06	48.62	51.12	51.74	52.92	50.16	48.82	51.15	53.05	52.82	50.46
13	48.23	44.39	49.25	50.95	51.87	53.12	50.33	49.38	51.31	53.15	52.76	50.16
14	48.06	44.65	50.33	50.69	52.07	53.22	50.56	49.70	51.38	53.25	52.62	49.97
15	47.64	45.11	51.02	50.52	52.26	53.31	50.69	50.03	51.35	53.22	52.46	50.16
16	47.31	45.51	51.57	50.39	52.46	53.18	50.72	50.10	51.38	53.22	52.36	50.39
17	47.18	45.87	51.84	50.33	52.62	53.08	50.75	50.13	51.31	53.31	52.33	50.36
18	47.05	46.33	52.07	50.49	52.69	52.95	50.82	50.20	51.35	53.51	52.36	50.16
19	46.92	46.69	52.17	50.85	52.69	52.76	50.79	50.30	51.51	53.67	52.36	50.10
20	46.85	47.01	52.33	51.12	52.56	52.43	50.75	50.33	51.64	53.58	52.33	50.00
21	46.72	47.34	52.49	51.38	52.59	52.00	50.75	50.62	51.71	53.51	52.36	49.87
22	46.56	47.77	52.40	51.71	52.76	51.61	50.85	50.79	51.84	53.58	52.33	50.03
23	46.39	48.26	52.20	51.94	52.76	51.25	50.82	50.49	51.94	53.44	52.26	50.26
24	46.16	48.92	52.00	52.17	52.76	50.95	50.79	50.59	52.07	53.38	52.23	50.56
25	45.83	49.70	52.20	52.36	52.59	50.59	50.66	50.85	52.13	53.28	52.17	50.82
26	45.57	49.67	52.40	52.62	52.46	50.10	50.52	50.95	52.20	53.35	51.97	51.15
27	45.54	49.48	52.59	53.08	52.40	50.03	50.39	51.08	52.30	53.25	52.07	51.15
28	45.41	49.02	52.82	53.22	52.53	50.30	50.26	51.15	52.36	53.02	52.17	50.75
29	46.10	48.16	52.89	53.58	52.59	50.46	50.20	51.18	52.26	52.85	52.36	50.79
30	48.62		52.92	53.97	52.46	50.79	50.13	51.25	52.13	52.92	52.49	50.62
31	48.88		52.95		52.43		50.03	51.38		52.85		50.46
Avg.	47.15	46.85	50.59	51.80	52.69	51.94	50.46	49.97	51.48	53.05	52.53	50.85

WASTEWAY TO COLORADO RIVER AT KILOMETER 38 IN MEXICO

DESCRIPTION: Wasteway to the Colorado River on the left bank of new Barrote Canal at old dam and bridge at Kilometer 18+251 (old Kilometer 38+000). The wasteway is located in the Colonia Bojorquez 0.8 mile (1.3 km) upstream from the Sonora-Baja California railroad bridge, 3.7 miles (5.9 km) downstream from the Miguel C. Rodriguez gaging station, and 28.1 miles (45.3 km) downstream from the southerly international boundary.
RECORDS: The records are computed by the Ministry of Agriculture and Hydraulic Resources and based upon gate openings. Records available: January 1964 through 1980.
REMARKS: The wasteway structure on the left bank of the Colorado River has two manually operated radial gates 9.8 feet (3.0 m) wide. It discharges into a dirt canal 656 feet (200 m) long with a total capacity of 459 second-feet (13.0 m^3/sec) which discharges to the river.

Monthly Discharge in Acre-Feet

Month	Current Year 1980	Period 1964-1980		
		Average	Maximum	Minimum
January	7,349	673	7,349	0
February	7,653	586	7,653	0
March	4,809	373	4,809	0
April	1,992	120	1,992	0
May	1,973	223	1,973	0
June	2,411	207	2,411	0
July	1,768	180	1,768	0
August	1,215	216	2,383	0
September	6,375	521	6,375	0
October	23,242	1,804	23,242	0
November	227	1,002	14,510	0
December	10,559	1,133	10,559	0
Yearly	69,574	7,039	69,574	0
	Thousands of Cubic Meters			
	85,819	8,682	85,819	0

COLORADO RIVER AT EL MARITIMO IN MEXICO - STAGES

DESCRIPTION: Water-stage recorder and cableway in Mexico, 47.6 miles (76.6 km) downstream from the southerly international boundary, 18.6 miles (30.0 km) downstream from the Sonora-Baja California railroad bridge and 3.7 miles (6.0 km) east of Kilometer 70 of the Mexicali-San Felipe highway. The recorder is located on the right bank of the Colorado River. The zero of the gage is 9.84 feet (3.00 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Records obtained and computed by the Mexican Section of the Commission. Records available: Mean daily discharges from January 1960 through 1968. Incomplete record of gage heights, March 1, 1946 through November 1947; twice daily readings of gage heights, January 1, 1948 through Deember 1949; continuous record of gage heights since installation of water-stage recorder February 8, 1956. Mean daily gage heights, January 1960 through 1980.

REMARKS: In former years, the flow past this station was affected by the tides in the Gulf of California. After July 1968, measurement by current meter was suspended; beginning in 1969, twice daily readings of gage heights and no record of mean daily discharges.

EXTREMES: January 1960 through 1968: Maximum daily discharge, 4,380 second-feet (124 m^3/sec), January 21 and December 7 and 8, 1960; minimum discharge, no flow on various occasions. Maximum monthly discharge, 225,224 acre-feet (277,811,000 m^3) January 1960; minimum monthly discharge, zero during various months of several years. Annual maximum discharge, 503,260 acre-feet (620,765,000 m^3) during 1960; minimum 59,335 acre-feet (73,189,000 m^3) in 1968. January 1960 through 1980: Maximum gage height, 19.69 feet (6.00 m) April 30 to May 4, May 24-27, August 1-3, and August 16 to December 4, 1980; minimum gage height, 12.47 feet (3.80 m) on August 31 and September 1, 1960.

Mean Daily Gage Height in Feet 1980

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	17.78	17.39	18.37	19.49	19.69	19.62	18.37	19.69	19.69	19.69	19.69	19.69
2	17.78	17.39	18.44	19.49	19.69	19.59	18.44	19.69	19.69	19.69	19.69	19.69
3	17.78	17.36	18.57	19.49	19.69	19.55	18.50	19.69	19.69	19.69	19.69	19.69
4	17.75	17.32	18.64	19.49	19.69	19.52	18.44	19.65	19.69	19.69	19.69	19.65
5	17.72	17.29	18.73	19.49	19.65	19.49	18.44	19.65	19.69	19.69	19.69	19.62
6	17.72	17.26	18.83	19.49	19.65	19.46	18.44	19.65	19.69	19.69	19.69	19.62
7	17.72	17.22	18.93	19.49	19.62	19.42	18.47	19.65	19.69	19.69	19.69	19.62
8	17.75	17.19	19.06	19.49	19.62	19.39	18.50	19.62	19.69	19.69	19.69	19.59
9	17.78	17.19	19.19	19.49	19.62	19.36	18.50	19.62	19.69	19.69	19.69	19.59
10	17.78	17.19	19.29	19.49	19.62	19.32	18.50	19.62	19.69	19.69	19.69	19.59
11	17.78	17.13	19.36	19.49	19.62	19.29	18.50	19.65	19.69	19.69	19.69	19.59
12	17.85	17.13	19.46	19.46	19.62	19.26	18.50	19.65	19.69	19.69	19.69	19.55
13	17.85	17.06	19.49	19.42	19.59	19.23	18.50	19.65	19.69	19.69	19.69	19.55
14	17.88	16.99	19.49	19.39	19.59	19.19	18.50	19.65	19.69	19.69	19.69	19.55
15	17.91	16.96	19.49	19.32	19.62	19.16	18.50	19.65	19.69	19.69	19.69	19.55
16	17.98	16.93	19.49	19.26	19.62	19.13	18.37	19.69	19.69	19.69	19.69	19.55
17	17.98	16.86	19.49	19.26	19.62	19.09	18.37	19.69	19.69	19.69	19.69	19.55
18	17.98	16.83	19.49	19.23	19.65	19.06	18.70	19.69	19.69	19.69	19.69	19.52
19	17.98	16.73	19.49	19.19	19.65	19.03	18.70	19.69	19.69	19.69	19.69	19.52
20	17.91	16.67	19.49	19.06	19.62	19.00	18.70	19.69	19.69	19.69	19.69	19.52
21	17.81	16.63	19.49	19.09	19.62	18.96	18.86	19.69	19.69	19.69	19.69	19.52
22	17.85	16.80	19.49	19.16	19.65	18.93	19.03	19.69	19.69	19.69	19.69	19.49
23	17.78	16.93	19.49	19.16	19.65	18.90	19.03	19.69	19.69	19.69	19.69	19.49
24	17.78	16.63	19.49	19.29	19.69	18.86	19.03	19.69	19.69	19.69	19.69	19.46
25	17.72	16.24	19.49	19.29	19.69	18.83	19.03	19.69	19.69	19.69	19.69	19.46
26	17.68	15.68	19.49	19.42	19.69	18.80	19.03	19.69	19.69	19.69	19.69	19.46
27	17.65	16.67	19.49	19.49	19.69	18.77	19.03	19.69	19.69	19.69	19.69	19.42
28	17.55	17.98	19.49	19.55	19.65	18.73	19.03	19.69	19.69	19.69	19.69	19.42
29	17.52	18.37	19.49	19.62	19.62	18.70	19.03	19.69	19.69	19.69	19.69	19.42
30	17.42		19.49	19.69	19.62	18.67	19.03	19.69	19.69	19.69	19.69	19.42
31	17.39		19.49		19.62		19.03	19.69		19.69		19.42
Avg.	17.78	17.03	19.26	19.39	19.65	19.16	18.67	19.69	19.69	19.69	19.69	19.55

STORED WATER IN LARGE RESERVOIRS OF THE COLORADO RIVER

Data are presented below for all large storage reservoirs in the Colorado River basin below Lee's Ferry, all of which are located in the United States. The monthly figures represent usable contents on the last day of the month, in thousands of acre-feet. The capacities indicated are usable capacities at the top of the spillway gates in closed position, for those dams having controlled spillways; for all others, capacities indicated are at spillway level. Records furnished by the U. S. Geological Survey.

In Thousands of Acre-Feet

Month	LAKE MEAD (Capacity 26,159.0)		LAKE MOHAVE (Capacity 1,810.0)		HAVASU LAKE (Capacity 619.4)		TOTAL IN UNITED STATES RESERVOIRS (Capacity 28,588.4)	
	1980	Average 1935-1980	1980	Average 1951-1980	1980	Average 1939-1980	1980	Estimated Average
Jan.	22,770	17,285	1,737	1,653	562.7	553.9	25,069.7	19,491.9
Feb.	23,520	17,066	1,684	1,674	500.9	555.9	25,704.9	19,295.9
Mar.	23,335	16,796	1,638	1,669	547.0	571.3	25,520.0	19,036.3
Apr.	23,198	16,896	1,552	1,669	589.9	601.3	25,339.9	19,166.3
May	22,906	17,746	1,762	1,734	589.5	603.0	25,257.5	20,083.0
June	23,247	18,967	1,585	1,621	585.5	604.1	25,417.5	21,192.1
July	23,597	19,145	1,558	1,491	568.0	591.5	25,723.0	21,227.5
Aug.	23,586	18,937	1,536	1,434	552.1	574.6	25,674.1	20,945.6
Sept.	23,637	18,680	1,445	1,418	559.2	570.5	25,641.2	20,668.5
Oct.	23,385	18,440	1,502	1,440	558.4	571.8	25,445.4	20,451.8
Nov.	23,454	18,242	1,503	1,516	551.3	560.9	25,508.3	20,318.9
Dec.	23,336	18,015	1,596	1,605	570.5	556.6	25,502.5	20,176.6
Avg.	23,331	18,018	1,592	1,577	561.2	576.3	25,483.6	20,171.3
Max.	23,637	27,780	1,762	1,808	589.9	688.7	25,723.0	28,235.0
Min.	22,770	* 10,727	1,445	1,186	500.9	76.9	25,069.7	13,062.6

* Minimum since 1940

SUSPENDED SILT

The following tables are based on determinations of gravimetric percentages of dry silt in water samples taken at each station by one of the following methods.

A. By lowering a D-48 depth integrating sampler at verticals located at centers of sections of equal discharge in the river cross section, being careful to approach but not strike the bottom. The samples obtained in the section are combined to comprise a composite sample for that date.

B. By lowering a D-43 depth integrating sampler at verticals located at centers of each span of the service bridge across the Alamo Canal, being careful to approach but not strike the bottom. The samples obtained in the section are combined to comprise a composite sample for that date.

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. The gravimetric percentage in each sample is determined, a coefficient of 1.10 is applied to the average of the three, and the product applied to the volume of the stream flow represented by that set of samples.

For ease of comparison, the assumption is made that 1,847 tons of deposited silt would occupy a volume of one acre-foot, or one cubic foot of deposited silt would weigh 85 pounds.

Month	1980						Period of Record		
	Tons		No. of Samples	Gravimetric Percentages			Acre-Feet at 1,847 Tons Per Acre Foot		
	Water	Silt		Average	Maximum Sample	Minimum Sample	Average	Maximum	Minimum

Colorado River at Northerly International Boundary

Period 1956-1980

Jan.	350,258,000	67,600	5	0.0193	0.0322	0.0322	36.6	25.3	336	1.4
Feb.	344,570,000	88,300	3	.0256	.0688	.0068	47.8	14.0	116	1.6
Mar.	864,593,000	189,700	4	.0219	.0494	.0158	103	42.7	499	8.8
Apr.	906,320,000	107,700	5	.0119	.0157	.0093	58.3	38.3	434	7.9
May	891,845,000	69,100	4	.0077	.0092	.0069	37.4	14.8	201	2.3
June	870,066,000	67,700	4	.0078	.0096	.0068	36.7	15.6	92.6	2.8
July	872,464,000	74,400	5	.0085	.0103	.0059	40.3	20.7	89.3	3.4
Aug.	887,802,000	66,900	4	.0075	.0105	.0056	36.2	20.4	103	3.8
Sept.	877,047,000	52,300	4	.0060	.0072	.0053	28.3	9.1	43.6	1.6
Oct.	973,897,000	67,800	5	.0070	.0077	.0062	36.7	5.3	36.7	.5
Nov.	850,685,000	50,900	4	.0060	.0073	.0049	27.6	10.5	89.9	.5
Dec.	733,564,000	28,300	5	.0039	.0049	.0028	15.3	19.2	174	.6
Yearly	9,423,111,000	930,700	52	0.0099	0.0688	0.0028	504.2	235.9	2,198	59.2

Samples by U. S. Section and analyses by United States Bureau of Reclamation, Method A

Intake Canal at Morelos Diversion Structure

Period 1952-1980

Jan.	195,861,000	38,554	4	0.0197	0.0277	0.0149	20.8	5.8	22.3	0.2
Feb.	175,184,000	83,778	4	.0478	.1420	.0065	45.2	6.9	45.2	.9
Mar.	385,721,000	163,145	4	.0423	.1022	.0254	88.1	41.3	154	5.3
Apr.	355,149,000	112,097	5	.0316	.0401	.0152	60.6	37.1	121	7.5
May	256,433,000	34,161	4	.0133	.0164	.0103	18.5	10.2	51.2	1.5
June	303,043,000	46,058	4	.0152	.0229	.0104	24.9	26.7	109	3.1
July	444,674,000	46,255	5	.0104	.0124	.0054	25.0	37.9	156	4.1
Aug.	457,721,000	55,144	4	.0120	.0147	.0100	29.8	35.3	135	3.8
Sept.	364,959,000	53,886	5	.0148	.0174	.0119	29.1	15.2	64.7	1.9
Oct.	309,548,000	49,449	4	.0160	.0182	.0134	26.7	4.7	26.7	.3
Nov.	241,985,000	25,661	4	.0106	.0132	.0075	13.9	2.7	13.9	.2
Dec.	228,994,000	30,694	5	.0134	.0181	.0108	16.5	6.0	18.6	1.1
Yearly	3,719,271,000	738,882	52	0.0206	0.1420	0.0054	399	230	696	51.4

Samples and analyses by Mexican Section, Method B

Colorado River at Southerly International Boundary

Period 1946-1980

Jan.	140,303,000	17,700	1	0.0126	0.0158	0.0102	9.6			
Feb.	163,303,000	28,100	1	.0172	.0239	.0094	15.2			
Mar.	446,003,000	98,400	1	.0220	.0263	.0187	53.3			
Apr.	515,225,000	217,500	1	.0421	.0623	.0184	118			
May	607,790,000	375,300	1	.0616	.0714	.0495	203			
June	557,060,000	244,600	1	.0438	.0486	.0401	132			
July	413,253,000	189,600	1	.0458	.0519	.0398	103			
Aug.	417,781,000	235,900	1	.0564	.0587	.0523	128			
Sept.	495,251,000	277,100	1	.0559	.0590	.0526	150			
Oct.	641,053,000	339,400	1	.0529	.0550	.0510	184			
Nov.	607,951,000	430,400	1	.0707	.0897	.0552	233			
Dec.	483,337,000	407,000	1	.0841	.1015	.0558	220			
Yearly	5,488,310,000	2,861,000	12	0.0520	0.1015	0.0094	1,549.1			

Samples by U. S. Section and analyses by United States Bureau of Reclamation, Method A

SUSPENDED SILT

Colorado River at Miguel C. Rodriguez Gaging Station

Month	1980						Period of Record		
	Tons		No. of Samples	Gravimetric Percentages			Acre-Feet at 1,847 Tons Per Acre Foot		
	Water	Silt		Average	Maximum Sample	Minimum Sample	Average	Maximum	Minimum
							Period 1960-1980		
Jan.	155,526,000	29,629	4	0.0191	0.0260	0.0112	16.0	14.4	251	0
Feb.	145,536,000	63,870	3	.0439	.0809	.0210	34.5	3.7	34.5	0
Mar.	431,788,000	185,479	5	.0430	.0950	.0250	100	5.2	100	0
Apr.	508,389,000	318,605	3	.0627	.0820	.0447	172	8.8	172	0
May	638,487,000	244,737	4	.0383	.0668	.0280	132	6.9	132	0
June	526,961,000	234,337	5	.0445	.0520	.0344	127	6.5	127	0
July	461,055,000	155,384	4	.0337	.0420	.0191	83.9	4.8	83.9	0
Aug.	440,102,000	234,175	4	.0532	.0680	.0360	126	7.7	126	0
Sept.	554,390,000	270,195	5	.0487	.0620	.0390	146	7.7	146	0
Oct.	794,108,000	381,102	4	.0480	.0530	.0440	206	12.2	206	0
Nov.	730,012,000	355,339	4	.0487	.0520	.0427	192	12.2	192	0
Dec.	565,914,000	259,538	5	.0459	.0510	.0380	140	9.6	140	0
Yearly	5,952,269,000	2,732,391	50	0.0441	0.0950	0.0112	1,476	99.1	1,476	1.6

Samples and analyses by Mexican Section, Method C

CHEMICAL ANALYSES OF WATER SAMPLES

1980

The table below is based on chemical analyses of weekly samples from the Colorado River at the Northerly International Boundary taken by the United States Section of the Commission and analyzed by the U.S. Geological Survey.

To convert milligram equivalents to parts per million by weight, multiply each ion by its appropriate conversion factor. These factors are: Ca, 20.04; Mg, 12.16; Na 22.99; (CO_3 plus HCO_3) expressed as CO_3, 30.00; SO_4, 48.03; Cl, 35.45; NO_3, 62.00. To convert tons per acre-foot to parts per million, multiply tons per acre-foot by 735.5. Electrical conductivity, reported in the tables as EC x 10^6 at 25° C, is a relative measure of the total salt concentration.

Colorado River at Northerly International Boundary

Month	No. of Samples	Dissolved Solids: Tons Per Acre-Foot	Dissolved Solids: Total Tons	EC x 10^6 @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	
Jan.	4	1.12	289,000	1,402		7.8	53	40	3.78	2.55	7.22	3.05	5.20	5.45		
Feb.	4	1.14	289,000	1,407		7.9	50	37	4.21	2.65	6.85	2.86	5.77	5.16		
Mar.	5	.86	547,000	1,036		7.9	46	30	3.51	2.01	4.78	2.72	4.50	3.06		
Apr.	4	.92	614,000	1,103		8.0	47	29	3.68	2.21	5.21	2.84	4.99	3.27		
May	4	.92	604,000	1,109		7.9	46	29	3.85	2.12	5.03	2.88	4.96	3.24		
June	5	.95	608,000	1,153		8.0	46	28	3.84	2.29	5.26	2.81	5.38	3.26		
July	4	1.04	668,000	1,212		7.8	46	28	4.16	2.52	5.76	3.01	6.01	3.43		
Aug.	4	.96	627,000	1,147		7.9	48	30	3.81	2.15	5.54	2.82	5.26	3.42		
Sept.	5	.99	639,000	1,204		7.9	49	34	3.88	2.28	5.85	2.79	5.12	4.05		
Oct.	4	1.02	731,000	1,244		7.9	50	36	3.80	2.29	6.11	2.82	5.07	4.49		
Nov.	4	1.13	707,000	1,331		8.0	48	34	4.32	2.76	6.43	2.92	6.01	4.69		
Dec.	5	1.20	648,000	1,410		8.0	47	34	4.69	2.99	6.81	3.06	6.48	4.91		
Mean @	Ø52	1.02	Ø6,971,000	1,229		7.9	48	32	3.96	2.40	5.90	2.88	5.39	4.03		
Period Avg.		1.52	2,564,168	1,824		8.0			5.63	3.37	9.37	3.28	7.94	7.19		
Tons of Constituents				1980					748,000	275,000	1,279,000	815,000	2,439,000	1,347,000		
Avg. Tons				Period 1962-1980					262,000	95,100	495,000	237,000	876,000	583,000		

** Percent of total cations *** Percent of total anions @ Weighted mean Ø Total

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES
1980

The following tables show electrical conductivity, expressed in mhos per centimeter x 10^6 at 25° C, of individual water samples taken at Colorado River stations and in Mexican canals. Samples were taken at the northerly international boundary by both Sections of the Commission and at the southerly international boundary by the United States Section. Conductivity determinations were made by the United States Geological Survey. Samples for the Intake Canal at Morelos Dam and Miguel C. Rodriguez Gaging Station were taken by the Mexican Section of the Commission, and determinations were made by the Ministry of Agriculture and Hydraulic Resources of Mexico.

Electrical conductivity is a relative indication of the concentration of dissolved solids in the water samples.

Date	ECx10^6 @25°C	Date	ECx10^6 @25°C	Date	ECx10^6 @25°C	Date	ECx10^6 @25°C	Date	ECx10^6 @25°C	Date	ECx10^6 @25°C	Date	ECx10^6 @25°C	Date	ECx10^6 @25°C

Colorado River at Northerly International Boundary

January		February		April		May		July		August		October		November	
1 *	1,300	15	1,360	1	1,030	16	1,100	1	1,310	16	1,130	1	1,220	16	1,320
2	1,290	16	1,370	2	1,040	17	1,110	2	1,300	17	1,140	2	1,210	17	1,350
3	1,300	17	1,380	3	1,040	18	1,110	3	1,270	18	1,150	3	1,210	18	1,360
4	1,250	18	1,380	4	1,040	19	1,090	4	1,330	19	1,150	4	1,210	19	1,380
5	1,290	19	1,410	5	1,040	20	1,100	5	1,330	20	1,130	5	1,210	20	1,390
6	1,280	20	1,420	6	1,030	21	1,080	6	1,320	21	1,140	6	1,210	21	1,390
7	1,310	21	1,370	7	1,080	22	1,120	7	1,320	22	1,150	7	1,210	22	1,380
8	1,310	22	1,350	8	1,070	23	1,090	8	1,320	23	1,140	8	1,220	23	1,380
9	1,340	23	1,230	9	1,090	24	1,130	9	1,300	24	1,150	9	1,240	24	1,380
10	1,340	24	1,270	10	1,100	25	1,130	10	1,250	25	1,150	10	1,230	25	1,390
11	1,280	25	1,220	11	1,110	26	1,120	11	1,210	26	1,140	11	1,230	26	1,390
12	1,380	26	1,210	12	1,110	27	1,120	12	1,200	27	1,140	12	1,240	27	1,360
13	1,400	27	1,160	13	1,130	28	1,100	13	1,210	28	1,140	13	1,240	28	1,370
14	1,410	28	1,140	14	1,090	29	1,110	14	1,190	29	1,140	14	1,240	29	1,360
15	1,440	29	1,160	15	1,100	30	1,120	15	1,180	30	1,150	15	1,260	30	1,380
16	1,470	March		16	1,100	31	1,130	16	1,170	31	1,160	16	1,260	December	
17	1,470	1	1,140	17	1,120	June		17	1,180	September		17	1,250	1	1,370
18	1,470	2	1,100	18	1,110	1	1,130	18	1,170	1	1,150	18	1,250	2	1,360
19	1,450	3	1,040	19	1,120	2	1,110	19	1,160	2	1,160	19	1,230	3	1,390
20	1,440	4	1,040	20	1,130	3	1,130	20	1,160	3	1,160	20	1,240	4	1,370
21	1,440	5	1,050	21	1,140	4	1,120	21	1,180	4	1,150	21	1,240	5	1,380
22	1,460	6	1,010	22	1,130	5	1,130	22	1,160	5	1,160	22	1,250	6	1,390
23	1,410	7	1,040	23	1,120	6	1,130	23	1,170	6	1,140	23	1,250	7	1,400
24	1,450	8	1,050	24	1,110	7	1,140	24	1,150	7	1,150	24	1,270	8	1,400
25	1,450	9	1,040	25	1,130	8	1,140	25	1,140	8	1,160	25	1,270	9	1,390
26 *	1,460	10	1,040	26	1,130	9	1,120	26	1,140	9	1,240	26	1,260	10	1,420
27 *	1,470	11	1,050	27	1,130	10	1,120	27	1,150	10	1,260	27	1,280	11	1,430
28	1,480	12	1,040	28	1,130	11	1,140	28	1,140	11	1,240	28	1,300	12	1,440
29	1,490	13	1,070	29	1,130	12	1,160	29	1,130	12	1,210	29	1,290	13	1,450
30	1,400	14	1,050	30	1,130	13	1,130	30	1,140	13	1,240	30	1,290	14	1,430
31	1,460	15	1,070	May		14	1,150	31	1,130	14	1,250	31	1,290	15	1,440
February		16	1,040	1	1,120	15	1,170	August		15	1,250	November		16	1,440
1	1,570	17	1,050	2	1,140	16	1,150	1	1,150	16	1,260	1	1,310	17	1,430
2	1,580	18	1,050	3	1,140	17	1,150	2	1,150	17	1,220	2	1,300	18	1,430
3	1,570	19	1,020	4	1,150	18	1,150	3	1,150	18	1,220	3	1,280	19	1,440
4	1,570	20	1,020	5	1,110	19	1,140	4	1,130	19	1,220	4	1,280	20	1,430
5	1,590	21	1,040	6	1,090	20	1,150	5	1,130	20	1,220	5	1,270	21	1,420
6	1,570	22	1,050	7	1,090	21	1,140	6	1,130	21	1,210	6	1,270	22	1,430
7	1,540	23	1,040	8	1,100	22	1,140	7	1,120	22	1,210	7	1,280	23	1,430
8	1,540	24	1,020	9	1,120	23	1,140	8	1,130	23	1,210	8	1,300	24	1,390
9	1,600	25	1,030	10	1,100	24	1,200	9	1,140	24	1,240	9	1,300	25 *	1,380
10	1,740	26	1,030	11	1,090	25	1,270	10	1,160	25	1,250	10	1,300	26	1,390
11	1,670	27	1,020	12	1,110	26	1,280	11	1,150	26	1,270	11	1,300	27	1,400
12	1,610	28	1,030	13	1,120	27	1,290	12	1,150	27	1,220	12	1,310	28	1,390
13	1,580	29	1,060	14	1,130	28	1,290	13	1,140	28	1,220	13	1,320	29	1,400
14	1,460	30	1,060	15	1,120	29	1,280	14	1,130	29	1,230	14	1,330	30	1,440
		31	1,030			30	1,290	15	1,130	30	1,210	15	1,330	31	1,420

* Estimated

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1980

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

Intake Canal at Morelos Diversion Structure

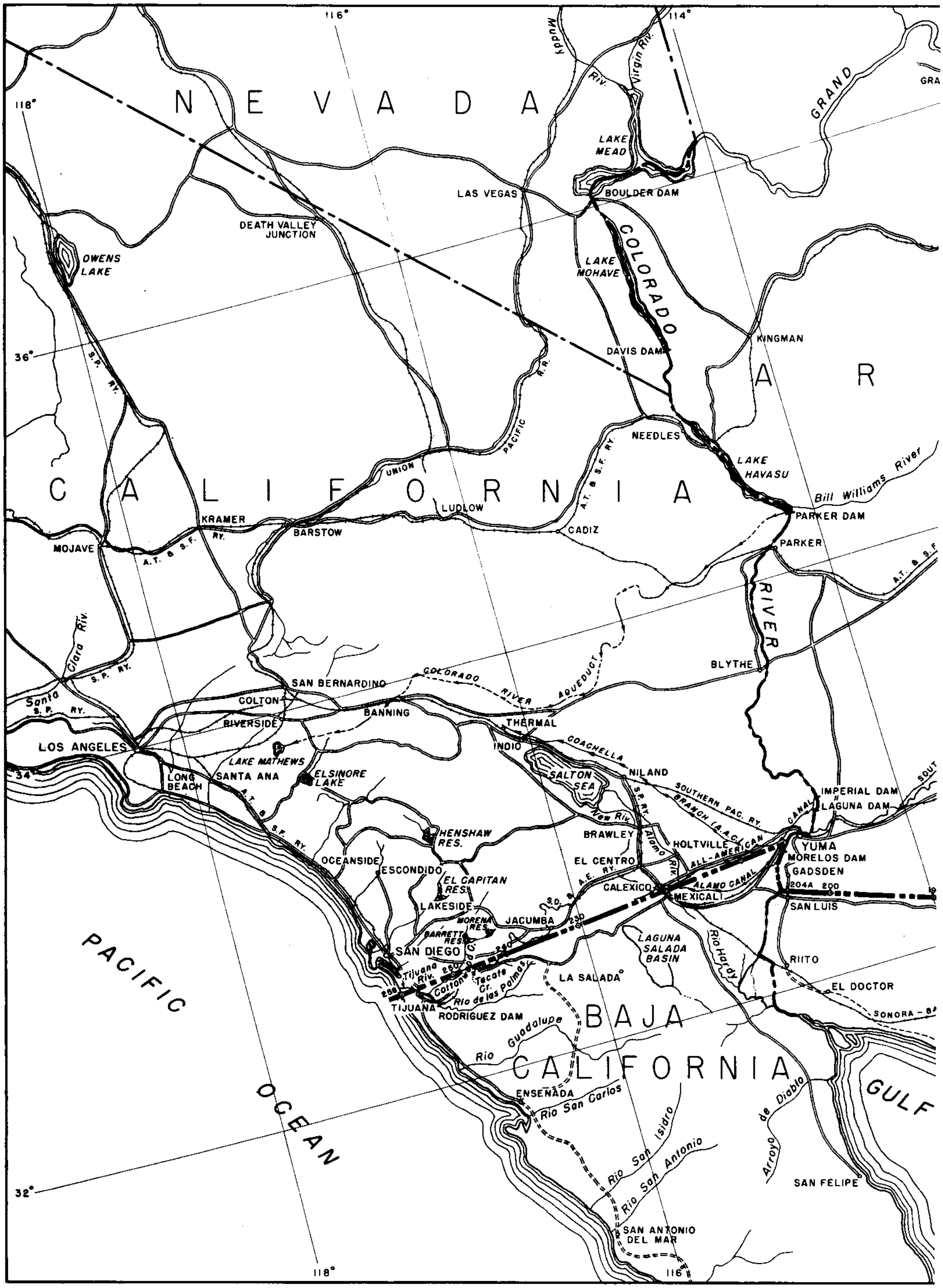
Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C
January		February		April		May		July		August		October		November	
1	1,290	15	1,360	1	1,040	16	1,120	1	1,280	16	1,130	1	1,230	16	1,340
2	1,300	16	1,370	2	1,030	17	1,130	2	1,260	17	1,130	2	1,230	17	1,360
3	1,310	17	1,370	3	1,050	18	1,130	3	1,300	18	1,150	3	1,230	18	1,360
4	1,280	18	1,370	4	1,050	19	1,100	4	1,320	19	1,150	4	1,220	19	1,380
5	1,280	19	1,420	5	1,040	20	1,130	5	1,330	20	1,150	5	1,210	20	1,390
6	1,300	20	1,420	6	1,030	21	1,100	6	1,310	21	1,140	6	1,210	21	1,400
7	1,320	21	1,380	7	1,070	22	1,100	7	1,300	22	1,150	7	1,230	22	1,390
8	1,340	22	1,350	8	1,080	23	1,130	8	1,310	23	1,140	8	1,220	23	1,380
9	1,330	23	1,230	9	1,080	24	1,130	9	1,300	24	1,160	9	1,260	24	1,400
10	1,360	24	1,270	10	1,100	25	1,130	10	1,260	25	1,150	10	1,240	25	1,400
11	1,370	25	1,220	11	1,120	26	1,120	11	1,220	26	1,150	11	1,230	26	1,390
12	1,380	26	1,230	12	1,120	27	1,140	12	1,230	27	1,150	12	1,250	27	1,370
13	1,400	27	1,160	13	1,130	28	1,110	13	1,250	28	1,150	13	1,250	28	1,380
14	1,420	28	1,140	14	1,100	29	1,120	14	1,200	29	1,150	14	1,240	29	1,390
15	1,450	29	1,150	15	1,120	30	1,120	15	1,210	30	1,140	15	1,270	30	1,390
16	1,490	March		16	1,100	31	1,140	16	1,200	31	1,160	16	1,250	December	
17	1,480	1	1,140	17	1,140	June		17	1,210	September		17	1,250	1	1,380
18	1,470	2	1,110	18	1,130	1	1,130	18	1,170	1	1,250	18	1,260	2	1,380
19	1,460	3	1,040	19	1,120	2	1,110	19	1,190	2	1,160	19	1,230	3	1,410
20	1,460	4	1,050	20	1,130	3	1,130	20	1,170	3	1,180	20	1,240	4	1,380
21	1,450	5	1,040	21	1,150	4	1,120	21	1,200	4	1,170	21	1,250	5	1,390
22	1,470	6	1,010	22	1,120	5	1,130	22	1,170	5	1,160	22	1,270	6	1,390
23	1,410	7	1,040	23	1,120	6	1,130	23	1,180	6	1,130	23	1,270	7	1,400
24	1,460	8	1,050	24	1,130	7	1,140	24	1,140	7	1,180	24	1,300	8	1,400
25	1,460	9	1,040	25	1,140	8	1,140	25	1,150	8	1,160	25	1,300	9	1,400
26	1,520	10	1,040	26	1,120	9	1,120	26	1,150	9	1,250	26	1,260	10	1,430
27	1,470	11	1,040	27	1,140	10	1,110	27	1,150	10	1,260	27	1,290	11	1,430
28	1,500	12	1,050	28	1,120	11	1,130	28	1,160	11	1,250	28	1,310	12	1,460
29	1,500	13	1,070	29	1,130	12	1,170	29	1,150	12	1,240	29	1,320	13	1,450
30	1,410	14	1,050	30	1,130	13	1,140	30	1,160	13	1,250	30	1,310	14	1,450
31	1,400	15	1,070	May		14	1,160	31	1,150	14	1,250	31	1,300	15	1,450
February		16	1,050	1	1,140	15	1,170	August		15	1,260	November		16	1,460
1	1,580	17	1,050	2	1,140	16	1,160	1	1,180	16	1,260	1	1,330	17	1,440
2	1,570	18	1,060	3	1,140	17	1,160	2	1,150	17	1,230	2	1,320	18	1,440
3	1,600	19	1,020	4	1,150	18	1,140	3	1,150	18	1,220	3	1,330	19	1,450
4	1,580	20	1,020	5	1,120	19	1,150	4	1,140	19	1,230	4	1,300	20	1,440
5	1,600	21	1,030	6	1,130	20	1,150	5	1,140	20	1,220	5	1,280	21	1,450
6	1,570	22	1,010	7	1,100	21	1,140	6	1,120	21	1,230	6	1,280	22	1,430
7	1,540	23	1,040	8	1,120	22	1,150	7	1,130	22	1,220	7	1,290	23	1,440
8	1,570	24	1,020	9	1,110	23	1,140	8	1,140	23	1,220	8	1,310	24	1,400
9	1,620	25	1,030	10	1,110	24	1,120	9	1,140	24	1,250	9	1,310	25	1,450
10	1,730	26	1,030	11	1,090	25	1,240	10	1,170	25	1,260	10	1,300	26	1,450
11	1,660	27	1,040	12	1,120	26	1,260	11	1,160	26	1,270	11	1,310	27	1,440
12	1,600	28	1,040	13	1,140	27	1,280	12	1,150	27	1,240	12	1,320	28	1,310
13	1,560	29	1,060	14	1,130	28	1,290	13	1,140	28	1,230	13	1,310	29	1,410
14	1,470	30	1,060	15	1,120	29	1,280	14	1,130	29	1,220	14	1,350	30	1,440
		31	1,040			30	1,260	15	1,150	30	1,220	15	1,340	31	1,450

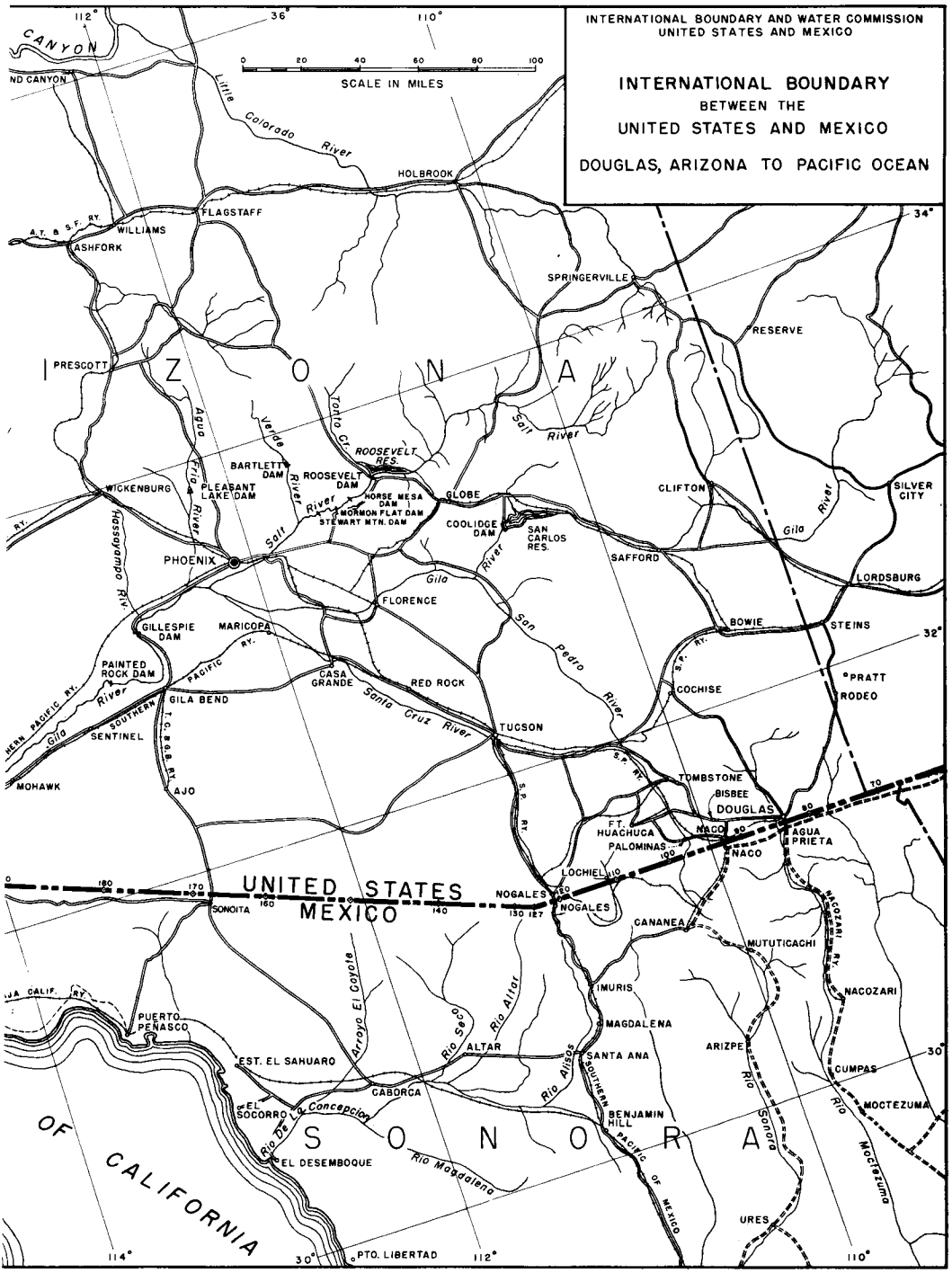
Colorado River at Southerly International Boundary

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
January		March		April		May		July		August		September		November	
2	1,300	4	1,040	1	1,020	6	1,130	1	1,310	6	1,110	2	1,160	4	1,320
February						June				12	1,120	October		December	
6	1,670					3	1,110					7	1,250	2	1,390

Colorado River at Miguel C. Rodriguez Gaging Station

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
January		February		April		May		July		August		October		November	
7	1,200	25	1,220	7	1,280	26	1,250	7	1,340	18	1,290	6	1,300	17	1,250
14	1,260	March		14	1,240	June		14	1,310	25	1,230	13	1,280	24	1,230
21	1,290	3	1,160	28	1,310	2	1,310	21	1,290	September		20	1,320	December	
28	1,320	10	1,100	May		9	1,290	28	1,270	8	1,290	27	1,340	1	1,260
February		17	1,090	5	1,270	16	1,320	August		15	1,310	November		8	1,290
11	1,460	24	1,200	12	1,290	23	1,280	4	1,300	22	1,350	3	1,270	15	1,310
18	1,310	31	1,230	19	1,320	30	1,280	11	1,390	30	1,310	10	1,290	22	1,320
														29	1,350


NEVADA
CALIFORNIA
BAJA CALIFORNIA
PACIFIC OCEAN
GULF
LAS VEGAS
DEATH VALLEY JUNCTION
OWENS LAKE
LAKE MEAD
BOULDER DAM
COLORADO
LAKE MOHAVE
DAVIS DAM
KINGMAN
NEEDLES
LAKE HAVASU
PARKER DAM
PARKER
Bill Williams River
RIVER
BLYTHE
Muddy Riv.
Virgin Riv.
GRAND
UNION PACIFIC R.R.
S.P. RY.
A.T. & S.F. RY.
LUDLOW
CADIZ
KRAMER
BARSTOW
MOJAVE
Santa Clara Riv.
SAN BERNARDINO
COLTON
RIVERSIDE
BANNING
COLORADO RIVER AQUEDUCT
THERMAL
INDIO
COACHELLA
LOS ANGELES
LONG BEACH
SANTA ANA
LAKE MATHEWS
ELSINORE LAKE
SALTON SEA
NILAND
SOUTHERN PAC. RY.
BRANCH (A.A.C.)
IMPERIAL DAM
LAGUNA DAM
New Riv.
Alamo Riv.
BRAWLEY
HOLTVILLE
ALL-AMERICAN CANAL
YUMA
MORELOS DAM
GADSDEN
204A
200
SAN LUIS
EL CENTRO
CALEXICO
MEXICALI
ALAMO CANAL
HENSHAW RES.
OCEANSIDE
ESCONDIDO
EL CAPITAN RES.
LAKESIDE
MORENA RES.
BARRETT RES.
JACUMBA
SAN DIEGO
Tijuana Riv.
Cottonwood Cr.
Tecate Cr.
Rio de las Palmas
TIJUANA
RODRIGUEZ DAM
LA SALADA
LAGUNA SALADA BASIN
Rio Hardy
RIITO
EL DOCTOR
SONORA
Rio Guadalupe
ENSENADA
Rio San Carlos
Rio San Isidro
Rio San Antonio
Arroyo de Diablo
SAN FELIPE
SAN ANTONIO DEL MAR
118°
116°
114°
36°
34°
32°


INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO
INTERNATIONAL BOUNDARY
BETWEEN THE
UNITED STATES AND MEXICO
DOUGLAS, ARIZONA TO PACIFIC OCEAN
SCALE IN MILES
0 20 40 60 80 100
CANYON
ND CANYON
Little Colorado River
HOLBROOK
FLAGSTAFF
WILLIAMS
ASHFORK
A.T. & S.F. RY.
SPRINGERVILLE
RESERVE
PRESCOTT
ARIZONA
Agua Fria River
Verde River
Tonto Cr.
ROOSEVELT RES.
Salt River
BARTLETT DAM
ROOSEVELT DAM
HORSE MESA DAM
MORMON FLAT DAM
STEWART MTN. DAM
WICKENBURG
PLEASANT LAKE DAM
GLOBE
COOLIDGE DAM
SAN CARLOS RES.
CLIFTON
SILVER CITY
Gila River
Hassayampa River
PHOENIX
SAFFORD
LORDSBURG
FLORENCE
GILLESPIE DAM
MARICOPA
San Pedro River
BOWIE
STEINS
PAINTED ROCK DAM
CASA GRANDE
RED ROCK
COCHISE
PRATT
RODEO
GILA BEND
Santa Cruz River
TUCSON
SENTINEL
MOHAWK
AJO
TOMBSTONE
BISBEE
DOUGLAS
FT. HUACHUCA
PALOMINAS
NACO
AGUA PRIETA
LOCHIEL
UNITED STATES
MEXICO
SONOITA
NOGALES
CANANEA
MUTUTICACHI
NACOZARI
IMURIS
MAGDALENA
ARIZPE
CUMPAS
MOCTEZUMA
PUERTO PEÑASCO
EST. EL SAHUARO
Arroyo El Coyote
Rio Sasabe
ALTAR
Rio Altar
SANTA ANA
Rio Aisos
CABORCA
EL SOCORRO
Rio De La Concepcion
BENJAMIN HILL
Rio Sonora
Rio Moctezuma
EL DESEMBOQUE
Rio Magdalena
Pacific Ocean of Mexico
SONORA
OF CALIFORNIA
URES
PTO. LIBERTAD
112°
36°
110°
34°
32°
30°
114°

RAINFALL ON THE COLORADO RIVER WATERSHED IN INCHES

Tabulated below are monthly records of rainfall at stations located in California and Arizona in the United States and in Baja California and Sonora in Mexico, with averages for their periods of record. Records of daily rainfall amounts, where available, are on file in the offices of the United States or Mexican Sections of the Commission. For location, elevation, period of record, and the observer, see alphabetical listings of these stations on page 51 in this bulletin.

In the United States

Month	Brawley, California		El Centro, California		Blythe, California		Yuma Citrus Station, Arizona		Bullhead City, Arizona	
	1980	Average 1931-1980	1980	Average 1931-1980	1980	Average 1931-1980	1980	Average 1931-1980	1980	Average 1978-1980
Jan.	1.12	0.36	1.01	0.37	0.77	0.46	0.49	0.43	3.43	2.25
Feb.	1.91	.33	1.57	.34	2.14	.45	.87	.36	2.47	1.67
Mar.	1.14	.21	1.31	.19	.53	.39	.49	.25	.96	1.80
Apr.	.13	.10	0	.10	.38	.14	.16	.12	.32	.25
May	.60	.02	0	.01	* T	.03	T	.02	.38	.28
June	T	.01	0	.01	.01	.04	T	.02	.01	0
July	T	.05	.17	.09	* .10	.17	T	.15	.50	.62
Aug.	.01	.36	0	.34	1.73	.80	.04	.51	.01	.38
Sept.	0	.34	0	.27	0	.36	T	.35	.33	.12
Oct.	0	.25	0	.25	0	.29	0	.41	.10	.24
Nov.	0	.16	0	.18	0	.25	0	.18	0	.46
Dec.	T	.40	0	.41	.05	.49	.16	.38	0	.67
Yearly	4.91	2.59	4.06	2.56	5.71	3.87	2.21	3.18	8.51	8.74

In Mexico

Month	Los Algodones, Baja California		Mexicali, Baja California		Bataques, Baja California		San Luis, R. C., Sonora		Delta, Baja California	
	1980	Average 1948-1980	1980	Average 1926-1980	1980	Average 1948-1980	1980	Average 1949-1980	1980	Average 1948-1980
Jan.	0.55	0.43	0.91	0.35	0.71	0.39	0.28	0.35	0.28	0.39
Feb.	.79	.24	1.57	.31	.94	.20	.87	.28	.79	.24
Mar.	.31	.12	.87	.20	.55	.12	.39	.20	.35	.12
Apr.	.20	.08	.04	.12	.20	.08	.16	.08	.08	.08
May	0	T	.04	T	0	T	T	.04	0	.04
June	0	T	T	T	0	.04	.08	.04	0	T
July	0	.08	.47	.16	0	.04	0	.24	0	.04
Aug.	.04	.43	.31	.35	.08	.16	.08	.43	0	.20
Sept.	0	.20	0	.39	0	.12	T	.24	0	.24
Oct.	0	.31	0	.31	0	.31	0	.39	0	.35
Nov.	0	.16	0	.16	0	.16	0	.47	T	.16
Dec.	.08	.31	T	.71	.04	.20	.16	.47	.04	.28
Yearly	1.97	2.36	4.21	3.11	2.52	1.73	2.01	2.76	1.54	2.01

Month	Colonia Juarez, Baja California		Riito, Sonora		Santa Clara, Sonora		San Felipe, Baja California			
	1980	Average 1952-1980	1980	Average 1959-1980	1980	Average 1971-1980	1980	Average 1969-1980		
Jan.	0.08	0.51	0.16	0.31	0.24	0.31	0.63	0.39		
Feb.	.98	.28	.87	.20	.28	.20	.83	.16		
Mar.	1.10	.28	1.18	.16	.16	.12	.04	.12		
Apr.	.08	.12	.08	.04	.04	.08	0	.08		
May	0	.04	0	T	0	.04	0	.04		
June	0	T	0	.04	0	T	0	.04		
July	0	.16	0	.12	0	0	0	.12		
Aug.	0	.31	0	.24	0	.12	0	.28		
Sept.	T	.28	0	.51	0	.35	0	.35		
Oct.	0	.47	0	.47	0	.75		.28		
Nov.	0	.28	0	.24	0	.04	0	.16		
Dec.	.08	.35	0	.35	.08	.24	.08	.39		
Yearly	2.32	2.48	2.28	2.80	0.79	2.28		2.48		

T Trace * Blythe FAA Airport

LOCATION OF RAINFALL STATIONS ON THE COLORADO RIVER WATERSHED

The precipitation records of the stations listed alphabetically below began on the date shown and extend through 1980.

In United States

NAME OF STATION	LATITUDE	LONGITUDE	δ ELEV. (FT.)	RECORD BEGAN	OBSERVER
* Blythe, California	33° 37'	114° 36'	268	1909	State Division of Forestry
Brawley, California	32° 57'	115° 33'	100	1908	Agricultural Research Service
Bullhead City, Arizona	35° 07'	114° 36'	580	1980	Bullhead City Fire Department
El Centro, California	32° 46'	115° 34'	30	1930	El Centro Water Department
Yuma Citrus Station, Arizona	32° 37'	114° 39'	191	1923	University of Arizona Experimental Farm

In Mexico

NAME OF STATION	LATITUDE	LONGITUDE	δ ELEV. (FT.)	RECORD BEGAN	OBSERVER
Bataques, Baja California	32° 33'	115° 04'	** 66	1963	# S. A. R. H.
Delta, Baja California	32° 21'	115° 11'	** 39	1948	S. A. R. H.
Colonia Juarez, Baja California	32° 15'	115° 03'	49	1952	S. A. R. H.
Los Algodones, Baja California	32° 42'	114° 44'	115	1948	S. A. R. H.
Mexicali, Baja California	32° 40'	115° 28'	13	1926	S. A. R. H.
Riito, Sonora	32° 08'	114° 54'	33	1959	S. A. R. H.
San Felipe, Baja California	31° 02'	114° 51'	33	1969	S. A. R. H.
San Luis, R. C., Sonora	32° 28'	114° 47'	131	1953	S. A. R. H.
Santa Clara, Sonora	31° 42'	114° 29'	49	1971	S. A. R. H.

* Not shown on map
δ Elevation above mean sea level except Brawley and El Centro which are elevations below mean sea level
** Elevations obtained from International Boundary and Water Commission topographic maps
# Ministry of Agriculture and Hydraulic Resources

EVAPORATION IN THE COLORADO RIVER BASIN IN INCHES

Tabulated below are records of evaporation observed at one station in Arizona and at nine stations in Baja California and Sonora, Mexico. The station in the United States is operated by the University of Arizona Experimental Farm. The stations in Mexico are operated by the Ministry of Agriculture and Hydraulic Resources. The type of pan used at all these stations was the National Weather Service standard pan of 4-foot diameter. For specific location of these stations, refer to data opposite the same station name shown in "Location of Rainfall Stations," page 51 in this bulletin.

In United States

	Yuma Citrus Station, Arizona	
Month	1980	Average 1931-1980
Jan.	3.33	3.86
Feb.	4.08	4.80
Mar.	6.04	7.48
Apr.	9.17	10.11
May	11.57	13.06
June	13.26	14.34
July	13.80	15.43
Aug.	12.82	13.66
Sept.	9.48	10.78
Oct.	7.36	7.61
Nov.	5.07	4.98
Dec.	3.93	3.69
Yearly	99.91	109.80

In Mexico

	Los Algodones, Baja California		Mexicali, Baja California		Bataques, Baja California		San Luis, R. C., Sonora		Delta, Baja California	
Month	1980	Average 1949-1955 1961-1980	1980	Average 1926-1980	1980	Average 1963-1980	1980	Average 1953-1980	1980	Average 1948-1980
Jan.	4.25	4.29	2.64	2.60	3.66	3.70	3.03	3.27	3.03	3.23
Feb.	5.12	5.20	3.39	3.54	4.21	4.69	3.78	4.02	4.09	4.33
Mar.	8.07	7.52	5.71	5.91	6.65	6.93	5.91	6.30	5.35	6.26
Apr.	11.14	10.20	7.87	7.99	8.98	9.02	7.91	8.43	8.98	8.19
May	14.06	12.87	10.08	10.55	11.73	11.85	9.61	11.02	10.16	10.31
June	16.81	14.02	11.57	11.73	14.02	12.76	* 12.76	12.76		11.50
July	15.94	13.78	11.18	11.81	11.97	12.56	12.87	13.94		12.01
Aug.	14.96	12.52	11.30	10.20	11.10	10.87	12.01	12.48	12.83	10.87
Sept.	12.24	10.31	7.91	8.15	8.50	9.06	8.82	9.61	7.13	8.54
Oct.	9.92	8.07	4.80	5.79	7.05	6.42	6.57	6.38		6.26
Nov.	7.83	5.31	2.83	3.43	5.39	4.72	4.29	4.25		4.33
Dec.	6.46	4.33	1.93	2.48	3.94	3.50	2.87	3.19	3.74	3.31
Yearly	126.81	109.84	81.22	84.17	97.20	96.14	90.43	96.46		83.03

	Colonia Juarez, Baja California		Riito, Sonora		Santa Clara, Sonora		San Felipe, Baja California			
Month	1980	Average 1970-1980	1980	Average 1963-1980	1980	Average 1971-1980	1980	Average 1952-1980		
Jan.	3.39	3.31	2.87	3.03	4.06	5.16	4.45	4.92		
Feb.	4.41	4.25	3.66	4.06	4.61	4.76	4.84	5.63		
Mar.	6.54	6.26	5.51	5.94	6.38	6.26	5.91	6.93		
Apr.	8.35	7.76	* 7.36	7.64	7.44	7.64	8.54	8.27		
May	10.87	9.96	10.16	10.20	9.25	8.78	8.82	10.24		
June	12.91	11.73	*12.76	11.69	9.96	11.30	10.67	10.83		
July	13.31	11.73	12.28	12.24	11.14	11.02	10.04	11.54		
Aug.	11.06	10.51	9.96	10.24	8.23	10.51	9.69	11.34		
Sept.	9.06	8.86	8.54	8.23	9.41	9.17	8.15	9.72		
Oct.	8.27	6.69	6.81	5.71	6.93	7.48	8.27 ¤	8.27		
Nov.	5.83	4.76	4.06	3.66	5.79	5.83	6.14	6.14		
Dec.	4.17	3.58	2.95	2.91	4.13	5.24	4.41	4.80		
Yearly	98.15	92.99	86.93	87.60	87.32	93.50	89.92 *	100.32		

* Partly estimated ¤ Estimated

TEMPERATURE IN THE COLORADO RIVER BASIN IN DEGREES FAHRENHEIT

The maximum, minimum, and monthly mean temperature observations for United States stations are from daily readings of thermometers generally exposed in a shelter located a few feet above sod-covered ground. The maximum and minimum temperatures shown for the stations in Mexico are from daily maximum and minimum thermometer observations, with maximum and minimum for their periods of record. For specific location, elevation, period of record, and the observer, refer to data opposite same station name as shown in "Location of Rainfall Stations," page 51 in this bulletin.

In the United States

	Blythe, California				Yuma Citrus Station, Arizona				Brawley, California			
	1980			Average	1980			Average	1980			Average
Month	Mean	Max.	Min.	1931-80	Mean	Max.	Min.	1931-80	Mean	Max.	Min.	1931-80
Jan.	57.3	84	33	52.5	56.8	75	35	53.0	58.4	77	34	53.6
Feb.	60.0	82	33	57.3	60.2	86	33	57.0	61.0	84	35	58.0
Mar.	61.0	83	39	62.9	60.5	86	39	62.0	60.8	86	40	63.1
Apr.	69.4	103	41	69.9	# 67.3	104	38	68.5	67.7	102	43	69.8
May	* 75.3	*105	* 50	77.4	71.9	102	45	75.7	71.7	101	46	77.2
June	85.1	115	58	85.2	83.5	112	56	83.6	84.2	115	54	85.1
July	* 98.3	*120	* 74	92.3	91.7	114	66	91.0	92.6	116	62	91.9
Aug.	91.2	114	66	90.9	89.0	112	61	90.2	89.5	113	63	91.3
Sept.	83.9	109	57	85.0	83.1	111	55	84.9	84.5	110	59	86.2
Oct.	# 72.8	111	41	73.2	73.5	110	43	73.6	74.9	111	44	75.0
Nov.	# 60.4	92	34	60.1	61.1	91	33	61.3	62.7	96	32	62.4
Dec.	57.4	82	32	53.2	58.1	81	35	54.5	59.2	86	33	55.0
Yearly	72.7	*120	32	71.7	71.4	114	33	71.3	72.3	116	32	72.4

	El Centro, California				Bullhead City, Arizona							
	1980			Average	1980			Average				
Month	Mean	Max.	Min.	1931-80	Mean	Max.	Min.	1978-80				
Jan.	57.8	77	34	53.7	55.6	75	35	51.4				
Feb.	60.8	84	35	57.9	59.1	83	35	56.2				
Mar.	61.5	84	38	62.9	59.6	82	39	61.6				
Apr.	# 68.4	103	42	69.4	68.8	101	43	68.8				
May	72.8	100	48	77.1	74.4	105	53	77.3				
June	85.7	115	53	85.1	86.9	124	50	89.2				
July	93.1	116	68	91.8	96.4	119	73	94.7				
Aug.	88.7	113	61	91.0	92.7	120	60	91.9				
Sept.	85.2	110	60	85.6	86.3	111	63	86.8				
Oct.	74.7	112	43	74.6	74.7	111	46	75.8				
Nov.	# 62.7	98	31	62.1	63.6	92	39	60.1				
Dec.	59.0	84	33	54.7	58.6	88	35	53.6				
Yearly	72.5	116	31	72.2	73.1	124	35	72.3				

In Mexico

	Los Algodones, Baja California				Mexicali, Baja California				Bataques, Baja California			
	1980		1948-1980		1980		1926-1980		1980		1948-1980	
Month	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	75	36	88	23	81	37	93	19	82	32	113	16
Feb.	82	39	95	28	82	39	93	23	86	36	99	21
Mar.	79	43	100	32	88	43	100	30	82	41	113	25
Apr.	99	43	109	37	100	45	106	34	104	43	118	16
May	97	48	117	43	102	48	117	43	100	48	124	34
June	111	59	126	52	113	54	120	48	117	55	135	43
July	115	72	118	61	115	68	118	55	117	57	133	45
Aug.	111	68	120	61	113	63	118	54	115	54	129	46
Sept.	100	63	122	54	111	64	122	48	111	55	135	39
Oct.	102	46	111	32	111	46	111	32	111	45	118	32
Nov.	90	39	100	27	97	39	104	28	99	37	115	32
Dec.	82	39	90	23	86	36	90	23	91	36	97	25
Yearly	115	36	126	23	115	36	122	19	117	32	135	16

One or more days of record missing

* Blythe FAA Airport

TEMPERATURE IN THE COLORADO RIVER BASIN IN DEGREES FAHRENHEIT

In Mexico

	San Luis, R. C., Sonora				Delta, Baja California				Colonia Juarez, Baja California			
	1980		1949-1980		1980		1948-1980		1980		1964-1980	
Month	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	81	34	100	19	82	43	104	27	77	34	91	19
Feb.	86	36	109	27	88	41	104	28	79	36	97	21
Mar.	88	41	108	28	90	46	113	28	77	41	99	25
Apr.	104	43	115	37	104	48	118	32	100	41	115	30
May	104	50	115	41	102	54	129	32	100	46	117	36
June	117	57	126	45	115	61	133	36	117	54	122	39
July	118	70	126	59	117	73	135	45	115	64	122	45
Aug.	115	68	122	55	113	68	140	52	113	61	118	50
Sept.	111	61	118	50	111	63	135	39	108	59	122	39
Oct.	111	45	118	32	109	48	117	34	108	45	118	36
Nov.	93	36	113	28	95	41	120	32	91	36	104	25
Dec.	82	36	102	23	84	45	104	27	82	36	97	19
Yearly	118	34	126	19	117	41	140	27	117	34	122	19

	Riito, Sonora				Santa Clara, Sonora				San Felipe, Baja California			
	1980		1949-1980		1980		1971-1980		1980		1948-1980	
Month	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	81	32	91	19	79	37	90	18	73	36	99	30
Feb.	84	32	95	21	86	43	90	23	82	36	102	32
Mar.	84	39	100	25	82	50	90	37	79	39	104	32
Apr.	102	43	109	36	97	50	102	46	97	43	113	34
May	102	43	115	41	90	54	106	50	91	46	120	41
June	115	52	124	45	102	59	117	57	102	57	124	50
July	117	66	140	52	108	68	115	64	108	52	124	50
Aug.	115	61	122	46	104	73	106	68	113	64	135	41
Sept.	108	57	118	39	106	70	108	61	111	61	126	37
Oct.	108	43	115	30	97	55	102	41			117	23
Nov.	93	34	118	27	90	46	93	36	88	45	118	21
Dec.	82	34	86	21	82	45	82	25	79	39	97	28
Yearly	117	32	140	19	108	37	117	18	113	36	135	21

IRRIGATED AREAS ALONG COLORADO RIVER BELOW IMPERIAL DAM
1980

The total drainage area within the Colorado River basin is about 246,000 square miles, of which 184,600 square miles lie above Imperial Dam and about 61,400 square miles are below the dam. Of the area below Imperial Dam, 59,400 square miles are in the United States and about 2,000 square miles are in Mexico. The area below Imperial Dam includes the Gila River watershed with a total area of about 58,200 square miles, of which about 1,100 square miles are in Mexico.

The irrigated areas tabulated below comprise the areas in the United States and Mexico which are served by diversions from the Colorado River at or below Imperial Dam. The diversions are supplemented by some pumping from wells in both countries. The areas in the United States include: 1) those within the U. S. Bureau of Reclamation Projects and in the North and South Gila Valleys located near Yuma, Arizona, the data for which are furnished by the U. S. Bureau of Reclamation; 2) those within the Coachella Valley, California, the data for which are furnished by the Coachella Valley County Water District and State of California Department of Water Resources; and 3) those within the Imperial Valley, California, the data for which are furnished by the Imperial Irrigation District. The areas in Mexico include those in the Mexicali Valley located in the states of Baja California and Sonora, the data for which are furnished by the Ministry of Agriculture and Hydraulic Resources of Mexico. The areas tabulated below refer to the total areas farmed, and insofar as possible, duplication of irrigated areas because of double cropping has been eliminated.

Point of Diversion from Colorado River and Designation of Areas	Total Irrigated Areas Acres
IN UNITED STATES:	
Imperial Dam	
Yuma Valley Division	45,747
Reservation Division	13,025
Yuma Mesa	17,798
Yuma Aux. Project Unit "B" (Yuma Mesa)	3,271
South Gila Valley	10,016
North Gila Valley	5,963
Wellton-Mohawk	58,641
Coachella Valley	57,879
Imperial Valley	460,532
Warren Act	80
Non-Project lands adjacent to Colorado River	12,560
Total in United States	685,512
IN MEXICO:	
Morelos Dam	
Mexicali Valley	* 602,020
Total in United States and Mexico	1,287,532

* An estimated 34% of total acreage is served by pumping from ground water in Mexicali Valley

ALAMO RIVER AT INTERNATIONAL BOUNDARY

DESCRIPTION; Staff gage located on the right bank of the river, about 7 miles (11.3 km) east of Calexico, California, immediately downstream from the international land boundary between the United States and Mexico and a few feet upstream from a 4-foot (1.22 m) Cipolletti weir in the throat of a twin-tube concrete culvert which carries the river flow under the All-American Canal.

RECORDS: Computed on the basis of head on the Cipolletti weir from daily staff gage readings, and weir ratings as determined by monthly current meter measurements. Records obtained and furnished by Imperial Irrigation District. Records available: June 1942 through 1980.

REMARKS: The flow at this station normally comprises seepage from the All-American Canal and drainage water from the Mexicali Valley which enters the United States.

EXTREMES: Maximum mean daily discharge, 258 second-feet (7.31 m^3/sec) (estimated), April 13, 1946; minimum discharge, no flow July 22-23, 29-30, 1949. Prior to the period of record, and since 1900, considerably higher flows occurred. During the years 1905 to 1907, when the Colorado River flowed into the Salton Sea, a part of its flow passed through the Alamo River channel.

Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.13	2.54	2.34	3.24	2.13	3.65	1.37	1.46	1.55	1.74	2.02	2.13
2	2.13	2.54	2.34	4.35	2.02	4.49	1.37	1.28	1.46	1.74	2.02	2.13
3	2.13	2.54	2.13	4.35	2.02	2.23	1.46	1.18	1.74	1.74	2.02	2.13
4	2.13	2.02	2.13	2.75	2.02	2.34	1.37	1.18	1.74	1.74	2.02	2.13
5	2.34	2.13	1.92	2.13	2.02	2.44	5.17	4.90	1.92	1.74	2.02	2.13
6	2.23	2.13	2.13	2.13	2.13	2.44	4.62	3.65	3.52	1.74	2.02	2.13
7	3.24	2.13	1.92	2.34	2.02	2.44	2.13	2.54	3.52	1.74	1.92	2.75
8	3.79	2.13	2.13	2.34	1.92	2.13	2.96	4.76	1.92	1.74	1.92	2.75
9	3.52	2.13	2.13	2.23	1.64	1.74	1.37	1.55	1.92	1.74	1.92	2.44
10	3.52	2.13	2.13	2.23	1.46	1.64	2.34	2.23	1.46	1.92	2.13	4.62
11	3.24	2.23	2.34	2.23	1.37	1.46	1.64	3.52	1.46	1.92	2.13	4.62
12	3.24	2.23	2.34	2.23	1.46	2.44	1.64	2.96	3.52	1.92	2.13	4.76
13	3.24	2.34	2.34	1.74	1.37	2.44	1.74	2.54	6.38	1.74	2.02	4.76
14	2.96	2.96	2.34	2.75	1.92	1.28	1.64	2.75	6.06	1.74	1.92	5.03
15	2.96	2.96	2.34	2.96	2.13	1.37	1.64	1.74	3.52	1.74	1.92	4.62
16	2.96	2.65	2.34	2.54	1.74	1.18	1.74	1.74	4.90	1.92	1.92	4.62
17	2.96	2.75	2.34	1.92	1.64	1.37	1.64	1.74	1.92	1.92	1.92	4.62
18	3.24	2.44	2.34	2.23	1.74	1.37	1.55	1.64	2.13	1.92	1.92	4.90
19	3.24	2.44	2.13	2.34	1.74	1.37	1.46	1.55	2.13	1.92	1.92	4.90
20	3.24	2.65	2.13	2.34	1.74	1.37	1.37	1.74	2.65	1.92	1.92	4.90
21	3.24	2.34	2.34	2.34	1.74	1.37	1.46	2.75	2.23	1.92	1.92	4.62
22	3.52	2.34	2.44	2.34	1.74	1.37	1.18	2.75	2.23	2.44	1.92	4.62
23	3.52	2.96	2.44	2.34	1.74	1.37	1.18	5.17	2.13	2.44	2.13	4.62
24	2.75	2.96	2.44	2.02	1.74	1.92	1.64	5.72	1.92	2.34	2.34	4.62
25	2.75	2.23	2.34	2.02	1.74	1.55	1.74	6.55	2.13	2.34	2.13	4.62
26	2.75	2.23	2.65	2.34	1.74	1.55	1.74	3.24	2.96	2.13	2.13	4.62
27	2.96	2.23	2.54	1.92	1.74	1.74	1.64	5.03	2.13	2.13	2.13	4.62
28	2.75	2.23	2.44	1.92	1.55	1.74	1.55	5.03	1.92	2.02	2.13	4.62
29	2.75	1.92	2.34	2.13	1.55	1.74	1.55	1.74	1.92	2.02	2.13	4.62
30	2.96		2.96	2.13	5.17	1.37	1.46	1.74	2.13	2.02	2.13	4.62
31	2.75		3.24		2.96		1.37	1.55		2.02		4.62
Sum	91.14	69.51	72.45	72.87	59.64	56.91	56.73	87.92	77.12	60.06	60.82	123.89

Month	Extreme Gage Ø Feet		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period 1943-1980 Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	0.46	0.32	8	3.79	! 1	2.13	2.94	181	327	2,790	99
Feb.	.40	.30	!14	2.96	29	1.92	2.40	138	296	2,822	90.2
Mar.	.42	.30	31	3.24	! 5	1.92	2.34	144	333	3,154	87.1
Apr.	.50	.28	! 2	4.35	13	1.74	2.43	145	355	2,222	97
May	.56	.24	30	5.17	!11	1.37	1.92	118	277	1,799	73
June	.51	.22	2	4.49	16	1.18	1.90	113	272	1,686	61
July	.56	.22	5	5.17	!22	1.18	1.83	113	249	1,712	59
Aug.	.65	.22	25	6.55	! 3	1.18	2.84	174	299	1,672	65.7
Sept.	.64	.25	13	6.38	! 2	1.46	2.57	153	282	1,406	83.5
Oct.	.35	.28	!22	2.44	! 1	1.74	1.94	119	301	1,845	61.6
Nov.	.34	.30	24	2.34	! 7	1.92	2.03	121	309	2,080	62.4
Dec.	.55	.32	14	5.03	! 1	2.13	4.00	246	292	1,686	80
	0.65	0.22		6.55		1.18	2.43	1,765	3,592	22,146	1,071
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	0.20	0.07		0.19		0.03	0.07	2,177	4,431	27,317	1,321

Current Year 1980

Ø Mean daily ! And other days

NEW RIVER AT INTERNATIONAL BOUNDARY

DESCRIPTION: Water-stage recorder located on the left (west) bank of the river in the limits of the city of Calexico, California, 1,400 feet (427 m) downstream (north) from the international land boundary between the United States and Mexico. Measurements are made from a foot bridge at the gage.

RECORDS: Based on a continuous record of gage heights and weekly current meter measurements, supplemented by additional measurements during periods of high flow, by the Imperial Irrigation District. Records computed and furnished by the District. Records available: June 1942 through 1980.

REMARKS: The New River flows northward from Mexico into the United States and thence into the Salton Sea. The flow at this station normally comprises 1) a portion of the waste and drainage water from the irrigation system in the Mexicali Valley, and 2) sewage and other wastes from Mexicali, Baja California. Flood waters enter the river from local drainage in Mexico, and such waters can reach damaging rates during violent desert storms. Waste flows from the Mexican system of canals are limited to an average annual quantity of 35,000 acre-feet (43,172,000 m^3) during any successive five-year period under the provisions of Minute No. 197 of the Commission.

EXTREMES: Maximum mean daily discharge, 691 second-feet (19.6 m^3/sec) on December 3, 1962; minimum mean daily discharge, 2 second-feet (0.06 m^3/sec) on May 14, 1945. Prior to the period of record, and since 1900, much higher flows occurred. During the years 1905 to 1907, when the Colorado River flowed into the Salton Sea, a considerable part of its flow passed through the New River channel.

Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	173	308	185	228	291	177	291	274	218	260	218	225
2	191	252	174	244	321	193	240	252	245	252	228	237
3	201	215	177	249	284	196	217	235	241	247	245	241
4	194	185	191	234	215	184	205	237	227	261	251	231
5	183	180	185	224	201	186	199	242	229	262	258	220
6	172	177	174	229	220	172	173	225	240	268	239	223
7	165	181	169	217	224	171	171	213	240	275	215	230
8	152	181	165	220	225	180	172	195	236	268	201	225
9	177	181	164	201	187	181	159	195	248	263	193	220
10	187	184	166	195	158	181	155	199	263	265	202	212
11	193	198	222	190	159	178	168	209	251	237	203	209
12	171	188	255	190	179	173	176	219	231	216	188	195
13	165	200	250	189	220	168	193	223	231	219	185	189
14	157	195	236	205	227	161	210	230	247	207	196	217
15	165	320	220	211	223	160	207	233	253	218	221	221
16	170	293	216	252	208	163	211	249	274	224	256	236
17	169	255	215	235	189	169	196	257	294	211	246	233
18	164	248	224	202	186	167	189	255	279	241	226	210
19	159	281	246	197	188	162	185	277	271	217	233	203
20	164	234	236	217	180	157	183	283	256	210	229	194
21	203	202	216	238	165	165	203	263	255	217	213	190
22	219	196	202	273	161	168	217	252	251	188	201	212
23	209	187	210	320	158	169	218	244	247	188	196	219
24	180	177	215	321	219	180	218	254	244	195	193	216
25	172	183	231	319	182	187	228	255	241	185	183	253
26	178	187	250	285	194	187	217	272	231	187	178	262
27	178	172	257	245	187	191	229	279	234	201	183	250
28	178	162	290	216	178	213	229	256	231	212	192	223
29	207	182	252	200	177	260	236	236	239	217	205	221
30	260		232	231	171	249	256	229	246	226	211	221
31	335		224		170		277	215		217		236
Sum	5,791	6,104	6,649	6,977	6,247	5,448	6,428	7,457	7,393	7,054	6,388	6,874

Month	Extreme Gage ** Feet ø High	Extreme Gage ** Feet ø Low	ø Extreme Second-Feet High Day	High	ø Extreme Second-Feet Low Day	Low	Average Second-Feet	Total Acre-Feet	Acre-Feet Average	Acre-Feet Maximum	Acre-Feet Minimum
	Current Year 1980								Period 1943-1980		
Jan.	39.93	41.64	31	335	8	152	187	11,486	7,867	20,160	1,751
Feb.	39.87	41.73	15	320	28	162	210	12,107	6,687	17,845	1,258
Mar.	40.30	41.59	28	290	9	164	214	13,188	7,467	13,188	1,008
Apr.	39.55	41.15	24	321	13	189	233	13,839	7,735	14,489	1,390
May	39.51	41.77	2	321	!10	158	202	12,391	6,896	12,391	629
June	40.58	41.77	29	260	20	157	182	10,806	5,991	17,026	1,087
July	40.20	41.28	1	291	10	155	207	12,750	6,158	22,576	817
Aug.	40.01	40.84	20	283	! 8	195	241	14,791	6,962	14,791	1,139
Sept.	40.15	40.87	17	294	1	218	246	14,664	6,981	14,664	1,795
Oct.	40.27	41.15	7	275	25	185	228	13,991	7,205	13,991	2,081
Nov.	40.58	41.24	5	258	26	178	213	12,670	6,848	12,670	2,483
Dec.	40.43	41.33	26	262	13	189	222	13,634	7,600	21,205	1,763
Yearly	39.51	41.77		335		152	215	156,317	84,397	156,317	24,573
	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
	12.04	12.73		9.49		4.30	6.09	192,815	104,103	192,815	30,311

** Feet below mean sea level ø Mean daily ! And other days

WASTES FROM MEXICALI POTABLE WATER PLANT TO NEW RIVER IN MEXICO

DESCRIPTION: An 11.5-foot (3.50 m) Parshall flume installed by the State Commission of Public Services of Mexicali. Located 1.2 miles (2.0 km) upstream of the pumping plant on the supply canal. Excess water discharges into an open channel, thence into a 36-inch (91 cm) diameter pipe that empties into Rivera Drain (Drain 134), which is 1.2 miles (2.0 km) below the plant and 1.2 miles (2.0 km) south of the international boundary. From this point the waste is carried by a closed concrete box conduit into New River.

RECORDS: During 1980 the mean daily flows were computed from the total inflow to the potable water plant as measured at the Parshall flume, less the water pumped to the city and the water used in the maintenance of the plant. The records are obtained and furnished by the State Commission of Public Services of Mexicali. Records available: January 1968 through December 1980.

REMARKS: The plant began operation on September 28, 1963 by the State Commission of Public Services of Mexicali. Before 1968 the flow was small and infrequent. The potable water plant obtains water from the West Main Canal, which is a part of Mexico's system of canals in the Colorado Irrigation System. Excess water discharges into a closed conduit that empties into New River 0.9 mile (1.4 km) upstream of the international boundary.

EXTREMES: Maximum instantaneous discharge, 81.9 second-feet (2.32 m^3/sec) on March 26, 1969; minimum instantaneous discharge, zero during several days in 1977, 1978, 1979, and 1980.

Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	2.1	1.4	0.4	0	4.9	1.8	1.8	1.8	1.8
2	0	0	0	2.1	1.4	.4	0	4.9	1.8	1.8	1.4	1.8
3	0	0	0	2.1	.7	.4	0	4.9	1.8	1.8	1.8	1.8
4	0	0	0	2.1	.7	.4	0	4.9	1.8	1.8	2.1	1.8
5	0	0	0	2.1	.7	.4	0	4.9	1.8	1.8	1.8	2.1
6	0	0	0	2.1	.7	.4	0	4.9	1.8	1.8	1.8	1.8
7	0	0	0	2.1	.7	.4	0	4.9	1.8	1.8	1.4	1.8
8	0	0	0	2.1	.7	.4	0	4.9	1.8	1.8	1.8	1.8
9	0	0	0	2.1	.7	.4	0	4.9	1.8	1.4	1.8	1.8
10	0	0	0	2.1	.7	.4	0	4.9	1.8	2.5	1.8	1.8
11	0	0	0	2.1	.7	.4	0	4.9	1.8	1.8	1.8	1.8
12	0	0	0	2.1	.7	.4	0	4.9	1.8	1.8	1.8	1.8
13	0	0	0	2.1	.7	.4	0	4.9	1.8	1.8	1.8	.7
14	0	0	0	2.1	.7	.4	0	4.9	1.8	1.8	.7	1.8
15	0	0	0	2.1	.7	.4	0	4.9	1.8	1.8	1.8	2.5
16	0	0	0	2.1	.7	.4	0	4.9	1.8	1.8	1.8	1.8
17	0	0	0	2.1	.7	.4	0	4.9	1.8	1.8	2.1	2.5
18	0	0	0	2.1	.7	.4	0	4.9	1.8	1.8	2.5	1.4
19	0	0	0	2.1	.7	.4	0	4.9	1.8	1.8	1.8	1.8
20	0	0	0	2.1	.7	.4	0	4.9	1.8	0	2.1	1.8
21	0	0	0	2.1	.7	.4	0	4.9	1.8	1.8	2.8	1.8
22	0	0	0	2.1	.7	.4	0	4.9	1.8	1.8	3.5	2.5
23	0	0	0	2.1	.7	.4	0	4.9	1.8	1.8	2.8	2.1
24	0	0	0	2.1	.7	.4	0	4.9	1.8	1.8	3.5	1.8
25	0	0	0	2.1	.7	.4	0	4.9	1.8	1.8	1.8	1.8
26	0	0	2.8	2.1	.7	.4	0	4.9	1.8	1.8	1.8	1.8
27	0	0	2.8	2.1	.7	.4	0	4.9	1.8	1.8	1.8	1.8
28	0	0	2.8	2.1	.7	.4	0	4.9	1.8	1.8	1.8	2.5
29	0	0	2.8	2.1	.7	.4	0	4.9	1.8	2.1	1.8	1.8
30	0		2.8	2.1	.7	.4	0	4.9	1.8	3.2	1.8	1.8
31	0		2.8		.7		0	4.9		1.4		1.8
Sum	0	0	17.0	63.6	23.3	10.6	0	153	53.0	54.7	58.6	56.9

Month	Current Year 1980 Extreme Gage Feet High	Extreme Gage Feet Low	ø Extreme Second-Feet High Day	High	ø Extreme Second-Feet Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1968-1980 Acre-Feet Average	Maximum	Minimum
Jan.				0		0	0	0	216	520	0
Feb.				0		0	0	0	186	311	0
Mar.			!26	2.8	! 1	0	.7	33.6	268	871	33.6
Apr.			! 1	2.1	! 1	2.1	2.1	126	251	431	120
May			! 1	1.4	! 3	.7	.7	46.2	270	435	46.2
June			! 1	.4	! 1	.4	.4	21.0	237	409	21.0
July				0		0	0	0	307	528	0
Aug.			! 1	4.9	! 1	4.9	4.9	304	345	596	111
Sept.			! 1	1.8	! 1	1.8	1.8	105	323	549	105
Oct.			30	3.2	20	0	1.8	109	293	507	109
Nov.			!22	3.	14	.7	2.1	116	254	504	109
Dec.			!15	2.5	13	.7	1.8	113	251	597	113
Yearly				4.9		0	1.4	974	3,206	5,359	974
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				0.14		0	0.04	1,201.4	3,955	6,610	1,201.4

ø Mean daily ! And other days

WASTE WATERS FROM MEXICAN SYSTEM OF CANALS ENTERING THE UNITED STATES

DESCRIPTION: During 1980 the only flow to the New River in Mexico was from the Mexicali Potable Water Plant, which discharges into Rivera Drain (Drain 134), and thence to New River. There were no discharges during 1980 from Wisteria Wasteway, located 4.3 miles (7.0 km) upstream from the international boundary in Colonia Wisteria.

RECORDS: Records of the Potable Water Plant are based on flows measured on a Parshall flume less pumping to the city. Records obtained and furnished by the State Commission of Public Services of Mexicali. Records available: Wisteria Wasteway, January 1951 through 1975; Sifon Wasteway, January 1952 to April 30, 1964; Pueblo Nuevo Wasteway, January 1956 through 1965; and the Potable Water Plant, January 1968 through December 1980.

REMARKS: To obtain data for Sifon and Pueblo Nuevo Wasteways, see bulletins 1 to 6 (1960-1965); and for Wisteria Wasteway, bulletins 1 to 16 (1960-1975). For data on wastes from Potable Water Plant, see page 58 of this bulletin.

Monthly Discharge in Acre-Feet

Month	Current Year 1980	Period 1956-1980		
		Average	Maximum	Minimum
January	1,607	1,204	8,758	15.4
February	2,356	859	7,281	19.6
March	2,075	592	2,610	21.7
April	3,194	528	3,194	16.1
May	1,176	355	1,176	9.1
June	21.0	468	5,670	0
July	2,171	714	10,251	0
August	4,137	633	4,137	0
September	3,215	520	3,215	21.0
October	2,541	696	3,474	8.4
November	1,587	727	3,784	0
December	2,696	1,162	8,691	0
Yearly	26,776	8,458	27,430	399
	Thousands of Cubic Meters			
	33,028	10,433	33,835	492

SALTON SEA - ELEVATIONS OF WATER SURFACE

DESCRIPTION: Water-stage recorder and staff gage located on the western shore of the Salton Sea, 15.5 miles (24.9 km) northwest of Westmoreland, Imperial County, California. The Salton Sea is the sink of a closed basin which has a drainage area of 8,360 square miles (21,652 km^2). Zero of the gage is 250.00 feet (76.2 m) below mean sea level, U. S. C. & G. S. datum.

RECORDS: Records of water surface elevations available from November 1904 through 1980. From January 1925 to October 22, 1951, once monthly records of elevations were collected by Imperial Irrigation District from a bench mark at Figtree John's Spring, about 22 miles (35.4 km) northwest along the western shore from the present gage. Since October 24, 1951, a continuous record of gage heights has been obtained by the U. S. Geological Survey at new gaging station published as "Salton Sea near Westmoreland, California." The elevation of the old station is at a datum of one foot (0.30 m) higher than that of the present station. All records reported below and the area and capacity table are adjusted to the datum of the present station.

REMARKS: Runoff from the basin, irrigation drainage and waste water from Imperial and Coachella Valleys in the United States, and drainage and waste water from part of the Mexicali Valley in Mexico discharge into the Salton Sea. Water from Mexico enters the United States in the Alamo and New River channels. The bottom of the sea is 277.7 feet (84.6 m) below mean sea level, U. S. C. & G. S. datum.

EXTREMES: Maximum elevation during year, 227.2 feet (69.3 m) below mean sea level. Minimum elevation during year, 228.4 feet (69.6 m) below mean sea level. Extremes for period of record, maximum elevation 195.9 feet (59.7 m) below mean sea level, February 10 to March 29, 1907; minimum elevation since 1906, 251.6 feet (76.7 m) below mean sea level in November 1924.

Mean Daily Water Surface Elevation in Feet below Mean Sea Level - 1980

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	228.4	228.2	227.6	227.4	227.2	227.4	227.5	227.6	227.9	228.0	228.2	228.1
2	228.4	228.2	227.6	227.5	227.2	227.4	227.5	227.6	227.9	228.0	228.2	228.2
3	228.4	228.2	227.6	227.4	227.2	227.4	227.5	227.6	227.9	228.0	228.2	228.1
4	228.4	228.1	227.6	227.4	227.2	227.4	227.5	227.6	227.9	228.0	228.2	228.1
5	228.4	228.1	227.6	227.4	227.2	227.4	227.5	227.6	227.9	228.0	228.2	228.1
6	228.4	228.1	227.6	227.4	227.2	227.4	227.5	227.6	227.9	228.0	228.2	228.1
7	228.4	228.1	227.6	227.4	227.2	227.4	227.5	227.6	227.9	228.0	228.2	228.1
8	228.4	228.1	227.6	227.4	227.2	227.4	227.5	227.6	227.9	228.0	228.2	228.1
9	228.4	228.1	227.6	227.4	227.2	227.4	227.5	227.7	227.9	228.0	228.2	228.1
10	228.4	228.1	227.5	227.4	227.3	227.4	227.5	227.7	228.0	228.0	228.1	228.1
11	228.3	228.1	227.5	227.3	227.3	227.4	227.5	227.6	228.0	228.0	228.1	228.1
12	228.3	228.1	227.5	227.3	227.3	227.4	227.5	227.7	228.0	228.0	228.1	228.1
13	228.3	228.1	227.5	227.3	227.3	227.4	227.6	227.7	228.0	228.0	228.1	228.1
14	228.3	228.0	227.5	227.3	227.3	227.4	227.6	227.7	228.0	228.1	228.1	228.1
15	228.3	228.0	227.5	227.3	227.3	227.4	227.6	227.7	228.0	228.1	228.1	228.1
16	228.3	228.0	227.4	227.3	227.3	227.4	227.6	227.7	228.0	228.1	228.1	228.1
17	228.3	227.9	227.5	227.3	227.2	227.4	227.6	227.8	228.0	228.1	228.2	228.1
18	228.4	227.9	227.5	227.3	227.2	227.4	227.6	227.8	228.0	228.1	228.2	228.1
19	228.3	227.8	227.5	227.3	227.2	227.4	227.6	227.8	228.0	228.1	228.2	228.1
20	228.3	227.8	227.5	227.2	227.2	227.5	227.6	227.8	228.0	228.1	228.2	228.1
21	228.3	227.7	227.5	227.3	227.2	227.5	227.6	227.8	228.1	228.1	228.2	228.1
22	228.3	227.6	227.5	227.4	227.3	227.5	227.6	227.9	228.1	228.1	228.2	228.1
23	228.3	227.6	227.5	227.4	227.4	227.5	227.6	227.9	228.1	228.1	228.2	228.1
24	228.3	227.6	227.5	227.3	227.4	227.5	227.6	227.9	228.1	228.1	228.2	228.1
25	228.3	227.6	227.5	227.3	227.4	227.5	227.6	227.9	228.1	228.2	228.2	228.1
26	228.3	227.6	227.5	227.3	227.4	227.5	227.6	227.9	228.1	228.2	228.2	228.1
27	228.3	227.6	227.4	227.2	227.4	227.5	227.6	227.9	228.1	228.1	228.2	228.1
28	228.3	227.6	227.4	227.2	227.4	227.5	227.6	227.9	228.1	228.1	228.2	228.0
29	228.2	227.6	227.4	227.2	227.4	227.5	227.6	227.9	228.0	228.2	228.2	228.0
30	228.2		227.4	227.3	227.4	227.5	227.6	227.9	228.0	228.2	228.2	228.0
31	228.2		227.4		227.4		227.6	227.9		228.2		228.0
Avg.	228.3	227.9	227.5	227.3	227.3	227.4	227.6	227.8	228.0	228.1	228.2	228.1

Current Year 1980			Period 1935-1980		
Month	Ø Extreme Elevation Feet		Elevation Feet		
	High	Low	# Average	# Maximum	! Minimum
Jan.	228.2	228.4	237.02	228.3	249.3
Feb.	227.6	228.2	236.70	227.9	248.8
Mar.	227.4	227.6	236.44	227.5	248.6
Apr.	227.2	227.5	236.24	227.3	248.7
May	227.2	227.4	236.23	227.3	248.5
June	227.4	227.5	236.38	227.4	248.8
July	227.5	227.6	236.54	227.6	249.1
Aug.	227.6	227.9	236.72	227.8	249.4
Sept.	227.9	228.1	236.92	228.0	249.4
Oct.	228.0	228.2	236.97	228.1	249.8
Nov.	228.1	228.2	236.99	228.2	250.0
Dec.	228.0	228.2	236.86	228.1	249.6
Yearly	227.2	228.4	236.67	227.8	250.0

Ø Mean daily # Mean monthly ! Reading near first day of month

Area and Capacity Table		
Elevation Feet Below M.S.L.	Area Acres	Capacity Acre-Feet
277.7	0	0
274.0	20,600	25,700
270.0	62,900	188,700
266.0	94,600	510,600
260.0	122,600	1,170,000
256.0	134,700	1,684,000
252.0	148,800	2,250,000
244.0	179,700	3,562,000
240.0	196,900	4,315,000
235.0	221,800	5,360,000
230.0	235,800	6,504,000
220.0	262,000	8,993,000
210.0	288,500	11,740,000
200.0	315,500	14,760,000

CHEMICAL ANALYSES OF WATER SAMPLES
1980

The tables below are based on quarterly samples from the Alamo River taken and analyzed by the State of California Department of Water Resources. Beginning December 1971, not all constituents analyzed. New River samples are collected monthly and analyzed by the U. S. Geological Survey.

Samples from the Alamo River are taken north of the international boundary at downstream end of box culvert under the All-American Canal. Flow at this point includes drainage flows across international boundary and flows from drain intercepts along toe of south bank of All-American Canal. Samples from New River are taken from the right bank at road bridge 450 feet north of international boundary. Records of sampling extend from April 1951 through 1980.

To convert milligram equivalents to parts per million by weight, multiply each ion by its appropriate conversion factor. These factors are: Ca, 20.04; Mg, 12.16; Na 22.99; (CO_3 plus HCO_3) expressed as CO_3, 30.00; SO_4, 48.03; Cl, 35.45; NO_3, 62.00. To convert tons per acre-foot to parts per million, multiply tons per acre-foot by 735.5. Electrical conductivity, reported in the tables as EC x 10^6 at 25°C, is a relative measure of the total salt concentration.

Alamo River

Month	No. of Samples	Dissolved Solids: Tons Per Acre-Foot	Dissolved Solids: Total Tons	EC x 10^6 @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
Jan.															
Feb.															
Mar.	1	5.15	742	5,890		8.1							21.86	32.72	
Apr.															
May															
June	1					7.9									
July															
Aug.															
Sept.	1					7.9									
Oct.															
Nov.															
Dec.	1	4.50	612	4,840		8.1							20.36	26.06	

New River

Jan.	1	5.90	67,800	7,200		7.7	69		11.48	9.87	47.85		14.78	53.60	
Feb.	2	5.96	72,200	7,500		6.9	68		11.48	10.69	47.85		16.03	53.60	
Mar.	2	6.43	84,800	7,050		7.8	69		12.97	10.69	52.20		15.30	55.85	
Apr.	2	6.70	92,700	6,740		7.8	68		13.22	11.92	54.37		12.70	64.88	
May	1	6.62	82,000	8,000		7.9	71		11.98	10.69	56.55		17.07	59.24	
June	3	6.68	72,200	8,150		7.7	71		12.97	10.69	56.55		15.93	63.19	
July	1	5.63	71,800	7,030		7.4	69		11.98	9.05	47.85		13.12	50.78	
Aug.	2	5.44	80,500	6,250		7.8	68		10.98	9.05	42.63		16.03	47.95	
Sept.	1	5.08	74,500	6,000		7.9	67		10.98	9.05	40.45		15.62	42.31	
Oct.	1	4.76	66,600	5,800		7.7	68		9.98	8.06	38.28		12.70	42.31	
Nov.	1	4.99	63,200	7,100		7.9	68		10.48	8.22	39.58		11.87	45.13	
Dec.	1	4.77	65,000	6,330		7.6	64		10.98	9.87	37.41		13.74	39.49	
	18														

** Percent of total cations

*** Percent of total anions

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

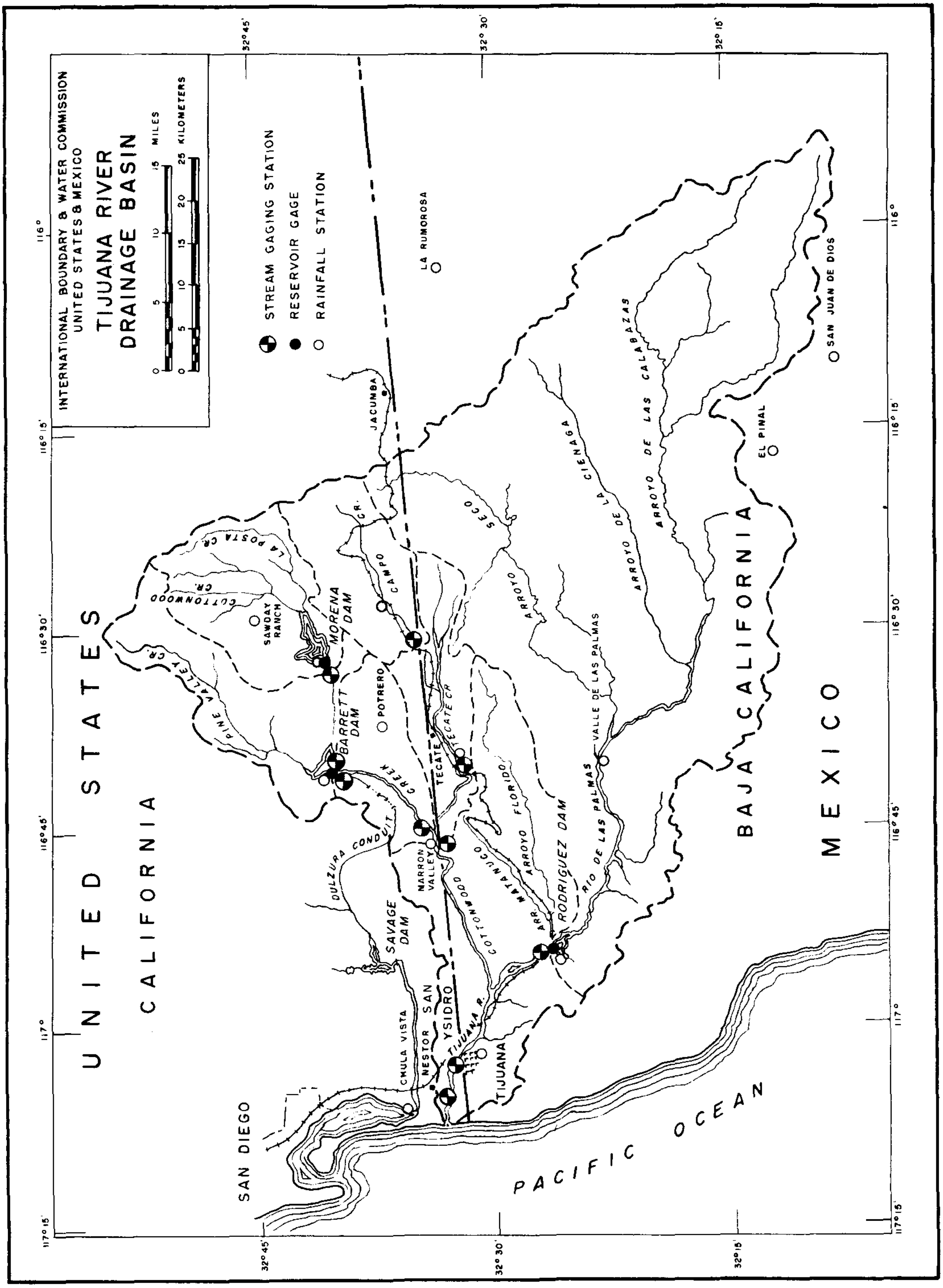
1980

The following table shows electrical conductivity, expressed in mhos per centimeter x 10^6 at 25°C, of individual water samples from the New River in Mexico at the international boundary. Samples were taken by the Mexican Section of the Commission, who also made the determinations.

Electrical conductivity is a relative indication of the concentration of dissolved solids in the water samples.

New River at International Boundary

Date	ECx10^6 @25°C	Date	ECx10^6 @25°C	Date	ECx10^6 @25°C	Date	ECx10^6 @25°C	Date	ECx10^6 @25°C	Date	ECx10^6 @25°C	Date	ECx10^6 @25°C	Date	ECx10^6 @25°C
January		February		April		May		July		August		October		November	
8	7,260	19	6,900	1	6,880	20	6,980	1	7,340	19	6,920	8	7,080	18	7,010
15	6,090	26	6,400	8	6,910	27	7,050	8	8,150	26	6,950	14	7,010	25	6,980
22	6,910	March		15	7,040	June		15	7,900	September		21	6,980	December	
29	7,210	4	6,100	22	6,960	3	6,990	22	7,730	2	7,050	28	7,010	2	6,910
February		11	6,700	29	7,020	10	7,010	29	7,020	9	6,980	November		9	7,120
4	6,400	18	6,950	May		17	6,970	August		17	7,000	4	6,930	16	7,220
12	6,090	25	7,000	6	7,000	24	7,150	5	7,200	23	6,990	11	7,110	23	7,340
				13	7,600			12	6,980	30	6,990			30	7,200


INTERNATIONAL BOUNDARY & WATER COMMISSION
UNITED STATES & MEXICO
TIJUANA RIVER
DRAINAGE BASIN
MILES
KILOMETERS
STREAM GAGING STATION
RESERVOIR GAGE
RAINFALL STATION
UNITED STATES
CALIFORNIA
BAJA CALIFORNIA
MEXICO
PACIFIC OCEAN
SAN DIEGO
CHULA VISTA
NESTOR
SAN YSIDRO
TIJUANA
TECATE
JACUMBA
LA RUMOROSA
EL PINAL
SAN JUAN DE DIOS
VALLE DE LAS PALMAS
SAWDAY RANCH
POTRERO
NARRON VALLEY
MORENA DAM
BARRETT DAM
SAVAGE DAM
RODRIGUEZ DAM
DULZURA CONDUIT
COTTONWOOD CR.
PINE VALLEY CR.
LA POSTA CR.
CAMPO CR.
TECATE CR.
TIJUANA R.
RIO DE LAS PALMAS
ARROYO SECO
ARROYO FLORIDO
ARR. MATANUCO
ARROYO DE LA CIENAGA
ARROYO DE LAS CALABAZAS
32° 45'
32° 30'
32° 15'
116°
116° 15'
116° 30'
116° 45'
117°
117° 15'

COTTONWOOD CREEK ABOVE MORENA DAM, CALIFORNIA

DESCRIPTION: Staff gage located on east side of outlet tower immediately upstream from face of Morena Dam. The dam is located on Cottonwood Creek 1.8 miles (2.9 km) upstream from the mouth of Hauser Creek, 8.5 miles (13.7 km) upstream from Barrett Dam, and about 20 miles (32.2 km) upstream from the international boundary. The zero of the gage is 2,882.4 feet (878.56 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Reservoir inflows shown below were computed from monthly reservoir records of storage, releases, spills, leakage, evaporation, and rainfall, by the International Boundary and Water Commission, United States Section. They represent all water reaching Morena Reservoir, including rainfall on reservoir water surface. Basic data were furnished by the city of San Diego, California. Records April 1911 through 1980.

REMARKS: Storage began in Morena Reservoir March 1910. Reservoir capacity and area ratings date from 1910 when Morena Dam was completed. Records for 1980 computed on basis of area-capacity curves determined from 1948 resurvey. Various changes have been made to the spillway section since construction of the dam. Elevation of the present crest of ungated spillway is 157.00 feet (47.85 m), gage datum. Reservoir capacity at spillway crest, 1948 survey, is 50,210 acre-feet (61,934,000 m^3). The entire capacity of Morena Reservoir is used to furnish a part of the water supply of the city of San Diego, California. Water is released from Morena Reservoir down Cottonwood Creek to Barrett Reservoir as required.

EXTREMES: Prior to 1937, maximum monthly inflow, 37,200 acre-feet (45,886,000 m^3), January 1916; minimum no flow during parts of many years.

Monthly Discharge in Acre-Feet

Month	Current Year 1980	Period 1937-1980		
		Average	Maximum	Minimum
January	7,472	584	7,472	0
February	33,569	1,867	33,569	8.0
March	24,190	2,216	24,190	19.3
April	12,101	1,289	12,101	3.3
May	10,544	597	10,544	0
June	5,719	311	5,719	0
July	3,151	184	3,151	0
August	1,119	107	1,260	0
September	246	62.3	1,070	0
October	198	71.7	1,270	0
November	502	146	1,380	0
December	1,195	449	3,590	4.4
Yearly	100,006	7,884	100,006	121
	Thousands of Cubic Meters			
	123,356	9,725	123,356	149

COTTONWOOD CREEK BELOW MORENA DAM, CALIFORNIA

DESCRIPTION: Two water-stage recorders, one on the upstream side of the southeast abutment of Morena Dam for measuring head on the spillway crest and one immediately below the dam with a rectangular control weir for measuring ordinary reservoir releases, and cableway located about 0.8 mile (1.3 km) downstream from the dam. Discharge measurements made at the cableway include leakage, controlled releases, and spillway discharges.
RECORDS: Monthly records shown below represent the water available immediately below Morena Dam, consisting of spillway waste, draft, and leakage from the dam. They are computed by the International Boundary and Water Commission, United States Section, from basic data furnished by the city of San Diego, California. Records available: January 1911 through 1980.
REMARKS: Flows at this station are regulated by Morena Dam; storage began March 1910. Water is released from Morena Reservoir as required and flows down the natural channel of Cottonwood Creek to Barrett Reservoir. There are no major diversions above Morena Dam.
EXTREMES: Maximum monthly discharge since 1937, 24,097 acre-feet (29,723,000 m^3) March of this year. Prior to 1937, maximum monthly discharge, 21,400 acre-feet (26,397,000 m^3), February 1916; minimum, no flow during several months of various years.

Monthly Discharge in Acre-Feet

Month	Current Year 1980	Period 1937-1980		
		Average	Maximum	Minimum
January	54.2	100	1,700	0
February	15,926	639	15,926	0
March	24,097	866	24,097	0
April	11,621	951	12,950	0
May	10,398	424	10,398	0
June	5,038	372	7,360	0
July	2,134	196	2,340	0
August	770	145	1,550	0
September	339	247	5,880	0
October	350	79.4	529	0
November	339	104	1,260	0
December	350	274	5,350	0
Yearly	71,416	4,397	71,416	0
	Thousands of Cubic Meters			
	88,091	5,424	88,091	0

COTTONWOOD CREEK ABOVE BARRETT DAM, CALIFORNIA

DESCRIPTION: Staff gage located immediately upstream from face of dam on west side of outlet tower. Barrett Dam is located on Cottonwood Creek 8.5 miles (13.7 km) downstream from Morena Dam, 1 mile (1.6 km) downstream from the mouth of Pine Valley Creek and about 12 miles (19.3 km) upstream from the international boundary. Zero of gage is 1,446.12 feet (440.78 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Records reported below represent all water reaching Barrett Dam from the sub-basin below Morena Dam, including rainfall on the reservoir water surface. Leakage, releases, and spills from Morena Reservoir are not included. The inflows were computed from monthly reservoir records of storage, releases, spills, leakage, evaporation, and rainfall furnished by the city of San Diego, California. Records available: January 1921 through 1980. Records of stream flow for a station at the dam site are also available for the periods 1906-1915 and 1917-1920.

REMARKS: Storage began at Barrett Reservoir in January 1921. The area-capacity-elevation curves used in the inflow calculations are dated 1948, 1951, and 1955 and were furnished by the city of San Diego, California. Capacity of reservoir at top of flash gates on spillway (gage height 168.88 feet (51.47 m)) is 44,755 acre-feet (55,205,000 m^3). Capacity at spillway crest (gage height 160.88 feet (49.04 m)) is 37,950 acre-feet (46,811,000 m^3). Dead storage, 719 acre-feet (887,000 m^3) below lowest outlet (gage height 58.88 feet) (17.95 m) is included in these capacities. The entire capacity of Barrett Reservoir is used to furnish a part of the water supply of the city of San Diego, California.

EXTREMES: Maximum monthly discharge since 1937, 54,755 acre-feet (67,540,000 m^3) February of this year. Prior to 1937, maximum monthly discharge, 54,800 acre-feet (67,595,000 m^3) February 1927; minimum, no flow during several months of various years.

Monthly Discharge in Acre-Feet

Month	Current Year 1980	Period 1937-1980		
		Average	Maximum	Minimum
January	3,721	642	3,721	5.2
February	54,755	2,787	54,755	7.6
March	36,010	3,691	36,010	14.1
April	7,128	1,872	21,630	10.2
May	5,461	729	5,461	0
June	2,568	285	2,568	0
July	1,687	181	1,687	0
August	541	99.5	596	0
September	522	106	759	0
October	614	78.5	645	.1
November	528	137	1,200	0
December	795	450	3,380	1.7
Yearly	114,330	11,058	114,330	129
	Thousands of Cubic Meters			
	141,025	13,640	141,025	159

DULZURA CONDUIT BELOW BARRETT DAM, CALIFORNIA

DESCRIPTION: Water-stage recorder 0.5 mile (0.8 km) downstream from Barrett Dam on right bank of Dulzura Conduit 50 feet (15.2 m) upstream from road crossing to Barrett Dam. Elevation of gage has not been determined.

RECORDS: Computed on basis of head on control section of flume, as measured by water-stage recorder, and rating curve determined from current meter measurements. Records obtained and furnished by the city of San Diego, California. Records available: January 1909 through 1980.

REMARKS: Barrett Dam was completed in 1921. Prior to this date the intake of Dulzura Conduit was located 1.5 miles (2.4 km) upstream. The conduit carries diversions from Barrett Reservoir on Cottonwood Creek westerly across the divide into Otay Reservoir for municipal use by the city of San Diego. Prior to September 30, 1958, station was located 8 miles (12.9 km) along the conduit from Barrett Dam, being reported as "Dulzura Conduit near Dulzura"; and the draft from Barrett Reservoir was computed from the discharges obtained at the conduit gaging station, multiplied by the factor 1.05 to allow for channel loss in the reach from the reservoir to the gaging station.

EXTREMES: Since 1937: Maximum mean daily discharge, 55 second-feet (1.56 m^3/sec) on March 15, 1954; minimum discharge, no flow for long periods on many occasions.

Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.26	0.56	0	0	0	0	0	0	28.2	29.8	32.6	33.0
2	.26	.52	0	0	0	0	0	0	28.0	29.4	33.2	32.8
3	.23	.44	0	0	0	0	0	0	28.0	29.4	33.9	32.8
4	.23	.40	0	0	0	0	0	0	28.0	29.4	34.1	32.6
5	.23	.36	0	0	0	0	0	0	28.0	29.6	34.3	32.6
6	.23	.32	0	0	0	0	0	0	28.0	29.6	34.5	32.4
7	.23	.32	0	0	0	0	0	0	28.0	29.6	34.8	32.2
8	.23	0	0	0	0	0	0	8.9	28.0	30.5	35.0	32.2
9	.29	0	0	0	0	0	0	16.4	27.8	31.1	35.2	32.0
10	.20	0	0	0	0	0	0	16.4	27.8	31.7	35.2	32.0
11	.32	0	0	0	0	0	0	16.4	27.8	32.0	35.4	32.0
12	.26	0	0	0	0	0	0	19.5	27.8	31.3	35.4	31.7
13	.23	0	0	0	0	0	0	24.9	27.8	30.9	35.4	31.7
14	.23	0	0	0	0	0	0	24.7	27.8	30.9	35.6	31.7
15	.23	0	0	0	0	0	0	24.7	27.8	29.8	35.9	31.7
16	.23	0	0	0	0	0	0	24.7	27.8	31.7	35.6	31.7
17	.23	0	0	0	0	0	0	24.7	27.8	31.7	35.6	31.7
18	.26	0	0	0	0	0	0	24.7	28.0	31.7	35.4	31.5
19	.26	0	0	0	0	0	0	26.5	28.2	31.7	35.0	31.5
20	.26	0	0	0	0	0	0	26.5	28.2	31.7	34.8	31.3
21	.26	0	0	0	0	0	0	26.5	30.9	31.7	34.5	31.3
22	.26	0	0	0	0	0	0	26.5	31.1	31.7	34.5	31.3
23	.26	0	0	0	0	0	0	26.5	31.5	31.7	34.3	31.1
24	.26	0	0	0	0	0	0	26.5	30.9	31.7	34.1	31.1
25	.26	0	0	0	0	0	0	26.5	30.7	32.0	33.9	31.1
26	.26	0	0	0	0	0	0	26.5	30.3	32.6	33.4	31.1
27	.26	0	0	0	0	0	0	28.2	29.5	32.4	33.9	31.1
28	.26	0	0	0	0	0	0	28.2	29.5	32.4	33.2	31.1
29	1.30	0	0	0	0	0	0	28.2	29.5	32.4	33.0	30.9
30	1.11		0	0	0	0	0	28.2	29.5	32.0	33.0	30.9
31	.71		0		0		0	28.2		32.2		30.9
Sum	10.10	2.92	0	0	0	0	0	579.0	862.2	966.3	1,034.7	983.0

Current Year 1980									Period 1937-1980		
Month	Extreme Gage Feet		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	High Day	High	Low Day	Low			Average	Maximum	Minimum
Jan.			29	1.30	10	0.2	0.33	20.0	324	2,350	0
Feb.			1	.56	! 8	0	.10	5.8	330	2,130	0
Mar.				0		0	0	0	485	2,330	0
Apr.				0		0	0	0	764	2,860	0
May				0		0	0	0	881	3,040	0
June				0		0	0	0	924	2,920	0
July				0		0	0	0	772	2,920	0
Aug.			!27	28.2	! 1	0	18.7	1,148	694	2,820	0
Sept.			23	31.5	! 9	27.8	28.7	1,710	479	2,320	0
Oct.			26	32.6	! 2	29.4	31.2	1,917	388	2,450	0
Nov.			15	35.9	1	32.6	34.5	2,052	476	2,760	0
Dec.			1	33.0	!29	30.9	31.7	1,950	446	2,305	0
				35.9		0	12.1	8,803	6,963	27,170	0
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				1.02		0	0.34	10,858	8,589	33,514	0

! And other days Ø Mean daily

COTTONWOOD CREEK BELOW BARRETT DAM, CALIFORNIA

DESCRIPTION: Water-stage recorder and cableway located about 2.5 miles (4.0 km) downstream from Barrett Dam and 0.5 mile (0.8 km) upstream from Rattlesnake Canyon for measuring Barrett Dam spills; and staff gage and control weir located immediately below the dam for measuring leakage. The elevation of the gage is about 1,000 feet (305 m) (from topographic map).

RECORDS: Data furnished by the city of San Diego, California. Prior to January 1953, the records were furnished by the city of San Diego and reviewed and revised by the United States Section of the Commission. The recorder is to be operated only when Barrett Reservoir is near or above spillway level. Spillway discharges have occurred in May 1943, March, April 1979, and January to May of this year. Spillway discharges included in the period record below were computed by the city of San Diego from the head on the spillway crest, read on the reservoir gage, and applied to a broad-crested weir formula. Records available: January 1921 through 1980. Storage began in Barrett Reservoir in January 1921.

REMARKS: Records reported below represent the water available in the natural channel of Cottonwood Creek immediately below Barrett Dam. Records of draft from Barrett Reservoir are not included, inasmuch as all releases are made to Dulzura Conduit which transports water outside the basin. Leakage is mainly through the spillway gates.

EXTREMES: Maximum monthly discharge since 1937, 70,318 acre-feet (86,737,000 m^3) February of this year. Prior to 1937, maximum monthly discharge 38,400 acre-feet (47,366,000 m^3) February 1927; minimum, no flow during several months of various years.

Monthly Discharge in Acre-Feet

Month	Current Year 1980	Period 1937-1980		
		Average	Maximum	Minimum
January	84.2	15.6	590	0
February	70,318	1,622	70,318	0
March	60,278	2,017	60,278	0
April	16,277	1,430	33,400	0
May	11,702	475	11,702	0
June	7,738	206	7,738	0
July	4,306	99.5	4,306	0
August	1,535	36.2	1,535	0
September	298	7.9	298	0
October	123	3.7	123	0
November	19.8	1.1	19.8	0
December	0	1.2	21	0
Yearly	172,679	5,915	172,679	0
	Thousands of Cubic Meters			
	212,998	7,296	212,998	0

COTTONWOOD CREEK ABOVE TECATE CREEK NEAR DULZURA, CALIFORNIA

DESCRIPTION: Water-stage recorder and cableway located 1.6 miles (2.6 km) upstream from the international land boundary between the United States and Mexico, 0.8 mile (1.3 km) upstream from the confluence with Tecate Creek, and 5.1 miles (8.2 km) south of Dulzura, California. Low water discharge measurements are made by wading at the gage; high water measurements are made from the cableway, which is located 700 feet (213 m) downstream from the gage. Zero of the gage is 569.40 feet (173.55 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on a continuous record of gage heights and current meter measurements or observation of no flow. Records obtained and furnished by the U. S. Geological Survey. Records available: October 1936 through 1980.

REMARKS: Flow is largely controlled by Barrett and Morena Reservoirs, 10 (16.1 km) and 18 miles (29.0 km), respectively, upstream from this station. During 1980 there were releases or spills to the natural channel of Cottonwood Creek at Barrett Dam, the lowermost dam in Cottonwood Creek Basin.

EXTREMES: Maximum discharge 11,700 second-feet (331 m^3/sec) February 21,1980 (gage height 11.15 feet) (3.40 m). Minimum discharge, no flow during part of each year.

Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	* Oct.	* Nov.	* Dec.
1	0.40	460	378	404	345	139	64	33	16	5.1	4.8	1.8
2	.40	317	357	465	364	137	65	33	16	4.0	2.4	3.7
3	.40	233	488	528	364	138	62	33	16	5.7	2.8	5.1
4	.40	186	498	462	317	136	61	32	16	5.9	2.7	2.7
5	.42	151	441	448	144	133	58	31	15	6.1	4.7	2.1
6	.40	122	839	406	125	131	57	30	15	5.0	4.8	1.2
7	.43	101	1,090	184	116	128	57	29	15	4.7	6.8	.59
8	.49	83	782	198	116	125	55	30	14	4.4	7.9	.32
9	1.2	69	685	221	106	118	55	29	13	3.5	5.4	.34
10	2.2	57	631	252	105	112	53	29	12	2.8	2.4	1.2
11	15	48	1,090	274	106	108	53	28	12	2.5	2.4	1.3
12	6.1	42	810	290	109	107	54	27	12	3.0	1.6	1.3
13	3.0	45	655	295	108	105	53	25	12	2.9	1.4	1.8
14	2.0	311	533	303	111	101	49	24	12	3.8	1.6	1.4
15	1.6	620	469	307	134	98	46	24	11	3.4	2.1	1.3
16	1.3	534	417	310	226	94	46	24	11	4.4	1.9	1.2
17	1.1	1,440	378	311	226	92	45	23	10	4.1	1.3	.50
18	1.7	4,650	365	313	218	89	44	22	9.6	2.5	1.2	.91
19	2.8	3,040	395	311	208	86	43	22	9.8	1.1	1.2	1.1
20	2.0	5,190	361	308	192	82	43	21	8.8	1.3	1.3	1.2
21	1.6	6,430	345	305	184	79	42	21	8.1	2.3	1.3	1.4
22	1.3	3,380	395	310	177	76	40	21	7.7	4.2	1.7	1.1
23	1.1	1,620	382	352	171	78	40	20	7.7	3.8	2.3	1.4
24	.94	1,060	353	350	164	76	39	19	7.3	4.4	2.8	1.9
25	.86	736	345	348	158	75	39	20	7.2	4.8	1.9	2.3
26	.79	559	378	346	154	74	36	18	6.7	6.7	1.2	2.7
27	.76	474	382	338	150	70	34	19	6.4	6.1	1.3	1.9
28	1.1	431	374	330	152	69	34	18	6.2	3.1	1.6	2.0
29	1,900	408	365	339	150	65	34	17	6.0	1.8	1.6	0
30	3,220		370	342	146	63	35	17	5.7	1.4	1.7	1.3
31	837		386		142		35	17		4.4		1.6
Sum	34,797		9,950		2,984		756			119.2		48.66
	6,008.79		15,737		5,488		1,471			325.2		78.1

Month	Extreme Gage Feet		Current Year 1980 Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period 1937-1980 Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.			30	3,220	! 1	0.40	194	11,918	461	11,918	0
Feb.			21	8,430	12	42	1,200	69,019	2,161	69,019	0
Mar.			! 7	1,090	!21	345	508	31,214	2,413	31,214	0
Apr.			3	528	7	184	332	19,736	1,919	40,240	0
May			! 2	364	10	105	177	10,885	558	10,885	0
June			1	139	30	63	99.5	5,919	193	5,919	0
July			2	65	!27	34	47.5	2,918	72.6	2,918	0
Aug.			! 1	33	!29	17	24.4	1,500	34.3	1,500	0
Sept.			! 1	16	30	5.7	10.8	645	16.2	645	0
Oct.*			26	6.7	19	1.1	3.85	236	8.6	236	0
Nov.*			8	7.9	!18	1.2	2.60	155	21.8	440	0
Dec.*			3	5.1	29	0	1.57	96.5	121	1,316	0
Yearly				8,430		0	212	154,242	7,980	154,242	0
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				239		0	6.00	190,256	9,843	190,256	0

* Provisional Ø Mean daily ! And other days

CAMPO CREEK NEAR CAMPO, CALIFORNIA

DESCRIPTION: Water-stage recorder and broad-crested weir on left bank, 0.5 mile (0.8 km) upstream from the international land boundary between the United States and Mexico, just upstream from the bridge on California State Highway 94, 3.5 miles (5.6 km) southwest of Campo, California. Zero of gage is 2,178.92 feet (664.13 m) above mean sea level, U. S. C. & G. S. datum.
RECORDS: Based on current meter measurements and observation of no flow. Records obtained and furnished by the U. S. Geological Survey. Records available: October 1936 through 1980.
REMARKS: Campo Creek originates in the United States and flows southwestward into Mexico where it joins Tecate Creek. The flow at this station was partially regulated by a small conservation reservoir, 1 mile (1.6 km) upstream, from August 1956 to February 20, 1980, when it was destroyed by a flood.
EXTREMES: Maximum discharge 880 second-feet (24.9 m^3/sec), February 6, 1937 (gage height 4.80 feet (1.46 m) present datum), from rating curve extended above 110 second-feet (3.12 m^3/sec) on basis of velocity-depth relation and cross-section area at the control. Minimum discharge, no flow during part of most years.

Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	* Oct.	* Nov.	* Dec.
1	0.43	11	80	86	51	21	14	10	8.0	7.0	11	7.6
2	.41	7.6	84	90	48	21	14	10	8.0	7.4	10	8.0
3	.42	6.1	110	76	36	20	13	10	8.0	7.6	11	8.1
4	.41	5.5	82	66	34	20	13	10	8.0	7.7	13	10
5	.44	4.8	85	53	33	19	13	10	8.0	7.5	13	13
6	.45	4.5	124	52	32	19	13	9.0	8.0	8.1	11	8.0
7	.61	4.2	83	51	34	19	13	9.0	7.5	6.7	12	8.1
8	.94	3.9	67	50	36	19	13	9.0	7.5	7.3	11	7.5
9	2.0	2.7	67	49	38	18	13	9.0	7.5	7.0	9.2	6.6
10	4.2	3.1	86	48	50	18	13	9.0	7.5	7.3	8.0	6.4
11	6.1	3.3	144	48	35	18	12	9.0	7.5	6.9	7.9	6.2
12	4.8	3.3	102	47	33	17	12	8.5	7.5	6.9	8.0	6.5
13	3.3	4.3	110	46	36	17	12	8.5	7.5	6.9	8.2	6.9
14	2.6	21	105	45	33	17	12	8.5	7.5	7.4	8.1	6.9
15	2.3	29	106	45	31	17	12	8.5	7.5	9.8	8.3	6.7
16	2.1	23	75	44	29	16	12	8.5	7.5	11	8.5	6.9
17	2.0	68	88	43	28	16	12	8.0	7.5	9.5	8.0	7.3
18	2.5	264	100	43	27	16	12	8.0	7.5	9.1	8.2	7.7
19	3.3	256	98	42	26	16	11	8.0	7.0	9.6	9.0	7.8
20	2.8	364	77	41	25	16	11	8.0	7.0	8.4	8.6	7.7
21	2.4	307	81	40	25	15	11	8.0	7.0	9.3	8.1	7.5
22	2.2	131	100	52	24	15	11	8.0	7.0	10	8.3	7.5
23	2.1	103	69	73	24	15	11	8.0	7.0	11	8.4	7.6
24	2.1	96	63	60	23	15	11	8.0	7.0	8.7	8.3	7.6
25	2.1	93	60	53	23	15	11	8.0	7.0	8.9	7.0	7.9
26	2.1	90	77	45	23	14	11	8.0	7.0	11	6.7	8.3
27	2.1	87	63	50	23	14	10	8.0	7.0	14	6.8	8.8
28	2.2	84	60	54	22	14	10	8.0	7.0	12	6.5	9.2
29	43	81	60	61	22	14	10	8.0	7.0	10	6.8	9.5
30	101		59	55	22	14	10	8.0	7.0	12	7.3	9.3
31	14		58		21		10	8.0		12		9.9
Sum	217.41	2,161.3	2,623	1,608	947	505	366	266.5	222.0	278.0	266.2	247.0

Current Year 1980 — **Period 1937-1980**

Month	Extreme Gage Feet		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.			30	101	! 2	0.41	7.01	431	118	906	0
Feb.			20	364	9	2.7	74.5	4,287	289	4,287	0
Mar.			11	144	31	58	84.6	5,203	418	5,203	0
Apr.			2	90	21	40	53.6	3,189	278	3,250	0
May			1	51	31	21	30.5	1,878	139	1,878	0
June			! 1	21	!26	14	16.8	1,002	61.5	1,002	0
July			! 1	14	!27	10	11.8	726	32.1	726	0
Aug.			! 1	10	!17	8.0	8.60	529	23.2	529	0
Sept.			! 1	8	!19	7.0	7.40	440	20.4	440	0
Oct. *			27	14	7	6.7	8.97	551	30.0	551	0
Nov. *			! 4	13	28	6.5	8.87	528	43.9	542	0
Dec. *			5	13	11	6.2	7.97	490	97.9	808	0
Yearly				364		0.41	26.5	19,254	1,551	19,254	0
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				10.3		0.01	0.75	23,750	1,913	23,750	0

* Provisional Ø Mean daily ! And other days

COTTONWOOD CREEK NEAR INTERNATIONAL BOUNDARY

DESCRIPTION: Water-stage recorder and cableway, 0.6 mile (1.0 km) upstream from the international land boundary between the United States and Mexico, 0.5 mile (0.8 km) downstream from the confluence of Cottonwood Creek and Tecate Creek, and 5.5 miles (8.9 km) south of Dulzura, California. This station is published by the U. S. Geological Survey under the name "Tijuana River near Dulzura, California." Low water discharge measurements are made by wading at the gage. The zero of the gage is 542.42 feet (165.33 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on a continuous record of gage heights and current meter measurements or observation of no flow. Records obtained and furnished by the U. S. Geological Survey. Records available: October 1936 through 1980.

REMARKS: Flow is partially controlled by Barrett and Morena Reservoirs, 11 (17.7 km) and 19 miles (30.6 km), respectively, upstream from this station. The flow at this station represents the amount of water passing the Marron Dam site.

EXTREMES: Maximum discharge, 12,200 second-feet (346 m^3/sec) estimated, February 21, 1980 (gage height 10.66 feet) (3.25 m) from rating curve extended above 200 second-feet (5.66 m^3/sec) on basis of hydrographic comparison with upstream station; maximum gage height, 11.19 feet (3.41 m) February 18, 1980; minimum discharge, no flow for part of most years.

Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	* Oct.	* Nov.	* Dec.
1	3.5	900	2,560	440	430	170	75	38	19	10	16	12
2	3.5	500	2,320	500	440	160	74	37	19	8.8	17	13
3	3.5	350	2,890	580	450	160	72	36	18	7.8	20	13
4	3.5	280	2,360	500	430	150	69	35	18	8.3	22	17
5	4.0	210	1,850	480	250	150	68	34	17	9.6	18	25
6	3.5	170	2,860	460	160	140	66	34	17	8.4	23	24
7	4.5	140	2,580	200	150	140	65	33	16	7.5	19	24
8	5.0	120	1,590	230	140	140	64	32	16	6.4	18	23
9	10.0	100	1,090	260	140	130	62	32	16	6.5	17	22
10	26.0	90	1,080	290	130	130	61	31	16	8.0	16	17
11	221	80	2,120	320	130	130	60	30	15	9.7	14	15
12	46.0	70	1,310	350	130	120	58	29	15	10.	13	16
13	20.0	118	1,250	370	130	120	57	29	14	9.9	14	12
14	12.0	681	1,240	380	130	120	56	28	14	11	17	15
15	9.0	1,060	1,230	380	150	110	54	28	14	20	16	17
16	7.0	912	933	380	240	110	53	27	14	19	16	16
17	5.7	2,340	664	390	240	110	52	26	13	16	13	13
18	13.0	5,480	656	390	230	100	51	26	13	14	9.5	12
19	31.0	3,700	691	390	230	100	50	25	13	9	11	13
20	10.0	5,600	644	390	220	95	49	25	12	11	12	13
21	8.0	11,000	400	380	220	95	48	24	12	11	12	12
22	7.0	7,790	450	380	210	90	47	24	12	12	11	13
23	6.0	6,050	400	420	210	90	46	23	12	11	11	15
24	5.5	5,370	390	430	200	85	45	23	11	13	15	15
25	5.0	4,860	390	440	200	85	44	22	11	12	10	12
26	4.8	4,260	420	430	190	82	43	22	11	15	9.5	12
27	4.5	3,870	430	420	190	81	42	21	11	18	11	14
28	200	3,330	410	410	180	80	41	21	10	17	12	15
29	3,000	2,910	400	410	180	79	40	20	10	17	12	15
30	5,110		420	420	170	78	39	20	10	19	11	14
31	1,690		430		170		38	19		18		18
Sum	10,482.5	72,341	36,458	11,820	6,670	3,430	1,689	854	419	373.9	436.0	487

Month	Current Year 1980								Period 1937-1980		
	Extreme Gage Feet		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
				High		Low					
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.			30	5,110	! 1	3.5	338	20,792	879	20,792	0
Feb.			21	11,000	12	70	2,490	143,486	4,317	143,486	0
Mar.			3	2,890	!24	390	1,180	72,313	4,559	72,313	0
Apr.			3	580	7	200	394	23,445	2,632	51,060	0
May			3	450	!10	130	215	13,230	765	14,110	0
June			1	170	30	78	114	6,803	252	6,803	0
July			1	75	31	38	54.5	3,350	92.8	3,350	0
Aug.			1	38	31	19	27.5	1,694	45.3	1,694	0
Sept.			! 1	19	!28	10	14.0	831	28.1	831	0
Oct. *			15	20	8	6.4	12.1	742	37.5	742	0
Nov. *			6	23	!18	9.5	14.5	865	75.3	865	0
Dec. *			5	25	! 1	12	15.7	966	326	3,330	0
Yearly				11,000		3.5	397	288,517	14,010	288,517	0
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				312		0.10	11.2	355,883	17,281	355,883	0

* Provisional Ø Mean daily ! And other days

INFLOWS TO RODRIGUEZ RESERVOIR, BAJA CALIFORNIA

DESCRIPTION: Rodriguez Dam is located in Mexico on Rio de las Palmas, the principal tributary to the Tijuana River, about 5.6 miles (9.0 km) upstream from its confluence with Cottonwood Creek, 10.6 miles (17.0 km) upstream from the point where the Tijuana River crosses the international boundary between the United States and Mexico, and 9.9 miles (16.0 km) southeast of Tijuana, Baja California.

RECORDS: Computed from monthly reservoir records of storage, releases, spills, leakage, evaporation, rainfall and including Emergency Deliveries of Colorado River Water to Tijuana beginning in August 1972. The Emergency Deliveries of Colorado River Water to Tijuana are made pursuant to Minute 240 of this Commission. Records obtained by the Ministry of Agriculture and Hydraulic Resources through May 1961; from June 1961 through March 1966 by the Junta de Agua Potable y Alcantarillado del Distrito Urbano of Tijuana, Baja California, and from April 1966 by the State of Baja California Commission of Public Services for Tijuana. Records furnished by the Mexican Section of the Commission. Records available: May 1937 through 1980. Storage began in Rodriguez Reservoir on September 22, 1936.

REMARKS: Records of runoff represent all water reaching Rodriguez Reservoir, including rainfall on the reservoir water surface. Area-capacity-elevation rating for reservoir used in the computations is dated 1927 when the reservoir area was initially surveyed. Elevation of crest of spillway 380.08 feet (115.85 m) above mean sea level; at top of spillway gates 410.10 feet (125.00 m) above mean sea level. Reservoir capacity at spillway crest 76,210 acre-feet (94,000,000 m^3); at top of spillway gates 111,070 acre-feet (137,000,000 m^3).

EXTREMES: Maximum monthly inflow, 157,453 acre-feet (194,216,000 m^3); February 1980; minimum, no flow during part of most years.

Monthly Discharge in Acre-Feet

Month	Current Year 1980			Period 1938-1980		
	Natural Inflow	*Otay Aqueduct	Total	Average	Maximum	Minimum
January	54,820	0	54,820	2,186	54,820	0
February	157,453	0	157,453	6,120	157,453	5.8
March	62,600	0	62,600	8,255	68,321	4.2
April	14,001	0	14,001	3,086	77,790	0
May	11,460	0	11,460	607	11,460	0
June	4,661	0	4,661	173	4,661	0
July	1,464	0	1,464	106	1,464	0
August	591	0	591	66.1	770	0
September	208	0	208	62.7	466	0
October	195	0	195	71.9	344	0
November	595	0	595	160	1,940	0
December	1,251	0	1,251	792	15,686	8.4
Yearly	309,298	0	309,298	21,688	309,298	254
	Thousands of Cubic Meters					
	381,516	0	381,516	26,752	381,516	313

* Inflow from the supply of water from Otay Aqueduct for the city of Tijuana

DIVERSIONS FROM RODRIGUEZ RESERVOIR, BAJA CALIFORNIA

DESCRIPTION: Sparling flow meter located immediately below the dam in the pipeline which carries water from Rodriguez Reservoir to Gate No. 1 (Poblado Presa) and to Gate No. 2 (City Aqueduct). Formerly, water for irrigation was also diverted to the North and South Canals.

RECORDS: Direct recording by Sparling flow meter. Records through May 1961 were obtained by the Ministry of Agriculture and Hydraulic Resources; from June 1961 to March 1966 by the Junta de Agua Potable y Alcantarillado del Distrito Urbano de Tijuana; and from April 1966 through 1980 by the State of Baja California Commission of Public Services for Tijuana. Records furnished by the Mexican Section of the Commission. Records available: May 1937 through 1980.

REMARKS: Beginning in January 1937, diversions for irrigation began from both sides for the Tijuana valley and for domestic use at the village by Rodriguez Dam and the city of Tijuana. Since February 1960, no water has been released for irrigation of farmlands.

EXTREMES: Maximum monthly diversion, 1,963 acre-feet (2,421,000 m^3), July 1944; minimum, no flow March and April 1941, August 1960, and December 1962.

Monthly Discharge in Acre-Feet

Month	Current Year 1980	Period 1938-1980		
		Average	Maximum	Minimum
January	729	225	782	1.5
February	349	242	1,132	.8
March	345	295	1,223	0
April	503	410	1,602	0
May	748	550	1,676	1.8
June	912	640	1,857	1.9
July	971	679	1,963	1.9
August	1,124	601	1,859	0
September	959	499	1,420	1.9
October	1,018	432	1,187	1.9
November	871	340	1,037	1.9
December	767	303	981	0
Yearly	9,296	5,219	15,317	29.3
	Thousands of Cubic Meters			
	11,466	6,437	18,893	36.2

TIJUANA RIVER AT INTERNATIONAL BOUNDARY

DESCRIPTION: Water-stage recorder on top of north levee about 0.7 mile (1.1 km) downstream (north) from boundary, 1.1 miles (1.8 km) upstream from the new Dairy Mart Road bridge, and 1.4 miles (2.3 km) west of the international gate at San Ysidro, California. Zero of the gage is 38.04 feet (11.59 m) above mean sea level, U. S. C. & G. S. datum. The gage silted in on February 22, 1980. The U. S. Geological Survey installed a water-stage recorder on the upstream right wing wall of Dairy Mart Road bridge on June 17, 1980. The upper gage was used again on December 19, 1980.

RECORDS: Based on current meter measurements, staff gage readings and a partial record of gage heights. Records obtained and furnished by the United States Section of the Commission. Stages were furnished by the U.S. Geological Survey from June 17 to December 19, 1980. Records available: May 1947 through 1980.

EXTREMES: Since May 1947: Maximum instantaneous discharge, 33,100 second-feet (937 m^3/sec), February 21, 1980; minimum discharge, no flow during many years since 1951.

Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.3	4,540	4,350	634	830	276	59.8	38.8	11.7	5.2	2.3	9.8
2	3.3	470	2,210	556	760	241	66.8	40.4	14.8	3.3	5.6	8.6
3	3.3	3,040	2,330	556	690	234	77.1	42.0	13.6	3.1	8.8	9.6
4	3.6	4,230	2,830	532	643	213	74.5	32.3	12.0	2.7	9.6	13.0
5	3.3	410	2,360	524	580	185	69.4	34.0	12.0	3.1	8.8	18.9
6	3.6	305	3,430	524	507	178	68.4	32.3	11.2	3.6	9.6	19.8
7	3.3	288	3,260	485	388	178	66.8	29.1	11.2	3.6	10.4	16.1
8	3.6	281	3,460	580	374	178	62.0	37.2	12.0	3.8	10.4	16.1
9	69.7	273	2,980	652	374	183	57.5	37.2	10.4	3.2	8.8	13.6
10	50.2	260	2,220	661	374	170	56.8	37.2	11.2	3.6	9.6	10.6
11	164	246	4,940	652	374	152	49.2	37.2	11.2	4.4	8.8	9.6
12	144	240	4,400	643	381	138	73.7	34.0	11.2	5.2	8.8	8.8
13	65.2	266	3,130	643	381	134	62.6	32.9	12.0	4.8	9.6	8.8
14	30.7	699	2,100	643	374	134	62.0	30.7	12.0	5.2	8.8	8.8
15	18.3	3,340	1,560	661	388	131	66.8	27.5	13.6	5.8	10.4	10.4
16	10.7	4,360	1,300	680	451	131	53.1	34.0	12.0	9.6	4.8	9.6
17	13.3	5,500	1,150	710	465	124	50.9	30.7	11.2	10.4	8.8	9.6
18	69.3	12,100	903	730	465	117	55.3	25.5	10.4	8.0	8.0	10.4
19	64.7	15,500	847	720	465	110	50.9	23.4	8.8	8.8	* 4.8	12.8
20	52.0	25,000	873	670	465	103	48.7	27.5	6.4	5.9	# 5.6	15.9
21	24.7	30,100	839	634	437	95.8	55.3	25.9	6.4	5.2	# 7.2	17.3
22	14.5	20,100	799	680	451	88.6	53.1	21.0	5.6	6.9	# 8.0	21.2
23	10.7	4,240	775	700	423	83.8	42.0	22.2	5.2	5.2	# 8.8	19.0
24	9.9	2,130	759	652	388	82.3	42.0	19.8	5.2	4.8	# 8.8	16.0
25	7.6	2,450	759	740	346	84.8	50.9	19.8	4.8	4.8	# 9.6	14.8
26	6.0	3,070	775	790	325	77.1	40.4	19.8	5.2	9.0	* 10.4	14.8
27	6.8	2,930	775	760	297	79.7	40.4	17.3	5.6	7.2	9.6	14.8
28	12.7	4,090	868	740	304	77.1	38.8	17.3	5.6	7.2	8.8	14.5
29	2,750	8,520	2,370	770	318	66.8	34.0	16.1	5.6	4.4	9.6	15.9
30	19,300		2,610	850	311	59.8	32.3	14.8	4.8	1.5	11.2	15.6
31	13,600		1,710		297		32.3	9.3		1.9		11.2
Sum	158,978		19,772		4,105.8		867.2		161.4			415.9
	36,522.3		63,672		13,626		1,693.8		282.9		254.3	

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period 1947-1980 Acre-Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.			30	32,100	1	2.0	1,180	72,441	2,849	72,441	0
Feb.			21	33,100	12	206	5,480	315,328	9,888	315,328	0
Mar.			1	11,200	!24	751	2,050	126,292	6,128	126,292	0
Apr.			1	1,110	7	430	659	39,217	1,884	39,217	0
May			1	850	28	276	440	27,027	883	27,027	0
June			1	283	30	53.1	137	8,144	271	8,144	0
July			12	171	31	27.5	54.6	3,360	123	3,360	0
Aug.			13	137	31	1.9	28.0	1,720	82.5	1,720	0
Sept.			2	19.8	30	.9	9.4	561	48.7	561	0
Oct.			26	35.6	! 2	0	5.2	320	53.4	320	0
Nov.			! 7	12.0	1	1.9	8.5	504	127	1,084	0
Dec.			!22	22.0	10	3.1	13.4	825	298	2,725	0
				33,100		0	821	595,739	22,636	595,739	0
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				937		0	23.3	734,838	27,921	734,838	0

* Partly estimated # Estimated ! And other days

TIJUANA RIVER NEAR NESTOR, CALIFORNIA

DESCRIPTION: Water-stage recorder on Hollister Street bridge 4.1 miles (6.6 km) downstream from the international land boundary between the United States and Mexico, 2.9 miles (4.7 km) upstream from mouth of the river, and 1.7 miles (2.7 km) south of Nestor, California. The zero of the gage is 15.14 feet (4.61 m) above mean sea level, U. S. C. & G. S. datum. From April 10, 1953 to August 5, 1958, station was located 2 miles (3.2 km) upstream at different datum.

RECORDS: Based on current meter measurements or observation of no flow. Records obtained and furnished by the U. S. Geological Survey. Records available: October 1914 through September 1915, and October 1922 through 1980 (October 1922 through May 1936 are from city of San Diego, California.) Records are good except those for estimated period February 23 to June 17, 1980, which are fair. The International Boundary and Water Commission provided gage height record for period of major flooding, and 65 discharge measurements during the year.

REMARKS: The flow at this station is partially controlled by Morena and Barrett Reservoirs on Cottonwood Creek in the United States and by Rodriguez Reservoir on Rio de las Palmas in Mexico. Some diversions for irrigation are normally made in Mexico whenever surface runoff occurs in the river or in its two principal tributaries.

EXTREMES: Since October 1, 1936: Maximum discharge, 33,500 second-feet (949 m^3/sec), February 21, 1980 (gage height 8.70 feet (2.65 m)), affected by channel outbreak; maximum gage height 11.50 feet (3.51 m) January 30, 1980, prior to channel outbreak and major river movement caused by February floods; minimum discharge, no flow during parts of most years.

Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	* Oct.	* Nov.	* Dec.
1	2.7	4,300	6,770	940	780	250	66	43	11	5.4	2.7	7.6
2	2.7	444	3,480	780	771	240	80	42	12	3.4	6.2	7.0
3	3.0	2,060	2,450	575	700	231	97	45	13	2.6	8.8	8.1
4	3.0	4,650	2,800	490	630	220	92	28	12	2.1	8.7	11.0
5	3.0	407	2,280	400	565	210	77	32	10	2.1	8.5	16.0
6	3.3	291	3,550	320	487	200	71	31	9.5	2.3	9.0	18.0
7	4.4	275	3,500	256	480	190	70	27	10	2.4	9.5	16.0
8	3.8	267	2,720	606	460	182	55	41	11	3.0	8.5	18.0
9	55.0	260	2,630	650	435	175	48	44	9.0	2.7	7.7	16.0
10	53.0	238	2,110	690	415	168	51	43	9.7	2.9	8.2	13.0
11	157	224	3,950	680	395	159	44	46	9.9	3.7	7.7	11.0
12	136	218	4,350	680	380	150	104	38	11	4.5	7.8	10.0
13	56.0	252	3,300	680	356	142	70	45	11	4.2	8.1	9.8
14	28.0	738	2,150	680	365	137	68	34	11	4.6	7.6	9.9
15	14.0	3,450	1,900	672	385	130	77	31	37	5.2	7.9	11.0
16	9.6	4,440	1,750	680	400	123	56	38	12	7.2	4.0	9.7
17	11.0	5,550	1,500	700	425	109	49	31	11	9.8	6.7	9.0
18	71.0	11,900	920	680	440	96	57	23	11	8.3	6.5	9.2
19	69.0	15,600	900	680	475	89	53	20	8.3	8.6	3.6	11.0
20	52.0	24,300	835	680	481	81	46	23	6.9	5.5	4.0	14.0
21	28.0	30,200	800	670	450	100	62	26	6.4	5.4	5.0	15.0
22	18.0	22,100	790	667	420	87	59	25	5.8	6.4	6.0	17.0
23	15.0	3,650	755	720	395	86	42	24	5.4	5.2	7.0	16.0
24	14.0	2,250	630	740	365	83	44	23	5.0	4.2	8.0	14.0
25	13.0	2,230	680	768	340	90	60	22	5.0	3.9	8.0	14.0
26	9.6	2,600	780	770	320	83	41	21	5.6	8.3	7.6	14.0
27	9.6	2,000	830	770	299	89	48	20	6.1	6.5	7.4	14.0
28	20.0	3,450	1,150	780	285	92	44	19	5.7	6.8	7.0	14.0
29	2,950	7,180	1,320	785	275	74	34	17	5.5	4.7	7.7	14.0
30	19,400		1,260	780	265	64	33	14	5.7	2.2	8.9	14.0
31	12,300		1,220		255		30	13		2.5		11.0
Sum	155,524		19,969		4,130		929		146.6			392.3
	35,514.7		64,060		13,494		1,828		292.5		214.3	

Current Year 1980 — **Period 1937-1980**

Month	Extreme Gage Feet		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	High Day	High	Low Day	Low			Average	Maximum	Minimum
Jan.			30	19,400	! 1	2.7	1,150	70,442	2,452	70,442	0
Feb.			21	30,200	12	218	5,360	308,477	10,482	308,477	0
Mar.			1	6,770	24	630	2,070	127,061	10,045	127,061	0
Apr.			1	940	7	256	666	39,608	6,175	181,900	0
May			1	780	31	255	435	26,765	1,179	26,765	0
June			1	250	30	64	138	8,192	285	8,192	0
July			12	104	31	30	59.0	3,626	105	3,626	0
Aug.			11	46	31	13	30.0	1,843	58.2	1,843	0
Sept.			15	37	24	5.0	9.8	580	35.0	580	0
Oct. *			17	9.8	! 4	2.1	4.7	291	77.6	1,340	0
Nov. *			7	9.5	1	2.7	7.1	425	134	1,490	0
Dec. *			! 6	18.0	2	7.0	12.7	778	624	7,930	0
				30,200		2.1	810	88,088	31,652	588,088	0
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				855		0.06	22.9	725,401	39,042	725,401	0

* Provisional Ø Mean daily ! And other days

STORED WATER IN RESERVOIRS, TIJUANA RIVER BASIN

Data are presented below for all storage reservoirs in the Tijuana River Basin. The data represent contents on the last day of the month in acre-feet. The reservoir capacities indicated are total capacities at the top of the spillway gates in closed position on the controlled spillways of Barrett and Rodriguez Dams, and at spillway level for Morena Dam, which has had an uncontrolled spillway since the spillway gates were removed in 1942. The records of storage reported below for Morena, Barrett, and Rodriguez Reservoirs are based on the capacities as determined by the following surveys: Morena 1948; Barrett 1948, 1951, and 1955; and Rodriguez 1927, when the reservoir area was initially surveyed.

Records for Morena and Barrett Reservoirs are obtained and furnished by the city of San Diego, the U. S. Geological Survey, and the National Weather Service. Records for Rodriguez Reservoir obtained and furnished by the State of Baja California Commission of Public Services for Tijuana.

In Acre-Feet

Month	MORENA RESERVOIR, CALIFORNIA (Capacity 50,210)		BARRETT RESERVOIR, CALIFORNIA (Capacity 44,760)		RODRIGUEZ RESERVOIR, BAJA CALIFORNIA (Capacity 111,880)		TOTAL IN TIJUANA RIVER BASIN RESERVOIRS (Capacity 206,850)	
	1980	Average 1937-1980	1980	Average 1937-1980	1980	Average 1937-1980	1980	Average 1937-1980
Jan.	33,516	14,373	38,551	10,769	86,746	29,641	158,813	54,783
Feb.	51,043	15,518	38,779	12,163	80,393	30,615	170,215	58,296
Mar.	50,957	16,738	38,485	14,135	85,617	34,899	175,059	65,772
Apr.	50,815	16,877	40,709	14,667	81,437	34,914	172,961	66,458
May	50,541	16,775	44,630	14,248	75,124	34,788	170,295	65,811
June	50,389	16,368	44,080	13,516	74,953	33,790	169,422	63,674
July	50,419	15,960	43,062	12,740	74,340	32,747	167,821	61,447
Aug.	49,960	15,563	41,220	11,995	72,808	31,772	163,988	59,330
Sept.	49,303	15,092	39,788	11,667	71,208	30,934	160,299	57,693
Oct.	48,624	14,862	38,420	11,302	69,492	30,220	156,536	56,384
Nov.	48,412	14,777	37,044	10,961	68,523	29,729	153,979	55,467
Dec.	48,926	14,860	36,123	11,177	68,336	29,935	153,385	55,972
Average	48,575	15,647	40,074	12,445	75,748	31,999	164,397	60,091
Maximum	51,043	# 61,670	44,630	* 45,920	86,746	109,608	175,059	213,600
Minimum	33,516	10	36,123	106	68,336	0	153,385	1,264

\# March 31, 1941 - Prior to removal of spillway gates
* April 30, 1937 - Sandbags were placed on crest of spillway

RAINFALL ON THE TIJUANA RIVER WATERSHED IN INCHES

Tabulated below are monthly records of rainfall with averages for their periods of record at stations located in California and Baja California. Daily records, where available, are on file in the offices of the United States and Mexican Sections of the Commission. For location, elevation, period of record, and the observer, see alphabetical listing of these stations on page 78.

In the United States

Month	Morena Dam, California		Barrett Dam, California		Marron Valley, California		Potrero, California		Sawday Ranch, California	
	1980	Average 1906-1980	1980	Average 1907-1980	1980	Average 1951-1980	1980	Average 1914-1980	1980	Average 1950-1980
Jan.	13.82	3.86	13.89	3.47	11.30	2.99	12.09	3.49	14.83	3.48
Feb.	11.86	3.78	11.36	3.46	7.20	2.23	10.28	3.69	14.33	2.88
Mar.	3.67	3.40	4.43	3.04	3.80	2.58	4.43	3.09	4.60	3.07
Apr.	2.82	1.73	2.22	1.56	1.70	1.34	2.19	1.77	1.70	1.62
May	1.03	.63	.86	.57	.70	.42	.94	.63	1.07	.46
June	0	.13	0	.07	0	.06	0	.10	0	.06
July	.09	.35	0	.11	0	.03	0	.19	1.20	.45
Aug.	.34	.51	0	.20	0	.14	0	.20	0	.66
Sept.	0	.38	0	.26	0	.29	0	.28	0	.41
Oct.	0.36	.87	.61	.71	0	.41	.38	.74	.50	.53
Nov.	0	1.55	0	1.36	0	1.46	0	1.48	0	1.66
Dec.	1.01	3.17	1.28	2.81	.80	2.12	1.10	3.04	0.83	2.34
Yearly	35.00	20.36	34.65	17.62	25.50	14.07	31.41	18.70	39.06	17.62

Month	Campo, California		Chula Vista, California		Lower Otay Dam, California		Brown Field, California			
	1980	Average 1900-1980	1980	Average 1930-1980	1980	Average 1906-1980	1980	Average 1964-1980		
Jan.	11.82	3.08	4.75	1.87	6.64	2.24	5.73	1.92		
Feb.	8.82	3.28	2.24	1.71	3.52	1.54	3.04	1.41		
Mar.	3.72	2.75	3.01	1.56	3.33	2.03	3.42	1.97		
Apr.	1.87	1.43	1.01	.82	1.62	1.09	1.44	1.04		
May	.80	.52	.19	.24	.73	.32	.41	.25		
June	T	.07	0	.05	0	.07	0	.07		
July	.55	.50	0	.02	0	.03	0	.05		
Aug.	0	.49	0	.10	0	.11	0	.15		
Sept.	0	.34	T	.17	0	.22	0	.17		
Oct.	.28	.63	.29	.41	.21	.34	.26	.33		
Nov.	0	1.34	0	1.02	0	1.27	0	1.44		
Dec.	.54	2.49	.26	1.61	.51	1.44	.56	1.68		
Yearly.	28.40	16.92	11.75	9.58	16.56	10.70	14.86	10.48		

In Mexico

Month	La Rumorosa, Baja California		Valle Redondo, Baja California		Tecate, Baja California		Tijuana, Baja California		Rodriguez Dam, Baja California	
	1980	Average 1945-1980	1980	Average 1971-1980	1980	Average 1946-1959 1961-1980	1980	Average 1948-1959 1961-1980	1980	Average 1938-1980
Jan.	4.45	0.94	9.57	3.03	12.05	2.76	5.63	1.85	6.54	1.65
Feb.	.98	.51	5.59	2.60	7.80	1.77	3.15	1.50	3.86	1.42
Mar.	T	.51	3.11	2.28	3.46	2.20	3.27	1.50	2.28	1.50
Apr.	.31	.31	1.89	.98	2.09	1.10	1.30	.67	.79	.75
May	1.30	.12	.43	.39	.63	.31	.31	.20	.39	.16
June	.20	.04	0	.04	0	.12	0	.04	0	.04
July	T	.31	0	.04	0	.12	0	.04	0	T
Aug.		.71	0	.16	0	.20	0	.04	0	.12
Sept.		.31	0	.39	0	.12	0	.16	0	.24
Oct.		.39	.35	.67	.35	1.06	.04	.31	T	.31
Nov.		.51	0	1.54	0	1.22	0	1.02	0	.87
Dec.		.71	.55	1.46	.51	2.05	.16	1.30	.16	1.50
Yearly		5.31	21.50	13.35	26.89	13.11	13.86	8.66	14.02	8.54

T Trace

RAINFALL ON THE TIJUANA RIVER WATERSHED IN INCHES

In Mexico

Month	Valle de las Palmas, Baja California		P. B. Rosarito, Baja California		El Pinal, Baja California		San Juan de Dios, Baja California			
	1980	Average 1948-1980	1980	Average 1967-1980	1980	Average 1964-1980	1980	Average 1956-1980		
Jan.	9.25	1.73	7.40	2.17	13.74	3.23	9.37	2.64		
Feb.	4.02	1.26	2.76	1.97	13.15	3.50	13.31	2.72		
Mar.	2.05	1.30		1.57	5.28	3.35	2.91	2.17		
Apr.	1.10	.63	.98	.71	2.48	1.73	1.10	1.10		
May	.51	.12	.31	.35	.79	.51	.55	.28		
June	0	.04	0	.08	0	.04	0	.12		
July	0	.04	0	0	.31	.63	1.02	1.06		
Aug.	0	.12	0	.08	.12	.67	.83	.87		
Sept.	0	.24	0	.20	T	.75	.24	.55		
Oct.	.08	.20	.24	.39	.24	.39	.08	.63		
Nov.	0	.75	0	.83	0	1.77	0	1.30		
Dec.	.20	1.02	.28	1.18	.87	3.03	.47	1.93		
Yearly	17.20	7.64		9.13	36.97	19.57	29.88	16.50		

T Trace

LOCATION OF RAINFALL STATIONS ON THE TIJUANA RIVER WATERSHED

In the United States

NAME OF STATION	LATITUDE	LONGITUDE	δ ELEV. (FT.)	RECORD BEGAN	OBSERVER
Barrett Dam, California	32° 41'	116° 40'	1,623	1907	City of San Diego
Brown Field, California	32° 34'	116° 59'	515	1964	City of San Diego
Campo, California	32° 38'	116° 28'	2,630	1877	Archie C. Leach
Chula Vista, California	32° 36'	117° 06'	9	1930	Western Salt Company
Lower Otay Dam, California	32° 37'	116° 56'	540	1906	City of San Diego
Marron Valley, California	32° 34'	116° 46'	550	1951	County of San Diego
Morena Dam, California	32° 41'	116° 31'	3,075	1906	City of San Diego
Potrero, California	32° 37'	116° 36'	2,400	1914	County of San Diego
Sawday Ranch, California	32° 45'	116° 29'	3,200	1950	William Tulloch

In Mexico

NAME OF STATION	LATITUDE	LONGITUDE	δ ELEV. (FT.)	RECORD BEGAN	OBSERVER
El Pinal, Baja California	¤ 32° 11'	¤ 116° 17'	¤ 4,429	1964	* S. A. R. H.
La Rumorosa, Baja California	32° 31'	116° 04'	3,937	1945	S. A. R. H.
P. B. Rosarito, Baja California	32° 18'	117° 02'	72	1967	S. A. R. H.
Rodriguez Dam, Baja California	32° 26'	116° 54'	459	1938	S. A. R. H.
San Juan de Dios, Baja California	31° 59'	116° 00'	¤ 3,986	1956	S. A. R. H.
Tecate, Baja California	32° 33'	116° 39'	1,690	1946	S. A. R. H.
Tijuana, Baja California	32° 31'	117° 02'	180	1948	S. A. R. H.
Valle de Las Palmas, Baja California	32° 23'	116° 40'	459	1948	S. A. R. H.
Valle Redondo, Baja California	32° 31'	116° 45'	794	1971	S. A. R. H.

δ Elevation above mean sea level ¤ Estimated from topographic maps
* Ministry of Agriculture and Hydraulic Resources

EVAPORATION IN THE TIJUANA RIVER BASIN IN INCHES

Tabulated below are records of evaporation observed at four stations in California and at five stations in Baja California, with averages for their periods of record. The stations in California are observed by Western Salt Company, city of San Diego, California, and the United States Section of the Commission; those in Baja California are observed by the Ministry of Agriculture and Hydraulic Resources of Mexico. For specific location of these stations, refer to data opposite same station name shown in "Location of Rainfall Stations," page 78 in this bulletin.

Types of pans used:

1. Barrett Reservoir: January 1921 through September 1926, square 3-foot by 3-foot by 18-inch deep floating pan. October 1926 through 1980, square 3-foot by 3-foot by 18-inch deep land pan set 15 inches in ground.

2. Chula Vista: September 1918 through 1980, National Weather Service 4-foot diameter pan, 10 inches deep, set on 2 by 4-inch-timber grill.

3. Morena Reservoir: October 1915 through December 1921, square 3-foot by 3-foot by 18-inch deep floating pan. January 1922 through August 1926 records are the average of evaporation in a square 3-foot by 3-foot by 18-inch deep floating pan and a land pan of the same dimensions. September 1926 through 1980, square 3-foot by 3-foot by 18-inch deep land pan set 15 inches in ground.

4. Lower Otay Dam: January 1950 through 1980, square 3-foot by 3-foot by 18-inch deep land pan set 15 inches in ground.

In United States

Month	Morena Dam, California		Barrett Dam, California		Chula Vista, California		Lower Otay Dam, California	
	1980	Average 1916-1980	1980	Average 1921-1980	1980	Average 1919-1980	1980	Average 1950-1980
Jan.	1.42	2.14	2.93	1.89	2.30	2.85	0.66	1.87
Feb.	.80	2.18	2.46	2.21	3.40	3.36	1.80	2.31
Mar.	1.23	3.39	2.25	3.44	5.26	5.00	3.42	3.38
Apr.	4.29	4.72	4.40	4.74	6.20	5.97	4.54	4.63
May	2.90	6.57	3.97	6.72	6.08	6.83	3.87	6.11
June	5.78	8.54	7.10	8.30	7.27	6.96	6.58	6.83
July	6.84	9.84	9.16	9.87	7.78	7.59	8.26	8.36
Aug.	5.63	9.11	8.27	9.26	8.16	7.34	7.53	7.89
Sept.	3.96	7.28	6.13	7.56	6.08	6.11	5.42	6.50
Oct.	3.74	5.11	5.36	5.33	4.87	4.91	4.60	4.73
Nov.	2.67	3.36	3.19	3.34	3.91	3.64	3.35	2.84
Dec.	2.34	2.41	2.20	2.07	3.04	2.78	2.49	2.17
Yearly	41.60	64.65	57.42	64.73	64.35	63.34	52.52	57.62

In Mexico

Month	Tijuana, Baja California		Rodriguez Dam, Baja California		Valle de las Palmas, Baja California		San Juan de Dios, Baja California		Valle Redondo, Baja California	
	1980	Average 1952-1959 1961-1980	1980	Average 1939-1942 1946-1980	1980	Average 1952-1980	1980	Average 1956-1980	1980	Average 1976-1980
Jan.		3.07	1.26	4.45	2.76	3.50		2.72	3.58	2.91
Feb.		3.50	2.17	3.66	3.23	3.46		2.76	3.15	2.99
Mar.		3.94	3.35	4.72	3.70	4.92		4.13	3.82	3.70
Apr.		4.84	5.28	5.67	4.45	6.30		4.92	6.30	5.55
May		5.75	4.76	4.92	5.28	7.52	4.96	6.69	5.83	6.69
June		5.83	7.87	7.80	8.86	9.17	7.80	7.99	12.48	10.35
July	8.46	6.77	9.02	8.78	10.31	10.71	7.36	8.98	12.76	10.20
Aug.	8.70	7.17	7.83	8.07	9.09	9.84	7.44	8.19	10.47	9.49
Sept.	5.79	5.83	5.79	6.85	6.65	8.43	6.77	7.68	7.09	6.65
Oct.	5.71	4.80	6.10	5.67	5.51	6.14	6.02	5.31	6.50	4.53
Nov.	4.45	3.54	4.65	4.72	4.88	4.45	5.24	3.74	5.39	3.50
Dec.		3.03	4.41	3.70	4.25	3.86	3.54	3.23	4.25	2.76
Yearly		57.13	62.48	70.51	68.98	78.03		60.71	81.61	73.46

TEMPERATURE IN THE TIJUANA RIVER BASIN IN DEGREES FAHRENHEIT

The maximum, minimum, and monthly average temperature observations for United States stations are from daily readings of thermometers generally exposed in a shelter located a few feet above sod-covered ground. The maximum and minimum temperatures shown for the stations in Mexico are from daily maximum and minimum thermometer observations, with maximum and minimum for their periods of record. For specific location, elevation, period of record, and the observer, refer to data opposite same station name as shown in "Location of Rainfall Stations," page 78 in this bulletin.

In the United States

	Barrett Dam, California				Campo, California				Chula Vista, California			
	1980			Average 1931-1980	1980			Average 1951-1980	1980			Average 1931-1980
Month	Mean	Max.	Min.		Mean	Max.	Min.		Mean	Max.	Min.	
Jan.	53.0	73	35	48.7	50.5	75	27	46.9	57.6	73	38	52.8
Feb.	55.5	79	34	50.5	51.8	81	21	48.1	59.0	75	42	54.0
Mar.	52.6	74	37	53.1	48.8	73	29	49.3	57.0	73	43	55.3
Apr.	58.8	90	37	57.5	54.8	91	28	53.0	59.7	79	44	57.9
May	57.7	81	43	62.5	55.9	88	32	58.1	60.1	69	49	60.6
June	68.7	100	42	68.3	63.9	99	31	64.9	62.9	87	50	63.1
July	78.3	105	56	76.1	74.7	105	43	73.2	68.0	85	58	66.8
Aug.	75.8	100	53	76.1	72.3	104	40	73.0	70.5	84	59	68.4
Sept.	71.7	100	51	72.3	68.3	99	38	68.8	66.8	77	56	67.2
Oct.	67.2	104	42	64.1	62.7	103	30	60.8	63.8	83	49	63.0
Nov.	58.8	90	36	55.8	54.8	87	25	52.6	58.9	84	42	58.1
Dec.	55.6	84	34	50.5	52.9	82	27	47.8	56.2	77	41	54.3
Yearly	62.8	105	34	61.3	59.3	105	21	58.0	61.7	87	38	60.1

	Potrero, California											
	1980			Average 1975-1980								
Month	Mean	Max.	Min.									
Jan.	51.7	77	29	50.9								
Feb.	54.2	85	30	51.4								
Mar.	50.0	75	30	50.9								
Apr.	58.8	96	30	55.0								
May	57.8	90	35	60.2								
June	69.4	102	41	70.2								
July	79.5	104	50	76.4								
Aug.	75.4	104	46	74.3								
Sept.	72.0	104	45	72.3								
Oct.	67.8	104	36	65.6								
Nov.	58.4	90	30	57.0								
Dec.	56.2	84	29	52.8								
Yearly	62.6	104	29	61.4								

In Mexico

	La Rumorosa, Baja California				Tecate, Baja California				Tijuana, Baja California			
	1980		1946-1980		1980		1946-1980		1980		1948-1980	
Month	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	73	30	81	5	77	30	100	16	82	39	93	27
Feb.	66	27	82	10	82	32	100	18	86	43	102	32
Mar.	75	27	88	16	75	34	97	23	75	41	93	34
Apr.	79	32	91	23	90	34	100	28	86	43	97	34
May	77	27	97	27	82	39	100	36	75	45	100	43
June	73	37	113	34	102	41	106	32	90	46	108	41
July	86	39	104	39	104	50	115	36	93	52	120	46
Aug.			102	46	97	45	113	34	93	57	106	52
Sept.			104	34	106	41	115	36	90	52	120	46
Oct.			95	25	104	37	106	27	90	43	117	41
Nov.			95	14	97	28	97	27	90	36	108	34
Dec.			84	10	86	30	97	23	84	34	99	25
Yearly			113	5	106	28	115	16	93	34	120	25

TEMPERATURE IN THE TIJUANA RIVER BASIN
IN DEGREES FAHRENHEIT

In Mexico

	Rodriguez Dam, Baja California				Valle de las Palmas, Baja California				P. B. Rosarito, Baja California			
	1980		1938-1980		1980		1948-1980		1980		1967-1980	
Month	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	81	43	90	27	77	34	91	12	93	46	93	36
Feb.	86	41	93	32	82	36	99	23	86	43	90	36
Mar.	75	41	90	32	77	37	100	28	73	45	90	34
Apr.	86	43	93	36	91	39	104	32	86	46	88	43
May	75	46	100	37	82	36	108	36	73	46	104	43
June	91	48	108	46	102	45	118	39	77	52	104	43
July	99	52	104	46	118	52	120	45	86	57	90	50
Aug.	93	59	106	50	100	52	111	41	86	50	91	50
Sept.	93	54	109	48	109	46	117	43	79	52	108	48
Oct.	91	46	108	34	109	37	109	32	90	48	100	43
Nov.	90	41	99	30	95	30	100	19	79	48	97	32
Dec.	86	41	93	27	88	30	95	21	88	46	90	36
Yearly	99	41	109	27	118	30	120	12	93	43	108	32

	El Pinal, Baja California				San Juan de Dios, Baja California				Valle Redondo, Baja California			
	1980		1964-1980		1980		1956-1980		1980		1974-1980	
Month	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	68	19	73	3	68	23	88	3	90	37	90	21
Feb.	72	23	81	14	77	19	84	16	95	36	95	23
Mar.	68	21	82	19	66	30	84	14	90	36	90	27
Apr.	82	23	82	18	82	32	102	19	88	36	95	32
May	81	25	90	25	81	27	91	19	93	43	102	39
June	86	32	99	28	91	34	106	28	108	43	113	41
July	93	36	102	32	93	39	120	36	108	50	111	50
Aug.	97	36	104	32	95	39	106	32	106	55	111	48
Sept.	88	32	102	25	106	34	106	25	113	46	115	45
Oct.	93	32	95	23	97	25	100	18	115	41	115	39
Nov.	88	25	88	14	86	19	99	12	93	34	97	28
Dec.	77	25	79	10	77	25	88	12	91	34	91	30
Yearly	97	19	104	3	106	19	120	3	115	34	115	21

DRAINAGE AREAS ABOVE GAGING STATIONS AND IRRIGATED AREAS ALONG TIJUANA RIVER AND TRIBUTARIES

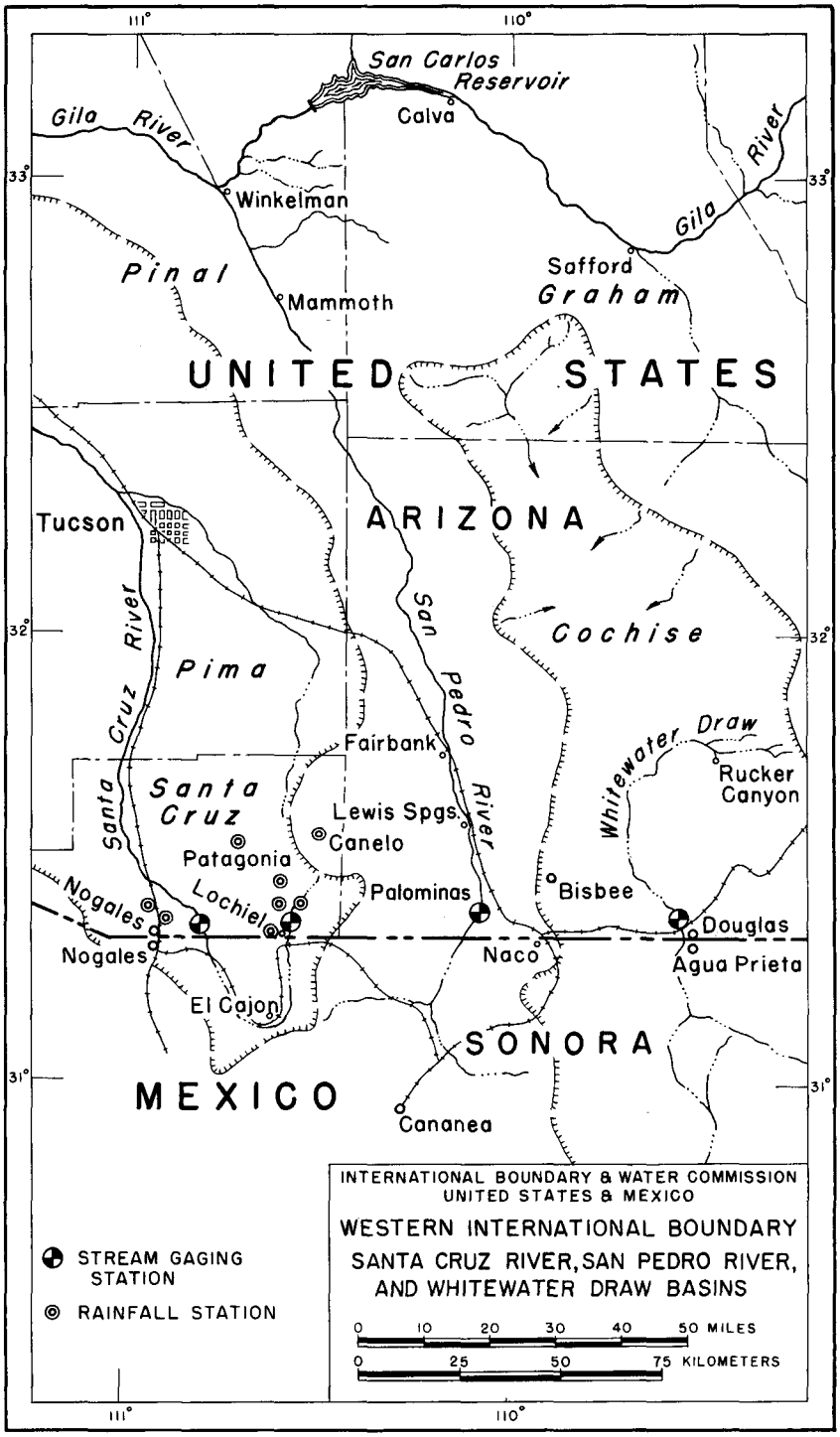
1980

The total area within the Tijuana River basin is 1,731 square miles, as determined from the best available maps from both the United States and Mexico. The drainage areas shown below are tabulated according to their downstream sequence.

The irrigated areas, tabulated in downstream sequence, are from the most reliable sources available. Those in the United States were furnished by the United States Department of Agriculture and the State Engineer, State of California, or estimated from aerial photographs. Those in Mexico were furnished by the Ministry of Agriculture and Hydraulic Resources of Mexico through the Mexican Section of the Commission. All irrigation in the Tijuana River basin in 1980 was by pumping from ground water.

Designation of Areas	Drainage Basin-Square Miles			Irrigated Areas-Acres		
	United States	Mexico	Total	United States	Mexico	Total
Cottonwood Creek above Morena Dam	114	0	114	0	0	0
Morena Dam to Barrett Dam	133	0	133	0	0	0
above Barrett Dam	247	0	247	0	0	0
below Barrett Dam and above Tecate Creek	65	0	65	0	0	0
above Tecate Creek	312	0	312	0	0	0
Campo Creek above International Boundary	82	4	86	0	0	0
Tecate Creek above International Boundary (not including Campo Creek)	19	64	83	0	0	0
Cottonwood Creek above International Boundary Station	413	68	481	(a) 100	0	(a) 100
Rio de las Palmas above Rodriguez Dam	7	981	988	0	(b) 0	0
Tijuana River above Nestor Gaging Station	458	1,266	1,724			
above the Mouth	462	1,269	1,731	(d) 310	(c) 0	(d) 310

(a) Estimated. During extremely dry years these areas may be materially reduced.
(b) Areas in upper valleys may be irrigated by pumping from ground water.
(c) There was no irrigation in 1980 in the Tijuana Irrigation District, Tijuana Valley, Baja California, Mexico, from the Rodriguez Reservoir.
(d) Reduction due to flooding


111°
110°
San Carlos Reservoir
Calva
Gila River
Winkelman
Gila River
33°
Safford
Pinal
Mammoth
Graham
UNITED STATES
Tucson
ARIZONA
Santa Cruz River
San Pedro River
32°
Cochise
Pima
Fairbank
Whitewater Draw
Rucker Canyon
Santa Cruz
Lewis Spgs.
Canelo
Patagonia
Nogales
Lochiel
Palominas
Bisbee
Douglas
Nogales
Naco
Agua Prieta
El Cajon
SONORA
31°
MEXICO
Cananea
INTERNATIONAL BOUNDARY & WATER COMMISSION
UNITED STATES & MEXICO
WESTERN INTERNATIONAL BOUNDARY
SANTA CRUZ RIVER, SAN PEDRO RIVER,
AND WHITEWATER DRAW BASINS
STREAM GAGING STATION
RAINFALL STATION
0 10 20 30 40 50 MILES
0 25 50 75 KILOMETERS

WHITEWATER DRAW NEAR DOUGLAS, ARIZONA

DESCRIPTION: Water-stage recorder located on U. S. Highway 80 bridge between Douglas and Bisbee, Arizona, about 450 feet (137 m) upstream from the Southern Pacific Railroad bridge, 1.5 miles (2.4 km) upstream from the international boundary, and 2 miles (3.2 km) west of Douglas, Arizona. Zero of gage is 3,909.14 feet (1,191.51 m) above mean sea level, U. S. C. & G. S. datum of 1929. Location April 26, 1972 to April 10, 1974 was 200 feet (61.0 m) upstream from bridge. Datum 4.40 feet (1.34 m) higher.

RECORDS: Based on current meter measurements or observations of no flow during the year. Computations by shifting control methods. Records obtained and furnished by the U. S. Geological Survey. Records poor. Records available: August to October 1911 (gage heights and discharge measurements only), July to October 1912, January to June 1913, October 1913, December 1913 to June 1914, February to June 1915, October 1915 to September 1919, October 1919 to April 1922 (gage heights and discharge measurements only), June 1930 to December 1933, May 1935 to July 1947, October 1947 through 1980 (July 1954 to March 1955, monthly discharge only).

REMARKS: Diversions above this station are mainly by pumping from ground water for irrigation. Records show flow at the international boundary into Mexico except for some smelter waste water entering the stream a short distance below this station.

EXTREMES: Prior to 1936: Maximum recorded discharge, 3,450 second-feet (97.7 m^3/sec) August 10, 1931 (gage height 12.15 feet (3.70 m); maximum estimated discharge, 4,050 second-feet (115 m^3/sec) July 27, 1919; minimum discharge, no flow for several days of many years. Since 1936: Maximum discharge, 5,060 second-feet (143 m^3/sec) August 7, 1955; maximum gage height 16.55 feet (5.04 m) July 29, 1966; minimum daily discharge, no flow at times during most years.

Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	2.2	0	0	0
8	0	0	0	0	0	0	0	0	.69	0	0	0
9	0	.71	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	97.0	0	0	0	0
14	0	.40	0	0	0	0	0	3.7	0	0	0	0
15	0	.58	0	0	0	0	0	3.6	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	6.7	0	0	0	0
20	0	0	0	0	0	0	0	.60	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	.06	0	0	0	0
25	0	0	0	0	0	0	0	2.4	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0
30	0		0	0	0	0	0	0	0	0	0	0
31	0		0		0		0	0		0		0
Sum	0	1.69	0	0	0	0	0	114.06	2.89	0	0	0

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
				Current Year 1980					Period 1936-1980		
Jan.				0		0	0	0	39.1	451	0
Feb.	4.47		14	3.7	! 1	0	.058	3.4	19.2	132	0
Mar.				0		0	0	0	27.8	295	0
Apr.				0		0	0	0	19.1	173	0
May				0		0	0	0	14.0	138	0
June				0		0	0	0	121	1,590	0
July				0		0	0	0	2,034	8,110	0
Aug.	7.92		13	467	! 1	0	3.68	226	3,054	14,480	0
Sept.	4.66		7	7.3	! 1	0	.096	5.7	707	3,170	0
Oct.				0		0	0	0	299	6,103	0
Nov.				0		0	0	0	36.0	352	0
Dec.				0		0	0	0	116	2,363	0
Yearly	7.92			467		0	0.32	235	6,486	22,321	235
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	2.41			13.2		0	0.01	290	8,000	27,533	290

! And other days

SEWAGE INFLUENT, DOUGLAS, ARIZONA
INTERNATIONAL TREATMENT PLANT

DESCRIPTION: Parshall flume in influent line to the international treatment plant, equipped with Simplex digital meter for measuring combined sewage flows from Douglas, Arizona and Agua Prieta, Sonora; and Parshall flume with recorder for measuring the sewage from Douglas. Flows from Agua Prieta are deduced from total flows and the city of Douglas flows; however, since April 8, 1968, all sewage flows from Agua Prieta have been diverted to new oxidation ponds located in Mexico, 1.6 miles (2.6 km) south of the international boundary.

RECORDS: Continuous monthly records since March 1948; daily records from March 18, 1948 through 1950 and from January 1952 through 1980.

REMARKS: The Douglas-Agua Prieta International Treatment Plant was constructed by the governments of the United States and Mexico in 1947 to correct a serious international sanitation problem. The plant is located in the United States adjacent to the international boundary about one mile (1.6 km) west of the Douglas-Agua Prieta Port of Entry. Prior to December 1970, the treatment of sewage was complemented by the use of old oxidation ponds in Mexico adjacent to the international boundary. Since December 1970, sewage effluent from the plant flows into Mexico and then across to the right bank of the Agua Prieta Arroyo, by means of a canal bridge, to be used for irrigation.

Month	Total Monthly Flows Millions of Gallons			Mean Daily Flows-Millions of Gallons Per Day					
				Current Year 1980			Period 1952-1980		
	U.S.	Mexico	Total	Maximum	Minimum	Mean	Maximum	Minimum	Mean
Jan.	37.650	0	37.650	1.700	0.720	1.215	1.700	0.619	1.070
Feb.	31.509	0	31.509	1.220	.905	1.087	1.784	.584	1.078
Mar.	30.151	0	30.151	1.100	.805	.973	1.598	.590	1.071
Apr.	30.646	0	30.646	2.047	.907	1.022	2.047	.619	1.071
May	32.352	0	32.352	1.173	.831	1.044	1.850	.619	1.077
June	39.936	0	39.936	1.964	1.017	1.331	2.060	.626	1.140
July	43.469	0	43.469	1.557	1.111	1.402	3.209	.619	1.195
Aug.	50.190	0	50.190	2.681	.981	1.619	2.681	.619	1.222
Sept.	27.465	0	27.465	1.785	.683	.916	1.884	.626	1.169
Oct.	29.012	0	29.012	1.737	.817	.936	1.770	.626	1.118
Nov.	27.636	0	27.636	1.479	.587	.921	1.586	.587	1.091
Dec.	23.811	0	23.811	1.201	.614	.768	2.040	.500	1.078
Yearly	403.827	0	403.827	2.681	0.587	1.103	3.209	0.500	1.115

SEWAGE INFLUENT, AGUA PRIETA, SONORA
INTERNATIONAL OXIDATION PONDS

DESCRIPTION: Parshall flume equipped with staff gage in influent line to oxidation ponds. Since April 8, 1968, all sewage from Agua Prieta, Sonora has been diverted to oxidation ponds, which are located in Mexico; if necessary, sewage from Douglas, Arizona may be included, but this has never been done.

RECORDS: Discharges are computed from daily 11:00 a.m. readings of the staff gage by applying an index for that hour, determined from 7 days of hourly measurements from which the relationship between mean daily readings and 11:00 a.m. readings was developed. Records available: Mean daily flows from April 8, 1968 through 1980.

REMARKS: The construction of the international oxidation ponds in Agua Prieta, Sonora was completed in April 1968 by the government of Mexico, fulfilling an international agreement to solve the problem of insufficient capacity at the international treatment plant in Douglas, where the combined flows from Douglas and Agua Prieta were treated. If necessary, sewage from Agua Prieta may be treated in this plant, but since the completion of the oxidation ponds, this has never been done. The ponds are located 1.6 miles (2.6 km) south of international monument 85a.

Month	Total Monthly Flows Millions of Gallons			Mean Daily Flows-Millions of Gallons Per Day					
				Current Year 1980			Period 1968-1980		
	U.S.	Mexico	Total	Maximum	Minimum	Mean	Maximum	Minimum	Mean
Jan.	0	18.503	18.503	0.630	0.436	0.597	0.640	0.394	0.500
Feb.	0	16.814	16.814	.630	.436	.580	.726	.394	.506
Mar.	0	17.941	17.941	.630	.436	.579	.666	.394	.490
Apr.	0	17.628	17.628	.630	.436	.588	.666	.394	.495
May	0	18.441	18.441	.630	.436	.595	.666	.394	.520
June	0	17.801	17.801	.630	.436	.593	.630	.394	.526
July	0	18.441	18.441	.630	.436	.595	.691	.259	.522
Aug.	0	18.309	18.309	.630	.436	.590	.967	0	.481
Sept.	0	17.873	17.873	.630	.436	.596	.630	0	.533
Oct.	0	18.503	18.503	.630	.436	.597	.630	0	.504
Nov.	0	17.618	17.618	.630	.436	.587	.717	.394	.517
Dec.	0	18.074	18.074	.630	.436	.583	.709	.394	.519
Yearly	0	215.945	215.945	0.630	0.436	0.590	0.967	0	0.510

SAN PEDRO RIVER AT PALOMINAS, ARIZONA

DESCRIPTION: Water-stage recorder located near left bank on downstream side of the bridge pier at Highway 92, 0.7 mile (1.1 km) east of Palominas, 2.5 miles (4.0 km) upstream from Green Brush Draw, 4.5 miles (7.2 km) downstream from international boundary, and 12 miles (19 km) southwest of Bisbee, Arizona. Zero of gage is 4,187.62 feet (1,276.39 m) above mean sea level (State Highway bench mark).
RECORDS: Based on current meter measurements or observations of no flow during the year. Records available: May 1930 to October 1933, May 1935 to July 1941, and July 1950 through 1980. Records obtained and furnished by U. S. Geological Survey.
REMARKS: There are some small diversions for irrigation of a few hundred acres above this station, mostly in Mexico. Record shows approximate flow of river at international boundary.
EXTREMES: Maximum daily discharge, 22,000 second-feet (623 m^3/sec) on August 14, 1940 (gage height 16.16 feet (4.93 m) present datum), from rating curve extended above 5,600 second-feet (159 m^3/sec) on basis of slope-area measurement of peak flow; no flow at times in most summers. Greatest flood known occurred on September 28, 1926 (gage height, about 23.9 feet (7.28 m) present datum, from flood marks; discharge not determined).

Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.9	0.56	0.10	1.9	0.09	1.5	0	0.09	0	0	0	0
2	1.9	.19	.53	2.2	0	.26	.16	131	0	0	0	0
3	2.1	.45	.87	1.8	0	1.8	.80	38	79	0	0	0
4	1.6	.42	1.1	2.7	0	.06	.12	300	.46	0	.06	0
5	.46	.21	.92	2.2	0	.09	.02	74	0	0	.43	0
6	.98	.16	.70	.50	.45	.04	.11	53	48	0	.49	0
7	1.5	.01	.60	1.6	1.1	.04	0	15	42	0	.37	0
8	2.0	.63	1.1	.44	.61	0	1.8	2.2	35	0	.49	0
9	2.7	.55	1.8	0	1.0	.40	3.0	.04	1.1	0	.16	0
10	1.3	.19	2.3	0	.51	.07	0	0	.86	0	.23	0
11	.05	.12	7.0	0	1.8	.07	0	0	.07	0	.51	0
12	.44	.05	3.1	.19	3.4	.99	0	0	0	0	.63	0
13	2.3	1.4	4.4	.69	4.5	2.5	2.7	83	0	0	.73	0
14	4.5	10	3.7	2.2	1.9	.08	15	139	0	0	.70	0
15	4.6	12	1.9	.74	1.9	.15	23	154	.01	0	.64	0
16	5.1	2.5	2.3	3.0	.88	.28	.51	252	.19	0	.74	0
17	3.3	.86	.41	4.7	.58	.53	.29	48	0	0	.83	0
18	1.9	.31	1.1	1.9	1.6	.07	.70	5.6	0	0	.78	0
19	1.7	.23	.82	2.3	.32	0	1.2	10	0	0	0	0
20	1.4	.27	.61	2.0	1.5	.67	.32	.72	1.4	0	0	0
21	3.0	.03	.58	.95	2.2	1.5	.19	.24	10	0	0	0
22	4.9	.05	.41	3.8	.86	.99	8.0	1.3	8.6	0	0	0
23	5.0	.01	.62	5.2	2.1	2.6	0	455	1.6	0	0	0
24	4.3	.01	0	5.1	1.8	.76	0	136	.35	0	0	0
25	2.6	0	.18	5.2	4.2	.60	.01	54	.30	0	0	0
26	.23	.06	.79	2.0	2.2	1.3	0	10	.15	0	0	0
27	.19	.08	1.7	0	2.0	.75	0	.22	0	0	0	.23
28	0	.08	1.5	0	1.8	0	0	0	0	0	0	.88
29	0	.07	1.2	0	3.1	0	60	0	0	0	0	1.1
30	0		1.3	0	3.6	0	2.6	.35	0	0	0	1.2
31	.97		1.4		1.4		.08	0		0		.97
Sum	62.92	31.50	45.04	53.31	47.40	18.10	120.61	1,962.76	229.09	0	7.79	4.38

Month	Current Year 1980								Period 1951-1980		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	4.37		24	9.4	28	0	2.03	125	1,487	27,763	2.6
Feb.	4.55		14	22	25	0	1.09	62.5	560	4,080	3.0
Mar.	4.21		11	11	24	0	1.45	89.3	527	4,659	13.3
Apr.	4.12		25	12	1 9	0	1.78	106	127	871	0
May	4.07		13	9.4	1 2	0	1.53	94.0	45.9	285	0
June	3.99		23	8.1	1 8	0	.60	35.9	180	1,391	0
July	4.64		29	190	1 1	0	3.89	239	5,907	17,238	184
Aug.	6.76		4	2,000	10	0	63.3	3,893	8,799	36,369	165
Sept.	5.22		6	458	1 1	0	7.64	454	1,685	16,344	11.3
Oct.				0		0	0	0	1,820	47,322	0
Nov.	4.63		18	1.2	1 1	0	.26	15.5	240	2,563	0
Dec.	4.64		30	1.4	1 1	0	.14	8.7	1,523	25,479	6.2
Yearly	6.76			2,000		0	7.06	5,123	22,901	62,788	4,400
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	2.06			56.6		0	0.20	6,319	28,248	77,448	5,427

1 And other days

SANTA CRUZ RIVER NEAR LOCHIEL, ARIZONA

DESCRIPTION: Water-stage recorder located in the United States near left bank on the downstream side of concrete bridge pier of county highway bridge, 2.5 miles (4.0 km) northeast of Lochiel, Arizona, and 1.7 miles (2.7 km) upstream from the international land boundary. The elevation of the zero of the gage has not been determined, but topographic maps indicate the elevation of the stream bed at the gage is about 4,620 feet (1,408 m).
RECORDS: Based on current meter measurements or observations of no flow during the year. Records obtained and furnished by the U. S. Geological Survey. Records available: January 1949 through 1980.
REMARKS: There are small diversions by ground water pumping for irrigating about 200 acres (80.9 ha) above this station.
EXTREMES: Maximum discharge, 12,300 second-feet (348 m^3/sec) on October 9, 1977 (gage height 10.21 feet) (3.11 m); minimum discharge, no flow for several days of each year.

Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.69	0.66	0.60	0.59	0.37	0.20	1.5	0.10	0.06	0.08	0.22	0.35
2	.69	.64	.60	.61	.35	.23	.18	.10	.05	.06	.19	.35
3	.69	.64	.60	.62	.36	.19	.15	15	.06	.03	.16	.35
4	.69	.69	.60	.62	.33	.19	.15	1.0	.05	.03	.17	.35
5	.64	.69	.60	.62	.33	.17	.12	.50	.04	.05	.19	.35
6	.62	.69	.60	.63	.33	.15	.13	.20	.03	.06	.21	.39
7	.60	.69	.60	.64	.31	.10	.16	.20	3.2	.07	.22	.42
8	.60	.72	.60	.62	.30	.05	.15	.10	.50	.07	.23	.37
9	.61	.69	.60	.62	.29	.08	.11	.20	.05	.08	.26	.35
10	.64	.73	.60	.62	.30	.06	.13	1.0	.04	.10	.26	.34
11	.64	.73	.60	.60	.29	.03	.08	.50	.05	.11	.26	.34
12	.63	.73	.60	.61	.32	.09	.04	.10	.06	.11	.27	.39
13	.57	.76	.58	.58	.35	.15	.10	.50	.05	.13	.28	.38
14	.56	.81	.56	.60	.36	.17	.04	1.0	.05	.13	.28	.35
15	.57	1.0	.55	.58	.36	.18	.02	.50	.04	.14	.29	.35
16	.56	.80	.54	.53	.35	.18	.02	.10	.04	.15	.30	.33
17	.56	.75	.53	.51	.34	.18	.05	.10	.04	.16	.30	.32
18	.56	.70	.51	.45	.32	.17	.07	.10	.02	.17	.32	.30
19	.59	.70	.55	.44	.32	.17	.09	.10	.01	.16	.33	.29
20	.58	.68	.56	.45	.30	.17	.09	.10	0	.16	.33	.28
21	.60	.68	.56	.42	.26	.16	.09	.09	0	.16	.35	.30
22	.60	.66	.57	.39	.20	.17	.09	.08	0	.17	.35	.30
23	.58	.66	.59	.39	.20	.16	.08	.07	0	.18	.35	.27
24	.59	.64	.59	.38	.20	.16	.10	.06	.90	.18	.34	.26
25	.62	.60	.59	.41	.22	.15	.09	.06	.07	.19	.33	.29
26	.60	.60	.60	.41	.26	.15	.08	.05	.08	.19	.34	.33
27	.60	.60	.63	.42	.25	.15	.08	.05	.06	.20	.35	.33
28	.60	.60	.60	.39	.25	.14	.08	.05	.06	.21	.35	.33
29	.60	.60	.61	.39	.27	.14	.08	.06	.08	.21	.35	.34
30	.64		.59	.40	.27	23	.10	.07	.08	.21	.35	.33
31	.67		.60		.21		.10	.06		.22		.33
Sum	18.99	20.14	18.11	15.54	9.17	27.29	4.35	22.20	5.77	4.17	8.53	10.36

Month	Current Year 1980 Extreme Gage Feet High	Extreme Gage Feet Low	Ø Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1949-1980 Acre-Feet Average	Maximum	Minimum
Jan.			! 1	0.69	!14	0.56	0.61	37.7	135	2,895	1.3
Feb.			15	1.0	!25	.60	.69	39.9	54.7	437	1.8
Mar.			27	.63	18	.51	.58	35.9	48.0	396	.7
Apr.			7	.64	24	.38	.52	30.8	30.2	262	0
May			1	.37	!22	.20	.30	18.2	13.6	128	0
June			30	23	11	.03	.91	54.1	15.1	169	0
July			1	1.5	!15	.02	.14	8.6	537	4,270	1.6
Aug.			3	15	!26	.05	.72	44.0	879	10,120	.08
Sept.			7	3.2	!20	0	.19	11.4	276	2,634	0
Oct.			31	.22	! 3	.03	.13	8.3	221	4,732	0
Nov.			!21	.35	3	.16	.28	16.9	48.0	273	0
Dec.			7	.42	24	.26	.33	20.5	97.6	1,093	0
				23		0	0.45	326	2,355	12,633	126
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				0.65		0	0.01	402	2,905	15,583	155

! And other days Ø Mean daily

SANTA CRUZ RIVER NEAR NOGALES, ARIZONA

DESCRIPTION: Water-stage recorder, cable with sit-down cable car located 5.5 miles (8.9 km) east of Nogales, Arizona, 0.8 mile (1.3 km) downstream from the international boundary and 6 miles (9.7 km) upstream from the Santa Cruz bridge on State Highway No. 82. Zero of gage is 3,702.54 feet (1,128.53 m) above mean sea level, U. S. C. & G. S. datum (levels by International Boundary and Water Commission).

RECORDS: Based on current meter measurements or observation of no flow during the year. Records obtained and furnished by the U. S. Geological Survey. 1980 records fair. Records available: March to November 1907 and April 1909 to December 1912 (discharge measurements and fragmentary gage height record); January 1913 to June 1922 (October 1915 to September 1916, monthly discharges only); May 1930 to December 1933; and July 1935 through 1980.

REMARKS: Diversions in both countries affect the flow at this station. The major diversions occur in Mexico for domestic and irrigation uses. There are no storage dams above the station as of December 1980.

EXTREMES: Maximum discharge, 33,500 second-feet (949 m^3/sec) on October 9, 1977 (gage height 15.5 feet) (4.72 m); minimum discharge, no flow for several days of many years.

Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.8	6.4	4.5	0.80	0.20	0	7.7	5.0	0	0	0	0
2	3.5	6.4	4.5	1.1	.20	0	0	2.0	0	0	0	0
3	3.5	6.4	5.4	.80	.20	0	0	53.0	14.0	0	0	0
4	3.5	6.1	4.8	.70	.20	0	0	166	21.0	0	0	0
5	3.5	5.8	4.8	.70	.10	0	0	4.0	8.0	0	0	0
6	3.7	5.4	4.1	.70	.10	0	0	2.0	8.5	0	0	0
7	4.1	5.8	4.6	.70	.10	0	0	.50	35.0	0	0	0
8	4.4	8.0	4.8	.60	0	0	0	0	5.1	0	0	0
9	3.0	7.4	4.6	.40	0	0	0	53.0	4.8	0	0	0
10	3.0	6.4	5.8	.40	0	0	0	40.0	3.9	0	0	0
11	4.4	5.8	6.7	.40	0	0	0	37.0	2.6	0	0	0
12	4.4	6.4	5.4	.40	0	0	0	8.0	2.0	0	0	0
13	3.3	7.0	4.6	.40	0	0	0	68.0	1.5	0	0	0
14	4.1	9.5	3.7	.40	0	0	0	40.0	1.0	0	0	0
15	5.1	20.0	3.7	.40	0	0	0	7.7	1.0	0	0	0
16	4.9	11.0	3.7	.30	0	0	0	2.2	.50	0	0	0
17	4.4	8.0	3.7	.30	0	0	0	1.3	.50	0	0	0
18	4.1	7.4	4.4	.30	0	0	0	.90	.20	0	0	0
19	3.7	7.4	3.5	.30	0	0	0	.90	.20	0	0	0
20	3.9	7.0	4.1	.20	0	0	0	.90	.10	0	0	0
21	4.8	6.4	3.5	.20	0	0	0	.50	0	0	0	0
22	5.1	6.4	3.0	.20	0	0	0	.50	0	0	0	0
23	4.6	5.4	3.0	.30	0	0	0	1.3	0	0	0	0
24	4.6	5.4	2.8	.20	0	0	0	2.2	0	0	0	0
25	5.4	4.8	2.1	.20	0	0	0	1.8	0	0	0	0
26	5.8	4.5	2.2	.20	0	0	0	.50	0	0	0	0
27	6.1	4.5	2.0	.20	0	0	0	.20	0	0	0	0
28	6.7	4.5	1.7	.10	0	0	0	.20	0	0	0	0
29	6.4	4.5	1.1	.20	0	0	0	.20	0	0	0	0
30	6.1		1.0	.20	0	26.0	0	0	0	0	0	0
31	6.7		1.0		0		15.0	0		0		0
Sum	139.6	200.0	114.8	12.30	1.10	26.0	22.7	499.80	109.90	0	0	0

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
	Current Year 1980								Period 1936-1980		
Jan.	4.25	4.10	31	7.0	1	2.5	4.50	277	1,704	30,282	0
Feb.	4.60		15	30	126	4.5	6.90	397	1,086	11,129	0
Mar.	4.30	4.00	11	8.5	31	.90	3.70	228	1,080	12,454	0
Apr.	4.06		2	1.3	28	0	.41	24.4	294	2,301	0
May	4.03		1	.30	! 8	0	.035	2.2	86.4	897	0
June	4.82		30	169	! 1	0	.87	51.6	63.6	1,020	0
July	4.40		1	55	! 2	0	.73	45.0	2,716	15,610	45
Aug.	6.52		9	1,950	! 8	0	16.1	991	5,704	45,790	91
Sept.	5.70		7	830	! 1	0	3.66	218	1,315	7,507	0
Oct.				0		0	0	0	1,645	59,025	0
Nov.				0		0	0	0	455	7,384	0
Dec.				0		0	0	0	2,305	33,568	0
Yearly	6.52			1,950		0	3.08	2,234	18,454	66,030	2,234
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	1.99			55.2		0	0.09	2,756	22,763	81,447	2,756

! And other days

SEWAGE INFLUENT, NOGALES INTERNATIONAL TREATMENT PLANT

DESCRIPTION: Three 24-inch (61.0 cm) Parshall flumes, each with a recording flow meter and continuous totalizer, one located at the international boundary for measuring effluent from Nogales, Sonora, one located in the influent line to the treatment plant, and one on the plant effluent line. Nogales International Treatment Plant is located approximately 6 miles (9.7 km) north of the international boundary.

RECORDS: Flows from the United States are deduced from total plant influent less the flows measured crossing the international boundary from Mexico. Records available: Continuous monthly record for plant influent since August 1951, daily records for plant influent, January 1952 through 1980.

REMARKS: Prior to December 18, 1971 the plant was located along the right bank of Nogales Wash, approximately two miles (3.2 km) north of the international boundary. Nogales International Treatment Plant treats combined sewage from Nogales, Arizona and Nogales, Sonora by means of aerated stabilization lagoons. Chlorination of plant effluent, which may be used for irrigation of lands lying north of the plant, is carried out by the United States at its expense.

Month	Total Monthly Flows Millions of Gallons			Mean Daily Flows-Millions of Gallons Per Day					
				Current Year 1980			Period 1952-1980		
	U.S.	Mexico	Total	Maximum	Minimum	Mean	Maximum	Minimum	Mean
Jan.	84.006	88.455	172,461	5.849	4.376	5.563	7.942	0.650	2.929
Feb.	73.935	95.048	168.983	6.860	4.620	5.827	7.031	.650	2.971
Mar.	80.557	96.194	176.751	6.137	5.002	5.702	7.922	.750	2.951
Apr.	74.755	85.162	159.917	5.653	5.027	5.331	6.130	.700	2.838
May	80.263	76.910	157.173	5.334	4.634	5.070	6.168	.550	2.727
June	72.077	68.770	140.847	4.999	4.303	4.695	5.509	.700	2.587
July	74.443	72.249	146.692	5.171	4.150	4.732	6.149	.700	2.666
Aug.	71.705	91.116	162.821	6.505	4.477	5.252	6.505	.750	2.951
Sept.	90.446	80.935	171.381	6.279	4.882	5.713	6.279	.800	3.199
Oct.	102.450	81.442	183.892	6.624	5.352	5.932	9.807	.700	3.119
Nov.	90.865	78.165	169.030	5.903	5.360	5.634	10.235	.800	3.026
Dec.	92.999	77.561	170.560	5.788	5.078	5.502	11.478	.350	2.995
Yearly	988.501	992.007	1,980.508	6.860	4.150	5.413	11.478	0.350	2.913

RAINFALL ON THE SANTA CRUZ RIVER WATERSHED IN INCHES

Tabulated below are the monthly records of rainfall with averages for their periods of record at stations located in Arizona and one in Sonora, Mexico. Two stations are operated and maintained by the United States Section of the Commission, three by the National Weather Service, and one by the Mexican Section of the Commission. For location, elevation, period of record, type of gage in use, and the observer, see alphabetical listing of stations on page 92.

In the United States

Month	San Rafael #2, Arizona		Canelo, Arizona		Patagonia, Arizona		Nogales, Arizona		Nogales Sanitation Plant 6N, Arizona	
	1980	Average 1973-1980	1980	Average 1930-1980	1980	Average 1930-1980	1980	Average 1914-1980	1980	Average 1953-1980
Jan.	0.45	1.43	0.72	1.17	0.69	1.22	0.50	1.05	0.46	1.05
Feb.	2.95	1.31	1.99	1.07	2.25	1.06	2.22	.87	1.10	.72
Mar.	.07	.88	.91	.80	.86	.88	.88	.79	.86	.83
Apr.	.15	.32	.21	.35	0	.33	.02	.29	.01	.17
May	0	.06	0	.13	0	.16	T	.14	0	.17
June	0	.42	1.43	.81	.79	.51	.76	.46	.03	.40
July	1.40	5.32	3.31	4.19	1.59	4.42	.70	4.25	.38	4.65
Aug.	2.31	2.69	4.57	4.22	1.73	3.95	6.19	3.87	9.06	3.82
Sept.	2.00	2.05	1.15	1.72	1.12	1.81	1.48	1.62	1.13	1.55
Oct.	0	1.52	0	.97	0	1.03	.38	.89	.01	1.23
Nov.	0	.83	0	.75	0	.79	0	.71	0	.65
Dec.	.18	.93	.58	1.32	.46	1.35	.34	1.26	.57	1.23
Yearly	9.51	17.76	14.87	17.50	9.49	17.51	13.47	16.20	13.61	16.47

In Mexico

Month	San Lazaro, Sonora									
	1980	Average 1961-1980								
Jan.	0.39	0.94								
Feb.	.71	.79								
Mar.	0	.71								
Apr.	0	.31								
May	0	.08								
June	.71	.47								
July	.63	4.33								
Aug.	5.04	3.31								
Sept.	2.60	1.65								
Oct.	0	1.10								
Nov.		.71								
Dec.	.39	1.22								
Yearly		15.12								

T Trace

LOCATION OF RAINFALL STATIONS ON THE SANTA CRUZ WATERSHED

The precipitation records of the stations listed alphabetically below begin on the data shown and extend through 1980.

In United States

NAME OF STATION	TYPE GAGE	LATITUDE	LONGITUDE	ELEV. (FT.)	RECORD BEGAN	OBSERVER
Canelo, Arizona	S	31° 33'	110° 32'	5,010	1930	R. E. Ewing
Nogales, Arizona	R	31° 21'	110° 55'	3,808	1914	Milford L. Noon
Nogales Sanitation Plant 6N, Arizona	S	31° 25'	110° 57'	3,560	June 1952	I. B. & W. C.
Patagonia, Arizona	S	31° 33'	110° 45'	4,190	1930	George R. Proctor
San Rafael #2, Arizona	S	31° 22'	110° 38'	4,860	Jan. 1973	I. B. & W. C.

In Mexico

NAME OF STATION	TYPE GAGE	LATITUDE	LONGITUDE	ELEV. (FT.)	RECORD BEGAN	OBSERVER
San Lazaro, Sonora	S	31° 18'	110° 38'	4,199	Mar. 1954	I. B. & W. C. Mexican Section

S Standard 8" rain gage R Recording rain gage

TEMPERATURE, HUMIDITY, EVAPORATION, AND WIND IN THE SANTA CRUZ RIVER BASIN

Tabulated below are monthly records of temperature, humidity, evaporation and wind at the station located at the Nogales Sanitation Plant in Arizona 6 miles (9.7 km) north of the international boundary. December 18, 1971 the station was moved to correspond with a new Nogales Sanitation Plant. Prior to this date, the station was located 2 miles (3.2 km) north of the international boundary at the old Nogales Sanitation Plant. This station is operated and maintained by the United States Section of the Commission. Also tabulated below are the monthly records of temperature and evaporation for a station at San Lazaro, Sonora, located approximately 6.5 miles (10.5 km) southwest of Santa Cruz, Sonora and approximately 22 miles (35 km) southeast of Nogales, Sonora. This station is operated and maintained by the Mexican Section of the Commission. The equipment at the Nogales Sanitation Plant - 6N consists of: Standard 8-inch (203 mm) rain gage, 48-inch (1,219 mm) evaporation pan with stillwell and hook gage, maximum and minimum thermometer, anemometer (registers miles), hygrothermograph, and psychrometer, hand turbine type. The equipment at the station at San Lazaro, Sonora consists of: Maximum and minimum thermometer, standard 8-inch (203 mm) rain gage and a 48-inch (1,219 mm) diameter evaporation pan.

For specific location of these two stations, refer to data opposite same station name shown in "Location of Rainfall Stations," page 92 of this bulletin.

In United States

Temperature - Degrees Fahrenheit

Month	Nogales Sanitation Plant - 6N		
	1980		
	Mean	Max.	Min.
Jan.	46.5	77	18
Feb.	50.7	82	24
Mar.	50.6	79	24
Apr.	56.3	90	26
May	60.3	95	26
June	73.4	106	35
July	80.7	104	54
Aug.	76.8	102	55
Sept.	71.5	98	45
Oct.	61.6	99	29
Nov.	51.7	88	19
Dec.	50.1	83	19
Yearly	60.8	106	18

Mean Relative Humidity - Percent

Month	Nogales Sanitation Plant - 6N	
	1980	
	Max.	Min.
Jan.	100	46
Feb.	94	41
Mar.	100	31
Apr.	100	30
May	95	41
June	100	65
July	100	68
Aug.	100	54
Sept.	91	46
Oct.	100	49
Nov.	92	42
Dec.	100	47
Yearly	100	30

Evaporation - Inches

Month	Nogales Sanitation Plant - 6N	
	1980	Average 1953-1980
Jan.	4.01	3.59
Feb.	4.24	4.58
Mar.	6.20	7.23
Apr.	9.50	9.56
May	11.14	12.25
June	13.05	13.78
July	12.06	10.47
Aug.	10.37	8.36
Sept.	7.90	8.15
Oct.	8.06	7.05
Nov.	5.01	4.59
Dec.	4.24	3.44
Yearly	95.78	93.05

Mean Wind Speed – Miles Per Hour

Month	Nogales Sanitation Plant - 6N	
	1980	Average 1953-1980
Jan.	2.0	2.0
Feb.	2.0	2.3
Mar.	2.2	2.6
Apr.	2.2	2.6
May	2.3	2.5
June	1.9	2.3
July	1.8	1.7
Aug.	1.5	1.1
Sept.	1.5	1.2
Oct.	1.9	1.6
Nov.	2.0	1.6
Dec.	1.7	1.7
Yearly	1.9	1.9

In Mexico

Temperature - Degrees Fahrenheit

Month	San Lazaro, Sonora			
	1980		1961-1980	
	Max.	Min.	Max.	Min.
Jan.	79	25	93	10
Feb.	77	28	88	16
Mar.	77	28	99	19
Apr.	88	32	106	18
May	91	39	117	28
June	104	41	124	39
July	99	54	126	50
Aug.	99	57	117	52
Sept.	97	50	115	39
Oct.	95	37	111	32
Nov.			102	19
Dec.	81	25	95	- 4
Yearly	104	25	126	- 4

Evaporation - Inches

Month	San Lazaro, Sonora	
	1980	Average 1961-1980
Jan.	3.39	3.54
Feb.	5.75	4.76
Mar.	6.73	6.97
Apr.	9.76	9.69
May	12.13	11.85
June		* 12.76
July		8.58
Aug.		7.52
Sept.		7.52
Oct.		6.89
Nov.		4.65
Dec.		3.58
Yearly		87.95

* From June through December, the period of record is 1961-1979

DRAINAGE AREAS ABOVE GAGING STATIONS AND IRRIGATED AREAS ALONG SANTA CRUZ RIVER, SAN PEDRO RIVER, AND WHITEWATER DRAW

1980

The drainage basin areas tabulated below are derived from the best available maps from both the United States and Mexico.

Data on irrigated areas in the Whitewater Draw Basin were furnished by the Soil Conservation Service at Douglas, Arizona and estimated from aerial photographs.

Designation of Areas	Drainage Basin - Square Miles			Irrigated Areas - Acres		
	United States	Mexico	Total	United States	Mexico	Total
Santa Cruz River:						
Above Lochiel, Arizona Gaging Station	82	0	82	100	0	100
Above El Cajon, Mexico Gaging Station	179	125	304	100	2,352	2,452
Above Nogales, Arizona Gaging Station	185	348	533	100	2,696	2,796
San Pedro River:						
Above Palominas, Arizona Gaging Station	92	649 *	741	1,010	3,459	4,469
Whitewater Draw:						
Above Douglas, Arizona Gaging Station	1,023	0	1,023	28,500	0	28,500

* An additional 47 square miles in Mexico is tributary to the San Pedro River downstream from this station

CORRECTIONS TO PREVIOUS WATER BULLETINS

Water Bulletin and Page Number	Heading	Reference	Published As	Correction
1976-76	Stored Water in Reservoirs, Tijuana River Basin	Rodriguez Reservoir, contents for March 1976	2,681	3,681
1977-89	Santa Cruz River near Nogales, Arizona	Mean daily discharges for October 8, 9, 10 and total for October	10,900 14,200 1,930 29,758.5	10,200 13,200 1,910 28,038.5
1979-6	General Hydrologic Conditions for 1979	Tijuana River Basin fourth paragraph, first line	52,764 acre-feet	42,776 acre-feet
1979-10	Yuma Main Canal Wasteway to Colorado River at Yuma, Arizona	Period Summary Maximum for November	1,010,500	101,500
1979-16	Colorado River at Northerly International Boundary - Discharges	Annual Summary, extreme second-feet low for the year	1,180	1,090