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WESTERN WATER BULLETIN 1983

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

1983

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FOREWORD

This bulletin is the twenty-fourth 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 1983.

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 1983.

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 from August 1972 to August 1980) 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:

<u>METRIC UNITS</u>	<u>ENGLISH UNITS</u>
	<u>LENGTHS</u>
1 Centimeter	0.393701 Inch
1 Meter	3.28084 Feet
1 Kilometer	0.621371 Mile
	<u>AREAS</u>
1 Square Meter	10.76391 Square Feet
1 Hectare	2.471054 Acres
1 Square Kilometer	0.386102 Square Mile
	<u>VOLUMES</u>
1 Cubic Meter	61023.74 Cubic Inches
1 Cubic Meter	35.314767 Cubic Feet
1 Cubic Meter	1.30795 Cubic Yards
1000 Cubic Meters	0.81071 Acre-Foot
1 Liter	0.264172 U.S. Gallon
	<u>WEIGHTS</u>
1 Kilogram	2.204623 Pounds
1 Metric Ton	2204.623 Pounds
1 Metric Ton	1.102311 Short Tons (2000 lbs)

GENERAL HYDROLOGIC CONDITIONS FOR 1983

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 1983. In the lower basin of the Colorado River in Mexico, from Morelos Diversion Dam to the Gulf of California, the average precipitation during 1983 measured at 5 index stations was 5.00 inches, compared to an average of 2.95 inches during the last 25 years (1959 to 1983).

The flow of the Colorado River reaching Imperial Dam was 16,929,700 acre-feet, about 210% of the 49-year average (1935-1983) of 8,044,451 acre-feet. At the northerly international boundary, the total flow of the river during 1983 was 14,091,113 acre-feet, about 384% of the 1935-1983 average of 3,672,682 acre-feet. At the southerly international boundary, the flow during 1983 was 11,209,984 acre-feet, or about 422% of the 1935-1983 average of 2,656,685 acre-feet. The total flow from January 1 to July 31, 1983 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 3,618,268 acre-feet. The recording station was dismantled on August 1, 1983 because of erosion of banks.

The total of all flows of the Colorado River entering Mexico in 1983 amounted to 14,368,813 acre-feet, 340% of the 1935-1983 average of 4,223,801 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 1983. A maximum instantaneous flow of 40,600 second-feet occurred in the Colorado River at the northerly boundary station on August 20, 1983.

Stored waters at the end of the year in the three major reservoirs on the Colorado River below Lee's Ferry amounted to 26,941,700 acre-feet, 94% of the usable capacity of 28,588,400 acre-feet. The greater part (24,151,000 acre-feet) of the storage was contained in Lake Mead (Hoover Dam). There were no reported shortages of Colorado River water for irrigation during 1983 due to drought or accident to the irrigation system.

The total reported acreage irrigated from waters of the Colorado River below Imperial Dam in 1983 was 1,232,568 acres; 660,467 acres in the United States and 572,101 acres in Mexico. An estimated 33% of acreage in Mexico is served by pumping from ground water.

The suspended sediment load passing the northerly boundary station in 1983 was 2,090 acre-feet, about 915% of the 1956-1983 average of 228.3 acre-feet.

Tijuana River Basin

During 1983, the temperatures at Barrett Dam, California (elevation 1,750 feet) in the upper portion of the basin in the United States averaged 62.2 degrees, 0.9 degree above the 53-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 recorded precipitation was 35.49 inches, 198% of normal; and at Chula Vista near the lower end of the basin, 19.11 inches, or 195% of normal. The recorded precipitation at San Juan de Dios in the upper portion of the basin in Mexico, was 33.93 inches, approximately 193% of the normal during the 28-year period; and at Rodriguez Dam in the lower portion of the basin in Mexico, 17.40 inches, 198% of the 46-year average.

Runoff above the Barrett and Rodriguez Reservoirs during 1983 averaged more than 884% of normal. Above Morena Reservoir the runoff was 143,966 acre-feet, or about 1,297% of the 47-year 1937-1983 mean of 11,096 acre-feet. Above Barrett Reservoir the runoff was 88,808 acre-feet, or about 689% of the 47-year 1937-1983 mean of 12,887 acre-feet. At Rodriguez Reservoir, the runoff was 205,507 acre-feet, or about 802% of the 46-year mean of 25,621 acre-feet.

The flow of the Tijuana River at the international boundary was 489,443 acre-feet during 1983.

Whitewater Draw

During 1983, the average annual temperature over the watershed was 0.6 degree below normal, while the annual precipitation was 157% of normal. Runoff for the year at the gaging station near Douglas, Arizona, of 4,514 acre-feet, was about 72% of average.

GENERAL HYDROLOGIC CONDITIONS FOR 1983

San Pedro River

During 1983, the average annual temperature was 0.9 degree below normal. The annual precipitation, as measured at Coronado National Monument Headquarters, was 144% of the 1961-1983 mean of 20.16 inches. The stream flow at the international boundary was 42,299 acre-feet, 186% of the 1951-1983 normal.

Santa Cruz River

During 1983, the average annual temperature over the watershed was somewhat below normal, and the annual precipitation was about 184% of the 45-year 1939-1983 mean. Runoff measured at the Nogales gaging station, where the stream re-enters the United States, was 87,615 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 11,298 acre-feet. Therefore, neglecting stream flow depletions in Mexico, the records indicate a contribution of about 76,317 acre-feet from the loop of the river lying in Mexico, or approximately 87% of the flow reaching the Nogales station.

Alamo and New Rivers

During 1983, the average annual temperature over the drainage areas of the Alamo and New Rivers, as recorded at El Centro, California, was 72.8 degrees, 0.6 degree above normal; and over the drainage area of the New River, as recorded at Mexicali, Baja California, it was 75.0 degrees, 3 degrees above the 58-year average.

At El Centro, the precipitation was 5.50 inches, about 205% of the 53-year average; and in Mexicali, the annual precipitation was 4.92 inches, 154% of the 58-year average. The total flow of the New River at the international boundary in 1983 was 242,601 acre-feet, which was about 264% of the 1943-1983 normal.

Salton Sea

During 1983, the average annual temperature around the Salton Sea was about 101% of the long-term average, while the annual precipitation recorded at Brawley, California, was approximately 227% of the long-term mean of 2.71 inches. The water surface of the Salton Sea remained more or less the same during the year. The maximum stage, 227.1 feet below mean sea level, was recorded on March 11-16 and and March 28 to June 8, inclusive. The minimum stage, 228.4 feet below mean sea level, was recorded on January 1-6, 1983.

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-Foot 1983 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
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21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
Sum												
	Current Year 1983							Period 1973-1983				
Month	Extreme Gage Feet		Extreme Second-Foot				Average Second-Foot	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low		Average	Maximum	Minimum		
Jan.				0		0	0	0	431	902	0	
Feb.				0		0	0	0	433	813	0	
Mar.				0		0	0	0	459	849	0	
Apr.				0		0	0	0	446	857	0	
May				0		0	0	0	470	887	0	
June				0		0	0	0	471	986	0	
July				0		0	0	0	477	1,021	0	
Aug.				0		0	0	0	454	918	0	
Sept.				0		0	0	0	374	904	0	
Oct.				0		0	0	0	390	905	0	
Nov.				0		0	0	0	367	902	0	
Dec.				0		0	0	0	367	993	0	
Yearly				0		0	0	0	5,139	10,258	0	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
				0		0	0	0	6,339	12,653	0	

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 1983.

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 m³). 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 m³), 1916; minimum annual flow 8,920 acre-feet (11,003,000 m³), 1913.

Mean Daily Discharge in Second-Foot 1983 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	34	49	45	57	52	49	40	45	55	60	60	74
2	34	49	78	53	53	56	40	45	55	60	60	65
3	35	67	80	51	49	56	40	45	55	60	60	54
4	37	51	77	51	50	53	40	45	55	60	60	55
5	39	47	74	58	50	62	40	45	55	60	60	57
6	40	63	50	56	50	61	30	45	55	60	60	57
7	41	65	46	57	50	57	30	45	55	60	60	59
8	44	60	44	58	51	55	30	45	55	60	60	59
9	47	55	47	61	51	50	30	45	55	60	60	54
10	50	51	50	65	51	47	30	45	55	60	60	60
11	53	48	46	61	51	48	30	45	55	60	60	68
12	49	38	51	53	51	31	30	45	55	60	60	65
13	47	36	47	46	51	12	30	45	55	60	60	54
14	47	33	43	42	53	21	30	45	55	60	60	45
15	45	34	45	41	51	24	30	45	55	60	60	39
16	45	33	43	42	51	24	30	55	55	60	60	40
17	45	34	47	42	52	20	30	55	55	60	60	44
18	45	36	46	42	51	14	30	55	55	60	60	41
19	44	36	45	44	51	8	30	55	55	60	60	44
20	42	41	47	44	51	8	30	55	55	60	60	39
21	43	35	45	45	51	12	30	55	40	60	60	37
22	43	36	45	45	52	36	30	55	40	60	60	36
23	47	38	51	46	52	43	30	55	40	60	60	48
24	47	40	62	47	52	20	30	55	40	60	60	57
25	44	49	66	48	53	0	30	55	50	60	60	75
26	44	43	66	50	53	0	35	55	63	60	60	77
27	45	41	69	51	51	0	35	55	63	60	60	75
28	46	42	67	51	58	0	35	55	63	60	60	85
29	46	46	62	52	51	10	35	55	63	60	60	69
30	46	46	70	53	49	10	35	55	63	60	60	68
31	48	48	70	51	51	9	35	55	60	60	60	62
Sum	1,362	1,250	1,724	1,512	1,593	887	1,010	1,555	1,625	1,860	1,800	1,763
Current Year 1983							Period 1937-1983					
Month	Extreme Gage Feet		Extreme Second-Foot			Average Second-Foot	Total Acre-Feet	Acre-Feet				
	High	Low	Day	High	Low			Average	Maximum	Minimum		
Jan.			11	53	1 1	34	43.9	2,701	3,144	4,780	877	
Feb.			3	67	114	33	44.6	2,479	2,965	4,320	563	
Mar.			3	80	114	43	55.6	3,420	3,658	5,240	1,240	
Apr.			10	65	15	41	50.4	2,999	3,669	5,250	1,160	
May			28	58	1 3	49	51.4	3,160	3,822	5,590	992	
June			5	62	125	0	29.6	1,759	3,674	5,580	885	
July			1 1	40	! 6	30	32.6	2,003	3,937	6,550	816	
Aug.			116	55	! 1	45	50.2	3,084	3,936	6,810	861	
Sept.			126	63	121	40	54.2	3,223	3,717	6,220	889	
Oct.			1 1	60	! 1	60	60.0	3,689	3,728	5,740	1,040	
Nov.			1 1	60	! 1	60	60.0	3,570	3,480	5,490	994	
Dec.			28	85	22	36	56.9	3,497	3,361	4,960	966	
Yearly				85		0	49.2	35,584	43,091	63,700	12,840	
	Meters		Cubic Meters per Second			Thousands of Cubic Meters						
				2.41		0	1.39	43,893	53,152	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 1983.

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 m³); maximum annual flow, 913,700 acre-feet (1,127,040,000 m³), 1932; minimum annual flow, 114,900 acre-feet (141,728,000 m³), 1917. Since 1935: Maximum mean daily discharge, 2,020 second-feet (57.2 m³/sec), December 24-25, 1948; minimum mean daily discharge, no flow on numerous occasions.

Mean Daily Discharge in Second-Feet 1983 — Annual and Period Summary

Day	Mean Daily Discharge in Second-Feet 1983											
	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	13	10	7.7	8.0	6.7	6.2	6.0	6.0	6.0	15	11	12
2	4.6	8.5	10	8.0	6.5	8.7	6.0	6.0	6.0	15	10	11
3	4.6	15.4	7.5	8.0	6.5	6.3	6.0	6.0	6.0	15	11	12
4	5.4	25	6.7	6.4	6.4	7.6	6.0	6.0	6.0	15	12	11
5	5.4	8.3	7.3	13	6.2	19	6.0	6.0	6.0	15	33	11
6	5.4	8.1	9.6	4.4	5.9	8.0	6.0	6.0	6.0	15	150	10
7	5.3	8.4	7.6	4.0	6.1	7.7	6.0	6.0	6.0	15	5.2	8.5
8	5.2	8.9	7.4	3.9	6.2	7.7	6.0	6.0	6.0	15	2.6	8.0
9	9.1	9.0	7.7	3.9	6.0	7.7	6.0	6.0	6.0	15	3.7	8.3
10	6.0	9.1	7.7	6.6	6.2	7.7	6.0	6.0	6.0	15	7.8	10
11	6.3	9.5	7.7	5.4	5.9	12	6.0	6.0	6.0	15	6.9	9.3
12	5.9	9.7	7.1	4.6	5.4	7.7	6.0	6.0	6.0	15	6.9	8.8
13	11	9.7	11	4.6	5.7	7.5	6.0	6.0	6.0	15	7.7	8.8
14	17	9.4	7.6	7.6	6.9	7.1	6.0	6.0	6.0	15	8.5	9.3
15	6.2	8.9	6.6	5.0	8.0	7.3	6.0	6.0	6.0	15	8.8	9.8
16	6.5	8.8	6.2	4.6	6.2	7.3	6.0	6.0	6.0	15	9.4	9.8
17	6.9	8.3	8.0	5.3	5.4	10	6.0	6.0	6.0	15	10	9.3
18	6.9	7.9	8.0	5.4	8.8	11	6.0	6.0	6.0	15	11	9.4
19	7.2	7.6	8.0	6.0	9.1	8.0	6.0	6.0	6.0	15	12	9.6
20	7.8	11	8.0	7.2	12	8.0	6.0	6.0	6.0	15	13	10
21	8.9	13	8.0	7.6	6.2	9.2	6.0	6.0	6.0	15	13	10
22	13	7.0	8.0	6.7	6.2	6.4	6.0	6.0	6.0	15	13	10
23	17	6.9	8.0	6.9	11	6.0	6.0	6.0	6.0	15	13	9.3
24	13	6.9	8.0	8.8	6.2	6.0	6.0	6.0	6.0	15	13	9.3
25	11	7.2	8.0	9.8	6.3	6.0	6.0	6.0	6.0	15	13	9.3
26	8.8	7.3	8.0	7.2	6.6	6.0	6.0	6.0	6.0	15	13	16
27	8.9	13	8.0	6.7	7.2	6.0	6.0	6.0	6.0	15	13	9.0
28	20	7.7	8.0	6.7	7.0	6.0	6.0	6.0	6.0	15	13	9.3
29	9.7		8.0	6.8	7.0	6.0	6.0	6.0	6.0	15	11	9.3
30	8.9		8.0	6.9	7.0	6.0	6.0	6.0	6.0	15	11	8.8
31	8.5		8.0		7.0		6.0	6.0	6.0	15		9.3
Sum	273.4	409.1	245.4	196.0	213.8	236.1	186.0	186.0	180.0	465	466.5	305.5
Current Year 1983												
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period 1935-1983			
	High	Low	Day	High	Low	Average			Maximum	Minimum		
Jan.			28	20	12	4.6	8.82	542	49,324	110,700	542	
Feb.			3	154	123	6.9	14.6	811	43,301	89,140	510	
Mar.			13	11	16	6.2	7.92	487	42,812	90,190	357	
Apr.			5	13	18	3.9	6.53	389	43,305	86,580	326	
May			20	12	112	5.4	6.90	424	51,849	88,280	333	
June			5	19	123	6.0	7.87	468	45,314	86,960	342	
July			11	6.0	11	6.0	6.00	369	42,359	91,220	369	
Aug.			11	6.0	11	6.0	6.00	369	42,950	89,890	369	
Sept.			11	6.0	11	6.0	6.00	357	47,034	83,660	357	
Oct.			11	15	11	15	15.0	922	43,570	90,050	567	
Nov.			6	150	8	2.6	15.6	925	43,608	101,500	841	
Dec.			26	16	8	8.0	9.85	606	47,950	108,800	598	
Yearly				154		2.6	9.21	6,669	543,376	1,042,850	6,669	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
				4.36		0.07	0.26	8,226	670,249	1,286,345	8,226	

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 1983. 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 1983 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,030	4,790	626	2,110	4,740	5,300	23,600	26,400	22,700	25,200	18,800	15,700
2	1,230	4,770	1,120	2,080	4,880	5,320	25,500	25,900	22,600	25,600	18,700	15,300
3	1,370	5,540	1,630	2,150	4,840	5,520	26,600	26,100	22,100	25,200	18,900	15,100
4	2,030	6,380	1,590	2,450	4,760	5,520	26,500	26,000	22,000	24,500	19,400	15,200
5	2,270	6,300	1,200	2,780	4,760	5,790	27,000	25,900	21,900	24,300	20,200	15,300
6	2,470	5,300	806	3,100	4,770	6,540	27,200	26,500	21,800	24,000	20,700	15,200
7	2,640	3,400	714	3,150	4,710	6,650	26,900	27,200	21,700	24,700	19,500	15,100
8	2,910	2,100	637	3,180	4,350	6,650	26,100	27,100	21,700	25,300	19,100	15,000
9	3,050	1,150	695	3,340	4,110	6,770	25,900	27,000	22,100	25,900	19,100	14,700
10	3,090	1,050	783	3,700	4,070	6,910	26,500	27,500	22,500	25,700	18,400	14,900
11	3,120	980	623	4,110	4,540	7,060	27,300	28,100	22,800	25,300	17,200	15,300
12	3,130	810	566	4,330	4,740	7,850	27,200	28,800	22,200	24,700	17,000	14,900
13	3,100	765	568	4,500	4,740	8,610	27,100	28,600	21,500	24,500	17,800	14,400
14	3,050	675	562	4,640	4,720	8,330	27,100	27,900	21,500	24,300	16,800	14,200
15	2,910	650	562	4,660	4,850	8,250	26,700	26,500	20,600	24,600	16,200	14,100
16	2,880	622	564	4,680	5,030	8,250	26,600	26,300	20,700	25,100	16,300	14,100
17	2,880	598	685	4,620	5,030	8,340	27,500	28,400	20,900	25,200	16,000	14,500
18	2,880	582	650	4,690	5,040	8,540	28,200	30,100	21,800	25,100	16,000	14,500
19	2,870	526	624	4,710	5,010	8,970	27,300	31,300	21,800	24,900	16,300	14,700
20	2,860	750	626	4,710	4,940	9,630	26,500	31,300	21,800	24,100	17,000	14,500
21	2,860	565	635	4,700	4,750	9,200	26,100	30,200	22,500	22,900	16,900	14,500
22	2,940	562	637	4,790	4,660	8,200	25,900	28,900	22,800	21,900	16,000	14,600
23	3,210	563	800	4,780	4,870	7,860	26,200	27,600	22,600	21,900	16,000	15,500
24	3,280	574	1,000	4,800	5,020	8,180	26,700	27,100	24,200	21,700	16,400	15,800
25	3,020	830	1,120	4,860	5,100	11,300	26,500	26,200	25,800	21,000	17,100	16,600
26	2,970	624	1,410	4,840	5,140	15,700	26,200	26,000	25,400	20,800	16,800	16,400
27	3,260	558	1,570	4,820	5,250	21,000	26,700	25,600	26,100	20,900	17,400	16,500
28	4,020	576	1,540	4,800	5,220	21,900	26,600	26,300	26,000	21,200	17,800	16,700
29	4,470		1,600	4,750	5,340	23,100	26,100	26,500	25,500	21,300	17,400	15,900
30	4,770		1,740	4,700	5,340	23,500	26,200	25,900	24,900	20,300	16,900	15,900
31	5,070		1,840		5,350		26,600	24,500		19,500		15,500
Sum	91,640	52,620	29,728	121,530	150,670	294,740	823,100	847,700	682,500	731,600	528,100	470,600
Current Year 1983												
Period 1951-1983												
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.	17.02	9.82	31	5,140	1	553	2,960	181,765	185,895	979,890	29,857	
Feb.	18.54	10.44	4	6,890	27	553	1,880	104,370	137,688	826,600	33,790	
Mar.	12.75	10.35	31	1,910	16	553	959	58,965	152,692	1,073,270	34,604	
Apr.	16.63	12.67	25	4,900	1	1,920	4,050	241,051	152,719	843,010	33,687	
May	17.35	15.63	31	5,360	10	4,000	4,860	298,850	155,399	863,860	45,872	
June	27.17	17.24	30	24,100	1	5,270	9,820	584,608	152,235	833,970	33,856	
July	27.67	25.42	18	28,600	1	23,400	26,600	1,632,595	188,655	1,632,595	34,413	
Aug.	26.67	23.59	19	31,600	31	23,100	27,300	1,681,388	197,822	1,681,388	33,610	
Sept.	24.24	22.61	27	26,800	15	20,600	22,800	1,353,719	174,355	1,353,719	43,182	
Oct.	23.84	21.19	9	26,200	31	18,900	23,600	1,451,107	154,426	1,451,107	34,965	
Nov.	21.82	19.50	6	21,000	22	15,600	17,600	1,047,471	153,680	1,047,471	34,832	
Dec.	19.68	18.42	28	17,100	15	14,000	15,200	933,421	176,991	1,114,550	33,023	
Yearly	27.67	9.82		31,600		553	13,200	9,569,310	1,982,554	10,220,870	513,755	
Yearly	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	8.43	2.99		895		15.7	374	11,803,648	2,845,461	12,607,341	633,712	

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

(See Preceding Page For Description)

Mean Daily Gage Height in Feet 1983

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	10.80	16.57	10.60	12.83	16.53	17.25	26.70	25.41	23.53		21.19	19.47
2	11.17	16.55	11.59	12.92	16.72	17.30	27.04	25.24	23.49		21.10	19.28
3	11.39	17.48	12.44	13.01	16.69	17.55	27.43	25.24	23.36		21.12	19.23
4	12.45	18.42	12.45	13.47	16.59	17.54	27.60	25.16	23.28		21.28	19.24
5	12.83	18.31	11.72	13.95	16.58	17.88	27.47	25.11	23.23		21.57	19.28
6	13.14	17.60	10.98	14.44	16.61	18.78	27.37	25.25	23.18	23.38	21.69	19.24
7	13.39	15.02	10.78	14.49	16.52	18.90	27.13	25.44	23.09	23.50	21.25	19.22
8	13.85	13.13	10.60	14.49	16.04	18.91	26.85	25.41	23.08	23.65	21.08	19.16
9	14.08	11.64	10.71	14.52	15.73	18.89	26.73	25.37	23.19	23.78	21.05	19.01
10	14.16	11.46	10.92	15.10	15.70	19.02	26.81	25.49	23.30	23.71	20.75	19.10
11	14.19	11.33	10.55	15.57	16.28	19.15	26.94	25.63	23.38	23.60	20.31	19.32
12	14.22	10.99	10.41	15.82	16.56	19.85	26.77	25.81	23.21	23.44	20.19	19.11
13	14.18	10.90	10.40	16.00	16.56	20.46	26.61	25.80	22.99	23.37	20.53	18.82
14	14.12	10.70	10.39	16.12	16.53	20.24	26.49	25.67	23.01	23.30	20.11	18.67
15	13.91	10.65	10.38	16.13	16.70	20.18	26.25	25.33	22.69	23.36	19.83	18.57
16	13.88	10.58	10.37	16.16	16.94	20.18	26.11	25.33	22.76	23.47	19.89	18.54
17	13.88	10.54	10.63	16.11	16.94	20.26	26.18	25.88	22.83	23.47	19.72	18.68
18	13.88	10.51	10.56	16.22	16.95	20.41	26.22	26.33	23.15	23.43	19.71	18.63
19	13.89	10.60	10.49	16.28	16.91	20.74	26.02	26.33	23.15	23.36	19.83	18.65
20	13.88	10.87	10.48	16.29	16.82	21.23	25.83	26.55	23.15	23.16	20.15	18.53
21	13.90	10.47	10.49	16.30	16.58	20.92	25.77	26.21	23.37	22.83	20.11	18.48
22	14.02	10.46	10.50	16.43	16.45	20.16	25.67	25.81	23.45	22.49	19.67	18.48
23	14.43	10.46	10.83	16.45	16.73	19.88	25.70	25.39	23.40	22.49	19.70	18.84
24	14.59	10.49	11.23	16.49	16.92	20.12	25.80	25.17	23.79	22.39	19.86	19.00
25	14.16	11.04	11.44	16.59	17.02	22.29	25.72	24.85	24.15	22.13	20.13	19.37
26	14.07	10.60	11.92	16.59	17.07	24.72	25.59	24.72	24.02	22.03	20.02	19.32
27	14.50	10.45	12.18	16.58	17.22	26.63	25.68	24.53	24.15	22.05	20.25	19.39
28	15.51	10.49	12.12	16.59	17.18	27.04	25.62	24.61	24.09	22.11	20.40	19.49
29	16.11		12.20	16.54	17.32	27.13	25.45	24.57	23.96	22.14	20.23	19.19
30	16.53		12.41	16.47	17.32	26.94	25.44	24.39	23.80	21.76	20.02	19.20
31	16.93		12.54		17.34		25.49	24.01		21.43		19.06
Avg.	13.94	12.44	11.14	15.50	16.71	20.68	26.34	25.37	23.37		20.42	19.02

**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 1983. Prior to July 21, 1972, records furnished by U. S. Bureau of Reclamation.

REMARKS: Records show water pumped from wells on the Yuma Mesa and conveyed by underground conduit to Colorado River.

Mean Daily Discharge in Second-Feet 1983 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	18	13	31	31	31	19	15	15	26	25	25	25
2	18	13	23	31	31	19	15	16	26	25	25	25
3	18	5.7	13	31	31	19	15	21	26	25	25	25
4	18	14	13	31	31	19	15	21	26	25	29	25
5	18	19	13	31	31	19	15	24	26	25	31	25
6	18	19	13	31	31	19	15	13	26	25	31	25
7	18	19	13	31	31	19	15	12	26	25	31	25
8	18	22	13	31	31	19	15	12	26	25	31	25
9	18	24	21	31	31	15	15	19	26	25	31	25
10	18	24	31	31	31	16	15	26	26	25	31	25
11	17	24	31	30	31	18	15	26	26	25	31	25
12	17	24	31	30	29	18	15	26	26	25	31	25
13	17	24	31	31	29	19	17	26	26	25	31	25
14	17	24	31	31	31	18	18	26	26	25	31	25
15	17	24	31	31	31	18	16	26	26	25	31	25
16	17	24	31	31	31	19	15	26	26	25	27	25
17	17	24	31	31	31	19	15	26	26	25	25	25
18	17	24	31	31	31	20	16	26	26	25	25	25
19	17	24	31	31	28	19	18	26	26	25	25	25
20	17	24	31	31	29	19	18	26	26	25	25	25
21	17	24	31	31	31	19	18	26	26	25	25	25
22	17	24	28	31	31	19	18	26	26	25	25	25
23	17	23	26	31	26	19	18	26	26	25	25	25
24	18	23	25	31	19	19	18	26	26	25	25	25
25	18	28	28	14	19	19	18	26	26	25	25	25
26	18	34	31	17	19	19	18	26	26	25	25	25
27	18	34	31	25	19	19	18	26	26	25	25	25
28	18	33	31	27	19	19	18	26	26	25	25	25
29	18		31	31	19	19	18	26	26	25	25	25
30	6.1		31	31	19	18	18	26	26	25	25	25
31	2.8		31		19		18	26		25		25
Sum	517.9	635.7	818	887	851	559	511	725	780	775	822	775
Current Year 1983									Period 1971-1983			
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.			! 1	18	31	2.8	16.7	1,027	2,575	5,840	0	
Feb.			! 26	34	3	5.7	22.7	1,261	2,429	4,830	0	
Mar.			! 1	31	! 3	13	26.4	1,622	2,841	5,430	4	
Apr.			! 1	31	25	14	29.6	1,759	8,682	5,120	242	
May			! 1	31	124	19	27.5	1,688	2,549	4,933	0	
June			! 18	20	9	15	18.6	1,109	2,579	4,828	0	
July			! 14	18	! 1	15	16.5	1,014	2,886	5,510	692	
Aug.			! 10	26	! 7	12	23.4	1,438	2,999	6,000	180	
Sept.			! 1	26	! 1	26	26.0	1,547	2,988	5,880	0	
Oct.			! 1	25	! 1	25	25.0	1,537	2,997	5,360	157	
Nov.			! 5	31	! 1	25	27.4	1,630	3,034	5,290	313	
Dec.			! 1	25	! 1	25	25.0	1,537	3,196	5,970	0	
Yearly				34		2.8	23.7	17,169	33,755	58,680	1,753	
	Meters		Cubic Meters per Second			Thousands of Cubic Meters						
				0.96		0.08	0.67	21,178	41,636	72,381	2,162	

! 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 1983.

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 m³/sec) on September 1, 1953; minimum, 0.1 second-foot (0.003 m³/sec) several days in February 1966.

Mean Daily Discharge in Second-Feet 1983 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
1	4.0	4.0	3.5	4.0	5.0	5.0	7.0	9.0	11	13	12	15	
2	4.0	4.0	3.5	4.0	5.0	5.0	7.0	9.0	11	13	12	14	
3	4.0	4.0	3.5	4.0	5.0	5.0	7.0	9.0	11	13	12	13	
4	4.0	4.0	3.5	4.0	5.0	5.0	7.0	9.0	11	13	12	13	
5	4.0	4.0	3.5	4.0	5.0	5.0	7.0	9.0	11	13	12	12	
6	4.0	4.0	3.5	4.0	5.0	5.0	7.0	9.0	11	13	12	12	
7	4.0	4.0	3.5	4.0	5.0	5.0	7.0	9.0	11	13	12	11	
8	4.0	4.0	3.5	4.0	5.0	5.0	7.0	9.0	11	13	12	11	
9	4.0	4.0	3.5	3.0	5.0	5.0	7.0	9.0	11	13	12	11	
10	4.0	4.0	3.5	3.0	5.0	5.0	7.0	9.0	11	13	12	11	
11	4.0	4.0	3.5	3.0	5.0	5.0	7.0	9.0	11	13	12	11	
12	4.0	4.0	3.5	3.0	5.0	5.0	7.0	9.0	11	13	12	11	
13	4.0	4.0	3.5	3.0	5.0	5.0	7.0	9.0	11	13	12	11	
14	4.0	4.0	3.5	3.0	5.0	5.0	7.0	9.0	11	13	12	11	
15	4.0	4.0	3.5	3.0	5.0	5.0	7.0	9.0	11	13	12	11	
16	4.0	4.0	3.5	3.0	5.0	5.0	7.0	9.0	11	13	12	11	
17	4.0	4.0	3.5	3.0	5.0	5.0	7.0	9.0	11	13	12	11	
18	4.0	4.0	3.5	3.0	5.0	5.0	7.0	9.0	11	13	11	11	
19	4.0	4.0	3.5	3.0	5.0	5.0	7.0	9.0	11	13	10	11	
20	4.0	4.0	3.5	3.0	5.0	5.0	7.0	9.0	11	13	10	11	
21	4.0	4.0	3.5	3.0	5.0	5.0	7.0	9.0	11	13	10	11	
22	4.0	4.0	3.5	3.0	5.0	5.0	7.0	9.0	11	13	10	11	
23	4.0	4.0	3.5	3.0	5.0	5.0	7.0	9.0	11	13	10	11	
24	4.0	4.0	3.5	3.0	5.0	5.0	7.0	9.0	11	13	10	11	
25	4.0	4.0	3.5	3.0	5.0	5.0	7.0	9.0	11	13	10	11	
26	4.0	4.0	3.5	3.0	5.0	5.0	7.0	9.0	11	13	10	11	
27	4.0	4.0	3.5	3.0	5.0	5.0	7.0	9.0	11	13	10	11	
28	4.0	4.0	3.5	3.0	5.0	5.0	7.0	9.0	11	13	10	11	
29	4.0	4.0	3.5	3.0	5.0	5.0	7.0	9.0	11	13	12	11	
30	4.0	4.0	3.5	3.0	5.0	5.0	7.0	9.0	11	13	13	11	
31	4.0	4.0	3.5	3.0	5.0	5.0	7.0	9.0	11	13	10	11	
Sum	124.0	112.0	108.5	98.0	155.0	150.0	217.0	279.0	330	403	340	354	
Current Year 1983								Period 1948-1983					
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet				
	High	Low	High		Low				Average	Maximum	Minimum		
	Day	Day	Day	Day	Day	Day	Day	Day	Day	Day			
Jan.			1	1	4.0	1	1	4.0	4.00	246	302	899	39.3
Feb.			1	1	4.0	1	1	4.0	4.00	222	261	746	40.5
Mar.			1	1	3.5	1	1	3.5	3.50	215	317	853	62.7
Apr.			1	1	4.0	1	1	3.0	3.27	194	334	1,000	66.8
May			1	1	5.0	1	1	5.0	5.00	307	385	966	58.3
June			1	1	5.0	1	1	5.0	5.00	298	360	1,030	67.4
July			1	1	7.0	1	1	7.0	7.00	430	415	1,260	72.8
Aug.			1	1	9.0	1	1	9.0	9.00	553	463	1,350	73.8
Sept.			1	1	11	1	1	11	11.0	655	448	1,370	53.6
Oct.			1	1	13	1	1	13	13.0	799	463	1,220	55.3
Nov.			3	1	13	1	1	11.0	11.3	674	415	1,240	57.7
Dec.			1	1	15	1	1	11	11.4	702	371	1,050	42.2
Yearly					15			3.0	7.31	5,295	4,494	12,429	774
	Meters		Cubic Meters per Second				Thousands of Cubic Meters						
					0.42			0.08	0.21	6,531	5,543	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 1983. 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, 9,600 second-feet (272 m³/sec) on February 4, 1983; minimum daily discharge, no flow during long periods.

Mean Daily Discharge in Second-Feet 1983 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3,450	8,720	1,890	1,830	6,890	6,480	3,350	4,330	6,500	7,800	8,020	8,090
2	4,550	8,790	1,850	1,780	6,230	6,780	3,140	4,410	7,640	7,970	8,020	8,230
3	4,110	9,500	1,840	1,930	6,070	7,410	3,690	3,930	8,060	7,710	8,020	8,280
4	4,220	9,600	1,840	2,310	5,940	8,430	3,720	3,330	7,910	7,280	8,010	8,700
5	4,730	8,320	1,850	2,640	5,600	8,650	3,350	3,450	8,080	7,330	7,980	8,610
6	5,450	7,540	1,860	2,800	6,310	8,250	3,080	3,950	8,030	7,880	7,980	8,430
7	6,990	5,270	1,990	3,080	6,020	8,050	2,720	4,280	7,580	8,090	8,010	8,380
8	7,510	5,000	2,400	3,690	4,890	7,780	3,100	5,040	7,650	8,100	8,020	8,230
9	7,510	3,540	2,450	4,120	4,720	7,400	3,660	5,360	8,490	8,310	8,020	8,650
10	6,970	1,730	2,400	5,370	5,260	7,830	4,100	5,810	8,400	8,190	8,020	9,330
11	6,440	1,310	2,610	4,100	4,980	8,220	3,580	6,300	8,330	8,210	7,980	9,470
12	6,300	1,800	2,690	4,140	4,950	7,850	3,190	6,510	8,380	7,990	8,000	9,210
13	6,560	1,310	2,680	4,130	5,200	7,870	3,090	6,950	8,340	7,710	8,000	8,870
14	7,460	996	2,940	4,900	5,980	7,590	3,140	6,790	8,060	8,200	7,780	8,610
15	7,730	996	2,970	5,570	6,450	7,950	3,610	6,280	8,080	8,150	7,800	8,440
16	8,210	996	2,910	5,930	4,960	8,110	4,380	6,870	8,580	8,070	7,800	8,480
17	8,110	1,270	2,850	6,500	5,060	8,240	4,640	7,270	8,510	7,930	7,900	8,950
18	7,730	1,260	3,130	5,550	5,180	8,250	4,120	7,970	8,280	7,680	8,260	9,280
19	7,710	1,320	3,100	5,140	5,480	7,640	3,990	8,220	8,350	8,060	8,520	8,850
20	8,160	1,150	3,100	5,060	5,440	7,390	3,770	8,000	8,210	8,290	8,590	8,440
21	8,290	1,600	3,130	5,170	6,170	7,570	3,890	8,160	8,400	8,400	8,060	8,460
22	8,340	1,940	3,170	6,030	6,720	7,070	4,280	7,440	8,400	8,510	8,000	8,240
23	8,190	2,280	3,330	6,740	6,200	7,240	4,810	6,970	8,560	8,670	8,090	8,770
24	7,840	2,500	3,010	6,700	5,990	6,900	4,920	6,440	8,310	8,750	8,570	9,380
25	7,830	2,020	2,900	5,960	6,000	3,440	4,800	6,050	7,890	8,760	8,060	9,390
26	8,170	2,160	2,890	5,790	5,860	3,570	4,010	5,820	7,490	8,850	8,020	9,410
27	8,410	2,370	2,460	5,240	6,070	3,400	4,030	5,390	7,960	8,670	8,300	9,400
28	8,390	2,210	2,590	5,710	7,310	3,110	4,240	5,320	7,570	8,210	8,200	9,390
29	8,770		2,470	5,920	7,800	3,200	4,610	5,180	7,860	8,050	8,120	9,410
30	8,960		2,380	6,380	7,650	3,320	4,730	5,310	7,940	7,990	8,020	9,410
31	8,440		2,290		6,780		4,890	6,450		8,010		9,410
Sum	222,130	97,498	79,970	140,210	184,160	204,990	120,630	183,580	241,840	251,820	242,170	274,200

Month	Current Year 1983						Period 1944-1983				
	Extreme Gate Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Low	Day			Average	Maximum	Minimum
Jan.			30	8,960	1	3,450	7,170	440,588	53,675	340,588	0
Feb.			4	9,600	114	996	3,480	193,384	30,855	193,384	0
Mar.			23	3,330	1	1,840	2,580	158,618	91,600	394,116	0
Apr.			23	6,740	2	1,780	4,670	278,102	118,185	362,400	0
May			29	7,800	9	4,720	5,940	365,276	40,242	365,276	0
June			5	8,650	28	3,110	6,830	406,592	79,960	406,592	0
July			24	4,920	7	2,720	3,890	239,266	127,239	385,131	0
Aug.			19	8,220	4	3,330	5,920	364,126	130,726	364,126	0
Sept.			16	8,580	1	6,500	8,060	479,683	65,564	479,683	0
Oct.			26	8,850	4	7,280	8,120	499,478	33,216	499,478	0
Nov.			20	8,590	14	7,780	8,070	480,337	35,439	480,337	0
Dec.			11	9,470	1	8,090	8,850	543,868	63,603	543,868	0
Yearly				9,600		996	6,150	4,449,318	870,304	4,449,318	0
	Meters		Cubic Meters per Second				Thousands of Cubic Meters				
				272		28.2	174	5,488,189	1,073,503	5,488,189	0

Ø Mean daily 1 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 364 current meter measurements during the year, 218 by the United States Section, 141 by the Mexican Section of the Commission, 5 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 1983; daily discharge records available January 1, 1950 through 1983.

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 1983, 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 m³/sec), January 22, 1916; maximum discharge, no flow several days during August and September 1934; average annual flow 13,443,000 acre-feet (16,581,806,000 m³); maximum annual flow 25,480,000 acre-feet (31,429,325,000 m³), 1907; minimum annual flow 1,174,000 acre-feet (1,448,117,000 m³), 1934. Since January 1935: Maximum instantaneous discharge 40,600 second-feet (1,150 m³/sec) on August 20, 1983; minimum discharge, no flow during April 1935.

Mean Daily Discharge in Second-Foot 1983 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	4,550	13,900	2,810	4,080	11,500	11,800	27,000	30,300	29,100	32,300	26,900	24,000
2	5,820	14,000	3,240	4,010	11,100	12,200	28,000	29,700	30,600	33,200	26,700	23,700
3	6,200	15,300	3,660	4,130	10,900	13,100	29,600	29,400	30,700	32,800	26,900	23,700
4	6,310	16,400	3,770	4,900	10,800	14,400	30,400	28,700	30,500	31,100	27,200	24,100
5	7,090	15,500	3,440	5,630	10,600	15,100	30,500	28,800	30,600	31,500	28,000	24,200
6	7,830	13,900	3,040	6,070	11,100	16,000	30,200	30,000	30,300	32,300	28,300	24,000
7	9,630	9,560	3,030	6,470	10,900	15,600	30,100	31,500	29,100	33,200	27,200	24,000
8	10,800	7,650	3,270	7,310	9,360	14,800	30,200	32,000	29,700	34,200	26,600	23,700
9	10,900	5,090	3,420	7,940	8,950	14,200	30,200	32,500	31,500	35,200	26,500	23,800
10	10,400	3,080	3,510	9,340	9,430	14,900	30,600	33,700	31,700	34,400	26,100	24,200
11	9,950	2,520	3,560	8,820	9,610	15,600	31,000	34,300	32,100	33,900	25,000	24,600
12	9,690	2,740	3,550	8,930	10,000	16,200	30,800	34,300	31,400	33,200	24,800	24,100
13	9,870	2,350	3,590	9,040	10,100	17,200	30,600	34,500	30,100	32,500	25,700	23,600
14	10,900	1,870	3,800	9,660	10,800	16,200	30,500	34,200	29,800	32,800	24,800	23,200
15	11,000	1,810	3,750	10,200	11,300	16,800	30,600	32,800	28,700	33,000	24,500	22,900
16	11,500	1,790	3,710	10,400	10,100	17,200	30,600	33,100	29,500	33,300	24,800	23,100
17	11,500	1,940	3,800	10,700	10,000	17,400	31,100	34,900	29,700	33,100	24,500	23,500
18	11,000	1,950	4,030	10,300	10,200	17,700	31,200	37,500	30,800	32,500	24,700	23,400
19	10,900	2,060	4,070	10,000	10,600	17,400	30,800	39,200	30,900	32,900	25,200	23,400
20	11,500	2,050	4,040	9,960	10,500	17,400	30,300	38,500	30,600	32,200	26,000	23,000
21	11,700	2,340	4,050	10,100	11,000	17,000	30,000	35,800	31,600	31,300	25,400	22,900
22	11,800	2,670	3,960	10,800	11,500	16,100	30,500	35,100	31,700	30,300	24,400	22,600
23	12,000	2,940	4,200	11,400	11,200	15,900	31,200	34,200	31,500	31,100	24,400	23,500
24	11,800	3,120	4,080	11,400	11,000	16,100	31,500	33,700	32,900	30,800	25,100	23,900
25	11,400	2,990	4,100	10,800	11,100	14,200	31,500	32,300	34,200	29,700	25,300	24,400
26	11,600	2,970	4,220	10,700	11,100	18,800	30,400	31,300	32,700	29,800	25,100	24,400
27	12,200	3,050	4,170	10,300	11,300	24,300	30,200	30,700	34,100	29,800	25,800	24,400
28	12,900	2,940	4,210	10,600	12,700	25,600	30,600	30,900	33,000	29,300	26,100	24,500
29	13,600		4,090	10,800	13,600	26,000	30,400	30,900	33,000	30,000	25,500	23,900
30	13,800		4,200	11,100	13,400	26,600	30,500	30,600	32,300	28,700	24,000	24,000
31	13,900		4,240		12,400		30,600	30,600		27,800	25,000	23,800
Sum	324,040	158,480	116,610	265,890	338,150	511,800	941,700	1,016,000	934,400	988,200	772,500	736,500
Current Year 1983												
Period 1935-1983												
Month	Extreme Gage Feet			Extreme Second-Foot			Average Second-Foot	Total Acre-Foot	Acre-Foot			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	111.68	104.21	31	14,000	1	3,490	10,500	642,724	377,007	1,644,000	31,900	
Feb.	112.57	102.85	4	16,600	116	1,760	5,660	314,340	310,757	1,378,000	60,400	
Mar.	105.19	103.52	25	4,610	1	2,740	3,760	231,293	333,366	1,120,000	19,400	
Apr.	109.86	104.60	25	11,500	2	3,980	8,860	527,385	281,895	823,850	0	
May	111.56	108.56	29	14,000	9	8,770	10,900	670,711	273,240	1,151,000	71,400	
June	114.55	110.17	30	30,600	1	11,700	17,100	1,015,140	270,167	1,175,000	8,500	
July	114.57	113.29	25	32,200	1	26,500	30,400	1,867,835	290,474	1,867,835	24,400	
Aug.	115.65	113.91	20	40,600	15	28,100	32,800	2,015,207	307,616	2,015,207	43,800	
Sept.	114.90	113.72	27	35,800	15	28,200	31,100	1,853,355	267,872	1,853,355	53,851	
Oct.	114.65	112.44	9	36,000	31	27,100	31,900	1,960,066	267,561	1,960,066	42,956	
Nov.	112.79	111.11	6	28,700	14	23,800	25,800	1,532,231	306,760	1,532,231	41,403	
Dec.	111.45	110.41	28	24,900	22	22,500	23,800	1,460,826	385,967	1,832,000	42,000	
Yearly	115.65	102.85		40,600		1,760	19,500	14,091,113	3,672,682	14,091,113	722,100	
Meters Cubic Meters per Second Thousands of Cubic Meters												
	35.25	31.35		1,150		49.8	552	17,381,106	4,530,180	17,381,106	890,696	

* Partly estimated † And other days

COLORADO RIVER AT NORTHERLY INTERNATIONAL BOUNDARY - STAGES

(See Preceding Page For Description)

Mean Daily Gage Height in Feet 1983

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	105.92	111.61	103.62	104.78	110.03	110.51	114.02	114.28	113.80	114.40	112.41	111.17
2	107.24	111.65	103.86	104.65	109.84	110.69	114.11	114.21	114.03	114.49	112.37	111.08
3	107.53	112.21	104.18	104.68	109.83	111.14	114.39	114.17	114.03	114.36	112.38	111.06
4	107.61	112.50	104.27	105.34	109.79	111.70	114.33	114.04	113.98	114.06	112.48	111.23
5	108.14	112.27	104.06	105.67	109.61	111.92	114.11	114.05	114.00	114.12	112.68	111.26
6	108.54	111.67	103.96	105.81	110.01	112.23	113.88	114.28	113.95	114.19	112.77	111.18
7	109.44	109.67	103.99	105.97	109.94	112.08	113.64	114.50	113.76	114.31	112.47	111.12
8	109.92	108.66	104.13	106.34	108.96	111.82	113.64	114.57	113.88	114.42	112.34	111.01
9	109.98	106.96	104.29	106.72	108.69	111.59	113.53	*114.62	114.17	114.51	112.32	111.02
10	109.65	*104.84	104.35	107.68	109.01	111.82	113.51	*114.78	114.17	114.41	112.17	111.20
11	109.32	*103.74	104.41	107.35	109.13	112.04	113.59	114.94	114.21	114.38	111.82	111.33
12	109.15	*103.97	104.45	107.40	109.38	112.18	113.56	115.07	114.17	114.23	111.71	111.17
13	109.23	*103.55	104.48	107.51	109.46	112.44	113.51	115.14	114.03	114.08	111.98	110.93
14	109.72	*103.37	104.64	108.01	109.89	112.22	113.54	115.05	113.99	114.13	*111.75	110.77
15	109.78	*103.03	104.54	108.50	110.22	112.32	113.62	114.75	113.78	114.14	*111.47	110.63
16	110.04	*102.97	104.49	108.75	109.58	112.29	113.57	*114.82	113.92	114.17	111.52	110.65
17	110.08	*103.11	104.48	109.03	*109.54	112.32	113.68	*115.29	113.93	114.12	111.40	110.83
18	109.79	103.26	104.69	108.69	*109.73	112.39	113.77	*115.58	114.09	114.07	111.45	110.80
19	109.71	103.27	104.81	108.40	109.94	112.29	113.71	115.54	114.10	114.11	111.60	110.79
20	110.06	103.26	104.73	108.41	109.87	112.28	113.67	115.27	114.11	113.99	111.84	110.59
21	110.20	103.49	104.76	108.50	110.14	112.18	113.68	115.20	114.36	113.74	111.61	110.56
22	110.27	*103.64	104.73	109.20	110.41	111.65	113.83	115.07	114.37	113.55	111.26	110.47
23	110.38	*103.84	104.88	109.70	110.28	111.43	114.00	114.86	114.34	113.60	111.27	110.86
24	110.28	*103.95	104.83	109.66	110.14	111.51	114.09	114.70	114.55	113.50	111.55	111.04
25	110.04	*103.84	104.79	109.40	110.20	110.57	114.11	114.45	114.68	113.27	111.59	111.26
26	110.17	103.79	104.96	109.37	110.16	112.44	114.06	114.37	114.49	113.21	111.54	111.23
27	110.55	103.89	104.93	109.04	110.29	114.16	114.33	114.23	114.68	113.18	111.77	111.26
28	110.96	103.85	105.02	109.29	110.95	114.44	114.48	114.32	114.54	113.09	111.84	111.32
29	111.37		104.83	109.48	111.38	114.45	114.47	114.31	114.54	113.11	111.62	111.10
30	111.53		104.87	109.69	111.30	114.26	114.48	114.21	114.42	112.79	111.50	111.10
31	111.60		104.96		110.80		114.41	114.21		112.62		110.98
Avg.	109.62	105.92	104.52	107.77	109.95	112.18	113.91	114.67	114.17	113.88	111.88	111.00

* 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 1983 obtained by the United States Section; monthly discharge, January 1934 through 1950 by the Bureau of Reclamation.

EXTREMES: Prior to March 1950, maximum monthly discharge 914 acre-feet (1,127,000 m³) in January 1940; minimum monthly discharge, zero for various months. Since March 1950, maximum instantaneous discharge, 79.3 second-feet (2.25 m³/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 1983 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.5	1.3	0.5	0.1	0	0.1	3.2	0.1	0.1	0.9	0.1	8.1
2	.4	.5	.2	0	0	.6	.3	0	.4	.9	3.2	.2
3	0	.2	4.8	1.8	0	.2	1.4	0	0	.4	3.9	4.5
4	.7	.2	1.6	.1	0	.1	.3	0	1.3	1.7	.7	.3
5	3.6	.2	1.7	0	0	1.1	.8	0	.4	.9	.3	.2
6	.4	.1	.9	0	.4	.1	.1	1.7	.9	.4	5.7	0
7	.3	.1	.1	0	1.7	.1	1.2	.2	1.5	.4	.3	0
8	2.0	0	.1	0	3.0	.6	5.2	4.4	2.3	0	.2	0
9	1.0	0	0	1.8	.1	.2	3.7	.4	1.7	.1	0	.6
10	.3	0	.9	.4	.1	.1	1.6	.3	1.0	.2	0	1.5
11	.9	0	.5	0	0	.1	.9	.3	.8	.4	2.8	6.2
12	.4	0	1.9	0	0	.1	.6	.3	.5	1.6	1.5	.6
13	.5	.1	.5	.9	1.4	.1	2.2	.5	.3	.3	7.2	.4
14	.3	.1	.1	.2	.4	3.3	.2	.6	.2	.3	.9	.6
15	7.0	.1	.1	.1	.2	.2	.2	.2	.2	.2	.8	3.7
16	7.1	.3	0	.1	.1	.1	.2	.2	3.2	.4	.3	.3
17	.4	.2	.2	0	.1	2.8	.2	.2	2.2	.3	.3	.2
18	.4	1.3	0	0	.1	1.5	1.1	.2	3.7	.2	.2	.2
19	1.8	.1	3.6	0	2.8	.1	1.5	.2	8.2	.2	.2	2.9
20	2.1	.2	9.1	1.6	1.8	.1	.3	.2	4.3	.2	1.7	4.5
21	2.5	.1	3.6	.2	1.5	.1	1.2	.2	1.1	4.3	.3	1.5
22	4.5	.1	6.2	.1	.2	.1	.8	.2	.4	6.7	.3	2.5
23	.1	1.9	4.6	.1	.2	.1	.3	.3	2.5	1.9	.5	3.5
24	0	.6	0	.3	.1	5.2	.2	.2	1.3	.8	3.3	.9
25	0	.1	.4	.2	.9	.5	2.5	.1	1.0	.2	1.9	.5
26	.1	.1	1.1	.2	.1	.3	.2	0	.2	2.4	.4	.3
27	2.4	1.1	4.1	.1	0	2.3	.2	0	.6	.7	.3	.5
28	.1	.6	.2	.1	.7	.5	2.2	2.0	.2	.9	4.7	1.5
29	.8	0	3.6	0	.1	.3	.2	* .1	2.3	.8	.7	2.7
30	.2	.1	0	0	0	.2	1.6	* .1	2.8	1.4	3.1	6.0
31	.1	.1	.8	0	0	0	7.3	.1	1.6	1.6	.9	.9
Sum	40.9	9.6	51.5	8.4	16.0	21.2	41.9	13.3	45.6	31.7	45.8	55.8
Current Year 1983												
Period 1935-1983												
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High		Low			Average	Maximum	Minimum	
				Day	Low							
Jan.	1.08	0	15	15.8	1	2	0	1.3	81.1	158	914	0
Feb.	1.23	0	23	18.8	1	8	0	.3	19.0	140	400	6.0
Mar.	2.61	0	29	49.2	1	6	0	1.7	102	151	517	0
Apr.	1.07	0	2	15.6	1	1	0	.3	16.7	156	425	16.7
May	1.26	0	8	19.5	1	1	0	.5	31.7	155	440	31.7
June	1.34	0	24	21.1	1	1	0	.7	42.0	142	595	22.6
July	1.85	0	8	32.1	1	4	0	1.4	83.1	134	516	0
Aug.	1.77	0	28	30.3	1	1	0	.4	26.4	102	617	0
Sept.	2.00	0	19	35.4	1	2	0	1.5	90.4	104	462	0
Oct.	1.26	0	26	19.5	1	7	0	1.0	62.9	129	490	0
Nov.	1.72	0	6	29.2	1	1	0	1.5	90.8	151	462	9.0
Dec.	1.55	0	11	25.6	1	6	0	1.8	111	170	592	13.7
Yearly	2.61	0		49.2		0	1.0	757	1,692	4,500	638	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	0.80	0		1.39		0	0.03	934	2,087	5,551	787	

* Partly estimated ! 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 1983.

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, 114.44 feet (34.88 m) on August 18, 1983; minimum mean daily elevation above mean sea level, 101.51 feet (30.94 m) on February 17, 1957.

Mean Daily Gage Height in Feet 1983

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	105.71	110.79	103.18	104.27	109.15	109.78	112.89	113.09	112.83	113.58	111.68	110.60
2	106.96	110.86	103.31	104.13	109.02	109.97	112.99	113.02	113.06	113.68	111.65	110.53
3	107.25	111.38	103.64	104.17	109.02	110.33	113.25	112.96	113.06	113.55	111.65	110.50
4	107.25	111.65	103.74	104.76	109.06	110.86	113.19	112.86	113.06	113.25	111.75	110.56
5	107.78	111.48	103.54	104.95	108.92	111.09	112.96	112.89	113.06	113.32	111.98	110.63
6	108.17	110.89	103.51	104.99	109.32	111.25	112.76	113.16	112.99	113.39	112.04	110.56
7	109.02	109.15	103.54	104.95	109.22	111.02	112.53	113.35	112.83	113.52	111.75	110.50
8	109.42	108.17	103.64	105.02	108.30	110.79	112.57	113.42	112.93	113.62	111.58	110.40
9	109.45	106.59	103.84	105.48	108.07	110.63	112.43	113.48	113.22	113.71	111.58	110.40
10	109.12	104.46	103.87	106.30	108.37	110.86	112.43	113.65	113.25	113.62	111.42	110.60
11	108.76	103.38	103.94	106.10	108.53	111.12	112.47	113.75	113.29	113.55	111.06	110.73
12	108.56	103.58	104.04	106.14	108.79	111.22	112.34	113.91	113.22	113.42	110.96	110.56
13	108.56	103.22	104.04	106.33	108.83	111.45	112.30	113.94	113.09	113.29	111.25	110.33
14	109.06	103.02	104.10	106.79	109.25	111.25	112.37	113.88	113.06	113.32	110.99	110.17
15	109.06	102.66	104.00	107.38	109.51	111.32	112.43	113.65	112.89	113.35	110.73	110.04
16	109.25	102.62	103.97	107.61	108.96	111.29	112.37	113.68	113.02	113.35	110.83	110.07
17	109.28	102.79	103.94	107.91	108.89	111.29	112.47	114.17	113.06	113.32	110.70	110.20
18	108.99	102.92	104.13	107.55	109.12	111.35	112.53	114.44	113.22	113.25	110.73	110.20
19	108.86	102.89	104.27	107.22	109.32	111.29	112.47	114.34	113.25	113.29	110.89	110.20
20	109.22	102.85	104.17	107.28	109.25	111.25	112.40	114.04	113.25	113.19	111.12	109.97
21	109.35	102.99	104.20	107.41	109.51	111.15	112.43	114.04	113.55	112.96	110.89	109.91
22	109.42	103.15	104.17	108.17	109.78	110.60	112.57	113.91	113.55	112.73	110.53	109.81
23	109.55	103.28	104.27	106.66	109.65	110.37	112.73	113.78	113.52	112.80	110.56	110.20
24	109.45	103.38	104.27	108.63	109.51	110.43	112.83	113.65	113.75	112.73	110.83	110.40
25	109.19	103.31	104.23	108.43	109.55	109.45	112.83	113.42	113.88	112.53	110.93	110.63
26	109.28	103.25	104.40	108.43	109.51	111.32	112.89	113.35	113.65	112.47	110.86	110.60
27	109.68	103.38	104.36	108.14	109.61	113.02	113.19	113.22	113.81	112.40	111.09	110.60
28	110.10	103.38	104.46	108.40	110.24	113.35	113.35	113.32	113.68	112.34	111.19	110.66
29	110.50		104.30	108.63	110.66	113.32	113.35	113.29	113.65	112.37	111.02	110.43
30	110.66		104.33	108.63	110.53	113.12	113.32	113.22	113.58	112.04	110.93	110.43
31	110.76		104.43		110.10		113.22	113.22		111.88		110.33
Avg.	108.86	105.41	104.00	106.76	109.28	111.19	112.73	113.55	113.29	113.09	111.15	110.37

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 1983. 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. Under conditions set forth in the 1944 Water Treaty, water for use in Mexico may 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. No diversions of this nature have been made during the years 1951 through 1983, and consequently the records reported below show the total water diverted from the Colorado River to the Alamo Canal during those years. Mexico occasionally pumps water from the Colorado River at other points below Morelos Dam when water is available in the channel.

EXTREMES: Maximum mean daily discharge, 6,600 second-feet (187 m³/sec), July 12 and 14, 1983; 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 1983 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug. *	Sept. *	Oct. *	Nov. *	Dec. *
1	2,350	3,300	2,800	4,060	3,780	2,220	6,110	5,470	4,800	3,920	3,570	3,240
2	2,000	3,200	3,050	3,990	3,600	2,260	6,320	5,400	4,870	3,640	3,570	3,290
3	2,010	2,400	3,120	4,130	3,360	2,300	5,990	5,440	4,910	3,710	3,570	3,260
4	2,100	2,600	3,000	4,910	3,220	2,500	5,970	5,470	4,980	3,600	3,570	3,300
5	2,190	2,300	3,010	5,120	3,260	2,700	5,860	5,510	5,050	3,640	3,530	3,290
6	2,350	2,100	2,990	5,090	3,010	3,000	5,830	5,470	4,980	3,710	3,530	3,260
7	2,700	1,740	3,020	5,160	2,830	2,700	6,000	5,440	4,910	3,670	3,530	3,260
8	2,970	1,600	3,200	5,440	2,840	2,200	6,390	5,400	4,870	3,490	3,530	3,280
9	2,990	1,520	3,410	5,860	2,820	2,000	6,110	5,440	4,800	3,380	3,600	3,250
10	3,010	1,540	3,500	5,650	2,930	2,200	6,390	5,400	4,800	3,430	3,570	3,280
11	3,150	1,560	3,570	5,830	2,890	2,500	6,500	5,400	4,770	3,640	3,570	3,290
12	3,250	1,680	3,530	5,790	2,830	2,800	6,600	5,470	4,730	3,670	3,570	3,270
13	3,300	1,650	3,570	5,790	2,800	3,200	6,290	5,470	4,700	3,670	3,570	3,260
14	3,710	1,600	3,780	5,690	2,770	2,800	6,600	5,440	4,770	3,640	3,570	3,270
15	3,780	1,250	3,740	5,400	2,630	3,000	6,290	5,440	4,800	3,640	3,600	3,240
16	3,990	1,300	3,710	5,260	2,510	3,200	6,000	5,440	4,800	3,600	3,640	3,270
17	3,960	1,560	3,780	5,160	2,570	3,300	5,790	5,230	4,800	3,600	3,600	3,290
18	3,780	1,900	4,030	5,230	2,440	3,400	5,690	5,300	4,840	3,600	3,670	3,280
19	3,780	2,040	4,060	5,300	2,480	3,300	5,790	5,370	4,630	3,600	3,640	3,280
20	4,060	2,040	4,030	5,160	2,400	3,400	5,190	5,330	4,410	3,600	3,600	3,240
21	4,130	2,330	4,060	5,120	2,470	3,300	4,410	4,980	4,200	3,640	3,640	3,260
22	4,200	2,660	3,960	4,870	2,470	3,810	4,410	4,800	4,240	3,570	3,600	3,290
23	4,170	2,930	4,200	4,630	2,330	4,100	5,010	4,870	4,200	3,570	3,640	3,270
24	4,130	3,110	4,060	4,660	2,320	4,100	5,690	4,840	4,100	3,530	3,600	3,270
25	4,030	2,980	4,100	4,310	2,320	4,560	5,790	4,800	4,170	3,570	3,340	3,290
26	4,100	2,960	4,200	4,200	2,360	4,700	5,620	4,870	4,130	3,570	3,260	3,270
27	4,100	3,040	4,170	4,240	2,290	5,620	5,190	4,870	4,170	3,570	3,220	3,230
28	3,960	2,930	4,200	4,130	2,300	4,770	5,510	4,910	4,130	3,570	3,250	3,250
29	3,600		4,100	3,960	2,400	4,910	5,620	4,910	4,130	3,570	3,270	3,280
30	3,400		4,200	3,960	2,400	5,330	5,510	4,870	4,060	3,570	3,210	3,260
31	3,300		4,240		2,300		5,120	4,840		3,570		3,260
Sum		61,820		148,100		100,180		161,890		111,750		101,330
	104,550		114,390		83,930		179,590		137,710		105,630	
Current Year 1983												
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period 1950-1983			
			High		Low				Acre-Feet			
	High	Low	Day	Day	Day	Day	Average	Maximum	Minimum			
Jan.	103.87	102.62	22	4,200	2	2,000	3,370	207,383	75,423	207,383	966	
Feb.	103.38	102.30	1	3,300	15	1,250	2,210	122,600	71,879	128,841	9,232	
Mar.	104.46	102.62	31	4,240	1	2,800	3,670	226,842	175,994	283,684	97,902	
Apr.	105.22	103.74	9	5,860	129	3,960	4,940	293,700	202,398	293,700	153,792	
May	104.20	103.25	1	3,780	27	2,290	2,710	166,533	102,342	188,597	66,207	
June	105.51	103.22	27	5,620	9	2,000	3,340	198,705	156,534	269,632	95,177	
July	105.54	105.28	13	6,600	121	4,410	5,790	356,040	222,991	356,040	125,745	
Aug.	105.74	104.66	5	5,510	122	4,800	5,230	321,158	219,512	341,044	130,298	
Sept.	104.92	140.36	5	5,050	30	4,060	4,590	273,177	128,517	273,177	53,633	
Oct.	104.49	103.94	1	3,920	9	3,380	3,600	221,603	62,813	227,661	10,453	
Nov.	104.33	103.87	18	3,670	30	3,210	3,520	209,478	52,871	209,478	7,516	
Dec.	104.07	103.90	4	3,300	27	3,230	3,270	200,974	83,956	200,974	8,825	
Yearly	105.74	102.30		6,600		1,250	3,850	2,798,192	1,558,142	2,798,192	1,272,332	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	32.23	31.18		187		35.3	109	3,451,533	1,921,947	3,451,533	1,569,404	

* Data from S.A.R.H. through International Boundary and Water Commission, Mexican Section

Ø Mean daily

! And other days

INTAKE CANAL AT MORELOS DIVERSION STRUCTURE - STAGES

(See Preceding Page For Description)

Mean Daily Gage Height in Feet 1983

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	102.72	103.31	102.79	104.00	104.17	103.48	105.35	105.54	104.69	104.46	104.17	103.97
2	102.69	103.08	102.95	103.81	104.07	103.51	105.35	105.61	104.72	104.33	104.17	103.97
3	102.69	102.85	103.38	103.87	104.00	103.48	105.38	105.64	104.72	104.30	104.13	103.97
4	102.69	102.76	103.31	104.53	103.90	103.48	105.38	105.61	104.76	104.23	104.13	103.97
5	102.69	102.62	103.35	104.76	103.81	103.44	105.28	105.64	104.82	104.27	104.10	103.97
6	102.79	102.62	103.31	104.82	103.74	103.41	105.31	105.64	104.82	104.27	104.10	103.97
7	102.92	102.62	103.35	104.79	103.77	103.41	105.31	105.61	104.86	104.27	104.00	103.97
8	102.99	102.62	103.44	104.86	103.77	103.41	105.38	105.64	104.92	104.17	104.04	103.97
9	103.02	102.56	103.64	105.02	103.71	103.41	105.41	105.71	104.89	104.10	104.13	103.97
10	103.02	102.59	103.67	104.99	103.67	103.48	105.38	105.68	104.86	104.10	104.10	103.90
11	103.08	102.53	103.74	104.95	103.64	103.54	105.45	105.61	104.86	104.10	104.13	103.94
12	103.15	102.56	103.81	104.95	103.61	103.74	105.48	105.64	104.86	104.10	104.10	104.00
13	103.28	102.56	103.87	104.89	103.58	103.84	105.54	105.64	104.86	104.10	104.10	103.97
14	103.35	102.82	103.97	104.89	103.58	103.87	105.51	105.64	104.82	104.10	104.10	104.00
15	103.51	102.36	103.87	104.82	103.58	103.81	105.41	105.68	104.82	104.10	104.13	104.00
16	103.54	102.43	103.81	104.79	103.58	104.00	105.41	105.68	104.82	104.13	104.13	103.97
17	103.58	102.59	103.77	104.79	103.61	104.07	105.41	105.54	104.82	104.13	104.10	103.97
18	103.64	102.72	103.94	104.79	103.48	104.07	105.45	105.45	104.82	104.07	104.07	103.97
19	103.61	102.69	104.10	104.76	103.44	104.10	105.45	105.51	104.72	104.13	104.07	103.97
20	103.67	102.69	104.00	104.69	103.41	104.10	105.41	105.51	104.56	104.13	104.10	103.97
21	103.71	102.79	104.04	104.63	103.41	104.17	105.41	105.05	104.72	104.10	104.10	103.94
22	103.77	102.92	104.00	104.53	103.41	104.27	105.28	104.86	104.59	104.10	104.04	103.97
23	103.81	103.05	104.13	104.49	103.41	104.40	105.31	104.79	104.49	104.10	104.10	103.94
24	103.74	103.15	104.10	104.53	103.41	104.46	105.31	104.72	104.43	104.07	104.04	103.97
25	103.74	103.05	104.04	104.40	103.41	104.82	105.38	104.69	104.46	104.10	103.97	103.97
26	103.81	102.89	104.20	104.20	103.41	105.05	105.41	104.72	104.49	104.13	103.97	103.97
27	103.81	103.05	104.20	104.20	103.44	105.15	105.38	104.72	104.49	104.10	103.97	103.97
28	103.71	103.12	104.27	104.20	103.41	105.15	105.45	104.72	104.49	104.13	103.94	103.97
29	103.58		104.07	104.20	103.44	105.22	105.48	104.72	104.49	104.13	103.97	103.94
30	103.54		104.10	104.17	103.48	105.35	105.48	104.72	104.49	104.13	103.97	103.97
31	103.44		104.20		103.48		105.51	104.72		104.13		103.97
Avg.	103.35	102.76	103.77	104.59	103.61	104.07	105.41	105.31	104.69	104.17	104.07	103.97

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 1983.

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, 113.98 feet (34.74 m) on August 18, 1983; minimum mean gage height, 98.03 feet (29.88 m) several days during December 1982.

Mean Daily Gage Height in Feet 1983

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	105.38	110.43	100.16	100.16	108.83	109.45	112.83	112.70	112.37	113.06	111.06	109.88
2	106.86	110.47	101.02	100.16	108.69	109.61	112.93	112.66	112.60	113.19	111.02	109.81
3	107.19	111.02	102.30	100.16	108.73	110.01	113.06	112.70	112.63	113.06	111.06	109.78
4	107.19	111.22	102.85	100.20	108.73	110.50	112.80	112.60	112.60	112.80	111.15	109.91
5	107.61	111.02	102.03	102.03	108.60	110.70	112.60	112.60	112.60	112.86	111.35	109.94
6	108.01	110.50	100.49	103.12	108.99	110.96	112.47	112.86	112.53	112.89	111.42	109.88
7	108.86	108.69	100.16	103.67	108.92	110.89	112.34	113.09	112.34	112.99	111.12	109.81
8	109.28	107.78	100.52	104.36	108.07	110.73	112.20	113.16	112.47	113.12	110.99	109.68
9	109.32	106.17	100.13	104.69	107.78	110.53	112.24	113.16	112.76	113.22	111.02	109.74
10	108.99	104.00	100.10	106.14	108.04	110.76	112.27	113.29	112.83	113.09	110.83	110.07
11	108.60	103.22	100.10	105.51	108.14	110.99	112.30	113.35	112.83	113.06	110.47	110.14
12	108.33	103.44	100.10	105.64	108.43	111.12	112.11	113.55	112.80	112.93	110.40	109.84
13	108.40	102.69	100.10	105.81	108.53	111.38	112.01	113.55	112.66	112.76	110.70	109.45
14	108.83	101.31	100.13	106.43	108.92	111.15	112.07	113.48	112.63	112.83	110.47	109.45
15	108.86	102.43	100.13	106.99	109.28	111.25	112.04	113.25	112.47	112.83	110.24	109.28
16	109.09	102.26	100.16	107.25	108.69	111.19	112.14	113.25	112.60	112.86	110.30	109.35
17	109.15	102.03	100.20	107.58	108.60	111.22	112.30	113.71	112.60	112.83	110.14	109.61
18	108.83	100.43	100.20	107.25	108.79	111.29	112.30	113.98	112.70	112.76	110.20	109.45
19	108.73	100.23	100.20	106.96	108.99	111.19	112.30	113.85	112.70	112.83	110.37	109.58
20	109.02	100.20	100.20	106.99	108.96	111.19	112.17	113.55	112.66	112.60	110.60	109.28
21	109.15	100.23	100.20	107.12	109.19	111.09	112.27	113.55	112.96	112.30	110.33	109.22
22	109.19	100.20	100.20	107.81	109.42	110.53	112.47	113.45	112.93	112.14	109.94	109.02
23	109.28	100.23	100.20	108.33	109.32	110.24	112.60	113.25	112.93	112.20	109.97	109.74
24	109.22	100.23	100.23	108.33	109.19	110.30	112.66	113.12	113.16	112.14	110.27	109.88
25	108.96	100.23	100.23	108.17	109.22	109.35	112.70	112.86	113.29	111.91	110.30	110.07
26	109.06	100.20	100.20	108.14	109.19	111.22	112.47	112.83	113.16	111.88	110.24	109.84
27	109.45	100.20	100.20	107.87	109.32	112.86	112.57	112.73	113.35	111.84	110.43	110.01
28	109.84	100.20	100.20	108.10	109.91	113.09	112.63	112.80	113.19	111.75	110.56	110.07
29	110.24		100.20	108.33	110.27	113.19	112.70	112.86	113.19	111.78	110.33	109.71
30	110.40		100.20	108.50	110.17	113.02	112.76	112.76	113.06	111.45	110.24	109.84
31	110.43		100.20		109.74		112.93	112.76		111.25		109.78
Avg.	108.76	103.97	100.43	105.74	108.96	111.02	112.47	113.12	112.80	112.57	110.60	109.71

**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 1983.

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-Foot 1983 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	0	0	196 #	0	0	180	2.0	0
2	0	0	0	0	0	0	207 #	0	0	194	2.0	0
3	0	0	0	0	0	0	212 #	0	0	183	2.0	0
4	0	0	0	0	0	0	169 #	0	0	151	2.0	0
5	0	0	0	0	0	0	* 74.9	0	0	157	2.0	0
6	0	0	0	0	0	0	16.8	0	0	165	2.0	0
7	0	0	0	0	0	0	0	0	0	175	2.0	0
8	0	0	0	0	0	0	0	0	0	189	2.0	0
9	0	0	0	0	0	0	0	0	0	199	2.0	0
10	0	0	0	0	0	0	0	0	0	188	2.0	0
11	0	0	0	0	0	0	0	0	0	180	0	0
12	0	0	0	0	0	0	0	0	0	165	0	0
13	0	0	0	0	0	0	0	0	0	110	0	0
14	0	0	0	0	0	0	0	0	0	55.7	0	0
15	0	0	0	0	0	0	0	0	0	54.2	0	0
16	0	0	0	0	0	0	0	0	0	55.8	0	0
17	0	0	0	0	0	0	0	0	0	54.6	0	0
18	0	0	0	0	0	0	0	0	0	49.5	0	0
19	0	0	0	0	0	0	0	0	0	46.8	0	0
20	0	0	0	0	0	0	0	0	0	39.4	0	0
21	0	0	0	0	0	0	0	0	0	29.2	0	0
22	0	0	0	0	0	0	0	0	0	22.0	0	0
23	0	0	0	0	0	0	0	0	0	21.0	0	0
24	0	0	0	0	0	0	0	0	0	49.2	0	0
25	0	0	0	0	0	0	0	0	25.2	50.3	0	0
26	0	0	0	0	0	0	0	28.1	0	46.8	0	0
27	0	0	0	0	0	5.6 #	0	39.1	0	45.5	0	0
28	0	0	0	0	0	151 #	0	30.2	15.8 #	0	0	0
29	0	0	0	0	0	199 #	0	170	2.0 #	0	0	0
30	0	0	0	0	0	216 #	0	180	2.0 #	0	0	0
31	0	0	0	0	0	0	0	0	2.0 #	0	0	0
Sum	0	0	0	0	0	571.6**	875.7**	0	472.6**	2,877.8#	20.0#	0
Current Year 1983												
Month	Extreme Gage Feet		Extreme Second-Foot				Average Second-Foot	Total Acre-Foot	Period 1966-1983			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.				0		0	0	10,784	18,718	0		
Feb.				0		0	0	8,393	16,992	0		
Mar.				0		0	0	5,859	18,506	0		
Apr.				0		0	0	4,879	18,061	0		
May				0		0	0	7,989	19,091	0		
June			29	234	1.1	0	**19.1	1,134 **	6,265	18,756	0	
July			3	342	1.6	0	**28.2	1,737 **	5,779	18,946	0	
Aug.				0		0	0	0	5,070	19,188	0	
Sept.			29	210	1.1	0	**15.8	937 **	8,253	18,474	0	
Oct.			2	218	28	2.0	# 92.8	5,708 #	11,618	19,200	0	
Nov.			1	2.0	111	0	# .7	39.7	11,016	18,478	0	
Dec.				0		0	0	0	10,005	19,121	0	
Yearly				342		0	13.2	9,556	96,710	214,781	0	0
Yearly												
Meters			Cubic Meters per Second				Thousands of Cubic Meters					
			9.69				0					
			0.37				11,787					
							119,291					
							264,930					
							0					

Extreme gage heights not reported due to backwater from the Colorado River
 ** All water is Colorado River water
 # All water is Gila River water
 * Estimated

! And other days
 # Partly estimated

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. Cableway dismantled on August 22, 1983. Recorder destroyed on July 4, 1983. Temporary recorder was installed and levels were established to ensure continuous record.

RECORDS: Based on current meter measurements, continuous record of gage heights and, beginning August 23, 1983, from deduced figures. Before August 23, 1983, computations by shifting control methods. Records available: Daily discharges, January 1, 1954 through 1983; continuous record of gage heights, July 20, 1952 through 1983.

REMARKS: Reservoirs, diversions in the United States and Mexico, drainage returns, and waste flows modify the river flow at this station. Deduced records beginning August 23, 1983 were derived by addition of flows at Northerly International Boundary, Cooper Wasteway, and M.O.D.E. No. 3, and subtraction of diversions into Alamo Canal at Morelos Dam. Diversion data were supplied by the Mexican Section of the International Boundary and Water Commission.

EXTREMES: Maximum instantaneous discharge, 38,000 second-feet (1,076 m³/sec) on August 18, 1983; maximum gage height, 112.99 feet (34.44 m) on August 18, 1983. Minimum discharge, no flow on various occasions.

Mean Daily Discharge in Second-Feet 1983 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,200	10,600	12.2	6.6	7,720	9,580	21,100	24,600	24,300	28,600	23,300	20,800
2	3,820	10,800	193	7.3	7,490	9,940	21,900	25,700	25,700	29,700	23,100	20,400
3	4,190	12,900	543	7.3	7,540	10,800	23,900	24,300	25,800	29,300	23,300	20,400
4	4,210	13,800	770	9.0	7,580	11,900	24,600	23,800	25,500	27,700	23,600	20,800
5	4,900	13,200	435	502	7,340	12,400	24,700	23,800	25,600	28,000	24,500	20,900
6	5,480	11,800	51.4	1,000	8,090	13,000	24,400	24,900	25,400	28,800	24,800	20,700
7	6,930	7,820	12.5	1,330	8,070	12,900	24,100	25,600	24,200	29,700	23,700	20,700
8	7,830	6,050	67.9	1,860	6,520	12,600	23,800	25,700	24,800	30,900	23,100	20,400
9	7,910	3,570	13.1	2,080	6,130	12,200	24,100	25,800	26,700	32,000	22,900	20,600
10	7,390	1,540	11.0	3,680	6,500	12,700	24,200	26,700	26,900	31,200	22,500	20,900
11	6,800	963	10.7	2,980	6,720	13,100	24,500	27,700	27,300	30,400	21,400	21,300
12	6,440	1,060	8.1	3,140	7,170	13,400	24,200	29,000	26,700	29,700	21,200	20,800
13	6,570	706	7.6	3,260	7,300	14,000	24,300	29,200	25,400	28,900	22,100	20,300
14	7,180	269	9.4	3,970	8,030	13,400	23,900	28,200	25,000	29,200	21,200	19,900
15	7,220	563	10.6	4,780	8,670	13,800	24,300	26,700	23,900	29,400	20,900	19,700
16	7,510	492	11.4	5,140	7,590	14,000	24,600	26,800	24,700	29,800	21,200	19,800
17	7,560	382	11.0	5,530	7,430	14,100	25,300	31,000	24,900	29,600	20,900	20,200
18	7,210	48.2	11.4	5,090	7,760	14,300	25,500	36,200	26,000	28,900	21,000	20,100
19	7,110	15.7	9.6	4,710	8,120	14,100	25,000	34,400	26,300	29,300	21,600	20,100
20	7,450	10.3	8.8	4,790	8,100	14,000	25,100	32,300	26,200	28,600	22,400	19,800
21	7,560	10.6	10.4	4,980	8,530	13,700	25,600	32,900	27,400	27,700	21,800	19,600
22	7,600	10.4	8.5	5,330	9,030	12,300	26,100	32,500	27,500	26,800	20,800	19,800
23	7,830	10.8	9.9	6,760	8,870	11,800	26,200	29,300	27,300	27,600	20,800	20,200
24	7,680	11.8	9.8	6,730	8,680	12,000	25,800	28,900	28,800	27,300	21,500	20,600
25	7,370	12.7	9.8	6,500	8,780	9,660	25,700	27,500	30,100	26,200	22,000	21,100
26	7,510	11.0	8.1	6,490	8,740	14,100	24,800	24,400	28,600	26,300	21,800	21,100
27	8,100	10.3	7.3	6,080	9,010	18,700	25,000	25,800	30,000	26,300	22,600	21,200
28	8,950	13.3	10.6	6,480	10,400	21,000	25,100	26,000	28,900	25,700	22,900	21,300
29	10,000		11.0	6,840	11,200	21,300	24,800	26,000	29,000	26,400	22,200	20,600
30	10,400		8.8	7,160	11,000	21,500	25,000	25,700	28,400	25,100	21,800	20,700
31	10,600		7.3	10,100	10,100		25,500	25,800		24,200		20,500
Sum	219,510	96,680.1	2,309.2	117,822.2	254,210	412,280	763,100	856,000	797,300	879,300	666,900	634,800

Month	Extremes Gage Feet		Extremes Second-Feet				Average Second-Feet	Total Acre-Feet	Period 1954-1983 Acre-Feet		
	High	Low	Day	High	Low	Day	Acre-Feet	Acre-Feet	Average	Maximum	Minimum
Jan.	109.30	101.65	31	10,800	1	900	7,080	435,392	135,236	969,540	478
Feb.	100.06	99.92	14	14,100	122	9.0	3,450	191,762	66,926	414,310	491
Mar.	102.12	99.18	4	878	30	6.6	74.5	4,580	50,392	630,230	659
Apr.	107.68	99.16	30	7,390	1	5.9	3,930	233,697	50,628	532,320	745
May	109.67	106.77	19	11,600	9	6,000	8,200	504,218	72,145	504,218	460
June	112.53	108.32	29	21,700	25	8,770	13,700	817,745	54,158	817,745	507
July	112.24	110.81	22	26,400	1	20,600	24,600	1,513,587	74,370	1,513,587	584
Aug.	112.99	111.34	18	38,000	14	23,300	27,600	1,697,851	89,829	1,697,851	618
Sept.	112.65	111.30	27	31,700	15	23,400	26,600	1,581,421	85,515	1,581,421	113
Oct.	112.39	110.45	9	32,800	31	23,500	28,400	1,744,066	112,981	1,744,066	383
Nov.	110.73	109.19	6	25,200	14	20,200	22,200	1,322,777	118,782	1,322,777	355
Dec.	109.81	109.05	28	21,700	22	19,200	20,500	1,259,107	133,443	1,259,107	465
Yearly	112.99	99.16		38,000		5.9	15,620	11,306,203	1,044,405	11,306,203	31,756
	Meters		Cubic Meters per Second				Thousands of Cubic Meters				
	34.44	30.22		1,076		0.17	442	13,945,975	1,288,253	13,945,975	39,170

δ Discharges deduced: Colorado River at NIB minus diversion into Alamo Canal at Morelos Dam. Mexican Section of the IBC supplied diversion figures. Discharge of Wellton-Mohawk Channel at M.O.D.E. #3 is also included in computation.
 * partly tabulated
 † other days

COLORADO RIVER AT MORELOS GAGING STATION - STAGES

(See Preceding Page For Description)

Mean Daily Gage Height in Feet 1983

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	103.63	109.23	99.95	99.17	107.87	108.78	111.88	111.68	111.47	112.12	110.36	109.36
2	105.14	109.29	100.62	99.18	107.74	108.94	111.94	111.66	111.62	112.26	110.30	109.21
3	105.43	109.82	101.49	99.18	107.77	109.34	112.10	111.61	111.64	112.28	110.31	109.17
4	105.45	110.00	101.93	99.21	107.79	109.81	* 111.86	111.48	111.65	111.90	110.40	109.27
5	105.96	109.82	101.26	101.06	107.65	110.01	* 111.44	111.47	111.66	111.94	110.61	109.33
6	106.36	109.32	99.76	102.07	108.07	100.28	* 111.10	111.76	111.69	112.00	110.69	109.28
7	107.24	107.61	99.36	102.53	108.05	110.25	* 110.94	111.91	111.50	112.11	110.44	109.24
8	107.74	106.67	99.78	103.16	107.14	110.12	* 110.85	111.94	111.62	112.25	110.32	109.11
9	107.78	104.97	99.34	103.40	106.87	109.93	* 110.94	111.96	111.93	112.34	110.31	* 109.16
10	107.50	103.11	99.31	104.96	107.13	110.13	* 110.94	112.13	111.94	112.27	110.16	* 109.48
11	107.17	102.43	99.30	104.31	107.27	110.33	* 111.02	112.29	111.95	112.24	109.79	* 109.55
12	106.95	102.57	99.26	104.46	107.56	110.43	* 110.98	112.48	111.92	112.15	109.68	* 109.47
13	107.03	101.97	99.24	104.57	107.63	110.66	* 110.97	112.51	111.78	112.01	109.96	* 109.32
14	107.49	101.09	99.26	105.19	108.04	110.45	* 110.89	112.37	111.71	112.01	109.85	* 109.22
15	107.53	101.76	99.25	105.83	108.36	110.53	* 110.97	112.13	111.48	112.04	109.48	* 109.16
16	107.77	101.62	99.25	106.10	107.78	110.47	* 111.04	112.15	111.56	112.04	109.53	* 109.19
17	107.80	101.40	99.27	106.41	107.71	110.51	* 111.18	* 112.63	111.66	112.01	109.44	* 109.35
18	107.52	100.34	99.27	106.18	107.89	110.59	* 111.23	* 112.87	111.82	111.94	109.42	* 109.30
19	107.42	100.13	99.25	105.78	108.09	110.49	* 111.12	* 112.69	111.86	111.98	109.57	* 109.28
20	107.72	100.06	99.24	105.84	108.07	110.48	* 111.14	112.37	111.91	111.88	109.87	* 109.10
21	107.81	100.06	99.26	105.99	108.29	110.36	* 111.25	112.43	112.18	111.65	109.66	* 109.12
22	107.84	100.05	99.24	106.71	108.53	109.83	* 111.35	112.39	112.16	111.48	109.38	* 109.12
23	107.98	100.04	99.25	107.31	108.45	109.61	* 111.46	112.21	112.14	111.52	109.29	* 109.49
24	107.89	100.02	99.25	107.29	108.36	109.71	* 111.49	112.12	112.32	111.42	109.54	* 109.62
25	107.66	100.00	99.25	107.12	108.41	108.70	* 111.55	111.97	112.57	111.22	109.65	* 109.76
26	107.77	99.96	99.22	107.12	108.39	110.51	* 111.42	111.95	112.38	111.13	109.57	* 109.72
27	108.14	99.94	99.21	106.83	108.52	112.15	* 111.48	111.90	112.51	111.08	109.73	* 109.70
28	108.56	99.96	99.24	107.11	109.13	112.43	* 111.50	111.99	112.23	111.03	109.90	* 109.56
29	109.00		99.24	107.36	109.51	112.38	* 111.51	112.00	112.25	111.06	109.68	109.36
30	109.15		99.21	107.55	109.44	112.13	* 111.64	111.90	112.11	110.76	109.59	109.36
31	109.22		99.18		109.04		111.79	111.91		110.58		109.28
Avg.	107.34	103.33	99.58	104.63	108.08	110.34	111.32	112.09	111.91	111.76	109.88	109.34

* Partly estimated

* 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 limnologic 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 1983, 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 m³) in August 1940; minimum monthly discharge, zero in April 1941. Since January 1, 1951, maximum instantaneous discharge, 800 second-feet (22.7 m³/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 1983 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.1	0.2	0.2	0.4	0.1	0.6	0.2	24.8	0.1	0.5	0.4	0.3
2	.1	.2	.2	.5	.1	.3	.3	.6	.2	.4	.2	.2
3	.1	.2	.2	57.9	.2	.4	.3	.1	.3	.4	.2	.3
4	.1	.3	.2	23.7	.2	.4	.3	.3	.1	.2	.2	25.8
5	.1	.2	.2	3.5	.2	.3	.1	.1	.1	.2	3.0	26.4
6	.2	43.0	61.1	2.0	.3	.3	.1	.2	.2	.3	39.6	3.5
7	.1	32.2	18.5	.4	.1	.3	.2	.2	.2	.5	49.4	1.2
8	.1	3.4	1.7	.4	50.7	.4	.2	.2	.2	.6	2.7	.1
9	2.0	1.1	.7	.4	25.5	.4	.2	.1	.2	.3	.8	.2
10	.3	.2	.2	.3	1.3	.4	.2	.3	.2	.3	.4	.1
11	.3	.3	.3	.3	.2	.3	.2	.3	.2	.3	.4	1.7
12	.4	.3	.3	.2	.1	.4	.2	.3	.2	.5	.4	.2
13	.3	.1	.3	.2	.1	.4	.3	.2	.4	.5	.4	.2
14	2.0	.3	.3	.2	.1	.2	.4	.3	.2	.5	.8	.2
15	.4	.1	.2	.3	0	.3	.4	.2	.2	.4	.2	.2
16	.3	.1	.1	.3	.1	.3	.4	.2	.2	.6	.2	.2
17	.4	.1	.1	.3	.2	.4	.2	.2	.1	.2	3.2	2.3
18	.2	.1	.1	.3	.2	.3	.3	.2	.1	.7	.4	.3
19	.2	.1	0	.3	.2	.3	.4	.3	.4	.3	.7	.2
20	.3	.1	.1	.2	.2	.3	.3	.4	.2	.7	.5	.4
21	.4	.2	.3	.2	.2	.2	.2	.3	.3	.4	.5	.2
22	.5	.3	.3	.2	.3	.2	.2	.3	.4	.4	.5	.2
23	.5	.3	.1	.1	.3	.1	.3	.3	.3	.4	.5	.2
24	.5	.3	.2	.2	.2	.1	.3	.3	.4	.5	.7	2.0
25	.5	.3	.2	.2	.1	.1	.3	.2	.4	.5	.9	.2
26	.6	.3	.3	.1	.1	.1	.3	.3	.4	.5	.7	.2
27	.6	.2	.2	.1	.1	.1	.4	.3	.4	.4	.4	.2
28	.5	.1	.2	.1	.2	.1	.4	.3	.4	.9	.4	5.8
29	.6	.2	.1	.2	.1	.2	.4	.6	.4	.3	.7	.5
30	.4	.3	.3	.1	.2	.2	.2	.2	.5	.7	.2	.4
31	.3		.4		.3		67.7	.1		.2		.4
Sum		84.6	87.7	93.5	82.3	8.3	75.9	32.7	7.9	13.6	109.6	74.3
	13.4											
Current Year 1983									Period 1935-1983			
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.	112.56	111.73	9	41.0	17	0.1	0.4	26.6	2,738	9,570	0	
Feb.	115.39	111.74	6	229	11	.1	3.0	168	2,231	8,430	14.5	
Mar.	115.70	111.72	6	265	116	0	2.8	174	2,102	6,230	59.1	
Apr.	115.82	111.73	3	283	126	.1	3.1	185	1,946	6,300	0	
May	115.67	111.72	8	261	15	0	2.7	163	2,301	9,320	8.3	
June	111.85	111.72	1	1.3	23	0	.3	16.5	2,199	7,440	10.5	
July	115.67	111.73	31	261	14	.1	2.4	151	2,203	8,320	9.1	
Aug.	114.02	111.72	1	129	3	0	1.1	64.9	1,904	9,740	64.9	
Sept.	111.84	111.73	19	1.2	4	.1	.3	15.7	1,374	6,140	6.0	
Oct.	111.90	111.73	17	2.0	18	.1	.4	27.0	1,875	5,680	11.9	
Nov.	115.56	111.73	7	248	15	.1	3.7	217	2,262	8,220	18.8	
Dec.	115.70	111.73	4	265	17	.1	2.4	147	2,978	9,430	61.9	
Yearly	115.82	111.72		283		0	1.9	1,356	26,113	82,900	943	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	35.30	34.05		8.01		0	0.05	1,673	32,210	102,255	1,163	

* Partly estimated

! 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 1983; 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, 108.77 feet (33.15 m) on June 28, 1983; minimum mean daily gage height, 94.95 feet (28.94 m) on June 22, 1968.

Mean Daily Gage Height in Feet 1983

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	100.18	106.06	¶ 96.79	96.78	104.55	105.48	108.11	107.89	108.21	108.36	107.05	106.01
2	101.90	106.11	¶ 97.40	96.77	104.45	105.61	108.05	107.82	108.32	108.40	107.02	106.00
3	102.28	106.69	¶ 98.23	96.93	104.45	105.97	108.10	107.67	108.31	108.31	107.04	105.97
4	102.33	106.84	¶ 98.38	97.08	104.46	106.46	107.83	107.62	108.27	108.14	107.12	106.12
5	102.84	106.65	¶ 97.90	97.78	104.29	106.68	107.55	107.70	108.27	108.17	107.27	106.16
6	103.24	106.19	¶ 98.07	98.68	104.69	106.94	107.38	107.92	¶ 108.19	108.23	107.39	106.04
7	104.18	104.54	96.90	99.15	104.73	106.90	107.28	108.03	¶ 108.00	108.33	107.13	106.01
8	104.70	103.45	¶ 97.13	99.75	103.80	106.80	107.16	108.04	¶ 108.12	108.37	107.04	105.94
9	104.79	101.77	¶ 96.98	99.97	103.52	106.63	107.16	108.05	¶ 108.34	108.49	107.01	105.93
10	104.53	99.70	¶ 96.92	101.61	103.77	106.80	107.22	108.12	¶ 108.38	108.37	106.93	106.10
11	104.15	98.90	¶ 96.91	101.07	103.90	106.98	107.19	108.14	108.39	108.39	106.59	106.20
12	103.91	* 99.00	¶ 96.90	* 101.15	104.21	107.08	107.07	108.29	108.34	108.27	106.50	106.09
13	103.94	* 98.68	¶ 96.89	* 101.21	104.29	107.31	107.09	108.29	108.24	108.18	106.72	105.88
14	104.37	* 97.71	¶ 96.89	* 101.85	104.70	107.16	107.19	108.22	¶ 108.20	108.28	106.55	105.77
15	104.42	* 98.27	96.88	* 102.52	105.09	107.22	107.32	108.03	¶ 107.98	108.31	106.31	105.66
16	104.65	* 98.11	96.88	* 102.80	104.53	107.14	107.40	108.11	¶ 108.06	108.23	106.36	105.67
17	104.68	* 97.86	96.88	* 103.07	104.41	107.20	107.53	108.31	¶ 108.17	108.24	106.25	105.83
18	104.38	* 96.98	96.88	* 102.84	104.61	107.26	107.61	108.52	¶ 108.33	108.28	106.24	105.80
19	104.27	* 96.90	96.88	102.49	104.83	107.20	107.59	108.53	¶ 108.35	108.24	106.34	105.82
20	104.55	* 96.88	96.87	102.53	104.84	107.17	107.62	108.33	¶ 108.32	108.24	106.54	105.64
21	104.63	* 96.84	96.87	102.65	105.02	107.06	107.72	108.36	108.48	¶ 108.03	106.35	105.61
22	104.66	* 96.82	96.83	103.31	105.32	106.59	107.79	108.40	108.45	¶ 107.83	* 106.08	105.53
23	104.78	* 96.81	96.82	103.95	105.25	106.36	107.81	108.37	108.38	¶ 107.86	* 106.02	105.88
24	104.70	* 96.80	96.82	103.96	105.10	106.46	107.84	108.46	108.59	¶ 107.79	106.27	106.04
25	104.42	* 96.80	96.83	103.82	105.13	105.49	107.84	108.31	108.69	¶ 107.66	106.32	106.22
26	104.50	* 96.80	96.82	103.78	105.12	107.07	107.69	108.30	108.46	107.61	106.31	106.22
27	104.86	* 96.78	96.81	103.52	105.24	108.51	107.63	108.33	108.53	107.63	106.46	106.22
28	105.28	* 96.79	96.81	103.74	105.75	108.77	107.65	108.42	108.54	107.58	106.57	106.30
29	105.76		96.78	104.02	106.15	108.66	107.56	108.48	108.51	107.55	106.35	106.10
30	105.95		96.77	104.20	106.10	108.37	107.81	108.42	108.44	107.34	106.28	106.12
31	106.01		96.77		105.72		107.99	108.42		107.22		106.01
Avg.	104.19	100.06	97.05	101.43	104.77	106.98	107.57	108.19	108.33	108.06	106.61	105.96

* Partly estimated

¶ Estimated

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

DESCRIPTION: Water-stage recorder and control weir on wasteway from West Main Canal to Colorado River. Located on east side of levee at site used prior to May 1, 1971. The site used May 1, 1971 to September 20, 1977 was located 200 feet (61 m) downstream from present site on west side of levee. 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 1983, 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 m³) in January 1946; minimum monthly discharge, 122 acre-feet (150,000 m³) in September 1950. Since January 1, 1951, maximum instantaneous discharge, 102 second-feet (2.89 m³/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 1983 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	4.7	0	0	0	0	0	0	0	0	0
2	0	0	3.9	0	0	0	0	0	0	0	0	0
3	0	0	2.9	0	0	0	0	0	0	0	0	0
4	0	0	.6	0	0	0	0	0	0	0	0	0
5	0	0	.2	0	0	0	0	0	0	0	0	0
6	0	0	.1	0	0	0	0	0	0	0	0	0
7	0	0	.1	0	0	0	.2	0	0	0	0	0
8	0	0	0	0	0	0	.2	.8	0	0	0	0
9	0	0	0	4.9	0	0	.1	4.2	0	0	0	0
10	0	0	0	0	0	0	.1	.2	0	0	0	0
11	0	0	0	0	0	0	0	.2	0	0	0	0
12	0	0	0	0	0	0	0	.2	0	0	0	0
13	0	0	0	0	0	0	0	.2	0	0	0	0
14	0	0	0	0	0	0	0	.1	0	0	0	0
15	0	0	0	0	0	0	.2	.2	0	0	0	0
16	0	0	0	0	0	0	0	.1	.2	0	0	0
17	0	0	0	0	0	0	.1	.2	0	0	0	0
18	0	0	0	0	0	0	.1	.2	0	0	0	0
19	0	0	0	0	0	0	0	.2	0	0	0	0
20	0	0	0	0	0	0	0	.2	0	0	0	0
21	0	5.3	0	0	0	0	0	.2	0	0	0	0
22	0	7.0	0	0	0	0	0	.2	0	0	0	0
23	0	1.0	0	0	0	0	0	.1	0	0	0	0
24	0	1.1	0	1.9	0	0	0	.1	0	0	0	0
25	0	.5	0	.4	0	0	0	0	0	0	0	0
26	0	4.3	0	.3	0	0	0	0	0	0	0	0
27	0	2.9	0	0	0	0	0	0	0	0	0	0
28	0	8.0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	.1	0	0	0	0
30	0	0	0	0	0	0	0	.3	0	0	0	0
31	0	0	0	0	0	0	0	.2	0	0	0	0
Sum	0	30.1	12.5	7.5	0	0	1.1	8.3	0	0	0	0
Current Year 1983												
Period 1939-1983												
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	670	2,860	0		
Feb.	.69	0	21	9.5	11	0	1.1	59.7	583	2,510		
Mar.	.64	0	1	8.4	17	0	.4	24.8	533	1,660		
Apr.	2.05	0	24	80.8	11	0	.2	14.9	572	1,940		
May	0	0	0	0	0	0	0	696	2,470	0		
June	0	0	0	0	0	0	0	608	2,350	0		
July	.90	0	7	15.0	11	0	0	2.2	525	1,950		
Aug.	.85	0	9	13.6	11	0	.3	16.5	553	2,530		
Sept.	0	0	0	0	0	0	0	495	2,180	0		
Oct.	0	0	0	0	0	0	0	600	2,100	0		
Nov.	0	0	0	0	0	0	0	696	2,380	0		
Dec.	0	0	0	0	0	0	0	766	2,680	0		
Yearly	2.05	0		80.8		0	0.2	118	7,297	24,370	0	
Yearly	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	0.62	0		2.29		0	0.01	146	9,001	30,060	0	

1 And other days

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 1983. 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-Foot 1983 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.0	1.2	5.8	2.9	7.3	2.6	14.1	1.9	0	8.8	3.2	8.4
2	2.3	1.6	2.3	1.3	6.8	2.9	5.2	.6	0	4.8	6.9	1.8
3	1.1	10.8	8.0	3.0	1.4	1.1	3.8	2.7	4.8	3.7	17.4	3.4
4	1.4	8.7	1.2	2.1	.7	4.7	3.7	1.3	9.6	6.1	9.0	6.7
5	10.0	7.7	.8	1.3	.2	1.4	1.0	3.4	17.0	9.5	6.2	.9
6	13.2	6.2	1.7	1.0	4.0	6.3	.4	11.2	6.5	21.9	18.4	1.3
7	9.2	.7	1.0	4.2	8.1	1.1	.3	8.5	3.5	5.8	13.9	4.7
8	10.4	.4	.6	2.2	.6	1.3	1.6	2.2	4.6	3.5	2.7	9.2
9	2.4	.6	2.4	5.2	.9	2.3	5.3	4.9	1.0	1.8	.8	2.4
10	1.6	.7	5.0	4.2	3.4	5.2	1.5	12.7	2.7	2.3	.4	1.1
11	.6	1.2	.8	.3	4.6	1.5	.6	5.9	3.3	1.2	6.8	1.4
12	.4	1.1	4.7	1.5	.8	.3	1.2	6.1	1.1	7.6	9.6	9.4
13	2.2	.7	1.8	1.1	1.8	1.4	1.7	1.4	1.6	3.3	8.2	8.4
14	1.1	.2	.2	3.0	5.1	1.8	5.4	.1	8.3	3.5	18.8	1.0
15	.9	0	0	1.9	5.6	5.2	2.8	8.1	6.4	6.4	13.0	5.7
16	.7	6.6	.1	1.9	11.1	.6	3.1	4.0	9.6	8.9	12.5	2.2
17	1.3	.9	1.6	11.6	5.8	.4	3.4	4.5	10.0	4.2	11.2	.8
18	.6	4.2	.7	19.0	3.1	.3	.3	2.2	11.4	11.6	9.6	1.3
19	2.7	1.3	3.9	4.2	2.8	7.2	1.7	.7	15.0	7.2	3.8	16.1
20	5.5	1.1	4.9	1.4	4.6	2.4	1.0	.9	3.4	5.7	11.9	5.2
21	5.8	14.4	17.2	.3	1.8	3.1	.9	4.6	8.4	17.8	5.0	1.8
22	2.1	2.9	2.8	.1	17.2	2.1	.4	2.6	6.2	11.1	1.1	.7
23	8.0	1.4	.5	.7	5.6	3.3	3.2	1.1	15.6	9.9	4.4	5.6
24	8.3	.9	.2	7.6	1.4	3.0	2.6	.7	16.5	17.0	7.0	1.6
25	6.8	.4	1.6	7.8	.8	3.9	4.9	.6	9.0	7.5	17.8	2.4
26	13.1	1.7	5.4	2.6	.7	3.0	3.1	2.1	2.4	2.5	2.5	7.7
27	11.9	2.5	8.3	7.5	.8	2.1	1.1	2.2	13.7	6.5	5.2	15.9
28	3.1	2.3	9.6	3.6	2.9	7.3	3.4	.3	6.7	7.0	10.5	4.0
29	1.3		7.0	3.9	4.6	5.5	12.0	0	5.4	6.7	10.4	1.6
30	4.8		1.4	7.0	3.3	3.3	5.5	.4	15.3	5.5	3.2	.7
31	3.2		4.5		.3		3.7	.1		.8		3.9
Sum	137.0	82.4	106.0	114.4	118.1	86.6	98.9	98.0	219.0	220.1	251.4	137.3

Month	Extreme Gage Feet		Extreme Second-Foot				Average Second-Foot	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
	Jan.	1.08	0.01	23	38.3	12	0.1	4.4	272	1,034	3,360
Feb.	.79	0	21	23.0	17	0	2.9	163	870	3,170	133
Mar.	1.06	0	12	37.2	111	0	3.4	210	999	2,920	154
Apr.	.87	0	18	27.1	111	0	3.8	227	973	3,170	175
May	.88	0	10	27.7	15	0	3.8	234	1,075	3,040	228
June	1.00	0	2	34.0	112	0	2.9	172	915	3,660	161
July	.99	0	9	33.5	18	0	3.2	196	986	3,590	170
Aug.	.92	0	10	29.8	114	0	3.2	194	1,006	3,960	159
Sept.	.91	0	24	29.2	11	0	7.3	434	955	3,170	159
Oct.	.97	.05	6	32.4	11	.5	7.1	437	997	3,280	307
Nov.	.87	0	25	27.1	11	0	8.4	499	1,078	3,570	241
Dec.	1.23	.04	1	46.7	117	.4	4.4	272	1,047	3,080	247
Yearly	1.23	0		46.7		0	4.6	3,310	11,935	38,310	3,026
	Meters		Cubic Meters per Second				Thousands of Cubic Meters				
	0.37	0		1.32		0	0.13	4,083	14,722	47,255	3,733

! 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 1983.

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 1983 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	92.8	78.8	91.1	112	118	95.0	115	105	119	148	142	147
2	83.5	97.2	93.9	101	108	95.4	110	116	114	140	157	136
3	90.9	78.8	103	99.2	101	86.6	107	120	130	147	159	143
4	89.9	68.6	94.8	108	110	85.3	106	119	129	158	170	138
5	90.3	78.8	91.9	103	108	98.1	103	134	121	168	167	141
6	81.3	85.1	92.3	100	105	96.2	103	111	125	161	165	140
7	99.9	85.7	91.9	101	99.9	90.3	107	99.5	127	154	162	133
8	81.3	74.9	94.1	90.8	101	90.6	110	95.5	137	139	157	136
9	81.3	81.7	93.7	96.9	104	87.1	110	119	139	153	130	134
10	86.8	81.4	94.5	101	87.3	99.0	115	108	139	162	134	132
11	84.8	75.4	100	105	96.3	86.4	109	107	138	149	157	150
12	84.8	89.1	98.7	107	94.4	90.3	104	126	149	155	153	132
13	85.7	80.0	93.9	109	93.3	76.3	112	126	143	148	143	134
14	78.6	81.7	94.9	107	103	103	119	118	147	148	139	143
15	92.8	94.0	94.3	105	101	99.5	125	123	140	159	156	144
16	88.1	89.4	102	108	103	95.6	124	118	149	156	144	142
17	95.2	87.8	98.9	112	102	115	116	124	133	151	139	140
18	88.0	99.7	101	114	98.2	119	117	123	140	152	145	164
19	89.6	99.7	99.3	108	102	112	114	128	140	150	153	146
20	92.2	98.2	113	100	95.0	115	116	129	138	156	144	132
21	88.0	95.6	108	95.0	109	108	122	117	140	147	142	132
22	94.0	88.5	104	93.1	132	105	123	116	153	143	129	130
23	93.8	80.5	112	115	94.7	106	121	115	141	149	137	136
24	81.8	80.1	104	118	101	106	119	118	139	150	133	146
25	93.5	92.9	114	114	93.2	107	111	110	112	147	136	148
26	102	92.6	121	111	90.2	108	114	115	116	147	138	144
27	99.7	100	109	112	91.6	117	112	122	115	158	142	135
28	116	102	110	106	83.0	101	118	123	128	157	137	136
29	100	104	104	108	90.4	102	121	124	152	161	144	136
30	99.0	94.9	111	111	96.0	105	126	129	155	146	144	127
31	89.7	104	104	104	89.0	104	122	96.9	155	160	144	133
Sum	2,815.3	2,438.2	3,122.1	3,171.0	3,100.5	3,000.7	3,551	3,634.9	4,048	4,719	4,398	4,310

Month	Extreme Gage Feet		Current Year 1983				Average Second-Feet	Total Acre-Feet	Period 1935-1983			
	High	Low	Extreme Second-Feet		Total	Acre-Feet						
			Day	High		Low	Day	Average	Maximum	Minimum		
Jan.			28	116	14	78.6	90.8	5,584	7,563	11,203	1,740	
Feb.			28	102	4	68.6	87.1	4,836	7,430	11,988	1,640	
Mar.			26	121	1	91.1	101	6,193	8,554	12,830	1,940	
Apr.			24	118	8	90.8	106	6,290	8,408	11,830	1,920	
May			22	132	28	83.0	100	6,150	8,612	13,140	1,950	
June			18	119	13	76.3	100	5,952	8,005	12,040	2,290	
July			30	126	5	103	115	7,043	7,943	11,830	2,530	
Aug.			5	134	8	95.5	117	7,210	7,915	11,960	2,560	
Sept.			30	155	25	112	135	8,029	7,889	11,568	2,280	
Oct.			5	168	8	139	152	9,360	8,776	12,385	2,940	
Nov.			4	170	22	129	147	8,723	8,360	12,010	2,800	
Dec.			18	164	30	127	139	8,549	8,029	11,480	2,450	
Yearly				170		68.6	116	83,919	97,484	139,380	27,040	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
			4.81		1.94	3.29	103,512	120,245	171,922	33,353		

0 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 outlet 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. Records available: February 23, 1971 through 1983.

REMARKS: Wasteway discharges from West Main Canal Wasteway comprise regulatory waste from the West Main Canal.

Mean Daily Discharge in Second-Foot 1983 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.8	8.4	9.8	8.3	1.3	1.8	16.4	18.3	12.4	2.0	1.6	0.5
2	2.1	12.3	4.6	1.3	1.2	3.9	17.8	2.1	11.1	6.2	.8	6.9
3	0	10.7	5.3	25.4	1.7	3.7	22.0	.7	2.6	4.0	3.4	16.4
4	0	23.4	.5	6.5	.6	2.0	27.5	1.8	3.5	7.5	7.2	37.0
5	6.0	13.7	16.9	5.6	1.0	5.1	14.6	7.7	4.7	5.8	4.4	42.8
6	12.1	9.2	37.1	.9	7.5	4.3	11.0	1.9	2.1	9.0	21.8	6.6
7	12.2	33.3	30.6	.4	9.8	2.9	2.6	4.6	3.2	3.5	38.1	1.7
8	2.9	9.3	9.3	.2	28.6	5.1	1.0	4.4	2.8	19.6	4.4	1.0
9	4.3	4.4	2.0	12.9	40.1	8.4	.4	11.3	2.2	9.2	1.3	10.9
10	15.8	3.0	2.0	17.3	5.9	2.8	.3	15.0	7.6	7.7	1.2	3.5
11	12.0	1.3	8.7	5.1	1.1	5.0	6.6	8.4	5.2	2.5	2.9	5.1
12	4.1	8.4	10.4	5.2	.7	8.7	5.0	3.3	5.1	3.4	2.4	6.6
13	* 8.6	15.6	7.4	10.4	.7	14.6	7.3	2.5	1.3	6.1	3.9	3.5
14	* 1.5	12.3	1.3	6.9	.2	3.7	5.3	2.0	2.5	2.6	7.5	8.5
15	* 7.9	11.1	5.1	9.5	6.2	4.8	4.7	5.7	.5	7.2	9.1	8.0
16	* 1.9	9.3	3.9	3.2	5.3	6.6	4.7	6.5	3.6	16.6	1.3	10.6
17	* .5	17.6	17.3	3.3	5.1	2.9	6.3	14.2	4.6	9.0	7.6	7.9
18	2.4	14.9	17.5	1.0	5.6	11.0	1.1	6.2	5.6	3.9	7.7	11.3
19	11.3	24.3	3.7	4.0	7.4	9.4	7.2	5.3	6.6	3.4	3.8	8.4
20	4.0	10.1	4.6	3.0	10.0	1.3	4.4	12.2	11.8	4.5	6.0	4.1
21	8.2	4.2	7.1	1.4	3.2	.5	3.9	13.3	2.4	7.3	7.8	5.4
22	4.0	.5	3.1	2.1	5.8	1.5	2.6	9.5	6.0	19.8	5.6	5.6
23	18.2	1.8	5.2	.5	8.4	3.9	9.5	3.3	4.5	7.9	2.4	7.2
24	8.1	.3	13.2	8.7	3.8	2.1	11.8	.9	5.9	8.8	5.1	12.5
25	.4	.2	7.4	6.3	2.2	4.5	1.4	7.4	9.0	9.0	10.6	15.8
26	.5	7.7	6.4	3.5	10.3	9.5	3.0	10.5	2.5	4.3	3.8	10.1
27	9.0	.6	7.5	5.0	10.9	9.3	2.7	4.9	2.1	5.3	.7	7.6
28	14.0	1.4	5.9	8.2	12.5	9.7	6.4	1.4	3.6	7.1	1.9	1.9
29	10.8		3.7	2.0	6.1	12.4	11.3	.6	1.6	2.8	13.5	6.8
30	22.4		.4	2.4	5.9	6.1	3.2	3.2	2.5	4.9	5.2	7.2
31	16.5		2.8		6.5		35.6	2.1		5.5		5.8
Sum		269.3		170.5		167.5		191.2		216.4		287.2
	225.5		260.7		215.6		257.6		139.1		193.0	
Current Year 1983												
Month	Extreme Gage Feet		Extreme Second-Foot				Average Second-Foot	Total	Period 1971-1983			
	High	Low	Day	High	Day	Low	Feet	Acre-Feet	Average	Maximum	Minimum	
Jan.	1.87	0	23	37.4	1	0	7.3	447	351	565	125	
Feb.	2.21	.03	7	49.4	125	.2	9.6	534	434	681	164	
Mar.	2.20	.04	6	49.0	114	.2	8.4	517	483	939	203	
Apr.	2.14	.02	3	46.9	8	.1	5.7	338	359	664	164	
May	2.22	0	9	49.7	15	0	7.0	428	291	434	148	
June	1.98	.03	13	41.3	111	.2	5.6	332	288	480	96.6	
July	2.21	0	2	49.4	26	0	8.3	511	300	556	93.2	
Aug.	1.80	0	25	35.0	4	0	6.2	379	309	536	98.0	
Sept.	1.56	0	2	27.3	16	0	4.6	276	372	768	190	
Oct.	1.98	.04	22	41.3	29	.2	7.0	429	371	728	133	
Nov.	2.14	.04	7	46.9	1	.2	6.4	383	372	541	161	
Dec.	2.52	.07	5	61.0	1	.4	9.3	570	375	610	188	
	2.52	0		61.0		0	7.1	5,144	4,305	6,229	2,829	
Yearly	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	0.77	0		1.73		0	0.20	6,345	5,310	7,683	3,490	

* Partly estimated

! 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 1983.

REMARKS: Records show the pumping of ground water from the 242 well field east of San Luis, Arizona.

Mean Daily Discharge in Second-Foot 1983 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	7.5	7.1	43.9	6.4	6.5	0.8	7.1	1.2	0.6	0	0	0.2
2	7.5	6.3	24.3	6.8	6.5	3.2	7.1	.2	0	0	0	.9
3	7.1	2.0	1.2	7.1	6.3	4.5	7.1	0	0	0	0	.4
4	7.2	1.5	.8	6.8	6.4	6.8	7.1	0	0	0	0	.1
5	7.2	1.1	.4	6.5	6.2	6.4	7.1	2.4	0	0	0	0
6	6.9	.8	.4	6.6	6.3	3.1	7.1	7.1	0	0	0	9.2
7	7.1	.8	.2	4.8	6.6	0	7.1	7.5	0	0	0	18.3
8	7.0	.8	.5	.8	6.6	0	7.1	7.5	0	0	1.2	18.8
9	7.9	.4	6.8	.6	6.3	2.6	6.7	5.2	0	0	5.2	23.2
10	7.8	1.2	6.8	.4	6.4	5.0	5.6	1.1	0	0	1.9	27.5
11	7.9	6.4	6.8	0	6.4	.9	6.1	.4	0	0	5.8	31.7
12	8.3	6.8	6.8	0	6.4	.1	6.4	0	0	0	6.8	24.9
13	8.3	6.8	6.7	0	6.3	0	6.8	0	0	2.0	6.9	21.6
14	7.5	6.5	6.8	0	6.4	0	6.6	0	8.8	5.1	7.1	22.9
15	7.5	6.5	6.6	.5	6.3	0	6.6	0	22.1	.8	7.1	14.1
16	7.5	6.5	6.8	6.4	6.4	0	7.5	0	13.5	.1	5.9	8.3
17	7.4	6.4	6.8	6.8	6.4	.4	7.5	0	.8	1.8	5.9	11.3
18	7.2	6.4	6.8	6.5	6.1	.6	7.5	0	.2	6.9	6.1	13.5
19	6.8	6.8	6.8	6.2	6.4	0	7.5	0	0	7.1	5.9	10.9
20	6.8	6.8	6.8	6.0	6.4	2.0	6.9	0	0	2.5	6.6	14.2
21	6.8	6.4	6.7	6.0	6.8	5.8	6.4	0	0	.8	7.1	12.0
22	6.8	6.8	6.8	6.3	7.3	5.7	6.4	1.1	0	.2	4.9	9.5
23	6.8	6.8	6.6	6.4	7.1	6.0	6.8	6.9	0	0	4.8	6.2
24	6.8	6.8	6.5	6.8	9.2	6.2	7.2	6.4	.2	0	7.5	6.9
25	6.8	18.1	6.6	6.8	13.7	6.0	7.5	6.8	0	0	6.3	7.8
26	7.1	43.9	6.4	6.5	7.1	6.0	7.5	6.8	.3	0	4.5	7.5
27	7.1	43.9	6.8	6.4	1.8	6.0	7.4	6.4	.2	0	5.0	7.5
28	7.1	43.9	6.4	6.5	.9	6.2	6.9	6.4	0	0	4.4	7.5
29	7.1		4.9	6.4	1.4	6.3	7.1	6.6	0	0	.8	6.1
30	7.1		1.3	6.5	1.4	6.8	7.1	7.2	0	0	.2	6.0
31	7.0		1.4		.4		6.8	5.1		0		7.5
Sum	224.9	264.5	213.4	143.8	184.7	97.4	215.6	92.3	46.7	27.3	117.9	356.5
Current Year 1983										Period 1979-1983		
Month	Extreme Gage Feet		Extreme Second-Foot				Average Second-Foot	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.			5	9.0	1 6	6.0	7.3	446	644	2,761	0	
Feb.			126	45.0	1 9	.4	9.4	525	560	2,257	0	
Mar.			1 1	43.9	1 7	0	6.9	423	512	2,132	0	
Apr.			1 2	7.1	1 11	0	4.8	285	654	2,681	0	
May			122	15.2	31	0	6.0	366	1,255	2,750	11.3	
June			3	18.3	1 1	0	3.2	193	1,185	2,800	21.4	
July			1	8.3	31	3.0	7.0	428	1,198	3,020	42.8	
Aug.			30	18.3	1 2	0	3.0	183	807	2,073	0	
Sept.			15	29.5	1 2	0	1.6	92.6	924	2,326	0	
Oct.			18	9.0	1 1	0	.9	54.1	880	2,711	0	
Nov.			26	8.3	1 1	0	3.9	234	255	1,011	0	
Dec.			110	31.7	1 1	0	11.5	707	816	2,962	0	
Yearly				45.0		0	5.4	3,937	9,690	23,566	163	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
				1.27		0	0.15	4,856	11,953	29,068	201	

1 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: February 23, 1971 through 1983; 242 Lateral from November 1978 through 1983.

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 1983 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	105	95.5	151	130	133	100	153	126	132	159	147	156
2	95.4	117	125	110	122	105	140	119	125	151	165	146
3	99.1	102	118	135	110	95.9	140	123	137	155	180	163
4	98.5	102	97.3	123	118	98.8	144	122	142	172	186	182
5	114	101	110	116	115	111	126	148	143	183	178	185
6	114	101	132	108	123	110	122	131	134	192	205	157
7	128	120	124	110	124	94.3	117	120	134	163	214	158
8	102	85.4	104	94.0	137	97.0	120	110	144	162	165	165
9	95.9	102	105	116	151	100	122	140	142	164	137	170
10	112	86.3	108	123	103	112	122	137	149	172	138	164
11	105	84.3	116	110	108	93.8	122	122	146	153	172	188
12	97.6	105	121	114	102	99.4	117	135	155	166	172	173
13	105	103	110	120	102	92.3	128	130	146	159	162	168
14	88.7	101	103	117	115	108	136	120	167	159	172	175
15	109	112	106	117	119	110	139	137	169	173	185	172
16												
17	98.2	112	113	120	126	103	139	128	176	182	164	163
18	104	113	125	134	119	119	133	143	148	166	164	160
19	98.2	125	126	140	113	131	126	131	157	174	168	190
20	110	132	114	122	119	129	130	134	162	168	166	181
21	108	116	129	110	116	121	128	142	153	169	168	156
22	109	121	139	103	121	117	133	135	151	173	162	151
23	107	98.7	117	102	162	114	132	129	165	174	141	146
24	127	90.5	124	123	116	119	140	126	161	167	149	155
25	105	88.1	124	141	115	117	141	126	162	176	153	167
26	108	112	130	135	110	121	125	125	130	164	171	174
27	123	146	139	124	108	126	128	134	121	154	149	169
28	128	147	132	131	105	134	123	136	131	170	153	166
29	140	150	132	124	99.3	124	135	131	138	171	154	149
30	119		120	120	102	126	151	131	159	170	169	150
31	133		98.0	127	107	121	142	140	173	156	153	141
31	116		113		96.2		168	104		166		150
Sum	3,402.6	3,053.9	3,705.3	3,599.0	3,616.5	3,349.5	4,122	4,015	4,452	5,183	4,962	5,090

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period 1935-1983 Acre-Feet		
	High	Low	Day	High		Day			Average	Maximum	Minimum
				Day	Day						
Jan.			28	140	14	88.7	110	6,749	9,592	12,131	* 2,123
Feb.			28	150	11	84.3	109	6,058	9,294	12,970	* 2,023
Mar.			1	151	4	97.3	119	7,343	10,548	13,704	* 2,322
Apr.			24	141	8	94.0	120	7,140	10,394	12,982	2,117
May			22	162	31	96.2	117	7,178	11,233	13,900	2,473
June			27	134	13	92.3	112	6,649	10,391	12,570	2,525
July			31	168	7	117	133	8,178	10,427	12,420	2,927
Aug.			5	148	31	104	130	7,966	10,037	12,657	2,989
Sept.			16	176	26	121	148	8,832	10,140	12,450	2,602
Oct.			6	192	2	151	167	10,280	11,024	13,898	3,444
Nov.			7	214	9	137	165	9,839	10,065	12,712	3,407
Dec.			18	190	30	141	164	10,098	10,267	12,050	2,888
Yearly				214		84.3	133	96,310	123,412	149,010	31,840
	Meters		Cubic Meters per Second				Thousands of Cubic Meters				
			6.06		2.39	3.77		118,796	152,227	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. This gage was destroyed on January 19, 1983. Temporary gages were installed on the United States side and levels were established to ensure continuous record.

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 1983; continuous record of gage heights, January 1947 through 1983. 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, 33,100 second-feet (937 m³/sec) on August 19, 1983; 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 1983 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	43.7	10,400	15.0	0	7,110	9,100	21,100	25,900	24,700	29,700	23,800	22,100
2	1,650	10,400	13.0	0	7,060	9,580	20,700	24,400	24,200	29,800	24,200	21,700
3	3,110	11,700	74.6	0	6,630	9,950	21,100	24,000	24,900	29,900	24,100	21,000
4	3,560	13,200	561	0	7,200	11,200	23,400	23,400	24,500	28,900	24,000	20,800
5	3,990	13,200	564	0	6,890	12,200	24,600	22,700	24,100	29,100	24,300	21,300
6	4,600	12,300	278	11.1	7,080	12,500	24,000	23,100	23,800	29,100	24,700	22,400
7	5,320	10,400	105	678	7,550	12,600	23,600	24,200	23,200	29,400	24,400	21,800
8	6,040	6,680	40.0	1,300	6,170	12,400	23,400	25,100	23,500	29,800	23,600	21,200
9	6,170	4,410	17.5	1,460	5,650	12,400	23,500	25,600	24,700	30,600	23,100	21,100
10	6,310	2,240	10.5	2,520	5,810	12,800	23,900	27,000	25,400	30,600	22,600	20,900
11	6,110	1,220	7.0	3,120	6,500	13,500	23,400	28,700	25,500	29,700	21,500	20,800
12	5,960	785	4.0	2,650	6,810	13,700	23,400	30,300	25,800	29,100	20,800	20,700
13	6,020	903	3.0	2,870	6,570	14,100	24,000	31,300	25,400	28,600	21,200	20,500
14	6,240	352	1.5	3,230	6,970	14,300	24,500	30,800	25,600	28,400	21,700	20,200
15	6,520	446	.1	3,900	7,490	14,300	24,100	29,000	25,100	28,600	21,500	20,000
16	6,640	530	0	4,090	7,440	14,100	24,700	27,800	25,500	28,900	21,400	19,900
17	6,910	401	0	4,160	6,710	14,200	24,700	29,800	26,000	29,600	21,200	20,500
18	6,860	362	0	4,360	7,160	14,200	25,100	32,100	26,500	29,500	21,200	20,700
19	6,790	132	0	4,130	7,290	14,100	24,700	32,900	27,300	29,400	21,100	20,700
20	7,010	78.0	0	4,230	7,190	14,400	24,000	33,000	27,400	29,100	21,900	19,900
21	6,940	66.0	0	4,470	7,460	14,500	23,500	32,600	28,500	28,600	22,500	19,900
22	6,930	58.0	0	4,920	8,100	13,900	24,200	31,400	28,800	27,500	21,400	19,700
23	7,040	49.0	0	5,710	8,640	13,200	24,200	27,900	28,200	27,300	21,200	19,700
24	7,160	42.0	0	6,320	8,450	13,700	25,400	27,400	29,000	27,300	21,400	19,900
25	6,940	30.0	0	6,470	8,790	11,800	25,600	26,100	30,600	26,300	22,100	20,700
26	6,960	23.0	0	6,090	8,760	13,200	24,300	26,300	30,800	25,900	22,100	21,700
27	7,390	19.0	0	5,960	8,730	18,600	24,400	26,500	31,300	25,900	22,100	22,300
28	7,830	17.0	0	5,770	10,600	20,700	24,700	27,300	30,400	25,500	21,800	22,100
29	8,050	0	0	6,500	11,600	20,700	25,200	28,000	29,500	25,400	21,500	21,900
30	9,930	0	0	6,810	11,400	21,300	25,300	28,000	29,200	24,700	21,900	21,100
31	10,600	0	0	9,970	0	0	26,000	27,100	0	24,200	0	20,800
Sum	191,623.7	100,443.0	1,694.2	101,729.1	239,780	417,230	744,700	859,700	799,800	876,700	670,300	648,000
Current Year 1983										Period 1935-1983		
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.	81.22	74.85	31	10,600	1	0	6,180	380,080	329,460	1,672,000	0	
Feb.	81.97	74.92	4	13,400	28	16.0	3,590	199,226	268,343	1,385,000	0	
Mar.	76.90	74.10	4	717	115	0	54.7	3,360	1,127,914	1,127,000	798	
Apr.	80.72	74.10	30	6,970	1	1	3,390	201,777	146,445	700,900	0	
May	81.56	80.18	30	12,100	9	5,430	7,730	475,597	205,662	1,160,000	0	
June	82.90	80.31	30	21,400	1	8,930	13,900	827,564	168,498	1,180,000	0	
July	82.87	82.21	31	26,100	2	20,500	24,000	1,477,091	141,974	1,477,091	0	
Aug.	83.30	81.80	119	33,100	1	22,600	27,700	1,705,190	160,576	1,705,190	0	
Sept.	82.67	81.87	27	32,000	7	23,100	26,700	1,586,380	183,456	1,586,380	0	
Oct.	82.35	81.88	10	31,200	31	24,200	28,300	1,738,909	227,957	1,738,909	0	
Nov.	81.97	80.60	7	24,900	112	20,600	22,300	1,329,521	274,224	1,428,000	0	
Dec.	81.22	80.88	6	22,600	23	19,600	20,900	1,285,289	332,176	1,839,000	0	
Yearly	83.30	74.10		33,100		0	15,500	11,209,984	2,656,685	11,209,984	9,570	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	25.39	22.59		937		0	439	13,827,291	3,276,994	13,827,291	11,804	

‡ Estimated

* Partly estimated

! And other days

COLORADO RIVER AT SOUTHERLY INTERNATIONAL BOUNDARY - STAGES

(See Preceding Page For Description)

Mean Daily Gage Height in Feet 1983

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	74.97	81.15	74.91	74.10	80.74	80.60	82.80	82.49	82.17	82.28	81.86	80.76
2	77.25	81.13	74.89	74.10	80.73	80.73	82.68	82.12	82.14	82.28	81.91	80.69
3	78.46	81.51	75.33	74.10	80.59	80.82	82.72	82.04	82.19	82.26	81.91	80.56
4	78.82	81.91	76.67	74.10	80.80	81.12	82.68	81.94	82.14	82.11	81.88	80.53
5	79.16	81.90	76.65	74.10	80.73	81.31	82.57	81.82	82.07	82.12	81.92	80.63
6	79.65	81.62	75.99	74.25	80.81	81.34	82.44	81.90	82.01	82.11	81.96	80.83
7	80.23	81.03	75.39	76.68	80.95	81.30	82.35	82.08	81.90	82.15	81.84	80.78
8	80.72	79.97	75.01	77.52	80.48	81.20	82.31	82.23	81.93	82.20	81.66	80.72
9	80.78	79.36	74.80	77.69	80.28	81.12	82.32	82.31	82.10	82.29	81.57	80.70
10	80.71	78.43	74.70	78.57	80.33	81.17	82.38	82.51	82.19	82.27	81.49	80.68
11	80.43	77.63	74.65	79.04	80.66	81.35	82.29	82.75	82.19	82.15	81.27	80.68
12	80.28	77.13	74.57	78.70	80.85	81.41	82.28	82.96	82.22	82.07	81.14	80.68
13	80.33	77.28	74.49	78.86	80.81	81.52	82.37	83.09	82.14	81.99	81.22	80.67
14	80.52	76.47	74.33	79.10	80.88	81.57	82.44	83.03	82.15	81.95	81.31	80.65
15	80.68	76.49	74.11	79.55	81.00	81.56	82.38	82.79	82.04	81.98	81.29	80.68
16	80.66	76.63	74.10	79.66	80.93	81.52	82.48	82.63	82.09	82.02	81.25	80.64
17	80.76	76.42	74.10	79.70	80.66	81.53	82.48	82.90	82.13	82.10	81.18	80.78
18	80.53	76.34	74.10	79.82	80.76	81.53	82.52	83.19	82.17	82.09	81.05	80.83
19	80.42	75.68	74.10	79.68	80.80	81.52	82.45	83.28	82.26	82.11	80.97	80.85
20	80.48	75.40	74.10	79.74	80.76	81.58	82.32	83.29	82.25	82.11	81.09	80.70
21	80.40	75.32	74.10	79.87	80.83	81.61	82.23	83.25	82.39	82.08	81.15	80.70
22	80.39	75.26	74.10	80.09	81.02	81.42	82.35	83.10	82.40	81.99	80.94	80.67
23	80.41	75.19	74.10	80.40	81.17	81.20	82.35	82.64	82.30	82.00	80.89	80.66
24	80.47	75.13	74.10	80.58	81.10	81.28	82.54	82.57	82.36	82.04	80.92	80.73
25	80.21	75.05	74.10	80.58	81.13	80.73	82.56	82.38	82.56	81.99	81.04	80.89
26	80.22	74.98	74.10	80.42	81.05	81.07	82.34	82.41	82.55	81.93	80.99	81.10
27	80.50	74.94	74.10	80.37	80.97	82.35	82.36	82.44	82.58	81.98	80.88	81.21
28	80.71	74.93	74.10	80.30	81.39	82.77	82.40	82.56	82.46	81.96	80.71	81.18
29	80.80		74.10	80.57	81.53	82.77	82.47	82.65	82.31	81.98	80.63	81.14
30	81.06		74.10	80.65	81.37	82.87	82.49	82.66	82.24	81.92	80.71	81.00
31	81.21		74.10		80.86		82.59	82.53		81.88		80.94
Avg.	80.07	77.54	74.58	78.43	80.87	81.46	82.45	82.60	82.22	82.08	81.29	80.78

* Estimated - interpolated from staff gage observations

* Partly 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 1983.

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. Due to high flows in the Colorado River, the Wellton-Mohawk Conveyance Channel was inundated. Flows from approximately June 26 to September 30, 1983 represent Colorado River intrusion; and from approximately October 1, 1983 to December 31, 1983, flows represent Gila River intrusion.

Mean Daily Discharge in Second-Foot 1983 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	220	171	194	193	196	205	319 #	262 #	208 #	296 #	283 #	132 #
2	222	169	196	194	195 u	202	314 #	255 #	208 #	298 #	287 #	121 #
3	224	154	200	196	192 u	206	354 #	252 #	321 #	289 #	310 #	113 #
4	225	178	194	196	193 u	218	328 #	251 #	338 #	265 #	310 #	110 #
5	230	176	189	194	194 u	218	271 #	244 #	336 #	262 #	316 #	107 #
6	223	176	187	200	195 u	216	266 #	248 #	334 #	262 #	319 #	104 #
7	199	180	189	198	195 u	216	338 #	259 #	331 #	265 #	314 #	102 #
8	176	181	185	194	197 u	221	323 #	266 #	328 #	277 #	306 #	99.6
9	196	181	189	189	198 u	223	314 #	267 #	329 #	286 #	304 #	92.8
10	189	191	194	189	200	220	315 #	276 #	330 #	291 #	300 #	91.2
11	192	193	193	189	200	220	325 #	282 #	329 #	285 #	287 #	94.0
12	205	193	198	190	202	220	324 #	293 #	331 #	279 #	277 #	92.6
13	200	196	200	189	205	218	314 #	300 #	324 #	285 #	254 #	86.4
14	193	198	198	191	214	218	307 #	304 #	323 #	362 #	237 #	211 #
15	191	194	194	191	212	218	299 #	298 #	321 #	364 #	202 #	220 #
16	191	196	196	193	214	218	289 #	282 #	321 #	364 #	190 #	228 #
17	191	198	194	194	216	218	290 #	286 #	316 #	364 #	170 #	234 #
18	191	202	193	194	218	218	296 #	309 #	322 #	364 #	156 #	212 #
19	191	208	198	193	222	220	288 #	327 #	327 #	364 #	154 #	223 #
20	191	202	189	194	219	220	275 #	352 #	327 #	358 #	165 #	208 #
21	189	172	191	196	218	222	262 #	355 #	332 #	345 #	169 #	200 #
22	189	171	176	198	220	222	264 #	325 #	338 #	334 #	151 #	193 #
23	189	181	189	194	212	222	260 #	289 #	339 #	329 #	139 #	208 #
24	185	193	191	194	214	222	269 #	262 #	340 #	313 #	142 #	222 #
25	186	198	196	193	216	209	277 #	246 #	348 #	332 #	152 #	246 #
26	172	198	194	153	211	325 **	270 #	236 #	331 #	301 #	149 #	261 #
27	180	193	194	122	193	406 **	268 #	226 #	330 #	300 #	153 #	253 #
28	187	196	194	152	210	386 **	270 #	226 #	337 #	290 #	176 #	272 #
29	181		187	194	209	369 **	268 #	226 #	329 #	319 #	163 #	252 #
30	172		187	191	208	337 **	264 #	222 #	293 #	313 #	156 #	248 #
31	171		191	208	208		267 #	214 #		290 #		248 #
Sum	6,041	5,239	5,960	5,648	6,396	7,253	9,088	8,440	9,621	9,646	6,691	5,484.6
Current Year 1983							Period 1977-1983					
Month	Extreme Gage Feet		Extreme Second-Foot				Average Second-Foot	Total Acre-Foot	Acre-Foot			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	1.93	1.45	5	230	8	140	195	11,982	13,550	17,542	9,241	
Feb.	1.81	1.39	19	208	3	132	187	10,391	12,577	14,896	10,391	
Mar.	1.80	1.57	13	204	22	160	192	11,821	14,480	17,427	11,821	
Apr.	1.83	1.30	16	204	26	112	188	11,203	14,133	16,711	11,203	
May	1.90	1.70	19	222	27	185	206	12,686	14,822	16,808	12,686	
June	2.80	1.51	127	415	26	151	242	14,386	13,897	16,086	11,425	
July	2.64	1.93	3	378	6	228	293	18,026	14,607	18,026	11,296	
Aug.	2.59	1.87	21	362	31	212	272	16,740	15,112	18,196	11,566	
Sept.	2.57	1.78	29	362	2	198	321	19,083	13,727	19,083	6,780	
Oct.	2.56	2.06	18	367	4	260	311	19,133	14,249	19,133	6,343	
Nov.	2.34	1.36	16	319	23	135	223	13,271	13,033	16,980	6,047	
Dec.	2.14	1.00	28	277	13	81.8	177	10,879	13,033	18,256	6,216	
Yearly	2.80	1.00		415		81.8	234	169,601	167,220	180,374	148,426	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	0.85	0.30		11.75		2.32	6.63	209,199	206,263	222,488	183,081	

u Estimated ** Days 26 through 30 represent Colorado River water. † And other days
 # Flow is from flooding of Wellton-Mohawk Channel by Colorado River upstream of Yuma, Arizona.
 # Flow is from the Gila River that is entering the Wellton-Mohawk Channel upstream of Yuma, Arizona.

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 1983.

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-Foot

Month	Current Year 1983	Period 1956-1983		
		Average	Maximum	Minimum
January	13,507	7,819	69,527	0
February	23,550	3,125	23,550	0
March	4,050	5,603	35,492	0
April	5,764	10,989	68,714	0
May	12,781	8,982	58,365	0
June	13,090	9,480	50,025	0
July	6,358	11,471	46,139	0
August	107,162	16,508	107,162	0
September	67,900	12,607	68,053	0
October	105,033	11,253	110,417	0
November	99,044	9,943	99,044	0
December	44,177	8,763	70,213	0
Yearly	502,418	113,076	509,407	0
	Thousands of Cubic Meters			
	619,726	139,478	628,347	0

COLORADO RIVER AT MIGUEL C. RODRIGUEZ IN MEXICO - STAGES

(See Preceding Page For Description)

Mean Daily Gage Height in Feet 1983

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	44.62	54.46	45.34	43.90	52.03	54.30	57.15	56.76	#			
2	48.82	53.05	45.34	43.90	51.94	54.33	57.41	56.63				
3	48.85	55.18	45.31	43.86	51.84	54.46	57.64	56.56				
4	49.05	55.68	45.51	43.86	51.80	54.59	57.94	56.43				
5	49.38	55.94	46.46	43.86	51.77	54.63	58.14	56.40				
6	49.61	55.25	47.21	43.86	51.74	54.69	58.04	56.36				
7	49.61	54.69	46.42	43.86	51.67	54.72	57.71	56.30				
8	51.02	54.13	45.96	44.49	51.64	54.76	57.61	56.27				
9	51.51	53.54	45.57	45.44	51.74	54.76	57.32	56.30				
10	52.33	52.43	45.51	46.36	51.84	54.79	57.41	56.36				
11	52.53	51.64	45.18	48.26	51.90	54.82	57.55	56.53				
12	52.56	50.95	45.11	47.70	52.10	54.89	57.55	56.79				
13	52.59	50.26	44.98	47.44	52.26	54.95	57.55	57.02				
14	52.62	49.48	44.88	47.51	52.43	54.95	57.55	57.12				
15	52.59	48.98	44.82	47.57	52.62	54.95	57.45	57.19				
16	52.59	48.00	44.55	47.90	52.82	54.95	57.38	57.35				
17	52.62	47.15	44.39	49.77	52.95	54.99	57.19	57.45				
18	52.69	46.65	44.36	51.02	53.08	55.02	57.12	57.64				
19	52.72	46.00	44.32	52.00	53.05	55.02	56.96	57.84				
20	52.76	46.23	44.19	51.80	53.05	55.05	56.89	58.01				
21	52.79	45.90	44.09	51.54	53.02	55.02	56.92	57.81				
22	52.82	44.82	44.03	51.48	52.92	54.89	56.99	57.58				
23	52.72	44.39	44.03	51.38	52.82	54.76	57.02	57.41				
24	52.66	44.49	44.00	51.35	52.99	54.69	57.09	57.25				
25	53.02	44.75	43.96	51.35	53.25	54.66	57.12	57.05				
26	53.08	44.91	43.96	51.25	53.51	54.43	57.02	56.79				
27	53.08	45.11	43.96	51.21	53.64	54.30	56.96	56.36				
28	53.22	45.41	43.96	51.25	53.74	55.18	56.96	55.61				
29	53.48		44.03	51.41	53.77	57.25	56.89	54.89				
30	53.87		44.00	51.51	53.87	57.64	56.86	54.79				
31	54.23		43.90		54.07		56.82					
Avg.	51.80	49.64	44.82	48.26	52.66	54.95	57.28	56.70				

Discontinued use of reorder gage due to high flows and erosion of river banks.

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 1983.

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 m³/sec) which discharges to the river.

Monthly Discharge in Acre-Feet

Month	Current Year 1983	Period 1964-1983		
		Average	Maximum	Minimum
January	1,655	1,082	8,546	0
February	3,923	725	7,653	0
March	143	353	4,809	0
April	105	109	1,992	0
May	520	222	1,973	0
June	631	214	2,411	0
July	0	152	1,768	0
August	14,402	923	14,402	0
September	10,007	972	10,007	0
October	20,972	2,269	23,242	0
November	20,481	1,906	20,481	0
December	10,847	1,535	10,847	0
Yearly	83,688	10,863	83,688	0
	Thousands of Cubic Meters			
	103,228	13,399	103,228	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 December 1949; continuous record of gage heights since installation of water-stage recorder February 8, 1956. Mean daily gage heights, January 1960 through August 31, 1983. Recorder taken out of operation due to high water and eroding banks.

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. At the beginning of the year, the release of surplus flow at Morelos Dam noticeably increased the height of the river above the normal river bed.

EXTREMES: January 1960 through 1968: Maximum daily discharge, 4,380 second-feet (124 m³/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 m³) January 1960; minimum monthly discharge, zero during various months of several years. Annual maximum discharge, 503,260 acre-feet (620,765,000 m³) during 1960; minimum 59,335 acre-feet (73,189,000 m³) in 1968. January 1960 through 1983: Maximum gage height, 22.44 feet (6.84 m) July 24 to 28, 1983. Minimum gage height, 12.47 feet (3.80 m) on August 31 and September 1, 1960.

Mean Daily Gage Height in Feet 1983

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	14.44	18.50	15.72	14.57	18.67	20.18	21.52	22.34				
2	14.47	18.64	15.72	14.53	18.70	20.21	21.52	22.34				
3	14.47	18.86	15.68	14.50	18.73	20.21	21.56	22.34				
4	14.50	19.06	15.68	14.50	18.77	20.14	21.59	22.34				
5	14.50	19.13	15.65	14.50	18.83	20.08	21.59	22.31				
6	14.57	19.13	15.62	14.47	18.77	20.01	21.59	22.28				
7	14.57	19.09	15.62	14.47	18.73	19.98	21.62	22.21				
8	14.63	19.03	15.58	14.47	18.77	19.91	21.65	22.15				
9	14.70	18.80	15.55	14.50	18.80	19.85	21.65	21.98				
10	14.70	18.44	15.55	14.57	18.93	19.78	21.72	21.95				
11	14.80	17.98	15.49	14.70	19.06	19.69	21.78	21.85				
12	14.90	17.65	15.49	14.80	19.16	19.62	21.82	21.72				
13	15.03	17.16	15.42	14.96	19.23	19.62	21.88	21.56				
14	15.29	16.57	15.35	15.09	19.42	19.55	21.95	21.33				
15	15.52	16.14	15.35	15.35	19.55	19.46	21.98	21.13				
16	15.78	16.01	15.29	15.62	19.62	19.36	22.05	20.87				
17	16.01	15.94	15.22	15.81	19.82	19.29	22.11	20.67				
18	16.14	15.94	15.22	16.01	19.88	19.26	22.18	20.41				
19	16.40	15.91	15.16	16.34	20.01	19.23	22.18	20.14				
20	16.73	15.88	15.09	16.63	20.08	19.23	22.28	19.95				
21	16.99	15.88	15.06	16.99	20.21	19.23	22.31	19.69				
22	17.22	15.88	15.03	17.29	20.28	19.29	22.34	19.59				
23	17.52	15.88	14.96	17.59	20.41	19.88	22.38	19.52				
24	17.72	15.85	14.93	17.98	20.44	20.18	22.44	19.39				
25	17.78	15.81	14.90	18.11	20.47	20.41	22.44	19.42				
26	17.98	15.75	14.83	18.31	20.47	20.64	22.44	19.36				
27	18.08	15.75	14.76	18.44	20.51	20.87	22.44	19.32				
28	18.21	15.72	14.70	18.57	20.54	21.19	22.44	19.29				
29	18.34		14.70	18.64	20.54	21.33	22.41	19.26				
30	18.44		14.63	18.67	20.54	21.52	22.38	19.23				
31	18.50		14.57		20.57		22.34	19.16				
Avg.	16.09	17.16	15.24	16.03	19.63	19.97	22.02	20.81				

Recorder removed - no records available after August 31, 1983

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

	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)	
	1983	Average 1935-1983	1983	Average 1951-1983	1983	Average 1939-1983	1983	Estimated Average
	Jan.	23,921	17,664	1,707	1,656	536.2	553.4	26,164.2
Feb.	24,435	17,475	1,647	1,673	557.5	555.9	26,639.5	19,703.9
Mar.	24,638	17,215	1,716	1,672	572.0	570.9	26,926.0	19,457.9
Apr.	24,588	17,289	1,644	1,672	576.2	601.3	26,808.2	19,562.3
May	24,751	18,080	1,634	1,733	613.6	604.0	26,998.6	20,417.0
June	25,981	19,242	1,784	1,628	544.1	603.2	28,309.1	21,473.2
July	26,802	19,424	1,756	1,499	574.3	591.1	29,132.3	21,514.1
Aug.	26,281	19,220	1,756	1,448	535.0	574.1	28,572.0	21,242.1
Sept.	25,658	18,971	1,600	1,425	545.8	569.9	27,803.8	20,965.9
Oct.	25,210	18,747	1,451	1,439	543.8	570.5	27,204.8	20,756.5
Nov.	24,911	18,570	1,516	1,516	535.5	560.2	26,962.5	20,646.2
Dec.	24,751	18,373	1,659	1,607	531.7	555.3	26,941.7	20,535.3
Avg.	25,161	18,356	1,656	1,581	555.5	575.8	27,372.5	20,512.3
Max.	26,802	! 27,780	1,784	! 1,808	613.6	! 688.7	29,132.3	! 29,132.3
Min.	23,921	■ 10,727	1,451	!! 1,186	531.7	!! 76.9	26,164.2	!! 13,062.6

! Maximum end of month storage for period of record
!! Minimum end of month storage for period of record

* Minimum end of month storage 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-43 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 weight 85 pounds.

Month	1983						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 1956-1983

Jan.	873,461,900	120,100	4	0.0137	0.0180	0.0072	65.0	25.3	336	1.4
Feb.	427,188,100	19,100	4	.0045	.0085	.0009	10.3	13.1	116	1.6
Mar.	314,327,200	14,500	5	.0046	.0097	.0013	7.9	38.9	499	6.3
Apr.	716,716,200	80,600	4	.0112	.0181	.0045	43.6	36.3	434	7.3
May	911,496,200	43,300	4	.0047	.0064	.0035	23.4	14.2	201	2.2
June	1,379,575,300	407,800	5	.0295	.0508	.0065	221	22.1	221	2.5
July	2,538,387,800	954,800	4	.0376	.0475	.0182	517	37.2	517	2.5
Aug.	2,738,666,300	667,300	5	.0243	.0363	.0146	361	31.4	361	3.8
Sept.	2,518,709,400	341,500	4	.0135	.0157	.0103	185	15.0	185	1.6
Oct.	2,663,729,700	362,900	4	.0136	.0168	.0120	196	11.8	196	.5
Nov.	2,082,301,900	349,500	5	.0168	.0204	.0127	189	16.1	189	.5
Dec.	1,985,262,500	499,700	4	.0251	.0284	.0210	271	26.9	271	.6
Yearly	19,149,822,500	3,861,100	52	0.0201	0.0508	0.0009	2,090	228.3	2,198	37.1

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

Intake Canal at Morelos Diversion Structure

Period 1952-1983

Jan.	281,976	31,180	4	0.0111	0.0179	0.0050	16.9	6.3	22.3	0.2
Feb.	166,698	37,261	4	.0224	.0726	.0034	20.1	7.1	45.2	.9
Mar.	308,433	52,300	6	.0170	.0956	.0018	28.2	39.3	154	5.3
Apr.	399,340	46,726	4	.0117	.0165	.0053	25.2	35.1	121	7.5
May	226,432	11,115	4	.0049	.0068	.0035	6.0	9.9	51.2	1.5
June	270,176	42,144	5	.0156	.0386	.0031	22.8	25.2	109	2.3
July	484,103	122,050	4	.0252	.0389	.0112	65.9	36.8	156	3.9
Aug.	436,674	103,983	5	.0238	.0316	.0111	56.2	34.2	135	3.8
Sept.	371,435	53,229	4	.0143	.0171	.0115	28.8	14.8	64.7	1.9
Oct.	301,310	33,435	4	.0111	.0135	.0076	18.1	4.9	26.7	.3
Nov.	284,824	38,384	5	.0135	.0180	.0100	20.8	3.2	20.8	.2
Dec.	273,262	43,880	4	.0161	.0221	.0105	23.7	6.4	23.7	1.1
Yearly	3,804,663	615,687	53	0.0162	0.0956	0.0018	332.6	223	696	51.4

Samples and analyses by Mexican Section, Method B

Colorado River at Southerly International Boundary

Period 1946-1983

Jan.	516,528,700	340,300	3	0.0658	0.0818	0.0607	184			
Feb.	270,748,100	229,200	1	.0845	.0845	.0845	124			
Mar.	4,566,200	3,900	0	.0845	.0845	0	2.1			
Apr.	274,214,900	147,200	1	.0536	.0575	0	79.7			
May	646,336,300	524,600	1	.0810	.1878	.0455	284			
June	1,124,659,500	2,313,800	1	.2054	.2266	.1873	1,253			
July	2,007,366,700	3,287,700	0	.1635	.1859	.1422	1,780			
Aug.	2,317,353,200	2,764,800	1	.1191	.1497	.1028	1,497			
Sept.	2,155,890,400	2,071,900	1	.0959	.1050	.0882	1,122			
Oct.	2,363,177,300	3,076,400	1	.1300	.1514	.1067	1,666			
Nov.	1,806,819,000	3,081,500	0	.1703	.1887	.1527	1,668			
Dec.	1,746,707,800	3,069,900	1	.1755	.1961	.1482	1,662			
Yearly	15,234,368,100	20,911,200	11	0.1370	0.2266	0	11,322			

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

SUSPENDED SILT

Month	1983						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 Miguel C. Rodriguez Gaging Station

Period 1960-1983

Jan.	498,489	119,758	4	0.0240	0.0429	0.0112	64.7	18.1	251	0
Feb.	350,276	37,300	4	.0105	.0153	.0020	20.2	4.2	34.5	0
Mar.	6,236	379	1	.0508	.0104	.0026	.2	4.9	100	0
Apr.	217,976	83,723	3	.0384	.0732	.0071	45.2	9.6	172	0
May	672,963	140,688	5	.0209	.0235	.0103	76.0	9.2	132	0
June	1,127,161	266,125	4	.0236	.0351	.0194	143	11.7	143	0
July	2,046,606	930,873	4	.0456	.0557	.0366	503	25.1	503	0
Aug.	1,113,828	570,295	3	.0591	.0684	.0435	308	19.6	308	0
Sept.	*									
Oct.										
Nov.										
Dec.										
Yearly										

Samples and analyses by Mexican Section, Method C

* Cableway dismantled on August 15, 1983

CHEMICAL ANALYSES OF WATER SAMPLES

1983

The table below is based on chemical analyses of a monthly sample from the Colorado River at the Northerly International Boundary taken by the United States Section of the Commission and analyzed by the U. S. Bureau of Reclamation.

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; (CO₃ plus HCO₃) expressed as CO₃, 30.00; SO₄, 48.03; Cl, 35.45; NO₃, 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 10⁶ at 25° C, is a relative measure of the total salt concentration.

Month	No. of Samples	Dissolved Solids		ECx10 ⁶ @25°C	Boron p. p. m.	pH	% Na **	% Cl ***	Mean Milligram Equivalents per Liter						
		Tons Per Acre-Foot	Total Tons						Ca	Mg	Na	CO ₃ + HCO ₃	SO ₄	Cl	NO ₃

Colorado River at Northerly International Boundary

Jan.	1	1.14	733,000	1,280		7.8	46		4.29	2.80	6.09		7.29	3.67
Feb.	1	1.20	377,000	1,350		7.9	45	27	4.79	2.80	6.31	3.00	7.50	3.89
Mar.	1	1.28	296,000	1,430		8.0	47	30	5.09	2.96	7.00	3.11	7.39	4.43
Apr.	1	.98	517,000	1,160		8.2	46	36	4.14	2.30	5.44	2.95	4.54	4.17
May	1	1.00	671,000	1,180		8.0	44	31	4.09	2.38	5.13	2.95	5.45	3.72
June	1	1.02	1,035,000	1,170		7.3	44	29	4.29	2.38	5.26	2.92	5.70	3.50
July	1	1.03	1,924,000	1,190		7.7	41	24	4.54	2.63	4.96	2.92	6.39	2.88
Aug.	1	1.00	2,015,000	1,180		7.6	42	24	4.19	2.63	5.00	2.75	6.10	2.76
Sept.	1	.95	1,761,000	1,170		7.6	44	24	3.99	2.38	4.96	2.47	6.04	2.76
Oct.	1	.97	1,901,000	1,150		7.8	42	23	4.29	2.55	4.87	2.79	6.04	2.68
Nov.	1	.95	1,456,000	1,140		8.3	41	26	4.09	2.47	4.65	2.51	5.70	2.96
Dec.	1	.97	1,417,000	1,190		7.5	42	28	4.34	2.38	4.96	2.95	5.45	3.33
Mean	Ø12	1.00	Ø14,103,000	1,180		7.7	44	27	4.26	2.52	5.08	2.78	6.00	3.09
Period Avg.		1.47	3,049,486	1,767		7.9			5.51	3.30	9.02	3.26	7.80	6.79
Tons of Constituents				1983					1,636,000	588,000	2,238,000	3,249,000	5,521,000	2,098,000
Avg. Tons				Period 1962-1983					322,000	116,000	566,000	394,000	1,082,000	635,000

** Percent of total cations

*** Percent of total anions

Ø Weighted mean

Ø Total

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1983

The following tables show electrical conductivity, expressed in mhos per centimeter $\times 10^6$ at 25° C, of individual water samples taken at Colorado River stations and in Mexican canals. Samples were taken at the northern international boundary by both Sections of the Commission and at the southerly international boundary by the United States Section. Conductivity determinations for the northerly international boundary were made by the Bureau of Reclamation; and for the southerly international boundary, by the United States Section of the Commission. 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 |
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Colorado River at Northerly International Boundary

January	February	April	May	July	August	October	November
1 * 1,500	15 1,610	1 1,240	16 1,210	1 1,230	16 1,190	1 * 1,170	16 1,170
2 * 1,390	16 1,640	2 1,230	17 1,210	2 1,210	17 1,160	2 * 1,170	17 1,180
3 1,280	17 1,560	3 * 1,230	18 1,200	3 * 1,210	18 1,160	3 1,160	18 1,180
4 1,260	18 1,530	4 1,160	19 1,200	4 1,210	19 1,150	4 1,150	19 * 1,180
5 1,290	19 1,560	5 1,170	20 1,200	5 1,190	20 * 1,160	5 1,150	20 * 1,180
6 1,220	20 * 1,580	6 1,170	21 1,200	6 1,200	21 * 1,170	6 1,150	21 1,180
7 1,210	21 1,570	7 1,170	22 * 1,200	7 1,200	22 1,180	7 1,150	22 1,180
8 * 1,230	22 1,390	8 1,180	23 1,200	8 1,210	23 1,180	8 * 1,140	23 1,180
9 * 1,260	23 1,420	9 * 1,200	24 1,200	9 1,210	24 1,180	9 * 1,150	24 * 1,180
10 1,230	24 1,430	10 * 1,200	25 1,200	10 * 1,210	25 1,180	10 * 1,150	25 1,190
11 1,240	25 1,470	11 1,220	26 1,190	11 1,200	26 1,180	11 1,140	26 * 1,190
12 1,260	26 1,460	12 1,200	27 1,190	12 1,200	27 * 1,180	12 1,150	27 * 1,180
13 1,240	27 1,430	13 1,200	28 1,190	13 1,200	28 * 1,180	13 1,140	28 1,180
14 1,250	28 1,410	14 1,200	29 * 1,190	14 1,200	29 1,180	14 1,140	29 1,180
15 * 1,260	March	15 1,210	30 1,190	15 1,200	30 1,180	15 * 1,140	30 1,180
16 * 1,250	1 1,410	16 * 1,220	31 1,190	16 1,210	31 1,180	16 * 1,140	December
17 1,240	2 1,400	17 * 1,210	June	17 * 1,210	September	17 1,140	1 1,200
18 1,250	3 1,320	18 1,230	1 1,200	18 1,200	1 1,190	18 1,140	2 1,210
19 1,270	4 1,340	19 1,190	2 1,210	19 1,210	2 1,190	19 1,140	3 * 1,210
20 1,250	5 1,370	20 1,190	3 1,210	20 1,210	3 * 1,190	20 1,140	4 * 1,200
21 1,240	6 * 1,430	21 1,190	4 1,190	21 1,200	4 * 1,180	21 1,150	5 1,190
22 * 1,230	7 1,430	22 1,200	5 * 1,200	22 1,200	5 1,180	22 * 1,160	6 1,210
23 * 1,220	8 1,540	23 1,210	6 1,170	23 * 1,200	6 1,170	23 * 1,150	7 1,210
24 1,210	9 1,500	24 1,210	7 1,190	24 * 1,190	7 1,170	24 1,150	8 1,190
25 1,220	10 1,500	25 1,210	8 1,190	25 1,190	8 1,190	25 1,150	9 1,210
26 1,230	11 1,490	26 1,200	9 1,180	26 1,200	9 1,170	26 1,150	10 1,210
27 1,230	12 1,460	27 1,200	10 1,200	27 1,200	10 * 1,170	27 1,150	11 * 1,200
28 1,210	13 * 1,440	28 1,220	11 1,210	28 1,190	11 * 1,160	28 1,150	12 1,200
29 1,220	14 1,430	29 1,230	12 * 1,210	29 1,200	12 1,170	29 * 1,160	13 1,180
30 * 1,210	15 1,350	30 1,200	13 1,210	30 * 1,200	13 1,170	30 * 1,160	14 1,180
31 1,220	16 1,320	May	14 1,220	31 * 1,200	14 1,180	31 1,170	15 1,200
February	17 1,340	1 * 1,190	15 1,200	August	15 1,180	November	16 1,200
1 1,220	18 1,320	2 1,180	16 1,200	1 1,180	16 1,180	1 1,160	17 * 1,200
2 1,220	19 1,310	3 1,200	17 1,200	2 1,190	17 * 1,180	2 1,160	18 1,190
3 1,210	20 * 1,280	4 1,200	18 1,190	3 1,200	18 * 1,170	3 1,160	19 1,190
4 1,210	21 1,260	5 1,200	19 * 1,190	4 1,190	19 1,170	4 1,160	20 1,200
5 * 1,240	22 1,310	6 1,190	20 1,190	5 1,190	20 1,170	5 * 1,150	21 1,210
6 * 1,280	23 1,280	7 * 1,200	21 1,200	6 1,200	21 1,170	6 * 1,160	22 1,210
7 1,350	24 1,280	8 * 1,210	22 1,200	7 1,190	22 1,170	7 1,160	23 1,210
8 1,370	25 1,280	9 1,190	23 1,200	8 1,190	23 1,160	8 1,160	24 1,200
9 1,400	26 1,280	10 1,190	24 1,200	9 1,190	24 * 1,150	9 1,170	25 * 1,200
10 1,420	27 * 1,290	11 1,200	25 1,230	10 1,180	25 * 1,140	10 1,170	26 * 1,200
11 1,480	28 1,310	12 1,200	26 * 1,220	11 1,180	26 1,150	11 * 1,170	27 1,200
12 1,510	29 1,260	13 1,200	27 1,360	12 1,180	27 1,150	12 * 1,170	28 1,180
13 * 1,560	30 1,220	14 1,200	28 1,290	13 * 1,180	28 1,170	13 1,150	29 1,190
14 1,590	31 1,210	15 * 1,200	29 1,250	14 1,180	29 1,160	14 1,170	30 1,200
			30 1,230	15 1,190	30 1,160	15 1,180	31 * 1,210

* Estimated

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1983

Date	ECx10 ⁶ @25°C										
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Intake Canal at Morelos Diversion Structure

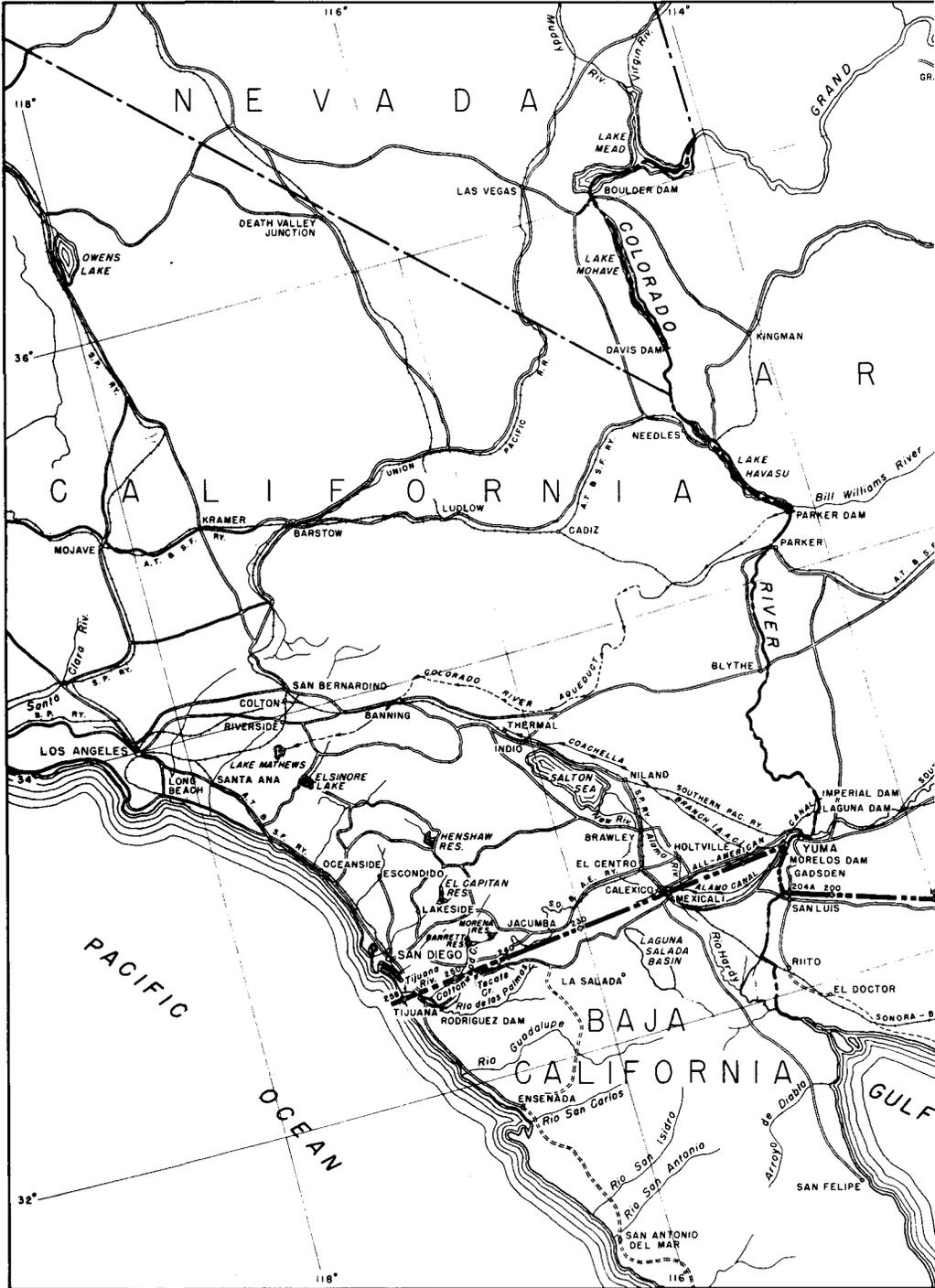
January		February		April		May		July		August		October		November	
1	1,380	15	1,630	1	1,260	16	1,200	1	1,220	16	1,170	1	1,140	16	1,160
2	1,350	16	1,620	2	1,260	17	1,200	2	1,210	17	1,160	2	1,140	17	1,160
3	1,280	17	1,570	3	1,280	18	1,200	3	1,200	18	1,140	3	1,140	18	1,190
4	1,250	18	1,610	4	1,230	19	1,200	4	1,200	19	1,130	4	1,140	19	1,160
5	1,300	19	1,620	5	1,180	20	1,200	5	1,200	20	1,140	5	1,140	20	1,160
6	1,210	20	1,600	6	1,160	21	1,210	6	1,200	21	1,160	6	1,140	21	1,160
7	1,220	21	1,570	7	1,180	22	1,200	7	1,210	22	1,170	7	1,150	22	1,160
8	1,230	22	1,430	8	1,180	23	1,200	8	1,210	23	1,170	8	1,140	23	1,170
9	1,230	23	1,400	9	1,170	24	1,200	9	1,210	24	1,170	9	1,140	24	1,150
10	1,240	24	1,460	10	1,200	25	1,210	10	1,200	25	1,180	10	1,140	25	1,170
11	1,250	25	1,540	11	1,220	26	1,190	11	1,190	26	1,180	11	1,140	26	1,170
12	1,260	26	1,510	12	1,200	27	1,190	12	1,200	27	1,160	12	1,140	27	1,170
13	1,230	27	1,530	13	1,200	28	1,200	13	1,200	28	1,170	13	1,130	28	1,160
14	1,240	28	1,480	14	1,210	29	1,180	14	1,200	29	1,170	14	1,140	29	1,170
15	1,240	March		15	1,210	30	1,200	15	1,200	30	1,160	15	1,130	30	1,160
16	1,250	1	1,420	16	1,210	31	1,230	16	1,200	31	1,170	16	1,130	December	
17	1,240	2	1,430	17	1,200	June		17	1,210	September		17	1,130	1	1,170
18	1,240	3	1,340	18	1,200	1	1,200	18	1,200	1	1,180	18	1,140	2	1,180
19	1,230	4	1,340	19	1,200	2	1,210	19	1,190	2	1,170	19	1,130	3	1,180
20	1,230	5	1,370	20	1,200	3	1,210	20	1,200	3	1,170	20	1,130	4	1,170
21	1,230	6	1,450	21	1,190	4	1,190	21	1,190	4	1,170	21	1,140	5	1,170
22	1,230	7	1,480	22	1,200	5	1,190	22	1,180	5	1,160	22	1,140	6	1,170
23	1,220	8	1,530	23	1,200	6	1,200	23	1,190	6	1,160	23	1,140	7	1,160
24	1,210	9	1,520	24	1,210	7	1,200	24	1,190	7	1,160	24	1,140	8	1,140
25	1,230	10	1,490	25	1,200	8	1,200	25	1,180	8	1,170	25	1,140	9	1,140
26	1,230	11	1,560	26	1,200	9	1,200	26	1,190	9	1,160	26	1,140	10	1,180
27	1,210	12	1,460	27	1,200	10	1,200	27	1,180	10	1,160	27	1,140	11	1,120
28	1,200	13	1,470	28	1,200	11	1,200	28	1,180	11	1,150	28	1,140	12	1,150
29	1,220	14	1,430	29	1,210	12	1,210	29	1,150	12	1,160	29	1,140	13	1,180
30	1,200	15	1,400	30	1,200	13	1,210	30	1,190	13	1,160	30	1,150	14	1,160
31	1,200	16	1,380	May		14	1,210	31	1,180	14	1,170	31	1,150	15	1,120
February		17	1,390	1	1,200	15	1,190	August		15	1,160	November		16	1,120
1	1,220	18	1,360	2	1,200	16	1,200	1	1,190	16	1,160	1	1,150	17	1,130
2	1,220	19	1,340	3	1,200	17	1,190	2	1,180	17	1,150	2	1,140	18	1,130
3	1,220	20	1,360	4	1,200	18	1,190	3	1,190	18	1,160	3	1,160	19	1,150
4	1,220	21	1,280	5	1,200	19	1,200	4	1,180	19	1,150	4	1,140	20	1,220
5	1,230	22	1,370	6	1,200	20	1,190	5	1,200	20	1,160	5	1,150	21	1,200
6	1,240	23	1,270	7	1,240	21	1,200	6	1,180	21	1,160	6	1,150	22	1,190
7	1,350	24	1,330	8	1,260	22	1,200	7	1,180	22	1,150	7	1,160	23	1,190
8	1,350	25	1,300	9	1,200	23	1,200	8	1,180	23	1,150	8	1,160	24	1,200
9	1,370	26	1,320	10	1,190	24	1,200	9	1,170	24	1,150	9	1,160	25	1,210
10	1,450	27	1,330	11	1,210	25	1,220	10	1,180	25	1,140	10	1,160	26	1,220
11	1,470	28	1,310	12	1,200	26	1,250	11	1,170	26	1,150	11	1,170	27	1,190
12	1,520	29	1,300	13	1,210	27	1,290	12	1,180	27	1,150	12	1,170	28	1,200
13	1,550	30	1,260	14	1,200	28	1,270	13	1,170	28	1,150	13	1,160	29	1,110
14	1,620	31	1,230	15	1,200	29	1,260	14	1,180	29	1,140	14	1,170	30	1,140
						30	1,230	15	1,180	30	1,150	15	1,170	31	1,140

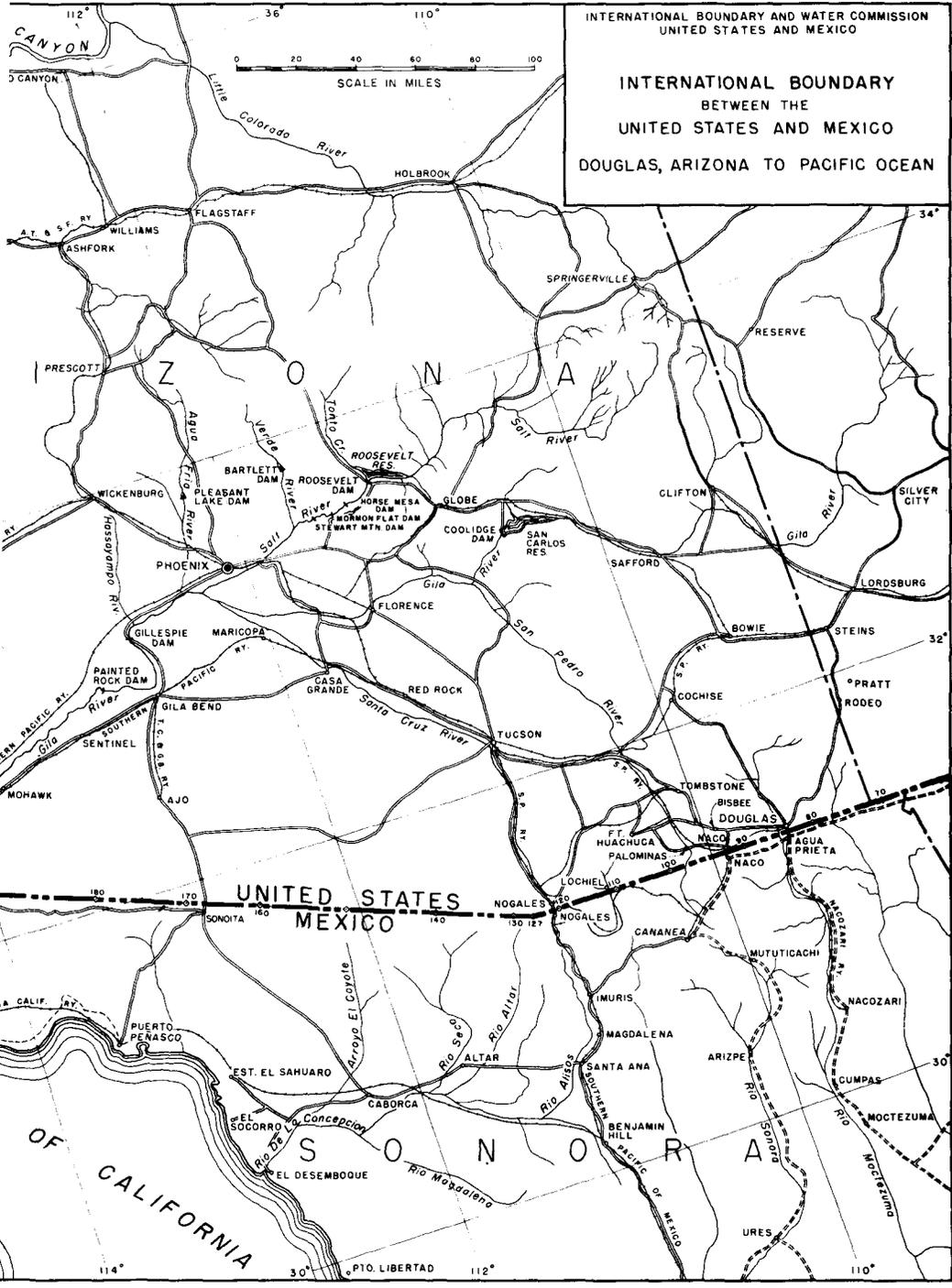
Colorado River at Southerly International Boundary

August	October	November				
16	1,180	4	1,150	1	1,120	

Colorado River at Miguel C. Rodriguez Gaging Station

January	February	March	April	May	June	July	
7	1,250	14	1,530	7	1,380	11	1,220
17	1,270	21	1,530			18	1,220
24	1,240	28	1,520			25	1,220
31	1,270					23	1,210
						30	1,220





INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

**INTERNATIONAL BOUNDARY
BETWEEN THE
UNITED STATES AND MEXICO
DOUGLAS, ARIZONA TO PACIFIC OCEAN**

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	
	1983	Average 1931-1983	1983	Average 1931-1983	1983	Average 1931-1983	1983	Average 1931-1983	1983	Average 1978-1983
Jan.	0.22	0.36	0.21	0.38	0.31	0.45	0.39	0.42	0.52	1.38
Feb.	1.02	.34	1.64	.36	.40	.44	.75	.36	.50	1.16
Mar.	1.63	.26	1.33	.23	* 1.75	.43	.32	.27	2.38	1.73
Apr.	0	.09	.04	.10	T	.13	T	.11	.38	.19
May	0	.02	0	.01	0	.03	0	.02	T	.23
June	0	.01	0	.01	0	.04	0	.02	0	.01
July	0	.07	0	.09	0	.17	T	.14	.04	.33
Aug.	3.05	.40	1.71	.37	1.43	.80	2.79	.59	3.91	1.32
Sept.	.75	.24	.09	.28	1.25	.37	.22	.34	1.99	.62
Oct.	T	.23	0	.23	.20	.28	.44	.40	1.25	.41
Nov.	0	.16	0	.18	.06	.24	.07	.18	.12	.52
Dec.	.84	.43	.48	.44	.43	.49	1.00	.41	.50	.62
Yearly	7.51	2.71	5.50	2.68	5.83	3.87	5.98	3.26	11.59	8.52

In Mexico

Month	Los Algodones, Baja California		Mexicali, Baja California		Bataques, Baja California		San Luis, R. C., Sonora		Delta, Baja California	
	1983	Average 1948-1983	1983	Average 1926-1983	1983	Average 1948-1983	1983	Average 1949-1983	1983	Average 1948-1983
Jan.	0.55	0.43	0.16	0.35	0.20	0.39	0.12	0.35	0.20	0.35
Feb.	.55	.24	1.50	.35	1.06	.20	1.34	.31	2.01	.28
Mar.	.35	.20	1.54	.24	.24	.16	1.10	.24	.59	.16
Apr.	T	.08	T	.08	.04	.08	0	.08	0	.08
May	0	T	0	T	0	T	0	.04	0	.04
June	0	T	0	T	0	.04	0	.04	0	T
July	0	.08	0	.12	0	.09	0	.24	0	.04
Aug.	.55	.39	.91	.39	2.99	.28	1.02	.47	2.60	.28
Sept.	0	.20	.39	.39	.08	.12	.98	.28	.47	.28
Oct.	.04	.28	.12	.28	0	.28	.43	.39	.16	.31
Nov.	0	.16	T	.16	.16	.16	0	.43	0	.12
Dec.	.63	.35	.31	.75	.43	.24	.67	.51	.12	.31
Yearly	2.68	2.40	4.92	3.19	5.20	1.93	5.67	2.91	6.14	2.24

Month	Colonia Juarez, Baja California		Laguna Salada, Baja California		Riito, Sonora		Santa Clara, Sonora		San Felipe, Baja California		El Centinela, Baja California	
	1983	Average 1952-1983	1983	Average 1974-1983	1983	Average 1959-1983	1983	Average 1971-1983	1983	Average 1969-1983	1983	Average 1978-1983
Jan	0.08	0.51	0	0.43	0	0.31	0	0.28	0	0.35	T	0.43
Feb.	1.10	.31	2.56	.51	1.57	.28	1.73	.31	1.02	.16	1.89	.47
Mar.	.55	.31	.39	.12	.16	.20	.08	.12	0	.12	.51	.16
Apr.	.04	.12	0	.08	0	.04	0	.08	0	.08	0	0
May	0	.04	#	.04	0	T	0	.04	0	.04	0	0
June	0	T	0	0	0	.04	0	T	0	.04	0	0
July	0	.16	0	.12	0	.08	0	0	0	.12	0	0
Aug.	2.05	.39	1.18	.87	1.61	.28	1.26	.24	5.83	.43	2.17	1.10
Sept.	.91	.31	0	.83	.98	.55	.04	.31	0	.39	.51	.08
Oct.	.39	.47	0	.16	0	.39	.24	.59	0	.24	.87	.16
Nov.	#	.24	0	.12	0	.24	0	.08	.39	.24	0	0
Dec.	.16	.35	0	.91	.43	.35	.08	.31	.43	.39	0	.67
Yearly		2.52		4.76	4.76	2.83	3.43	2.40	7.68	2.76	5.94	

* Blythe FAA Airport

T Trace

Missing record

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 1983.

In the United States

NAME OF STATION	LATI- TUDE	LONGI- TUDE	Ø 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	LATI- TUDE	LONGI- TUDE	Ø ELEV. (FT.)	RECORD BEGAN	OBSERVER
Bataques, Baja California	32° 34'	115° 00'	** 66	1948	# S. A. R. H.
Colonia Juarez, Baja California	32° 18'	115° 05'	49	1952	S. A. R. H.
Delta, Baja California	32° 21'	115° 11'	** 39	1948	S. A. R. H.
El Centinela, Baja California	32° 35'	115° 45'	164	1978	S. A. R. H.
Laguna Salada, Baja California	32° 12'	115° 44'	7	1975	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'	43	1959	S. A. R. H.
San Felipe, Baja California	31° 01'	114° 51'	72	1969	S. A. R. H.
San Luis, R. C., Sonora	32° 28'	114° 47'	131	1949	S. A. R. H.
Santa Clara, Sonora	31° 42'	114° 29'	49	1971	S. A. R. H.

* Not shown on map

Ø 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 ten 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 the United States

Month	Yuma Citrus Station, Arizona	
	1983	Average 1931-1983
Jan.	3.97	3.85
Feb.	3.37	4.77
Mar.	6.03	7.40
Apr.	8.85	10.07
May	12.33	13.00
June	13.28	14.31
July	14.31	15.39
Aug.	10.61	13.53
Sept.	9.55	10.70
Oct.	6.40	7.56
Nov.	4.50	4.95
Dec.	2.93	3.67
Yearly	96.13	109.20

In Mexico

Month	Los Algodones, Baja California		Mexicali, Baja California		Bataques, Baja California		San Luis, R. C. Sonora		Delta Baja California	
	1983	Average 1949-1955 1961-1983	1983	Average 1926-1983	1983	Average 1963-1983	1983	Average 1953-1983	1983	Average 1948-1983
Jan.	5.24	4.41	2.44	2.60	3.98	3.74	3.27	3.31	3.27	3.23
Feb.	4.13	5.24	2.48	5.51	3.54	4.65	3.23	4.02	3.23	4.29
Mar.	6.61	7.48	5.20	5.87	6.50	6.81	6.81	6.26	5.55	6.18
Apr.	10.08	10.28	7.24	7.99	8.74	8.62	6.89	8.35	4.80	8.11
May	13.27	12.87	10.47	10.59	12.99	11.38	11.18	11.06	10.12	10.31
June	14.33	14.06	11.14	11.77	13.90	12.99	11.73	12.64	7.83	11.42
July	14.02	13.86	11.57	11.85	14.69	12.91	12.68	13.70	13.98	12.13
Aug.	11.38	12.44	7.64	10.16	11.30	10.98	*	12.32	10.94	10.98
Sept.	9.96	10.31	6.42	8.11	10.08	9.25	*	9.49	9.06	8.58
Oct.	7.36	8.15	4.37	5.75	*	6.46	*	6.38	6.30	6.34
Nov.	5.79	5.35	2.99	3.39	6.26	4.84	*	4.21	4.76	4.33
Dec.	3.54	4.33	1.89	2.44	3.07	3.50	2.28	3.15	2.80	3.27
Yearly	105.71	110.08	73.86	84.02		96.14		95.71	82.64	83.39

Month	Colonia Juarez, Baja California		Laguna Salada, Baja California		Riito, Sonora		Santa Clara, Sonora		San Felipe Baja California	
	1983	Average 1970-1983	1983	Average 1975-1983	1983	Average 1963-1983	1983	Average 1971-1983	1983	Average 1952-1983
Jan.	4.25	3.46	4.96	4.25	4.96	3.11	5.04	5.00	*	
Feb.	3.74	4.25	4.45	4.57	3.70	4.06	4.45	4.72	*	
Mar.	7.28	6.30	6.30	7.05	6.42	5.98	5.83	6.14	*	
Apr.	7.80	7.99	7.20	8.35	8.19	7.72	7.52	7.68	*	
May	12.56	10.39	*	11.06	12.28	10.55	6.38	8.46	*	
June	12.44	12.24	11.65	13.19	12.60	11.81	8.43	10.75	*	
July	14.33	12.36	14.37	13.74	*	12.40	11.97	11.14	*	
Aug.	10.35	10.91	10.94	12.24	11.38	10.47	8.90	10.08	*	
Sept.	13.39	9.45	9.37	8.46	9.57	8.46	8.70	9.02	*	
Oct.	11.38	7.32	11.61	7.91	8.70	6.02	6.34	7.36	*	
Nov.	*	4.84	*	5.39	*	3.74	6.97	5.79	*	
Dec.	3.74	3.62	3.07	3.86	*	3.03	4.45	5.08	*	
Yearly		95.20		103.27		88.43	84.96	92.76		

* No record

**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

Month	Blythe, California				Yuma Citrus Station, Arizona				Brawley, California			
	1983			Average 1931-83	1983			Average 1931-83	1983			Average 1931-83
	Mean	Max.	Min.		Mean	Max.	Min.		Mean	Max.	Min.	
Jan.	54.3	77	28	52.7	54.9	77	31	53.1	57.1	82	28	53.8
Feb.	58.6	84	33	57.4	56.7	80	33	57.1	58.9	84	36	58.1
Mar.	63.6	92	43	62.9	62.3	89	39	62.0	63.9	88	40	63.1
Apr.	65.2	91	40	70.0	64.7	92	38	68.5	65.4	93	40	69.7
May	77.9	113	50	77.4	76.1	115	46	75.7	77.0	113	49	77.1
June	84.5	108	57	85.4	83.0	107	52	83.6	82.7	108	53	85.0
July	91.4	115	65	92.4	90.9	114	63	91.0	90.8	116	61	91.9
Aug.	89.1	112	64	90.9	88.6	112	65	90.2	89.2	114	67	91.3
Sept.	87.4	112	58	85.0	88.4	111	60	85.0	89.4	113	63	86.2
Oct.	73.4	96	52	73.1	74.3	95	55	73.4	76.5	99	56	75.0
Nov.	61.4	89	32	60.2	61.9	87	34	61.3	64.4	92	35	62.5
Dec.	55.4	73	32	53.3	55.8	75	34	54.6	58.1	78	32	55.1
Yearly	71.8	115	28	71.7	71.5	115	31	71.3	72.8	116	28	72.4

Month	El Centro, California				Bullhead City, Arizona							
	1983			Average 1931-83	1983			Average 1978-83				
	Mean	Max.	Min.		Mean	Max.	Min.					
Jan.	57.2	80	31	53.9	54.4	74	31	52.6				
Feb.	59.9	83	42	58.1	58.5	79	37	57.6				
Mar.	64.0	94	42	62.9	62.8	91	40	62.1				
Apr.	65.4	92	41	69.4	67.3	92	40	69.9				
May	77.0	114	48	77.0	81.0	118	51	78.9				
June	82.8	107	55	85.0	88.2	113	62	89.5				
July	91.4	114	61	91.7	93.3	120	65	94.4				
Aug.	90.3	112	68	91.0	91.5	116	68	92.9				
Sept.	89.3	113	60	85.7	89.2	114	62	87.3				
Oct.	76.2	98	51	74.5	74.8	93	53	74.0				
Nov.	63.3	91	34	62.1	62.4	89	32	61.0				
Dec.	57.3	76	34	54.8	54.3	71	29	53.3				
Yearly	72.8	114	31	72.2	73.1	120	29	72.8				

In Mexico

Month	Los Algodones, Baja California				Mexicali, Baja California				Bataques, Baja California			
	1983		1948-1983		1983		1926-1983		1983		1948-1983	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	75	34	88	23	79	32	93	19	79	34	113	16
Feb.	79	36	95	28	86	41	93	23	79	39	99	21
Mar.	90	39	100	32	90	46	100	30	90	43	113	25
Apr.	88	41	109	37	93	45	106	34	86	41	118	16
May	117	50	117	43	115	50	117	43	111	48	124	34
June	106	52	126	52	111	55	120	48	108	55	135	43
July	113	70	118	61	118	70	118	55	115	64	133	45
Aug.	111	68	120	61	117	68	120	54	113	66	129	46
Sept.	109	64	122	50	115	66	122	48	109	59	135	39
Oct.	93	52	111	32	99	52	111	32	100	54	118	32
Nov.	84	36	100	27	90	37	104	28	93	36	115	32
Dec.	73	39	90	23	75	37	90	23	81	34	97	25
Yearly	117	34	126	23	118	32	122	19	115	34	135	16

TEMPERATURE IN THE COLORADO RIVER BASIN IN DEGREES FAHRENHEIT

In Mexico

Month	Riito, Sonora				Santa Clara, Sonora				San Felipe, Baja California			
	1983		1949-1983		1983		1971-1983		1983		1969-1983	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	81	34	91	19	79	39	90	18	75	39	99	30
Feb.	77	37	95	21	79	45	90	23	81	37	102	32
Mar.	90	41	100	25	84	50	90	37	88	41	104	32
Apr.	91	39	109	36	88	48	102	46	84	41	113	38
May	108	46	115	41	106	54	106	50	106	46	120	41
June	104	50	124	45	95	64	117	57	99	57	124	50
July	106	61	140	52	113	70	115	64	104	52	124	50
Aug.	108	66	122	46	104	73	106	68	106	52	135	41
Sept.	106	61	118	39	100	68	108	61	104	64	126	37
Oct.	95	57	115	30	97	64	102	41	90	50	117	23
Nov.	88	36	118	27	86	46	93	36	82	39	118	21
Dec.	81	37	86	21	84	43	86	25	75	39	97	28
Yearly	108	34	140	19	113	39	117	18	106	37	135	21

Month	San Luis, R. C., Sonora				Delta, Baja California				Colonia Juarez, Baja California			
	1983		1949-1983		1983		1948-1983		1983		1964-1983	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	90	34	100	19	81	39	104	27	77	37	91	19
Feb.	93	36	109	27	84	46	104	28	82	41	97	21
Mar.	102	41	108	28	95	50	113	28	90	45	99	25
Apr.	100	39	115	37	90	46	118	32	90	45	115	30
May	115	48	115	41	111	52	129	32	109	48	117	36
June	111	52	126	45	108	54	133	36	106	52	122	39
July	117	68	126	59	115	70	135	45	113	64	122	45
Aug.	118	68	122	55	113	75	140	52	113	68	118	50
Sept.	113	55	118	50	111	70	135	39	111	64	122	39
Oct.	95	54	118	32	99	59	117	34	95	57	118	36
Nov.	90	41	113	28	93	39	120	32	88	36	104	25
Dec.	79	41	102	23	81	41	104	27	88	36	97	19
Yearly	118	34	126	19	115	39	140	27	113	36	122	19

Month	Laguna Salada, Baja California				El Centinela, Baja California							
	1983		1974-1983		1983		1977-1983					
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.				
Jan.	82	32	84	18	73	36	75	34				
Feb.	82	37	95	27	82	43	82	41				
Mar.	90	37	95	32	79	50	90	41				
Apr.	93	39	100	36	86	46	100	46				
May	*	*	111	39	111	54	111	54				
June	113	54	120	50	106	63	118	50				
July	118	64	122	54	109	72	120	68				
Aug.	118	66	118	52	102	68	115	68				
Sept.	111	50	118	48	108	64	115	52				
Oct.	108	50	118	36	90	63	108	50				
Nov.	90	37	95	28	82	41	93	39				
Dec.	77	30	86	19	72	43	82	32				
Yearly			122	18	111	36	120	32				

* Missing record

IRRIGATED AREAS ALONG COLORADO RIVER BELOW IMPERIAL DAM**1983**

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 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	46,517
Reservation Division	9,978
Yuma Mesa	18,292
Yuma Aux. Project Unit "B" (Yuma Mesa)	2,531
South Gila Valley	8,747
North Gila Valley	5,027
Wellton-Mohawk	54,946
Coachella Valley	55,864
Imperial Valley	445,925
Warren Act	80
Non-Project lands adjacent to Colorado River	12,560
Total in United States	660,467
IN MEXICO:	
Morelos Dam	
Mexicali Valley	* 572,101
Total in United States and Mexico	1,232,568

* An estimated 33% 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 1983.

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 m³/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 1983 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.54	2.75	2.96	3.24	2.65	2.54	2.34	2.75	2.34	1.92	2.13	2.13
2	2.54	2.96	3.24	3.24	2.65	2.54	2.44	3.52	2.34	1.92	2.13	2.75
3	2.54	3.65	4.62	3.38	2.96	2.54	2.44	2.96	2.54	2.13	2.13	2.75
4	2.54	5.03	4.62	2.96	2.75	2.54	2.34	2.75	2.65	2.13	2.13	2.44
5	2.65	4.62	3.24	2.96	2.75	2.75	2.44	2.96	2.54	2.13	2.23	2.13
6	2.65	3.93	3.24	2.96	2.75	2.54	2.65	2.96	2.54	2.13	2.23	2.13
7	2.75	3.93	3.24	2.96	2.75	2.96	2.65	2.75	2.54	1.92	2.44	2.13
8	2.75	3.24	2.96	2.75	2.75	2.96	2.44	2.96	2.54	1.92	2.44	2.13
9	2.75	3.24	2.96	2.75	2.65	2.75	2.44	2.96	2.54	1.74	2.34	2.34
10	2.86	3.24	2.96	2.54	2.75	2.44	2.34	2.75	2.54	1.74	2.13	2.34
11	2.86	3.24	2.96	2.54	2.75	2.44	2.34	2.75	2.23	1.92	2.44	2.13
12	2.86	3.24	2.96	2.54	2.75	2.34	2.34	2.75	2.23	2.13	2.44	2.34
13	2.86	3.79	2.96	3.24	2.44	2.34	2.34	2.75	2.34	2.02	2.44	2.34
14	2.65	2.96	2.75	3.24	2.44	2.44	2.34	2.75	2.13	1.83	2.44	2.13
15	2.65	2.96	2.96	3.38	2.65	2.75	2.34	2.65	2.13	1.83	2.13	2.34
16	2.54	2.96	2.75	3.38	2.65	2.75	2.34	2.44	2.86	1.92	2.75	2.34
17	2.54	2.96	3.38	4.49	2.44	2.54	2.44	2.96	2.86	1.92	2.75	2.13
18	2.54	2.96	3.38	4.21	2.75	2.54	2.44	2.75	2.54	1.92	2.65	2.75
19	2.96	2.96	3.38	3.65	2.75	2.65	2.44	2.65	2.34	1.92	2.54	2.75
20	2.96	2.54	3.38	2.75	2.75	2.65	2.44	2.65	2.34	1.92	2.75	2.96
21	2.96	2.54	3.38	2.75	2.54	2.54	2.44	2.75	2.13	2.02	2.54	2.96
22	2.96	2.54	2.96	2.75	2.54	2.23	2.44	2.75	2.13	1.92	2.44	2.65
23	2.96	2.54	2.86	2.75	2.54	2.23	2.54	2.54	2.23	1.92	2.44	2.65
24	2.86	2.54	2.96	2.75	2.75	2.34	2.44	2.75	2.65	1.74	2.13	2.44
25	2.86	2.75	3.24	2.75	2.75	2.34	4.49	2.75	2.34	1.92	2.13	2.75
26	2.86	2.75	3.24	3.65	2.75	2.44	2.54	2.23	2.34	2.13	2.34	2.54
27	2.86	2.75	3.24	3.65	2.54	2.34	2.75	2.13	2.13	2.02	2.54	2.54
28	2.75	3.24	3.24	2.96	2.44	2.34	2.75	2.02	1.92	2.02	2.13	2.54
29	2.75		3.10	2.96	2.44	2.54	2.34	2.02	1.92	2.02	2.13	2.44
30	2.75		2.96	2.65	2.44	2.54	2.34	2.23	1.92	2.13	2.13	2.54
31	2.75		3.24		2.54		2.44	2.13		2.34		2.23
Sum	85.31	88.81	99.32	92.78	82.05	75.88	77.83	82.72	70.82	61.19	70.61	75.76
Current Year 1983											Period 1943-1983	
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second- Feet	Total Acres-Feet	Acres-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	0.40	0.36	!19	2.96	! 1	2.54	2.75	169	316	2,790	99	
Feb.	.55	.36	4	5.03	120	2.54	3.17	176	287	2,822	90.2	
Mar.	.52	.38	! 3	4.62	!14	2.75	3.20	197	326	3,154	87.1	
Apr.	.51	.36	17	4.49	!10	2.54	3.09	184	345	2,222	97	
May	.40	.35	3	2.96	!13	2.44	2.65	163	270	1,799	73	
June	.40	.33	! 7	2.96	!22	2.23	2.53	151	263	1,686	61	
July	.51	.34	25	4.49	! 1	2.34	2.51	154	243	1,712	59	
Aug.	.44	.31	2	3.52	128	2.02	2.67	164	289	1,672	65.7	
Sept.	.39	.30	!16	2.86	128	1.92	2.36	140	273	1,406	83.5	
Oct.	.34	.28	31	2.34	! 9	1.74	1.97	121	289	1,845	61.6	
Nov.	.38	.32	!16	2.75	! 1	2.13	2.35	140	297	2,080	62.4	
Dec.	.40	.32	!20	2.96	! 1	2.13	2.44	150	281	1,686	80	
Yearly	0.55	0.28		5.03		1.74	2.64	1,909	3,479	22,146	1,071	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	0.17	0.09		0.14		0.05	0.07	2,355	4,291	27,317	1,321	

! 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 1983.

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 m³) during any successive five-year period under the provisions of Minute No. 197 of the Commission.

EXTREMES: Maximum mean daily discharge, 1,030 second-feet (29.2 m³/sec) on December 9, 1982; minimum mean daily discharge, 2 second-feet (0.06 m³/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 1983 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	217	353	255	323	305	331	263	344	296	347	358	350
2	227	645	567	323	347	337	279	361	301	334	334	350
3	217	810	710	305	385	315	297	373	308	346	332	311
4	205	811	674	311	371	289	319	355	349	392	311	289
5	197	735	540	325	328	282	331	333	361	416	303	307
6	198	558	436	304	325	279	386	317	380	410	305	326
7	205	380	363	296	335	280	366	303	415	390	313	316
8	210	313	325	302	318	263	347	321	437	402	331	304
9	218	304	300	297	308	240	289	394	428	422	341	295
10	208	345	258	302	315	230	293	392	439	419	343	275
11	203	292	253	339	325	229	288	385	453	398	326	275
12	204	268	246	367	317	232	290	355	422	364	293	291
13	203	262	241	357	317	259	299	350	406	329	274	316
14	205	259	243	373	320	316	313	397	422	323	277	333
15	207	259	244	373	321	322	310	449	433	325	301	327
16	217	252	248	358	295	320	296	569	421	343	308	300
17	237	247	252	371	283	368	293	738	390	343	315	292
18	232	241	254	399	274	343	320	710	395	366	300	275
19	235	230	257	386	294	281	325	674	409	390	283	292
20	249	237	257	376	313	265	345	667	433	421	267	347
21	261	238	270	359	308	267	363	644	455	409	273	375
22	270	238	304	356	281	261	361	589	435	401	280	361
23	274	237	304	347	282	254	358	540	384	394	296	329
24	288	234	315	329	273	238	351	495	317	388	292	331
25	292	233	288	321	269	229	375	463	355	376	280	394
26	280	229	288	346	284	233	379	471	418	383	290	533
27	274	228	297	385	280	263	386	447	436	358	303	560
28	268	229	294	373	265	282	345	412	446	337	317	433
29	289		301	331	251	279	321	380	426	328	340	292
30	292		331	304	245	260	316	367	386	297	343	251
31	319		332		277		337	329		323		247
Sum	7,401	9,667	10,247	10,238	9,411	8,347	10,141	13,924	11,956	11,474	9,229	10,277

Month	Current Year 1983						Period 1943-1983				
	Extreme Gage # Feet		# Extreme Second-Feet				Average Second- Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.	39.68	41.12	31	319	5	197	239	14,680	8,306	20,160	1,751
Feb.	36.63	40.93	4	811	27	228	345	19,174	7,229	19,174	1,258
Mar.	37.39	40.64	3	710	13	241	331	20,325	8,154	20,325	1,008
Apr.	39.34	40.19	18	399	7	296	341	20,307	8,366	20,307	1,390
May	39.33	40.77	3	385	30	245	304	18,666	7,556	18,666	629
June	39.67	41.07	17	368	111	229	278	16,556	6,492	17,026	1,087
July	39.18	40.70	16	386	1	263	327	20,114	6,802	22,576	817
Aug.	36.66	40.08	17	738	7	303	449	27,618	7,881	27,618	1,139
Sept.	38.37	40.12	21	455	1	296	399	23,714	7,681	23,714	1,795
Oct.	38.87	39.99	9	422	30	297	370	22,758	7,765	22,758	2,081
Nov.	39.48	40.54	1	358	20	267	308	18,305	7,269	18,305	2,483
Dec.	37.62	40.33	27	560	31	247	332	20,384	8,258	21,205	1,763
Yearly	36.63	41.12		811		197	335	242,601	91,759	242,601	24,573
	Meters		Cubic Meters per Second				Thousands of Cubic Meters				
	11.16	12.53		23.0		5.6	9.5	299,246	113,184	299,246	30,311

Mean daily

** Feet below mean sea level

! 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 1983 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 1983.

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 m³/sec) on March 26, 1969; minimum instantaneous discharge, zero during several days in 1977, 1978, 1979, 1980, 1981, and 1982.

Mean Daily Discharge in Second-Feet 1983 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	1.8	0.4	1.8	1.8	1.8	1.8	1.8	0	1.8	1.8	1.8
2	0	1.8	.4	1.8	1.8	1.8	1.8	1.8	1.1	1.8	1.8	.7
3	0	0	1.8	1.8	0	1.8	1.8	1.8	1.8	1.8	1.8	.7
4	0	1.8	1.8	.4	1.8	1.8	1.8	1.8	1.8	1.8	1.8	.7
5	0	1.8	1.8	1.8	2.1	1.8	1.8	1.8	0	1.8	1.8	.4
6	0	1.8	1.8	2.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	0
7	0	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	.7
8	0	1.8	1.8	2.8	1.8	1.8	1.8	1.8	1.1	.7	2.1	0
9	1.8	1.8	.4	1.8	.4	1.8	1.8	1.8	1.1	1.1	1.8	0
10	1.8	1.8	1.8	.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	.7
11	2.5	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.1	1.1	1.8	1.1
12	2.1	1.8	1.8	1.8	2.1	1.8	1.8	1.8	1.8	1.8	1.8	.7
13	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.1	.7
14	1.8	1.8	1.8	1.8	1.1	1.8	1.8	1.8	1.1	1.8	1.8	.7
15	1.8	.4	1.8	1.8	2.1	1.8	1.8	1.8	1.1	1.8	2.1	.4
16	1.8	1.8	1.8	1.8	0	1.8	1.8	1.8	1.8	1.8	1.8	0
17	1.8	0	2.8	1.8	1.8	1.8	1.8	1.8	0	1.8	0	.7
18	1.8	0	.7	1.8	1.8	1.8	1.8	1.8	0	1.8	1.8	0
19	1.8	0	0	1.8	1.8	1.8	1.8	1.8	0	1.8	0	1.1
20	3.2	3.2	1.8	1.8	1.8	1.8	1.8	1.8	0	1.8	1.8	.7
21	2.8	0	1.8	2.1	1.8	1.8	1.8	1.8	0	1.8	0	1.1
22	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	0	1.8	1.8	0
23	1.8	1.8	1.8	.7	1.8	1.8	1.8	1.8	1.8	1.8	2.1	.7
24	1.8	1.8	1.8	1.8	0	1.8	1.8	1.8	1.8	1.8	1.8	0
25	0	1.8	1.8	1.8	1.8	.7	1.8	1.8	1.8	0	1.8	1.8
26	1.8	0	1.8	1.8	1.8	1.8	1.8	1.8	1.8	0	0	0
27	1.8	1.8	1.8	1.8	2.1	1.8	1.8	0	1.1	1.8	.7	.7
28	1.8	1.8	1.8	1.8	2.1	1.8	1.8	1.8	1.8	1.8	1.8	.7
29	1.8	0	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	0
30	1.8	0	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	0
31	1.8	1.8	1.8	1.8	2.5	1.8	1.8	1.8	1.8	0	1.8	0
Sum	43.0	39.6	46.1	52.7	50.5	52.9	55.8	54.0	34.7	47.9	45.9	16.8
Current Year 1983									Period 1968-1983			
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.			20	3.2	1	0	1.4	84.3	188	520	0	
Feb.			20	3.2	1	0	1.4	77.0	112	311	0	
Mar.			17	2.8	1	0	1.4	90.0	234	871	33.6	
Apr.			18	2.8	4	.4	1.8	103	223	431	90.8	
May			31	2.5	1	0	1.8	98.9	238	435	46.2	
June			11	1.8	25	.7	1.8	103	211	309	21.0	
July			11	1.8	1	1.8	1.8	109	269	528	0	
Aug.			11	1.8	27	0	1.8	105	300	596	102	
Sept.			13	1.8	1	0	1.1	67.2	279	549	67.2	
Oct.			11	1.8	125	0	1.4	93.2	258	507	93.2	
Nov.			18	2.1	117	0	1.4	90.0	225	504	90.0	
Dec.			11	1.8	16	0	.7	32.9	215	597	32.9	
Yearly				3.2		0	1.4	1,054	2,805	5,359	940	
Meters		Cubic Meters per Second				Thousands of Cubic Meters						
			0.09		0	0.04	1,300	3,460	6,610	1,160		

0 Mean daily

1 And other days

WASTE WATERS FROM MEXICAN SYSTEM OF CANALS ENTERING THE UNITED STATES

DESCRIPTION: During 1983 the only flow to the New River in Mexico was waste from the City of Mexicali Potable Water Plant, which discharges into Rivera Drain and then to New River, and drainage water coming from the Colorado River District system of canals that enter the New River below Laguna Xochimilco.

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 1983.

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 1983	Period 1956-1983		
		Average	Maximum	Minimum
January	84.3	1,082	8,758	6.3
February	77.0	773	7,281	18.2
March	90.0	538	2,610	21.7
April	103	482	3,194	16.1
May	98.9	328	1,176	9.1
June	103	428	5,670	0
July	109	649	10,251	0
August	105	576	4,137	0
September	67.2	474	3,215	21.0
October	93.2	632	3,474	8.4
November	90.0	660	3,784	0
December	32.9	1,043	8,691	0
Yearly	1,054	7,669	27,430	399
	Thousands of Cubic Meters			
	1,299.5	9,460	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 km²). 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 1983. 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, 227.1 feet (69.2 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 - 1983

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	* 228.4	228.1	227.7	227.1	227.1	227.1	227.4	227.6	227.3	227.4	227.5	227.5
2	* 228.4	228.0	227.5	227.1	227.1	227.1	227.4	227.6	227.3	227.5	227.5	227.6
3	* 228.4	227.9	227.3	227.1	227.1	227.1	227.4	227.6	227.3	227.5	227.5	227.6
4	* 228.4	227.9	227.2	227.1	227.1	227.1	227.4	227.6	227.3	227.5	227.5	227.6
5	* 228.4	227.9	227.2	227.1	227.1	227.1	227.4	227.6	227.3	227.5	227.5	227.6
6	* 228.4	227.9	227.2	227.1	227.1	227.1	227.4	227.6	227.3	227.5	227.5	227.6
7	* 228.3	227.9	227.2	227.1	227.1	227.1	227.4	227.6	227.3	227.5	227.5	227.6
8	* 228.3	227.9	227.2	227.1	227.1	227.1	227.4	227.6	227.3	227.5	227.5	227.6
9	* 228.3	227.8	227.2	227.1	227.1	227.2	227.4	227.6	227.3	227.5	227.5	227.6
10	* 228.3	227.8	227.2	227.1	227.1	227.2	227.4	227.6	227.3	227.5	227.5	227.6
11	* 228.3	227.8	227.1	227.1	227.1	227.2	227.4	227.6	227.3	227.5	227.5	227.6
12	* 228.3	227.8	227.1	227.1	227.1	227.2	227.4	227.6	227.3	227.5	227.5	227.6
13	* 228.3	227.8	227.1	227.1	227.1	227.2	227.4	227.6	227.3	227.5	227.5	227.6
14	* 228.3	227.8	227.1	227.1	227.1	227.2	227.4	227.6	227.3	227.5	227.5	227.6
15	* 228.3	227.8	227.1	227.1	227.1	227.2	227.4	227.6	227.3	227.5	227.5	227.6
16	* 228.2	227.8	227.1	227.1	227.1	227.2	227.5	227.6	227.3	227.5	227.5	227.6
17	* 228.2	227.8	227.2	227.1	227.1	227.2	227.5	227.4	227.3	227.5	227.5	227.6
18	* 228.2	227.8	227.2	227.1	227.1	227.2	227.5	227.3	227.3	227.5	227.6	227.6
19	* 228.2	227.8	227.2	227.1	227.1	227.2	227.5	227.2	227.3	227.5	227.6	227.6
20	* 228.2	227.8	227.2	227.1	227.1	227.2	227.5	227.2	227.3	227.5	227.6	227.6
21	228.2	227.8	227.2	227.1	227.1	227.2	227.5	227.2	227.3	227.5	227.6	227.6
22	228.1	227.8	227.2	227.1	227.1	227.2	227.5	227.2	227.3	227.5	227.6	227.6
23	228.1	227.8	227.2	227.1	227.1	227.3	227.5	227.3	227.3	227.5	227.6	227.6
24	228.1	227.8	227.2	227.1	227.1	227.3	227.5	227.3	227.3	227.5	227.6	227.6
25	228.1	227.8	227.2	227.1	227.1	227.3	227.5	227.3	227.3	227.5	227.6	227.6
26	228.1	227.8	227.2	227.1	227.1	227.3	227.5	227.3	227.3	227.5	227.6	227.5
27	228.1	227.7	227.2	227.1	227.1	227.3	227.6	227.3	227.4	227.5	227.7	227.5
28	228.1	227.7	227.1	227.1	227.1	227.3	227.6	227.3	227.4	227.5	227.7	227.5
29	228.1	227.7	227.1	227.1	227.1	227.3	227.6	227.3	227.4	227.5	227.7	227.5
30	228.1	227.7	227.1	227.1	227.1	227.4	227.6	227.3	227.4	227.5	227.7	227.5
31	228.1	227.7	227.1	227.1	227.1	227.4	227.6	227.3	227.4	227.5	227.7	227.5
Avg.	228.2	227.8	227.2	227.1	227.1	227.2	227.5	227.4	227.3	227.5	227.6	227.6

Month	Current Year 1983		Period 1935-1983			Area and Capacity Table		
	Ø Extreme Elevation Feet		Elevation Feet			Elevation	Area	Capacity
	High	Low	# Average	Maximum	! Minimum	Feet Below M.S.L.	Acres	Acres-Feet
Jan.	228.1	* 228.4	236.47	227.9	249.3	277.7	0	0
Feb.	227.7	228.1	236.15	227.7	248.8	274.0	20,600	25,700
Mar.	227.1	227.7	235.89	227.1	248.6	270.0	62,900	188,700
Apr.	227.1	227.1	235.70	227.1	248.7	266.0	94,600	510,600
May	227.1	227.1	235.68	227.1	248.5	260.0	122,600	1,170,000
June	227.1	227.4	235.82	227.1	248.8	256.0	134,700	1,684,000
July	227.4	227.6	235.99	227.4	249.1	252.0	148,800	2,250,000
Aug.	227.2	227.6	236.17	227.2	249.4	244.0	179,700	3,562,000
Sept.	227.3	227.4	236.36	227.3	249.4	240.0	196,900	4,315,000
Oct.	227.4	227.5	236.43	227.4	249.8	235.0	221,800	5,360,000
Nov.	227.5	227.7	236.45	227.5	250.0	230.0	235,800	6,504,000
Dec.	227.5	227.6	236.33	227.5	249.6	220.0	262,000	8,993,000
Yearly	227.1	* 228.4	236.12	227.1	250.0	210.0	288,500	11,740,000
						200.0	315,500	14,760,000

Ø Mean daily

Mean monthly

! Reading near first day of month

* Estimated

CHEMICAL ANALYSES OF WATER SAMPLES

1983

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 upstream 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 1983.

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; (CO₂ plus HCO₃) expressed as CO₂, 30.00; SO₄, 48.03; Cl, 35.45; NO₃, 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 10⁶ at 25°C, is a relative measure of the total salt concentration.

Month	No. of Samples	Dissolved Solids		ECx10 ⁶ @25°C	Boron p. p. m.	pH	% Na **	% Cl ***	Mean Milligram Equivalents per Liter						
		Tons Per Acre-Foot	Total Tons						Ca	Mg	Na	CO ₂ + HCO ₃	SO ₄	Cl	NO ₃

Alamo River

Jan.																	
Feb.																	
Mar.	1	6.15	1,210	4,850		7.3								24.98		42.03	
Apr.																	
May																	
June	1	5.66	855	4,250		7.7								23.32		37.24	
July																	
Aug.																	
Sept.																	
Oct.																	
Nov.																	
Dec.	1	4.57	686	3,370		7.2								19.51		27.79	
	3																

New River

Jan.	1	5.40	79,300	6,440		8.7	68		11.48	9.05	43.06			15.62		47.95	
Feb.																	
Mar.	1	6.20	126,000	7,030		7.7	64		13.97	10.69	43.50			17.28		47.95	
Apr.																	
May	1	5.13	95,800	6,030		7.9	69		9.98	8.22	39.58			13.33		42.31	
June																	
July	1	4.54	91,300	5,160		7.7	65		10.48	8.22	34.80			14.57		36.67	
Aug.																	
Sept.	1	3.96	93,900	4,780		7.9			8.48		29.58			12.28		31.03	
Oct.																	
Nov.																	
Dec.																	
	5																

** Percent of total cations

*** Percent of total anions

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES 1983

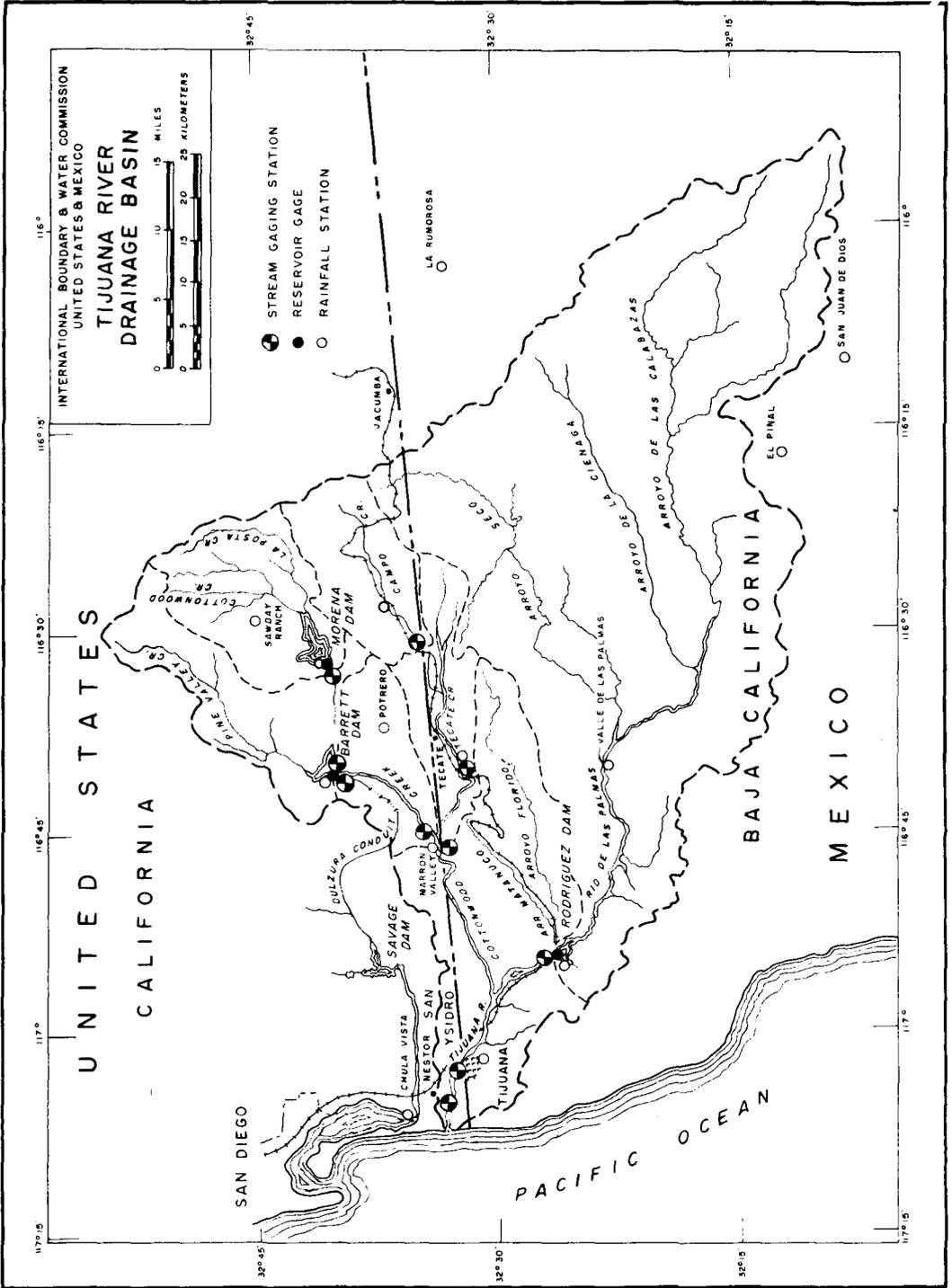
The following table shows electrical conductivity, expressed in mhos per centimeter $\times 10^6$ at 25°C , of individual water samples from the New River in Mexico at the international boundary. Samples were taken by the Mexican Section of the Commission, who also made the determinations.

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

Date	ECx10 ⁶ @25°C												
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New River at International Boundary

January		February		April		May		July		August		October		November	
5	6,970	23	7,700	6	6,980	25	6,180	6	5,720	17	4,030	5	5,280	16	7,980
12	6,820		March	20	6,100		June	13	6,120	24	4,650	12	4,820	23	7,460
19	5,740	2	6,740	27	6,410	1	6,140	20	6,650	31	5,380	19	5,580	30	6,770
26	6,480	9	6,160		May	8	5,510	27	4,440		September	26	5,660		December
	February	16	8,020	4	6,040	15	5,760		August	7	5,620		November	7	5,840
2	4,370	23	6,780	11	6,640	22	6,160	3	5,210	15	5,410	2	6,370	14	6,210
9	6,010	30	6,640	18	7,040	29	6,180	10	5,520	21	4,310	9	7,480	21	6,420
16	6,960									28	4,720			28	6,400



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 1983.

REMARKS: Storage began in Morena Reservoir March 1910. Reservoir capacity and area ratings date from 1910 when Morena Dam was completed. Records for 1983 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 m³). 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: Maximum monthly inflow since 1937, 45,274 acre-feet (55,845,000 m³), March 1983. Prior to 1937, maximum monthly inflow, 37,200 acre-feet (45,886,000 m³), January 1916; minimum no flow during parts of many years.

Monthly Discharge in Acre-Feet

Month	Current Year 1983	Period 1937-1983		
		Average	Maximum	Minimum
January	3,151	678	7,472	0
February	14,336	2,133	33,569	8.0
March	45,274	3,221	45,274	19.3
April	23,130	1,814	23,130	3.3
May	15,113	924	15,113	0
June	8,247	482	8,247	0
July	6,203	305	6,203	0
August	7,228	260	7,228	0
September	5,133	181	5,133	0
October	3,905	153	3,905	0
November	4,567	254	4,567	0
December	7,679	691	7,679	4.4
Yearly	143,966	11,096	143,966	121
	Thousands of Cubic Meters			
	177,579	13,687	177,579	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 1983.

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, 45,088 acre-feet (55,615,000 m³) March 1983. Prior to 1937, maximum monthly discharge, 21,400 acre-feet (26,397,000 m³), February 1916; minimum, no flow during several months of various years.

Monthly Discharge in Acre-Feet

Month	Current Year 1983	Period 1937-1983		
		Average	Maximum	Minimum
January	1,530	141	1,700	0
February	13,841	908	15,926	0
March	45,088	1,856	45,088	0
April	22,829	1,446	22,829	0
May	14,674	737	14,674	0
June	7,507	522	7,507	0
July	5,056	306	5,056	0
August	6,435	288	6,435	0
September	4,341	339	5,880	0
October	3,761	169	3,761	0
November	4,111	199	4,111	0
December	7,377	428	7,377	0
Yearly	136,550	7,339	136,550	0
	Thousands of Cubic Meters			
	168,432	9,053	168,432	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 1983. 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 m³). Capacity at spillway crest (gage height 160.88 feet (49.04 m)) is 37,950 acre-feet (46,811,000 m³). Dead storage, 719 acre-feet (887,000 m³) 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 m³) February 1980. Prior to 1937, maximum monthly discharge, 54,800 acre-feet (67,595,000 m³) February 1927; minimum, no flow during several months of various years.

Monthly Discharge in Acre-Feet

Month	Current Year 1983	Period 1937-1983		
		Average	Maximum	Minimum
January	4,926	758	4,926	5.2
February	10,787	2,902	54,755	7.6
March	45,700	4,590	45,700	14.1
April	13,952	2,169	21,630	10.2
May	8,311	885	8,311	0
June	3,906	375	3,906	0
July	0	186	1,687	0
August	206	113	596	0
September	19.6	114	759	0
October	19.6	84.1	645	.1
November	728	163	1,200	0
December	253	548	5,549	1.7
Yearly	88,808	12,887	114,330	129
	Thousands of Cubic Meters			
	109,543	15,896	141,024	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 1983.

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 m³/sec) on March 15, 1954; minimum discharge, no flow for long periods on many occasions.

Mean Daily Discharge in Second-Feet 1983 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	11.3	27.5	0	0	0	18.5	28.4	28.0	27.1	0	21.6
2	0	11.3	0	0	0	0	18.5	32.6	28.0	26.9	0	21.6
3	0	11.3	0	0	0	0	18.5	32.0	27.8	26.9	0	21.6
4	0	11.3	0	0	0	0	18.5	32.0	27.5	26.9	0	21.4
5	0	11.3	0	0	0	0	18.5	32.0	27.5	26.9	0	21.4
6	0	11.3	0	0	0	0	18.5	32.0	27.5	26.9	0	26.5
7	0	11.3	0	0	0	0	18.5	32.0	27.5	26.9	0	26.5
8	0	11.3	0	0	0	0	23.5	32.0	27.3	26.9	0	26.3
9	0	11.3	0	0	0	0	23.5	32.6	27.3	26.9	0	26.3
10	0	11.1	0	0	0	0	23.5	33.0	27.3	26.9	0	26.3
11	0	14.1	0	0	0	0	23.7	33.4	27.3	26.9	0	26.3
12	0	17.5	0	0	0	0	23.7	33.9	27.3	26.9	0	26.3
13	0	21.0	0	0	0	0	23.9	34.8	27.3	26.9	0	26.3
14	0	23.9	0	0	0	0	24.1	34.5	27.3	26.9	0	26.3
15	0	27.5	0	0	0	0	24.3	34.8	27.3	26.9	0	26.3
16	0	27.5	0	0	0	0	24.5	35.2	27.3	26.9	0	26.3
17	0	27.3	0	0	0	0	24.9	35.4	27.3	26.9	0	26.3
18	0	27.3	0	0	0	0	25.1	20.8	27.3	26.9	7.2	26.3
19	0	27.3	0	0	0	0	25.5	21.2	27.3	26.9	15.3	26.3
20	0	27.3	0	0	0	0	24.9	21.2	27.3	26.7	21.6	26.3
21	0	27.3	0	0	0	0	25.1	21.4	27.3	26.7	21.6	26.3
22	0	27.3	0	0	0	0	25.3	21.4	27.3	26.7	21.6	26.5
23	0	27.3	0	0	0	14.4	25.5	24.7	27.3	26.7	21.6	26.5
24	0	27.3	0	0	0	14.4	25.7	28.6	27.1	26.7	21.6	26.5
25	0	27.3	0	0	0	14.4	26.5	28.6	27.1	26.7	22.1	26.9
26	0	27.3	0	0	0	14.3	24.9	28.6	27.1	0	21.6	26.9
27	8.7	27.3	0	0	0	14.3	24.5	28.6	27.1	0	21.6	26.9
28	8.6	27.5	0	0	0	14.3	24.3	28.4	27.1	0	21.6	26.7
29	11.4	0	0	0	0	14.3	24.3	28.4	27.1	0	21.6	26.9
30	11.3	0	0	0	0	14.3	24.3	28.4	27.1	0	21.6	26.7
31	11.3	0	0	0	0	0	28.4	28.2	0	0	0	26.7
Sum	51.3	572.1	27.5	0	0	114.7	723.4	919.1	820.3	671.5	260.6	796.0
Current Year 1983									Period 1937-1983			
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.			29	11.4	1	0	1.7	102	346	2,350	0	
Feb.			15	27.5	10	11.1	20.4	1,135	371	2,130	0	
Mar.			1	27.5	1	2	.9	54.5	510	2,330	0	
Apr.				0	0	0	0	0	768	2,860	0	
May				0	0	0	0	0	889	3,040	0	
June			123	14.4	1	1	3.8	228	947	2,920	0	
July			31	28.4	1	1	18.5	23.3	1,435	805	2,920	0
Aug.			17	35.4	18	20.8	29.6	1,823	759	2,820	0	
Sept.			1	28.0	124	27.1	27.3	1,627	558	2,320	0	
Oct.			1	27.1	126	0	21.7	1,332	458	2,450	0	
Nov.			25	22.1	1	1	8.7	517	496	2,760	0	
Dec.			125	26.9	1	4	21.4	25.7	1,579	457	2,305	0
Yearly				35.4		0	13.6	9,832	7,364	27,170	0	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
				1.00		0	0.39	12,128	9,083	33,514	0	

‡ Mean daily

! And other days

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, January to May of 1980, April, December 1982, and the entire year of 1983. 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 1983. 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, 90,618 acre-feet (111,775,000 m³) March 1983. Prior to 1937, maximum monthly discharge 38,400 acre-feet (47,366,000 m³) February 1927; minimum, no flow during several months of various years.

Monthly Discharge in Acre-Foot

Month	Current Year 1983	Period 1937-1983		
		Average	Maximum	Minimum
January	6,048	143	6,048	0
February	23,006	2,007	70,318	0
March	90,618	3,859	90,618	0
April	36,820	2,202	36,820	0
May	22,933	933	22,933	0
June	10,947	425	10,947	0
July	3,039	158	4,306	0
August	3,410	107	3,410	0
September	106	9.7	298	0
October	28.8	4.2	123	0
November	4,135	89.1	4,135	0
December	4,911	137.1	4,911	0
Yearly	206,002	10,074	206,002	0
	Thousands of Cubic Meters			
	254,099	12,426	254,099	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 1983.

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 1983 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 m³/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 1983 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	31.0	19.0	890	707	656	147	33.0	0.24	3.20	1.50	0.33	14.0
2	29.0	388	4,320	649	624	144	31.0	.21	2.50	1.30	.55	30.0
3	30.0	1,200	5,530	597	531	144	26.0	.21	2.10	1.10	2.60	32.0
4	31.0	915	4,050	544	471	146	23.0	.19	1.90	1.00	3.70	42.0
5	31.0	784	2,760	503	426	146	25.0	.17	1.70	.95	4.90	43.0
6	30.0	799	1,810	473	395	147	24.0	.20	1.30	.69	6.20	39.0
7	30.0	870	1,240	433	383	142	21.0	.22	.98	.66	8.80	36.0
8	30.0	1,150	884	403	361	139	17.0	.35	.75	.46	12.0	32.0
9	30.0	949	698	381	343	134	16.0	.47	.95	.42	16.0	31.0
10	29.0	694	562	377	328	130	13.0	2.80	.87	.35	14.0	32.0
11	32.0	551	477	447	312	127	12.0	17.0	.56	.28	13.0	28.0
12	30.0	453	411	529	298	121	12.0	16.0	.36	.18	14.0	24.0
13	29.0	373	357	624	287	117	11.0	13.0	.28	.21	24.0	25.0
14	29.0	316	359	606	283	116	10.0	8.60	.20	.24	27.0	20.0
15	26.0	268	344	529	275	100	7.20	7.90	.23	.29	28.0	22.0
16	24.0	237	299	452	265	92.0	5.50	21.0	.16	.30	25.0	25.0
17	23.0	213	340	388	257	85.0	4.50	67.0	.16	.35	22.0	21.0
18	23.0	192	755	414	246	82.0	3.80	171	.13	.33	16.0	17.0
19	22.0	169	1,560	451	232	76.0	2.80	120	.11	.29	15.0	17.0
20	25.0	152	1,030	461	222	72.0	2.20	83.0	.22	.28	16.0	21.0
21	24.0	134	1,210	762	214	68.0	1.70	58.0	.23	.26	38.0	22.0
22	22.0	120	1,360	784	203	62.0	1.20	38.0	.18	.21	55.0	20.0
23	23.0	111	1,330	635	200	53.0	.95	27.0	.15	.18	41.0	21.0
24	25.0	163	2,530	548	194	48.0	.76	21.0	.12	.19	28.0	22.0
25	25.0	361	2,680	497	185	43.0	.64	18.0	.11	.16	30.0	36.0
26	23.0	239	1,760	467	177	41.0	.54	18.0	.11	.10	32.0	126
27	96.0	437	1,360	444	174	39.0	.48	12.0	.08	.13	24.0	146
28	398	1,050	1,130	426	163	37.0	.43	9.40	.13	.15	19.0	135
29	178		986	446	160	36.0	.36	7.10	.15	.22	15.0	96.0
30	75.0		867	630	153	36.0	.31	5.30	.47	.25	12.0	68.0
31	19.0		784		149		.27	4.00		.29		52.0
Sum		13,357.0		15,607		2,871.0		747.36		13.32		1,295.0
	1,472.0		44,723		9,172		307.64		20.29		563.08	
Current Year 1983								Period 1937-1983				
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.			28	398	31	19.0	47.5	2,920	504	11,918	0	
Feb.			3	1,200	1	19.0	477	26,493	2,601	69,019	0	
Mar.			3	5,530	16	299	1,440	83,707	4,205	88,707	0	
Apr.			22	784	10	377	520	30,956	2,528	40,240	0	
May			1	656	31	149	296	18,192	913	18,192	0	
June			1	147	129	36.0	95.7	5,695	303	5,919	0	
July			1	33.0	31	.27	9.9	610	81.0	2,918	0	
Aug.			18	171	5	.17	24.1	1,482	63.7	1,500	0	
Sept.			1	3.20	27	.08	.68	40.2	16.1	645	0	
Oct.			1	1.50	26	.10	.43	26.4	8.6	236	0	
Nov.			22	55.0	1	.33	18.3	1,117	45.3	1,117	0	
Dec.			27	146	1	14.0	41.8	2,559	181	2,569	0	
Yearly	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
				5,530		0.08	247	178,808	11,450	178,908	0	
			157		0	7.0	220,558	14,123	220,558	0		

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 1983.

REMARKS: Campo Creek originates in the United States and flows southwestward into Mexico where it joins Teacote 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, 895 second-feet (25.3 m³/sec), March 24, 1983 (gage height 5.39 feet (1.64 m) present datum), from rating curve extended above 110 second-feet (3.12 m³/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 1983 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	7.5	11.0	68.0	150	118	34.0	27.0	23.0	21.0	17.0	14.0	29.0
2	7.9	64.0	399	145	112	39.0	28.0	24.0	20.0	15.0	14.0	27.0
3	7.8	72.0	347	140	107	38.0	26.0	26.0	19.0	15.0	12.0	28.0
4	7.7	35.0	305	135	95.0	36.0	25.0	24.0	18.0	18.0	11.0	29.0
5	7.5	30.0	179	130	90.0	34.0	24.0	26.0	16.0	18.0	12.0	24.0
6	7.3	33.0	121	125	80.0	35.0	24.0	28.0	18.0	14.0	14.0	22.0
7	7.2	31.0	75.0	125	75.0	34.0	23.0	30.0	21.0	20.0	14.0	24.0
8	6.8	39.0	49.0	120	70.0	32.0	21.0	32.0	19.0	23.0	14.0	21.0
9	6.8	29.0	45.0	115	65.0	31.0	21.0	31.0	17.0	19.0	15.0	20.0
10	6.4	27.0	65.0	110	60.0	32.0	21.0	30.0	16.0	15.0	15.0	23.0
11	6.0	22.0	76.0	140	55.0	33.0	20.0	29.0	17.0	14.0	16.0	22.0
12	6.0	19.0	66.0	165	48.0	34.0	18.0	32.0	17.0	14.0	18.0	21.0
13	6.1	19.0	59.0	150	47.0	33.0	17.0	32.0	15.0	15.0	19.0	22.0
14	6.4	17.0	69.0	135	44.0	29.0	17.0	36.0	16.0	13.0	21.0	24.0
15	6.7	16.0	60.0	120	40.0	28.0	18.0	40.0	15.0	12.0	21.0	23.0
16	6.8	16.0	61.0	110	39.0	29.0	16.0	44.0	14.0	13.0	21.0	26.0
17	7.2	15.0	72.0	100	35.0	28.0	16.0	60.0	16.0	15.0	21.0	27.0
18	7.3	15.0	115	90.0	32.0	28.0	16.0	32.0	14.0	15.0	21.0	27.0
19	8.6	15.0	79.0	81.0	31.0	29.0	15.0	21.0	14.0	13.0	22.0	26.0
20	8.8	14.0	70.0	93.0	28.0	27.0	15.0	20.0	19.0	14.0	25.0	27.0
21	7.9	15.0	130	122	28.0	26.0	15.0	17.0	17.0	13.0	32.0	27.0
22	7.7	15.0	138	103	31.0	26.0	17.0	16.0	18.0	11.0	30.0	26.0
23	8.1	15.0	192	97.0	31.0	26.0	18.0	16.0	16.0	12.0	28.0	26.0
24	8.2	36.0	454	99.0	30.0	27.0	19.0	16.0	13.0	11.0	29.0	26.0
25	9.9	39.0	282	100	31.0	30.0	19.0	18.0	13.0	11.0	31.0	44.0
26	8.7	23.0	240	110	32.0	29.0	20.0	15.0	15.0	12.0	28.0	34.0
27	20.0	34.0	210	120	33.0	26.0	20.0	18.0	14.0	13.0	26.0	30.0
28	21.0	81.0	200	124	31.0	27.0	21.0	19.0	16.0	12.0	27.0	28.0
29	32.0		180	129	33.0	26.0	23.0	21.0	16.0	12.0	26.0	25.0
30	16.0		170	149	33.0	27.0	23.0	22.0	16.0	12.0	25.0	21.0
31	12.0		160		33.0		20.0	23.0		12.0		19.0
Sum	294.3	797.0	4,736.0	3,632.0	1,617.0	913.0	623.0	821.0	496.0	443.0	622.0	798.0
Current Year 1983								Period 1937-1983				
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total	Acre-Feet			
	High	Low	Day	High	Day	Low	Acre-Feet	Average	Maximum	Minimum		
Jan.			29	32.0	111	6.0	9.5	584	154	906	0	
Feb.			28	81.0	1	11.0	28.5	1,581	346	4,287	0	
Mar.			24	454	9	45.0	153	9,394	640	9,394	0	
Apr.			12	165	19	81.0	121	7,204	441	7,204	0	
May			1	118	120	28.0	52.2	3,207	209	3,207	0	
June			2	39.0	121	26.0	30.4	1,811	101	1,811	0	
July			2	28.0	119	15.0	20.1	1,236	57.8	1,236	0	
Aug.			17	60.0	26	15.0	26.5	1,628	57.3	1,628	0	
Sept.			1	21.0	124	13.0	16.5	984	41.5	984	0	
Oct.			8	23.0	122	11.0	14.3	879	48.2	879	0	
Nov.			21	32.0	4	11.0	20.7	1,234	78.4	1,234	0	
Dec.			25	44.0	31	19.0	25.7	1,583	145	1,583	0	
Yearly	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
				12.9	0.17	1.2	38,639	2,860	38,725	0		

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 1983.

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, 13,600 second-feet (385 m³/sec), March 3, 1983 (gage height 7.03 feet); (2.14 m); 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 1983 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	49.0	23.0	1,590	1,100	682	205	86.0	49.0	33.0	28.0	31.0	82.0
2	45.0	450	7,830	1,000	653	199	82.0	50.0	31.0	23.0	30.0	119
3	43.0	1,500	6,340	900	517	197	78.0	51.0	29.0	23.0	36.0	106
4	41.0	1,100	5,230	850	473	196	76.0	53.0	25.0	19.0	33.0	130
5	40.0	900	3,500	800	439	197	73.0	58.0	23.0	20.0	36.0	109
6	38.0	1,000	1,970	750	419	192	70.0	58.0	21.0	20.0	34.0	85.0
7	38.0	1,100	1,210	700	411	186	67.0	64.0	21.0	37.0	36.0	73.0
8	41.0	1,400	1,060	650	397	180	61.0	67.0	19.0	40.0	35.0	65.0
9	42.0	1,100	1,070	615	377	175	53.0	78.0	18.0	29.0	32.0	64.0
10	38.0	593	1,010	618	363	169	49.0	69.0	16.0	26.0	31.0	65.0
11	44.0	494	920	711	348	163	47.0	93.0	15.0	24.0	34.0	64.0
12	40.0	390	711	743	331	156	50.0	93.0	14.0	22.0	45.0	64.0
13	38.0	334	681	684	324	160	49.0	88.0	14.0	21.0	58.0	63.0
14	34.0	308	714	686	321	164	50.0	81.0	14.0	24.0	62.0	63.0
15	32.0	295	677	625	315	150	50.0	89.0	14.0	24.0	61.0	62.0
16	30.0	237	611	577	306	135	51.0	117	14.0	26.0	58.0	61.0
17	28.0	206	681	550	295	128	52.0	213	17.0	28.0	52.0	60.0
18	28.0	183	1,340	642	296	122	50.0	359	16.0	28.0	52.0	59.0
19	26.0	166	2,400	602	293	117	50.0	210	17.0	27.0	49.0	61.0
20	30.0	170	1,700	629	286	113	50.0	147	19.0	26.0	68.0	60.0
21	28.0	168	1,900	895	279	108	48.0	114	20.0	26.0	139	61.0
22	26.0	165	2,100	839	274	102	49.0	94.0	18.0	27.0	125	58.0
23	27.0	176	2,500	630	269	93.0	51.0	80.0	18.0	30.0	98.0	58.0
24	29.0	249	4,000	620	266	88.0	51.0	68.0	17.0	29.0	78.0	62.0
25	30.0	568	4,300	586	258	82.0	52.0	61.0	18.0	30.0	109	179
26	29.0	479	3,000	563	250	95.0	52.0	56.0	18.0	23.0	96.0	202
27	150	796	2,200	539	247	96.0	55.0	50.0	18.0	21.0	80.0	246
28	500	1,830	1,800	510	234	95.0	52.0	45.0	19.0	28.0	72.0	226
29	250		1,500	552	222	94.0	52.0	41.0	20.0	30.0	65.0	148
30	90.0		1,400	711	213	92.0	56.0	39.0	21.0	30.0	64.0	103
31	23.0		1,200		207		51.0	35.0		31.0		86.0
Sum	1,927.0	16,370.0	67,145	20,877	10,565	4,249.0	1,763.0	2,770.0	577.0	820.0	1,799.0	2,944.0
Current Year 1983									Period 1937-1983			
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.			28	500	31	23.0	62.2	3,822	960	20,792	0	
Feb.			28	1,830	1	23.0	585	32,469	4,775	143,486	0	
Mar.			2	7,830	16	611	2,170	133,180	7,238	133,180	0	
Apr.			1	1,100	28	510	696	41,409	3,459	51,060	0	
May			1	632	31	207	341	20,955	1,178	20,955	0	
June			1	205	25	32.0	142	8,428	416	8,428	0	
July			1	86.0	11	47.0	56.9	3,497	162	3,497	0	
Aug.			18	359	31	35.0	89.4	5,494	160	5,494	0	
Sept.			8	33.0	112	14.0	19.2	1,144	51.3	1,144	0	
Oct.			8	40.0	4	19.0	26.5	1,626	70.1	1,626	0	
Nov.			21	139	2	30.0	60.0	3,568	154	3,568	0	
Dec.			27	246	122	53.0	95.0	5,839	484	5,839	0	
				7,330		14.0	351	261,431	19,107	288,517	0	
Yearly	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
			222		0.40	10.2		322,473	23,568	355,880	0	

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 de 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 1983. 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 74,885 acre-feet (92,370,000 m³); at top of spillway gates 111,880 acre-feet (138,000,000 m³).
EXTREMES: Maximum monthly inflow, 157,453 acre-feet (194,216,000 m³); February 1980; minimum, no flow during part of most years.

Monthly Discharge in Acre-Feet

Month	Current Year 1983			Period 1938-1983		
	Natural Inflow	Otay Aqueduct	Total	Average	Maximum	Minimum
January	3,912	0	3,912	2,189	54,820	0
February	30,415	0	30,415	6,484	157,453	5.8
March	139,893	0	139,893	11,163	139,893	4.2
April	23,895	0	23,895	3,522	77,790	0
May	4,723	0	4,723	681	11,460	0
June	2,314	0	2,314	212	4,661	0
July	0	0	0	99.7	1,464	0
August	31.2	0	31.2	62.4	770	0
September	28.0	0	28.0	59.6	466	0
October	49.2	0	49.2	69.8	344	0
November	132	0	132	165	1,940	0
December	113	0	113	911	15,686	8.4
Yearly	295,507	0	295,507	25,621	309,298	254
	Thousands of Cubic Meters					
	253,490	0	253,490	31,603	381,515	313

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 (Foblado 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 1983 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 1983.

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 m³), July 1944; minimum, no flow March and April 1941, August 1960, and December 1962.

Monthly Discharge in Acre-Feet

Month	Current Year 1983	Period 1938-1983		
		Average	Maximum	Minimum
January	1,088	268	1,088	1.5
February	968	281	1,132	.8
March	1,052	336	1,223	0
April	1,090	444	1,602	0
May	1,199	582	1,676	1.8
June	1,135	665	1,857	1.9
July	1,156	705	1,963	1.9
August	1,304	640	1,859	0
September	1,292	542	1,420	1.9
October	1,247	477	1,247	1.9
November	1,173	386	1,173	1.9
December	1,208	351	1,208	0
Yearly	13,913	5,674	15,317	29.3
	Thousands of Cubic Meters			
	17,161	6,999	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. Gage was silted in and inoperable from May 28 to August 1 and August 10 to October 26, 1983.

RECORDS: Based on current meter measurements, staff gage readings and record of gage heights. Records obtained and furnished by the United States Section of the Commission. Records available: May 1947 through 1983.

EXTREMES: Since May 1947: Maximum instantaneous discharge, 33,100 second-feet (937 m³/sec), February 21, 1980; minimum discharge, no flow during many years since 1951.

Mean Daily Discharge in Second-Feet 1983 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	49.1	228	2,400	1,230	1,550	232 *	* 85.8	299 *	▫ 27.9	▫ 17.2	20.2	67.9
2	45.0	1,210	18,400	1,940	1,430	220 *	* 83.6	299	▫ 21.9	▫ 17.3	23.1	103
3	38.6	1,480	24,600	2,060	1,050	220 *	* 83.6	299	▫ 21.3	▫ 17.4	23.0	119
4	35.4	772	11,900	1,670	1,000	218 *	* 81.3	302	▫ 20.7	▫ 17.5	26.8	110
5	34.0	483	11,800	1,440	916	216 *	* 78.2	493	▫ 20.1	▫ 17.6	27.1	105
6	32.3	445	8,290	1,230	878	211 *	* 78.2	513	▫ 19.6	▫ 17.7	36.6	90.7
7	31.7	488	4,800	1,050	846	209 *	* 77.1	490	▫ 19.0	▫ 81.1	32.4	77.5
8	31.1	1,010	3,620	983	805	198 *	* 76.1	462	▫ 18.4	▫ 30.0	29.4	71.2
9	31.1	1,340	1,480	983	763	196 *	* 73.1	380	▫ 17.8	▫ 20.0	30.6	66.7
10	29.4	1,480	1,300	983	743	190 *	* 72.0	306 *	▫ 16.5	▫ 19.0	30.6	65.0
11	25.9	1,010	1,220	1,000	725	188 *	* 69.0	231	▫ 15.3	▫ 18.8	30.6	65.0
12	27.2	673	1,170	1,110	699	182 *	* 66.1	157 *	▫ 14.0	▫ 18.7	37.5	63.3
13	25.1	564	1,140	942	676	177 *	* 61.2	130 *	▫ 12.7	▫ 18.6	57.0	61.5
14	25.6	516	1,120	659	670	171 *	* 52.6	125 *	▫ 11.4	▫ 18.5	74.0	58.1
15	25.1	458	1,120	611	656	166 *	* 44.1	803	▫ 10.2	▫ 18.5	81.9	58.1
16	26.2	404	1,100	611	648	159 *	* 35.0	474	▫ 8.9	▫ 18.4	66.6	57.3
17	24.1	360	1,090	587	614	154 *	* 35.0	485 *	▫ 10.2	▫ 18.4	59.8	56.7
18	22.7	328	1,400	635	598	148 *	* 26.6	522	▫ 11.6	▫ 18.3	58.1	56.7
19	27.2	302	2,960	622	588	144 *	* 26.6	562	▫ 13.0	▫ 18.2	63.8	56.7
20	30.9	297	3,110	741	565	138 *	* 22.8	334	▫ 14.3	▫ 18.2	112	56.7
21	32.8	286 *	3,650	847	580	136 *	* 19.0	208	▫ 15.6	▫ 18.1	167	56.4
22	29.4	275 *	4,040	1,100	546	130 *	* 19.0	163	▫ 17.0	▫ 17.4	191	54.0
23	29.4	273 *	3,850	1,370	534	126 *	* 19.0	107	▫ 17.0	▫ 16.6	129	55.3
24	29.8	445	4,320	983	532	122 *	* 15.6	▫ 78.6	▫ 17.0	▫ 15.9	95.0	74.7
25	35.4	533	9,290	942	509	118 *	* 27.4	▫ 72.2	▫ 17.0	▫ 15.1	214	159
26	39.2	487	7,440	942	506	113 *	* 587	▫ 71.3	▫ 16.9	▫ 14.4	115	323
27	92.3	647	4,140	1,020	498	109 *	* 572	▫ 67.2	▫ 16.9	▫ 14.4	117	315
28	169	1,280	2,060	1,070	449 *	105 *	* 544	▫ 56.7	▫ 16.9	▫ 14.4	102	296
29	720		2,300	1,070	350 *	* 99.6	511	▫ 48.1	▫ 17.0	▫ 14.4	87.6	239
30	523		1,540	1,300	292 *	* 92.8	481	▫ 45.6	▫ 17.1	▫ 21.4	67.0	185
31	322		1,320		261 *		390	▫ 33.3		▫ 22.2		157
Sum	2,640.0	18,074	147,970	31,731	21,477	4,888.4	4,659.6	8,617.0	493.2	623.7	2,206.7	3,380.5
Current Year 1983										Period 1947-1983		
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.	43.72	40.34	29	3,900	18	22.3	85.2	5,236	2,824	72,441	0	
Feb.	43.95	41.27	2	5,580	2	190	646	35,849	10,141	315,328	0	
Mar.	46.98	43.03	3	27,700	17	1,050	4,770	293,494	13,875	293,494	0	
Apr.	43.86	43.06	2	3,370	17	575	1,060	62,938	3,584	62,938	0	
May	43.45	* 41.80	1	1,900	31	* 247	693	42,599	1,979	42,599	0	
June	* 41.80	* 41.17	1	* 247	30	* 90.4	163	9,696	519	9,696	0	
July			26	▫ 587	24	▫ 15.6	150	9,242	366	9,242	0	
Aug.			15	▫ 803	31	▫ 33.3	278	17,092	541	17,092	0	
Sept.			1	▫ 27.9	16	▫ 8.9	16.4	978	74.4	978	0	
Oct.		39.14	7	* 81.1	26	▫ 13.3	20.1	1,237	87.0	1,237	0	
Nov.	41.31	39.18	25	778	12	17.8	73.6	4,377	250	4,377	0	
Dec.	40.60	39.42	26	414	121	54.0	109	6,705	501	6,705	0	
Yearly	46.98			27,700		▫ 8.9	676	489,443	34,741	595,739	0	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	14.32			784		0.25	19.1	603,723	42,853	734,838	0	

* Partly estimated

▫ Estimated

! 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 and the U. S. Geological Survey. 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)	
	1983	Average 1937-1983	1983	Average 1937-1983	1983	Average 1937-1983	1983	Average 1937-1983
Jan.	50,693	16,514	38,322	12,307	69,753	32,007	158,768	60,828
Feb.	51,119	17,645	38,747	13,666	91,688	33,432	181,554	64,743
Mar.	51,180	18,873	38,747	15,657	105,139	37,978	195,066	72,508
Apr.	50,518	19,013	38,518	16,196	112,272	38,314	201,308	73,523
May	50,663	18,900	38,256	15,775	105,276	37,943	194,195	72,618
June	50,510	18,478	38,126	15,032	104,731	36,918	193,367	70,428
July	50,434	18,029	37,931	14,260	90,131	35,546	178,496	67,835
Aug.	50,480	17,607	37,987	13,503	74,749	34,210	163,216	65,320
Sept.	50,465	17,129	37,656	13,127	73,523	33,312	161,644	63,568
Oct.	50,206	16,849	37,987	12,740	73,898	32,572	162,091	62,161
Nov.	50,556	16,770	38,060	12,413	75,328	32,078	163,944	61,261
Dec.	50,739	16,936	38,126	12,711	79,274	32,458	168,139	62,105
Average	50,630	17,729	38,205	13,949	87,980	34,731	176,815	66,409
Maximum	51,180	! # 61,670	38,747	! # 45,920	112,272	! 112,272	201,308	! 213,600
Minimum	50,206	!! 10	37,656	!! 106	69,753	!! 0	158,768	!! 1,264

- # March 31, 1941- Prior to removal of spillway gates
 * April 30, 1937 - Sandbags were placed on crest of spillway
 ! Maximum end of month storage for period of record
 !! Minimum end of month storage for period of record

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	
	1983	Average 1906-1983	1983	Average 1907-1983	1983	Average 1951-1983	1983	Average 1914-1983	1983	Average 1950-1983
Jan.	3.18	3.85	3.68	3.49	2.80	2.97	3.05	3.48	3.92	3.53
Feb.	6.31	3.81	6.51	3.47	5.70	2.31	6.62	3.70	7.93	3.07
Mar.	10.69	3.58	11.41	3.23	10.90	3.00	10.43	3.28	12.28	3.54
Apr.	3.41	1.73	3.06	1.57	1.90	1.32	3.45	1.78	3.34	1.64
May	1.62	.63	.56	.56	.10	.39	.30	.62	.23	.44
June	0	.13	0	.06	0	.06	0	.09	0	.05
July	.20	.34	0	.10	0	.03	0	.18	0	.45
Aug.	2.77	.54	3.05	.24	.10	.13	1.21	.21	2.72	.76
Sept.	.21	.38	.29	.26	.20	.27	.52	.29	.32	.42
Oct.	1.11	.86	.29	.69	.50	.40	.38	.72	.51	.51
Nov.	2.42	1.60	2.90	1.42	3.20	1.53	3.98	1.56	3.04	1.76
Dec.	5.53	3.18	3.74	2.83	2.60	2.10	4.13	3.04	2.94	2.47
Yearly	37.45	20.63	35.49	17.92	28.00	14.51	34.07	18.95	37.23	18.64

Month	Campo, California		Chula Vista, California		Lower Otay Dam, California		Brown Field, California			
	1983	Average 1900-1983	1983	Average 1930-1983	1983	Average 1906-1983	1983	Average 1964-1983		
Jan.	2.23	3.07	1.90	1.87	1.94	2.22	1.96	1.90		
Feb.	4.82	3.27	3.92	1.71	2.91	1.55	3.96	1.49		
Mar.	9.92	2.87	7.39	1.76	8.03	2.31	7.29	2.33		
Apr.	2.23	1.43	1.80	.83	2.14	1.10	2.31	1.06		
May	.19	.51	T	.23	.05	.30	0	.22		
June	0	.06	.01	.05	.05	.07	.02	.07		
July	.01	.49	0	.02	0	.03	0	.04		
Aug.	4.05	.53	.08	.09	.52	.12	.05	.13		
Sept.	.68	.34	.03	.17	.53	.22	.32	.17		
Oct.	1.16	.63	.31	.40	.38	.33	.37	.31		
Nov.	2.45	1.39	1.95	1.08	1.73	1.30	1.54	1.47		
Dec.	3.20	2.48	1.72	1.58	1.67	1.46	1.22	1.60		
Yearly	30.94	17.07	19.11	9.79	19.95	11.01	19.04	10.79		

In Mexico

Month	La Rumorosa, Baja California		Valle Redondo, Baja California		Tecate, Baja California		Tijuana, Baja California		Rodriguez Dam, Baja California	
	1983	Average 1945-1983	1983	Average 1971-1983	1983	Average 1945-1959 1961-1983	1983	Average 1948-1959 1961-1982	1983	Average 1938-1993
Jan.	1.10	0.98	1.25	2.83	2.36	2.76	1.38	1.81	1.30	1.65
Feb.	1.81	.59	5.12	2.64	5.79	1.93	3.66	1.54	3.62	1.46
Mar.	7.87	.75	6.59	2.95	9.53	2.60	6.50	1.73	6.65	1.69
Apr.	1.61	.31	2.05	.98	2.91	1.14	1.54	.67	1.97	.75
May	0	.12	0	.31	.31	.31	.20	.04	.04	.16
June	0	.04	0	.04	T	.12	.04	.04	.04	.04
July	0	.28	0	.04	0	.08	0	.04	0	T
Aug.	2.17	.75	.79	.20	2.52	.24	.16	.04	.31	.12
Sept.	.91	.35	.31	.35	.31	.12	.12	.16	.28	.24
Oct.	0	.39	.63	.59	.59	.35	.39	.31	.55	.31
Nov.	.35	.51	2.24	1.73	3.03	1.38	1.38	1.05	1.42	.94
Dec.	.39	.75	2.28	1.54	3.70	2.09	1.42	1.26	1.22	1.46
Yearly	16.22	5.63	21.38	14.06	31.06	13.86		8.66	17.40	8.78

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		El Hongo, Baja California	
	1983	Average 1948-1983	1983	Average 1967-1983	1983	Average 1964-1983	1983	Average 1956-1983	1983	Average 1980-1983
Jan.	2.09	1.77	1.34	2.05	2.83	3.31	2.91	2.68	2.32	2.60
Feb.	.12	1.22	3.74	1.97	6.46	3.66	5.51	2.80	4.61	2.95
Mar.	7.13	1.57	7.99	2.28	11.89	4.06	7.52	2.56	9.29	5.91
Apr.	1.97	.63	1.69	.75	4.29	1.81	1.89	.94	1.89	1.26
May	.08	.12	T	.31	.12	.43	T	.28	.08	.31
June	0	.04	T	.04	0	.04	0	.08	0	T
July	0	.04	0	0	0	.59	0	1.14	.02	.39
Aug.	3.98	.24	T	.08	6.57	1.06	6.18	1.26	3.35	1.22
Sept.	.24	.24	.35	.20	1.22	.75	2.72	.67	.59	.31
Oct.	1.10	.24	.28	.31	.94	.43	T	.59	.63	.28
Nov.	T	.83	2.20	1.10	3.58	2.09	3.03	1.57	2.52	2.01
Dec.	1.38	1.06	1.02	1.10	3.31	2.95	2.05	1.97	1.81	1.34
Yearly	18.09	7.76	18.62	10.08	41.22	21.22	31.81	17.28	27.28	19.69

Month	El Carrizo, Baja California		Belen, Baja California							
	1983	Average 1980-1983	1983	Average 1965-1983						
Jan.	1.38	2.09	1.85	2.76						
Feb.	3.39	2.05	4.80	2.80						
Mar.	7.87	5.12	9.06	3.03						
Apr.	2.32	1.18	2.40	1.22						
May	.31	.24	0	.20						
June	T	.04	0	.08						
July	0	T	0	.20						
Aug.	.75	.20	2.52	.35						
Sept.	.31	.12	.71	.43						
Oct.	.83	.31	1.10	.51						
Nov.	2.05	1.57	2.40	1.65						
Dec.	1.89	1.30	2.24	2.09						
Yearly	21.10	14.92	27.09	15.63						

T Trace

LOCATION OF RAINFALL STATIONS ON THE TIJUANA RIVER WATERSHED

The precipitation records of the stations listed alphabetically below began on the date shown and extend through 1983.

In the United States

NAME OF STATION	LATI- TUDE	LONGI- TUDE	♠ 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	LATI- TUDE	LONGI- TUDE	♠ ELEV. (FT.)	RECORD BEGAN	OBSERVER
Belen, Baja California	32° 12'	116° 29'	1,821	1965	* S. A. R. H.
El Carrizo, Baja California	32° 29'	116° 42'	1,624	1980	S. A. R. H.
El Hongo, Baja California	32° 31'	116° 18'	3,150	1980	S. A. R. H.
El Pinal, Baja California	♠ 32° 11'	♠ 116° 17'	♠ 4,429	1964	S. A. R. H.
La Rumorosa, Baja California	32° 31'	116° 04'	4,042	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'	394	1938	S. A. R. H.
San Juan de Dios, Baja California	31° 59'	116° 00'	4,199	1956	S. A. R. H.
Tecate, Baja California	32° 33'	116° 41'	1,575	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'	919	1948	S. A. R. H.
Valle Redondo, Baja California	32° 31'	116° 45'	794	1971	S. A. R. H.

♠ 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 three stations in California and at six stations in Baja California, with averages for their periods of records. 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 1983, square 3-foot by 3-foot by 18-inch deep land pan set 15 inches in ground.

2. 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 1983, square 3-foot by 3-foot by 18-inch deep land pan set 15 inches in ground.

3. Lower Otay Dam: January 1950 through 1983, square 3-foot by 3-foot by 18-inch deep land pan set 15 inches in ground.

In the United States

Month	Morena Dam, California		Barrett Dam, California		Lower Otay Dam, California			
	1983	Average 1916-1983	1983	Average 1921-1983	1983	Average 1950-1983		
Jan.	1.50	2.11	1.41	1.88	1.95	1.89		
Feb.	.22	2.15	1.13	2.19	1.12	2.27		
Mar.	.86	3.31	2.13	3.38	2.05	3.32		
Apr.	3.55	4.67	3.48	4.71	3.35	4.58		
May	5.16	6.53	5.78	6.66	5.30	6.02		
June	6.20	8.44	6.80	8.25	5.71	6.80		
July	8.51	9.73	8.28	9.80	9.05	8.39		
Aug.	5.19	8.99	6.13	9.18	7.92	7.88		
Sept.	5.61	7.17	6.13	7.50	6.60	6.47		
Oct.	2.82	5.04	4.08	5.28	3.96	4.71		
Nov.	.74	3.29	2.10	3.29	2.94	2.84		
Dec.	.82	2.36	.88	2.04	1.85	2.15		
Yearly	41.18	63.79	48.33	64.16	51.80	57.32		

In Mexico

Month	Rodriguez Dam, Baja California		Valle de las Palmas, Baja California		San Juan de Dios, Baja California		Valle Redondo, Baja California		El Carrizo, Baja California		Belen, Baja California	
	1983	Average 1939-1942 1946-1983	1983	Average 1952-1983	1983	Average 1956-1983	1983	Average 1976-1983	1983	Average 1980-1983	1983	Average 1974-1983
Jan.	3.58	4.33	4.17	3.50	*	2.68	3.11	3.31	5.04	4.76	3.11	2.44
Feb.	1.57	4.53	2.36	3.46	*	2.83	2.28	2.99	2.83	4.13	2.32	2.87
Mar.	2.48	4.61	3.15	4.76	*	4.13	3.27	3.70	*	4.92	3.27	3.78
Apr.	4.33	5.63	4.49	6.14	*	5.00	4.84	5.39	*	6.50	4.29	6.10
May	6.22	4.96	7.91	7.48	*	6.65	7.72	6.89	*	6.81	7.09	6.85
June	6.26	7.72	8.15	9.17	*	8.07	7.83	9.61	*	10.79	*	10.51
July	8.54	8.74	10.75	10.71	9.65	9.02	9.49	10.31	*	12.13	*	10.94
Aug.	7.56	8.03	6.81	9.72	5.12	8.07	8.46	9.69	*	10.87	*	10.51
Sept.	6.50	6.77	7.40	8.31	5.20	7.36	8.23	7.28	7.83	9.02	*	7.48
Oct.	4.92	5.67	4.76	6.14	*	5.28	5.98	5.16	5.24	8.94	*	5.63
Nov.	2.52	4.61	*	4.41	2.95	3.70	3.54	3.70	4.13	5.71	*	4.09
Dec.	1.81	3.58	1.93	3.74	*	3.23	2.48	2.76	3.19	4.61	*	3.11
Yearly	56.30	69.53		77.56		60.71	67.24	71.93		90.79		78.27

* No record

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

Month	Barrett Dam, California				Campo, California				Chula Vista, California			
	1983			Average 1931- 1983	1983			Average 1951- 1983	1983			Average 1931- 1983
	Mean	Max.	Min.		Mean	Max.	Min.		Mean	Max.	Min.	
Jan.	52.8	80	29	48.9	51.0	75	24	47.2	58.3	83	35	53.0
Feb.	52.1	78	35	50.7	49.9	80	28	48.4	57.9	76	41	54.3
Mar.	53.3	78	39	53.1	51.7	81	34	49.5	59.7	74	43	55.5
Apr.	53.9	80	35	57.4	50.6	76	27	53.1	59.5	81	43	58.0
May	62.7	90	43	62.5	60.3	98	34	58.3	63.3	86	46	60.7
June	66.4	95	49	68.3	63.3	94	35	65.0	65.4	74	54	63.2
July	75.1	106	50	76.1	70.9	104	36	73.2	69.7	85	57	67.0
Aug.	78.1	104	53	76.2	74.2	102	41	73.1	74.5	87	59	68.6
Sept.	77.2	102	56	72.4	72.5	101	46	69.0	74.5	89	61	67.4
Oct.	66.6	93	49	64.1	62.1	84	39	60.7	69.3	93	49	63.2
Nov.	56.4	85	33	55.8	52.2	94	23	52.5	61.5	81	38	58.2
Dec.	52.4	77	34	50.6	49.6	79	25	48.0	58.1	82	39	54.4
Yearly	62.2	106	29	61.3	59.0	104	23	58.2	64.3	93	35	60.3

Month	Potrero, California				Average 1975- 1983						
	1983										
	Mean	Max.	Min.								
Jan.	51.2	78	24	50.9							
Feb.	50.0	76	30	51.7							
Mar.	52.2	80	32	51.3							
Apr.	54.5	83	30	55.6							
May	63.4	104	33	60.8							
June	64.0	98	42	69.5							
July	76.6	106	40	76.5							
Aug.	79.1	106	43	75.3							
Sept.	78.7	104	52	73.2							
Oct.	68.9	91	46	65.2							
Nov.	54.7	84	23	56.5							
Dec.	51.8	73	23	52.4							
Yearly	62.1	106	24	61.6							

In Mexico

Month	La Rumorosa, Baja California				Tecate, Baja California				Tijuana, Baja California			
	1983		1946-1983		1983		1946-1983		1983		1948-1983	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	63	36	81	5	79	32	100	16	96	36	93	27
Feb.	61	23	82	10	73	34	100	18	81	43	102	32
Mar.	75	27	88	16	77	39	97	23	77	46	93	34
Apr.	66	27	91	23	81	39	100	28	84	43	97	34
May	95	34	97	27	90	41	100	36	*	*	100	43
June	90	39	113	34	97	45	106	32	*	*	108	41
July	93	50	104	39	106	45	115	36	86	59	120	46
Aug.	91	48	102	46	106	50	113	34	99	54	106	52
Sapt.	91	43	104	34	106	52	115	36	95	63	120	46
Oct.	84	39	95	25	93	43	106	27	91	57	117	41
Nov.	68	34	95	14	89	29	97	27	86	43	108	34
Dec.	64	32	84	10	81	34	97	23	82	43	99	25
Yearly	95	23	113	5	106	28	115	16			120	25

* Missing data

**TEMPERATURE IN THE TIJUANA RIVER BASIN
IN DEGREES FAHRENHEIT**

In Mexico

Month	Rodriguez Dam, Baja California				Valle de las Palmas, Baja California				P. B. Rosarito, Baja California			
	1983		1938-1983		1983		1948-1983		1983		1967-1983	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	88	37	90	27	79	30	91	12	84	37	93	36
Feb.	81	41	93	32	81	34	99	23	*	*	90	36
Mar.	77	45	90	32	81	39	100	28	75	46	90	34
Apr.	84	43	93	36	82	28	104	28	75	45	88	36
May	90	46	100	37	95	41	108	36	81	46	104	43
June	82	55	108	46	99	46	118	39	82	52	104	43
July	95	55	104	46	111	48	120	45	84	55	90	50
Aug.	106	57	106	50	108	50	111	41	93	61	93	50
Sept.	100	61	109	48	109	50	117	43	95	57	108	48
Oct.	97	54	108	34	102	46	109	32	100	57	100	43
Nov.	90	39	99	30	*	*	100	19	84	43	97	32
Dec.	82	41	93	27	81	30	95	21	75	45	90	36
Yearly	106	37	109	27			120	12			108	32

Month	El Pinal, Baja California				San Juan de Dios, Baja California				Valle Redondo, Baja California			
	1983		1964-1983		1983		1956-1983		1983		1974-1983	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	70	18	77	3	72	25	88	3	84	34	90	21
Feb.	75	28	81	14	72	28	84	16	81	39	95	23
Mar.	73	32	84	19	70	34	84	14	75	39	90	27
Apr.	73	28	84	18	72	30	102	19	82	37	95	32
May	84	34	90	25	*	*	91	19	91	43	102	39
June	79	34	99	25	84	32	106	27	95	46	113	41
July	91	39	102	32	95	36	120	36	100	52	111	48
Aug.	90	41	104	32	93	41	106	32	104	52	111	48
Sept.	91	39	102	25	90	41	106	25	113	55	115	39
Oct.	79	36	95	23	*	*	100	18	97	50	115	39
Nov.	73	28	88	14	75	21	99	12	91	34	97	28
Dec.	70	27	79	10	75	21	88	12	82	32	91	30
Yearly	91	18	104	3			120	3	113	32	115	21

Month	El Hongo, Baja California				El Carrizo, Baja California							
	1983		1981-1983		1983		1980-1983					
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.				
Jan.	66	28	70	28	81	36	81	34				
Feb.	79	32	79	25	73	39	88	39				
Mar.	79	34	79	30	73	43	92	39				
Apr.	70	32	86	32	79	39	90	39				
May	97	36	97	36	88	45	93	43				
June	91	39	100	39	88	48	106	48				
July	102	45	102	45	99	52	102	52				
Aug.	99	52	102	50	106	54	106	52				
Sept.	95	48	95	37	104	57	106	48				
Oct.	81	45	82	36	88	50	97	43				
Nov.	81	28	82	28	86	39	91	39				
Dec.	73	25	75	25	81	37	86	36				
Yearly	102	25	102	25	106	36	106	34				

* Data missing

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

1983

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.

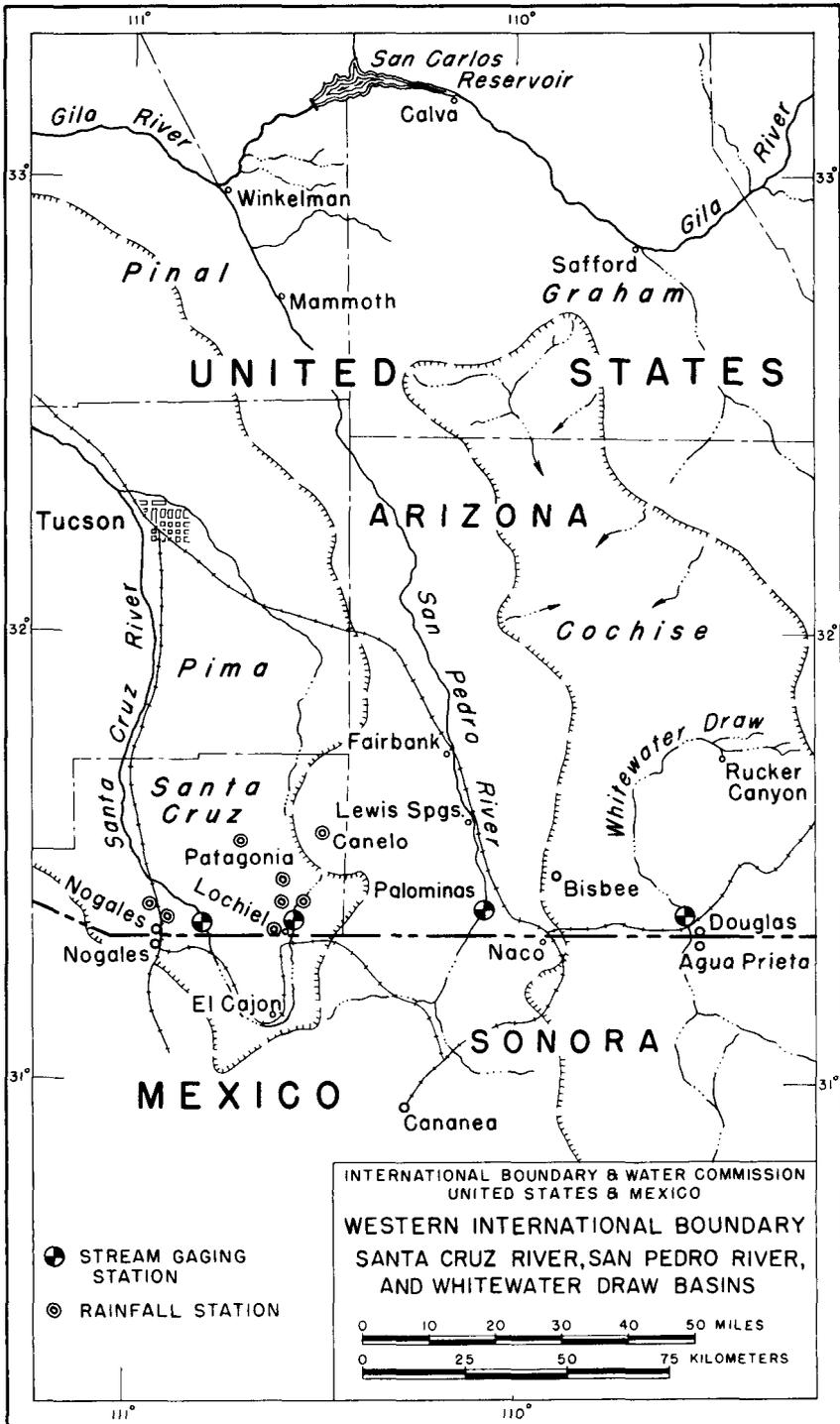
The irrigated areas, tabulated in downstream sequence, are from the most reliable sources available. Those in the United States were furnished by the Tijuana River Valley Association or estimated from aerial photographs. Those in Mexico were furnished by the Ministry of Agriculture and Hydraulic Resources of Mexico through the Mexican Section of the Commission. All irrigation in the Tijuana River basin in 1983 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 above Barrett Dam	133	0	133	0	0	0
below Barrett Dam and above Tecate Creek	247	0	247	0	0	0
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	100	0	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	(a) 545	(c) 0	545
above the Mouth	462	1,269	1,731			

(a) Data from Tijuana River Valley County Water Users Association

(b) Areas in upper valleys may be irrigated by pumping from ground water.

(c) There was no irrigation in 1983 in the Tijuana Irrigation District, Tijuana Valley, Baja California Mexico, from the Rodriguez Reservoir.



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. Section of the Commission. 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), July 1930 to December 1933, May 1935 to July 1947, October 1947 through 1983 (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 m³/sec) August 10, 1931 (gage height 12.15 feet (3.70 m)); maximum estimated discharge, 4,050 second-feet (115 m³/sec) July 27, 1919; minimum discharge, no flow for several days of many years. Since 1936: Maximum discharge, 5,060 second-feet (143 m³/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-Foot 1983 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0.1	0	0	0	0	0	0	0.3	355	1.2	0
2	0	0	0	0	0	0	0	0	0	239	.9	0
3	0	.4	0	0	0	0	0	0	0	235	1.0	.9
4	0	13.2	.3	0	0	0	0	0	0	83.4	4.1	1.0
5	0	3.1	.1	0	0	0	0	0	30.7	129	3.3	.6
6	0	.3	0	0	0	0	0	0	14.1	144	1.5	.3
7	0	.1	0	0	0	0	0	0	4.2	124	1.4	.2
8	0	0	0	0	0	0	0	0	.9	72.0	1.2	.1
9	0	0	0	0	0	0	6.6	.3	.1	29.9	1.1	.1
10	0	0	0	0	0	0	22.2	.4	14.4	12.2	1.0	0
11	0	0	0	0	0	0	1.9	0	6.0	10.3	.9	0
12	0	0	0	0	0	0	.2	0	1.1	8.2	.7	0
13	0	0	0	0	0	0	0	0	.2	6.9	.6	0
14	0	0	0	0	0	0	.2	0	0	5.8	.4	0
15	0	0	0	0	0	0	0	0	0	4.3	.2	0
16	0	0	0	0	0	0	0	44.6	0	3.9	.1	0
17	0	0	0	0	0	0	2.4	10.0	1.1	3.5	0	0
18	0	0	0	0	0	0	2.2	.2	1.7	3.1	0	0
19	0	0	0	0	0	0	.2	0	.4	2.4	0	0
20	0	0	0	0	0	0	.1	0	.1	21.6	0	0
21	0	0	0	0	0	0	6.5	0	0	4.0	0	0
22	0	0	0	0	0	0	2.1	0	0	1.6	0	0
23	0	0	0	0	0	0	23.9	0	4.7	.4	.1	0
24	0	0	0	0	0	0	48.9	3.0	12.5	.1	.1	0
25	0	0	0	0	0	0	.2	.8	1.5	0	.1	0
26	0	0	0	0	0	0	0	0	.3	0	.1	0
27	0	0	0	0	0	0	0	.1	1.4	0	0	0
28	0	0	0	0	0	0	0	0	45.7	0	0	0
29	0	0	0	0	0	0	12.1	0	83.7	0	0	0
30	0	0	0	0	0	0	.3	3.0	312	1.1	0	0
31	.6	0	0	0	0	0	0	3.0	0	1.4	0	0
Sum	0.6	17.2	0.4	0	0	0	130.0	65.4	537.1	1,502.1	20.0	3.2

Current Year 1983									Period 1936-1983		
Month	Extreme Gage Feet		Extreme Second-Foot				Average Second-Foot	Total Acre-Foot	Acre-Foot		
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.	5.00		31	1.6	1 1	0	0	1.2	36.7	451	0
Feb.	5.82		4	18.5	1 2	0	.6	34.1	18.7	132	0
Mar.	4.92		4	1.1	1 1	0	0	.8	26.2	295	0
Apr.				0		0	0	0	17.9	173	0
May				0		0	0	0	13.1	138	0
June				0		0	0	0	114	1,590	0
July	7.49		24	170	1 1	0	4.2	258	1,937	8,110	0
Aug.	6.81		16	90.6	1 1	0	2.1	130	2,889	14,480	0
Sept.	9.68		30	891	1 2	0	17.9	1,065	706	3,170	0
Oct.	8.73		1	891	125	0	48.4	2,979	343	6,103	0
Nov.	5.56		5	8.1	117	0	.7	39.7	34.6	352	0
Dec.	5.12		3	2.0	1 1	0	.1	6.3	112	2,363	0
Yearly	9.68			891		0	6.2	4,514	6,248	22,321	235
	Meters		Cubic Meters per Second				Thousands of Cubic Meters				
	2.95			25.2		0	0.18	5,568	7,707	27,533	290

1 And other days

SEWAGE INFLUENT, DOUGLAS ARIZONA INTERNATIONAL TREATMENT PLANT

DESCRIPTION: Parshall flume in the influent line to the old plant and a Parshall flume in the new headworks, located about 200 feet (61 m) east of the old treatment plant. The plant is located about one mile (1.6 km) west of the Douglas-Aguia Prieta Port of Entry.

RECORDS: Continuous monthly records since March 1948; daily records from March 18, 1948 through 1950 and from January 1952 through 1983.

REMARKS: The treatment plant was constructed in 1947 by the governments of the United States and Mexico to correct a serious international sanitation problem. Since April 8, 1968, all sewage flows from Agua Prieta have been diverted to oxidation ponds located in Mexico, 1.6 miles (2.6 km) south of the international boundary. Since December 1970, sewage effluent from the plant flows into Mexico and then crosses to the right bank of the Agua Prieta Arroyo, by means of a canal bridge, to be used for irrigation. On July 1, 1973, ownership and operation of the plant was transferred from the Commission to the city of Douglas. The plant was modified in 1980. The flow entering the plant is divided; about one-third treated at the old plant and two-thirds at the new plant. The old and new plant effluent is combined, disinfected and discharged to Mexico.

Month	Total Monthly Flows			Mean Daily Flows-Millions of Gallons Per Day					
	Millions of Gallons			Current Year 1983			Period 1952-1983		
	U.S.	Mexico	Total	Maximum	Minimum	Mean	Maximum	Minimum	Mean
Jan.	41.604	0	41.604	1.447	1.249	1.342	1.867	0.416	1.070
Feb.	37.413	0	37.413	1.722	1.017	1.336	1.784	.543	1.073
Mar.	41.374	0	41.374	1.932	.867	1.335	1.932	.590	1.073
Apr.	40.839	0	40.839	1.516	1.181	1.362	2.047	.380	1.076
May	43.798	0	43.798	1.528	1.275	1.413	1.850	.510	1.082
June	41.607	0	41.607	1.435	1.294	1.387	2.060	.555	1.140
July	43.513	0	43.513	1.592	1.260	1.403	3.209	.483	1.194
Aug.	40.246	0	40.246	2.011	.752	1.298	2.681	.365	1.211
Sept.	39.774	0	39.774	1.904	.833	1.325	1.904	.470	1.162
Oct.	42.248	0	42.248	1.945	.770	1.363	1.945	.603	1.123
Nov.	41.329	0	41.329	1.596	1.121	1.378	1.596	.587	1.099
Dec.	42.046	0	42.046	1.810	.942	1.357	3.330	.500	1.095
Yearly	495.791	0	495.791	2.011	0.752	1.358	3.330	0.365	1.117

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 1982.

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.

DATA FOR 1983 WILL BE PUBLISHED IN NEXT BULLETIN

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 1983. Records obtained and furnished by U. S. Geological Survey to September 30, 1981; thereafter by the United States Section of the Commission.

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 m³/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 m³/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 1983 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	8.1	257	21.1	36.2	3.4	0	0	* 83.7	1.1	892	14.4	16.8
2	8.1	138	21.1	36.2	2.8	0	0	* .3	0	2,470	15.2	19.2
3	8.1	114	67.6	34.9	1.0	0	0	* .1	0	1,780	12.8	19.2
4	9.4	1,130	601	34.2	.4	0	0	0	0	722	12.8	25.8
5	10.1	565	833	33.6	.6	0	0	0	53.1	315	12.0	27.7
6	9.4	280	429	29.5	.2	0	0	* 0	20.8	190	11.4	27.7
7	10.1	* 176	* 250	28.8	.3	0	0	* 0	9.4	135	12.0	24.4
8	9.4	* 107	* 185	26.0	.4	0	0	* 0	4.3	* 115	12.0	24.4
9	9.4	* 69.9	* 140	22.5	.2	0	0	* 49.4	1.4	* 78.0	11.4	22.2
10	8.8	* 53.8	* 109	21.1	.2	0	10.5	* 622	.9	* 55.2	10.7	19.2
11	7.4	* 46.8	* 78.8	20.0	.2	0	32.9	* 68.7	.8	* 48.2	10.1	17.6
12	6.8	* 42.7	* 61.4	19.2	.2	0	1.9	* 37.9	.8	* 33.6	10.1	16.8
13	6.8	* 40.1	* 58.0	17.6	.2	.1	.1	* 31.0	.8	* 23.3	10.1	15.6
14	6.2	* 34.9	* 58.0	16.8	.2	.1	0	* 21.1	.6	* 21.1	8.8	15.2
15	6.2	* 28.8	* 55.2	15.2	.2	0	0	* 76.0	.4	* 16.0	8.1	14.4
16	6.2	* 27.7	* 55.2	14.4	.3	0	0	* 153	.4	* 13.6	6.8	13.6
17	6.2	* 27.7	* 53.8	12.8	.3	0	0	* 29.4	.4	* 12.8	6.8	12.0
18	5.5	* 24.4	* 52.4	12.5	.3	0	0	* 20.0	.3	* 12.0	7.4	11.7
19	4.7	* 23.3	* 52.4	11.1	.3	0	0	* 15.2	.3	* 12.5	7.4	10.7
20	5.5	* 23.7	* 49.6	10.1	.4	0	0	* 10.7	.2	* 13.6	7.4	10.7
21	4.7	26.6	49.6	9.4	.4	0	46.8	* 9.4	.2	12.0	10.7	10.1
22	4.7	26.6	49.6	8.8	.4	0	8.8	* 10.7	.1	11.4	20.2	9.4
23	5.1	26.6	49.6	8.8	.5	0	5.1	* 6.8	51.3	10.7	22.2	9.4
24	5.9	25.5	49.6	7.8	.6	0	84.1	* 1.2	57.8	10.9	21.1	9.4
25	5.5	24.4	* 49.6	7.7	.8	0	* 46.3	* .6	19.6	12.0	21.1	10.7
26	5.5	24.4	* 49.2	8.1	.4	0	* 40.2	.3	5.7	12.8	20.0	11.4
27	5.1	23.3	44.0	7.1	.5	0	* 9.8	.1	54.4	15.2	24.4	10.7
28	5.5	22.2	42.7	5.9	.3	0	* .1	0	419	16.8	21.1	10.7
29	5.1		40.5	4.4	.4	0	75.6	19.3	433	16.0	19.2	10.1
30	68.8		38.0	3.4	.2	0	* 16.2	45.9	1,640	13.6	17.6	10.1
31	393		37.5		0		* 29.9	8.7		12.8		10.7
Sum	661.3	3,410.4	3,731.5	524.0	16.6	0.2	408.3	1,321.5	3,266.7	7,103.2	405.3	477.6
Current Year 1983									Period 1951-1983			
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total	Acre-Feet			
	High	Low	Day	High	Day	Low	Feet	Acres-Feet	Average	Maximum	Minimum	
Jan.	5.26	3.75	31	454	118	4.3	21.3	1,312	1,397	27,763	2.6	
Feb.	7.51	4.03	4	1,950	119	22.2	122	6,764	718	6,764	3.0	
Mar.	6.30	4.02	5	1,080	1	21.1	120	7,401	706	7,401	13.3	
Apr.	4.16	3.74	1	37.5	30	1.2	17.5	1,039	148	1,039	0	
May	3.86		1	5.5	127	0	.5	32.9	50.0	285	0	
June	3.71		14	.6	1	0	0	.4	165	1,391	0	
July	5.13		26	410	1	0	13.2	810	5,556	17,238	184	
Aug.	7.43		10	1,880	1	0	42.6	2,621	8,275	36,369	165	
Sept.	12.38		30	7,690	1	2	109	6,479	1,889	16,344	11.3	
Oct.	12.88	3.41	2	8,490	122	10.1	229	14,089	2,083	47,322	0	
Nov.	3.68	3.35	22	34.9	116	6.2	13.5	804	246	2,563	0	
Dec.	3.63	3.40	15	28.8	122	8.8	15.4	947	1,479	25,479	6.2	
Yearly	12.88			8,490		0	58.4	42,299	22,712	62,788	4,400	
Yearly	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	3.93			240		0	1.65	52,175	28,015	77,448	5,427	

* Partially estimated

! And other days

^ Estimated

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 1983.

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 m³/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 1983 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.30	0.30	1.7	5.7	4.9	0.81	0.16	0.54	0.49	135	16	5.5
2	.33	.33	1.7	5.7	4.8	.73	.16	2.5	.46	1,510	17	7.4
3	.33	.45	20	5.5	5.2	.64	.18	19	.43	278	19	5.9
4	.33	222	434	5.2	5.4	.65	.18	13	.41	43	20	5.4
5	.30	8.1	291	5.1	5.1	.68	.16	.71	.46	25	21	5.1
6	.30	1.9	67	5.2	4.9	.69	.14	.56	.52	20	21	4.9
7	.33	1.1	27	6.4	5.0	.65	.14	2.6	.52	19	15	4.8
8	.33	.95	16	5.3	4.7	.63	.43	7.0	.49	19	6.3	4.9
9	.33	.86	12	4.4	4.8	.63	.49	.87	22	19	6.6	4.9
10	.33	.78	9.9	4.3	4.5	.60	.24	21	7.4	19	6.6	4.6
11	.33	.73	9.2	4.1	4.0	.55	.25	14	2.2	20	6.5	4.5
12	.35	.73	8.8	4.5	3.6	.49	.23	1.0	.79	15	6.1	4.5
13	.35	.64	8.7	4.1	2.9	.47	.24	.80	4.9	15	6.4	4.4
14	.35	.64	8.6	3.8	2.5	.46	.21	.76	1.2	15	6.1	4.4
15	.33	.64	8.7	3.4	2.2	.44	.22	33	1.1	15	6.4	4.3
16	.33	.60	8.2	3.3	1.9	.42	.20	12	1.1	15	6.1	4.2
17	.33	.57	8.6	3.2	1.6	.40	.20	.78	1.0	14	6.0	4.2
18	.30	.52	8.8	3.0	1.6	.37	.21	.64	1.1	14	5.9	3.9
19	.30	.54	13	2.9	1.6	.37	.22	.64	1.2	14	5.9	3.9
20	.33	.52	11	2.8	1.5	.36	.25	.64	1.2	13	5.9	3.9
21	.30	.50	8.9	2.8	1.5	.32	.22	.56	3.6	13	5.9	3.8
22	.30	.57	8.5	2.7	1.4	.25	3.2	.52	110	13	5.9	3.7
23	.30	.95	8.1	2.9	1.4	.24	.47	.56	16	12	5.9	3.6
24	.30	1.3	8.2	3.1	1.3	.25	.40	.52	3.2	12	5.7	3.6
25	.30	1.5	9.8	3.1	1.3	.20	.37	.52	1.8	11	5.9	3.6
26	.30	1.6	8.1	3.0	1.3	.19	1.4	.60	1.2	11	5.7	3.5
27	.28	1.6	7.7	3.4	1.2	.18	.73	.52	1.1	12	5.9	3.5
28	.33	1.7	7.4	3.8	1.1	.16	.51	.56	144	13	5.0	3.4
29	.30		5.9	4.1	.94	.16	.66	.52	243	14	5.4	3.3
30	2.7		6.4	4.4	.91	.16	.48	.46	603	15	5.4	3.1
31	.38		6.2		.88		.49	.46		15		3.1
Sum	12.30	297.17	1,060.1	121.2	85.93	13.15	14.64	137.84	1,175.67	2,378	266.5	133.8
Current Year 1983												
Period 1949-1983												
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.	3.43	2.99	30	7.1	27	0.28	0.40	24.4	125	2,895	1.3	
Feb.	5.09	3.00	3	613	1	.30	10.6	589	68.1	589	1.8	
Mar.	5.91	3.13	4	1,120	1	1.7	34.2	2,103	105	2,103	.7	
Apr.	3.38	3.27	7	7.9	22	2.6	4.0	240	35.0	262	0	
May	3.37	3.07	1	5.2	31	.78	2.77	170	17.6	170	0	
June	3.10	2.96	1	.94	27	.16	.44	26.1	14.6	169	0	
July	3.49	2.95	22	18.0	6	.14	.47	29.0	508	4,270	1.6	
Aug.	4.75	3.06	15	451	30	.43	4.45	273	842	10,120	.08	
Sept.	6.88	3.04	29	2,020	3	.38	39.2	2,332	328	2,634	0	
Oct.	8.22	3.23	2	3,870	31	9.4	76.7	4,717	341	4,732	0	
Nov.	3.26	2.25	5	10.0	30	5.2	8.88	529	60.0	529	0	
Dec.	2.40	2.16	2	8.80	29	3.1	4.32	265	97.9	1,093	0	
Yearly	8.22	2.16		3,870		0.14	15.61	11,298	2,542	12,633	126	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	2.51	0.66		110		0	0.44	13,936	3,136	15,583	155	

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, 1983 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 1983.

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 1983.

EXTREMES: Maximum discharge, 33,500 second-feet (949 m³/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 1983 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	27	214	49	80	26	5.0	0.06	10	18	1,100	84.0	45
2	29	185	48	76	26	4.4	.03	38	17	4,860	84.0	57
3	31	1,140	576	71	24	3.8	.03	26	17	1,080	89.0	80
4	26	3,450	3,340	65	25	3.5	.05	19	17	420	86.0	73
5	25	531	1,970	63	25	3.5	.02	16	17	240	81.0	69
6	26	399	412	64	24	3.2	0	9.8	22	200	77	68
7	23	350	312	74	23	3.3	0	8.8	20	190	80	65
8	22	262	270	69	23	2.9	.04	11	17	180	71	60
9	22	199	240	63	23	2.0	.35	12	17	170	73	60
10	20	146	190	58	22	1.7	0	43	17	160	72	58
11	20	141	170	56	21	1.5	3.8	97	19	140	72	55
12	19	136	132	52	20	1.3	1.4	37	19	121	69	51
13	19	132	115	53	19	1.0	1.1	107	18	111	65	48
14	19	117	115	50	19	1.0	30	42	17	107	63	46
15	17	88	115	51	18	.95	6.1	34	76	106	62	50
16	18	76	108	47	17	.76	2.2	61	50	105	54	54
17	18	73	105	46	16	.91	1.6	145	24	106	54	54
18	18	70	104	45	16	.83	1.3	54	21	106	58	53
19	19	68	138	43	15	.70	1.2	36	14	109	57	52
20	25	65	164	42	15	.66	8.1	30	14	107	51	53
21	19	62	138	40	15	.67	137	25	63	105	61	47
22	16	59	124	39	14	.72	333	21	47	107	71	45
23	17	58	113	37	12	.63	106	18	296	102	64	44
24	17	58	107	35	11	.63	31	17	90	97	58	43
25	16	56	112	33	8.8	.65	27	15	50	99	55	44
26	16	54	117	29	7.9	.60	70	15	33	97	58	46
27	16	52	105	28	8.0	.63	48	14	25	97	51	44
28	17	52	103	28	5.9	.40	14	46	180	94	47	44
29	15	98	98	27	7.0	.26	10	31	1,130	92	47	36
30	1,840	90	90	26	6.9	.13	10	19	2,390	96	46	42
31	453	86	86	26	5.5		10	20		90		42
Sum	2,885	8,293	9,869	1,490	520.0	48.13	853.38	1,077.6	4,755	10,794	1,950	1,628
Current Year 1983								Period 1936-1983				
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.	6.99	4.17	30	3,840	26	14	93.1	5,722	1,719	30,282	0	0
Feb.	8.85	4.40	4	6,410	28	50	296	16,449	1,362	16,449	0	0
Mar.	7.50	4.39	4	4,460	1	48	318	19,575	1,422	19,575	0	0
Apr.	4.30	4.10	1	85	30	26	49.7	2,955	338	2,955	0	0
May	4.10	3.94	1	26	31	4.9	16.8	1,031	102	1,031	0	0
June	3.96		1	5.7	29	0	1.60	95.5	61.6	1,020	0	0
July	5.78		21	1,700	6	0	27.5	1,693	2,670	15,610	45	45
Aug.	4.68	3.83	17	290	4	1.3	34.8	2,137	5,480	45,790	91	91
Sept.	8.40	3.89	29	5,650	19	13	159	9,431	1,485	9,431	0	0
Oct.	12.40	4.09	2	16,200	29	80	348	21,410	2,005	59,025	0	0
Nov.	4.20	4.05	3	100	16	44	65.3	3,888	509	7,384	0	0
Dec.	4.35	4.16	3	85	29	36	52.5	3,229	2,333	33,563	0	0
Yearly	12.40			16,200		0	121	87,615	19,487	87,615	2,234	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	3.78			459		0	3.43	108,072	24,037	108,072	2,755	

1 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 1983.

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			Mean Daily Flows-Millions of Gallons Per Day					
	Millions of Gallons			Current Year 1983			Period 1952-1983		
	U.S.	Mexico	Total	Maximum	Minimum	Mean	Maximum	Minimum	Mean
Jan.	84.373	138.527	222.900	10.421 *	6.134	7.190	10.421 *	0.650	3.256
Feb.	106.771	178.130	284.901	13.523 *	9.146 *	10.175	13.523 *	.650	3.392
Mar.	130.768	210.895	341.663	18.861	8.606	11.021	18.861	.750	3.417
Apr.	111.451	180.536	291.987	10.902	8.363	9.733	10.902	.700	3.247
May	104.495	151.669	256.164	9.054	7.692	8.263	9.054	.550	3.078
June	89.065	134.001	223.066	7.910	6.998	7.436	7.910	.700	2.910
July	86.618	140.482	227.100	8.870	6.435	7.326	8.870	.700	3.010
Aug.	87.683	134.093	221.776	8.191	5.520	7.154	8.315	.750	3.311
Sept.	85.367	136.153	221.520	10.159	6.626	7.384	10.159	.800	3.557
Oct.	136.256	172.338	308.594	13.055	8.874	9.955	13.055	.700	3.554
Nov.	127.623	155.763	283.386	10.352	8.922	9.446	10.352	.800	3.448
Dec.	106.902	157.233	264.135	9.535	7.429	8.520	11.478	.350	3.416
Yearly	1,257.372	1,889.820	3,147.192	18.861	5.520	8.634	18.861	0.350	3.300

* Partly estimated

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. Two stations are operated and maintained by the United States Section of the Commission and three by the National Weather Service. For location, elevation, period of record, type of gage in use, and the observer, see alphabetical listing of stations on this page.

In the United States

Month	San Rafael #2, Arizona		Canelo, Arizona		Patagonia, Arizona		Nogales, Arizona		Nogales Sanitation Plant 6N, Arizona	
	1983	Average 1973-1983	1983	Average 1930-1983	1983	Average 1930-1983	1983	Average 1914-1983	1983	Average 1953-1983
Jan.	2.15	1.48	2.22	1.20	2.50	1.25	2.09	1.07	1.94	1.10
Feb.	2.90	1.38	2.00	1.07	1.92	1.06	1.69	.87	1.22	.73
Mar.	5.43	1.45	3.67	.89	3.26	.96	3.83	.85	3.32	.95
Apr.	1.55	.45	.60	.35	.37	.32	.32	.28	.30	.18
May	0	.10	0	.13	.08	.18	.27	.16	.67	.22
June	0	.33	.45	.78	0	.49	0	.45	0	.37
July	5.48	5.54	3.69	4.17	3.66	4.38			5.59	4.70
Aug.	2.98	2.85	3.35	4.17	4.80	3.93			3.61	3.84
Sept.	7.29	2.55	7.47	1.82	5.03	1.86			6.85	1.74
Oct.	2.35	1.44	2.01	.97	3.74	1.06			3.02	1.30
Nov.	2.58	1.01	2.11	.79	1.07	.81			.98	.65
Dec.	.15	1.07	.84	1.33	.63	1.35			.73	1.30
Yearly	32.86	19.65	28.41	17.67	27.06	17.65			28.23	17.08

* Station discontinued July 1983

LOCATION OF RAINFALL STATIONS ON THE SANTA CRUZ WATERSHED

The precipitation records of the stations listed alphabetically below begin on the date shown and extend through 1983.

In the 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.

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 5 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. 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.

For specific location of these two stations, refer to data opposite same station name shown in "Location of Rainfall Stations," page 91 of this bulletin.

In the United States

Temperature - Degrees Fahrenheit

Month	Nogales Sanitation Plant - 6N		
	1983		
	Mean	Max.	Min.
Jan.	45.5	74	19
Feb.	47.3	78	21
Mar.	50.7	80	26
Apr.	53.2	86	21
May	# 61.8	# 100	# 32
June	69.4	99	43
July	78.3	106	49
Aug.	76.2	99	48
Sept.	76.5	102	57
Oct.	63.6	87	42
Nov.	52.0	80	20
Dec.	49.1	84	20
Yearly	60.3	106	19

Mean Relative Humidity - Percent

Month	Nogales Sanitation Plant - 6N	
	1983	
	Max.	Min.
Jan.	100	32
Feb.	100	14
Mar.	100	24
Apr.	100	9
May	# 100	# 27
June	**	**
July	100	40
Aug.	100	62
Sept.	100	68
Oct.	100	42
Nov.	100	44
Dec.	100	27
Yearly		

Evaporation - Inches

Month	Nogales Sanitation Plant - 6N	
	1983	Average 1953-1983
	Jan.	3.72
Feb.	# 3.32	4.54
Mar.	* 5.58	7.14
Apr.	* 8.34	9.48
May	* 11.56	12.17
June	* 13.53	13.76
July	* 11.86	10.59
Aug.	* 9.80	8.53
Sept.	* 7.60	8.18
Oct.	* 7.77	7.16
Nov.	* 4.78	4.61
Dec.	* 3.85	3.52
Yearly	91.71	93.28

Partial month

* Partly estimated

Mean Wind Speed - Miles Per Hour

Month	Nogales Sanitation Plant - 6N	
	1983	Average 1953-1983
	Jan.	1.3
Feb.	1.4	2.2
Mar.	1.8	2.5
Apr.	1.6	2.4
May	1.4	2.4
June	1.4	2.2
July	1.1	1.6
Aug.	.8	1.1
Sept.	.9	1.2
Oct.	1.6	1.5
Nov.	.7	1.5
Dec.	.9	1.6
Yearly	1.2	1.8

** No record

**DRAINAGE AREAS ABOVE GAGING STATIONS AND IRRIGATED AREAS ALONG
SANTA CRUZ RIVER, SAN PEDRO RIVER, AND WHITEWATER DRAW
1983**

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	1,000	3,459	4,459
Whitewater Draw:						
Above Douglas, Arizona Gaging Station	1,023	0	1,023	30,500	0	30,500

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