50038100 RIO GRANDE DE MANATI AT HIGHWAY 2 NEAR MANATI, PR

RIO GRANDE DE MANATI BASIN

LOCATION.--Lat 18°25′52″, long 66°31′37″ referenced to North American Datum of 1927, Manatí Municipio, PR, Hydrologic Unit 21010002, at bridge on Highway 2 and 2.3 mi (3.7 km) west of Manatí.

DRAINAGE AREA.--197 mi^2, (510 km^2), approximately of which about 38 mi^2 (98 km^2) is partly or entirely noncontributing, excludes 6 mi^2 (15.5 km^2) upstream from Lago El Guineo and Lago de Matrullas.

SURFACE-WATER RECORDS

PERIOD OF RECORD.--1963-68 (annual maximum discharge only), February 1970 to current year.

REVISED RECORDS.--WRD PR-86-1: 1970-71 (M), 1975, 1979, 1982-85 (P).

GAGE.--Water-stage recorder, satellite telemetry at station. Elevation of gage is 14 ft (4 m), from topographic map. Prior to 1968 crest-stage gage at same site and datum 3.57 ft (1.09 m) lower.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Possible water extraction about 500 ft (152.4 m) upstream of gage by unknown source affecting low flow.

The figures for WY 2010 mean daily discharge for the month of September has been revised.Revision does not exceeded USGS parameters for publication of a superseding table. Revised figures are available at the CWSC files.

EXTREMES OUTSIDE PERIOD OF RECORD.--Approximate gage heights to gage datum of major floods, pointed out by local residents, are as follows: September 13, 1928, 36.6 ft (11.16 m), September 27, 1932, 36.3 ft (11.06 m), and August 4, 1945, 34.3 ft (10.45 m).

Suggested citation: U.S. Geological Survey, 2012, Water-resources data for the United States, Water Year 2011: U.S. Geological Survey Water-Data Report WDR-US-2011, site 50038100, accessed at http://wdr.water.usgs.gov/wy2011/pdfs/50038100.2011.pdf

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DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011
DAILY MEAN VALUES
[e, estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	2,020	1,140	433	1,080	281	182	160	205	1,840	425	275	903
2	3,220	980	414	1,310	276	183	155	228	2,050	766	566	946
3	3,070	e823	402	1,290	272	182	152	242	2,120	818	1,870	846
4	2,620	665	391	1,020	268	187	180	169	3,250	1,470	1,150	931
5	1,800	606	389	e1,030	268	613	158	154	10,500	566	501	1,660
6	1,780	2,720	380	952	271	485	149	144	1,750	414	360	2,170
7	14,100	1,320	488	804	258	246	149	139	4,370	360	315	1,200
8	14,100	1,210	1,510	737	246	216	146	136	13,800	340	296	996
9	3,310	1,580	584	676	235	198	147	133	2,140	314	265	1,020
10	e1,950	1,900	451	610	235	182	143	546	1,460	303	246	804
11	e1,620	1,510	399	577	228	182	147	1,130	1,310	296	241	818
12	e1,790	2,090	e388	537	224	191	146	268	1,500	296	225	838
13	2,310	1,320	379	536	221	173	149	192	1,670	280	218	12,800
14	1,790	e1,050	e365	531	219	178	343	571	1,370	511	226	3,440
15	1,480	e902	e1,030	472	217	180	546	482	1,090	1,430	216	1,880
16	2,100	e776	e3,500	446	236	189	1,220	763	884	1,150	322	1,280
17	1,500	706	e1,660	e425	230	179	311	300	851	494	290	1,240
18	1,140	667	914	e405	225	173	199	1,090	781	358	216	1,470
19	937	641	662	390	240	182	168	1,840	936	526	231	1,620
20	845	632	551	e377	382	304	158	1,720	792	451	362	e2,840
21	785	599	602	370	418	315	199	4,220	604	303	234	1,340
22	729	e621	e805	e364	407	319	225	1,240	527	442	23,500	2,170
23	e689	784	e786	e352	250	502	173	1,850	478	992	47,100	1,340
24	e666	625	e546	346	215	295	157	3,420	444	721	12,800	1,050
25	640	540	e468	333	203	271	149	4,620	437	379	2,810	944
26	607	518	e444	322	199	284	150	2,000	450	309	2,050	1,150
27	e603	498	e475	312	191	369	294	1,980	409	295	1,570	2,090
28	807	487	10,000	307	186	239	403	2,530	428	837	1,310	1,020
29	1,250	470	9,240	302	---	203	199	2,260	367	348	1,150	970
30	e2,140	448	2,200	292	---	179	163	2,530	342	294	1,010	2,170
31	e1,500	---	1,400	291	---	169	---	1,910	---	277	951	---
Total	73,898	28,828	42,256	17,796	7,101	7,750	7,038	39,012	58,950	16,765	102,876	53,946
Mean	2,384	961	1,363	574	254	250	235	1,258	1,965	541	3,319	1,798
Max	14,100	2,720	10,000	1,310	418	613	1,220	4,620	13,800	1,470	47,100	12,800
Min	603	448	365	291	186	169	143	133	342	277	216	804
Ac-ft	146,600	57,180	83,810	35,300	14,080	15,370	13,960	77,380	116,900	33,250	204,100	107,000
Cfsm	12.1	4.88	6.92	2.91	1.29	1.27	1.19	6.39	9.97	2.75	16.8	9.13
In.	13.95	5.44	7.98	3.36	1.34	1.46	1.33	7.37	11.13	3.17	19.43	10.19

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1992 - 2009, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	613	957	550	386	211	214	431	629	259	181	201	1,006
Max	3,103	3,885	2,399	1,742	458	932	1,187	1,660	815	651	650	3,732
(WY)	(2006)	(2005)	(2008)	(2005)	(2005)	(2009)	(2002)	(2005)	(1999)	(2005)	(2005)	(1998)
Min	130	71.0	55.1	59.1	72.0	56.2	49.9	97.7	63.8	53.0	75.9	67.4
(WY)	(2002)	(1995)	(1998)	(1995)	(1994)	(1994)	(1995)	(1994)	(1994)	(1994)	(1994)	(1994)

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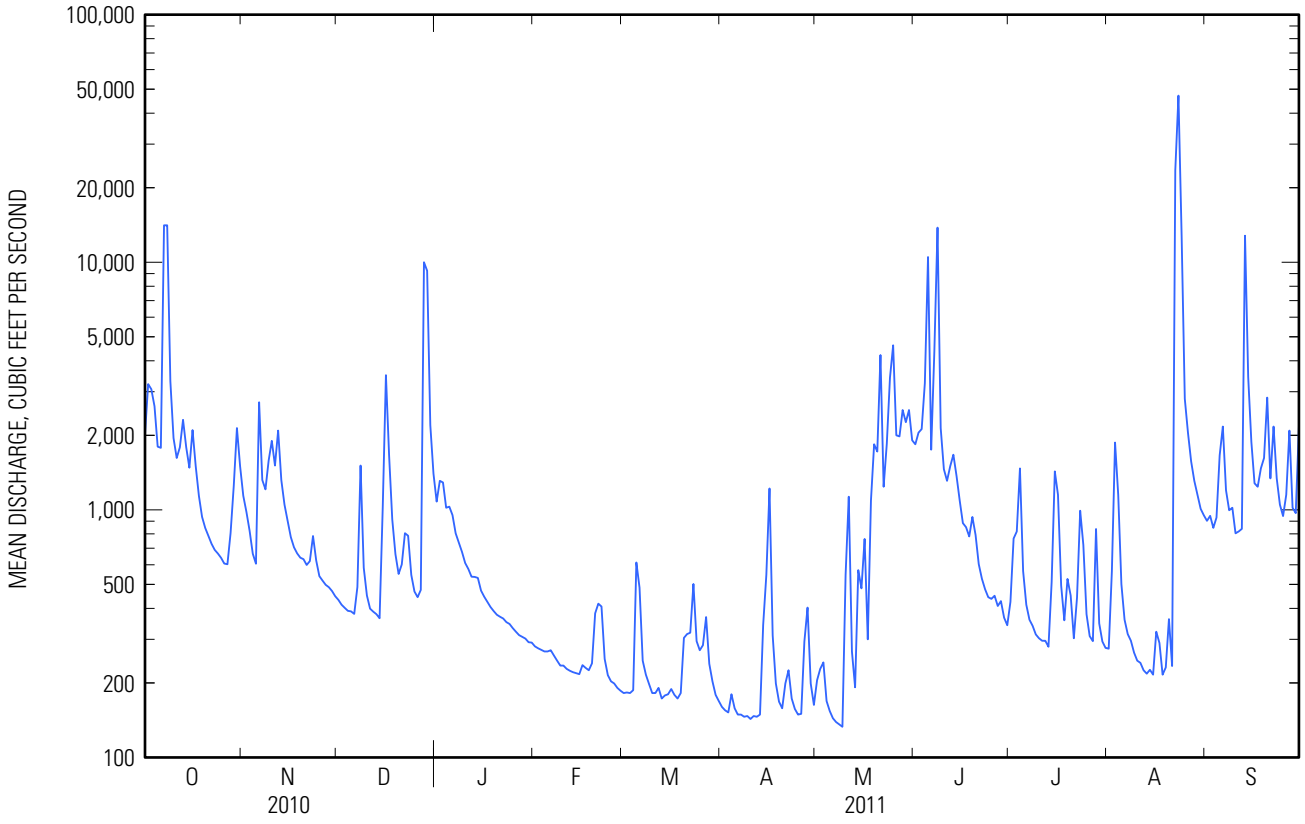
SUMMARY STATISTICS

	Calendar Year 2010		Water Year 2011		Water Years 1992 - 2009	
Annual total	373,928		456,216			
Annual mean	1,024		1,250		470	
Highest annual mean					1,054	2005
Lowest annual mean					96.5	1994
Highest daily mean	14,100	Oct 7	47,100	Aug 23	80,400	Sep 22, 1998
Lowest daily mean	119	Feb 18	133	May 9	31	Jan 24, 1995
Annual seven-day minimum	127	Feb 12	147	Apr 6	33	Jul 23, 1994
Maximum peak flow			120,000	Aug 23	198,000	Sep 10, 1996
Maximum peak stage			34.79	Aug 23	36.39	Sep 10, 1996
Instantaneous low flow					28	Jan 23, 1995
Annual runoff (ac-ft)	741,700		904,900		340,300	
Annual runoff (cfsm)	5.20		6.34		2.38	
Annual runoff (inches)	70.61		86.15		32.39	
10 percent exceeds	1,980		2,090		794	
50 percent exceeds	575		518		189	
90 percent exceeds	166		182		77	



50038100 RIO GRANDE DE MANATI AT HIGHWAY 2 NEAR MANATI, PR—Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1969 to current year.

WATER-QUALITY DATA
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011
Part 1 of 4
[MF, membrane filter; N, nitrogen; NTRU, nephelometric turbidity ratio unit; P, phosphorus; col/100 mL, colonies per 100 milliliters; ft³/s, cubic feet per second; mg/L, milligrams per liter; ng/L, nanograms per liter; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; --, no data; <, less than; E, estimated]

Date	Sample start time	Discharge, instantaneous, ft³/s (00061)	Dissolved oxygen, water, unfiltered, mg/L (00300)	pH, water, unfiltered, field, standard units (00400)	Specific conductance, water, unfiltered, µS/cm at 25 °C (00095)	Temperature, water, °C (00010)	Turbidity, water, unfiltered, broad band light source (400-680 nm), detectors at multiple angles including 90 +/- 30 degrees, ratiometric correction, NTRU (63676)	Calcium, water, unfiltered, recoverable, mg/L (00916)	Magnesium, water, unfiltered, recoverable, mg/L (00927)
12-01-2010	**1405**	415	7.8	8.0	318	25.9	E 7.2	--	--
02-08-2011	**1235**	249	9.7	7.8	336	25.6	E 2.4	44.9	7.69
05-24-2011	**1350**	1,360	7.9	7.7	187	26.8	150	--	--
08-29-2011	**1320**	1,140	7.5	6.8	270	26.6	84	34.6	7.95

WATER-QUALITY DATA
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011
Part 2 of 4
[MF, membrane filter; N, nitrogen; NTRU, nephelometric turbidity ratio unit; P, phosphorus; col/100 mL, colonies per 100 milliliters; ft³/s, cubic feet per second; mg/L, milligrams per liter; ng/L, nanograms per liter; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; --, no data; <, less than; E, estimated]

Date	Sample start time	Hydrogen ion, water, unfiltered, calculated, mg/L (00191)	Ammonia, water, unfiltered, mg/L as N (00610)	Nitrate plus nitrite, water, filtered, mg/L as N (00631)	Nitrite, water, filtered, mg/L as N (00613)	Phosphorus, water, unfiltered, mg/L as P (00665)	Total nitrogen, water, unfiltered, analytically determined, mg/L (62855)	Fecal coliform, M-FC MF (0.7 micron) method, water, col/100 mL (31625)	Total coliform, M-Endo MF method, immediate, water, col/100 mL (31501)
12-01-2010	**1405**	.00001	.03	.74	.005	.062	.86	1,100	2,800
02-08-2011	**1235**	.00002	< .02	.78	.012	.056	.98	E 110	E 150
05-24-2011	**1350**	.00002	.03	.64	.002	.332	1.27	4,600	E 96,000
08-29-2011	**1320**	.00015	.04	.91	.003	.271	1.24	E 1,000	5,600

50038100 RIO GRANDE DE MANATI AT HIGHWAY 2 NEAR MANATI, PR—Continued

WATER-QUALITY DATA
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011
Part 3 of 4
[MF, membrane filter; N, nitrogen; NTRU, nephelometric turbidity ratio unit; P, phosphorus; col/100 mL, colonies per 100 milliliters; ft³/s, cubic feet per second; mg/L, milligrams per liter; ng/L, nanograms per liter; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; --, no data; <, less than; E, estimated]

Date	Sample start time	Cadmium, water, unfiltered, µg/L (01027)	Chromium, water, unfiltered, recover-able, µg/L (01034)	Copper, water, unfiltered, recover-able, µg/L (01042)	Lead, water, unfiltered, recover-able, µg/L (01051)	Mercury, water, unfiltered, ng/L (50286)	Zinc, water, filtered, µg/L (01090)	Arsenic, water, unfiltered, µg/L (01002)	Cyanide, water, unfiltered, milligrams per liter (00720)	Selenium, water, unfiltered, µg/L (01147)
12-01-2010	**1405**	--	--	--	--	--	--	--	--	--
02-08-2011	**1235**	< .05	1	1.6	.12	.97	< 1.4	1.0	E .0039	.21
05-24-2011	**1350**	--	--	--	--	--	--	--	--	--
08-29-2011	**1320**	< .05	7	16.1	1.60	16.4	< 1.4	.82	< .0050	.21

WATER-QUALITY DATA
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011
Part 4 of 4
[MF, membrane filter; N, nitrogen; NTRU, nephelometric turbidity ratio unit; P, phosphorus; col/100 mL, colonies per 100 milliliters; ft³/s, cubic feet per second; mg/L, milligrams per liter; ng/L, nanograms per liter; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; --, no data; <, less than; E, estimated]

Date	Sample start time	Methylene blue active sub-stances, water, unfiltered, recover-able, mg/L (38260)
12-01-2010	**1405**	--
02-08-2011	**1235**	< .05
05-24-2011	**1350**	--
08-29-2011	**1320**	< .05