50029000 RIO GRANDE DE ARECIBO AT CENTRAL CAMBALACHE, PR

RIO GRANDE DE ARECIBO BASIN

LOCATION.--Lat 18°27′20″, long 66°42′10″ referenced to North American Datum of 1927, Arecibo Municipio, PR, Hydrologic Unit 21010002, at bridge on unimproved road, about 500 ft (152 m) upstream from Central Cambalache, near Highway 2, 13.9 mi (22.4 km) downstream from Lago Dos Bocas reservoir, 1.9 mi (3.1 km) downstream from Río Tanamá junction, and 1.6 mi (2.6 km) southeast of Arecibo.

DRAINAGE AREA.--200 mi^2, (520 km^2).

SURFACE-WATER RECORDS

PERIOD OF RECORD.--January 1963 to January 1965 (monthly measurements only), February 1965 to April 1969 (occasional measurements only), May 1969 to September 1983, October 1996 to current year.

GAGE.--Water-stage recorder, satellite telemetry at station. Datum of gage is 9.84 ft (3.00 m) above mean sea level.

REMARKS.--Records poor. Flow regulated by Lago Dos Bocas dam, 13.9 mi (22.4 km) upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, undetermined, gage height 19.28 ft (5.876 m), September 22, 1998; minimum daily discharge, 38.0 ft^3/s (1.076 m^3/s), March 5, 2002.

EXTREMES FOR CURRENT YEAR.--Maximum recorded discharge, 6,160 ft^3/s (174 m^3/s), gage height 9.85 ft (3.00 m), August 31; but could have been higher during period of no gage-height record or when the orifice was broken, minimum daily discharge, 92 ft^3/s (2.60 m^3/s),

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DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2009 TO SEPTEMBER 2010
DAILY MEAN VALUES
[e, estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	e364	e795	689	e379	e730	e610	e333	e1,110	1,140	1,010	487	2,110
2	463	e880	568	e410	e599	e505	e278	e1,060	1,090	860	583	1,520
3	e306	e599	457	e583	e510	e361	e261	e1,530	704	524	781	1,870
4	147	e648	547	e514	e764	e361	e300	e1,490	e633	462	745	1,360
5	402	e551	282	e487	e345	e316	e860	e691	e752	395	701	1,270
6	553	e576	e317	e402	e387	e483	e1,180	e1,100	e834	685	718	1,270
7	330	e276	176	e472	e541	e256	e1,460	e935	e907	911	683	1,300
8	196	e318	424	e834	e1,070	e666	e749	e917	e797	674	477	1,380
9	190	e597	e293	e518	e675	e998	e533	e2,010	e943	909	267	1,340
10	e964	e576	e564	e518	e744	e511	e926	e935	e623	625	802	1,290
11	e203	660	e398	e1,050	e883	e377	e1,010	e2,180	e560	265	1,040	1,420
12	e416	754	e500	e414	e571	e311	e822	e1,710	e710	653	940	1,400
13	e673	546	e527	e456	e863	e627	e794	e1,650	e364	634	846	1,150
14	e533	404	e892	e1,260	e541	e233	e832	e1,450	e670	631	904	1,180
15	e1,620	295	e419	e1,190	e809	e533	e521	e1,050	e1,080	685	768	1,090
16	e872	423	e429	e1,100	e432	e516	e1,220	e954	1,100	774	1,270	1,040
17	e234	1,500	e391	e803	e228	e267	e1,100	e907	1,080	638	1,070	826
18	e400	1,110	e304	e795	e383	e256	e935	e822	930	489	790	451
19	e838	723	e439	e784	e397	e239	e1,260	e832	568	607	604	528
20	e714	1,200	e1,160	e514	e305	e283	e935	e614	472	688	679	646
21	e578	848	e388	e399	e850	e294	e907	e701	707	956	613	879
22	e553	e428	e314	e760	e488	e427	e596	e738	374	1,000	600	775
23	e778	330	e429	e402	e917	e516	e1,650	e819	451	1,080	365	618
24	e897	417	e520	e680	e706	e516	e559	e812	740	1,900	532	664
25	e489	848	e510	e695	e333	e400	e1,690	e1,030	1,010	914	527	573
26	e425	274	e510	e506	e389	e339	e2,060	914	845	715	524	774
27	e408	308	e518	e745	e400	e350	e1,280	760	2,200	784	1,080	836
28	e736	537	e499	e348	e433	e372	e1,550	589	2,410	922	998	999
29	e748	92	e452	e406	---	e383	e1,200	1,680	1,750	1,300	890	958
30	e472	711	e529	e379	---	e372	e1,150	1,490	1,130	1,240	1,440	1,210
31	e310	---	e495	e341	---	e444	---	1,060	---	794	4,360	---
Total	16,812	18,224	14,940	19,144	16,293	13,122	28,951	34,540	27,574	24,724	27,084	32,727
Mean	542	607	482	618	582	423	965	1,114	919	798	874	1,091
Max	1,620	1,500	1,160	1,260	1,070	998	2,060	2,180	2,410	1,900	4,360	2,110
Min	147	92	176	341	228	233	261	589	364	265	267	451
Ac-ft	33,350	36,150	29,630	37,970	32,320	26,030	57,420	68,510	54,690	49,040	53,720	64,910
Cfsm	2.71	3.04	2.41	3.09	2.91	2.12	4.83	5.57	4.60	3.99	4.37	5.45
In.	3.13	3.39	2.78	3.56	3.03	2.44	5.38	6.42	5.13	4.60	5.04	6.09

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1969 - 2010, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	741	756	534	343	274	259	393	561	430	344	416	689
Max	1,607	1,639	1,885	651	582	627	1,022	1,192	1,220	854	1,269	1,866
(WY)	(2006)	(2005)	(2008)	(1997)	(2010)	(1972)	(2002)	(1980)	(1979)	(1979)	(1979)	(1979)
Min	331	201	150	106	76.8	53.8	89.7	188	139	62.0	133	271
(WY)	(2002)	(1998)	(1998)	(2007)	(2007)	(2003)	(2001)	(1977)	(1977)	(2003)	(2003)	(1997)

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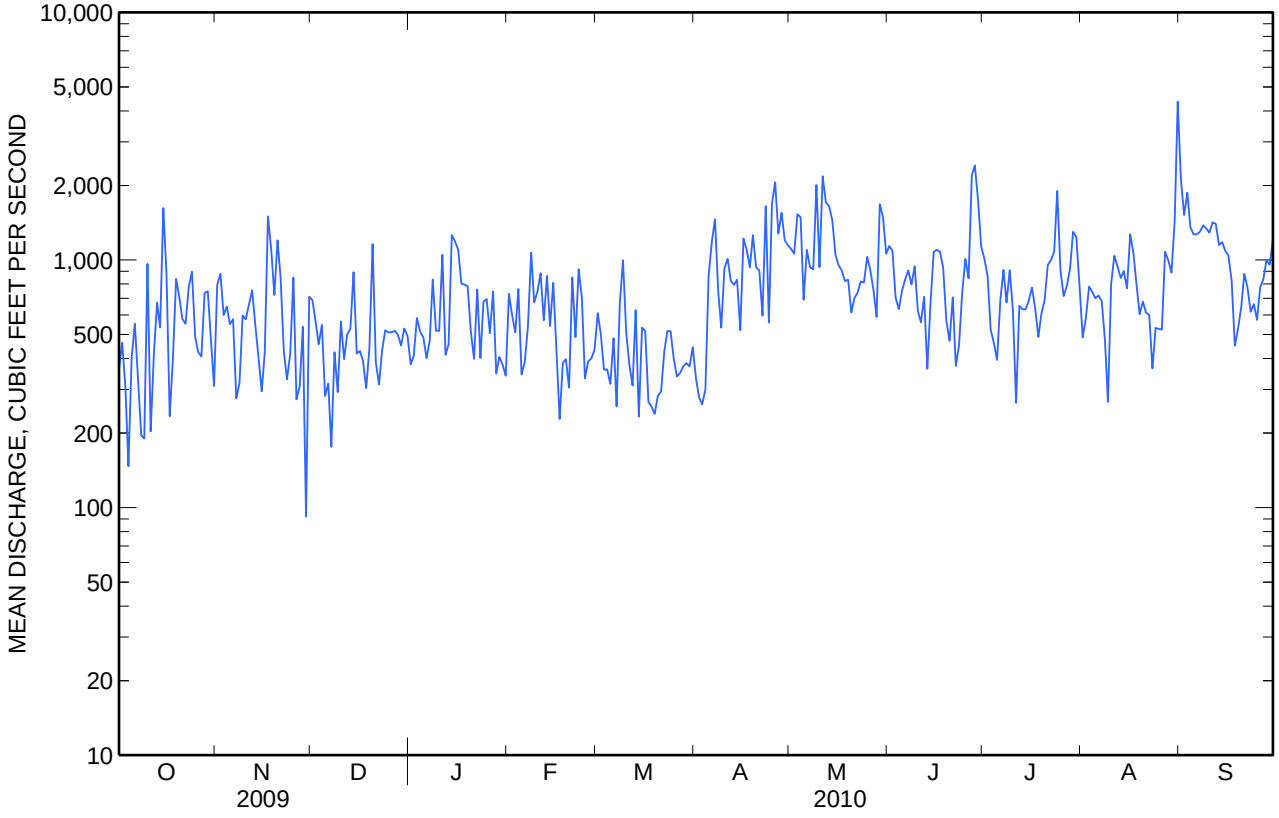
SUMMARY STATISTICS

	Water Year 2010		Water Years 1969 - 2010	
Annual total	274,135			
Annual mean	751		485	
Highest annual mean			751	2010
Lowest annual mean			208	2003
Highest daily mean	4,360	Aug 31	15,900	Aug 31, 1979
Lowest daily mean	92	Nov 29	38	Mar 5, 2002
Annual seven-day minimum	303	Oct 3	46	Mar 21, 2003
Maximum peak flow	6,160	Aug 31		
Maximum peak stage	9.85	Aug 31	19.28	Sep 22, 1998
Annual runoff (ac-ft)	543,700		351,600	
Annual runoff (cfsm)	3.76		2.43	
Annual runoff (inches)	50.99		32.97	
10 percent exceeds	1,270		952	
50 percent exceeds	673		338	
90 percent exceeds	330		115	



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WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1963-66, 1969 to current year.

WATER-QUALITY DATA
WATER YEAR OCTOBER 2009 TO SEPTEMBER 2010
Part 1 of 3
[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; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, 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)
12-01-2009	1020	292	7.8	7.5	211	24.5	180	--	--
03-10-2010	1335	120	7.9	7.5	310	25.1	E 4.2	42.4	5.14
05-24-2010	1420	260	7.5	7.6	295	26.4	66	--	--
09-02-2010	1335	1,380	7.8	7.7	204	26.6	77	22.5	4.35

WATER-QUALITY DATA
WATER YEAR OCTOBER 2009 TO SEPTEMBER 2010
Part 2 of 3
[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; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than; E, estimated]

Date	Hydrogen ion, water, unfiltered, calculated, milligrams per liter (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)	Cadmium, water, unfiltered, µg/L (01027)
12-01-2009	.00003	E .04	.67	.005	.149	1.13	21,000	34,000	--
03-10-2010	.00003	E .03	.56	.004	.053	.73	E 170	570	< .04
05-24-2010	.00002	E .04	.62	.004	.135	.91	E 2,200	5,900	--
09-02-2010	.00002	E .04	.61	.011	.122	.98	E 650	2,600	E .03

50029000 RIO GRANDE DE ARECIBO AT CENTRAL CAMBALACHE, PR—Continued

WATER-QUALITY DATA
WATER YEAR OCTOBER 2009 TO SEPTEMBER 2010

Part 3 of 3

[MF, membrane filter; N, nitrogen; NTRU, nephelometric turbidity ratio unit; P, phosphorus; col/100 mL, colonies per 100 milliliters; ft^3/s, cubic feet per second; mg/L, milligrams per liter; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than; E, estimated]

Date	Chromium, water, unfiltered, recoverable, µg/L (01034)	Copper, water, unfiltered, recoverable, µg/L (01042)	Lead, water, unfiltered, recoverable, µg/L (01051)	Mercury, water, unfiltered, nanograms per liter (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)	Methylene blue active substances, water, unfiltered, recoverable, milligrams per liter (38260)
12-01-2009	--	--	--	--	--	--	--	--	--
03-10-2010	< 0.6	E 1.2	.11	1.32	< 2.8	.47	< .0050	.19	< .10
05-24-2010	--	--	--	--	--	--	--	--	--
09-02-2010	2	8.6	.91	7.35	< 2.8	.92	< .0050	.17	< .10