

APPENDIX IV – TIDES AND WATER LEVELS

Abstract of Times of Hydrography

Start and End times refer to tidal applications requirement.

Time on Task indicates actual time of task in the survey area. All times and dates are in UTC.

06_3caborojo

Date Flown	JD	Sortie No	Start Time	End Time	Tide Duration	Time on Task
April-09-06	99	1	12:30	18:24	5:54	4:17
April-10-06	100	2	12:00	19:00	7:00	4:45
April-11-06	101	3	10:30	18:30	8:00	5:16
April-12-06	102	4	11:00	18:30	8:30	5:28
April-13-06	103	5	9:00	15:00	6:00	3:21
April-15-06	105	6	9:00	17:30	8:30	5:09
April-17-06	107	7	8:00	19:00	11:00	5:24
April-18-06	108	8	9:30	18:00	8:30	5:07
April-19-06	109	9	9:30	17:30	8:00	4:15
April-20-06	110	10	10:00	16:30	6:30	4:49
April-22-06	112	11	10:00	18:00	8:00	5:04
April-24-06	114	12	10:00	18:30	8:30	5:31
April-25-06	115	13	9:30	18:00	8:30	5:46
April-26-06	116	14	9:30	17:30	8:00	4:37
April-28-06	118	16	10:00	17:30	7:30	5:47
April-29-06	119	17	10:00	18:00	8:00	5:30
April-30-06	120	18	10:00	18:00	8:00	4:50
May-10-06	130	19	9:30	17:30	8:00	5:02
May-11-06	131	20	14:30	20:30	6:00	4:19
May-12-06	132	21	13:30	20:00	6:30	4:05
May-13-06	133	22	9:00	16:00	7:00	3:55

Datums

Click [HERE](#) for printable version

Data Units:



Feet



Meters

Apply Change

Nov 8 2006 12:49

ELEVATIONS ON STATION DATUM
National Ocean Service (NOAA)

Station: 9759110

T.M.: 0

W

Name: MAGUEYES ISLAND, CARIBBEAN SEA, PR

Units:

Meters

Status: Accepted
2001

Epoch: 1983-

Datum	Value	Description
MHHW	1.294	Mean Higher-High Water
MHW	1.292	Mean High Water
DTL	1.192	Mean Diurnal Tide Level
MTL	1.193	Mean Tide Level
MSL	1.191	Mean Sea Level
MLW	1.094	Mean Low Water
MLLW	1.091	Mean Lower-Low Water
GT	0.204	Great Diurnal Range
MN	0.198	Mean Range of Tide
DHQ	0.003	Mean Diurnal High Water Inequality
DLQ	0.003	Mean Diurnal Low Water Inequality
HWI		Greenwich High Water Interval (in Hours)
LWI		Greenwich Low Water Interval (in Hours)
NAVD		North American Vertical Datum
Maximum	1.781	Highest Water Level on Station Datum
Max Date	19980922	Date Of Highest Water Level
Max Time	05:48	Time Of Highest Water Level
Minimum	0.823	Lowest Water Level on Station Datum
Min Date	19680611	Date Of Lowest Water Level
Min Time	11:30	Time Of Lowest Water Level

To refer Water Level Heights to a Tidal Datum, apply the desired Datum Value.

Click [HERE](#) for further station information including New Epoch products.

TIDAL DATUMS

Tidal datums at MAGUEYES ISLAND, CARIBBEAN SEA based on:

LENGTH OF SERIES: 19 Years
TIME PERIOD: January 1983 - December 2001
TIDAL EPOCH: 1983-2001
CONTROL TIDE STATION:

Elevations of tidal datums referred to Mean Lower Low Water (MLLW), in METERS:

HIGHEST OBSERVED WATER LEVEL (09/22/1998) = 0.690
MEAN HIGHER HIGH WATER (MHHW) = 0.204
MEAN HIGH WATER (MHW) = 0.201
MEAN TIDE LEVEL (MTL) = 0.102
MEAN SEA LEVEL (MSL) = 0.101
MEAN LOW WATER (MLW) = 0.003
MEAN LOWER LOW WATER (MLLW) = 0.000
LOWEST OBSERVED WATER LEVEL (06/11/1968) = -0.268

National Geodetic Vertical Datum (NGVD 29)

Bench Mark Elevation Information In METERS above:

Stamping or Designation	MLLW	MHW
TIDAL BM NO 1 CAMA UPR 1955 ELEV	3.664	3.463
TIDAL BM NO 2 CAMA UPR 1955 ELEV	6.959	6.758
TIDAL BM NO 3 CAMA UPR 1955 ELEV	10.246	10.045
9110 B 1980	3.183	2.982
9110 D 1980	0.671	0.470
9110 E 1980	0.937	0.736
9110 F 1982	1.746	1.545
9110 G 1982	3.244	3.042
9110 H 1998	3.019	2.818
975 9110 J 2000	1.424	1.223

Tide Station Report

Punta Guanajibo, Puerto Rico 975-9421

Position (NAD83):	18° 09' 36"	67° 10' 53"	Time Meridian = 0° (UTC)
Owner:	Dept. de Recursos Naturales y Ambientales Laboratoria de Investigaciones Pesqueras Aida Rosario Jimenez (Director) Juan De La Cruz Rasado Cruz (Admin. Dir)	P.O. Box 3665 (mailing) Mayaguez Puerto Rico, 00681 office: (787) 833-2025	
Established:	March 14, 2006	Removed: June 1, 2006	
Type of station:	Tertiary	Density Observations: Yes	
Prime Contractor:	Tenix LADS Inc.	Darren Stephenson, project mgr.	
Tides Consultant:	John Oswald & Assoc, Anchorage, AK.	John Oswald, PLS, project mgr.	
Project Numbers:	OPR-I305-KRL-2006	JOA WO No: 81	
To Reach:	To reach the tide station by vehicle from the junction of Route 2 and Route 63 located about 1.6 km (1.0 mile) SW of the center of Mayaguez, proceed west on Route 63 (Avenida William C. Dunscombe) for 0.5 km (0.3 mile) to a T-intersection with Route 102, turn left on Route 102 and proceed southerly following the coast for 4.5 km (2.8 miles) to the top of a hill, continue down the hill for 0.40 km (0.25 miles) to a reverse turn on the right at the bottom of the hill, turn right on this reverse turn and proceed NWly for 0.32 km (0.20 mile) on a paved road to the security gate and guard shack. Check in with the guard to get access to the Fisheries Research property. The tide station, dock and all bench marks are inside this fenced and secured area.		
Tide House:	Established two digital bubbler tide gauges and the electronics for a radar tide gauge in 4' by 4' by 2' wood shed at the south end of a wooden dock. This dock is in poor condition, and is about 3 meters wide and 30 meters long, with a plank wood deck supported by concrete filled PVC and wood pilings. The radar gauge sensor was suspended off the damaged end of the dock, with wood and unistrut brackets. Orifices were mounted on the end of 3/4" iron pipe attached to treated 4 by 6 timbers. These orifice boards were in turn, banded to separate concrete filled PVC pilings about 25 meters from the shore.		
Tide Gauge(s):	Three gauges: Two digital bubblers: Design Analysis (DAA) H350XL, with H355 pump, and H222 (Signal Engineering) GOES radios, with Yagi antennas. One DAA H360 Radar gauge interfaced to a DAA H350XL DCP and H222 Goes Radio with Yagi Antenna. Bubbler range is 0 > 30 psi, and the radar gauge range is 0.3 > 22 m. Gauge #1 (Bubbler) H350XL S/N: 1042, Gauge #2 (Bubbler) H350XL S/N 1039, Gauge #3 (Radar) H360 S/N 1288 with H350XL S/N 1043. Two 12vdc batteries run each system are charged by individual 20 watt solar cells. GPS modules provide time syncing.		
Tide Staff	A 1.25 meter fiberglass survey rod, graduated in centimeters from 2.79 to 4.04 meters, was bolted to a 2" x 6" board which was banded to a dock piling about 15 meters from shore. A stilling well with orange float was placed next to the graduations. The tide staff was leveled directly into the primary bench mark (BM 1 1975). The base of the radar gauge was also directly leveled into the PBM.		
GPS Tie:	Static L1/L2 GPS observations made on bench mark 975 9421 A.		
Tidal Bench Marks:	4 recovered Tidal 1, Tidal 3, Tidal 4, Tidal 5	1 established 975 9421 A	Primary Bench Mark: 975 9421 Tidal 1 (975 9421 Tidal 2 searched for, not found)
Third Order Leveling:	Initial: March 13-14, 2006		Closeout: May 31, 2006