

10076

Diagram No. 920

NOAA FORM 76-35A

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY

DESCRIPTIVE REPORT

Type of Survey Hydrographic
Field No. MI-80-2-83
Office No. H-10076

LOCALITY

State Puerto Rico
General Locality Atlantic Ocean
Locality Offshore--San Juan to
..... Isla De Culebra

1983

CHIEF OF PARTY
CAPT J.A. Yeager

LIBRARY & ARCHIVES

DATE February 14, 1985

☆U.S. GOV. PRINTING OFFICE: 1980-766-230

ACAB

CHTS

25668 } In sign off see
25650 }
25640 } Record of Application

NOAA FORM 77-28 <small>(7-72)</small> <div style="text-align: center;"> HYDROGRAPHIC TITLE SHEET </div>	<div style="text-align: center;"> U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION </div> <div style="text-align: center;"> REGISTER NO. H-10076 </div>
INSTRUCTIONS - The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.	FIELD NO. MI-80-2-83

State PUERTO RICO
 General locality ATLANTIC OCEAN
 Sublocality Isle DE
 Location OFFSHORE SAN JUAN TO NORTH OF CULEBRA ISLAND
 Scale 1:80,000 Date of survey 3 March through 6 APRIL 1983
 Instructions dated 1 DECEMBER 1982 Project No. OPR-I 149-MI-83
 Vessel 2220
 Chief of party J. AUSTIN YEAGER, CAPT, NOAA
 Surveyed by SHIP'S OFFICERS (SEE REMARKS)
 Soundings taken by echo sounder, hand lead, pole UGR ECHO SOUNDER
 Graphic record scaled by RW, EM, DH, JM, MS
 Graphic record checked by RW, EM, DH, JM, MS
 Protracted by N/A Automated plot by AMC-DIGITAL PLOTTER
 Verification by H.R. Smith
 Soundings in fathoms feet at ~~MLW~~ ^{MLW} MLLW FATHOMS AT MLLW

REMARKS: L.A. LAPINE, R.L. PARSONS, D.R. RICE, G.R. YATES,
B.L. COAKLEY, C.N. MCLEAN, D.I. CREWS, J.A. MILLER, W.E. SITES,
J.L. HENDRIX
Notes in the Descriptive Report were made in red during office
processing AWOIS - 2/20/85 /mjt
SURF - 2/20/85 /mjt
STANDARDS CK'D 2-19-85
Cloy

66° 00'

65° 40'

ATLANTIC OCEAN

NORTH COAST OF PUERTO RICO

AREA SURVEYED MARCH/APRIL 1983

JOINS H-10083

JOINS H-10078

18°
30'

H-10076, MI-80-2-83

66° 00'

65° 40'

PROGRESS SKETCH HYDROGRAPHIC OPERATIONS OPR-I149-MI-83 SCALE OF CHART 25640
NOAA SHIP MT. MITCHELL S-222, J. AUSTIN YEAGER, CAPT., NOAA SHEET 1 of 2

65° 40'

65° 30'

ATLANTIC OCEAN

NORTH COAST OF PUERTO RICO

AREA SURVEYED MARCH/APRIL 1983

JOINS H-10074

18°
30'

65° 40'

65° 30'

H-10076, MI-80-2-83

GROSS SKETCH (CONTD)

SCALE
SCALE OF CHART 25640
SHEET 2 of 2

TABLE OF CONTENTS

HYDROGRAPHIC TITLE SHEET

4

PROGRESS SKETCH

ii

PAGE

A. PROJECT.....	1
B. AREA SURVEYED.....	1
C. SOUNDING VESSEL.....	1
D. SOUNDING EQUIPMENT & CORRECTIONS TO ECHO SOUNDINGS.....	1
E. HYDROGRAPHIC SKETCHES.....	3
F. CONTROL STATIONS.....	3
G. HYDROGRAPHIC POSITION CONTROL.....	4
H. SHORELINE.....	5
I. CROSSLINES.....	5
J. JUNCTIONS.....	5
K. COMPARISON WITH PRIOR SURVEYS.....	6
L. COMPARISON WITH CHART.....	7
M. ADEQUACY OF THE SURVEY.....	7
N. AIDS TO NAVIGATION.....	7
O. STATISTICS.....	8
P. MISCELLANEOUS.....	8
Q. RECOMMENDATIONS.....	8
R. AUTOMATED DATA PROCESSING.....	8
S. REFERENCE TO REPORTS.....	8

"APPENDICES"

* A. HYDROGRAPHIC SHEET PROJECTION AND ELECTRONIC CONTROL PARAMETERS	10
* B. FIELD TIDE NOTE	14
* C. GEOGRAPHIC NAMES LIST	18
* D. ABSTRACT OF CORRECTIONS TO ECHO SOUNDINGS	20
* E. ABSTRACT OF CORRECTIONS TO ELECTRONIC POSITION CONTROL	37
F. LIST OF STATIONS	39
* G. ABSTRACT OF POSITIONS	41
* H. BOTTOM SAMPLES	45
I. LANDMARKS FOR CHARTS	47
J. APPROVAL SHEET	48

* - Removed from Descriptive Report and filed with original records

A. PROJECT

THIS SURVEY WAS CONDUCTED IN ACCORDANCE WITH PROJECT INSTRUCTIONS OPR I 149-MI-83 ISSUED 1 DECEMBER 1982 AND AMENDED BY CHANGE NUMBER ONE DATED 3 FEBRUARY 1983 AND CHANGE NUMBER TWO DATED 4 FEBRUARY 1983.

B. AREA SURVEYED

THIS SURVEY WAS CONDUCTED ON THE ATLANTIC COAST OF PUERTO RICO BETWEEN SAN JUAN AND CULEBRA ISLAND. THE AREA SURVEYED IS BOUNDED ON THE NORTH BY LATITUDE $19^{\circ}01'00''N$, ON THE EAST BY LONGITUDE $65^{\circ}15'30''W$, ON THE WEST BY LONGITUDE $66^{\circ}05'30''W$, AND ON THE SOUTH BY THE NORTHERN LIMITS OF MI-20-1-83 AT LATITUDE $18^{\circ}33'06''N$ AND THE 100 FATHOM CURVE.

THE SURVEY DATA WAS COLLECTED ON THE FOLLOWING DATES:

<u>JULIAN DATE</u>	<u>CALENDAR DATE</u>
062-063	3 ⁴ MARCH 1983
083 - 092	24 MARCH 1983 - 2 APRIL 1983
094 - 096	4 APRIL 1983 - 6 APRIL 1983

C. SOUNDING VESSELS

SOUNDINGS FOR THE SURVEY WERE OBTAINED BY NOAA SHIP MT MITCHELL S-222. THERE WERE NO UNUSUAL PROBLEMS WITH THE SOUNDING VESSEL.

D. SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO SOUNDINGS

THE SOUNDING EQUIPMENT USED ON THIS SURVEY FOLLOWS:

<u>EQUIPMENT</u>	<u>SERIAL No.</u>
RAYTHEON MODEL 196C	UNIVERSAL GRAPHIC RECORDER 184
RAYTHEON MODEL PTC R105A	TRANSCEIVER 028
EDO WESTERN	
DIGITRAK MODEL 261C	DIGITIZER 227
ROSS MODEL 5000 FINELINE	ECHO SOUNDER 1050

SOUNDINGS FOR THE MT MITCHELL WERE TAKEN WITH A 12 KHZ TRANSDUCER LOCATED AT SOUNDING ROOM TWO. THE ANTENNA DISTANCE FOR SOUNDING ROOM TWO IS 6.0 METERS. ALL ONLINE AND OFFLINE PROGRAMS HAVE TAKEN INTO ACCOUNT THE ANTENNA DISTANCE VIA THE PARAMETER TAPE. ALL SURVEY RECORDS WERE SCANNED BY TRAINED SURVEY DEPARTMENT PERSONNEL AND CHECKED BY THE OFFICER-IN-CHARGE. PEAKS AND DEEPS CONSIDERED SIGNIFICANT THAT OCCURRED BETWEEN SOUNDINGS WERE INSERTED INTO THE DIGITIZED RECORD. DIGITIZING ERRORS WERE CORRECTED ON THE ELECTRONIC CORRECTOR TAPE. SCALE CHECKS WERE MADE AT FREQUENT INTERVALS.

IN DEPTHS LESS THAN 200 FATHOMS, THE ROSS ECHO SOUNDER WAS ACTIVATED FOR COMPARISON WITH THE UGR RECORD. WHERE SIGNIFICANT DIFFERENCES BETWEEN THE ROSS RECORD AND UGR RECORD OCCURRED, THE ROSS DEPTH WAS CHOSEN AND INSERTED IN THE RECORD VIA THE ELECTRONIC CORRECTOR TAPE.

NANSEN CASTS WERE TAKEN FOR THIS SURVEY ON THE FOLLOWING DATES AND AT THE FOLLOWING LOCATIONS:

<u>CAST #</u>	<u>LATITUDE</u>	<u>LONGITUDE</u>	<u>DATE</u>
1	18°58'25"N	65°10'00"W	26 FEB 1983-outside survey limits-5NM
2	18°59'00"N	66°31'24"W	26 MAR 1983-outside survey limits-24NM

PRINTOUTS OF VELOCITY TABLES I AND III AND THEIR ASSOCIATED VELOCITY CURVES ARE INCLUDED IN APPENDIX D.

A TRA CORRECTION OF 2.3 FATHOMS WAS APPLIED TO ALL SOUNDINGS TAKEN BY THE SHIP DURING ONLINE DATA ACQUISITION. THIS TRANSDUCER DRAFT WAS DETERMINED BY MEASURING THE DISTANCE FROM THE WATERLINE TO THE RAIL, THEN SUBTRACTING THIS VALUE FROM THE KNOWN RAIL TO TRANSDUCER HEIGHT. SETTLEMENT AND SQUAT CORRECTORS FOR THE SHIP WERE DETERMINED ON 26 JULY 1981 OFF CAPE CHARLES, VIRGINIA. A COPY OF THAT REPORT ALONG WITH OTHER SUPPORT DATA APPEARS IN APPENDIX D. A TC/TI TAPE PREPARED FROM THIS DATA IS ALSO INCLUDED IN THE SURVEY DATA. THE SETTLEMENT AND SQUAT CORRECTORS WILL BE APPLIED DURING FINAL PROCESSING OF THE DATA BY MOA3, PROCESSING DIVISION, ATLANTIC MARINE CENTER. } in error
revised during
preprocessing
examination

THIS SURVEY WAS CONDUCTED USING PREDICTED TIDES BASED ON DAILY PREDICTIONS AT SAN JUAN, PUERTO RICO (STATION No. 975-5371). PREDICTED TIDE CORRECTORS WERE GENERALLY APPLIED ONLINE DURING ACTUAL SOUNDING OPERATIONS.

E. HYDROGRAPHIC SHEETS

THIS SURVEY WAS PLOTTED ON THREE (3) MYLAR FIELD SHEETS BY THE HYDROPLOT SYSTEM ONBOARD THE MT MITCHELL.

<u>NO. OF SHEETS</u>	<u>TYPE</u>	<u>SKEW</u>
3	MAINScheme, CROSSLINES AND BOTTOM SAMPLES	90,21,36

THE SURVEY WAS PLOTTED OFFLINE USING THE MASTER DATA TAPES, ELECTRONIC CORRECTOR TAPES AND VELOCITY CORRECTOR TAPES. SOUNDINGS ON THE FIELD SHEETS ARE CORRECTED FOR DRAFT, PREDICTED TIDES, DIGITIZING ERRORS AND SOUND VELOCITY. SOUNDINGS ARE NOT CORRECTED FOR SMOOTH TIDES OR SETTLEMENT AND SQUAT; THESE CORRECTIONS WILL BE APPLIED ON THE FINAL SMOOTH SHEET TO BE PLOTTED BY MOA3, PROCESSING DIVISION, ATLANTIC MARINE CENTER. ALL FIELD RECORDS AND THE FOLLOWING TAPES HAVE BEEN FORWARDED TO THE ATLANTIC MARINE CENTER FOR VERIFICATION AND SMOOTH PLOTTING.

MASTER DATA TAPES (RAW AND EDITED)
ELECTRONIC CORRECTOR TAPES
VELOCITY CORRECTOR TAPES
PARAMETER TAPES
SIGNAL TAPE
TC/TI TAPE

F. ELECTRONIC CONTROL STATIONS

THE FOLLOWING STATIONS WERE USED FOR ELECTRONIC CONTROL:

<u>SIGNAL NO.</u>	<u>NAME</u>	<u>LATITUDE</u>	<u>LONGITUDE</u>
	CADAstral 97, 1982		
10	BENNER HILL	18°19'49.515"	64°51'34.401"
20	LIGHT HOUSE RM3, 1983	18°23'01.332"	65°37'07.586"
100	ACADEMY (HYDROTRAC), 1983	18°28'57.096" 37.4959	66°08'24.408" (field position)

ALL CONTROL STATIONS WERE ESTABLISHED BY AT LEAST THIRD-ORDER, CLASS I METHODS. BENNER HILL WAS AN EXISTING AND MONUMENTED STATION. LIGHT HOUSE RM3 WAS ESTABLISHED BY PERSONNEL FROM OPERATIONS DIVISION, ATLANTIC MARINE CENTER AND IS MONUMENTED. ACADEMY (HYDROTRAC) WAS ESTABLISHED BY SHIP'S PERSONNEL AND IS NOT MONUMENTED. A COMPLETE LIST OF SIGNALS, NAMES AND GEOGRAPHIC POSITIONS, IS INCLUDED IN APPENDIX F.

G. HYDROGRAPHIC POSITION CONTROL

AN ODUM OFFSHORE HYDROTRAC SYSTEM OPERATING ON A FREQUENCY OF 1718.59 KHZ IN THE RANGE/RANGE MODE WAS USED TO PROVIDE POSITION CONTROL FOR THIS SURVEY. THE FOLLOWING EQUIPMENT WAS USED:

<u>LOCATION</u>	<u>EQUIPMENT</u>	<u>MODEL</u>	<u>SERIAL No.</u>
10 BENNER HILL CADASTRAL 97, 1982	SLAVE DRIVE UNIT	702	215
	AMPLIFIER	74-87	536
	POWER SUPPLY	620	751
	COUPLER		722
20 LIGHT HOUSE RM3	SLAVE DRIVE UNIT	702	226
	AMPLIFIER	74-87	540
	POWER SUPPLY	620	620
	COUPLER		131
100 ACADEMY (HYDROTRAC)	SLAVE DRIVE UNIT	702	215
	AMPLIFIER	74-87	537
	POWER SUPPLY	620	754
	COUPLER		130
VESNO 2220	MASTER DRIVE UNIT	702	122
	RECEIVER	700	328
	AMPLIFIER	74-87	538
	SAWTOOTH RECORDER IDN	3162	8501

PARTIAL LANE CORRECTORS WERE DETERMINED USING ONE OF TWO METHODS. HORIZONTAL SEXTANT ANGLES WITH A CHECK ANGLE WERE USED IN CONJUNCTION WITH PROGRAM RK 561 IN AREAS WHERE STRONG VISUAL CONTROL WAS AVAILABLE. IN AREAS WHERE STRONG VISUAL CONTROL WAS NOT AVAILABLE, PARTIAL LANE CORRECTORS WERE DETERMINED WITH THE USE OF AN H.P. 3810B ELECTRONIC DISTANCE MEASURING UNIT, USING A RANGE/AZIMUTH CONFIGURATION. PRISM BOARDS WERE MOUNTED ON THE FOREMAST AND APPROPRIATE DISTANCE CORRECTORS WERE APPLIED TO ACCOUNT FOR THE HORIZONTAL SEPARATION BETWEEN THE PRISMS AND THE HYDROTRAC ANTENNA. THE H.P. 3810 R-AZ CALIBRATION PROGRAM (VER. 2/22/82) WAS USED TO COMPUTE CORRECTORS.

WHOLE LANE COUNTS WERE DETERMINED EVERY FEW DAYS BY RUNNING A KNOWN VISUAL RANGE AND INTERSECTING WITH A HORIZONTAL SEXTANT ANGLE. RK 300, FUNCTION 7, WAS USED TO DETERMINE THE SHIP'S POSITION FOR COMPARISON.

THE WHOLE LANE COUNT WAS CONSTANTLY MONITORED BY COMPARING THE NAVIGATIONAL INTERFACE READOUT WITH THE ANNOTATED RUNNING COUNT ON THE SAWTOOTH RECORDER. PARTIAL LANE CORRECTORS BETWEEN CONSECUTIVE CALIBRATIONS WERE AVERAGED TO YIELD MORE ACCURATE CORRECTORS OVER THAT PERIOD OF TIME.

H. SHORELINE

THERE WAS NO SHORELINE WITHIN THE SURVEY LIMITS.

I. CROSSLINES

CROSSLINES WERE RUN BETWEEN FORTY-FIVE AND NINETY DEGREES TO THE MAINSCHEME LINES. CROSSLINE MILEAGE ACCOUNTED FOR 9% OF THE MAINSCHEME SOUNDINGS. AGREEMENT BETWEEN THE CROSSLINES AND THE MAINSCHEME WAS EXCELLENT.

J. JUNCTIONS - *See section 5 of the Evaluation Report*

THIS SURVEY JUNCTIONS WITH THE FOLLOWING SURVEYS WHICH WERE RUN CONCURRENTLY:

<u>SURVEY</u>	<u>SCALE</u>	<u>DATE</u>	<u>AREA OF JUNCTION</u>
H-10074	1:80,000	1983	EAST
H-10083	1:80,000	1983	WEST
H-10078	1:20,000	1983	SOUTH

THE SOUNDINGS AT THE JUNCTIONS ARE IN EXCELLENT AGREEMENT WITH NO SHIFT IN CONTOUR.

K. COMPARISON WITH PRIOR SURVEYS - *See section 6 of the Evaluation Report*

THE FOLLOWING PRIOR SURVEYS WERE WITHIN THE LIMITS OF THIS SURVEY:

<u>SURVEY</u>	<u>SCALE</u>	<u>DATE</u>
²⁶⁷² H-2677	^{40,000} 1:20,000	1904
H-2874	1:80,000	1907

BOTH PRIOR SURVEYS COVERED INSHORE AREAS WITH LITTLE TO NO SOUNDINGS AT THE NORTHERN LIMITS OF THE SURVEY. AGREEMENT IN THE INSHORE AREAS WAS EXCELLENT WITH NO APPARENT SHIFTS IN THE CONTOURS.

L. COMPARISON WITH THE CHARTS - *See section 7 of the Evaluation Report.*

THE SURVEY AREA IS PRESENTLY COVERED BY THE FOLLOWING CHARTS:

<u>CHART NUMBER</u>	<u>EDITION</u>	<u>DATE</u>	<u>SCALE</u>
25640	29TH	22 AUG 1982	1:326,856
25650	25TH	18 SEP 1982	1:100,000
25668	11TH	28 AUG 1982	1:100,000

COMPARISON OF THE INSHORE AREAS OF ALL THREE CHARTS SHOWED VERY GOOD AGREEMENT WITH THE PRESENT SURVEY AS ALL INSHORE DEPTHS WERE FROM PREVIOUS SURVEYS (SEE SECTION K).

THE FOLLOWING MAJOR DISCREPANCIES WERE NOTED IN THE COMPARISON OF THE OFFSHORE AREAS:

CHART 25640

<u>CHARTED DEPTH</u>	<u>SURVEY DEPTH</u>	<u>LATITUDE</u>	<u>LONGITUDE</u>
2150 FATHOMS	1699 FATHOMS	18°55.2 N	65°47.3 W
2900 FATHOMS	2697 FATHOMS	19°00.5 N	65°50.3 W

CHART 25650

<u>CHARTED DEPTH</u>	<u>SURVEY DEPTH</u>	<u>LATITUDE</u>	<u>LONGITUDE</u>
119 FATHOMS	177 FATHOMS	18°33.2 N	65°15.4 W

CHART 25668

<u>CHARTED DEPTH</u>	<u>SURVEY DEPTH</u>	<u>LATITUDE</u>	<u>LONGITUDE</u>
990 FATHOMS	700 FATHOMS	18°39.0 N	66°04.7 W

The present survey data should be charted

M. ADEQUACY OF THE SURVEY

THIS SURVEY IS CONSIDERED ADEQUATE AND COMPLETE TO SUPERSEDE PRIOR SURVEYS FOR CHARTING.

N. AIDS TO NAVIGATION

THERE WERE NO FIXED OR FLOATING AIDS TO NAVIGATION WITHIN THE SURVEY AREA.

O. STATISTICS

LINEAR NAUTICAL MILES OF MAINSCHEME	1785.4
LINEAR NAUTICAL MILES OF CROSSLINES	171.7
LINEAR NAUTICAL MILES OF DEVELOPMENTS	1.2
TOTAL LINEAR MILES OF HYDROGRAPHY	1957.3
MISCELLANEOUS MILES	441.7
TOTAL LINEAR MILES	2399.0
BOTTOM SAMPLES	3
NANSEN CASTS	2
SQUARE MILES OF HYDROGRAPHY	1530.0
NUMBER OF POSITIONS	1659.0

P. MISCELLANEOUS

DUE TO THE DEPTH OF THE SURVEY AREA AND THE STEEP SLOPE AT THE 100 FATHOM CURVE, ONLY ^{TWO} THREE BOTTOM SAMPLES WERE OBTAINED IN CONJUNCTION WITH THIS SURVEY. *Bottom samples were brought forward from the prior surveys.*

Q. RECOMMENDATIONS

IT IS RECOMMENDED THAT THIS SURVEY SUPERSEDE ALL PRIOR SURVEYS OF THE AREA.

R. AUTOMATED DATA PROCESSING

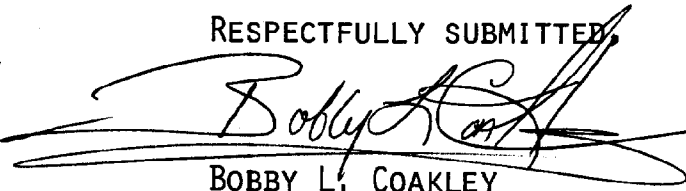
THE FOLLOWING HYDROPLOT PROGRAMS WERE USED TO ACQUIRE AND PROCESS THE SURVEY DATA:

<u>PROGRAM</u>	<u>NAME</u>	<u>VERSION</u>
112	HYPERBOLIC RANGE/RANGE HYDROPLOT	8/04/81
201	GRID, SIGNAL & LATTICE PLOT	4/18/75
211	RANGE/RANGE NON-REAL TIME PLOT	2/02/81
300	UTILITY COMPUTATIONS	10/21/80
330	REFORMAT AND DATA CHECK	5/04/76
360	ELECTRONIC CORRECTOR ABSTRACT	2/02/76
500	PREDICTED TIDE GENERATOR	11/10/72
530	LAYER CORRECTIONS FOR VELOCITY	5/10/76
561	H/R GEODETIC CALIBRATIONS	2/19/75
602	ELINOR-LINE ORIENTED EDITOR	5/20/75


S. REFERENCES

HORIZONTAL CONTROL REPORT
HUMPBACK WHALE SURVEY REPORT
COAST PILOT REPORT

RESPECTFULLY SUBMITTED



BOBBY L. COAKLEY
ENSIGN, NOAA



APPENDIX J
APPROVAL SHEET

APPROVAL SHEET

The field work on this Hydrographic Survey was under my daily supervision. The boat sheet and records have been reviewed and approved by me.

J. Gustin Yeager
Commanding Officer *May 13, 1983*

APPENDIX F
LIST OF STATIONS

SIGNAL NAMES

020 LIGHTHOUSE RM3, 1983
 053 CAPITOL DOME SAN JUAN CAPITAL CUPOLA, 1927
 060 ST. AUGUSTINE CHURCH SPIRE
 070 MORRO LIGHTHOUSE 1900 ✓
 080 CATANO FRONT RANGE LIGHT, 1983
 090 CATANO REAR RANGE LIGHT, 1983
 140 LEVITTOWN MUN. TANK, 1964
 270 ARECIBO LIGHTHOUSE USGS
 274 ARECIBO CHURCH
 275 QUEBRAS 1901
 276 ARECIBO CENTRAL CAMBALCHE STACK
 302 HELECHO EGG
 10 CADASTRAL ST, 1982
 100 ACADEMY HYDROTRAC, 1983
 102 ISLA DE CABRAS LT, 1983

SIGNAL GEODETIC POSITIONING

MI-80-2-83

020	4	18	23	01332	065	37	07586	250	0000	171859
070	4	18	28	22774	066	07	26371	139	0000	000000
080	4	18	27	24242	066	07	49410	139	0000	000000
090	4	18	26	44315	066	07	55044	139	0000	000000
100	4	18	28	37096	066	08	24408	250	0000	171859
101	4	18	28	36721	066	08	24104	139	0000	000000
102	4	18	28	37242	066	08	24527	139	0000	000000
110	4	18	28	36648	066	08	23588	250	0000	000000
120	4	18	27	38022	066	08	46401	139	0000	000000
140	4	18	27	02164	066	10	50239	139	0000	000000
200	4	18	28	37186	066	10	47356	250	0000	000000
300	4	18	14	52536	066	48	43204	250	0702	171859
053	18	28	47512	066	06	22776	139			
066	18	28	02903	066	05	57971	139			

APPENDIX I

LANDMARKS FOR CHARTS

(There were no landmarks in this survey area)

DATE: October 4, 1983

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY

TIDE NOTE FOR HYDROGRAPHIC SHEET

Processing Division: Atlantic Marine Center:

Hourly heights are approved for

Tide Station Used (NOAA Form 77-12): 975-5371 San Juan, PR

Period: March 3 - April 6, 1983

HYDROGRAPHIC SHEET: H-10076

OPR: I149

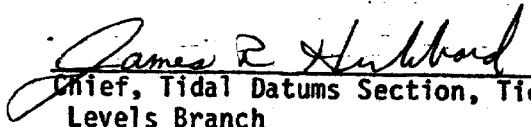
Locality: Offshore Island of Puerto Rico

Plane of reference (mean ~~lower~~ low water): 2.05 feet

Height of Mean High Water above Plane of Reference is 1.1 feet

REMARKS: Recommended Zoning:

1. East of longitude $65^{\circ}30.0'$ apply - 15 minute time correction.
2. West of $65^{\circ}30.0'$ zone direct.


Chief, Tidal Datums Section, Tides & Water
Levels Branch

GEOGRAPHIC NAMES

H-10076

Name on Survey	<div style="display: flex; justify-content: space-between; font-size: small;"> <div style="transform: rotate(-45deg);">A 25640 25650 ON CHART NO. 25668</div> <div style="transform: rotate(-45deg);">B ON PREVIOUS SURVEY NO.</div> <div style="transform: rotate(-45deg);">C ON U.S. QUADRANGLE MAPS</div> <div style="transform: rotate(-45deg);">D FROM LOCAL INFORMATION</div> <div style="transform: rotate(-45deg);">E ON LOCAL MAPS</div> <div style="transform: rotate(-45deg);">F P.O. GUIDE OR MAP</div> <div style="transform: rotate(-45deg);">G RAND McNALLY ATLAS</div> <div style="transform: rotate(-45deg);">H U.S. LIGHT LIST</div> </div>											
ATLANTIC OCEAN (title)X												1
ISLA DE CULEBRA (title)X												2
PUERTO RICO (title) X												3
SAN JUAN (title) X												4
												5
												6
												7
												8
												9
												10
												11
												12
												13
												14
												15
												16
									Approved:			17
												18
									<i>Charles E. Harrington</i>			19
									Chief Geographer - NCG2x5			20
									11 DEC 1984			21
												22
												23
												24
												25

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NO.: H-10076

Number of positions 1634

Number of soundings 8808

Number of control stations 10

	<u>TIME-HOURS</u>	<u>DATE COMPLETED</u>
Preprocessing Examination	<u>21</u>	<u>6/03/83</u>
Verification of Field Data	<u>296</u>	<u>11/27/84</u>
Quality Control Checks	<u>53</u>	
Evaluation and Analysis	<u>39</u>	<u>12/14/84</u>
Final Inspection	<u>8</u>	<u>12/19/84</u>
TOTAL TIME	<u>409</u>	
Marine Center Approval		<u>12/20/84</u>

Transmittal letter of survey and survey records will be included in the Descriptive Report to identify the records accompanying the survey.

ATLANTIC MARINE CENTER
EVALUATION REPORT

SURVEY NO.: H-10076

FIELD NO.: MI-80-2-83

Puerto Rico, Atlantic Ocean, Offshore--San Juan to Isla De Culebra

SURVEYED: 3 March through 6 April 1983

SCALE: 1:80,000

PROJECT NO.: OPR-1149-MI-83

SOUNDINGS: Raytheon UGR and Ross
Digital Echosounders

CONTROL: Hydrotrac (Range-Range)

Chief of Party.....J. A. Yeager

Surveyed by.....L. A. Lapine
.....R. L. Parsons
.....D. R. Rice
.....G. R. Yates
.....B. L. Coakley
.....C. N. McLean
.....D. I. Crews
.....J. A. Miller
.....W. E. Sites
.....J. L. Hendrix

Automated Plot by.....Xynetics 1201 Plotter (AMC)

1. INTRODUCTION

- a. No unusual problems were encountered during office processing.
- b. Notes in red were made in the Descriptive Report during office processing at AMC.

2. CONTROL AND SHORELINE

- a. The control is adequately discussed in sections F, G and S of the Descriptive Report.
- b. There is no shoreline within the area surveyed.

3. HYDROGRAPHY

- a. Soundings at crossings agree within the criteria stated in sections 4.6.1 and 6.3.4.3 of the Hydrographic Manual and section 6.6 of the Project Instructions.
- b. Except in the junctional area where only segments of the 20, 30, 40 and 50 fathom curves could be drawn, the standard curves were drawn in their entirety.

c. Development of the bottom configuration and determination of least depths is considered adequate. For the purpose of bathymetric mapping, additional development and reduced line spacing would have been desirable to delineate ridges and troughs. Also, some lines normal to the canyons would have been appropriate.

4. CONDITIONS OF SURVEY

The smooth sheet and accompanying overlays, hydrographic records and reports are adequate and conform to the requirements of the Hydrographic Manual with the following exceptions:

a. A negative Dangers to Navigation report was not included in the Descriptive Report as required by section 6.12 of the Project Instructions. No dangers to navigation were discovered during the course of this survey.

b. Sufficient bottom samples were not taken as required by sections 1.6.3 and 4.7.1 of the Hydrographic Manual and section 8.1 of the Project Instructions. However, see section P. of the hydrographer's Descriptive Report.

c. The hydrographer failed to submit a report on currents or a negative report as per section 8.2.2 of the Project Instructions.

d. An investigation of landmarks, NOAA Form 76-40 (Nonfloating Aids or Landmarks for Charts), was not submitted. There were no fixed aids or landmarks within the survey area but the southern limits of the present survey were two (2) to five (5) miles offshore. An evaluation of charted landmarks suitable for small scale charting purposes would have been desirable.

e. No original graphs of velocity correction data and no sounding corrector abstracts were submitted.

f. Data for horizontal control was not complete; a control station was omitted from the signal tape and dates of establishment for ten stations were not submitted.

g. The control station CADASTRAL 97, 1982, was called BENNER HILL, 1982, on the field's signal list.

h. The hydrographer failed to make a comparison with prior survey H-2672 (1904) and listed in the Descriptive Report making a comparison with prior survey H-2677 (1904) which is not within the limits of the present survey.

i. TC/TI correctors were submitted in error. This was corrected during office processing.

5. JUNCTIONS

H-10074 (1983) to the east

H-10078 (1983) to the southwest

H-10083 (1983) to the west

Excellent junctions were made between the present survey and surveys H-10074 (1983), H-10078 (1983) and H-10083 (1983).

There are no contemporary surveys to the north and south of the present survey. The charted depths and the present survey depths are in harmony to the south.

6. COMPARISON WITH PRIOR SURVEYS

H-2672 (1904) 1:40,000

H-2874 (1907) 1:80,000

The above surveys taken together cover a small portion along the southern part of the present survey from the 400 fathom curve to the 40 fathom curve.

H-2672 (1904) and H-2874 (1907) are in general agreement with a few scattered soundings ranging from 133 fathoms deeper to 124 fathoms shoaler than the present survey.

The locations of deeps and highs show good agreement between the prior surveys and the present survey. There is better delineation of all features on the present survey because of its greater sounding density. All indications show that this is a stable bottom area and the differences between prior and present survey depths can be attributed to the less accurate sounding and positioning methods used in the past.

Bottom characteristics were carried forward from these prior surveys to supplement present survey data. With this addition, the present survey is adequate to supersede the above prior surveys in the common area.

7. COMPARISON WITH CHARTS

No. 25640 (29th Edition, 22 August 1981)

No. 25640 (25th Edition, 18 September 1982)

No. 25668 (11th Edition, 28 August 1982)

a. Hydrography

A small part of the charted hydrography, mainly those soundings within the 400-fathom depth curve, originates with the previously discussed prior surveys and is adequately discussed under those comparisons. The remaining charted hydrography probably originates with British Admiralty and Defense Mapping Agency Charts.

Beyond the 400 fathom depth curve, charted soundings range from scattered instances of good agreement to extremes of 847 fathoms deeper to 344 fathoms shoaler than the present survey depths. These differences can be attributed to charting sources which are inaccurate.

The present survey is adequate to supersede the charted hydrography in the common area.

b. Aids to Navigation

There are no fixed or floating aids to navigation within the limits of the present survey.

8. COMPLIANCE WITH INSTRUCTIONS

Except as listed elsewhere in this report, this survey adequately complies with the Project Instructions.

9. ADDITIONAL FIELD WORK

This is an adequate basic survey and no additional field work is recommended. However, for the purpose of bathymetric mapping, additional development and reduced line spacing would have been desirable defining for ridges and troughs.

for Leroy G. Gann

Harry R. Smith
Senior Cartographic Technician
Verification of Field Data

Richard H. Whitfield

Richard H. Whitfield
Cartographic Technician
Evaluation and Analysis


Robert R. Hill

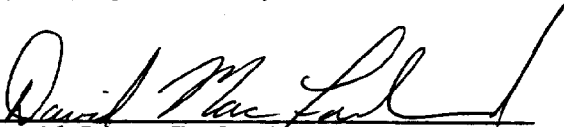
Robert R. Hill
Senior Cartographic Technician
Verification Check

Inspection Report
H-10076

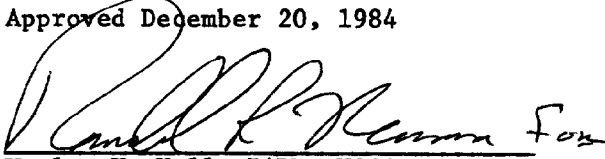
The completed survey has been inspected with regard to survey coverage, delineation of depth curves, development of critical depths, cartographic symbolization, and verification or disproval of charted data. The digital data have been completed and all revisions and additions made to the smooth sheet during survey processing have been entered in the magnetic tape record for this survey. Final control, position, and sounding printouts of the survey have been made. The survey complies with National Ocean Service requirements except as noted in the Evaluation Report. The survey records comply with NOS requirements except where noted in the Evaluation Report.

Inspected


R. D. Sanócki
Chief, Hydrographic Surveys
Processing Section
Hydrographic Surveys Branch


David B. MacFarland, Jr., LCDR, NOAA
Chief, Hydrographic Surveys Branch

Approved December 20, 1984


Wesley V. Hull, RADM, NOAA
Director, Atlantic Marine Center

H-10076
MI-80-2-83

PAGE 1 of 2

NOAA FORM 61-29
(12-71)

U. S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

REFERENCE NO.

MOA23-07-85

LETTER TRANSMITTING DATA

TO:

CHIEF, DATA CONTROL SECTION
HYDROGRAPHIC SURVEYS BRANCH, N/CG243
NATIONAL OCEAN SERVICE, NOAA
BROCKVILLE, MD 20652

DATA AS LISTED BELOW WERE FORWARDED TO YOU
BY (Check):

☐ ORDINARY MAIL

☐ AIR MAIL

☒ REGISTERED MAIL

☐ EXPRESS

☐ GBL (Give number) _____

DATE FORWARDED

2/4/85

NUMBER OF PACKAGES

one tube; two boxes

NOTE: A separate transmittal letter is to be used for each type of data, as tidal data, seismology, geomagnetism, etc. State the number of packages and include an executed copy of the transmittal letter in each package. In addition the original and one copy of the letter should be sent under separate cover. The copy will be returned as a receipt. This form should not be used for correspondence or transmitting accounting documents.

H-10076, OPR-II49-MI-83, Field No. MI-80-2-83, Puerto Rico, Atlantic Ocean,
Offshore - San Juan to Isla De Culebra

Package 1 of 3 (Tube)

- ✓One smooth sheet
- ✓One smooth position overlay
- ✓One smooth excess overlay
- ✓One original Descriptive Report
- ✓Three final field sheets
- ✓Three preliminary field sheets

Package 2 of 3 (box)

- ✓Fourteen envelopes of UGR Echograms for:
VESNO 2220: JD 062, 063, 083, 084, 085, 086, 087, 088, 089, 090, 091, 092,
095 and 096.

Package 3 of 3 (box)

- ✓One accordion file containing:
 - ✓Field Data Printouts for JD 062, 083, 084, 085, 086, 087, 088, 089, 090,
091, 092, 095 and 096
 - ✓Ross Echograms for JD 085, 086, 087, 088, 089, 090 and 091
 - ✓Two sounding volumes
 - ✓Two bundles of sawtooth position charts
 - ✓One envelope with position calibration records

FROM: (Signature)

D. B. MACFARLAND, JR., LCDR, CHIEF, HYDRO SURVEYS BR

RECEIVED THE ABOVE
(Name, Division, Date)

Dwayne S. Clark
February 14, 1985
N/CG243

Return receipted copy to:

HYDROGRAPHIC SURVEYS BRANCH, N/MOA233
ATLANTIC MARINE CENTER
NOAA - NATIONAL OCEAN SERVICE
439 WEST YORK STREET
NORFOLK, VA 23510

ATTN: THERESA HIGH

NOAA FORM 61-29
(12-71)U. S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

REFERENCE NO.

MOA23-07-85

LETTER TRANSMITTING DATA

TO:

CHIEF, DATA CONTROL SECTION
HYDROGRAPHIC SURVEYS BRANCH, N/CG243
NATIONAL OCEAN SERVICE, NOAA
ROCKVILLE, MD 20852

DATA AS LISTED BELOW WERE FORWARDED TO YOU
BY (Check):☐ ORDINARY MAIL☐ AIR MAIL☒ REGISTERED MAIL☐ EXPRESS☐ GBL (Give number) _____

DATE FORWARDED

2/4/85

NUMBER OF PACKAGES

one tube; two boxes

NOTE: A separate transmittal letter is to be used for each type of data, as tidal data, seismology, geomagnetism, etc. State the number of packages and include an executed copy of the transmittal letter in each package. In addition the original and one copy of the letter should be sent under separate cover. The copy will be returned as a receipt. This form should not be used for correspondence or transmitting accounting documents.

- ✓ One envelope with data removed from Descriptive Report
- ✓ One envelope with miscellaneous data
- ✓ One cahier with: final control printout
final position printout
- ✓ One cahier with: final sounding printout
L-file (Z-record) printout

FROM: (Signature)

D. B. MACFARLAND, JR., LCDR, CHIEF, HYDRO SURVEYS BR

Return receipted copy to:

HYDROGRAPHIC SURVEYS BRANCH, N/MOA232
ATLANTIC MARINE CENTER
NOAA - NATIONAL OCEAN SERVICE
439 WEST YORK STREET
NORFOLK, VA 23510
L ATTN: THERESA HIGH

RECEIVED THE ABOVE
(Name, Division, Date)

Dwayne S. Clark
February 14, 1985
N/CG243

PUERTO RICO AND VIRGIN ISLANDS

Diagram No.
920

