H10073

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey ... Hydrographic

Field No. ... MI-10-01-83

Registry No. ... H10073

LOCALITY

State ... Puerto Rico

General Locality ... Atlantic Ocean

Sublocality ... Punta Salinas to Punta Escambron

1985

CHIEF OF PARTY
CAPT J.A. Yeager

LIBRARY & ARCHIVES

DATE ... June 25, 1987

DIAGRAM 903-2

Charts

25670
25669
25668
25640

FORM C&GS-537 (8-15-59)

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

REGISTER NO.

H-10073

HYDROGRAPHIC TITLE SHEET

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-10-1-83

State PUERTO RICO

General locality ATLANTIC OCEAN

Locality ~~ENSENADA DE BOCA VIEJA~~ PUNTA SALINAS TO PUNTA ESCAMBRON

Scale 1: 10,000 Date of survey ~~17~~ 18 FEB to 22 APR, 1983

Instructions dated 01 DEC, 1982 Project No. OPR-I-149-MI-83

Vessel LAUNCH 1008 (VESNO 2224), LAUNCH 1002 (VESNO 2225), SKIFF (VESNO 2221).

Chief of party J. AUSTIN YEAGER, CAPT., NOAA

Surveyed by see remarks

Soundings taken by echo sounder, hand lead, ~~pole~~ ROSS MODEL 5000

Graphic record scaled by RPW,EEM,ULG,RDC,BEM,MS,BRJ.

Graphic record checked by RPW,EEM,ULG,RDC,BEM,MS,BRJ.

Protracted by _____ Automated plot by ~~AMC Digital Plotter~~ XYNETICS 1201 PLOTTER (AMC)

Soundings penciled by _____

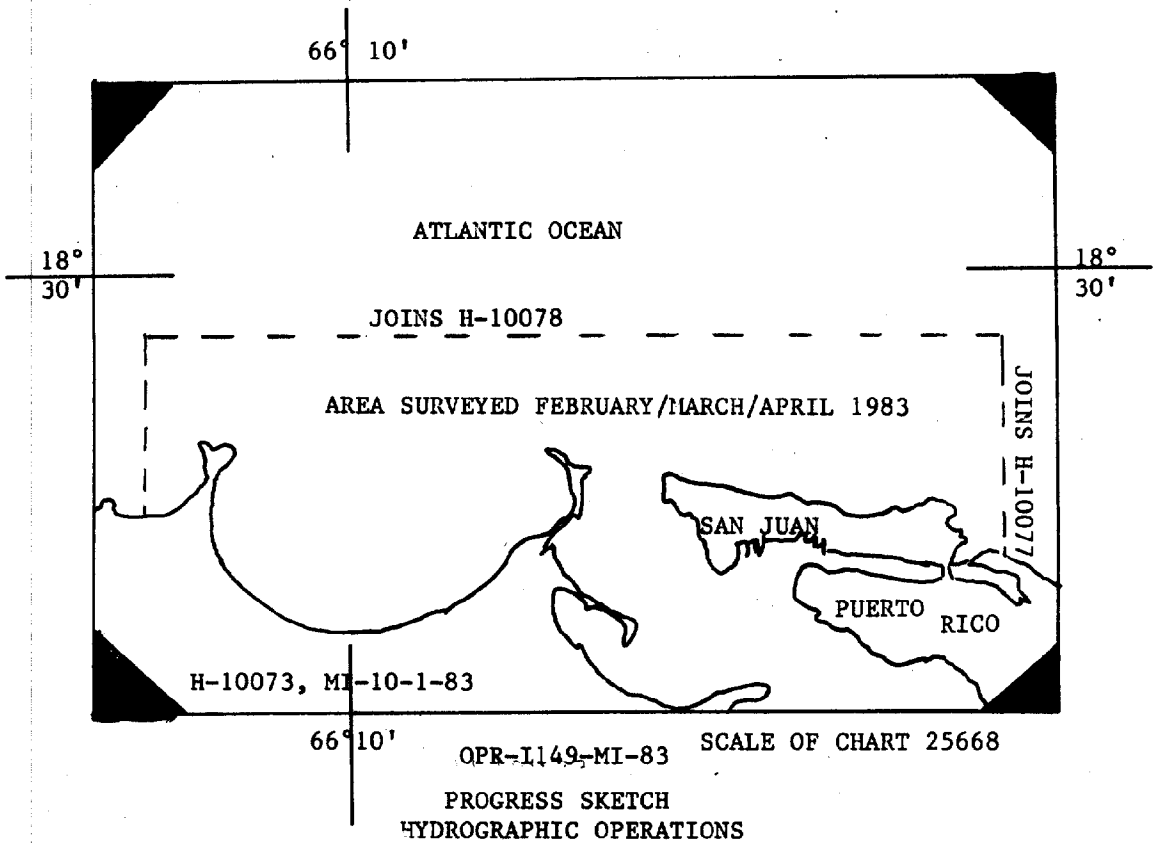
Soundings in ~~FATHOMS~~ feet at ~~MLLW~~ ~~MLW~~ MLW

VERIFICATION BY: R. L. KEENE

REMARKS: CAPT. Yeager, LCDR Lapine, LT Parsons, LT Rice, LTJG Henegar, LTJG Yates, ENS McLean, ENS Crews, ENS Miller, ENS Sites, ENS Hendrix.

NOTED IN THE DESCRIPTIVE REPORT WERE MADE IN RED DURING OFFICE PROCESSING.

AWOIS/SURF MSM 12/15/88



PROGRESS SKETCH
HYDROGRAPHIC OPERATIONS
NOAA SHIP MT. MITCHELL S-222
J. AUSTIN YEAGER, CAPTAIN, NOAA

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"APPENDICES"

* DATA Removed from DESCRIPTIVE REPORT and submitted with field Data

DESCRIPTIVE REPORT

TO ACCOMPANY

SURVEY H-10073

(Field No. MI-10-1-83)

SCALE 1:10,000 YEAR: 1983

CAPT. J. Austin Yeager

Chief of Party

A. PROJECT

This survey was conducted in accordance with Project Instructions OPR-I-149-MI-83, North Coast of Puerto Rico, issued December 1, 1982. These instructions were ammended by changes No. 1 and 2 dated February 3 and February 4, 1983, respectively.

B. AREA SURVEYED

The area covered by this survey is the North Coast of Puerto Rico from Punta Salinas to Punta Escambron, including Ensenada de Boca Vieja and approaches to Bahia de San Juan.

The area of the survey extends North to Latitude 18°~~21'30"~~ 30' N from Longitude 66°04'22" W to 66°~~12'07"~~ 11'48" W and bordered to the South by the Northern Coast of Puerto Rico.

This survey was conducted from ~~17~~ 18 February (JD 048) to 22 April, 1983 (JD 112) in weather of prevailing Northeast winds and few days of calm seas.

C. SOUNDING VESSELS

Soundings for the survey were obtained by the following vessels:

Launch 1002	(VESNO 2224)
Launch 1012	(VESNO 2225)
Skiff	(VESNO 2221)

No unusual sounding vessel configuration or problems were encountered.

D. SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO SOUNDINGS

EQUIPMENT (VESNO 2224)	SERIAL NUMBER
Ross Model 5000 200A Fineline Depth Recorder	C537-1039-5
Ross Digitizer Model 6000	1039
Rpss Model 4000 Transceiver	1053

EQUIPMENT (VESNO 2225)	SERIAL NUMBER
Ross Model 5000 Fineline Depth Recorder	1050 412
Ross Digitizer Model 6000	1050
Ross Model 4000 Transciever	1050

EQUIPMENT (VESNO 2221)	SERIAL NUMBER
Raytheon DE-719B Depth Recorder	3947

Soundings from all launches were taken with a hull-mounted transducer (Antenna distance: 0.0M for Vesno 2221 and 2225; 2.0M for Vesno 2221)

All survey records were scanned by trained survey department personnel and checked by the Officer-in-Charge. Peaks and deeps considered significant occurring between soundings, were inserted on the electronic corrector tape. SUBSTANTIAL RESCANNING REQUIRED BECAUSE bottom not caused by seas was considered sea on part of the record. Digitizing errors were corrected to agree with the graphic record via the electronic corrector tape.

Phase calibration checks were made at frequent intervals. Necessary adjustments were made and noted in the sounding volume and on the fathogram. Any departure of the trace from the calibration due to phase difference was corrected during the scanning process.

Velocity corrections were obtained from two Nansen Casts.

The casts and locations of the casts are as follows:

CAST	LATITUDE	LONGITUDE	DATE	JULIAN DATE
1	18°58'25"N	65°10'00"W	26 February 1983	057
2	18°59'00"N	66°31'24"W	26 February 1983	058

Data obtained from cast #1 were used for Julian Dates 48 through 77. Data obtained from cast #2 were used for Julian Dates 78 through 112.

Bar check and Nansen cast data compared favorably but due to the sparsity of usable bar check data, due to sea and current conditions, only Nansen casts were used to determine velocity correctors. Printouts of velocity tables II and IV and their respective velocity curves are included in Appendix D.

A draft of ~~1.5~~ 1.8 feet was applied to all soundings taken by the launches during the on-line and off-line processing. Changes in draft for the launches were insignificant. Settlement and squat correctors for vessels 2224 and 2225 were determined

on February 21, 1983, at U.S.C.G. Pier, San Juan, Puerto Rico. Settlement and squat correctors for vessel 2221 were determined on May 9, 1983 in Norfolk, Va.

A copy of the field data and the settlement and squat correctors versus launch RPM's is included in appendix D. These correctors are incorporated in the TC/TI tapes. Printouts of these tapes are included in Appendix D.

This survey was conducted using predicted tides based on daily predictions at San Juan, ~~Puerdo~~ Puerto Rico (Station Number 975-5371)

Smooth tides were requested from the Chief, Tides and Water Levels Branch (N/OMS 12) in a letter dated 23 April 1983.

Smooth tides and settlement and squat correctors will be applied on the final smooth sheet prepared by the ~~Processing Division,~~ Hydrographic Surveys Branch Atlantic Marine Center (MOA 23)

E. HYDROGRAPHIC SHEETS (FIELD SHEETS)

This survey was plotted on 3 mylar field sheets by the Hydroplot system on board the NOAA ship MT. MITCHELL as follows:

SHEET	DATA	SKEW
1	Main Scheme	0,21,54
1	Development, Bottom Samples X-lines, Detached Positions	0,21,54
1	1:5000 Enlargement of Laguna del Condado	0,21,25

In addition to the above mentioned field sheets, all notes and details have been transfered to the sounding plots prepared by the Hydrographic Surveys Branch (N/MOA23). These sounding plots will serve as the smooth field sheets for this survey.

This survey was plotted off-line using an electronic corrector tape and a velocity corrector tape. Soundings on the field sheets are corrected for draft, predicted tides and sound velocity. Sheets submitted are not corrected for smooth tides or settlement and squat. All field records and the following tapes have been forwarded to the Atlantic Marine Center:

Master Range/Range, Range/Azimuth Data Tapes (Raw and Edited)
Velocity Corrector Tapes
Paramater Tapes
Signal Tape
TC/TI Tape

F. CONTROL STATIONS

All control stations were established by at least Third Order, Class I methods. The control stations were recovered during February 1983, by Operations Division, Atlantic Marine Center, with assistance from MT MITCHELL personnel. Electronic control stations were erected by NOAA Ship MT MITCHELL personnel.

AMC	NOAA Ship MT MITCHELL
Dupont Plaza	Morro Del Norte Ecc
Morro Del Norte	Condado North
SAL	Condado South
	Radome
	GRO

All stations, with the exception of Morro Del Norte Ecc, Condado North and Condado South, have been monumented.

G. HYDROGRAPHIC POSITION CONTROL

Del Norte trisponders were used for electronic control using Range-Range and Range-Azimuth methods. Visual control was established using three-point sextant fixes.

The following electronic equipment was used during this survey:

Del Norte Remotes

Code 72	S/N 221
Code 72	S/N 1069
Code 74	S/N 189
Code 74	S/N 249
Code 76	S/N 1137

Del Norte Master Units

S/N 159

S/N 187

S/N 250

S/N 1067

Del Norte DMU Units

S/N 162

S/N 182

S/N 188

S/N 505

Each Del Norte DMU-Master pair was calibrated with the Remote units over a measured baseline, in accordance with AMC Operations Order No. 79.

The measured baseline was established between the USCG Station, San Juan and the Ruins at Isla de Cabras using a Hewlett-Packard 3810-B DMU unit.

Frequent baseline calibrations were made during the survey and daily calibration checks were made before and after data acquisition.

On JD 081, a corrector of - 104.7 m was used. This resulted from a baseline calibration error setting the DMU for a distance in excess of the true baseline by 100 meters. A new baseline calibration was conducted successfully on J.D. 082.

H. SHORELINE SEE ALSO SECTION 2.a. of EVALUATION REPORT.

Shoreline details were obtained from Class III Shoreline Maps, Job CM-8002, and represented on manuscripts numbered TP-00953 and TP-00954. The scale of both manuscripts is 1:10,000.

No intense field edit was done in this survey area but shoreline features were

checked for accuracy during nearshore hydrographic operations.

Shoreline data has changed since the photogrametric work was completed. In Bahia de Toa, rocks indicated at 18°28'16.5" N, 66°11'15" W were not observed during a walking examination of this beach by ship's personnel. It is recommended that the symbol for rocks not be added to the chart. CONCUR

Along the western coast of Punta Salinas a new jetty has been built, and station GRO (signal #376) was established at 18°28'35.7" N, 66°11'15.0" W, which is at the southern end of the jetty. This feature has been drawn on the field sheet in red ink. DELINEATION TRANSFERRED to SMOOTH SHEET.

The riprap jetty located at 18°28'01" N, 66°08'25" W in Boca Vieja is much shorter than appears on the photographs and TP-00953. The structure now extends 15 to 20 meters seaward, and this configuration has been approximated on the field sheet in red ink. REVISED DELINEATION SHOWN ON SMOOTH SHEET.

The dome charted at 18°28'32" N, 66°10'55" W, does not exist. Listed as "charted detail not visible on the photographs" on the notes to the Hydrographer, this item should be removed from the chart. (This item is also addressed in Section L of the report). CONCUR

An investigation was conducted to determine the reported pier under construction located West of Isla de Cabras light extending in a North-South orientation along Longitude 66°08'27" W from Latitude 18°28'30" N to 18°28'37" N. The structure was represented in the photogrammetric documents and included on Shoreline Manuscript TP-00953. The reported structure was approximately 225m in length.

No such structure was found in this area when searched by launch. Diving investigations revealed several pilings cut off at the sediment line, none of which has a least depth less than the adjacent bottom area. Due to heavy surf activity, sounding lines could not be run in this area. The location in question did reveal a long deposit of riprap in a North-South orientation approximately 15 feet wide. This band of riprap was deliberately deposited and was not continuous with adjacent bottom sediments which were largely white sand and scattered heads of coral. The riprap covers a 60" diameter pipeline (discussed in Section N and L) represented on Charts No. 25668 as a pipeline under construction.

Detached positions were taken on J.D. 081 as Vesno 2221 followed the diver along the path of the pipeline. Positions 7008-7011 show the direction of the pipeline, and position 1278 taken by Vesno 2224 on JD 098 marks the inshore continuation of the same riprap covered pipeline. DELINEATED ON SMOOTH SHEET, SEE ALSO SECTION 7.a.4) OF THE EVALUATION REPORT. ✓

The structure in question, which appeared as a pier under construction to a Photogrammetric compiler, was actually an elevated railway supported on pilings above the water in the area of the reef west of Pt. Salinas. No structure exists today, no pilings were observed above the sediment line, and the riprap covered pipeline was clearly found to exist and should be charted along the axis of the positions listed above. CONCUR

A total of thirteen pilings were photo identified along Longitude 66°08'27" W extending from LATITUDES 18°28'06" N to 18°28'18" N in Ensenada de Boca Vieja. These obstructions were investigated on JD 098 by Vesno 2224 through a diving investigation.

The North-South axis of the structure was positioned and bouyed based on photogrammetric positions. The divers then conducted a 100 ft. radial sweep along this line. Only five pilings were found, and these have been cut below the chart datum. Located by positions 1271-2175, the five southern pilings remain as submerged obstructions. All others were not located in the sweep and are believed to have been cleared.* The five located pilings should be included on the chart as submerged pilings dangerous to navigation. The two rock awash symbols depicted on sheet TP-00953 are located in the approximate position of PSR Item No. 2734 (wreck awash) at 18°28'27" N, 66°09'24" W. Visual and diving investigations described in section K of this report reveal that only wreckage is visible above the datum at this position and the rock awash symbol should not be charted.

* CONCUR ✓ CONCUR

I. CROSSLINES SEE also Section 3.a. of the Evaluation Report.

This survey contains 16.8% crosslines run per mile of hydrography. The agreement between crossline and mainscheme overlap was 99% based on criterion for comparison cited in Section 1-1-2 Part B.II.1 of the Hydrographic Manual.

At position 18°28'45"N, 66°05'09"W, an area of rapid change in bottom relief was observed. Several soundings were inserted at this location on both the mainscheme and crosslines to fully define this uneven bottom. Crossline positions 457^{+4} to 458 and main scheme positions 437 to 438 show adjacent soundings differing by 10 ft. but no soundings directly overlap. This area is considered to be well defined by the main scheme and crossline coverage. SOME SOUNDING DATA WAS REJECTED BECAUSE OF CROSSING INCONSISTENCIES OFFSHORE.

J. JUNCTIONS SEE SECTION 6. of the Evaluation Report.

This survey was junctioned by two surveys, H-10077 at Scale 1:10,000 and H-10078 at Scale 1:20,000. Both of these surveys were conducted concurently with the present survey.

Excellent agreement was found in comparing junction soundings and depth contours. Survey H-10077 has 100% agreement with the present survey along

the junction line at Longitude 66°04'50" W, representing the eastern most main scheme line of this survey and the western most line of H-10077. Survey H-10078, which junctions to the north of this survey, also showed 100% agreement with junctioned soundings.

K. COMPARISON WITH PRIOR SURVEYS SEE ALSO SECTION 6. of the EVALUATION REPORT.

This survey was compared with three prior surveys containing work in the present operational area. They are as follows:

NUMBER	DATE	SCALE
H-2677	May 1904	1:20,000
H-2883	Apr-May 1907	1:20,000
H-6556	June 1940	1:10,000

Survey No. H-2677 proved to be less comprehensive than the present survey. It is of a smaller scale (1:20,000), and as such contains a lesser density of soundings. Comparison was made between these surveys from the westerly limit of this survey east to Longitude 66°07'18" W, and from Latitude 18°28'58" N to the northerly limits of this survey.

A comparison of soundings showed a 99% agreement between these two surveys within acceptable standards of the Hydrographic Manual, Sec 1-1.2 Part BII.1.

A better definition of the 120 ft. and 600 ft. contours was obtained through the greater density of soundings in this 1:10,000 scale survey. The 120 ft. contour is drawn farther offshore in Survey H-2677 than was presently found to exist along Latitude 18°29'18" N from Longitude 66°09'00" W to 66°09'30" W.

The 600 ft. contour of survey H-2677 can be better defined with soundings from this survey, as a 569 ft. sounding from survey H-2677 lies between a 615 and 639 ft. sounding from this survey at 18°29'31" N, 66°07'23" W.

The discontinued dumpsite located at 18°29'06" N, 66°08'21" W showed excellent agreement with soundings from Survey H-2677, indicating no significant changes in

depth in this area due to its designated usage. The shoal depth in the present survey of 69 ft. (position 284^{+6}) was compared to soundings from Survey 2677 and showed very good agreement. This shoal depth of 69 ft. is less than any surrounding depth of the prior survey.

Comparison with Survey No. H-2883 was made from Longitude 66°07'55" W to the eastern limits of this survey. To the South, the area of comparison is defined by a line approximating the 100 ft. contour along Latitude 18°28'42" N.

An agreement of 99% was found between Survey H-2883 and present, noting the different scale of each survey as the probable limitation in achieving total agreement between surveys.

The present survey, at a larger scale, more clearly defines the depth contours. Also, the prior survey contains sounding lines run parallel to depth contours while the present survey was run 90° to the contours. Notable clarification of contours was observed along the 180 ft. contour between φ18°29'06" N, λ66°06'20" W and φ18°29'06" N, λ66°06'40" W.

The 300 foot contour at Latitude 18°29'30" N between 66°07'00" W and 66°05'00" W Longitude is also better defined by the present survey while the prior survey merely approximates these deliniations.

The dumpsite centered Northeast of El Morro shows a least depth of ~~69~~ 65 ft. (position ~~480~~ 533^{+4}_{+2}). This position lies South of the limits of Survey No. 2883, and thus no comparison can be made with this depth.

Survey No. H-6556 provides soundings for comparison within the Eastern half of Ensenada de Boca Vieja, from Longitude 66°09'36" W to Isla de Cabras and offshore from the same Longitude to 66°07'48" W and North to Latitude 18°29'07" N.

Sounding comparisons based on guidelines of Sec. 1.1.2 Part B.II.1 of the Hydrographic Manual show a 97% agreement between these two surveys.

The area of comparison contains a diverse bottom topography containing

sharply contrasting bottom features with high contour density in many areas. The conspicuous absence of soundings from Longitude 66°09'18" W to Isla de Cabras from Latitude 18°28'00" N to 18°28'30" N, is common to both surveys. This area is extremely hazzardous to the safe navigation of the sounding vessel, and breaks in nearly all weather. Additionally, numerous submerged natural obstructions (i.e. coral heads and limestone rocks) are found in this area. A rock awash is reported in Survey H-6556 at φ18°27'56" N, λ66°08'50.5" W. This rock was not located at this position and no rock awash was visible in this area. A ROCK AWASH COVERING 1-FT at MLW WAS FOUND IN THE AREA IN 1986. South of this position along the same Longitude, a 20m wide coral head was found to rise to a least depth of 3.8 ft. measured by leadline. The position of this obstruction is φ18°27'53" N, λ66°08'50.5" W and is discussed further in Section L.* Several areas of change were noted indicating a deeper bottom than found in Survey H-6556. Areas of change are noted as follows:

PRESENT SURVEY DATA SHOULD BE CHARTED.

POSITION	SURVEY H-6556	PRESENT SURVEY	POSITION #
φ18°27'28" N λ66°09'16" W	12 ft.	~~14~~ 12 ft.	835 +1
φ18°27'52" N λ66°09'22" W	22 ft.	~~26~~ 22 ft.	~~830~~ 831 +5
φ18°28'01" N λ66°08'36" W	2 ft.	~~6~~ 5 ft.	~~7020~~ +2 2133 +2

The above positions are randomly disturbuted throughout the bay. This does not indicate any general process or trend but highlights several changed areas.

A change has occurred at position φ18°27'28" N, λ66°09'21" W, which finds positions 831 +9 to 834 from 3 ft. to 5 ft. deeper than in the prior survey.

The 6 ft. contour represented in Survey H-6556 is in question at position φ18°28'23" N λ66°09'22" W. Here, position number 828 +1 of the present survey is a ~~13~~ 9 ft. depth yet lies within the 6 ft. contour of the prior survey.

* IT IS RECOMMENDED THE CHARTED ROCK AWASH BE DELETED, AND A ROCK AWASH BE CHARTED AS PORTRAYED ON PRESENT SURVEY.

At φ18°28'54" N, λ66°08'33" W an extension of the 24 ft. contour further north was not identified on the earlier survey.

There is excellent agreement between surveys in the general area of φ18°28'36" N, λ66°09'40" W. This area has a high density of contour lines having shallow reefs that drop rapidly to 40 ft. Agreement in this area shows the stability of this hard coral bottom and accuracy of both surveys. No prior survey has been conducted in Western Ensenada de Boca Vieje.

Four pre-survey review items were assigned to this survey; items 2734, 2735, 2736 and 2744. All other PSR items lying within the sheet limits were investigated and these additional items are addressed in this section as well.

PSR Item No. 2734: Unknown wreck, 10 ft. above chart datum.

Charted Position: φ18°28'28" N, λ66°09'26" W. ✓

This unknown vessel, believed to have been a freighter, is now badly broken on a coral reef. The AWOIS listing describes a vessel visible 10 ft. above chart datum, (from T-11884 (1964-65)) yet is charted as a submerged wreck dangerous to navigation. Both are incorrect as the vessel ~~extends 1 ft. above~~ is awash at MLW datum. The charted location of this vessel lies several meters north of its true position.

AWOIS updated 12/14/88 ✓

Diving investigations found two boilers ~~visible above datum by 1 ft.~~ awash at MLW with heavy wreckage lying beyond the area of the charted symbol. Wreckage extends from the stern, position 1182 (Vesno 2224, JD 097) at φ18°28'28" N, λ66°09'27" W, to the bow at φ18°28'27" N, λ66°09'22" W. CENTERED IN φ18°28'27"N, λ 66°09'26"W ON PRESENT SURVEY.

~~The structures awash should be marked by danger Symbol 11 (Nautical Chart No. 1), indicating a wreck visible above sounding datum, centered between the bow and stern positions indicated above.~~ IT IS RECOMMENDED CHART AS PORTRAYED ON PRESENT SURVEY.

formerly—presently AWOIS Item No. 930.

PSR Item No. 2735: Unknown wreck awash.

Charted position: φ18°28'25" N, λ66°09'20" W. from Notice to Mariners 18 of 1963 (PA). (NM 18/63)

This item was searched for by launch using 25 m spacing and a diving investigation at the reported location of this wreck awash. No wreckage is visible above chart datum, and no wreckage was seen during the dive which included a 100' sweep around the reported location.

AWOIS cmdm 12/14/88

Should wreckage exist in this area, it is now part of the reef structure which is well defined on both the present and the prior surveys and should be avoided by the prudent mariner. The charted symbol is in error, as no wreckage is visible, and should be removed. ~~The date of report of this item is 1963, which precludes the assumption that this item is part of item No. 2734, lying 100 m to the West on the same reef, sunk in 1964.~~ AWOIS Item 2734 is based upon 1964 aerial photography and most probably was in existence in 1963. Given the approximate location of Item 930 it is reasonable to conclude that Items 2734 and 930 are the same wreck. Recommend charting as shown on present survey, the charted visible wreck in φ18°28'25"N, λ66°09'20"W should be removed.

PSR Item No. 2736: Unknown barge aground.

formerly 2736— presently AWOIS Item No. 907.

Charted position: φ18°28'22" N, λ66°08'22" W (PA). from Local Notice to Mariners 5 of 1976, (LNM 5/76)

This item was identified as McAllister Bros. 226-foot fuel barge Z-102, hard aground in 7 feet of water. This item was positioned and investigated on JD 081 by Vesno 2221. A midpoint position was calculated at 18°28'27.5" N, 66°08'22.0" W, using range/azimuth control (positions ~~7006-7007~~ 2172-2173).

AWOIS mdm 12/14/88

It is recommended that the charted symbol be relocated to the correct position as determined in this survey, and the "PA" notation be removed. concur

Neither the temporary white light nor the oil containment skirt was found as reported in the AWOIS listing. Chart as shown on present survey and remove charted visible wreck, PA.

PSR Item No. 2737: OCEAN EAGLE (stern section).

Reported position: φ18°36'54.0" N, λ66°11'18.0" W. from chart letter 641 of 1968. (CL 641/68)

The tanker OCEAN EAGLE broke in two upon approach to San Juan Harbor in 1968. Documentation is lacking regarding the removal and deliberate sinking in deep water. An eye wittness to the incident and local wreck historian confirms the break up of the vessel with both bow and stern sections being towed offshore and sunk. Knowledge of the exact position is lacking in both U.S. Coast Guard and U.S. Army Corps of Engineer's files.

AWOIS msm 12/13/88

The stern section, after floating into the harbor channel was reportedly sunk several miles offshore and poses no hazzard to navigation. This item should not be charted. concur

formerly 2738 – presently AWOIS Item No. 595

PSR Item No. 2738: OCEAN EAGLE (bow section).

Reported position: 18°36'18.0" N, 66°08'42.0" W. from CL 641 of 1968.

A local historian confirms the towing of the bow section from North of the San Juan harbor entrance to several miles offshore for sinking. No knowledge of the exact psition was obtained (see PSR Item No.2737). This item should not be charted. CONCUR

AWOIS msm 12/14/88

formerly 2740 – presently AWOIS Item No. 767

PSR Item No. 2740: Wreck on beach.

Reported position: 18°28'26.0" N, 66°07'52.0" W. from CL 1322 of 1963.

The reported area was thoroughly searched by launch and no wreckage or obstructions were found. The original information should be regarded as erroneous and no changes to the charts be made. CONCUR The item is presently not charted. CONCUR.

AWOIS msm 12/14/88

NO position data was available from field unit to support area searched.

PSR Item No. 2741: TRANSCARIBBEAN.

Charted position: 18°28'30" N, 66°08'00" W. from shoreline manuscript T-11884 (1964-65)

A thorough visual investigation from surface craft confirmed the existence of this vessel, visibly imbedded in a reef and hard aground. The vessel is in part visible above datum as is the reef mass in which it is now contained. As such it presents no hazzard to navigation, ~~and its symbol can be removed from the chart. The remaining reef outline should be carried forth.~~

AWOIS msm 12/14/88

The location of this item was determined by a three (3) point sextant fix, and is at 18°28'29.9" N, 66°07'59.9" W (pos. ~~8004~~ 4005). RETAIN AS PRESENTLY CHARTED. PER CL-182 of 1968.

PSR Item No. 2742: Barge "DUO".

Charted position: 18°28'24.0" N, 66°07'57.0" W (PA). FROM LNM 44 of 1981 and LNM's 11, 13, 15 of 1982.

This barge, hard aground, is actually the "PROCK Barge 19" and is located at 18°28'~~57.0~~ 16.5" N, 66°07'59.7" W (pos ~~8003=8004~~ 4004). The barge is visible above datum and ran aground with the tug "CARL O".

AWOIS MDM 12/15/88

The name "DUO" is incorrectly applied to this item. The "DUO" is a capsized frieghter lying several hundred yards North and is PSR Item No. 2743.

It is recommended that the existing wreck symbol be relocated to the correct position and remove the "PA" notation. The AWOIS listing should be updated to include the proper vessel name. CONCUR CHART AS SHOWN ON PRESENT SURVEY.

PSR Item 2743: Frieghter capsized, aground.

Charted position: 18°28'25" N, 66°08'00" W. FROM LNM 44 of 1981.

This item was identified through USCG documentation as the 130 ft. frieghter "DUO". Due to heavy surf in this area, a thorough inspection was not possible. Both Coast Guard and Army Corps of Engineers have no record of any salvage effort on this vessel.

AWOIS MDM 12/15/88

A local wreck historian indicates that the wreck is at the charted location and broken in two. It is recommended that the above position be used to chart this vessel and change the symbol to show a DANGEROUS sunken wreck. No wreckage is visible above the chart datum. CONCUR

PSR Item No. 2744: Tug GELDERLAND, removed.

Now AWOIS item 608

Location: 18°28'41.6" N, 66°08'36.0" W.

This item is not presently charted and has been removed. The area was searched by surface craft and no obstructions were found.

✓ AWOIS MDM 12/14/88

The removal of the tug M/V GELDERLAND from the above location on 24 August 1978 was documented in USCG files. A copy of a letter from the Caribe

Tugboat Corp. confirms the removal of this vessel and is included with the survey data. There should be no change on the charts regarding this item. CONCUR

PSR Item No. 2751: ANTONIO LOPEZ.

Charted position: φ18°28'~~51.0~~ 50.1" N, λ66°13'~~15.0~~ 63.3" W. from SURVEY H-2677 (1904).

This wreck is charted in the above position as a sunken wreck, not hazardous to navigation. This item was not investigated by launch, but information from local divers and a wreck historian indicate the wreck has not been salvaged and lies approximately as charted.

AWOIS MSM 12/15/88

The wreck was sunk during the Spanish-American War and a triangulation station established in 1901 at φ18°28'50.1" N, λ66°13'53.3" W. The mark has been lost as no wreckage is visible above datum. The symbol should be carried forth as presently charted. CONCUR

PSR Item No. 2779: Tug "CARL O", aground. 5

Charted position: φ18°28'19.0" N, λ66°07'55.0" W (PA). from LNM 15 of 1982.

The tug was located using a three (3) point sextant fix as the observers occupied, the bow and stern (pos ~~8001-8002~~ 4001). A mid-point was calculated to be φ18°28'13.5" N, λ66°07'58.0" W and the wreck symbol should be relocated to this position. The notation "PA" should be removed. CONCUR

AWOIS MSM 12/15/88

The vessel is aground and listing slight to starboard. Most of the hull and all of the superstructure is visible. CHART AS SHOWN ON PRESENT SURVEY.

L. COMPARISON WITH THE CHART SEE ALSO SECTION 7. OF THE EVALUATION REPORT.

Presently, two published charts encompass the area of this survey. They are:

CHART NO.	EDITION	DATE	SCALE
25668	11th	28 Aug. 1982	1:100,000
25670	32nd	18 Sept. 1982	1:10,000

Comparison with Chart 25668 showed a 95% agreement of soundings compared.

All discrepencies appear to be due to the scale of Survey 25668 (1:100,000) in comparison with the present survey.

~~Only one (1) charted depth is more shoal than the present survey depth.~~ Current survey sounding density and coverage is greater than the prior surveys from which Chart 25668 is based. At φ18°28'03" N, λ66°09'~~30~~27" W, a charted depth of ~~16~~17 ft. is compared with a ~~26~~18 ft. depth from the present survey.

~~This survey shows no such depth in this well developed area, and the origin of the 16 ft. sounding is unclear since prior surveys did not present this depth. The 16 ft. depth should be superseded by this survey.~~

Several additional comparisons were found not to agree, and are probably due to the magnitude of scale difference between this chart and this survey. They are:

H-10073 Depth	Position No.	Chart 25668 Depth	Location
~~244~~243 ft.	102^{+3}	216 ft.	φ18°29'~~45~~42" N
			λ66°10'~~42~~33" W
~~220~~219 ft.	75	180 ft.	φ18°29'42" N
~~222~~228 ft.	220^{+4}		λ66°09'36" W
~~316~~309 ft.	586^{+3}	~~240~~204 ft.	φ18°29'53" N
			λ66°09'08" W

At position φ18°27'34" N, λ66°09'54" W, this survey finds a least depth of ~~11~~10 ft. at pos. 70^{8+1}. A charted depth in this area is lacking and should be updated to fill this void. CONCUR

The dumpsite area at φ18°29'03" N, λ66°08'24" W shows a charted least depth of 90 ft. This survey shows a least depth of 69 ft. (pos 284^{+6}) and the chart should be updated as such. CONCUR RECOMMEND DISPOSAL AREA BE DELETED FROM THE CHART

The dumpsite at approximate φ18°28'41" N, λ66°07'00" W shows good agreement with the chart but should be updated to the ~~69~~ 66 ft. depth of this survey (pos ~~480~~ 53513 +2) rather than the 78 ft. sounding now charted. CONCUR RECOMMEND this disposal area be deleted from chart.

The dome located at φ18°28'32" N, λ66°10'55" W, as discussed in Section H, should be deleted from the chart, as none was found to exist. Rather, the two domes on Pt. Salinas which are photogrammetricly located, should be charted to aid in coastal navigation. CONCUR SEE also section 4.5. of the EVALUATION REPORT.

Comparison with Chart No. 25670 showed a 93% agreement of all soundings compared.

The present survey provides a better definition of depth contours in several areas. Contour definition is enhanced along Latitude 18°28'15" N from Longitude 66°05'30" W to 66°06'00" W and the ~~20~~ 18 ft. contour as charted can be modified to exclude a ~~24~~ 23 ft. sounding (pos. 1048) found within position φ18°28'31" N, λ66°07'10" W.

Two charted depths were found to be less than depths from this survey. They are:

POSITION NO.	LOCATION	CHART	PRESENT SURVEY
977+5	φ18°28'55" N λ66°09'54" W	36 ft.	~~51 ft.~~ 37-40 ft CHART PRESENT SURVEY depths.
1048+2	φ18°28'31" N λ66°07'11" W	26 ft.	37 ft. RETAIN CHARTED DEPTH.

Several areas within Ensenada de Boca Vieja showed disagreement, believed due to the movement of the bay's fine sand sediment. This survey found deeper water at several locations and these should be charted as follows: RECOMMEND CHARTING PRESENT SURVEY DEPTHS.

SURVEY DEPTH	CHART DEPTH	POSITION NO.	LOCATION
~~19, 21~~ 14 ft.	12 ft.	828+3, +4	φ18°28'17" N λ66°28'23" W
~~12, 6~~ 3, 5 ft.	4 ft.	860+1, +2	φ18°28'02" N λ66°09'08" W
8 7 ft.	4 ft.	820+3	φ18°28'10" N λ66°09'01" W
18 7 ft.	14 ft.	~~831~~ 832+1 +7	φ18°27'38" N λ66°09'21" W

Shoreline areas were observed to lie deeper than the charted depths in several areas. Survey depths are deeper by 2 to 3 ft. in 10 to 15 ft. of water from φ18°27'23" N, λ66°09'26" W (pos 911) to φ18°27'48" N, λ66°08'51" W (pos. 917). This was also observed in shoreline positions 7025 to 7031, North of Punta Tacones from Long. 66°08'15" W to Long. 66°08'33" W. These discrepencies are attributed to sediment movement and should be charted according to depths of this survey.

Several features are included on both Charts No. 25668 and No. 25670 and are in need of charting modification. These items are discussed in detail in the Shoreline and Prior Survey Comparison. They are presented in summary below along with the corresponding charting recommendation.

ITEM	LOCATION	RECOMMENDATION
Rock Awash	Charted at φ18°27'56" N λ66°08'50.5W	Delete; ~~Not found~~ ~~Chart least depth of 3.8 ft.~~ CHART PRESENT SURVEY data IN VICINITY.
Submerged Rock	Chart at φ18°27'53"N λ66°08'50.5" W	
Pipeline submerged	Charted along approximate Long. 66°08'21" W	Delete "sewer under construction" and carry label of "Submerged Pipeline". CONCUR
Wreck Awash (PSR #2735)	Charted at φ18°28'25" N λ66°09'20" W } SEE PAGE 13 of this REPORT FOR RECOMMENDATION.	~~Delete; not found~~
Wreck Awash (PSR #2734)	Charted at φ18°28'28" N λ66°09'26" W } SEE PAGE 14 of this REPORT FOR RECOMMENDATION.	~~Change Danger Symbol to wreck awash (See Section K)~~
Barge aground (PSR #2736)	Charted at 18°28'22" N 66°08'22" W (PA) } SEE PAGE 13 of this REPORT FOR RECOMMENDATION.	~~Delete "PA"~~ ~~Delete charted position~~ ~~Chart at 18°28'27.5" N~~ ~~66°08'22.0" W~~

Several features currently on both charts are recommended to be carried forth unchanged. The submarine cable discussed in Section N of this report is to be carried as charted. The rock awash symbol charted at φ18° 28' 17"N, λ66° 09' 09"W is to be carried forth. The entire area breaks in all weather and the symbol is valid. CONCUR

M. ADEQUACY OF SURVEY

Due to the nature of the survey area, the standard line spacing for a 1:10,000 scale survey was increased from 100m to 200m. The survey area, from Punta Salinas to Punta Escambron, is a relatively shallow area transited only by local traffic with drafts of generally less than three feet. The hydrographer's observations coupled with local knowledge indicated that this area is seldom transited due to the extremely dangerous reef formations and breakers and that during MT MITCHELL's stay in the area only a few local skiffs were seen in the area in addition to MT MITCHELL's survey launches. The present chart adequately indicates the hazzards of this coastal area. The United States Coast Pilot (No. 5) correctly and cautiously advises mariners to steer for a point 4 miles North of Punta del Morro before lining up on the entrance to Bahia San Juan.

Since the sounding line spacing was increased beyond what is normally acceptable on a 1:10,000 scale survey, this survey cannot be considered to have met the requirements of a Basic Survey in accordance with section 4.3.4 of the Hydrographic Manual. However, due to the nature of the survey area, as explained above, this survey should be considered adequate. ~~to supplement prior surveys of the area.~~

Due to the concern for launch and crew safety, the following areas could not be surveyed and the existing charted information should be considered adequate in depicting the areas:

1. The area in the vicinity of Isla de la Palamos (φ18° 28' 45"N, λ66° 11' 20"W).

2. The shoreline North and East of Punta Salinas.

3. The area West of Isla de Cabras (φ18° 28' 15"N, λ66° 08' 45"W).

4. The shoreline between Punta del Morro (~~77~~ 66° 07' 30"W) and Punta Escambron (66° 05' 00"W).

5. The zero-foot contour along the entire shoreline of the survey area.

N. AIDS TO NAVIGATION

There are no floating aids to navigation contained within the limits of the

survey area.

A submarine cable is represented on Chart 25668 and a more detailed representation of the same on Chart 25670. The cable originates within San Juan Harbor at Bajo San Augustin which lies between Punta del Morro and La Puntilla. The cable extends North between Punta del Morro and Isla de Cabras but does not enter the navigable channel, lying to the East of all floating aids. At an approximate position of ϕ18°28'30"N, λ66°07'37"W, the cable leads seaward to the Northeast. It is at this position that the representation begins on Chart 25668. No evidence was found to indicate the removal or change of status of this cable and this feature should remain as charted on both charts. CONCUR

Cabras Light, located at ϕ18° ~~28.6 N~~ 28'37.24"N, λ66° ~~08.4 W~~ 08'24.52"W, is the only fixed aid to navigation located within the limits of this survey. Although its geodetic position was not verified, this aid was used in several geodetic observations and yielded no errors. It is therefore assumed to be accurately positioned as reported in the light list and serves its purpose well (used as station 102).

O. STATISTICS

LAUNCH 1002 (VESNO 2224)

Positions	1294
Main Scheme Mileage	112.2
Cross Line Mileage	25.7
Development Mileage	41.1
Total Hydrographic Mileage	179.0
Miscellaneous Mileage	185.0
Total Miles	364.0

LAUNCH 1008 (VESNO 2225)

Positions	14
Main Scheme Mileage	0
Cross Line Mileage	0
Development	0
Total Hydrographic Mileage	0
Miscellaneous Mileage	10
Total Miles	10

SKIFF (VESNO 2221)

Positions	111
Main Scheme Mileage	6
Cross Line Mileage	0
Development Mileage	0
Total Hydrographic Mileage	6
Miscellaneous Mileage	12
Total Miles	18

TOTAL FOR ALL VESSELS

Positions	1419
Main Scheme Mileage	118.2
Cross Line Mileage	25.7
Development Mileage	41.1
Total Hydrographic Mileage	185.0
Miscellaneous Mileage	207.0
Total Mileage	392.0
Square Miles	20.5

P. MISCELLANEOUS

Laguna del Condado was surveyed on JD 099 by Vesno 2221 (positions 9000 - 9066). It was determined that this body of water is navigable and used by USCG skiffs as an alternate route during foul weather. The requirement for survey was established in a letter dated 02 March, 1983 from N/CG24. A copy of this letter is included in the survey suport data. THE SURVEY data shown on the PRESENT SURVEY IN this AREA IS CONSIDERED to BE RECONNAISANCE data and NOT a BASIC SURVEY. See also section 3.c. of the Evaluation Report.

Q. RECOMMENDATIONS SEE EVALUATION REPORT.

As previously stated in Section M, this survey should be considered adequate to ~~supplement~~ supersede prior surveys of the area.

R. AUTOMATED DATA PROCESSING

The following HYDROPLOT Programs were used to aquire and process the data.

PROGRAM #	PROGRAM NAME	VERSION
RK 112	Hyperbolic, R/R Hydroplot	03/19/81
RK 116	Range/Azimuth Real Time Hydroplot	08/24/81
RK 201	Grid, Signal, and Lattice Plot	04/18/75
RK 210	Hyperbolic Non-Real Time Plot	02/02/81
RK 211	Range - Range Non-Real Time Plot	02/02/81
RK 212	Visual Station Table Load and Plot	04/01/74
RK 216	Range/Azimuth Position & Sounding Plot	02/09/81
RK 300	Utility Computations	10/21/80
RK 330	Data Reformat and Check	05/04/75
PM 360	Electronic Corrector Abstract	02/02/76
AM 500	Predicted Tide Generator	11/10/72
RK 530	Velocity Corrections Computations	05/10/76
RK 561	H/R Geodetic Calibration	02/19/76
RK 602	Extended Line Oriented Editor	05/20/75

S. REFERENCE TO REPORTS

Horizontal Control Report

Coast Pilot Report

Humpback Whale Report

Respectfully submitted for approval,

Craig N. McLean

Craig N. McLean
Ensign, NOAA

APPROVAL SHEET

The field work on this Hydrographic Survey was under my daily supervision. The boat sheets and records have been reviewed and approved by me. As the sounding line spacing does not meet the requirements of a Basic Survey, this survey should be considered adequate to supplement prior surveys of the area. Due to the nature of the survey area, it is not recommended that additional time and expense be expended to bring this survey up to Basic Survey standards. SEE also 1985 Report by NOAA Ship PEIRCE and the Evaluation Report.

J. Curtis Yeager

Commanding Officer

NOAA Ship MT. MITCHELL S-222

APPENDIX "J"

NOAA FORM 77-28 (11-72)

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

REGISTER NO.

H-10073

HYDROGRAPHIC TITLE SHEET

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-10-1-83

State Puerto Rico

General locality San Juan

Locality Punta Salinas to Punta Escambron

Scale 1:10,000 Date of survey 16 Oct - ~~21~~ 7 Nov, 1985

Instructions dated 16 Sept, 1985 Project No. OPR-I149-PE-85

Vessel PEIRCE Launches PE-1 (VESNO 2831 Hull #1009), PE-2 (VESNO 2832 Hull #1017) (VESNO 2833 Hull #1287)

Chief of party CDR A.E. Theberge, NOAA

Surveyed by D. Waltz, D. Ross, V. Barnum, B. Lake, J. Hill

Soundings taken by echo sounder, ~~xxxxxxxxxx~~ Raytheon DSF-6000N

Graphic record scaled by VDR, VAB, JAH, BAL, MHB, MJB, WRM, DAW

Graphic record checked by VDR, VAB, JAH, BAL, MHB, MJB, WRM, DAW

Protracted by N/A Automated plot by ~~Hydroplot~~ XYNETICS 1201 PLOTTER (AMC)

Verification by Atlantic Marine Center, R. L. KEENE

Soundings in ~~fathoms~~ feet at ~~MLW~~ ~~MLLW~~ MLW

REMARKS: All times are in Coordinated Universal Time

NOTES IN THE DESCRIPTIVE REPORT WERE MADE IN RED DURING OFFICE PROCESSING.

NOAA FORM 77-28 SUPERSEDES FORM C&GS-537.

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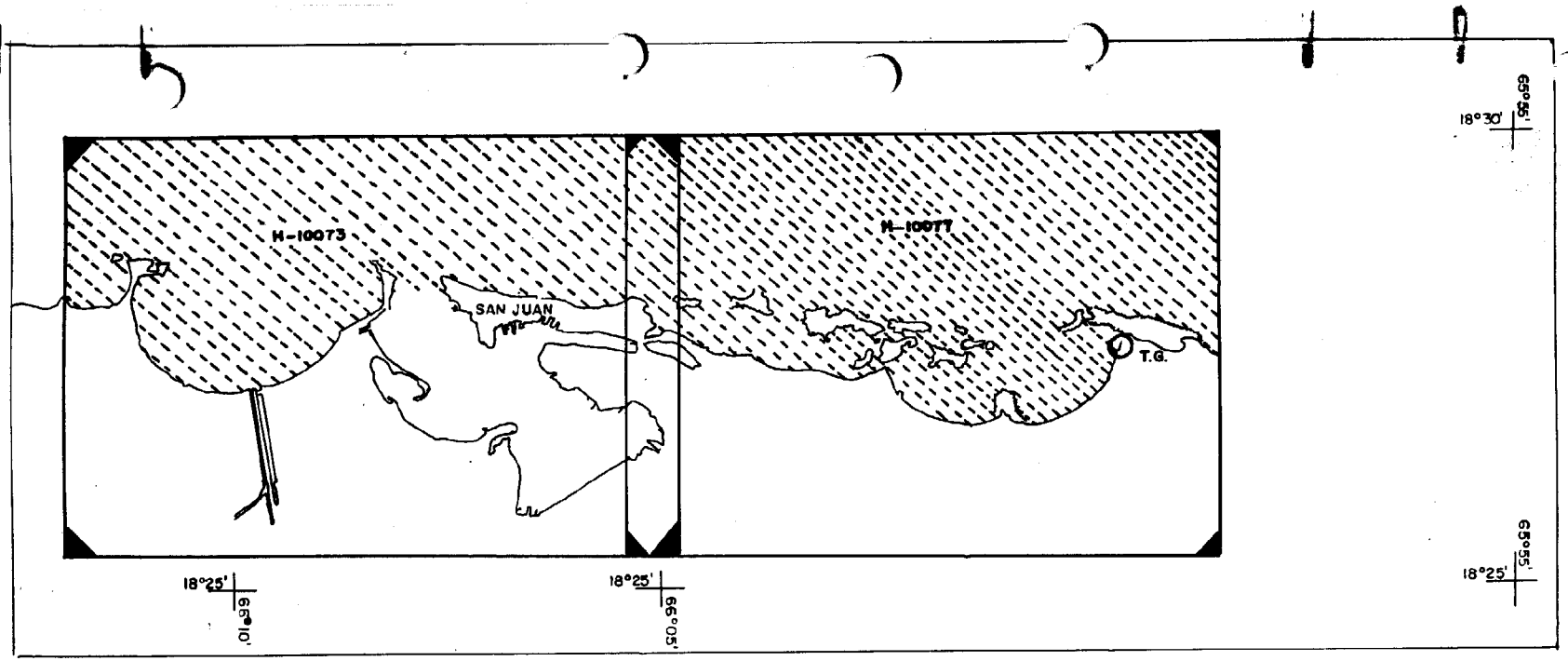


PROGRESS SKETCH

OPR-I149 - PE-85

NORTH COAST OF PUERTO RICO

OCT — DEC 1985

NOAA SHIP PEIRCE S-328

ALBERT E. THEBERGE, CDR, NOAA
COMMANDING

from CHART 25668
SCALE=1:100,000

LEGEND

16---2

OCT	NOV	DEC	
322	0.2		SQ. NM. SOUNDING
144	35		LNM MISCELLANEOUS DISTANCE
266.2	57		LNM DISTANCE TO AND FROM
229.9	8.9		LNM SOUNDING LINE
7	24		BOTTOM SAMPLES (GRAB)
5	5		WATER SAMPLES ANALYZED(SALINITY)
1	0		CONTROL STATIONS
0	0		TEMPERATURE, DEPTH, CONDUCTIVITY
1	1		NANSEN CAST
1	0		TIDE GAGE

DESCRIPTIVE REPORT
TO ACCOMPANY HYDROGRAPHIC SURVEY
H-10073
Scale: 1:10,000
Cdr. Albert E. Theberge, NOAA
Chief of Party

A. PROJECT

This survey was conducted in accordance with Project Instructions OPR-I149-PE-85, dated September 16, 1985, with Change No. 1, dated October 7, 1985. The purpose of this project is to provide supplemental data to complete survey H-10073 which was begun by the MT.MITCHELL in 1983. The work by the MT. MITCHELL and the work by the PEIRCE must be considered one survey; are intended to provide useful information to support the current NOS Nautical Charts of the area, and for the compilation of a new 1:10,000 scale chart of the approaches to San Juan Harbor, Puerto Rico.

B. AREA SURVEYED

This survey covers the area off the north coast of Puerto Rico between Punta Salinas and Punta Escambron. The actual limits of the survey lie between longitude 066°11'48"W and 066°04'50"W. The Northern limit is 18°~~21'30~~ 30'00"N or a depth of approximately 130 ft.

This 1:~~20~~10,000 scale survey was conducted from 16 October (DAY 289) to ~~21~~ 7 November (DAY ~~325~~ 306), 1985.

C. SOUNDING VESSEL

Hydrography on this sheet was performed by the PEIRCE launches, PE-1 (VESNO 2831, hull no. 1009), PE-2 (VESNO 2832, hull no. 1017), and PE-3 (VESNO 2833, hull no. 1287). Shoreline and item investigations were performed by PE-1 and PE-3. Bottom samples were collected using both launches, PE-1 and PE-2. No unusual sounding vessel configurations were used.

D. SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO SOUNDINGS

All Type-1 survey launchs were equipped with Raytheon DSF-6000N echo sounders. The 17-ft. Monarch (VESNO 2833, hull no. 1287) was equipped with a portable DE-719B echo sounder. Both high and low frequencies of the DSF-6000N were used simultaneously during this survey with only the high frequency soundings being digitized.

The following sounding equipment was used:

VESNO	INSTRUMENT	MODEL	S/N	DAYS
2831	Raytheon	DSF-6000N	A112N	289-305
2832	Raytheon	DSF-6000N	B050N	289-291 295-306
2832	Raytheon	DSF-6000N	A105N	292
2832	Raytheon	DSF-6000N	A108N	294
2833	Raytheon	DE-719B	5441	302

Sounding machine initials were maintained at 0.0 during survey operations. On DAY 302, on VESNO 2832, the initial setting of the DE-719B intermittently drifted off zero by two-tenths of a foot. Fix numbers 8048-8051 were the only data affected. According to the Hydrographic Manual, Table 4-4, sounding corrections need only be applied to the nearest five-tenths for a non-shoal irregular bottom. The area affected was a steep sloping bottom, ranging from 15 to 50 ft. Due to the insignificance of the error, no corrections were applied to these soundings.

The calibration lines on the DE-719B were set 50 ft. apart. The Hydrographic Manual states that the top calibration line be set at the zero scale and that the lower calibration line be set at 50 ft. Note that on DAY 302 both calibration lines drifted simultaneously, retaining the 50 ft. calibration. No corrections for the speed of sound were necessary in these instances.

Bar checks for the DSF-6000N were taken in 5-ft increments over the maximum depth range possible for weather and sea conditions down to 45 ft. This exceeds the requirements of the provisional operating and processing instructions for the DSF-6000N echo sounder, which requires only one 2-fathom check per day. Bar check correctors tended to vary with increasing depth, which may have been partially caused by excessive bar movement. The bar check corrections were not used for velocity correction data. Oceanographic data was taken during the project. Abstracts of bar check data are included in the survey records and the appendices of this report.

Settlement and squat were determined for launches PE-1 (VESNO 2831) and PE-2 (VESNO 2832) in San Juan, Puerto Rico, in October 1985. Settlement and squat were determined for the Monarch (VESNO 2833) in Rockland, Maine, in May 1985. Curves from these data are included in Appendix D of this report. Settlement and squat correctors were consistent with previous correctors for these vessels.

Martek casts were taken from PE-2 (VESNO 2832) and the NOAA Ship PEIRCE (VESNO 2830). The Martek is a model 167 (S/N 127) calibrated

August 8, 1985. Four Martek casts were performed during the project on the following dates: Oct 17, Oct 19, and Oct 31. Nansen casts were also taken from the PEIRCE (VESNO 2830) in the survey area on the following dates: Oct 31 and Nov. 4.

The Nansen casts were intended to serve as a check for the Martek casts. However, erratic readings appeared on all Martek samples. All Martek casts were subsequently rejected and an average of all Nansen casts were used in calculating velocity correctors. Graphs of all Nansen casts are included in Appendix D of this report.

E. HYDROGRAPHIC SHEETS (FIELD SHEETS)

All field sheets were made aboard the PEIRCE by the pdp8/e computers (serial numbers 13945 and 11118) and the Houston Instruments Complot DP-3 plotters (serial numbers 5848-19 and 7486-22). Hydrographic data is presented on four sheets. Main-scheme lines by the PEIRCE are plotted on one sheet, while main-scheme lines run by the MT. MITCHELL in 1983 are plotted on another sheet. Each of these sheets is accompanied by an overlay with bottom samples, detached positions, crosslines and shoreline hydrography. All sheets are 1:10,000 scale.

Parameter tape printouts for all plotter sheets are included in the appendices. All field records will be forwarded to AMC for final verification.

F. CONTROL STATIONS

No control stations were established by the PEIRCE for this survey. Only existing control was used. ✓

G. HYDROGRAPHIC POSITION CONTROL

Hydrographic position control was accomplished using the Mini-Ranger Falcon 484 system. Range/range and range/azimuth positioning methods were used. The following Mini-Ranger equipment was used.

VESNO	EQUIPMENT	S/N	DAY
2831	RANGE PROCESSING UNIT	D0017 ✓	289-305
	CONTROL DISPLAY UNIT	D0062	
	RECEIVER/TRANSMITTER	D2123 ✓	
2832	RANGE PROCESSING UNIT	D0018 ✓	289-306
	CONTROL DISPLAY UNIT	D0059	
	RECEIVER/TRANSMITTER	C2096 ✓	
2833	RANGE PROCESSING UNIT	D0004 ✓	302 ✓
	CONTROL DISPLAY UNIT	D0057	
	RECEIVER/TRANSMITTER	D2128 ✓	

REFERENCE STATIONS:

CODE	S/N
2	C2059
5	C2067
6	C2091
8	E2974
9	E2911
10	E2912
11	C2075

The following theodolites and total station instruments were used both for calibration and range/azimuth hydrography:

INSTRUMENT	SERIAL NUMBER
Wild T-2	30694
Wild T-2	75507
HP-3810B	1929A00361

Mini-Ranger Falcon Calibration

This survey was conducted with no specific, formal guidance for calibrating the Mini-Ranger Falcon system other than the general provisions of the Hydrographic Manual for short range systems. There is no final AMC OPORDER concerning the Falcon system, although a draft version has been written. The draft AMC OPORDER #86 and the hydrographer's best judgment have been used as guidance for electronic positioning calibration.

Only baseline calibration values have been used for the electronic corrector tapes. Baseline calibrations were performed to the standards of the draft AMC OPORDER #86 and records of these are included with the survey data. An abstract of the baseline calibrations follows, together with mean and standard deviation values for each code. The standard deviation values are typically less than 3 meters. AMC OPORDER #86 gives no guidance for averaging baseline correctors but a single average for all baseline correctors seems appropriate for use as final correctors. Smooth sheet data was plotted with baseline correctors derived from the initial Mini-Ranger calibration prior to the commencement of surveying (12 Oct. 1985). Corrector tapes have been edited to include average baseline correctors to be used as final correctors.

No unusual problems were noted with the Mini-Ranger equipment during this survey. On one particular day (DAY 294), several Mini-Ranger rates were received with a lower than permissible signal strength of 15. These rates were either rejected or dead reckoned to avoid erroneous Mini-Ranger rates often associated with low signal strengths.

DAILY SYSTEM CHECKS

Only critical system checks were performed during this survey according to the guidelines of the draft AMC OPORDER #86 concerning calibration. Critical checks were made using the HP3810B total station instrument to provide a range and azimuth to the sounding vessel or with a FEN MARINE Laser EDM, which provided an observed range to each Mini-Ranger being calibrated. The FEN MARINE EDM was a new piece of equipment on loan to the PEIRCE for field testing with intentions of using it for future work. The FEN MARINE EDM was checked against HP3810 measured ranges prior to using it for calibrations in the field with excellent results. Measured ranges for the FEN MARINE EDM and the HP3810 were the same for several trials, good within one-tenth of a meter. Documentation can be found in the daily records for days the FEN MARINE EDM was used in the field. These days are as follows:

VESNO	DAY
2831	294, 295, 305
2832	297
2833	302

The FEN MARINE EDM was either used from the sounding vessel and aimed at reflectors on the onshore Mini-Ranger or an observer with the instrument positioned themselves over the Mini-Ranger and aimed at reflectors on the vessel's master R/T. In either case the observed ranges were compared to the Mini-Ranger rates with baseline calibration correctors applied. The FEN MARINE EDM served as a valuable piece of equipment which can help save precious time in the field. By setting up each Mini-Ranger station with a set of mirrors or reflectors, critical system checks can be performed from the vessel without having to spend time and additional manpower needed in setting up an HP3810 total station instrument. The only problem encountered with the FEN MARINE EDM was, on a few occations, the instrument was not able to get a return signal if the vessel was rolling due to rough seas.

The following tables show the daily system check values obtained by each boat. All system checks are critical, thus the values represented are "DELTA". As discussed in the draft AMC OPORDER #86, "DELTA" is the absolute value of the difference between the daily corrector and the latest baseline corrector.

VESNO 2831

ABSTRACT OF DAILY SYSTEM CHECKS

DAY	Code 2	Code 5	Code 8	Code 9	Code 10	Code 11
289	No system check					
290		4.0	5.5			
291	No system check					
292		3.0	5.0			
293		4.6	5.3			
294	1.0					
295	2.1					
305		3.8	2.6			

VESNO 2832

DAY	Code 2	Code 5	Code 8	Code 9	Code 10	Code 11
289		4.4	3.0			
290	No calibration					
291	No calibration					
292		0.6	5.0			
294			1.2	3.8	1.8	5.0
295			0.0	4.0	0.8	2.4
297	2.8	2.0				

VESNO 2833

DAY	Code 2	Code 5	Code 8	Code 9	Code 10	Code 11
302						5.4

H. **SHORELINE** SEE section 2.b. of the EVALUATION REPORT.

Shoreline data was transferred to the field sheets from a registered shoreline manuscript, TP 00953, TP 00954 at a scale of 1:10,000. The existence of shoreline features was verified visually if attached to the shoreline and noted in the field notes. Electronically controlled detached positions were used for features seaward of the shoreline. The only shoreline that is to be considered verified is that which is immediately adjacent to the plotted field sheet soundings.

The riprap supporting station GRO 1983 (signal no. 376), located at φ18°28'35"N and λ66°11'15"W, was not on TP 00953. This feature, also covered in the MT. MITCHELL descriptive report, does exist and has been drawn in red ink on the smooth FIELD sheet to indicate its location. Shown on FINAL smooth sheet IN RED.

The riprap, transferred from TP 00953, located at 18°28'03"N, 66°08'25"W, does not exist above the water line as charted. Shoreline verification was run over the charted position of the riprap. The sounding vessel hit bottom in this area, fix number 145 and 146, indicating that the riprap is below the waterline and presently exists as a submerged obstruction. ~~The hydrographer recommends that a submerged obstruction be charted in place of the present riprap symbol.~~ DO NOT CONCUR. CHART AS SHOWN ON PRESENT SURVEY.

I. CROSSLINES SEE SECTION 3.a. of the EVALUATION REPORT.

Crosslines were run according to the Hydrographic Manual, Fourth Edition. 10.3 linear nautical miles of crosslines were run, which is equivalent to 11 percent of the total main scheme linear nautical miles acquired. Crossline soundings agreed well with the main scheme hydrography. Overall agreement was between 0 and 2 ft. except in areas of rough bottom.

J. JUNCTIONS SEE also section 5 of the EVALUATION REPORT.

The PEIRCE work (1985) does not junction, in the traditional sense, with the Mt. MITCHELL work (1983) on survey H-10073. Main-scheme sounding lines were run by the MT. MITCHELL at a spacing of 200 meters rather than the 100m spacing required. As a result, the configuration of underwater features, especially the offshore reefs, have not been determined nor dangers to navigation found as specified in the hydrographic manual. The PEIRCE performed 100m sounding lines between Punta Salinas and Isla de Cabras as well as to the southwest of Punta Salinas. These were considered shallow areas, with a great deal of submarine features. 200m sounding lines were performed between the MT. MITCHELL's 200 meter sounding lines in the areas off shore to provide the required 100m line spacing. The PEIRCE work is intended to provide supplemental soundings to the MT. MITCHELL work in order to present a more complete bathymetric study of the area in accordance with section 4.3.4 of the Hydrographic Manual.

The work done in 1983 by the MT. MITCHELL and in 1985 by the PEIRCE ~~must be~~ 13 considered one hydrographic survey. Although these two survey sheets do not junction as would two separate surveys, they do cover a common area by registry number and therefore agreements and disagreements have been included in this section. DATA HAS BEEN COMBINED DURING OFFICE PROCESSING at AHC.

Overall, the work done by both ships was consistent. The PEIRCE performed 200m line spacing in the area between Punta Salinas and Isla de Cabras north of latitude 18°28'50"N. Due to the depth and steep sloping bottom characteristic to this area, 200m line spacing by the PEIRCE was considered adequate to supplement the MT. MITCHELL work. Agreement was very good between both ship's work. No significant lateral displacement of depth curves was observed. There was no overlapping junction of the main-scheme hydrography. However, crosslines run by the PEIRCE agreed well with the MT. MITCHELL's soundings and crosslines run by the MT. MITCHELL agreed well with the PEIRCE's soundings. Sounding agreement was within 0-2 ft. for all soundings.

The PEIRCE ran 200m range/azimuth arcs off of station GRO 1983 (376) in the cove to the west of Punta Salinas. These soundings supplement 200m range/azimuth arcs run by the MT. MITCHELL off station GRO 1983. Both PEIRCE and MT. MITCHELL soundings run parallel to depth curves in the region between latitudes 18°28'15"N and 18°28'45"N.

Depth curves were drawn using PEIRCE soundings only, so that the discrepancies between the two sheets would be shown. An exception was made in the region of latitude 18°28'30"N, longitude 066°11'37"W in order to prevent a false representation of the bottom. A significant change in the bottom rise is clearly defined by a slight lateral displacement of the 700m arc run by the PEIRCE and a sounding line run just east by the MT. MITCHELL. PEIRCE soundings were up to 7 ft. shoaler in depths of 21 ft. The large discrepancy between the two sounding lines can be explained by the diverse bottom relief in this area associated with coral reef formations. Dangerous breakers from the north prevented the running of crosslines in this region.

Shoreline hydrography showed good agreement in the cove to the west of Punta Salinas north of latitude 18°28'24"N; within 1 ft. in 6 ft. of water. South of the same latitude, PEIRCE soundings are 4 to 5 ft. shoaler, in depths of 8 ft. surveyed by the MT. MITCHELL. Apparently, the shoreline run by the PEIRCE is closer to the shore. The southern most sounding from the PEIRCE 700m arc, from station GRO 1983, agrees within 1 ft. of the MT. MITCHELL shoreline sounding. No other overlap occurs in this area. Both shorelines together accurately describe the steep sloping nature of this sandy beach.

The area between Punta Salinas and Isla de Cabras was covered with a high density of soundings in order to adequately define the shoals common in this area. By comparing the PEIRCE soundings with those of the MITCHELL, the following observations were made:

(1) In the location of φ18°28'30"N,λ066°10'12"W the 30-ft. curve drawn on the MT. MITCHELL sheet includes a holiday. PEIRCE soundings in this area are less than 30 ft.,thus this area is shoaler than indicated on the MT. MITCHELL sheet and more clearly defined on the PEIRCE sheet.

(2) The reef formation extending out to the west of Punta Salinas, along the latitude 18°28'40"N, is well defined by both MT.MITCHELL and PEIRCE soundings. Dangerous breakers existed in the area where there is an absence of soundings. The limits of safe navigation are delineated by connecting the following fixes with straight lines (refer to sounding volumes for field notes): 2481, 2482, 2483, 2484, 2485, 2488, 5616, 5609, ~~489, 491, 490~~, 2419. Limit line has been delineated on present survey.

(3) In the cove on the southeast shore of Punta Salinas, at φ18°28'20"N and λ066°11'00"W, is a holiday common to both PEIRCE and MT. MITCHELL hydrographic sheets. This area was too shallow to run hydrography with a Type I survey launch.

(4) At φ18°28'07"N, λ066°11'05"W main-scheme lines do not junction with the shoreline. Sounding lines run by the MT. MITCHELL adequately cover the area where PEIRCE sounding density is insufficient. MT. MITCHELL soundings junction with PEIRCE soundings within 1 ft. in 10 ft. of water.

(5) A holiday exists at the mouth of the Rio de Bayamon River near φ18°27'20"N, λ066°09'40"W. No hydrography was run in this area due to breakers. Shoreline and main-scheme lines, run on different days, were broken at the point of safe navigation for a Type I survey launch. A hazardous zone has been delineated by means of connecting the following fixes with straight lines: 5293, 5375, 2008, 2186. The hydrographer recommends that this area be designated foul with breakers and supersede any previous soundings of the MT. MITCHELL's. Possibly, the breakers in this area are caused by silting or accretion at the mouth of the Rio de Bayamon River. DO NOT CONCUR. CHART AS SHOWN ON PRESENT SURVEY.

A shoal near φ18°27'42"N, λ066°10'25"W, indicates sharply contrasting bottom features. This feature is common to both survey sheets. A discrepancy between soundings exists at φ18°27'42"N, λ066°10'25"W where the PEIRCE has a 12-ft. sounding and the MT. MITCHELL has a 22-ft. sounding. This area was thoroughly developed with 50-m splits performed on both sheets. The more recent PEIRCE soundings show more shoal soundings. This indicates that this is probably an active reef and could tend toward continual shoaling. ~~The hydrographer recommends that PEIRCE soundings supersede any previous soundings taken in this area.~~ CHART PRESENT SURVEY depths IN this AREA.

Several areas of change were noted indicating a shoaler bottom than found by the MT. MITCHELL. Areas of change are noted as follows:

LOCATION	PEIRCE Sounding	MT. MITCHELL Sounding	
φ18°28'04"N, λ066°09'47"W	~~13~~ 12 ft.	18 ft.	Field records note Coral Heads in these areas.
φ 18°28'08"N, λ066°09'49"W	13 ft.	17 ft.	
φ 18°28'17"N, λ066°09'49"W	15 ~~13~~ ft.	19 ft.	
φ 18°28'02"N, λ066°09'08"W	3 ft.	12 ft.	IDENTIFIED AS PKP bottom ON PRIOR SURVEY.

The above ~~13-ft.~~ 12, 13, and 15-foot shoals are isolated soundings, surrounded by 20-ft. depths. They ~~could be~~ are significant because they lie in the center of the navigable portion of the cove. CONCUR

A 4-ft. shoal was ~~charted~~ found at φ18°28'0~~5~~6"N,λ066°09'~~10~~10.5"W within the 12-ft. curve. ~~No soundings by the MT. MITCHELL were charted in this area for comparison.~~ 6-ft sounding was found by MT. MITCHELL in the vicinity.

An isolated ~~12~~ 10-ft. ~~sounding~~ shoal, outside the 18-ft. curve, at position φ18°27'35"N,λ066°09'55"W appears on both survey sheets. Agreement was good within 1 ft.

Each of the shoals mentioned above indicate isolated areas of change. No general processes or trends were detected. CONCUR

There is an absence of soundings common to both survey sheets near φ18°28'10"N,λ066°10'40"W. Breakers were present in almost all types of weather. The limits of safe navigation for the launch were delineated by a combination of buffer lines defined by the following fix numbers: 5143-5145, 5268-5270, 5264-5265, and 5274-5275. CONCUR
BREAKER LIMIT LINE HAS BEEN DELINEATED ON THE PRESENT SURVEY.

PEIRCE soundings agree well with MT. MITCHELL soundings in the area surrounding the breakers. On DAY 291, the seas were exceptionally calm allowing a line to be run through the breaker area (fix 5267-5267+6). The hydrographer recommends that these soundings be ignored and the entire area within the delineation be designated foul with breakers. This is shown by a dashed black line on the survey sheet. CONCUR

The conspicuous absence of soundings to the west of Isla de Cabras along latitude 18°28'30"N is common to both survey sheets. Dangerous breakers and coral reef formations are prevalent throughout this area. The hydrographer recommends that this entire area be designated unsafe for navigation. Hydrography was run to the limits of safe navigation for a Type I survey launch. The northern limit has been delineated by joining the ending fixes of each main-scheme line with a straight line. The southern limit has been delineated with buffer lines. The following is a list of fixes used to delineate this foul area by joining them with a straight line: 2247, 2244, 2241, 2238, 2235, 2223-2234, 2277, 2281, 2286, 2291, 2296, 2301, 5617, 2314, 2321, 2325, 2425-2426, 2222-2217.
THIS AREA HAS BEEN DELINEATED BY A LIMIT LINE ON PRESENT SURVEY.

Junctions between PEIRCE and MT. MITCHELL soundings are good around the periphery of this area, within 0-2 ft. where overlap occurs in depths of 18 ft. or less. Any discrepancies in soundings in this area may be attributed to the irregular nature of the bottom with sharply contrasting features, as well as the differences in echo sounders used. CONCUR

There is good junction between PEIRCE and MT. MITCHELL soundings in the area between ~~Morro Del Norte~~ Punta Del Morro and Punta Escambron. Depth curves between the two sheets coincide with each other with the exception of the area near φ18°28'15"N,λ066°05'00"W northeast of Punta Escambron. There are many changes in the bottom relief in this area characteristic of coral reef formations. Supplemental soundings by the PEIRCE reveal additional shoals not ~~charted~~ surveyed by the MT. MITCHELL. They are as follows:

(1) Two 6-ft. pinnacles rocks with 6 and 7-foot depths were ~~charted~~ found at φ18°28'21"N, λ066°05'12"W and φ18°28'17"N,λ66°05'15"W respectively. These features were

not developed in detail. However, inspection of the fathogram (DAY 306) reveals them as real peaks. Chart present survey depths.

(2) A ~~10~~ 11-ft. shoal located at φ18°28'22"N,λ066°04'55"W, was ~~charted~~ found by the PEIRCE within a 30-ft. depth curve. See Section 7.a.3) of the Evaluation Report.

The 30-ft. curve on the MT. MITCHELL survey sheet, near φ18°28'17"N,λ066°05'04"W does not accurately represent the bathymetry. Supplemental soundings by the PEIRCE at 100m line spacing reveals a shallower bottom than recognized by the MT. MITCHELL.

Depth curves near φ18°28'22"N,λ066°04'58"W have been drawn to incorporate MT. MITCHELL soundings in order to accurately represent the bathymetry. CONCUR

There is a shoal which extends to the east of Punta Escambron near φ18°28'07"N,λ066°05'00"W with a least depth of λ8ft. Note, only the northern most extension of the shoal junctions with MT. MITCHELL soundings. Sounding agreement is within 1 ft. Junctional depth from survey H-10077 (1983-85) in this area of 7 feet.

A shoal extending out approximately 600m east of latitude 18°28'22"N longitude 066°05'12"W is defined with 100m sounding lines by the PEIRCE. Sounding density by the MT. MITCHELL was not adequate to show the extent of this shoal. Sounding agreement in this area is within 2 ft. in 18 ft. of water. CONCUR See Section 7.a.3) of the Evaluation Report.

No shoreline was run on either survey sheet between Punta Del Morro ~~Del Norte~~ and Punta Escambron. In order to run a shoreline, the boat would have been running parallel to breakers and this was considered too dangerous. Mainscheme hydrography was run starting at the edge of the surf, safely navigable by the Monarch, and run North. To delineate the surf zone, the beginning of each line represents the shoreward limit of safe navigation. A foul area has been delineated by adjoining these fixes with straight lines. Sounding volumes are annotated accordingly (DAYS 302, 294 and 306). CONCUR

Several detached positions locating rocks, wrecks, and shore line features (such as groins and piers) are synonymous with those of the MT. MITCHELL. Due to the unique nature of this survey, detached positions from the PEIRCE and MT. MITCHELL are presented in summary below to help show consistencies and inconsistencies between the two sheets.

Consistencies between the two survey sheets:

PEIRCE Located Charted Obstr.	Location	MT. MITCHELL Charted Obstr.
Visual inspection (DAY 291)	φ 18°27'~~45~~46"N λ066°11'~~05~~03"W	Groin, fix 734
Visual inspection (DAY 291	φ 18°27'30"N λ066°10'47"W	Groin, fix 733
Groin not found upon vis. inspection	φ 18°27'~~47~~57"N λ066°11'~~18~~07"W	No groin found. Subm coral formation Rk, fix 802 Shown on present survey.
Breakers and Rk ledge identified 803	φ 18°27'~~15~~12"N λ066°10'~~17~~16"W	Groin 50 m south of fix (DAY 291)
Visual inspection	φ 18°27'35"N λ066°09'~~00~~03"W	Groins, fix 814 and 815
Visual inspection	φ 18°28'~~25~~27"N λ066°08'~~15~~16"W	Pier, fix 7005
Pipeline, fixes 2135, 2136	φ 18°28'00"N λ066°08'30"W	Pipeline, Sewer outfall (under construction) fix 7000
Shoal, fixes 2145, 2146	φ 18°28'04"N λ 066°08'~~55~~20"W	Shoal, Show present survey data fix 1262
~~4~~3-ft. Shoal sdg	φ 18°28'~~08~~08.6"N λ 066°08'~~55~~20"W	5-ft. Shoal, fix 1264
"H"-beam, fix 2162	φ 18°28'~~13~~13.6"N λ 066°08'15"W	"H" beam, Pile (≥) on present survey, fixes 7003, 7004
Concrete cone fix 2174	φ 18°28'~~20~~19.6"N λ 066°08'~~15~~16"W	Concrete cone obstr (concrete cone) fix 7002 on present survey
Wreck fixes	φ 18°28'27"N λ 066°08'22"W	Wreck, fixes 2172 and 2173 7006 and 7007 Hulk (barge 225 x 60 ft) on present survey.
~~4-ft. shoal sdg~~	~~φ 18°28'10"N~~ ~~λ 066°08'25"W~~	~~Shoal, 5 ft., fix 1264~~
Rks, fix 8039 and 8047	φ 18°28'~~30~~18"N λ 066°06'~~10~~03"W	Rks, fix 1134 and 1135
Rks, fix 8080	φ 18°28'~~30~~20"N λ 066°05'~~30~~31"W	Rks, fix 1154-1155

Rks, fix 8081	φ 18°28'30"N λ 066°05'20"W	Rks, fix 319 and 322
No visible obstr. Isolated 6' curve ~~4~~ 5 shoalest sdg	φ 18°27'53"N λ 066°08'50"W	Coral reef, fix 1280. with 1.8 ~~4 ft.~~ lead line sdg.

ROCK AWASH COVERS 1-ft at MLW ON PRESENT SURVEY IN VICINITY.

Inconsistencies between the two survey sheets:

(1) A concrete cone (fix 481) was located by the PEIRCE at φ18°28'~~36~~ 36.57"N, λ066°11'~~15~~ 13.41"W. The MT. MITCHELL made no mention of this obstruction, however it does exist. The hydrographer recommends charting a visible obstruction at this location. CONCUR

(2) Thirteen submerged piling were photo identified along longitude 066°08'27"W extending from latitude 18°28'06"N to 18°28'18"N in Ensenada de Boca Vieja. 100m sounding lines were run over these piles with no identifiable peaks observed on the sounding machine printout. No further development was performed by the PEIRCE due to a dive investigation conducted by the MT. MITCHELL in 1983. Five of the most southerly pilings were identified and detached positions obtained on each of them (fix 1271-1275). A detailed description and recommendation on their findings can be found in Section H (page 7) of the MT. MITCHELL's Descriptive Report which accompanies this report. CONCUR CHART AS SHOWN ON PRESENT SURVEY.

(3) The visible wreck, Pre-Survey Review item No. 2734, charted at φ18°28'28"N, λ066°09'26"W was not found upon visual inspection by the PEIRCE. However, according to the 1983 MT. MITCHELL dive investigation, a visible wreck was found and recommendations were made to change the existing charted dangerous submerged wreck to a charted visible wreck. This was done and a visible wreck now appears on the chart. Because the PEIRCE found no visible signs of a wreck it is reasonable to assume that submerged wreckage exists in this area. The wreck itself is not a danger to navigation. However, the entire area surrounding it has been delineated foul with breakers and coral reefs, and unsafe for navigation. ~~The hydrographer recommends the charted visible wreck be removed from the chart and a submerged wreck symbol be charted in its place.~~ CHART AS SHOWN ON PRESENT SURVEY.

This survey junctions with H-10077 to the East, at longitude 66°04'50"W. H-10077 was conducted concurrently at 1:10,000 scale. Sounding agreement was excellent, within 1 ft. for soundings less than 18 ft. and within 2 ft. for deeper soundings on a sloping bottom. SEE also SECTIONS 4.9. AND 5. of THE EVALUATION REPORT.

This survey, H-10073, junctions with H-8848 at a scale of 1:5,000. Junction occurs at the mouth of the San Juan Harbor. Agreement between the surveys was good. Soundings agreed within 2 ft. in depths of 20 ft. or deeper. H-8848 HAS BEEN CHANGED to PRIOR SURVEY status. SEE also SECTION 6.4. of THE EVALUATION REPORT.

K. COMPARISON WITH PRIOR SURVEYS See also SECTION 6. of the EVALUATION REPORT.

This survey was compared with four prior surveys containing work in the present operational area. They are as follows:

NUMBER	DATE	SCALE
H-2677	May 1904	1:20,000
H-2883	Apr-May 1907	1:20,000
H-6556	June 1940	1:10,000
H-4205	1921	1:20,000

Comparison of prior survey H-6556 and H-10073 covers the area between longitude 066°09'45"N, 066°07'50"W. The northern limit is the limit of hydrography run by the PEIRCE to approximately 130 ft. or latitude 18°29'20"N. The Southern limit is marked by land.

A large foul area extending west from Isla de Cabras exists on both surveys. Survey H-6556 has soundings in the area designated foul by the PEIRCE in the vicinity of ϕ18°28'30"N, λ066°09'10"W. On an extremely calm day, a buffer line (fix 225-232) was run by the PEIRCE within this delineated foul area. At latitude 18°58'30"N longitude 066°09'18"W a ~~45~~ 46-ft. sounding (fix 227) is followed by a 4- and 6-ft. sounding. These soundings demonstrate sharply contrasting bottom features which make this area extremely hazardous to navigation. Comparison with survey H-6556 in this area shows a steep sloping bottom with depth curves running from north to south starting at 18 ft. near longitude 066°09'05"W, and getting progressively deeper to the west. Along latitude 18°28'25"N, a 6-ft. curve on H-6556 does represent the breaker zone transferred from TP 00953.

Apparently, the active reef growth is prominent in this area. In the 46 years that have elapsed since survey H-6556, the reef has radiated north and west. The hydrographer recommends that this area be designated as foul and unsafe for navigation as described earlier in Section J of this report. CONCUR

Overall sounding agreement between the two surveys is excellent, soundings agree within 2 ft. in 30 ft. of water. Generally, for soundings less than 30 ft. agreement is within 1 ft. In the area of ϕ18°28'05"N, λ066°08'35"W a charted 2-ft. shoal was surveyed at 5 ft., 3ft. deeper. The hydrographer recommends that all of the present soundings supersede those charted on H-6556. CONCUR DEVELOPMENT WAS MINIMAL IN THIS AREA. SIGNIFICANT CHANGE IN THIS AREA.

Sounding agreement is poor in the area near ϕ18°28'33"N, λ066°08'45"W. PEIRCE soundings are 5 ft. shoaler than the charted 20-ft. soundings. This shoaling is believed due to active coral growth in this area as well as possible accretion of sand and particulate matter carried in with steady swells from the north. BREAKER AREA DELINEATED ON PRESENT SURVEY.

Major discrepancies between the two surveys are as follows:

(1) A ~~least~~ SHOAL depth of 5 ft. at φ18°27'~~25~~25.3"N, λ066°09'~~25~~25.3"W was found on H-6556 in an area of ~~14~~13 ft. soundings by the PEIRCE. ~~Recommendation: PEIRCE soundings supersede prior survey soundings.~~ DO NOT CONCUR 5-FT shoal depth BROUGHT FORWARD to SUPPLEMENT the PRESENT SURVEY.

✓(2) Rock charted on H-6556 at φ18°27'57"N, λ066°08'50"W was not found upon visual inspection by either the PEIRCE or MT. MITCHELL. Recommendation: Remove the rock symbol from the chart. ROCK COV 1-ft at MLW FOUND IN the AREA to the SOUTH. CHART PRESENT SURVEY data.

The general shape of the depth curves is consistent between the two surveys. A 3-ft. shoal at φ18°28'03"N, λ066°09'08"W was common to both surveys.

Comparison was made with H-2883 between the latitudes 18°28'50"N and 18°28'07"N. The western limit is λ066°07'34"W and the eastern limit extends to λ066°04'50"W. Sounding agreement was good, soundings agreed within 3 ft. for depths 80 ft. and deeper.

Comparison was made with prior survey H-2677 from φ18°29'15"N to φ18°29'30"N. Agreement was good between the two surveys within 2 ft. for depths 50 ft. and deeper, on a steep sloping bottom.

All Automated Wreck and Obstruction Information System items assigned to this project were covered by the MT. MITCHELL in 1983. Descriptions can be found in the MT. MITCHELL Descriptive Report, Section K, which accompanies this report. Several detached positions (including wrecks, rocks, and obstructions seaward of the low water line) are duplicated in the PEIRCE's and the MT. MITCHELL's work. Section J of this report includes an itemized list of all detached positions by both ships.

L. COMPARISON WITH THE CHART SEE SECTION 7. of the EVALUATION REPORT.

This survey was compared with chart 25668, 12th edition, November 24, 1984 at a scale of 1:100,000. In general, sounding agreement was good, within 2 ft. for depths greater than 12 ft.

Discrepancies between this survey and chart 25668 are as follows:

(1)	φ 18°28'03"N λ066°~~08~~09'~~57~~37"W	7 ~~16~~ ft. charted, surveyed at 21 ~~20~~ ft. ~~Recommend charting at 20 ft.~~ SEE also section 6.a. of the EVALUATION REPORT.
(2)	φ 18°27'~~25~~26.3"N λ066°09'~~25~~26.3"W	4 ft. charted, surveyed at ~~14~~13 ft. by both the PEIRCE and the MT MITCHELL. ~~Recommend charting at 14 ft.~~ RETAIN AS CHARTED. SEE also SECTION 6.a of the EVALUATION REPORT.
(3)	φ 18°27'57"N λ066°08'50"W	No rock found upon visual inspection by either the PEIRCE or the MT MITCHELL. ~~Recommend removal of rock symbol.~~ SEE RECOMMENDATION ABOVE in section NO. (K.(2))

(4) φ 18°28'48"N (40.6) — 1-fathom
λ066°08'22"W
~~1 ft.~~ charted, ~~surveyed at 8 ft.~~
~~Recommend charting 8 ft.~~
ORIGINATES WITH BP-33805-7 of 1939. UNSURVEYED AREA of "BREAKERS" ON PRESENT SURVEY.

~~(5) φ 18°28'42"N~~
~~λ066°08'25"W~~
~~4 ft. charted, surveyed at 10 ft.~~
~~Recommend charting 10 ft.~~

(6) φ 18°28'72"N (6)
λ066°09'00"W
~~1~~ 7 ft. charted, surveyed at ~~6~~ 5 ft.
(by the edge of delineated breakers.) Recommend charting ~~6~~ 5 ft.
CHART PRESENT SURVEY DEPTHS.

(7) φ 18°28'28"N
λ 066°09'26"W
Visible wreck charted, not found visually by the PEIRCE. However, this area was delineated as foul with breakers. ~~Recommend remove visible wreck symbol and replace with a submerged wreck symbol.~~
CHART AS PORTRAYED ON PRESENT SURVEY.

The wreck mentioned immediately above, charted as a visible wreck located at φ18°28'28"N, λ066°09'26"W, was a Pre-Survey Review item #2734, which was found visually by the MT. MITCHELL in 1983. A thorough dive investigation was performed on the wreck which is described in detail in Section K of the MT. MITCHELL Descriptive Report. The MT. MITCHELL described the wreck as extending 1 ft. above the charted datum and recommended in 1983 to change the charted submerged wreck dangerous to navigation to a visible wreck. The PEIRCE's work in this area is the most recent work however, and no signs of a wreck were observed visually. It is reasonable to assume that the wreck has been broken-down on the reef by wave action and submerged wreckage exists in this area. ~~A recommendation was made earlier in Section J of this report to remove the charted visible wreck and replace it with a submerged wreck symbol.~~ CONCUR SEE DESCRIPTIVE REPORT, SECTION K. (PAGE 13) of MT. MITCHELL WORK FOR RECOMMENDATIONS.

An isolated 12-ft. shoal located beyond the 18-ft. curve near φ18°27'42"N, λ066°10'25"W was charted as 13 ft., showing good agreement in this area. CHART PRESENT SURVEY DEPTHS.

The disposal area, located near φ18°29'03"N, λ066°08'24"W is charted with a least depth of 90 ft. This area was presently surveyed at 85 ft. The discrepancy between the two soundings can be attributed to their lateral displacement on a sloping bottom. A LEAST DEPTH OF 69 FEET WAS FOUND BY THE PRESENT SURVEY IN THIS AREA. CHART PRESENT SURVEY DEPTHS.

This survey was compared to chart 25670, 33rd. edition, January 7, 1984, at a scale of 1:10,000. Charted soundings are 2-5 ft. shoaler than the present survey in the area west of Isla de Cabras and north of Punta Palo Seco. This area has changed significantly, causing the 6-ft. curve to shift shoreward. The following changes were observed in this area:

(1) φ 18°28'04"N — Charted 2 ft., surveyed at 8 ft.
λ066°08'45"W — ~~Recommend charting 8 ft.~~ CHART AS SHOWN ON PRESENT SURVEY.

(2) φ 18°28'08"N — Charted 1 ft., surveyed at 6 ft.
λ066°08'32"W — ~~Recommend charting 6 ft.~~ CHART PRESENT SURVEY DEPTHS.

(3) φ 18°27'~~25~~25.3"N — Charted 5 ft., surveyed at ~~14~~13 ft.
λ066°09'~~25~~25.3"W — ~~Recommend charting 14 ft.~~

SEE SECTIONS K.(1) AND L.(2) OF THIS DESCRIPTIVE REPORT.

The area west of Isla de Cabras and north of Punta Palo Seco, near φ18°28'10"N, λ066°08'40"W is characterized by a sandy bottom with scattered coral formations. Sand movement by surf and currents is a probable cause for the deeper ~~sounds~~ SOUNDINGS found on the present survey.

In general, soundings south of the breakers to the west of Isla de Cabras, show good agreement. Soundings agree within 1 ft. in 10 ft. of water. The 12-ft. and 18-ft. curves in this area are consistent and show little change in their configuration.

Charted soundings exist in the area designated foul by this survey, near φ18°28'30"N, λ066°09'15"W. Dangerous breakers prevented surveying this area with a Type I survey launch. A detailed explanation of delineation of this area was presented earlier in Section J of this report. The hydrographer recommends that this area be designated foul and dangerous to safe navigation for all types of vessels. CONCUR

A slight northerly shift of the 18-ft. and 30-ft. curves was observed to the north of the breaker zone, near φ18°28'45"N, λ066°08'45"W. Comparison with prior survey H-6556, covered earlier in Section K of this report, shows the same effect. PEIRCE soundings compare within 3 ft. to chart 25670 soundings in less than 30 ft. of water. The shoaling observed in this area is believed due to active coral growth and accretion of sand and particulate matter carried in with steady northerly swells.

Along the north shore of San Juan, continuity of depth curves is excellent for soundings 30 ft. and deeper. The 12-ft. and 18-ft. depth curves have moved offshore near φ18°28'20"N, λ066°06'30"W when compared to chart 25670.

The foul area limits, along the entire north shore of San Juan, is consistent with those portrayed on the chart. Several rocks were exposed seaward of the shore located on the edge of the foul area limit. All of the rocks found were consistent with those charted.

A new shoal extending east from longitude 066°05'15"W, and along latitude 18°28'22"N was surveyed with a least depth of ~~6~~ 5 ft. in an area charted as 30 ft. The magnitude of this shoal is significant and is a hazard to safe navigation. SEE SECTION 7.a.3) of the EVALUATION REPORT. ✓

M. ADEQUACY SEE EVALUATION REPORT.

H-10073 is complete and adequate to supersede all prior surveys for charting purposes.

N. AIDS TO NAVIGATION

There were no floating aids to navigation within this survey area.

Two fixed aids to navigation were within the limits of this survey. Cabras Light is located at ~~18°28.6'N, 066°08.4'W~~ 18°28'37.24"N, 066°08'24.62"W on the west side of the entrance to Bahia de San Juan on the NW end of Isla de Cabras. Puerto San Juan Light, located at 18°28.4'N, 066°07.4'W is positioned on the summit of Castillo del Morro. No geodetic position was verified on either of these lights. However, they were both visually identified as reported in the light list and to serve their purpose well.

O. STATISTICS

VESNO	NUMBER OF POSITIONS	LNM: HYDROGRAPHY
2831	498	35
2832	657	62.2
2833	189	10

NANSEN CASTS: 4
MARTEK: 2
BOTTOM SAMPLES: 6
TIDE STATIONS: 1

P. MISCELLANEOUS

This survey, H-10073, found the north coast of Puerto Rico, between Punta Salinas and Punta Escambron, to have numerous submerged obstructions, particularly coral reefs and rocks. Breaking waters prevailed throughout a majority of the survey area making it impossible to run hydrography around much of Punta Salinas, the west side of Isla de Cabras, and along the entire shoreline east of Castillo del Morro.

The area surveyed is very dynamic and constantly being altered by natural forces from pounding seas, storms, wind and organic growth. Many changes have occurred since the MT. MITCHELL's work in 1983 due to the dynamic nature of this area. Recommendations for charting based on survey findings are discussed in Section J of this report and Sections K and L of the MT. MITCHELL's Descriptive Report. THE COMBINATION OF 1983 AND 1985 WORK REVEALED NO SIGNIFICANT CHANGE EXCEPT FOR INCREASED DEFINITION OF THE BOTTOM CONFIGURATION.

Tide correctors, generated using the 75° time meridian instead of the 60° time meridian, were used for plotting the final field sheet. New tide correctors have since been generated referencing the 60° time

meridian. Due to the small tidal range in Puerto Rico the one hour time difference did not generate any significant error. Smooth tides applied during survey processing at AMC.

Refer to the United States Coast Pilot, for outstanding features in the marine weather and prevailing sea conditions.

All bottom samples were submitted to the Smithsonian Institution in Washington, D.C.

Q. RECOMMENDATIONS SEE EVALUATION REPORT.

The hydrographer recommends that the work performed by the PEIRCE and the MT. MITCHELL be considered as one survey, to supersede all previous existing charted soundings and prior surveys. No additional field work is required. DATA WAS COMBINED INTO ONE SURVEY.

R. AUTOMATED DATA PROCESSING

PROGRAM	PROGRAM NAME	VERSION
112	Hyperbolic R/R Hydroplot	10-12-83
116	Range/Azimuth Hydroplot	10-12-83
201	Grid, Signal, and Lattice Plot	04-18-75
211	Range/Range Non-Real Time Plot	02-02-81
216	R/AZ Non-Real Time Plot	02-09-81
300	Utility Computations	10-21-80
330	Reformat and Data Check	05-04-76
360	Electronic Corrector Abstract	02-02-76
500	Predicted Tide Generator	11-10-72
530	Layer Correction for Velocity	05-10-76
561	H/R Geodetic Calibration	12-01-82
602	Elinore - Extended Line Oriented Editor	12-08-82
612	Line Printer List	03-22-78
VELTAB	Velocity table calculation (PC program)	02-01-85

S. REFERRAL TO REPORTS

MT. MITCHELL Descriptive Report; OPR-I149-MI-83; San Juan, Puerto Rico; H-10073.

Horizontal Control Report, OPR-I149-MI-83.
Coast Pilot Report, OPR-I149-PE-85.

Submitted by,

Elizabeth A. Lake, Ens NOAA

Elizabeth A. Lake
Ensign, NOAA

SIGNAL NAMES OPR-I149-MI-83
MI-10-1-83 H-10073

045 CONDADO SOUTH
047 CONDADO NORTH
051 DUPONT PLAZA AZI MK
052 DUPONT PLAZA
053 CAPITAL DOME
054 MORRO DEL NORTE
055 MORRO DEL NORTE ECC
070 MORRO LIGHTHOUSE 1900
077 COAST GUARD MICROWAVE TOWER
090 CATANO REAR RANGE
102 ISLA DE CABRAS LT
120 CARIOCA STACK
130 WEST TWIN STACK
140 LEVITTOWN MUN.TANK
200 SAL
210 PT SALINAS 1901/1966
212 RADOME
376 GRO

GEOGRAPHIC POSITIONS OPR-I149-MI-83
MI-10-1-83 H-10073

045	4	18	27	42517	066	05	10674	~~139~~ 264	0000	000000
047	4	18	27	43440	066	05	10768	~~139~~ 264	0000	000000
051	4	18	27	32161	066	04	06414	250	0000	000000
052	4	18	27	30865	066	04	14576	250	0078	000000
053	4	18	28	07500	066	06	22750	253	0000	000000
054	4	18	28	22845	066	07	26440	250	0052	000000
055	4	18	28	22885	066	07	26285	~~250~~ 264	0052	000000
070	4	18	28	22774	066	07	26371	139	0000	000000
077	4	18	27	45755	066	07	00253	139	0000	000000
090	4	18	26	44315	066	07	55044	139	0000	000000
102	4	18	28	37242	066	08	24527	139	0000	000000
120	4	18	27	38022	066	08	46401	139	0000	000000
130	4	18	27	27780	066	08	56170	253	0000	000000
140	4	18	27	02164	066	10	50239	139	0000	000000
200	4	18	28	37186	066	10	47356	250	0000	000000
210	4	18	28	31506	066	10	48721	250	0000	000000
212	4	18	28	38783	066	11	03641	139	0000	000000
378	4	18	28	35685	066	11	15019	139	0002	000000

SIGNAL TAPE LISTING

OPR-I149-PE-85

H-10073

NORTH COAST OF PUERTO RICO

```
L
052 6   18 27 30865 066 04 14576 250 0078 000000-DUPONT PLAZA
054 6   18 28 22845 066 07 26440 250 0000 000000-MORRO DEL-NORTE
055 6   18 28 22885 066 07 26285 250 0052 000000-MORRO DEL-NORTE ECC
070 6   18 28 22774 066 07 26371 139 0052 000000-MORRO LT.HOUSE,1900
102 6   18 28 37242 066 08 24527 250 0000 000000-ISLA DE CABRAS,LT.1967
140 6   18 27 02164 066 10 50239 139 0000 000000-LEVITTOWN MUN.TANK,1964
210 6   18 28 31506 066 10 48721 139 0019 000000-POINT SALINAS,1901
212 6   18 28 38783 066 11 03641 250 0000 000000-RADOME,1983
376 6   18 28 35685 066 11 15019 250 0002 000000-GRO,1983
*
```

JDAB
5-1-86

* JW 6-86
Pos

APPENDIX I

LANDMARKS FOR CHARTS

No non-floating aids nor landmarks were located during this project.

CERTIFIED MAIL--RETURN RECEIPT REQUESTED

SAJDR
82-53-001

20 January 1982

Eng. José Fernández:
Transworld Insurance Company
G.P.O. Box AA
San Juan, Puerto Rico 00936

MARK AND REMOVAL ORDER

Dear Eng. Fernández:

Reference is made to your tugboat registered under the name of CARL O. and your barge registered under the name of FROCK NUMBER 19 which are presently hard aground, and in danger of breaking up, close to the eastern shoreline of Isla de Cabras, west of Buoy Number 4, San Juan Entrance Channel, San Juan Harbor.

We regret to hear of your loss but we must invite your attention to Section 15, 33 U.S.C. 409 of the River and Harbor Act of 3 March 1899, which states in part that "it shall not be lawful...to voluntarily or carelessly sink, or permit or cause to be sunk, vessels or other craft in navigable channels...And whenever a vessel, raft, or other craft is wrecked and sunk in a navigable channel, accidentally or otherwise, it shall be the duty of the owner of such sunken craft to immediately mark it with a buoy or beacon during the day and a lighted lantern at night and to maintain such marks until the sunken craft is removed or abandoned, and the neglect or failure of the said owner so to do shall be unlawful; and it shall be the duty of the owner of such sunken craft to commence the immediate removal of the same, and prosecute such removal diligently..."

It is imperative that you take immediate action to mark the vessel and to remove and/or dispose of the vessel in a manner which is acceptable to this office. Notify this office in writing of the removal or your plans for removal by 27 January 1982. Failure to comply may leave us no alternative but to refer this matter for appropriate legal action.

SAJDO [illegible] 26 January 1982
Eng. Jose Fernández

Your prompt attention to this matter is expected. Any questions you may have should be referred to Mr. Adrián I. Rodríguez, Chief of our Permits and Statistics Section, telephone (809)753-4688.

SAJOD
[illegible] Sincerely, 26 January 1982

Eng. José Fernández
Transatlantic [illegible] Company
G.P.O. Box [illegible]
San Juan, Puerto Rico 00936

WILLIAM C. BURNS
LTC, Corps of Engineers
Deputy District Engineer for
Puerto Rico and Virgin Islands

CF:
U.S. Coast Guard

BEEBE/lr
[illegible]

Dear Eng. Fernández:

Reference is made to your tugboat registered under the name of [illegible] and your barge registered under the name of [illegible] which are presently hard aground, and in danger of breaking up, close to the [illegible] shoreline of Isla de Cabras, [illegible] of Buoy Number 4, San Juan Entrance Channel, San Juan Harbor.

We regret to hear of your loss but we must invite your attention to Section 15, 33 U.S.C. 409 of the River and Harbor Act of 3 March 1899, which states in part that "it shall not be lawful...to voluntarily or carelessly sink, or permit or cause to be sunk, vessels or other craft in navigable channels;...And whenever a vessel, raft, or other craft is wrecked and sunk in a navigable channel, accidentally or otherwise, it shall be the duty of the owner of such sunken craft to immediately mark it with a buoy or beacon during the day and a lighted lantern at night, and to maintain such marks until the sunken craft is removed or abandoned, and the neglect or failure of the said owner to do so shall be unlawful; and it shall be the duty of the owner of such sunken craft to commence the immediate removal of the same, and prosecute such removal diligently..."

It is imperative that you take immediate action to mark the vessel and to remove and/or dispose of the vessel in a manner which is acceptable to this office. Notify this office in writing of the removal or your plans for removal by 27 January 1982. Failure to comply may leave us no alternative but to refer this matter for appropriate legal action.

NOAA SHIP MT MITCHELL PSR/ DIVING INVESTIGATION

DATE April 8, 1983
SHEET MT 10-1-83
OPR I149-MT-83
H- 10073
PSR ITEM # 2779

DIVERS _____ OIC

ITEM DESCRIPTION Tug "CARL O"
Aground

REPORTED LOCATION: 18° 28' 19.0'N } PA
66° 07' 55.0'W }

SOURCE OF REPORT LOCATION: LNM 15/82

ACTUAL LOCATION: 18° 28' 13.5" N
66° 07' 58.0'W

AREA SEARCHED: E

REASON FOR SEARCH OF ITEM:
PSR ITEM ✓
SIDE SCAN _____
NOTICE TO MARINERS _____
LOCAL REPORT _____

D.P.'s POS : TIME
8001
&
8002

CHARTING RECOMMENDATIONS: relocate wreck symbol (Danger Symbol #(1)) to new location
Remove "PA" notation concur CHART as shown on PRESENT SURVEY.

*** THIS ITEM WAS WAS NOT EXAMINED SUFFICIENTLY.

DIVE INFORMATION
LEAST DEPTH:
MAX DIVE DEPTH:
BOTTOM TIME:
TOTAL DIVE TIME:
VISIBILITY:
CURRENTS & CONDT'S:

SEARCH PROCEDURE:

REFERENCE FEATURES AND LOCATIONS:

RESULTS (use additional sheets):

SKETCH AND COMMENTS:
Tug was located with a three point sextant Fix on the bow and stern. Rk 561 was used to determine a posit for each point; the mid point being the position given

August 28, 1978

Department of ~~Navy~~ Army
Corps of Engineers
400 Fernandez Juncos Avenue
San Juan, Puerto Rico 00901

Attention: Mr. R.S. Lluch, Area Engineer

Subject : M/V GELDERLAND

Gentlemen:

Please be advised herewith that remains of the tug M/V GELDERLAND have been removed from the wreck sight effective August 24, 1978.

We will greatly appreciated your written confirmation that the work is complete.

Very truly yours,

CARIBE TUGBOAT CORPORATION

Captain G. M. Graham
General Manager

GMG:se
cc: Messrs. B. Strickland
S. Wilson

P.O. Box S-1072
San Juan, Puerto Rico 00902
(809) 723-6164
Telex itt 345-0396
RCA 325-2660

TNC/2

REPORT OF
NOAA SHIP MT MITCHELL PSR/ DIVING INVESTIGATION

DATE ~~8 A~~ 22 MARCH '83
SHEET MI 10-1-83

DIVERS 0

OPR I149-MI-83

ITEM DESCRIPTION M/V GELDERLAND (removed)

H- 10073

PSR ITEM # 2744

REPORTED LOCATION: reported removed

SOURCE OF REPORT LOCATION: LNM 40/80

REASON FOR SEARCH OF ITEM:
PSR ITEM X
SIDE SCAN
NOTICE TO MARINERS
LOCAL REPORT

TUAL LOCATION:

D.P.'s POS : TIME

AREA SEARCHED: visually inspected - no sign of vessel

CHARTING RECOMMENDATIONS: no change

concur

DIVE INFORMATION
LEAST DEPTH:
MAX DIVE DEPTH:
BOTTOM TIME:
TOTAL DIVE TIME:
VISIBILITY:
CURRENTS & CONDT'S:

*** THIS ITEM WAS WAS NOT EXAMINED SUFFICIENTLY .

SEARCH PROCEDURE:

SKETCH AND COMMENTS:

tug M/V GELDERLAND was removed from the site on 24 August 1978. A letter substantiating this information is attached.

REFERENCE FEATURES AND LOCATIONS:

RESULTS (use additional sheets):

FLORIDA-GULF COAST WITHLACOOCHEE RIVER: Aid Rebuilt.

Withlacoochee River Entrance Daybeacon 25, previously reported destroyed, has been rebuilt on charted position and the buoy removed. Search failed to locate old structure.

Ref: LNM 22-81 LLPg: 127
BNM 1619, 1648-81
Charts: 11408

WEST INDIES-PUERTO RICO-NORTH COAST: Vessel Capsized.

The 130-foot freighter DUO has been reported capsized and aground in approximate position 18-28-25N 66-08-00W. The vessel is not lighted.

Ref: SJUAN BNM 719, 803-81
Charts: 25668, 25640, 25670

WEST INDIES-PUERTO RICO SOUTH COAST: Radiobeacon off Air Time.

Punta Tuna Light (LLNR 1378) Radiobeacon will be off the air for maintenance from 1300 Z to 2100 Z on 18 November 1981.

Charts: 25659, 25668, 25650, 25640 LLPg: 138

WEST INDIES-PUERTO RICO-WEST COAST: Ocean Sewer Outfall Information.

Healy Tibbits Construction Company advises that in connection with the construction of the Mayaguez Ocean Sewer Outfall, six 18 inch pipe piles have been temporarily established along the outfall line under construction. A temporary obstruction white light is being displayed from each pile as indicated:

Approximate Position	Type of Light
18-14-52N 67-10-35W	Fixed White
18-14-48N 67-10-45W	Fixed White
18-14-43N 67-10-56W	QK. FL. White
18-14-39N 67-11-08W	Fixed White
18-14-34N 67-11-18W	Fixed White
18-14-30W 67-11-23W	QK. FL. White

Mariners are reminded that two derrick barges and a supply barge are operating in the area between 18-14-54.5N 67-10-31W and 18-14-33N 67-11-25W and will continue for approximately 12 months. Small boats should stay clear of the area.

Ref: LNM 29, 42-81
SJUAN BNM 579, 769, 773, 781-81
Charts: 25673, 25671

WEST INDIES-VIRGIN ISLANDS-ST. THOMAS: Aircraft Wreck.

A 749 Constellation cargo aircraft has been reported sunk in approximate position 18-22.7N 65-01.8W.

Ref: SJUAN BNM 791, 798-81
Charts: 25650, 25641

SOUTH CAROLINA-INTRACOASTAL WATERWAY-WINYAH BAY-CHARLESTON HARBOR: Aid Destroyed.

Winyah Bay-Charleston Harbor Light 30 (LLNR 3520) has been reported destroyed. The site has been marked with a lighted buoy. It will be rebuilt on charted position and the buoy removed as soon as practicable.

Ref: BNM 3186, 3194-81 LLPg: 338
Charts: 11513

GEORGIA-INTRACOASTAL WATERWAY-SAVANNAH RIVER-ST. SIMONS SOUND: Aid Missing.

Doboy Sound Light 178 (LLNR 3743.10) has been reported destroyed and awash. The site has been marked with a lighted buoy. It will be rebuilt on charted position and the buoy removed as soon as practicable.

Ref: BNM 3192, 3201, 3208-81 LLPg: 355
Charts: 11507

FLORIDA INTRACOASTAL WATERWAY-MOSQUITO LAGOON-EAU GALLIE: Aid Missing.

Indian River (North Section) Light 35 (LLNR 4000) has been reported missing. The site has been marked with a lighted buoy. It will be rebuilt on charted position and the buoy removed as soon as practicable.

Ref: BNM 3243-81 LLPg: 375
Charts: 11485

FLORIDA-INTRACOASTAL WATERWAY-EAU GALLIE-ST. LUCIE INLET: Hazard.

A partially submerged piling has been reported in approximate position 27-53N 80-29.5W. The piling is visible 2 to 3 feet above water and leans to the south.

Ref: BNM 3233-81
Charts: 11472

THE COAST GUARD AND A PILOT BOAT HAVE PICKED UP ALL TWELVE PERSONS ABOARD AN INTER ISLAND FREIGHTER THAT CAPCIZED AT THE ENTRANCE OF SAN JUAN HARBOR TONIGHT.

AT 7:30 THIS EVENING THE COAST GUARD RECEIVED A MAYDAY FROM THE 130 FOOT FREIGHTER "DUO" REPORTING THAT HER LOAD HAD SHIFTED AND THE VESSEL WAS LISTING 50 DEGREES. THERE WERE SIX PEOPLE IN THE WATERR . A SAN JUAN HARBOR PILOTS ASSOCIATION BOAT IN THE VICINITY PICKED UP TWO SURVIVORS AND A COAST GUARD 41 FOOT UTILITY BOAT DISPATCHED FROM COAST GUARD BASE SAN JUAN PICKED UP THE REMAINING TEN PERSONS ABOARD THE "DUO" WITHIN FIVE MINUTES.

THE "DUO", ~~SUNKEN~~ WAS ENROUTE TO ST. THOMAS WITH A TRUCK AND CAR ON DECK AND A CARGO OF PLYWOOD AND FOOD BELOW WHEN ~~XX~~ THE LOAD ~~SHI~~ SHIFTED CAUSING THE SHIP TO CAPCIZE. THE DUO WAS LOCATED APPROXIMATELY 300 YARDS off EL MORRO HEADING OUT OF THE HARBOR WHEN THE INCIDENT ~~HAPP~~ HAPPENED. THE AGENT FOR THE "DUO" IS ANTILLES SHIPPING COMPANY.

724-1420
725-1324

Anguila
UPI.
AP
El Nuevo Dia
SJ star
Chan. 2
Chan 11
Chan 4
EL MUNDO.

1981

135 gross tons

October 8, 1981

Lic. Eugene F. Hesterer
P.O. Box 5982
Old San Juan, P.R. 00905

Dear Sir:

This is our report for the underwater survey conducted on the vessel DUO capsized at the entrance of San Juan Harbor, Puerto Rico.

Findings of survey were as follows:

A) Vessel has a slight positive attitude. Vessel rolls four to six feet on a port to starboard axis. Bow and stern have a rising and falling movement of about fourteen inches. All movements were observed at mean high tide with easterly swells of two to four feet.

B) Superstructure is completely destroyed. Parts were lost as vessel traveled over the reef. The remaining undamaged sections are being smashed inboard at this time by the rising and falling movement of the vessel.

C) Starboard side did not show any damage except for one missing port hole.

D) Port side area is receiving all the damage from contact with the bottom. There is a plate seam split over the port bilge keel. This runs from amid ship to the bow section and is about twelve feet long with a half inch gap. This split continues to grow due to the wave action on the vessel and will eventually split the vessel. Smaller splits were observed on the stern section.

E) Bow and stern are smashed inboard. Damage is about four feet long on both areas.

F) No diesel fuel or lubricating oil was detected on the area. It is unknown at this time if large amounts of the above mentioned still exist on the vessel.

At the date of our survey, structural integrity appears to be strong enough to tolerate a refloating and towing operation. Vessel is suffering great structural stress due to continuous wave action, hull movement against the reef and internal sea water pressures. Shell plating is beginning to separate from frames and other structural members.

If any salvage operation is to be conducted by your office, work must be initiated as soon as possible. Once the ability to create a large air bubble in the hull is lost, refloating operations will be highly improbable.

Respectfully yours,

Carlos E. Tirado

sea

cc Mr. Luis A. Rodrigues
U.S. Army Corps of Engineers

NOAA SHIP MT MITCHELL PSR/ DIVING INVESTIGATION

DATE 8 April '83
SHEET MT 10-1-83

DIVERS _____ OIC

OPR I 149-MI-83

ITEM DESCRIPTION unknown

H- 10073

Freighter aground

PSR ITEM # 2743

REPORTED LOCATION: 18° 28' 26.0' N
66° 08' 00.0

SOURCE OF REPORT LOCATION: LNM HH/81

REASON FOR SEARCH OF ITEM:
PSR ITEM ✓
SIDE SCAN _____
NOTICE TO MARINERS _____
LOCAL REPORT _____

ACTUAL LOCATION: not found

D.P.'s POS : TIME

AREA SEARCHED: thoroughly inspected area

CHARTING RECOMMENDATIONS: ~~if shown to have been salvaged - remove charted symbol~~
SEE PAGE 15 of MT. Mitchell Descriptive Report for recommendations

DIVE INFORMATION
LEAST DEPTH:
MAX DIVE DEPTH:
BOTTOM TIME:
TOTAL DIVE TIME:
VISIBILITY:
CURRENTS & CONDT'S:

*** THIS ITEM WAS WAS NOT EXAMINED SUFFICIENTLY .

SEARCH PROCEDURE:

SKETCH AND COMMENTS:
Area of grounding was thoroughly inspected by small craft. Coast Guard documentation (attached) shows that this item was the Freighter DUO (previously thought to be PSR # 2742)

REFERENCE FEATURES AND LOCATIONS:

LTS (use additional sheets):

All indications are that the vessel was salvaged. Corps of Engineers will notify us of its status.

REPORT OF
NOAA SHIP MT MITCHELL PSR/ DIVING INVESTIGATION

DATE 8 Apr 1 '83
SHEET MT 10-1-83

DIVERS _____ OIC

OPR I/149-MT-83

ITEM DESCRIPTION Dredge Barge aground (reported as the barge "DUO")

H- 10073

PSR ITEM # 2742

REPORTED LOCATION: 18° 28' 24.0' N } PA
66° 07' 07.0'W

SOURCE OF REPORT LOCATION: LNM 15/82

ACTUAL LOCATION: 18° 28' 16.8' N
66° 07' 39.7'W

REASON FOR SEARCH OF ITEM:
PSR ITEM ✓
SIDE SCAN _____
NOTICE TO MARINERS _____
LOCAL REPORT _____

D.P.'s POS : TIME
8003
+
8004

AREA SEARCHED: _____

CHARTING RECOMMENDATIONS: relocate wreck symbol (Danger Symbol # 11) to new location. Remove "PA" notation CONCUR CHART as SHOWN ON PRESENT SURVEY.

DIVE INFORMATION
LEAST DEPTH:
MAX DIVE DEPTH:
BOTTOM TIME:
TOTAL DIVE TIME:
VISIBILITY:
CURRENTS & COMMENTS:

*** THIS ITEM WAS / WAS NOT EXAMINED SUFFICIENTLY.

SEARCH PROCEDURE:

REFERENCE FEATURES AND LOCATIONS:

SKETCH AND COMMENTS:

RESULTS (use additional sheets):

This barge was reported as being the barge DUO (Found to be PSR # 2743). Dredge barge aground is the "PROCK BARGE 19" which ran aground with the Tug "CARL O". Barge was located with a three point sextant FIX on the bow and stern RK56 was used to determine a position for each point; the midpoint being the position given.

REPORT OF
NOAA SHIP MT MITCHELL PSR/ DIVING INVESTIGATION

DATE 8 April '83
SHEET MI 10-1-83

DIVERS _____ OIC

OPR I149-MI-83

ITEM DESCRIPTION vessel aground (TRANSCARIBBEAN)

H- 10073

PSR ITEM # 2741

REPORTED LOCATION: 18° 28' 30.0' N
66° 08' 00.0 W

SOURCE OF REPORT LOCATION: LNM 17/83

ACTUAL LOCATION: 18° 28' 29.9' N
66° 07' 39.9' W

REASON FOR SEARCH OF ITEM:
PSR ITEM ✓
SIDE SCAN _____
NOTICE TO MARINERS _____
LOCAL REPORT _____

D.P.'s POS : TIME
8005

AREA SEARCHED: _____

CHARTING RECOMMENDATIONS: ~~Charted word "wreck" be removed from chart~~ Retain as presently charted.

DIVE INFORMATION
LEAST DEPTH:
MAX DIVE DEPTH:
BOTTOM TIME:
TOTAL DIVE TIME:
VISIBILITY:
CURRENTS & CONDT'S:

*** THIS ITEM WAS WAS NOT EXAMINED SUFFICIENTLY .

SEARCH PROCEDURE:

REFERENCE FEATURES AND LOCATIONS:

SKETCH AND COMMENTS:

RESULTS (use additional sheets):

thorough visual inspection of area yielded debris of a vessel hard aground embedded in a reef at position mentioned above. As this item can now be considered part of the reef and presents ~~no~~ hazzard to navigation, its symbol should be removed from the chart. Position was determined with a three point sextant fix and an estimated distance utilizing RM 361 and the H.P. Geodetic Package (80061C)

NOAA SHIP MT MITCHELL INVESTIGATION

DATE 22 March '83
SHEET MT 10-1-83

DIVERS OI

OPR I149-MT-83

ITEM DESCRIPTION Unknown barge aground

H- 10093

PSR ITEM # 2736

REPORTED LOCATION: 18° 28' 22.0" N } PA
66° 08' 22.0" W }

SOURCE OF REPORT LOCATION: LNM 5/76

ACTUAL LOCATION: 18° 28' 27.5" N
66° 08' 22.0" W

AREA SEARCHED:

REASON FOR SEARCH OF ITEM:
PSR ITEM ✓
SIDE SCAN
NOTICE TO MARINERS
LOCAL REPORT

D.P.'S	POS	TIME
7006 and 7007		
JD 081		
VESRO 2221		

CHARTING RECOMMENDATIONS: Relocate wreck Symbol (Danger Symbol #11) to new location
Remove "PA" notation
chart 25 shows on present survey and remove visible wreck, PA

DIVE INFORMATION
LEAST DEPTH:
MAX DIVE DEPTH:
BOTTOM TIME:
TOTAL DIVE TIME:
VISIBILITY:
CURRENTS & COND'T'S:

WAS THIS ITEM WAS WAS NOT EXAMINED SUFFICIENTLY

SEARCH PROCEDURE:

SKETCH AND COMMENTS:

Bow and Stern of barge (determined to be McAllister Bros Barge Z-102) were located using range/azimuth method from PT SALINAS (316 #210). G.P.'s of bow and stern were determined using H.P. geodetic package (8006/10) and the mid point of said barge is what is given

REFERENCE FEATURES AND LOCATIONS:

YES (use additional sheets):

CM

NOAA SHIP MT MITCHELL INVESTIGATION

DATE ~~8-07 April~~ 19 MARCH 1983

SHEET MI-10-1-83

DIVERS McLEAN OIC

ITEM DESCRIPTION WRECK AWASH

SNORKEL INVESTIGATION

OPR I-149

VISIBLE AT CHART DATUM

H-10073

PSR ITEM # 2735

REPORTED LOCATION: 18°28'25"N 66°09'20"W
CHARTED 18°28'25"N 66°09'20"W
ON CHARTS 25668, 25670

SOURCE OF REPORT LOCATION: PSR LISTING AND CURRENT CHARTS

REASON FOR SEARCH OF ITEM:

PSR ITEM X No 2735

SIDE SCAN

NOTICE TO MARINERS

LOCAL REPORT

ACTUAL LOCATION:

D.P.'s POS : TIME

AREA SEARCHED: 100' RADIUS AROUND REPORTED LOCATION.
~~No EV~~

CHARTING RECOMMENDATIONS: ~~REMOVAL FROM CHART.~~

SEE PAGE 13 of MT MITCHELL REPORT FOR RECOMMENDATION.

DIVE INFORMATION

LEAST DEPTH:
MAX DIVE DEPTH:
BOTTOM TIME:
TOTAL DIVE TIME:
VISIBILITY:
CURRENTS & CONDITIONS:

*** THIS ITEM WAS / WAS NOT EXAMINED SUFFICIENTLY.

SEARCH PROCEDURE: 100' CIRCULAR SWEEP FROM CENTER OF CHARTED POSITION

SKETCH AND COMMENTS:
NO STRUCTURE ABOVE DATUM OR OBSERVED UNDERWATER. ~~BELIEVE THIS~~ LOCATION TO BE ~~A MIS-POSITIONED REPORT OF BOW SECTION OF PSR # 2734. THIS AREA OF HIGH ENERGY IN SURF/REEF ZONE HAS BROKEN DOWN THIS WRECK. IT IS HIGHLY CONCEIVABLE THAT BOW WAS ABOVE DATUM AND NOW RESTS 4' BELOW SURFACE, 50 m WEST OF THIS POSITION.~~

REFERENCE FEATURES AND LOCATIONS:
RANGE RANGE
L: STA 210 R: STA 102

RESULTS (use additional sheets):
NO STRUCTURE IS VISIBLE ABOVE DATUM IN THIS AREA EXCEPT PSR ITEM 2734. AREA DIVED AND ONLY CORAL REEF OBSERVED UNDERWATER. NO WRECKAGE FOUND IN AREA IN QUESTION. DEVELOPMENT LINES WERE RUN JD 078 RANGE-RANGE CONTROL AT 25 M SPACING FROM POS 839 TO ~~872~~ 858. SHOALEST DEPTH WAS 4.0 Ft at 171445 AND WAS TAKEN OVER CORAL REEF.

CM

REPORT OF
NOAA SHIP MT MITCHELL PSR/ DIVING INVESTIGATION

DATE 07 April 1983
SHEET MI-10-1-83

DIVERS McLEAN OIC
- snorkel investigation

OPR I-149

ITEM DESCRIPTION Wreck
Visible 10' Above datum.
Field edited in 1965

H-10073

PSR ITEM # 2734

REPORTED LOCATION: 18°28'28"N 66°09'26"W
CHARTED SAME
ON CHARTS 25668, 25670

SOURCE OF REPORT LOCATION: 24th ed. Chart 25670
LNM

REASON FOR SEARCH OF ITEM:
PSR ITEM X No. 2734
SIDE SCAN
NOTICE TO MARINERS
LOCAL REPORT

ACTUAL LOCATION:

D.P.'s	POS	TIME
STERN	1182	142701 (JD 097)
BOW (NO #) R/Az Plotted x-y position but no pos # or DP		143403
BOILERS	750	134356 (JD 078)

AREA SEARCHED: Swam East/West of charted position until no wreckage was found for over 75 feet in either direction.

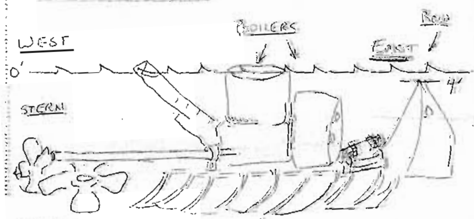
CHARTING RECOMMENDATIONS: Wreck is visible above datum by one foot. Boilers are located in charted position. Carry location; identify as awash. Wreckage area exceeds charted area on chart no. 25670. Recommend chart as plotted on present survey.

WAS THIS ITEM (WAS) WAS NOT EXAMINED SUFFICIENTLY.

DIVE INFORMATION
LEAST DEPTH:
MAX DIVE DEPTH:
BOTTOM TIME:
TOTAL DIVE TIME: 35 min
VISIBILITY: 30'
CURRENTS & CONDITIONS: Calm

SEARCH PROCEDURE: Swim along axis of wreckage.

SKETCH AND COMMENTS:



REFERENCE FEATURES AND LOCATIONS:
RANGE/AZ. T-2 # 19293
RANGE FROM STA #210
T-2 OBSERVER AT STA #210
INITIAL ON STA # 102 } JD 097
RANGE RANGE
L: STA 210 R: STA 102 } JD 078

STERN
POS 1182 JD 097
DEPTH: 7.7 Ft
RANGE: 2390
AZ: 105/12/25

BOILERS
POS 750 JD 078
DEPTH 8.5 Ft. (Boiler Actually 1 Ft Awash)
RANGE: L: [illegible]
R: [illegible]

BOW
NO POS #
X= [illegible]
Y= [illegible]
AZ: [illegible]

RESULTS (use additional sheets):
Wreck located in and exceeding area charted. Symbol charted represents location of boilers while stern is to west and bow to east. Bow sits facing up at least depth of 4 feet between charted pos's of PSR No 2734 and 2735. Believe bow to be source of PSR 2735 at earlier time when bow extended above datum. Wreck lies in area of high surf impact and has broken up extensively. Wreck is steel hulled, [illegible]

APPROVAL SHEET

This survey is complete and adequate for the purpose of a hydrographic field examination as explainedin the project instructions. The Commanding Officer continually supervised and examined all work except while on leave. A.T.

APPROVED BY: A. Thebeau 4/7/86

DATE: 10/3/83

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, P.R.

Period: February 17 - April 22, 1983

HYDROGRAPHIC SHEET: H-10073

OPR: I 149

Locality: North Coast, 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:

Zone Direct

James R. Hubbard

Chief, Tidal Datums Section, Tides & Water Levels Branch

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

TIDE NOTE FOR HYDROGRAPHIC SHEET

DATE: 05/16/86

Marine Center: Atlantic

OPR: I-191

Hydrographic Sheet: H-10073

Locality: North Coast, Island of Puerto Rico

Time Period: October 20 - November 2, 1985

Tide Station Used: 975-5371 San Juan, Puerto Rico

Plane of Reference (Mean ~~Lower~~ Low Water): 1.90 ft.

Height of Mean High Water Above Plane of Reference: 1.1 ft.

Remarks: Recommended Zoning:

Zone direct

for Richard K. Lee
Chief, Tidal Datum Quality
Assurance Section

NOAA FORM 76-155
(11-72)

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

GEOGRAPHIC NAMES

SURVEY NUMBER

H-10073

Name on Survey	A ON CHART NO.	B ON PREVIOUS SURVEY NO.	C ON U.S. QUADRANGLE MAPS	D FROM LOCAL INFORMATION	E ON LOCAL MAPS	F P.O. GUIDE OR MAP	G RAND MCNALLY ATLAS	H U.S. LIGHT LIST	K	
ATLANTIC OCEAN										1
BAHIA DE SAN JUAN										2
BAHIA DE TOA										3
BAJO COLNAS										4
BAJO SANTA ELENA										5
EL BOQUERON										6
ENSENDA DE BOCA VIEJA										7
FORT SAN GERONIMO										8
ISLA DE CABRAS										9
ISLA DE LAS PALOMAS										10
ISLA SAN JUAN										11
LAGUNA DEL CONDADO										12
LAS CABRITAS										13
PALO SECO										14
PENON DE SAN JORGE										15
PUERTO RICO (title)										16
PUNTA SALINAS										17
PUNTA TOCONES										18
PUNTA DEL MORRO										19
PUNTA ESCAMBRON										20
SAN JUAN										21
										22
										23
										24
										25

Approved:

Charlie E. Harrington
Chief Geographer - N/CG25

FEB 10 1987

NOAA FORM 76-155 SUPERSEDES C&GS 197

NOAA FORM 61-29
(12-71)

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

REFERENCE NO.
MOA23-35-87

LETTER TRANSMITTING DATA

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

☐ ORDINARY MAIL ☐ AIR MAIL
☑ REGISTERED MAIL ☐ EXPRESS
☐ GBL (Give number) _____

TO:

Chief, Data Control Branch, N/CG243
Room 151, WSC-1
National Ocean Service - NOAA
Rockville, MD 20852

DATE FORWARDED
29 MAY 1987

NUMBER OF PACKAGES
THREE (3) 1 TUBE, 2 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-10073 (MI-10-1-83)
OPR-I149-MI-83 and OPR-I149-PE-85,
Puerto Rico, Atlantic Ocean
Punta Salinas to Punta Escambron

PKG. 1 (TUBE)

1 SMOOTH SHEET
1 FINAL SMOOTH POSITION OVERLAY
2 FINAL EXCESS OVERLAY
5 FINAL FIELD SMOOTH SHEET
1 ORIGINAL DESCRIPTIVE REPORT

PKG. 2 (BOX)

8 NOAA FORM 77-44 (SOUNDING VOLUMES)
3 BINDERS containing BASELINE CALIBRATION DATA
1 ENVELOPE containing DATA REMOVED FROM ORIGINAL DESCRIPTIVE REPORT
1 ENVELOPE containing FIELD CALIBRATION DATA

FROM: (Signature)

NORRIS A. WIKE Norris A. Wike

RECEIVED THE ABOVE
(Name, Division, Date)

Return receipted copy to:

Chief, Hydrographic Surveys Branch,
N/MOA23
Atlantic Marine Center
439 W. York Street
Norfolk, VA 23510-1114

NOAA FORM 61-29 SUPERSEDES FORM C&GS 413 WHICH MAY BE USED.

☆ U.S. G.P.O. 1981-564-008/1048

NOAA FORM 61-29 (12-71)

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

REFERENCE NO.
MOA23-35-87

LETTER TRANSMITTING DATA

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

☐ ORDINARY MAIL ☐ AIR MAIL
☑ REGISTERED MAIL ☐ EXPRESS
☐ GBL (Give number) _____

TO:

Chief, Data Control Branch, N/CG243
Room 151, WSC-1
National Ocean Service - NOAA
Rockville, MD 20852

DATE FORWARDED
29 May 1987

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H-10073 (MI-10-1-83)
OPR-I149-MI-83 and OPR-I149-PE-85,
Puerto Rico, Atlantic Ocean
Punta Salinas to Punta Escambron

PKG. 2 (BOX) cont:

1 CAHIER containing FINAL POSITION PRINTOUT
1 CAHIER containing FINAL SOUNDING PRINTOUT and L-FILE
1 ENVELOPE containing SUPPLEMENTAL DATA from PRINTOUT

PKG. 3 (BOX)

1 ACCORDION FILE containing MASTER TAPE PRINTOUTS, CORRECTOR TAPE PRINTOUTS, and FATHOGRAMS for following JD,s:
VESNO 2831: 289-293, 294 fathogram only, 295-296, 305
VESNO 2832: 289-292, 294-295, 297, 306
VESNO 2833: 302
one slot containing velocity correction data

FROM: (Signature)
NORRIS A. WIKE Norris A. Wike

RECEIVED THE ABOVE
(Name, Division, Date)

Return receipted copy to:

Chief, Hydrographic Surveys Branch,
N/MOA23
Atlantic Marine Center
439 W. York Street
Norfolk, VA 23510-1114

NOAA FORM 61-29 SUPERSEDES FORM C&GS 413 WHICH MAY BE USED.

☆ U.S. G.P.O. 1981-564-008/1048

NOAA FORM 61-29 (12-71)

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

REFERENCE NO.
MOA23-35-87

LETTER TRANSMITTING DATA

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

☐ ORDINARY MAIL ☐ AIR MAIL
☑ REGISTERED MAIL ☐ EXPRESS
☐ GBL (Give number)_____

TO:

Chief, Data Control Branch, N/CG243
Room 151, WSC-1
National Ocean Service - NOAA
Rockville, MD 20852

DATE FORWARDED
29 May 1987

NUMBER OF PACKAGES
THREE (3) 1 TUBE, 2 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-10073 (MI-10-1-83)
OPR-I149-MI-83 and OPR-I149-PE-85,
Puerto Rico, Atlantic Ocean
Punta Salinas to Punta Escambron

PKG. 3 (BOX) cont:

1 ACCORDION FILE containing MASTER TAPE PRINTOUTS, CORRECTOR TAPE PRINTOUTS, and FATHOGRAMS for following JD,s:
VESNO 2221: 81, 99
VESNO 2224: 49-51, 69-72, 78, 80-82, 97-98, 110, 112
VESNO 2225: 73 printout only
one slot containging supplemental field data

FROM: (Signature)
NORRIS A. WIKE Norris A. Wike

RECEIVED THE ABOVE
(Name, Division, Date)

Return receipted copy to:

Chief, Hydrographic Surveys Branch,
N/MOA23
Atlantic Marine Center
439 W. York Street
Norfolk, VA 23510-1114

NOAA FORM 61-29 SUPERSEDES FORM C&GS 418 WHICH MAY BE USED.

☆ U.S. G.P.O. 1981-564-008/1048

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NO.: H-10073

Number of positions	2513
Number of soundings	11497
Number of control stations	15

	TIME-HOURS	DATE COMPLETED
Preprocessing Examination	65	24 May 86
Verification of Field Data	403	30 Jan 87
Quality Control Checks	124	
Evaluation and Analysis	87	27 Apr 87
Final Inspection	48	14 Apr 87
TOTAL TIME	727	
Marine Center Approval		28 Apr 87

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-10073 FIELD NO.: MI-10-1-83

Puerto Rico, Atlantic Ocean, Punta Salinas to Punta Escambron

SURVEYED: 18 February through 22 April 1983 and 16 October through 7 November 1985

SCALE: 1:10,000 PROJECT NO.: OPR-I149-MI-83 and OPR-I149-PE-85

SOUNDINGS: ROSS Model 5000 Digital Echo Sounder, RAYTHEON DSF-6000N Fathometer, RAYTHEON DE-719B Fathometer, Leadline

CONTROL: Del Norte (Range/Range), Del Norte/WILD T-2 Theodolite (Range/Azimuth), MOTOROLA Mini-Ranger Falcon 484 (Range/Range), (Range/Azimuth), WILD T-2 Theodolite/HP-3810B Total Control Station Instrument (Range/Azimuth)

Chief of Party.....J. A. Yeager
.....A. E. Theberge

Surveyed by.....L. A. Lapine
.....D. A. Waltz
.....R. L. Parsons
.....D. R. Rice
.....V. D. Ross
.....G. R. Yates
.....V. A. Barnum
.....B. L. Coakley
.....C. N. McLain
.....E. I. Crews
.....J. A. Miller
.....W. E. Sites
.....J. A. Hendrix
.....J. A. Hill
.....E. A. Lake

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

1. INTRODUCTION

a. No unusual problems were encountered during office processing; however, this survey was conducted by two different field units over two different field seasons. The data were combined during office processing. The two separate Descriptive Reports submitted by the field units are combined under one cover.

b. One (1) page size plot of a charted obstruction, investigated during this survey, has been inserted into the Descriptive Report. This item investigation was incorporated into this survey through project instructions OPR-I149-PE-85, Change NO. 1., dated October 7, 1985.

c. Notes in the Descriptive Reports were made in red during office processing.

2. CONTROL AND SHORELINE

a. Control is adequately discussed in sections F., G., and S. of the Descriptive Reports.

b. Shoreline originates with final reviewed Class III Shoreline Manuscripts TP-00953 and TP-00954 of 1980. Shoreline revisions from the field data are shown in red on the smooth sheet.

3. HYDROGRAPHY

a. Soundings at crossings are in excellent agreement and comply with the criteria found in sections 4.6.1 and 6.3.4.3. of the HYDROGRAPHIC MANUAL with the following exception:

Sounding data in the vicinity of Latitude 18°29'27.0"N, Longitude 66°07'18.0"W were rejected due to crossing inconsistencies.

b. The standard depth curves could not be drawn in their entirety. The zero (0) curve was not delineated and the six (6), twelve (12), and eighteen (18) curves were not delineated in there entirety because of vessel safety. The supplemental thirty (3) foot curve was drawn to show additional bottom relief. Some brown and dashed curves were also drawn to delineate bottom relief.

c. The development of the bottom configuration and determination of least depths is considered adequate with the following exceptions:

1) The following shoal features and area found by the present survey were not developed.

Shoal	Latitude	Longitude	Surrounding Depths
11	18°28'39.14"N	66°11'42.12"W	15-17
8	18°28'30.13"N	66°11'32.76"W	16-20
12	18°27'45.25"N	66°10'25.41"W	20-24
16	18°27'50.82"N	66°10'09.18"W	21-23
12	18°28'03.31"N	66°09'47.02"W	15-24
16	18°28'28.40"N	66°09'43.96"W	30-37
12	18°28'13.62"N	66°09'40.01"W	15-34
6	18°28'11.51"N	66°09'19.68"W	7-19
3	18°28'01.86"N	66°09'07.95"W	5-14

15	18°28'25.81"N	66°06'15.63"W	22-38
12	18°28'16.07"N	66°05'11.73"W	19-20
Shoal area to 4 feet	18°28'07.0"N	66°10'53.4"W	
Shoal area to 16 feet	18°27'53.5"N	66°10'30.0"W	
Shoal area to 16 feet	18°28'22.6"N	66°10'20.3"W	
Shoal area to 14 feet	18°28'38.0"N	66°10'15.4"W	
Shoal area to 11 feet	18°28'27.8"N	66°09'55.5"W	
Shoal area to 10 feet	18°28'11.3"N	66°09'26.0"W	
Shoal area to 10 feet	18°28'42.61"N	66°11'41.16"W	
Shoal area to 7 feet	18°28'36.0"N	66°11'44.0"W	
Shoal area to 12 feet	18°28'30.52"N	66°11'45.25"W	

Additional lines of hydrography in the vicinity of the items discussed above would have provided a better delineation of the bottom configuration.

2) Reduced line spacing in the vicinity of Latitude 18°28'13.5"N, Longitude 66°08'30.7"W would have provided a better delineation of the bottom configuration. The present survey line spacing of 150 to 200 meters is inadequate to define the area.

3) Hydrography in Laguana Del Condado and El Boqueron, in the vicinity of Latitude 18°27'43.4"N, Longitude 66°05'05.0"W is considered reconnaissance only. The transducer draft could not be determined, velocity corrections for the area were not ascertained, and the DE-719B Fathometer was not operating properly at all times. Accurate depths can not be assured.

The lack of developments of items discussed above does not significantly degrade the overall portrayal of the bottom configuration for this survey.

4. CONDITION 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. The field unit did not examine, locate, or describe landmarks on charts 25668 (12th Edition, 24 Nov. 1984), and 25670 (32nd Edition, 18 Sept. 1982), as required by section

4.2.2. of the Project Instructions, and sections 1.6.5., 4.5.13., and 5.5.1. of the HYDROGRAPHIC MANUAL.

b. Final reviewed Class III Photogrammetric Manuscripts TP-00953 and TP-00954 of 1980 were sent to the field unit with "Notes to the Hydrographer" applied to them. The hydrographer, while addressing several of these items in section H. of the Descriptive Report, did not resolve all questions as required by section 4.1.2.2. of the Project Instructions.

c. The field unit did not meet the requirements of section 4.2.1.2. of the Project Instructions. The U.S.Coast Guard requested third-order Class I positions on navigational aids. The aids were not positioned.

d. The field unit did not obtain bottom characteristics in the vicinity of many shoal features as required by section 6.7. of the Project Instructions and section 4.5.9.2. of the HYDROGRAPHIC MANUAL.

e. The field unit did not locate an uncharted rock in Latitude 18°28'19.45"N, Longitude 66°06'08.60"W as required by section 4.1.2.3. of the Project Instruction and section 1.4.3. of the HYDROGRAPHIC MANUAL. Reference to this rock was made in the field data. No detached position was obtained on the rock. This rock was positioned from field references, and then added to the present survey during office processing. It is recommended the rock be charted as portrayed on present survey.

f. The field unit did not submit a NOAA form 76-40, (NONFLOATING AIDS OR LANDMARKS FOR CHARTING) for two domes located photogrammetricly. This requirement is discussed in section 4.2.5. of the Project Instructions.

g. The field unit did not fill in a holiday between the present survey and junctional survey H-10077 (1983-85) in vicinity of Latitude 18°28'06.0"N, Longitude 66°04'48.0"W. Junctional procedures are discussed in sections 1.4.4., and 4.3.2. of the HYDROGRAPHIC MANUAL.

h. The field unit did not locate two (2) uncharted obstructions (concrete cylinders) as required by sections 1.4.3 and 4.5.11. of the HYDROGRAPHIC MANUAL. Reference to the obstructions was made on the "Notes to Hydrographer" copy of shoreline manuscript TP-00953 (1980). No detached positions were obtained on the obstructions. The obstructions were positioned from the field references, and then added to the present survey. One of the obstructions is in Latitude 18°28'26.60"N, Longitude 66°11'02.95"W and the other is in Latitude 18°28'27.39"N, Longitude 66°08'17.25"W. It is recommended the obstructions be charted as protrayed on present survey.

5. JUNCTIONS

H-10077 (1983-85) 1:10,000 to the east
H-10078 (1983) 1:20,000 to the north

An excellent junction was effected between H-10077 (1983-85) and the present survey.

A standard junction could not be effected with the junctional survey H-10078 (1983). The junctional survey is archived at National Ocean Service, (NOS), Headquarters, Rockville, Maryland. Survey H-10077 (1983-85) and survey H-10078 (1983) are in substantial agreement. Depths generally agree to within one (1) foot. In the vicinity of Latitude 18°29'27.0"N, Longitude 66°07'18.0"W data from the present survey were rejected due to poor fathogram traces. Digital depths were not obtained. Differences between the present survey depths selected by the field and junctional survey H-10078 (1983) could not be reconciled. Any adjustments to the depth curves in the junctional areas will have to be made at headquarters on the chart compilation after application of the survey data.

There is no contemporary survey to the west of the present survey. Charted hydrography and the present survey soundings are in harmony.

6. COMPARISON WITH PRIOR SURVEYS

a. Hydrographic

H-2418 (1899) 1:5,000
H-2466 (1900-04) 1:10,000
H-2677 (1904) 1:20,000
H-2883 (1907) 1:20,000
H-4205 (1921) 1:20,000
H-6556 (1940) 1:10,000
H-8848 (1965) 1:5,000 unverified survey

The seven (7) prior surveys listed above cover the present survey in its entirety.

Prior survey H-2418 (1899) is common to the entrance area of San Juan Harbor. Sparse soundings with few depths in the area common to the present survey affords little basis for comparison.

Prior survey H-2466 (1900-04) falls in the common area in the vicinity of Palo Seco. There is considerable change in the bottom configuration and shoreline. The area between Palo Seco and Isla De Cabras has been filled. Differences in depths of 50% or more in comparison with previous depths was not uncommon. Differences may be attributed to a combination of cultural changes and natural processes.

Prior survey H-2677 (1904) is common to the offshore area generally outside of the sixty (60) foot curve between Pta Salinas and Punta Del Morro. Comparable depths, portrayal of the bottom configuration, greater density of soundings, and larger scale of present survey improves definition of the common area.

Prior survey H-2883 (1907) covers the area offshore of the 120 foot curve from Punta Del Morro to the eastern limits of the present survey. Bottom configuration is in substantial agreement. Greater scale and density of present survey enhance portrayal of bottom.

Prior survey H-4205 (1921) covers the common area from Punta Del Morro to the eastern limits of the present survey from the inshore reef line to approximately the sixty (60) foot curve offshore. There are similar configurations but with much more detail of the bottom configuration shown on the present survey.

Prior survey H-6556 (1940) covers a portion of Ensenada De Boca Vieja in the vicinity of Punta Tocones. Differences of up to fifteen (15) feet with general differences being plus or minus two to three (± 2-3) feet. Differences are probably due to natural causes and less accurate control methods of prior survey. Several depths not considered disproved by the present and several bottom characteristics from prior survey H-6556 (1940) were brought forward to supplement the present survey.

Prior survey H-8848 (1965), an unverified survey, covers the area between Isla De Cabras and Punta Del Morro. The prior survey compares favorably with the present survey and shows a general trend of being one (1) to four (4) feet shoaler than present survey depths.

The difference between the present and prior surveys may be attributed to the natural changes in the bottom and technological advances in surveying.

The present survey is adequate except as noted above to supersede the above prior surveys within the common area.

b. Shoreline Manuscripts

T-11884 (1964-65) 1:5,000
T-11885 (1964-65) 1:5,000
T-11886 (1964-65) 1:5,000

Prior shoreline manuscript T-11884 (1964-65) covers the shoreline area from Latitude 18°27'14.7"N, Longitude 66°09'37.5"W to Punta Del Morro. The prior survey shoreline compares favorably with present survey shoreline with no significant changes in the present survey shoreline.

Prior shoreline manuscript T-11885 (1964-65) covers the shoreline area from Punta Del Morro to Latitude 18°28'07.0"N, Longitude 66°05'37.5"W. The prior survey shoreline compares favorably with present survey shoreline with no significant changes in the present survey shoreline.

Prior shoreline manuscript T-11886 (1964-65) covers the shoreline area from Latitude 18°28'07.0"N, Longitude 66°05'37.5"W to Latitude 18°27'33.9"N, Longitude 66°04'56.9"W. The prior survey shoreline compares favorably with present survey shoreline with no significant changes in the present survey shoreline.

Several bottom characteristics from the prior shoreline manuscripts were brought forward to supplement the present survey.

The present survey is adequate except as noted above to supersede the above prior shoreline manuscripts within the common area.

7. COMPARISON WITH CHART 25668 12th. Edition 24 Nov. 1984
25670 33rd. Edition 7 Jan. 1984

a. Hydrography

Ninety-nine percent of the charted hydrography originates with the previously discussed prior surveys and requires no further consideration. The remaining hydrography is from a not readily ascertainable source. The following should be noted:

1) Charted breakers, and foul areas on above listed charts were partially verified by the field unit. The limits were portrayed from shoreline maps, and notes and positions by the hydrographer on present survey during office processing. It is recommended the charted breakers, and foul areas be deleted, and new breaker and foul area limits be charted as portrayed on present survey.

2) A charted rock awash in Latitude 18°28'17.9"N, Longitude 66°09'10.0"W was neither verified nor disproved by the field unit. It is recommended the charted rock awash be retained as charted.

Awois #7055

3) A submerged reef charted in Latitude 18°28'21.5"N, Longitude 66°04'54.0"W originates with shoreline map T-11886 (1964-65). The shoalest depth found on this feature by the present survey is eleven (11) feet. The development of this feature by the present survey is inadequate to insure the least depth was obtained. It is recommended that the submerged reef be retained as charted.

Awois #7056

4) A charted sewer under constr was located by the field unit south of Latitude 18°28'36.16"N, Longitude 66°08'27.59"W. The entire sewer line was not located. It is recommended the charted sewer under constr be revised and shown as protrayed on present survey south of Latitude 18°28'36.16"N Longitude 66°08'27.59"W, and north of this location be retained as charted.

The present survey is adequate except as noted above and in the hydrographer's reports to supersede the charted hydrography in the common area.

b. Aids to Navigation

There are two (2) fixed aids to navigation in the survey area. These aids appear adequate to serve their intended purposes.

8. COMPLIANCE WITH INSTRUCTIONS

This survey complies with the Project Instructions except as noted in sections of this report.

9. ADDITIONAL FIELD WORK

This is considered to be an adequate basic survey. Additional work on future surveys of the area would be desirable to develop shoals and other features discussed in sections 3.c., 4.d., 4.e., 4.g., 6., 7.a. of this report.

Reginald L. Keene
Cartographic Technician
Verification of Field Data

Norris A. Wike
Cartographer
Evaluation and Analysis

Robert R. Hill
Senior Cartographic Technician
Verification Check

Inspection Report
H-10073

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. Sanocki
Chief, Hydrographic Survey
Processing Section
Hydrographic Surveys Branch

David B. MacFarland
Chief, Hydrographic Surveys Branch

Approved: 28 April 1987

Ray E. Moses, RADM, NOAA
Director, Atlantic Marine Center

66° 05′ 30″

66° 05′ 00″

18° 27′ 30″

18° 27′ 30″

1[illegible] 27′ 00″

18° 27′ 00″

7000

18° 26′ 30″

18° 26′ 30″

66° 05′ 30″

66° 05′ 00″

66° 05′ 30

66° 05′ 00″

18° 27′ 30″

18° 27′ 30″

18° 27′ 00″

18° 27′ 00″

Investigation Of Charted
Obstruction

° obstr (tree trunk)

18° 26′ 30″

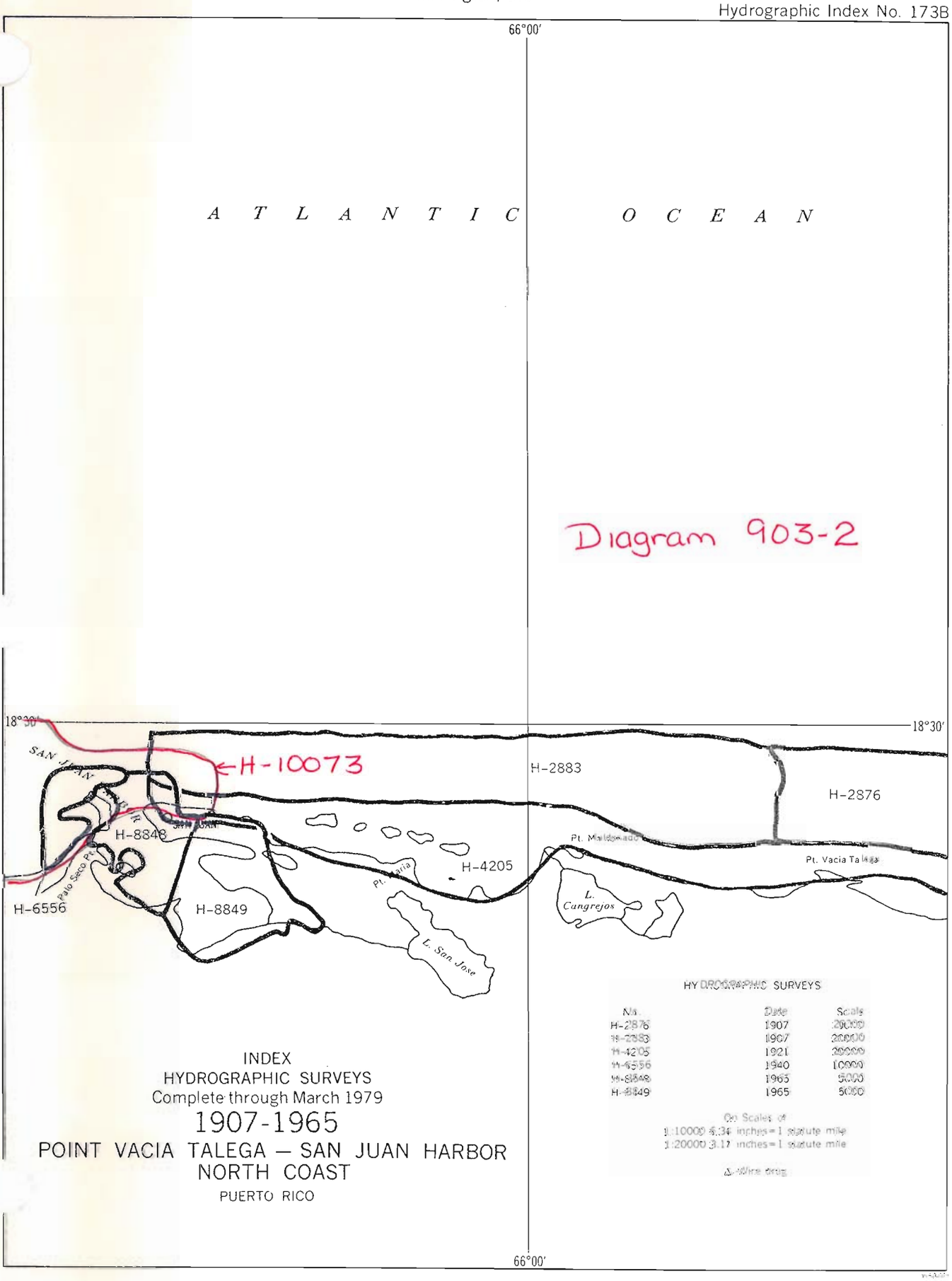
18° 26′ 30″

66° 05′ 30″

66° 05′ 00″

DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Survey
Washington, D.C.

Hydrographic Index No. 173B



INDEX
HYDROGRAPHIC SURVEYS
Complete through March 1979

1907-1965

POINT VACIA TALEGA — SAN JUAN HARBOR NORTH COAST

PUERTO RICO

NOAA FORM 75-96
(10-83)

U.S. DEPARTMENT OF COMMERCE
EXAMINED FOR
GDBU
AmS 10-26-89

MARINE CHART BRANCH

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10073

INSTRUCTIONS

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.

1. Letter all information.
2. In "Remarks" column cross out words that do not apply.
3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

CHART	DATE	CARTOGRAPHER	REMARKS
25670	7-29-87	S. P. LaBossiere	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. 26
25669	7-29-87	S. P. LaBossiere	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. 1
25668	7-29-87	S. P. LaBossiere	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. 20
~~25640~~	~~7-29-87~~	~~S. P. LaBossiere~~	~~Full Part Before After Marine Center Approval Signed Via~~
			~~Drawing No. 35~~
25640	7-2-90	Ed Martin	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. 35 thru 25668 drg 20
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Appl'd to Std 7-2-87

SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED.