9267

Diag. Cht. No. 902

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT
(HYDROGRAPHIC)

Type of Survey HYDROGRAPHIC

Field No. MI-10-3-72

Office No. H-9267

LOCALITY

State PUERTO RICO

General Locality SOUTH COAST

Locality PLAYA SALINAS TO PUNTA CAYITO

19 72-75

CHIEF OF PARTY
R.M. Buffington, E.K. McCaffrey

LIBRARY & ARCHIVES

DATE October 5, 1977

☆U.S. GOV. PRINTING OFFICE: 1976—669-441

9267

Area 3

Charts
25-685
25-687
25-677
25-640

INDEX

✓ = Misc. items removed and filed with the field records

FORM C&GS-537 (5-66)

U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET

REGISTER NO. H-9267

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. (Incomplete) MI-10-3-72

State Puerto Rico — See other title page

General locality South Coast ~~(Incomplete)~~

Locality Playa Salinas to Punta Cayito ~~(Inshore)~~

Scale 1:10,000 Date of survey Apr. 17 to May 22, 1972 Jan. 24 - Feb 20, 1975

Instructions dated January 5, 1972 Project No. OPR-423-MI-72

Vessel NOAA Ship MT MITCHELL Launches MI-3, MI-5, MI-6 & Skiffs

Chief of party R.M. Buffington Edwin K. McCaffrey, CAPT, NOAA, Commanding Officer

Surveyed by Ship's Personnel (LT C.R. Berman, Officer-in-Charge)

Soundings taken by echo sounder, hand lead, pole used all listed methods

Graphic record scaled by Ship's Personnel

Graphic record checked by

Protracted by Automated plot by Calcomp-618

Soundings penciled by Verified by R. Hill

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

REMARKS: This survey is incomplete (1972) - completed in 1975.

Applied to stds 3/8/78

Descriptive Report

To Accompany

Incomplete Hydrographic Survey MI-10-3-72

Registry Number H-9267

OPR-423-MI-72

South Coast of Puerto Rico

1972 Field Season

Scale 1:10,000

NOAA Ship MT MITCHELL (MSS-22)

Edwin K. McCaffrey
CAPT, NOAA
Commanding Officer

Descriptive Report (See other report)

To Accompany

Incomplete Hydrographic Survey MI-10-3-72

Registry Number H-9267

OPR-423-MI-72

South Coast of Puerto Rico

1972 Field Season

Scale 1:10,000

NOAA Ship MT MITCHELL (MSS-22)

Edwin K. McCaffrey
CAPT, NOAA
Commanding Officer

A. Project

Authority for this survey was Project Instructions, OPR-423-MI-72 dated January 5, 1972.

All work was recorded using Greenwich Mean Time in accordance with Paragraph 38 of the project instructions.

B. Area Surveyed (This (1972) survey is not complete) See 1975 report for completion.

The area surveyed is on the south coast of Puerto Rico beginning at approximately the mouth of the Rio Coamo River (Punta Cayito) and extending one quarter mile to the east of the town of Playa Santa Isabel. The limits of the area surveyed are:

Northern Limit, South Coast, Puerto Rico

Southern Limit, Latitude 17°54'15"N.

Eastern Limit, Longitude 66°23'54"W.

Western Limit, Longitude 66°26'00"W.

The coastline includes several large mangrove islands on the eastern sheet extremity, and an extensive cove between these islands and the shoreline.

Hydrography commenced on April 17, 1972 and was concluded on May 22, 1972.

This sheet junctions on the south with contemporary survey MI-20-1-72 (H-9266), and on the west by contemporary surveys MI-10-1-72 (H-9264), MI-10-2-72 (H-9265) and prior survey MI-10-2-71 (H-9190).

C. Sounding Vessels

Launches MI-3, MI-5 and MI-6 were used on this sheet for echo sounding work. Launch MI-3 was used primarily for work along the shoreline and in shoal areas. Launch MI-5 was used primarily in the areas of deeper water in which automated control was adequate (10 feet and deeper). MI-6 was used for developments. The Boston Whaler (skiff) was used for shoreline and shoal definition. A breakdown of the sounding vessel data according to type, propulsion, and position number blocks appears below:

Boat Type	Engine	Position Numbers
MI-3 25' Bertram (Twin Outdrive)	Rover/Mercury	0001 - 0310
MI-5 Pacific Plastics Boat (Single Screw)	GM/Muncie 4/53	5000 - 5335
MI-6 31' Uniflite (Twin V-Drive)	Cummins	0900 - 0929
MI-7 Boston Whaler	40 HP Outboard	7000 - 7197

One copy of this boatsheet is being submitted. This boatsheet was plotted on the COMPLOT plotter on board the MT MITCHELL, which plots the sounding and the position number. The boatsheet is plotted in black ink and is comprised of two plotter sheets. One sheet contains all hydrographic survey work with exception of developments and bottom samples. The other sheet contains all developments and bottom samples. These final

plots do not have velocity corrections and observed tides applied.

D. Sounding Equipment

Raytheon Survey Fathometer, Model DE-723B, was used in obtaining soundings in Launch MI-3. The graphic records were scanned to 0.5 feet. The remaining soundings were recorded to 0.1 foot by the Ross Echo Sounder/Digitizer package as listed below. The Ross graphic records were scanned to 0.2 feet.

Launch	Echo Sounder Package	Days Used
MI-3	Raytheon Survey Fathometer, Model DE-723B, Serial Number 1281	116-118 123-125
MI-5	Ross Echo Sounder Recorder, Model 5000, Serial Number 1049, Transceiver, Model 4000, Serial Number 1049, Digitizer, Model 6000, Serial Number 1049	115 123-130
MI-6	Ross Echo Sounder Recorder, Model 5000, Serial Number 201745, Transceiver, Model 4000, Serial Number 201746, Digitizer, Model 6000, Serial Number 201747	143

Frequent checks were made on the operational characteristics of the Raytheon Survey Fathometer. At the end of a line or whenever possible, the following checks were made: A-F Scale Comparison (with fine arc checks); Speed Count; MRV evaluation; and the initial setting check. The checks were marked and indicated on the graphic record and recorded in the sounding volumes where appropriate. The initial and daily calibration checks were the only checks made when using the Ross equipment.

A ten foot calibrated aluminum pipe (1½" diameter - painted alternating one foot black and white sections) was used as a sounding pole to determine shallow water measurements along shoals and for all skiff soundings.

Hand leadlines, with snapper attachments, were used to obtain bottom samples and determine the sample depth. The leadlines were check measured and the results entered in the volumes.

Velocity and instrument error corrections were determined by bar check. Reference is invited to "Report on Corrections to Echo Soundings" for 1972 Field Season.

The initial was set at 0.0 feet for all echo sounders. The draft and settlement and squat corrections were included in the corrector tapes for the launches used.

Settlement and squat correctors were obtained from data gathered on February 9, 1972. Interpolation was used to obtain values for speeds other than those indicated in the "Abstract of Settlement and Squat". A copy of the abstract is included in this report.

The draft of the transducers was added to the soundings plotted on-line for MI-5 (2.0'), MI-6 (2.6') and added to the Master Tape format for MI-3 (1.8').

The graphic records were scanned by trained personnel, spot checks for errors were made by the Officer-in-Charge of the particular launch used for the day's work, and the Officer-in-Charge of the sheet. These spot checks insured that the data were correctly interpreted in accordance with Paragraphs 1-34, 5-121, and 5-122 of the Hydrographic Manual (20-2).

E. Smooth Sheet

No smooth sheet was plotted by NOAA Ship MT MITCHELL; smooth sheets will be produced at the Atlantic Marine Center. The boatsheet was plotted from paper punched tapes using the COMPLOT roll plotter on board the ship. Sounding tapes for Launch MI-3 and Skiff MI-7 were made, using the Hydrographic Logger and manually entering the data, from the respective sounding volumes. Visual work accomplished by Launch MI-5 was also plotted in this manner. Otherwise, Launches MI-5 and MI-6 used an on-line computer system which created data tapes as the survey progressed. Later, corrector tapes for soundings and position control were created after visual work was smooth plotted (by hand) and the graphic record scanned. A list of generated tapes is as follows:

ASCII Signal Tape
Position and Sounding Master Tape
Position and Sounding Corrector Tape
Velocity Tape
TC/TI Tape

F. Control

The methods of horizontal control included visual and electronic. All areas not surveyed by Launches MI-5 and MI-6 (in the electronic mode) depended strictly upon visual control. MI-3 and MI-7 used this method exclusively and MI-5 used visual control on a few occasions. The large majority of the sheet was surveyed using electronic control utilizing Hi-Fix, operating at a frequency of 1618.650 KHz in the hyperbolic mode. The Hi-Fix shore station locations were:

ISABEL 1972 (Master Station)

Latitude 17°57'25.578"N.
Longitude 66°24'39.803"W.

HOMER 1972 (Slave 1 Station)

Latitude 17°57'53.152"N.
Longitude 66°36'58.297"W.

MAREAS 1972 (Slave 2 Station)

Latitude 17°55'55.632"N.
Longitude 66°09'29.483"W.

These positions are all recoverable third-order traverse stations. The Hi-Fix was calibrated twice daily and whenever possible during the working day. The calibration procedure involved the establishment of a three-point fix (visual) with a check angle which was compared with Hi-Fix receiver values recorded simultaneously. The calibration was then computed and the procedure duplicated as a check. Calibrations were taken at the working grounds. An abstract of Hi-Fix correctors is included in this report.

Signal positions (latitude & longitude) were provided, for the most part, by the photogrammetrists (Photo Party 62). However, visual control for this sheet also included photopoint signals and hydrographic signals which were established by ship's personnel. A complete list of signals and positions is included in this report.

G. Shoreline

The approximate shoreline was transferred to the boatsheet in

blue-line from T-Sheet 13372 which was based on photography flown in March 1970. The limited range of the diurnal tide made walking the shoreline at Mean Low Water impractical and this procedure was not followed. The shoreline was walked when convenient and three-point fixes with check angles were taken in order to establish position. Depths were recorded as necessary.

The shoreline differed from the preliminary photo manuscript in the vicinity of Punta Cayito. Shoreline here is subject to seasonal change by river flood erosion. The latest compilation of shoreline from the hydrographer's position and depth data appears upon the boatsheet and photo field edit in dashed red (magenta) line.

Shoal areas that appeared as awash were walked at approximately Mean Low Water in order to develop the zero depth curve. The insignificant range of tide in this area was again a factor affecting this procedure.

H. Crosslines

10% of the total linear miles sounded were crosslines. The crossline agreement is excellent. The majority of east-west crossline soundings agree with the north-south lines exactly, the greatest difference being one foot between crossline and sounding line.

I. Junctions

Junction with prior survey H-9190 (MI-10-2-71, 1971) on the western edge of the area under discussion shows the prior survey soundings to range from zero to one foot deeper than the present survey. The average difference between the two surveys is one foot. This difference can be partially accounted for by the strong wind-driven east-west current in this location which causes continual shifting of the soft, silty bottom.

J. Comparisons with Prior Surveys

The charted 22 foot sounding, pre-survey review item, located at Latitude 17°56'04"N. Longitude 66°23'55"W., should be deleted from the chart and replaced with a sounding of 18' (velocity correction applied). This 18' sounding appears to

be a peak based on the values of adjacent soundings (Positions 0906-0907). See Verifier's Report 7a(21)

The charted 23 foot sounding, pre-survey review item, located at Latitude 17°55'44"N. Longitude 66°24'27"W., may remain as charted. Sounding lines recorded in the vicinity of this item could resolve soundings of between 27 and 28 feet. (Positions 0912-0913, 5146-5147, 5159-5160). Because the pre-survey review sounding, or one with less depth, was not found, further development in this area is recommended. ~~concur~~ See Verifier's Report 7a(22)

The charted 14 foot sounding, ~~pre-survey review item,~~ located at Latitude 17°55'27"N. Longitude 66°24'32"W., ~~may remain as charted.~~ A sounding of 14 feet (velocity correction applied) was found was recorded in ~~the same location~~. (Positions 0916-0917) lat 17°55.46' long 66°24.51' Recommend survey depths be charted. concur

The charted 17 foot sounding, pre-survey review item, located at Latitude 17°55'17"N. Longitude 66°24'39"W., may remain as charted. A sounding of 19 feet was recorded slightly to the southeast of the present position but no sounding of 17 feet least depth was found. (Positions 0924-0925) concur
17-foot sounding from H-4699 (1927) brought forward to supplement present survey.

K. Comparison with Chart

Comparison with C&GS Chart 926 (3rd Edition, November 11, 1968) is good with the following exceptions:

(a) The large shoal area (center approximately at Latitude 17°55'30"N. Longitude 66°24'30"W.) ~~has developed considerably and now covers an area at least one third larger than that which is shown on the chart.~~ is shown on the present survey
Present survey depths to 14 ft. obtained.

(b) The mangrove islands which appear on the eastern extremity of the present survey area have changed shape to the extent that a large grove has separated from the main linear development and a channel (Latitude 17°57'03"N. Longitude 66°24'03"W.) now exists between these two groves. The depth of this channel is 1 foot. concur

(c) The swift onshore current has created a gradual shoreward shifting of the 6' and 12' curves and scoured the shoreline to a considerable extent. The 6' curve now lies approximately two times closer to the shoreline than charted. In fact, the present 6' curve appears to coincide with the actual shoreline on the present
The shifting of these ~~curves~~ curves on the fields boatsheet can be attributed to the incorrect TRA corrector applied.

1:10,000 sheet indicating a much sharper shoal-to-deep gradient than the charted curves describe.

L. Adequacy of Survey

This survey is not complete, comprising only the westernmost one third of the assigned boatsheet, and is adequate only for the area covered, not the entire Boatsheet MI-10-3-72, Registry Number H-9267. See 1975 descriptive report.

M. Aids to Navigation

No aids to navigation were located on this survey.

N. Statistics

	Launches				
	MI-6	MI-5	MI-3	Skiff	Total
Linear N.M., Sounding Line	3.9	55.0	50.5	0.0	109.4
Square N.M., Area Surveyed	0.5	2.3	1.5	0.5	4.8
Positions Plotted	30	336	335	198	899
Positions Rejected	0	13	0	36	49
Positions Duplicated	0	2	0	0	2
Position Numbers Omitted	0	1	0	1	2
Detached Positions	0	9	9	198	216
Bottom Samples	0	9	9	0	18

O. Miscellaneous

The discovery was made during this partial survey that one half-one quarter mile spacing of signals was not adequate for the convoluted coastline which exists on this sheet. The character of mangrove is such that unless a signal is 30' high, the hydrographer loses sight of his positioning aid when only a few meters away. The photo signals and hydro signals, which were discussed under Section "F", were necessary because existing signals could not provide a strong enough geometery for an adequate fix. Operational difficulties also pointed out that signals around mangrove or coral islands should be as far off shore as possible. In other words, the wider the field of view to a particular signal, the more useful that signal becomes. In one instance, a 30' tripod located on an offshore mangrove island (Signal 800 on accompanying list) was used extensively due to a high visibility factor.

P. Recommendations

An experienced hydrographer should always accompany the photogrammetrists when they are in the process of establishing initial signal locations. This officer could decide the particular signal density for an area based upon his observations in situ. Such a procedure would eliminate the necessity of creating photo or hydro signals later in the season.

Q. Reference to Reports

Attention is directed to the following OPR-423-MI-72 field season reports:

Calibration of Hi-Fix Report
Corrections to Echo Soundings Report

Respectfully Submitted:

Carl R. Berman
LT, NOAA

Approved and Forwarded:

Edwin K. McCaffrey
CAPT, NOAA
Commanding Officer

Puerto Rico (South Coast) 1972

Signal Number	N- Latitude Deg-Min-Sec	W- Longitude Deg-Min-Sec	Located by (Method)	Temporary or Recoverable	Traverse control number or other name, year located
100	18-00-22.74	066-36-52.28	Intersection	Recov.	Microwave Antenna, Ponce, 1972
105	18-01-25.44	066-37-15.87	Intersection	Recov.	WRIK TV Tower, Ponce Intercont. Hotel
110	17-59-57.43	066-36-54.70	Intersection	Recov.	Ponce Mills Water Tank
115	18-02-27.24	066-34-38.16	Intersection	Recov.	EL Monte Tank
120	17-57-50.48	066-34-44.69	Traverse	Temp.	Wirshing Eccentric, 1971
125	18-01-14.16	066-33-53.18	Intersection	Recov.	Don Q South Stack
130	17-59-53.13	066-32-25.26	Intersection	Recov.	Central Fortuna Stack, 1972
140	18-00-32.88	066-30-17.74	Intersection	Recov.	Fort Allen Water Tank, 1966
150	17-59-34.99	066-28-31.77	Intersection	Recov.	WCGB Radio Tower, 1972
160	17-59-50.12	066-26-01.35	Intersection	Recov.	Cortada Sugar Company Stack
170	17-58-23.22	066-24-16.32	Intersection	Recov.	Santa Isabelle E. Municipal Water Tank
175	17-58-38.85	066-18-14.01	Intersection	Recov.	Salinas Radio Tower, WHOY, 1972
177	17-58-50.63	066-17-45.57	Intersection	Recov.	Salinas Water Tank, 1972
180	17-56-08.75	066-16-59.68	Intersection	Recov.	Bahia De Jobos Light, 45 feet
190	17-57-18.14	066-13-21.22	Intersection	Recov.	Central Aguire Stack, Tallest of two
195	17-59-47.81	066-18-21.89	Intersection	Recov.	Salinas Silo, 1972
200	17-53-42.52	066-31-17.60	Intersection	Recov.	Muertos Island Lighthouse, 1899
500	17-56-04.90	066-27-33.10	3 Point Fix	Recov.	Kay, 1970, Berberia Island
504	17-56-06.46	066-27-25.61	Traverse	Temp.	CK-04, "
508	17-56-04.24	066-27-23.56	Traverse	Temp.	CK-04-A, "
512	17-55-58.19	066-27-17.66	Traverse	Temp.	CK-03, "
516	17-55-55.89	066-27-18.30	Traverse	Temp.	CK-03-A, "
520	17-55-47.84	066-27-15.41	Traverse	Temp.	CK-02, "
524	17-55-41.58	066-27-16.27	Traverse	Temp.	CK-01-A, "
528	17-55-39.15	066-27-13.18	Traverse	Temp.	CK-01, "
532	17-55-32.69	066-27-12.38	3 Point Fix	Recov.	Claire, 1970 "
534	17-55-28.82	066-27-17.95	Sextant	Temp.	C-01-D, "
536	17-55-23.97	066-27-24.97	Traverse	Temp.	C-01, "

Signal Number	N- Latitude Deg-Min-Sec	W- Longitude Deg-Min-Sec	Located By (Method)	Temporary or Recoverable	Traverse control number or Other name, Island name
540	17-55-35.27	066-27-21.82	Traverse	Temp.	C-01-B, Berberia Island
544	17-55-32.25	066-27-24.19	Traverse	Temp.	C-01-A, "
548	17-55-37.43	066-27-25.77	Traverse	Temp.	K-01-D, "
552	17-55-43.06	066-27-24.96	Traverse	Temp.	K-01-C, "
556	17-55-49.11	066-27-28.76	Traverse	Temp.	K-01-B, "
560	17-55-53.82	066-27-35.44	Traverse	Temp.	K-01, "
564	17-55-57.87	066-27-31.96	Traverse	Temp.	K-01-A, "
600	17-57-53.00	066-25-53.90	Traverse	Temp.	Cayito 2, 1972
604	17-57-39.55	066-25-43.41	Traverse	Temp.	CJ-01, Mainland
606	17-57-41.72	066-25-34.34	Traverse	Temp.	CJ-01-A, "
608	17-57-41.87	066-25-22.41	Traverse	Temp.	CJ-02, "
610	17-57-40.71	066-25-05.58	Traverse	Temp.	CJ-01-B, "
612	17-57-36.92	066-24-53.13	Traverse	Temp.	CJ-03, "
613	17-57-32.50	066-24-44.10	Photo Point	Temp.	PP-5, "
615	17-57-24.74	066-24-41.12	Photo Point	Temp.	PP-4, "
616	17-57-21.37	066-24-37.08	Traverse	Temp.	CJ-04, "
617	17-57-21.43	066-24-26.22	Photo Point	Temp.	PP-3, "
620	17-57-16.32	066-24-18.02	Traverse	Temp.	CJ-05, "
622	17-57-14.42	066-24-04.04	Traverse	Temp.	CJ-06-A, "
624	17-57-09.01	066-24-12.52	Traverse	Temp.	CJ-06, "
626	17-57-03.15	066-24-01.96	Traverse	Temp.	CJ-06-B, "
627	17-57-09.50	066-23-58.25	Photo Point	Temp.	PP-2, "
628	17-57-07.21	066-23-54.54	Traverse	Temp.	CJ-07, "
629	17-57-02.84	066-23-52.86	Photo Point	Temp.	PP-1, "
631	17-56-59.85	066-24-05.83	Sextant	Temp.	HP-1, "
632	17-56-30.29	066-23-27.86	Traverse	Temp.	CJ-08, "
633	17-56-52.53	066-23-52.51	Sextant	Temp.	HP-2, "
635	17-56-45.95	066-23-45.69	Sextant	Temp.	HP-3, "
636	17-56-38.98	066-23-33.94	Traverse	Temp.	CJ-09, "
640	17-56-54.55	066-23-34.39	Traverse	Temp.	CJ-10, "
644	17-56-22.51	066-23-15.11	Traverse	Temp.	CJ-11, "
648	17-56-38.50	066-22-50.95	Traverse	Temp.	CJ-12, "

Signal Number	N- Latitude Deg-Min-Sec	W- Longitude Deg-Min-Sec	Located by (Method)	Temporary or Recoverable	Traverse control number or Other name
652	17-56-49.27	066-22-41.68	Traverse	Temp.	CJ-13, Mainland
653	17-57-13.00	066-22-31.77	Photo Point	Temp.	PP-6, "
655	17-57-25.41	066-22-20.97	Photo Point	Temp.	PP-7, "
656	17-57-10.99	066-22-12.96	Traverse	Temp.	CJ-14, "
660	17-57-17.93	066-22-02.69	Traverse	Temp.	CJ-15, "
664	17-57-48.41	066-22-06.45	Traverse	Temp.	CJ-16, "
668	17-57-30.80	066-21-46.57	Traverse	Temp.	CJ-17, "
672	17-57-50.43	066-21-37.61	Traverse	Temp.	CJ-18, "
676	17-58-13.78	066-21-45.51	Traverse	Temp.	CJ-19, "
680	17-58-01.68	066-21-30.06	Traverse	Temp.	CJ-20, "
684	17-58-04.65	066-21-17.53	Traverse	Temp.	CJ-22, "
688	17-58-24.67	066-20-48.04	Traverse	Temp.	CJ-23, "
692	17-58-40.17	066-20-28.00	Triangulation	Recov.	Bocamar, 1966
696	17-58-45.14	066-20-03.93	Traverse	Temp.	CJ-24, Mainland
700	17-58-48.34	066-19-39.13	Traverse	Temp.	CJ-25, "
704	17-58-42.28	066-19-01.26	Traverse	Temp.	CJ-26,
708	17-58-23.90	066-18-56.51	Traverse	Temp.	CJ-27, "
712	17-58-05.76	066-18-30.62	Traverse	Temp.	CJ-28, "
716	17-57-53.08	066-18-07.15	Traverse	Temp.	CJ-29, "
720	17-57-41.46	066-17-54.15	Traverse	Temp.	CJ-30, "
800	17-55-25.73	066-23-09.25	Triangulation	Recov.	Jauca 3, 1966
804	17-58-04.92	066-20-27.06	Traverse	Temp.	CJ-21, Small island off the coast
808	17-55-36.07	066-22-50.67	Traverse	Temp.	J-01, "
812	17-55-51.99	066-22-10.34	Traverse	Temp.	J-02, "
816	17-55-55.50	066-21-52.21	Traverse	Temp	J-03, "
820	17-55-53.84	066-21-09.52	Traverse	Temp.	J-04, "
824	17-55-45.98	066-19-22.99	Traverse	Temp.	J-05, "
999	17-57-25.58	066-24-39.80	Traverse	Temp.	Santa Isabel Hi-Fix, 1972

VELOCITY TABLE 03

CORRECTION	TO DEPTH	CORRECTION	TO DEPTH
- 1.0	2.5	2.4	58.9
.8	5.5	22.6	62.5
.6	8.6	2.8	66.3
.4	11.5	3.0	72.9
.2	14.5	3.5	82.5
0.0	17.4	4.0	91.8
+ .2	20.3	4.5	100.8
.4	23.2	5.0	110.4
.6	26.2	5.5	117.9
.8	29.1	6.0	129.0
1.0	32.1	6.5	138.6
1.2	36.1	7.0	148.0
1.4	40.0	7.5	157.3
1.6	44.0	8.0	166.6
1.8	47.8	8.5	176.0
2.0	51.3	9.0	185.4
2.2	55.1	9.5	194.6

VELOCITY TABLE 04

CORRECTION	TO DEPTH	CORRECTION	TO DEPTH
- .6	3.3	3.0	66.8
.4	6.5	3.2	70.6
.2	9.9	3.4	74.3
0.0	13.0	3.6	78.1
+ .2	16.3	3.8	82.0
.4	19.8	4.0	88.6
.6	22.5	4.5	98.0
.8	25.9	5.0	107.6
1.0	29.5	5.5	117.2
1.2	32.8	6.0	126.7
1.4	36.1	6.5	136.0
1.6	41.2	7.0	145.6
1.8	44.0	7.5	155.0
2.0	47.9	8.0	164.5
2.2	51.8	8.5	173.8
2.4	55.5	9.0	183.5
2.6	59.3	9.5	192.7
2.8	63.0		

VELOCITY TABLE 05

CORRECTION	TO DEPTH	CORRECTION	TO DEPTH
- .6	2.1	3.2	60.8
.4	4.8	3.4	64.6
.2	7.3	3.6	68.3
0.0	10.0	3.8	72.0
+ .2	12.7	4.0	78.6
.4	15.4	4.5	87.6
.6	18.0	5.0	97.2
.8	20.5	5.5	106.4
1.0	23.3	6.0	115.5
1.2	26.0	6.5	125.0
1.4	28.8	7.0	134.0
1.6	31.0	7.5	143.5
1.8	35.0	8.0	152.5
2.0	38.2	8.5	161.6
2.2	42.1	9.0	171.1
2.4	46.0	9.5	180.6
2.6	49.8	10.0	190.0
2.8	53.3	10.5	199.0
3.0	57.0		

Settlement and Squat Abstract

Launch MI-3 February 14, 1972 Transducer Depth=1.8 feet

1. Two engines in operation

RPMs	Pass#1	Pass#2	Pass#3	Pass#4	Mean Diff.	Correction
DIW*	8.10	8.10	8.15	----	0.00	0.00
Slow	8.15	8.10	8.15	----	+0.05	0.00
Half	8.05	8.15	8.15	----	0.00	0.00
Hydro(3/4)	8.00	7.95	8.00	8.00	-0.10	-0.10
Full	8.00	7.95	7.95	7.95	-0.15	-0.20

2. One engine (port)

Half	8.15	8.15	----	----	+0.05	0.00

Test stopped due to engine overheating - used same values obtained from starboard engine test.

3. One engine (starboard) **Full or Hydro Speed

Half	8.15	8.15	8.15	----	+0.05	0.00
Full**	8.15	8.10	8.10	----	0.00	0.00

Launch MI-5 February 14, 1972 Transducer Draft=2.0 feet

DIW*	6.05	6.00	6.05	----	0.00	0.00
1000	6.15	6.15	6.10	----	+0.05	0.00
1500	6.30	6.27	6.30	----	+0.25	+0.20
2000	6.65	6.65	6.60	----	+0.60	+0.60

Launch MI-6 February 9, 1972 Transducer Depth=2.6 feet

Both engines running

DIW*	7.30	7.30	7.30	----	0.00	0.00
1000	7.45	7.50	7.40	----	+0.15	+0.10
1500	7.60	7.75	7.60	----	+0.35	+0.30
1800	7.80	7.80	7.80	----	+0.50	+0.50
2000	7.85	7.80	7.80	----	+0.50	+0.50
2500	7.45	7.40	7.40	----	+0.10	+0.10
Full**	7.15	7.15	7.00	----	-0.10	-0.10

* DIW - Dead in the Water ** 3000 (Port), 2600 (Starboard)

Approval Sheet

Field Number MI-10-3-72

Registry Number H-9267

(Incomplete)

The field work and processing of data from this incomplete hydrographic survey was under my immediate daily supervision. The boatsheet and all records have been reviewed and are approved by me.

The completed section of this boatsheet requires further development in some areas.

Edwin K. McCaffrey
CAPT, NOAA
Commanding Officer

9/26/75

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): Santa Isabel

Period: April 17 - May 15, 1972

HYDROGRAPHIC SHEET: H-9267

OPR: 423

Locality: Off the southern coast of Puerto Rico

Plane of reference (mean ~~lower~~ low water): 3.07 ft.

Height of Mean High Water above Plane of Reference: 0.8 ft.

Remarks: Zone direct.

James R Hubbard
for Chief, Tides Branch

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

(HYDROGRAPHIC)

Type of Survey HYDROGRAPHIC

Field No. MI-10-3-72

Office No. H-9267

LOCALITY

State Puerto Rico

General Locality ~~Bahia de Rincon~~

Locality ~~Playa Santa Isabel to Playa Salinas~~

1975

CHIEF OF PARTY
Ronald M. Buffington, Commander, NOAA

LIBRARY & ARCHIVES

DATE

☆U.S. GOVERNMENT PRINTING OFFICE: 1974-763-098

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

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET

REGISTER NO.

H-9267

FIELD NO.

MI-10-3-72

INSTRUCTIONS - The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

State: Puerto Rico

General locality: ~~Bahia de Rincon~~ South Coast

Locality: ~~Playa Santa Isabel to Playa Salinas~~

Scale: 1:10,000 Date of survey: Jan 24,-Feb.26, 1975

Instructions dated: November 1, 1974 Project No.: OPR-423-MI-75

Vessel: NOAA Ship MT. MITCHELL MSS-22

Chief of party: Ronald M. Buffington, Commander, NOAA, Commanding Officer

Surveyed by: See remarks

Soundings taken by echo sounder, hand lead, pole:

Graphic record scaled by: Ship's personnel

Graphic record checked by:

Protracted by: Automated plot by: Ca/comp - 6/8

Soundings penciled by: Verified by R. Hill

Soundings in fathoms feet at MLW MLLW:

REMARKS:

Cdr. Richard J. DeRycke	Lcdr. Martin R. Mulhern
LT(jg) David Pasciuti	LT(jg) Thomas G. Russell
Ens. Karen L. O'Donnell	Ens. Evelyn J. Fields
Ens. Richard E. Marriner II	Ens. Stanley R. Iwamoto
Ens. John O'Reilly	Ens. Bruce C. Woodry

Note: This survey is the continuation of work by the NOAA Ship MT. MITCHELL in 1972, and completes field work on H-9267.

USCOMM-DC 19086-P65

DESCRIPTIVE REPORT

to accompany

HYDROGRAPHIC SURVEY H-9267

OPR-423-M1-72, OPR-423-M1-75

SOUTH COAST OF PUERTO RICO

Scale 1:10,000

NOAA SHIP MT. MITCHELL (MSS-22)

Ronald M. Buffington, Cdr. NOAA
Commanding Officer

CONTENTS

Attachments:

✓= Misc. items removed and filed with the field records.

A. PROJECT

This survey is the completion of survey H-9267 (MI-10-3-72), south coast of Puerto Rico, and was conducted in accordance with project instructions dated November 1,1974, change 2 dated November 22, 1974 and change 3 dated January 2, 1975.

B. AREA SURVEYED

This survey was conducted from approximately one quarter mile east of Playa Santa Isabel at Longitude 66°23'27"W to Longitude 66°17'07"W. The Northern limit is the south coast of Puerto Rico and the southern limit is Latitude 17°54.4'N. This year's survey junctions with the incomplete portion of this survey (H-9267,MI-10-3-72) on the west and H-9266 (MI-20-2-72) on the south. Work began on January 24, 1975 and was completed February 26,1975. Additional development work was completed in the area surveyed in 1972.

C. SOUNDING VESSELS

The following launches were used to obtain soundings on this survey:

NOAA #	Vessel #	Position Nos. used
1207 (Pacific Plastic Launch)	2227	1001 - 1920
1204 " " "	2224	8001 - 8051
1002 (Jensen)	2222	3001 - 4391
1261 (Uniflite)	2221	6001 - 6026
Skiff 2228 (17' MonArk)	2228	9001 - 9508

Launches 2227 and 2222 were automated and used for echo sounding, launches 2224 and 2221 were used to collect bottom samples and the skiff 2228 was used for shoreline and around shoals. Final processing of all work was completed aboard the ship MT.MITCHELL.

D. SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO SOUNDINGS

The MT. MITCHELL launches 2227, 2222 and skiff 2228 acquired soundings on this survey in 1975. Launches 2224 and 2221 collected bottom samples and depths recorded by these launches were used for bottom sample records only. Launch 2227 worked generall inshore in depths of from 2 to 40 feet with one day's work on the pffshore part of the survey in a depth of 65 ft. Launch 2222 worked generally offshore in depths of from 35 to 70 feet with approximately four days of inshore work in depths up to 5 feet. The skiff 2228 worked around shoals and along the shoreline. Launch 2227 and 2222 used a complete hydroplot system with a Raytheon DE723D fathometer in launch 2227 and a Ross model 5000 in launch 2222. The skiff 2228 used a Raytheon DE719B fathometer. The launch 2224 used a Raytheon DE723B fathometer and launch 2221 used a Raytheon 723D fathometer. The Serial Nol for all equipment will be found in the appendix.

On both launches and the skiff, the initial trace was checked and reset to zero when necessary. Variations in the initial were taken into account when the fathograms were scanned. The A-F scale check, stylus arm length check (fine arc) and speed count check were all performed at least several times a day on the DE723 models of fathometer and phase calibrations were taken at least several times a day on the Ross modell 5000 fathometer.

The DE719B fathometer had two other adjustments that were checked, the adjustment for entering the tide and draft into the fathogram trace and the adjustment for calibration of velocity by varying the motor speed of the stylus belt. The tide and draft adjustment were kept at zero at all times and the adjustment for varying the motor speed of the stylus belt was kept for a speed of sound of 800 fathoms per second.

The fathograms were scanned by survey department personnel and officers in charge of the survey. Significant peaks and deeps which had occurred between soundings and erroneous soundings were corrected and/or inserted on the correction tape.

Predicted tide corrections were based on data forwarded by the National Ocean Survey Oceanographic Division for Santa Isabel, Puerto Rico. Smooth tides will be used as per instructions in the letter requesting smooth tides.

Reference should be made to the field tide note in the appendix. Bar checks were made at least onee daily on each launch if sea conditions permitted. The results of the bar checks for launches 2227 and 2222 were meaned separately. Any observation at a specific depth that was more than $\pm$ 0.4 feet from the mean was rejected in accord with the hydrographic manual. Velues within the acceptable range were meaned to give a value that was used in determining velocity correctors.

Velocity correctors for the DE719B fathometer were determined from bar checks taken during this survey and from other surveys which were conducted during the same approximate times. This was necessitated by the fact that the skiff could obtain only few bar checks due to the few number of days on which actual sounding lines were run. To obtain a better representation of the water column, the bar checks from this survey were meaned with the bar checks from other surveys in the operating area to yield a more accurate set of velocity correctors. All of the bar checks chosen were in adjacent areas and differences in the water column characteristics should be negligible. No bar checks were taken for launches 2224 and 2221. Velocity corrections were not applied to any of the soundings on bottom samples. Leadline comparisons accompanied three of the bar checks for launch 2222 and accompanied each bar check for launch 2227. Two sets of leadline comparisons were obtained for the skiff on Julian Day 086, March 27,1975. The leadline markings were checked with a steel tape and no significant difference was found.

Using the final TRA and velocity correctors and applying them to the fathometer reading at the time the leadline was taken, it was found that the average difference between the leadlinesreadings and the fathometer plus corrections was 1.0 feet for launch 2222, -0.3 feet for launch 2227, and +0.1 feet for the skiff 2228. Since instrument error is included in the bar check values, these minor differences were attributed to random errors in the leadline readings. The large difference found between the leadline and the fathometer plus corrections on launch 2222 was found on other work done this season by this launch. This was due to incorrect readings on the leadline.

Transducer correction is the sum of the corrections for draft, instrument error and settlement and squat. The draft for launches 2227, 2222, and skiff 2228 was determined from the velocity curve determined from the bar checks. For launch 2227 the draft was determined to be 1.8 feet, for launch 2222 and the skiff it was determined to be 1.0 feet. Measurement of the actual draft with tapes while the boats were out of the water confirmed these values. The draft was applied on the corrector tape. The velocity tape includes corrections and instrument error. Settlement and squat corrections were applied on the TC/TI tape.

Settlement and squat information for each vessel is included in the appendix to this report. Because the skiff 2228 was not fitted with a tachometer, the exact speed of the skiff was not known and it was not practical to measure settlement and squat. However, the skiff was run at a sufficiently slow speed during all soundings so as to cause the settlement and squat corrections to be considered negligible for this work. Settlement and squat corrections will be applied from the TC/TI tape.

The velocity table numbers and the vessel for which each table corresponds is as follows:

VELOCITY TABLE NO.	VESSEL NO.
01	2227
02	2222
~~03~~ 06	2228
~~04~~ 07	2221
~~05~~ 08	2224

Velocity tables 04-05 are for data pertaining to bottom samples. There are no velocity corrections to be applied to this data.

E. HYDROGRAPHIC SHEETS

The field boat sheets were prepared aboard the NOAA Ship MT. MITCHELL with the program RK201 Grid and HR Lattice Plot. The smooth sheet will be prepared by the Atlantic Marine Center, Norfolk, Virginia. All field records and the following tapes have been forwarded to the Atlantic Marine Center:

1. Range-Range master tapes	(Launch 2227 and 2222)
2. Range-Range corrector tapes	(Launch 2227 and 2222)
3. Range-azimuth master tapes	(skiff 2228)
4. Range-azimuth corrector tapes	(skiff 2228)
5. Visual master tapes	(Launch 2221 and 2224)
6. Visual corrector tapes	(launch 2221 and 2224)
7. Velocity table tape	
8. TC/TI tape	
9. ASCII Signal tape	
10. Computer projection parameter tapes	

Data from launch 2227 and 2222 were recorded by the on line real time hydroplot range-range program. Data from launches 2221, 2224 and skiff2228 was manually logged and reformatted into master tape format by using program RK337 or RK337X. The original information from launches 2221, 2224 and skiff 2228 is recorded in sounding volumes which are forwarded along with listings of the automated reformatted data. The sounding data input for launches 2227 and 2222 was collected by the hydroplot system which produced paper tape and a printout of all data. All work done by the skiff 2228 was recorded in a sounding volume and logged on paper tape aboard the ship MT.MITCHELL.

Soundings on the field sheets have been corrected for predicted tide, draft and velocity corrections.

F. CONTROL STATIONS

All stations are at least third order accuracy, located by three point fix with a check, published triangulation, or photo points. These stations were located by ship's personnel and Photo Party 62, an Atlantic Marine Center field party. Reference to horizontal control report for OPR-423-MI-75.

G. HYDROGRAPHIC POSITION CONTROL

Control for this survey included visual, (a range-range system operating at a frequency of 9400 MHz), and range-azimuth.

A T-2 theodolite, to measure the azimuth and a Del Norte unit to measure the distance were used for the range-azimuth control. TheDel Norte unit used one remote, a master and a DMU (distance measuring unit). The master unit, DMU and theodolite were set up at a station, and the remote unit was used on the skiff. These soundings were later assigned azimuths and ranges for incorporation into the master data tapes and for plotting by the hydroplot system. These position numbers and the julian days were:

Julian Day	Position Nos.
53	9251-9266, 9273-9286
58	9516-9520

Landmarks identified on the aerial photographs for the survey area were occupied for certain portions of the range-azimuth hydrography. The geographic positions for these points were scaled from their locations on the topographic sheets covering the particular area. The photo-point used on this survey was at Playa Salinas at the Aquarium Restaurant pier. The point on the pier is 3'5" from the end of the pier and 1'7" from the east edge of the pier. The T-sheet that this point is located on is T-13372, and the aerial photograph number is 70-E-(C)6173.

The daily calibration for the Del Norte units used with the range-azimuth work was accomplished by using a known distance upon which the Del Norte units were set up. These distances had been previously established using a geodimeter. The visual calibration area was located in the work area for that day's work and calibrations were taken generally twice daily during this survey.

The DelNorte unitswere also calibrated twice a month by measuring a distance with the geodimeter, then setting up the DelNorte units and comparing the range of the DelNorte with the geodimeter range. The DelNorte readings were generally within $\pm$ .3 meters of the geodimeter distance.

The DelNorte equipment used and corresponding numbers (serial) for launches 2222 and 2227 are as follows:

	Vessel 2222	Vessel 2227
DMU	182,189	180
Parallel buffer	183,123	122
T/R unit	281,250	250
Remote	251,248,249,252	216,262,252

See list of "DelNorte remotes used Daily" for a list of the remote units and station numbers in use each day. Certain areas of the survey did not warrant the time and cost to establish control stations of the normal accuracy because of inaccessibility. These areas were surveyed using the characteristics on the photo-shoreline as control for the position of the skiff 2228, as well as information based on time and course.

Range-range control was used for regular sounding lines, developments and two bottom samples. Visual control was used for all other bottom samples and range-azimuth was used for developing shoreline and shoals.

The electronic control stations were as follows:

Juaca 3, 1966	17°55'25".727N	66°23'09".287W
Bocamar, RM2,1966	17°58'40".405	66°20'28".116
UNO,1975	17°57'38".793	66°25'40".904
Alpha,1975	17°55'45".965	66°19'23".152
Beta,1975	17°55'42".237	66°21'17".413
Dos,1975	17°55'51".967	66°22'10".270
Kam,1975	17°55'59".270	66°27'19".790
Jim,1975	17°57'52".161	66°18'05".895
Cabe,1975	17°55'17".046	66°23'14".326

The daily calibration of the DelNorte electronic control system was accomplished by using three-point sextant fixes with a check angle. Correctors and inverse distances were computed using the hydroplot calibration program RK561, Hyperbolic and Range-Range Geodetic Calibration. A listing of the abstract of correctors is attached to this report.

Correctors used were taken from the mean of those computations with inverse distances between fix and check fix positions with less than five meters. In most cases, any error found on the units was corrected on the DMU. Where the error was not corrected (julian days52,53), it was incorporated into the corrector tapes for the soundings affected.

The DelNorte equipment used and corresponding serial numbers for skiff 2228 are as follows:

	Skiff 2228
DMU	182
T/R unit	281
Remote	249,262

See "Abstract for Skiff 2228" for a list of DelNorte units, serial numbers, stations, pseudo fixes and photo points used each day.

H. SHORELINE

Depths close to the shoreline were established by using range-azimuth control with the skiff 2228 or were developed by running sounding lines along the shore. Shoreline was taken from T-13370, T-13371 and T-13372. Field edit on T-13372 was done during 1972 field work and has been applied to the T-sheet (T-13372). T-13370 and T-13371 was completed during the 1975 field work. The field edit was done by Photo Party 62, an Atlantic Marine Center field party, and the hydrographer did field edit on the offshore islands. Notes pertaining to field edit were put on the field edit sheet and on the boat sheet where necessary. The offshore islands referred to are Cayo de Caracoles, Arrecife Alfenique, and Arrecife Media Luna.

I. CROSSLINES

16% of the total linear miles sounded were crosslines. The crossline agreement was good, with the greatest difference being one foot between the east/west crosslines and the regular sounding lines.

J. JUNCTIONS

This survey junctioned on the western edge with the incomplete portion of this survey done during the 1972 field season, (H-9267). The junction with the 1972 work on this survey was good. Tides and velocity corrections were applied to this year's work and were not applied to the 1972 field work on the field sheets.

This survey also junctioned with H-9266 (MI-20-1-72) to the south, and the junction was found to be good. Tides and velocity corrections were also not applied to H-9266. Also on the south with H-9486 (MI-20-1-75) the

junctions were generally good with one to two foot discrepancies in a few cases.

On the east this survey junctions with H-9485 (MI-10-1-75) and the junctions were generally good with one foot differences in a few places.

K. COMPARISON WITH PRIOR SURVEYS

The least depths found for most of the pre-survey review items were generally in agreement with the soundings in the area of the pre-survey item. These depths agreed within a foot of the soundings in the area surrounding the pre-survey item. The pre-survey review items that were not in good agreement with the soundings in the same area are listed below with recommendations.

1. Un-numbered pre-survey item - ~~39~~ 30 foot charted Lat.17°55'20"N, Long.66°22'05"W boatsheet shows least depth of ~~44~~ 39 feet in immediate vicinity. It is recommended that the ~~44~~ 39 foot sounding be used for charting purppses. Concur
Pos# 4173 - 4174

2. Un-numbered pre-survey item - 5 foot charted Lat.17°58'02"N, Long.66°20'50"W boatsheet shows a least depth of 6 feet at ~~Lat.17_58'00"~~ 64, Long.66°~~21'49"~~ 20'52". It is recommended that the 5 foot sounding ~~remain~~ as charted. Concur see Verifier's Report 7a(1)
Pos# 1629 - 1630

3. Un-numbered pre-survey item-7 feet charted Lat.17°57'57", Long.66°20'55", boatsheet shows a least depth of ~~25~~ 24 feet in the immediate vicinity. It is recommended that the ~~25~~ 24 foot sounding be used for charting purposes. Concur ~~see Verifier's Report~~
Pos# 1617 - 1618

4. Un-numbered pre-survey item - 4 feet charted Lat. 17°58'26", Long. 66°19'57", boatsheet shows a least depth of ~~5~~ 4 feet in the immediate vicinity. It is recommended that the 4 foot sounding ~~remain as~~ charted. ~~See Verifier's Report~~ from the present survey.
Pos# 3461 - 3462

5. Un-numbered pre-survey item - 14 feet charted Lat. 17°58'12", Long.66°19'42", boatsheet shows a least depth of 6 feet in the immediate vicinity. It is recommended that the 6 foot sounding be used for charting purposes. ~~Concur~~ see Verifier's Report
Pos# 3418 - 3420 (411)

6. Un-numbered pre-survey item - 26 feet charted Lat.17°56'33", Long.66°19'49", boatsheet shows a least depth of 24 feet in the immediate vicinity. It is recommended that the 24 foot sounding be used for charting. Concur
Pos# 3932 - 3933

7. Un-numbered pre-survey item - 23 feet charted Lat.17°55'52", Long.66°19'54", boat sheet shows a least depth of 29 feet in the immediate vicinity. It is recommended that the ~~29~~ 27 foot sounding be used for charting. ~~Concur~~ see Verifier's Report
Pos# 3906 - 3907

8. Un-numbered pre-survey item - 11 feet charted Lat.17°56'23", Long.66°18'~~33~~ 29", boatsheet shows a least depth of ~~24~~ 13 feet in the immediate vicinity. It is recommended that the ~~24~~ 13 foot depth sounding be used for charting. An investigation by a diver obtained a corrected least depth by lead line of 12 feet on stag horn coral. Prior 12 ft depth is considered dismissed. Pos. 4392
Pos# 4392

9. Un-numbered pre-survey item - 26 feet charted Lat.17°56'18", Long.66°18'31", boatsheet shows a least depth of 20 feet in the immediate vicinity. It is recommended that the 20 foot sounding be used for charting. Concur
Pos.# 3203 - 3204 A shoal with a depth of 18' was located 4150 m. to the Northeast. Chart survey depths.

10. Un-numbered pre-survey item - 25 feet charted Lat.17°56'~~53~~ 19", Long.66°18'35", boatsheet shows a least depth of 23 feet. It is recommended that the 23 foot sounding be used for charting. Concur Depths of 23 feet found by the present survey in the vicinity of lat. 17° 56' 19", long. 66° 18' 33". Chart present survey depths.

The most recent survey in this area, (prior), is H-2421, scale 1:20,000 completed in 1899. Agreement is good. This survey, (H-9267), shows soundings generally one foot less thannthe prior survey, (H-2421).

L. COMPARISON WITH CHART

Comparison with NOS charts 926 and 909 (Corrected through Notice to Marriners dated 2/24/75) showed good agreement with the soundings and depth curves. The following is a list of least depths, the latituded and longitudes of investigations of shoals in the area of this survey:

Least depth	Position No.	Latitude	Longitude
~~15~~ 14 Ft.	1517-1518	17°56'03" N	66°23'42" W
9 ~~15~~ 14 Ft.	~~1534~~ ~~4307-4308~~ 1535	17 57 21	66 21 38 (9 ft. in lat. 17°57'21.17" long. 66° 21' 39.18")
33 ~~32~~ Ft.	4320-4321	17 55 15	66 21 45
63 ~~62~~ Ft.	4352-4353	17 55 08	66 20 43
48 Ft.	3869-3870	17 54 51	66 20 24
49 ~~48~~ Ft.	3762-3763	17 55 15	66 20 ~~18~~ 80
50 ~~49~~ Ft.	3877-3878	17 55 07	66 19 ~~48~~ 54
59 ~~58~~ Ft.	3678-3679	17 55 06	66 19 15
53 Ft.	~~4337~~ 3702-3703 ~~4338~~	17 55 08	66 19 ~~32~~ 20
58 Ft.	3409	17 54 ~~47~~ 46	66 19 42
27 ~~26~~ Ft.	3388-3389	17 56 ~~24~~ 43	66 19 ~~38~~ 34
17 ~~16~~ Ft.	1545-1546	17 56 58	66 21 ~~48~~ 54
4 ~~7 6~~ Ft.	~~1768~~ ~~1599-1600~~ 1769	17 57 ~~57~~ 58	66 21 ~~08~~ 09
4 ~~3~~ Ft.	4388-4389	17 58 ~~12~~ 24	66 19 ~~48~~ 47
~~9~~ 8 Ft.	3504	17 58 21	66 20 09

The shoal that is charted at Lat. 17°55'25"N, Long.66°24'30"W ~~has shifted to the west. The position is Lat.17°55'33"N, Long. 66°23'42"W.~~ ~~The~~ least depth ~~is~~ 18 feet.

M. ADEQUACY OF THE SURVEY

This survey completes the boatsheet MI-10-3-72, registry No.H-9267, and is complete and adequate to supersede all previous surveys.

N. AIDS TO NAVIGATION

There were no aids to navigation within the survey area.

O. STATISTICS

	Vessel Numbers 2222	2227	2224	2228	2221	Total
Linear nautical miles sounding including crosslines	364.8	209		35.5		609.3
Sq.Naut.Miles,area surveyed						65.75
Number of positions	1391	920	51	548	24	2934
Number of bottom samples		2	51		24	77
Linear Naut.Miles,crosslines	28	7.5				35.5

P. MISCELLANEOUS

All times and dates used during this survey are Greenwich Mean Time.

A hydrographic operations log (sounding volume) was used by the automated launches to record remarks and supplementary data. Eight volumes are included with the survey. Bottom Samples were obtained with a small snapper cup sampler. The samples were forwarded to Dr. J.W. Pierce, Division of Sedimentology, Smithsonian Institute, Washington, D.C. as per standing NOS instruction. Form 733M was completed and the originals accompany this report.

Q. RECOMMENDATIONS

NONE

R. AUTOMATED DATA PROCESSING

The principal programs utilized and their respective version dates were:

RK337	Unscrambler	8/8/74
RK337X	Unscrambler modified	10/29/74
RK212	Visual station table load and plot	4/1/74
RK215	Visual position and sounding plot	8/16/74
RK201	Grid and H/R Lattice Plot	2/19/75
RK111	Range-range real time hydroplot	8/7/74
RK216	Range-azimuth position and sounding plot	2/4/75
RK211	Range-range non-real time plot	8/16/74

RK337X is a temporary modified version of RK337 and will be incorporated in RK337. RK337X was requested from Marine Data System project for reformatting the range-azimuth data.

S. REFERENCE TO REPORT

There is no electronic control report or corrections to echo soundings to refer. The information can be found in this report. Reference should be made to the descriptive report of 1972 for the westernmost one-third of this sheet. Reference should also be made to the horizontal control report of OPR-423-MI-75.

Respectfully submitted,

Evelyn J. Fields

Evelyn J. Fields
Ensign, NOAA

APPENDICES

9/3/75

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): Santa Isabel

Period: January 24 - February 27, 1975

HYDROGRAPHIC SHEET: H-9267

OPR: 423

Locality: Southern coast of Puerto Rico in the area of Rincon Bay

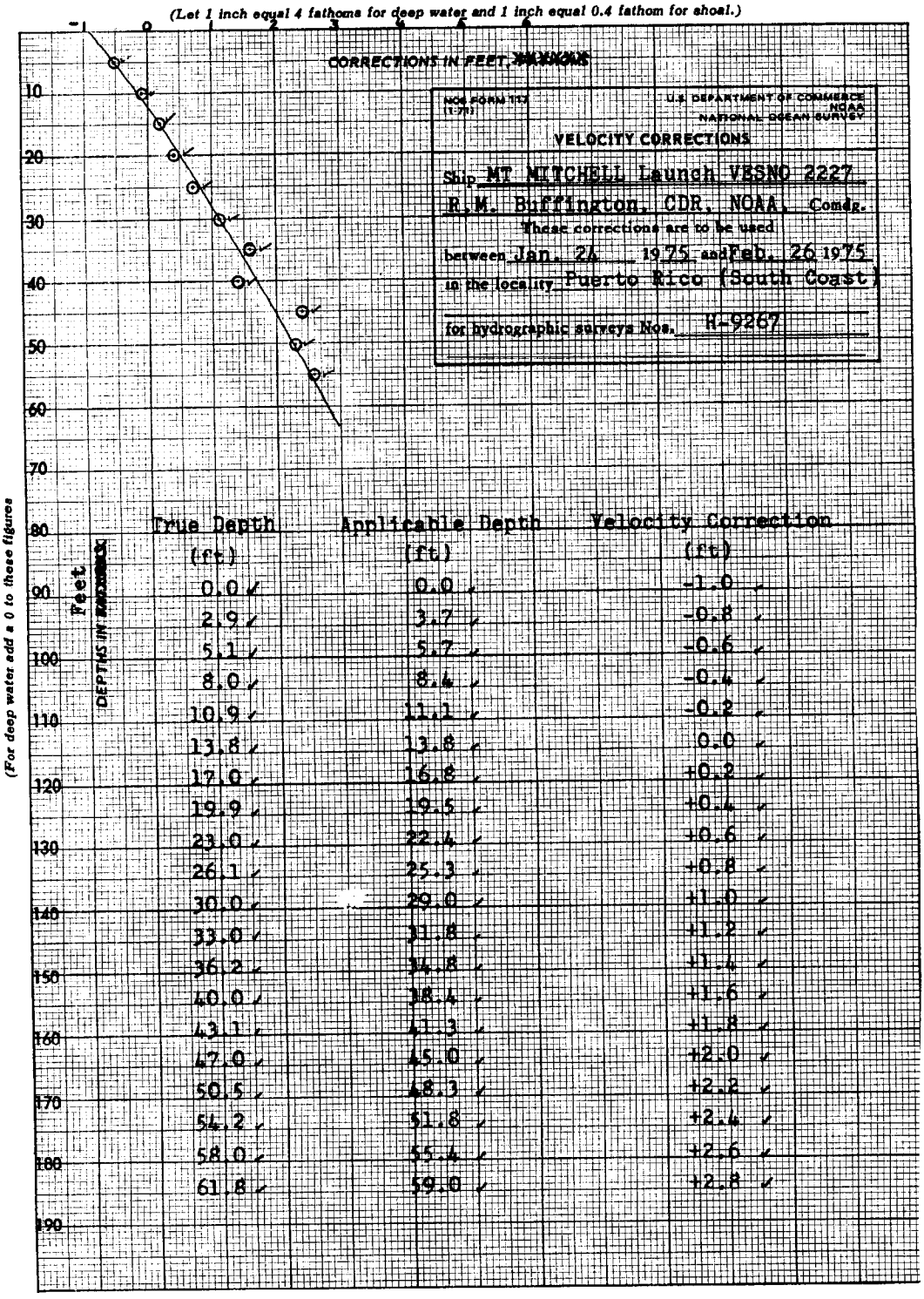
Plane of reference (mean ~~lower~~ low water): 3.08 ft.

Height of Mean High Water above Plane of Reference is 0.8 ft.

Remarks: Zone direct.

James R Hubbard
for Chief, Tides Branch

(Let 1 inch equal 4 fathoms for deep water and 1 inch equal 0.4 fathom for shoal.)



NOS FORM 111 (1-71) — U.S. DEPARTMENT OF COMMERCE NOAA NATIONAL OCEAN SURVEY

VELOCITY CORRECTIONS

Ship MT MITCHELL Launch VESNO 2227
R.M. Buffington, CDR, NOAA, Comdg.

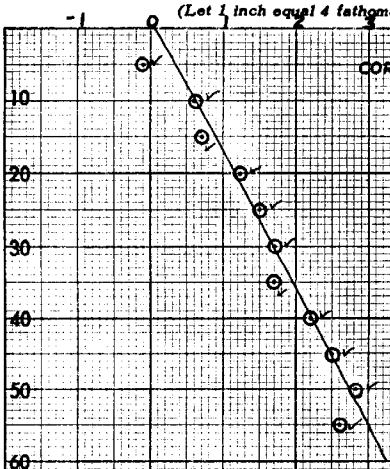
These corrections are to be used
between Jan. 24 1975 and Feb. 26 1975
in the locality Puerto Rico (South Coast)

for hydrographic surveys Nos. H-9267

(For deep water add a 0 to these figures

True Depth (ft)	Applicable Depth (ft)	Velocity Correction (ft)
0.0	0.0	-1.0
2.9	3.7	-0.8
5.1	5.7	-0.6
8.0	8.4	-0.4
10.9	11.1	-0.2
13.8	13.8	0.0
17.0	16.8	+0.2
19.9	19.5	+0.4
23.0	22.4	+0.6
26.1	25.3	+0.8
30.0	29.0	+1.0
33.0	31.8	+1.2
36.2	34.8	+1.4
40.0	38.4	+1.6
43.1	41.3	+1.8
47.0	45.0	+2.0
50.5	48.3	+2.2
54.2	51.8	+2.4
58.0	55.4	+2.6
61.8	59.0	+2.8

(Let 1 inch equal 4 fathoms for deep water and 1 inch equal 0.4 fathom for shoal.)



CORRECTIONS IN FEET. ~~XXXXXX~~

NOS FORM 117 (1-70)

U.S. DEPARTMENT OF COMMERCE
NOAA
NATIONAL OCEAN SURVEY

VELOCITY CORRECTIONS

Ship MT MITCHELL launch VRSNO 2222
R.M. Buffington, CDR, NOAA, Comdg.

These corrections are to be used

between Jan. 24 19 75 and Feb. 26 19 75

in the locality Puerto Rico (South Coast)

for hydrographic surveys Nos. H-9267

(For deep water add a 0 to these figures)

DEPTHS IN ~~FATHOMS~~ Feet

True Depth (ft)	Applicable Depth (ft)	Velocity Correction (ft)
1.0	1.0	0.0
4.0	3.8	+0.2
7.9	7.5	+0.4
11.3	10.7	+0.6
15.0	14.2	+0.8
18.8	17.8	+1.0
22.3	21.1	+1.2
26.2	24.8	+1.4
30.0	28.4	+1.6
33.9	32.1	+1.8
37.5	35.5	+2.0
41.1	38.9	+2.2
45.0	42.6	+2.4
49.0	46.4	+2.6
53.0	50.2	+2.8
56.9	53.9	+3.0

(Let 1 inch equal 4 fathoms for deep water and 1 inch equal 0.4 fathom for shoal.)

CORRECTIONS IN FEET, ~~METERS~~

NOS Form 449 (1-71)

U.S. DEPARTMENT OF COMMERCE
NOAA
NATIONAL OCEAN SURVEY

VELOCITY CORRECTIONS

Ship MT MITCHELL Skiff VESMO 2228

R. M. Buffington, CDR, NOAA Comdg.

These corrections are to be used

between Feb. 22 1975 and Mar. 26 1975

in the locality Puerto Rico (South Coast)

for hydrographic surveys Nos. H-9267, H-9485, H-9490, H-9491

(For deep water add a 0 to these figures)

DEPTHS IN ~~METERS~~ Feet

True Depth (ft)	Applicable Depth (ft)	Velocity Correction (ft)
1.6	1.6	+ 0.0
5.1	4.9	+ 0.2
8.9	8.5	+ 0.4
12.7	12.1	+ 0.6
16.7	15.9	+ 0.8
20.9	19.9	+ 1.0
25.6	24.4	+ 1.2
31.1	29.7	+ 1.4
37.5	35.9	+ 1.6
53.4	51.6	+ 1.8

VELOCITY TABLE TAPE LISTING
H-9267 (MI-10-3-72)

```
000000 1 0010 0001 000 222700 009267
000029 1 0008
000051 1 0006
000080 1 0004
000109 1 0002
000138 0 0000
000170 0 0002
000199 0 0004
000230 0 0006
000261 0 0008
000300 0 0010
000330 0 0012
000362 0 0014
000400 0 0016
000431 0 0018
000470 0 0020
000505 0 0022
000542 0 0024
000580 0 0026
000618 0 0028
999999 0 0028
000010 0 0000 0002 000 222200 009267
000040 0 0002
000079 0 0004
000113 0 0006
000150 0 0008
000186 0 0010
000223 0 0012
000262 0 0014
000300 0 0016
000339 0 0018
000375 0 0020
000411 0 0022
000450 0 0024
000490 0 0026
000530 0 0028
000569 0 0030
999999 0 0030
000016 0 0000 0003 000 222800 009267
000049 0 0002
000085 0 0004
000121 0 0006
000159 0 0008
000199 0 0010
000244 0 0012
000297 0 0014
000359 0 0016
000516 0 0018
999999 0 0020
000050 0 0000 0004 000 222100 009267
999999 0 0000
000050 0 0000 0005 000 222400 009267
999999 0 0000
```

ABSTRACT OF SETTLEMENT AND SQUAT CORRECTORS

NOAA Ship MT. MITCHELL MSS-22

13 and 14 January, 1975

LAUNCH 1002

RPMS	CORRECTOR
1000	+ 0.1
1100	+ 0.1
1200	+ 0.1
1300	+ 0.1
1400	+ 0.2
1500	+ 0.2
1600	+ 0.2
1700	+ 0.2
1800	+ 0.2
1900	+ 0.2
2000	+ 0.2
2100	+ 0.1
2200	+ 0.1
2300	0.0
2400	- 0.2

LAUNCH 1261

RPMS	CORRECTOR
800	+ 0.1
900	+ 0.1
1000	+ 0.1
1100	+ 0.1
1200	+ 0.2
1300	+ 0.2
1400	+ 0.3
1500	+ 0.3
1600	+ 0.3
1700	+ 0.3
1800	+ 0.3
1900	+ 0.3
2000	+ 0.3
2100	+ 0.3
2200	+ 0.3
2300	+ 0.3
2400	+ 0.2
2500	+ 0.2
2600	+ 0.1
2700	0.0
2800	- 0.1
2900	- 0.6

LAUNCH 1204

RPMS	CORRECTOR
1400	+ 0.1
1500	+ 0.1
1600	+ 0.1
1700	+ 0.1
1800	+ 0.2
1900	+ 0.2
2000	+ 0.2
2100	+ 0.2
2200	+ 0.2
2300	+ 0.2
2400	+ 0.3

SETTLEMENT AND SQUAT CORRECTORS

LAUNCH 1207

MT. MITCHELL 1975 FIELD SEASON

RPMS	CORRECTOR
500	0.0
600	0.0
700	0.0
800	0.0
900	0.1
1000	0.1
1100	0.1
1200	0.1
1300	0.1
1400	0.2
1500	0.2
1600	0.2
1700	0.3
1800	0.4

VESNO 2222 LIST OF DEL NORTE REMOTES USED DAILY

DAY	DMU	MASTER	REMOTE	STATION	REMOTE	STATION
024	182	281	251	302	249	052
025	182	281	251	302	249	052
026	182	281	251	302	249	052
028	182	281	251	302	249	052
029	182	281	251	302	249	052
030	182	281	251	302	249	052
034	182	281	251	302	249	052
035	182	281	251	302	249	052
036	182	281	251	302	249	052
037	182	281	251	302	249	052
038	182	281	251	302	249	052
039	182	281	251	302	249	052
040	182	281	248	302	249	052
041	182	281	249	052	248	310
042	182	281	249	052	251	310
043	182	281	251	314	248	306
044	182	281	251	314	248	306
049	182	281	249	052	251	310
050	182	281	249	052	251	310

TIME 1445 (GMT) 248

VESNO 2227 LIST OF DEL NORTE REMOTES USED DAILY

DAY	DMU MASTER	REMOTE	STATION	REMOTE	STATION
026	180 250	262	020	252	300
027	180 250	216	308	252	300
028	180 250	216	308	252	300
029	180 250	216	308	252	300
030	180 250	216	308	252	300
034	180 250	216	306	252	032
035	180 250	216	306	252	032
036	180 250	216	306	252	032
037	180 250	216	306	252	032
038	180 250	252	304	216	306
039	180 250	252	304	216	306
040	180 250	252	304	216	306
041	180 250	252	304	216	306
042	180 250	252	304	216	306
043	180 250	216	308	252	300
044	180 250	216	308	252	300

SIGNAL NAMES LIST - SOUTH COAST OF PUERTO RICO

OPR-423-MI-75 5/15/75

SIGNAL NUMBER	STATION NAME	QUAD*	R/T	ORDER
010	MUERTOS ISLAND LIGHTHOUSE 1899,1966	170664 1002	R	3
012	PONCE DON Q RUM COMPANY TALLEST STACK 1966	180663 1006	R	3
016	FORT ALLEN US NAVY BASE WATER TANK 1966	180663 1007	R	3
020	KAY 1970	FIELD G P	R	3
024	CORTADA SUGAR COMPANY STACK 1966	170661 1021	R	3
028	SANTA ISABEL WEST MUNICIPAL WATER TANK 1966	170661 1019	R	3
030	SANTA ISABEL EAST MUNICIPAL WATER TANK 1966	170661 1018	R	3
032	JAUCA 3 1966	170661 1015A	R	2
034	CJ-19 1972	FIELD G P	T	3
038	SALINAS SILO 1972	FIELD G P	R	3
040	SALINAS RADIO TOWER WHOY 1972	FIELD G P	R	3
042	SALINAS MUNICIPAL WATER TANK 1972	FIELD G P	R	3
044	BAHIA DE JOBOS LIGHT 1975	FIELD G P	R	3
048	AGUIRRE SUGAR ASSN TALLEST STACK 1966	170661 1020	R	3
052	BOCAMAR RM 2 1966	170661	R	2
054	BAHIA DE JOBOS RANGE B REAR LIGHT 1966	170661 1013	R	3
300	UNO 1975	170661 RESEC	T	3
302	BETA 1975	170661 RESEC	T	3
304	ALPHA 1975	170661 RESEC	T	3
306	DOS 1975	170661 RESEC	T	3
308	KAM 1975	170661 RESEC	T	3
310	JIM 1975	170661 RESEC	T	3
314	CABE 1975	170661 RESEC	T	3
368	JAUCA 3 ECCENTRIC 1975	170661 TRAV	T	3
370	BOCAMAR RM 2 ECCENTRIC 1975	170661 TRAV	T	3
400	P1 (EL AQUARIUM RESTAURANT PIER)	170661 PHOTO	T	

* - WHERE THE STATION IS PUBLISHED, THE QUAD GIVEN BY THE PUBLICATION IS LISTED.
FOR OTHER STATIONS, THE METHOD OF LOCATION IS GIVEN AS FOLLOWS:

RESEC - RESECTION
TRAV - TRAVERSE
INTER - INTERSECTION

THOSE STATIONS NOT PUBLISHED AND WHERE THE METHOD OF LOCATION IS NOT KNOWN ARE SIMPLY LISTED AS "FIELD G P"

R/T RECOVERABLE OR TEMPORARY STATION

SIGNAL LIST PRINTOUT

H-9267 (MI-10-3-72)

010	7	17	53	42518	066	31	17599	139	0000	000000
012	7	18	01	14165	066	33	53185	139	0000	000000
016	7	18	00	32879	066	30	17736	139	0000	000000
020	7	17	56	04900	066	27	33100	139	0000	149835
024	7	17	59	50122	066	26	01346	139	0000	000000
028	7	17	58	23067	066	24	17529	139	0000	000000
030	7	17	58	23225	066	24	16319	139	0000	000000
032	7	17	55	25727	066	23	09247	139	0000	149835
034	7	17	58	13780	066	21	45510	243	0000	149835
038	7	17	59	47810	066	18	21890	139	0000	000000
040	7	17	58	38850	066	18	14010	139	0000	000000
042	7	17	58	50630	066	17	45570	139	0000	000000
044	7	17	56	08740	066	16	59679	139	0000	149835
048	7	17	57	18137	066	13	21221	139	0000	000000
052	7	17	58	40405	066	20	28116	139	0000	149835
300	7	17	57	38793	066	25	40904	243	0000	149835
302	7	17	55	42237	066	21	17413	243	0000	149835
304	7	17	55	45965	066	19	23152	243	0000	149835
306	7	17	55	51967	066	22	10270	243	0000	149835
308	7	17	55	59270	066	27	19790	243	0000	149835
310	7	17	57	52161	066	18	05895	243	0000	149835
314	7	17	55	17046	066	23	14326	243	0000	000000
368	7	17	55	25791	066	23	09194	252	0000	149835
370	7	17	58	40254	066	20	28061	252	0000	149835
400	7	17	57	18020	066	24	20559	243	0000	149835

ABSTRACT FOR SKIFF 2228

J. D.	STATION	INITIAL FOR T-2	REMOTE S/N	MASTER S/N	CALIBRATION	PHOTO PT. FROM PHOTO	T-2 S/N	DMU S/N
051	JAUCA 3	BOCAMAR	251	281	0	-	19293	182
051	JIM	ALPHA	251	281	0	-	19293	182
052	JIM	ALPHA	262	281	-38	-	19293	182
053	JAUCA 3 ECCENTRIC	BOCAMAR	262	281	-38	-	35838	182
056	ALL WORK REJECTED - DUE TO DEL NORTE MALFUNCTION							
057	BOCAMAR RM2 ECC.	BETA	262	281	0	-	35838	189
057	CJ-19,	ALPHA	262	281	0	-	35838	189
058	BETA	ALPHA	262	281	0	-	35838	189
058	Aquarium Restraunt Pier	Muertos Island Lighthouse	262	281	0	70-E(C)6173	35838	189

Calibration of Del Norte by AGA Geodimeter Range

Sheet: MI-10-3-72 H-9267

The Del Norte DMU's, Master and Remote Trisponders used by each launch were set up over two known ranges previously established by AGA Geodimeter (S/N 1036) for this purpose. After the required system warm-up time, the Del Norte readings were recorded and compared to the geodimeter value for each of the ranges, the error on each range, and the mean error, being noted below. On the 31 January calibration, while on range 1, the readings were brought to the value of the geodimeter reading for this range by use of the calibration pods on the front panel of the DMU, with the exception of the "A" calibration pod on DMU S/N 180, which did not function. The "average calibration" column is the mean of the daily calibrations carried by each launch as determined from the three-point fix method. Two values are given: the first is the average obtained on the survey days prior to the 31 January calibration when the pods were adjusted, while the second is for the subsequent days after the pod adjustments.

Date: 31 January 1975

Geodimeter Range 1 - 996 meters
Geodimeter Range 2 - 2374 meters

DMU and Master S/N	Remote S/N	Error on Range 1	Error on Range 2	Mean Error	Average Calib.	Error after Correction	Average Calib.
182,281	251	+ 99	+ 104	+ 102	+ 96	0	- 2
	249	+ 47	+ 47	+ 47	+ 52	0	- 2
180, 250	216	+ 276	+ 276	+ 276	+ 277	+ 277	+ 276
	252	+ 17	+ 20	+ 18	+ 14	0	+ 2

Date: 14 February 1975

Geodimeter Range 1 - 996 meters
Geodimeter Range 2 - 1528 meters

182, 281	248	- 28	_ 26	_ 27	- 26
180, 250	216	+ 278	+ 276	+ 277	+ 278
	252	0	- 2	-]	+ 2
	262	+ 250	+ 276	+ 263	+ 250

GEOGRAPHIC NAMES LIST

The geographic names were obtained by an officer and a Quartermaster of Puerto Rican descent from the ship MT. MITCHELL. A complete geographic names list was not done as it was not in project instructions. The names obtained were from the fishermen in the local area. The investigation was conducted in the area of Bahia de Rincon. Geographic names were obtained for the small bays, points and small islands. The names obtained are as follows:

	Latitude	Longitude
THE BAYS		
Ensenada de Cabros	17°57'36"N	66°22'06"W
Canto Blancas	17 57 24	66 22 30
THE POINTS		
Mata dela Mariquita	17 57 00	66 22 24
Mata del Viejo	17 57 20	66 22 36
Punta Balaju	17 57 12	66 22 18
Aguila Hauk	17 57 48	66 21 48
Puercos Fig	17 57 42	66 21 42
Punta Clavejino	17 58 01	66 21 30
Punta Palo Seco	17 58 24	66 20 48
THE ISLANDS		
Pinto Melendre	17 55 18	66 22 00
Mata Palo Seco	17 58 15	66 20 42
Mata Langosta	17 55 32	66 22 48

Do not use
C6H
11-14-77
Will be sent to BGN

APPROVAL SHEET

Field Number MI-10-3-72
Registry Number H-9267

The field work and processing of data from this hydrographic survey were under my daily supervision. The sheet and records have been reviewed and approved by me.

Ronald M. Buffington
Commander, NOAA
Commanding Officer
NOAA Ship MT. MITCHELL, MSS-22

NOAA FORM 76-155
(11-72)

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

SURVEY NUMBER

H-9267

GEOGRAPHIC NAMES

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	
ARRECIFE MEDIA LUNA										1
BAHÍA DE JAUCA										2
BAHÍA DE RINCON										3
CAYO ALEENIQUE										4
CAYO MATA										5
CAYOS CABEZAZOS										6
CAYOS DE CARACOLES										7
CAYOS DE RATONES										8
ISLA PUERCA										9
JAUCA										10
PLAYA DE SANTA ISABEL										11
PLAYA SALINAS										12
PUNTA AGUILA										13
PUNTA CAYITO										14
PUNTA PETRONA										15
PUNTA SALINAS										16
RIO NIGUA										17
										18
										19
										20
					APPROVED					21
					Chas. E. Harrington					22
					STAFF GEOGRAPHER - CSLX2					23
					14 Nov. 1977					24
										25

NOAA FORM 76-155 SUPERSEDES C&GS 197

U.S. G.P.O. 1972-769-565/516 REG.#6

NOAA FORM 77-27 (5-77) | U. S. DEPARTMENT OF COMMERCE NOAA | HYDROGRAPHIC SURVEY NUMBER

HYDROGRAPHIC SURVEY STATISTICS

H-9267

RECORDS ACCOMPANYING SURVEY: To be completed when survey is registered.

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET	1	BOAT SHEETS & PRELIMINARY OVERLAYS	1 17
DESCRIPTIVE REPORT	1	SMOOTH OVERLAYS: POS. ARC, EXCESS	3

DESCRIPTION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS/ SOURCE DOCUMENTS
ENVELOPES	3		3			1-misc.data
CAHIERS	4 - with printouts					
VOLUMES	14					
BOXES			2 1 smooth			

T-SHEET PRINTS (List) T-13370, T-13371, T-13372

SPECIAL REPORTS (List) Horizontal Control Report, OPR-423-MI-75 - not recieved 10/5/

OFFICE PROCESSING ACTIVITIES

The following statistics will be submitted with the cartographer's report on the survey

PROCESSING ACTIVITY	AMOUNTS: PRE-VERIFICATION	AMOUNTS: VERIFICATION	AMOUNTS: TOTALS
POSITIONS ON SHEET			4097
POSITIONS CHECKED		250	
POSITIONS REVISED		75	
SOUNDINGS REVISED		500	
SOUNDINGS ERRONEOUSLY SPACED		25	
SIGNALS (CONTROL) ERRONEOUSLY PLOTTED		0	
	TIME — HOURS		
CRITIQUE OF FIELD DATA PACKAGE (PRE-VERIFICATION)			
VERIFICATION OF CONTROL		20	
VERIFICATION OF POSITIONS		60	
VERIFICATION OF SOUNDINGS	15	70	
COMPILATION OF SMOOTH SHEET		0	
APPLICATION OF TOPOGRAPHY		12	
APPLICATION OF PHOTOBATHYMETRY		0	
JUNCTIONS		8	
COMPARISON WITH PRIOR SURVEYS & CHARTS		40	
VERIFIER'S REPORT		35	
OTHER		100	
TOTALS	15	345	360

Pre-Verification by: J. Griffin	Beginning Date: 06/13/75	Ending Date: 07/15/75
Verification by: R. Hill	Beginning Date: 02/13/76	Ending Date: 09/07/77
Verification Check by: W. Jonns	Time (Hours): 10	Date: 08/23/77
Marine Center Inspection by: Hydrographic Inspection Team (AMC)	Time (Hours): 30	Date: 08/31/77
Quality Control Inspection by: R. W. Wellman	Time (Hours): 68	Date: 11/11/77
Requirements Evaluation by: D. J. Hill	Time (Hours): 10	Date: 3/2/78

D.R Engle 10 1/19/78

Reg. No. H-9267

The Computer and Excess Sounding Cards for this survey have not been corrected to reflect the changes made to the Computer Card and Excess Card Printouts at this time of the review.

When the cards have been updated to reflect the final results of the survey the following shall be completed:

CARDS CORRECTED

DATE_____ TIME REQ'D_____ INITIALS_____

REMARKS:

Reg. No. H-9267

The magnetic tape containing the data for this survey has not been corrected to reflect the changes made during evaluation and review.

When the magnetic tape has been updated to reflect the final results of the survey, the following shall be completed:

MAGNETIC TAPE CORRECTED

DATE 6-16-82 TIME REQ'D._____ INITIALS JAC

REMARKS:

H-9267

Information for Future Presurvey Reviews

Several soundings have been carried forward to supplement the present survey. The present survey should be examined and all such soundings carried forward to the present survey should be investigated and verified or disproved during future work in the area.

Position Index Lat.	Long.	Bottom Change Index	Use Index	Resurvey Cycle
175	0663	2	1	50 years
175	0662	2	1	50 years

APPROVAL SHEET
FOR
SURVEY H- 9267

A. All revisions and additions made on the smooth sheet during verification have been entered in the magnetic tape records for this survey. A new final position printout has/~~has not~~ been made. A new final sounding printout has/~~has not~~ been made.

B. The verified smooth sheet has been inspected, is complete, and meets the requirements of the Provisional Hydrographic Manual. Exceptions are listed in the Verifier's Report.

Date: Sept. 7, 1977

Signed: William L Jones

Title: Chief, Verification Branch

ATLANTIC MARINE CENTER
VERIFIER'S REPORT

REGISTRY NO. H-9267 FIELD NO. MI-10-3-72

Bahia De Rincon, South Coast of Puerto Rico

SURVEYED: April 17 through May 22, 1972 and January 24 through February 26, 1975

SCALE: 1:10,000 PROJECT NO.: OPR-423

SOUNDINGS: Raytheon DE-719B, DE-723B, DE-723D, and Ross 5,000 CONTROL: Del-Norte, Visual Hi-Fix (Hyperbolic)

Chief of Party ..... CAPT E. McCaffrey (1972)
..... CDR R. Buffington (1975)
Surveyed by ..... CDR R. DeRycke
..... LCDR C. Berman
..... LCDR M. Mulhern
..... ENS E. Fields
..... ENS K. O'Donnell
..... ENS S. Iwamoto
Automated Plot by ..... Calcomp Plotter #618 (AMC)
Verified and Inked by ..... R. R. Hill
September 21, 1977

1. Introduction

No unusual problems were encountered during verification. The projection parameters have been revised and noted in the Descriptive Report.

2. Control and Shoreline

a. The control is adequately described in Sections F and G of the 1975 Descriptive Report and Section F of the 1972 Descriptive Report.

b. The shoreline on this sheet was taken from Class I, unreviewed Photogrammetric Manuscripts T-13370 of 1970-75, T-13371 of 1970-75, and T-13372 of 1970-75. However, in the vicinity of latitude 17° 57' 42" and longitude 66° 25' 30", shoreline was taken from the field's boat sheet in dashed red ink.

3. Hydrography

a. Depths at crossings are in good agreement.

b. The standard depth curves are adequately delineated; however, there are areas where a dashed curve was utilized due to the sparse hydrographic detail of the present survey. Some examples of these areas are as follows:

Latitude:	17° 55' 50"	Longitude:	66° 22' 52"
	17° 55' 51"		66° 22' 46"
	17° 57' 05"		66° 22' 15"

(See Q.C. Report-item 1)

c. The development of the bottom configuration and investigation of least depths are considered adequate, with the exception of the areas noted.

4. Condition of Survey

The field procedures, sounding records, automated plotting, and the Descriptive Report are adequate and conform to the requirements of the Provisional Hydrographic Manual, with the following exceptions:

a. The TRA correction for hydrography, done in 1972 by launch MI-3, was incorrect ~~(a corrector of 1.8 feet has been applied)~~. (See Q.C. Report-item 2)

b. An area in the vicinity of latitude 17° 55' 36", longitude 66° 21' 54" was not sufficiently covered by hydrography on the present survey. (See Q.C. Report-item 3)

c. The use of photogrammetrically established positions for Del-Norte stations is not recommended under Section 1.3.1 of the Provisional Hydrographic Manual. Also, Del-Norte station UNO 1975 (station #300) was not described.

5. Junctions

Adequate junctions were effected with the following contemporary surveys:

H-9486 (1975) on the southeast
H-9266 (1972) on the southwest (See Q.C. Report-item 4)
H-9265 (1972) on the west

Junctions on the west with contemporary survey H-9190 (1971) and on the east with contemporary survey H-9485 (1975) were not completed. Due to the unavailability of these contemporary surveys for adjustments, the depth curves are not in complete harmony. These junctions should be considered further by Quality Control when both surveys are available. (See Q.C. Report-item 5)

6. Comparison With Prior Surveys

H-2421 (1899) 1:20,000
H-2422 (1899) 1:10,000
H-2737 (1905-06) 1:40,000
H-4699 (1927) 1:20,000

These surveys, taken together, cover the common area of the present survey. A comparison between the present survey and prior surveys reveals minor differences in the bottom configuration. These differences may be attributed to improved survey methods and the more detailed development of the present survey. However, numerous dashed-circled Presurvey Review Items, which are primarily doubtful, unsupported, and inadequately developed depths from the above prior surveys, were investigated to a limited extent by the present survey. In many instances the present survey does not present sufficient data to absolutely disprove the prior survey information. Therefore, the present survey has been supplemented by prior survey information where necessary. (See Q.C. Report-items 6 and 7)

Except as noted above, the present survey is adequate to supersede the prior surveys within the common areas.

7. Comparison With Charts 25687 (formerly 909) 7th (8th Edition, June 8, 1974 ~~March 1, 1975~~) and 926 (4th Edition, February 5, 1972) (See Q.C. Report-section 8)

a. Hydrography

The charted hydrography originates with the previously discussed prior surveys. Numerous charted dashed-circled Presurvey Review Items required the specific attention of the hydrographer. These items were in part discussed adequately, except as noted, in Sections J and K of the 1972 Descriptive Report and Sections K and L of the 1975 Descriptive Report. The following additional information regarding charted items, all of which are dashed-circled Presurvey Review Items, is brought to your attention: (See Q.C. Report-items 9 and 10)

(1) The 5-foot depth charted in latitude 17° 58' 02", longitude 66° 20' 50" was not investigated adequately to disprove its existence and has been brought forward to supplement the present survey. However, a reef awash ~~30~~ 45 meters to the northwest of the depth, originating with the contemporary shoreline manuscript shown on the present survey, substantiates the existence of lesser depths in the area.

(2) The 14-foot depth charted in latitude 17° 58' 12", longitude 66° 19' 42", originating with prior survey H-2737 (1905-06), was investigated by the present survey. A shoal with depths to four feet was located approximately 200 meters to the northwest by the present survey and should be charted.

(3) The 4-foot depth charted in latitude 17° 56' 55.5", longitude 66° 17' 43.5", originates with H-2422 (1899). This depth has not been disproved by the present survey and has been brought forward to supplement the present survey.

(4) The 15-foot depth charted in latitude 17° 56' 48", longitude 66° 17' 43.5", originates with H-2422 (1899). This depth has not been disproved by the present survey and has been brought forward to supplement the present survey.

(5) The 25-foot depth charted in latitude 17° 56' 47", longitude 66° 17' 58.5", originates with H-2422 (1899). This depth has not been disproved by the present survey and has been brought forward to supplement the present survey.

(6) The 28-foot depth charted in latitude 17° 56' 22", longitude 66° 18' 33", originates with H-2421 (1899). This item has been adequately investigated by the present survey. Present survey depths should be charted. (25 ft)

(7) The 47-foot depth charted in latitude 17° 55' 44", longitude 66° 18' 27", originates with H-2737 (1905-06). The present survey adequately defines the bottom configuration; it is recommended that present survey depths be charted. (47 sdg nearby)

(8) The 35-foot depth charted in latitude 17° 56' 20", longitude 66° 19' 25", originates with H-2421 (1899). The present survey investigated this item and found a depth of 30 feet in the vicinity. Present survey depths should be charted.

(9) The 30-foot depth charted in latitude 17° 55' 58", longitude 66° 20' 00", originates with H-2421 (1899). The present survey investigated this item and found a shoal area in the vicinity with depths to 27 feet. The present survey depths should be charted.

(10) The 43-foot depth charted in latitude 17° 55' 31", longitude 66° 20' 12", originates with H-2421 (1899). The present survey investigated this item and found depths to 40 feet in the vicinity. The present survey depths should be charted.

(11) The 23-foot depth charted in latitude 17° 55' 52", longitude 66° 19' 54", originates with H-2737 (1905-06). This depth falls in present survey depths of ~~20~~ 40 to ~~32~~ 45 feet. A shoal area with depths to 27 feet was found 100 to 200 meters to the northwest, which verifies the existence of shoaling in the area; however, the differences are attributed to the improved positioning system of the present survey and the possibility the prior survey depth, obtained by lead line, was misread six feet too shoal. It is recommended that the prior survey depth be ~~disregarded~~ retained and ~~and present survey depths be charted or~~ the prior survey ~~records~~ be closely examined during Quality Control Evaluation to verify or disprove the above. The 23 ft. sounding has been carried forward to supplement the present survey.

(12) The 35-foot depth charted in latitude 17° 56' 42", longitude 66° 20' 32", originates with H-2737 (1905-06). This depth is not considered verified or disproved by the present survey and has been brought forward to supplement the present survey.

(13) The 29-foot depth charted in latitude 17° 57' 03", longitude 66° 21' 37", originates with H-2421 (1899). The present survey obtained a 27-foot depth in the vicinity; however, a shoal with depths to 17 feet was also found 200 meters to the southwest. Present survey depths should be charted. (27 ft)

(14) The elongated shoal with charted depths to 15 feet in the vicinity of latitude 17° 57' 15", longitude 66° 21' 30", originates with H-2421 (1899). The present survey investigated this area and found discontinuous shoal features with depths to nine feet. Present survey depths should be charted.

(15) The 17-foot depth charted in latitude 17° 56' 14", longitude 66° 21' 43", originates with H-2421 (1899). An investigation by the present survey confirmed the existence of the prior survey depths. Present survey depths should be charted.

(16) The 15-foot depth charted in latitude 17° 56' 18", longitude 66° 21' 53", originates with H-2421 (1899). An investigation by the present survey obtained depths to 16 feet in the vicinity and further defines the continuity of a shoal area to the west. It is recommended that present survey depths be charted in the area. The 15 ft. sounding has been carried forward to supplement the present survey.

(17) The 10-foot depth charted in latitude 17° 56' 25", longitude 66° 22' 08", originates with H-2421 (1899). An investigation by the present survey obtained a depth of nine feet in the area. Present survey depths should be charted.

(18) The 12-foot depth charted in latitude 17° 56' 35", longitude 66° 25' 30", originates with H-2421 (1899). The present survey investigated this item and obtained depths to 10 feet in the vicinity. Present survey depths should be charted.

(19) The 2-foot depth charted in latitude 17° 57' 06", longitude 66° 22' 25.5", originates with H-2737 (1905-06). The reef awash originating with contemporary shoreline manuscript provides adequate indication of shoal depths in the area. The two-foot depth has been brought forward to supplement the present survey.

(20) The 39-foot depth charted in latitude 17° 55' 40", longitude 66° 22' 14", originates with H-2421 (1899). The present survey found depths of 49 feet in this location; however, depths of 24 to 27 feet were found 100 meters to the northwest. Present survey depths should be charted. The 39 ft. sounding has been carried forward to supplement the present survey.

(21) The 20-foot depth charted in latitude 17° 56' 04", longitude 66° 23' 55", originates with H-2421 (1899). An investigation by the present survey revealed a shoal extending east-west in this vicinity with a depth of 14 feet in latitude 17° 56' 03", longitude 66° 23' 42.6". Present survey depths should be charted.

(22) The 23-foot depth charted in latitude 17° 55' 44", longitude 66° 24' 27", originates with H-4699 (1927). An investigation by the present survey revealed a shoal ridge in the vicinity extending in a northeasterly direction for approximately 800 meters, with depths to 15 feet in surrounding depths of 25 to 30+ feet. Present survey depths should be charted.

(23) The 3-foot depth charted in latitude 17° 57' 31.5", longitude 66° 25' 35.5", originates with H-2737 (1905-06). An investigation by the present survey found depths of 14 feet in this area. The difference may be attributed to improved positional accuracies of the present survey, which locates a foul area 150 meters to the northwest with depths to two feet found by the present survey. The three-foot depth is considered ~~disproved~~ discredited and present survey information should be charted.

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

b. Aids to Navigation

There are no aids to navigation located within the limits of this survey.

8. Compliance With Instructions

This survey does comply with the Project Instructions.

9. Additional Field Work

This is a good basic survey, and additional field work is not recommended.

Survey H-9267
Examined and Approved:
Hydrographic Inspection Team
Date: August 31,1977

CDR Robert A. Trauschke, NOAA
Chief, Processing Division

CDR Charles H. Nixon, NOAA*
Chief, Operations Division

C. Douglas Mason, LT, NOAA
Chief, EDP Branch

R. D. Sanocki
Technical Assistant
Processing Division

Guy F. Trefethen
Verification Branch

* Absent

Approved/Forwarded

Robert C. Munson
RADM, NOAA
Director, Atlantic Marine Center

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
Atlantic Marine Center
439 West York Street
Norfolk, Virginia 23510

File No: D6-5
Ser. No: 77-129

September 21, 1977

CAM3/RAT

TO: RADM Robert C. Munson
Director, Atlantic Marine Center

FROM: CDR Robert A. Trauschke
Chief, Processing Division

SUBJECT: Hydrographic Inspection Team Report, H-9267 (1975)

This survey was originally started by the NOAA Ship MT MITCHELL in 1972 and was completed by the MT MITCHELL in 1975, when operations in Puerto Rico were resumed. It is in general compliance with Project Instructions OPR-423-MI-75.

FIELD WORK

The development of foul areas within the 12- and 6-foot curves was not complete. The Project Instructions prescribed that foul areas must be delineated. As reflected in the Verifier's Report, the investigation of the dashed-circled items of the Presurvey Review was not adequate.

VERIFICATION

The 1972 Descriptive Report was submitted to the Hydrographic Inspection Team with the verifier's notes in pencil. The notes should have been inked in red. The HIT Team returned the Verifier's Report to the verifier to have the sections dealing with comparisons with chart and prior surveys rewritten. The original statements were very inconclusive.

There were approximately 30 HIT hours on this sheet.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
Rockville, Md. 20852

C352

November 11, 1977

TO: A. J. Patrick
Chief, Marine Surveys Division

THRU: Chief, Quality Control Branch

FROM: K. W. Wellman
Quality Evaluator

SUBJECT: Quality Control Report for H-9267 (1972-75)
Puerto Rico, South Coast, Playa Salinas to
Punta Cayito

A quality control inspection of H-9267 has been accomplished to evaluate the accuracy and adequacy of the survey with respect to data acquistion, delineation of the bottom, determination of least depths and navigation hazards, junctions, shoreline transfer, decisions and actions by the verifier and cartographic presentation of data.

In general, the present survey was found to conform to National Ocean Survey standards and requirements except as follows:

1. Section 3b of the Verifier's Report is supplemented by the following:

Several brown curves have been added to emphasize isolated shoaler depths.

2. Reference section 4a of the Verifier's Report.

It appears that the noted erroneous TRA correctors were not rectified during verification. The TRA correctors

appearing in the final smooth plot printout are, in some cases, as much as + 0.4 ft. greater than the corresponding corrector provided in the TRA Correction Abstract. Consequently, some depths (between positions 1 to 334) may be + 0.4 ft. in error. Due to the relatively minor effects of the erroneous soundings vis-a-vis the general development of the bottom in the area in question, revisions effected during quality control evaluation were limited to critical depths only.

3. Section 4b of the Verifier's Report is supplemented by the following:

In addition, a holiday exists in the vicinity of lat. 17°56'20", long. 66°17'40". The referenced area was not developed on the present survey or on the adjoining survey H-9485 (1975).

4. Reference section 5 of the Verifier's Report (Junctions):

An adequate junction between the present survey and H-9266 was not effected during verification; i.e., the 60-ft. depth curve was not in coincidence and several soundings were in conflict with surrounding depths (see the memorandum dated 8-6-76 from the Office of Marine Surveys and Maps entitled "Depth Contour Agreement in Overlap Areas").

An inconsistent 64-ft. sounding on the present survey was noted to be in conflict with 67-ft. depths on H-9266. It appears that the questionable 64-ft. sounding was displaced approximately 190 meters to the southeast of its true position during the automated plot of the present smooth sheet. In addition, a 73-ft. sounding on H-9266 was found to have been scanned erroneously and was revised to 64 ft. to effect agreement with general depths in the vicinity. Additional depth differences of 3 to 5 feet in the junctional area were found to be caused by misinterpretation of the fathograms thus necessitating rescanning of the fathograms to effect reconcilation of the conflicting depths in the junctional area. Minor junctional discrepancies of 1 to 2 feet are attributed to sea conditions and were disregarded to minimize time consuming rescanning of the fathograms.

5. Section 5 of the Verifier's Report (Junctions) is supplemented by the following:

Adequate junctions have been effected with H-9485 (1975) on the east and H-9190 (1971) on the west.

6. Reference section 6 of the Verifier's Report:

The referenced section of the Verifier's Report does not indicate the general magnitude of depth differences between the present and prior surveys (see provisional manual-section 6.6[11]).

Section 6 of the Verifier's Report is supplemented by the following:

There is a variable pattern of depth differences ranging from areas of stable depths to scattered depth differences of ± 6 ft.

The shorelines of the offshore cays have accreted and receded in a random fashion while maintaining the same general individual shapes as on the prior surveys.

Numerous submerged rock symbols are shown in proximity to the fringing reefs on the prior surveys. The submerged rock symbols are considered to represent the generally foul nature of the area rather than individual submerged rocks or coral heads. The present survey is considered to provide a more accurate portrayal of the present extent of the fringing reefs and, therefore, obviates the necessity of retaining the generalized prior survey information.

7. Several soundings carried forward from the prior surveys were displaced (as much as 60 meters) from the source document position. In addition, the 5-ft. sounding carried forward to the present survey in lat. 17°58.05', long. 66°20.84' (approximately 25 meters northwest of the source document position) in brown ink, ostensibly from H-2737, actually originates with H-2421. Appropriate revisions were effected during quality control evaluation.

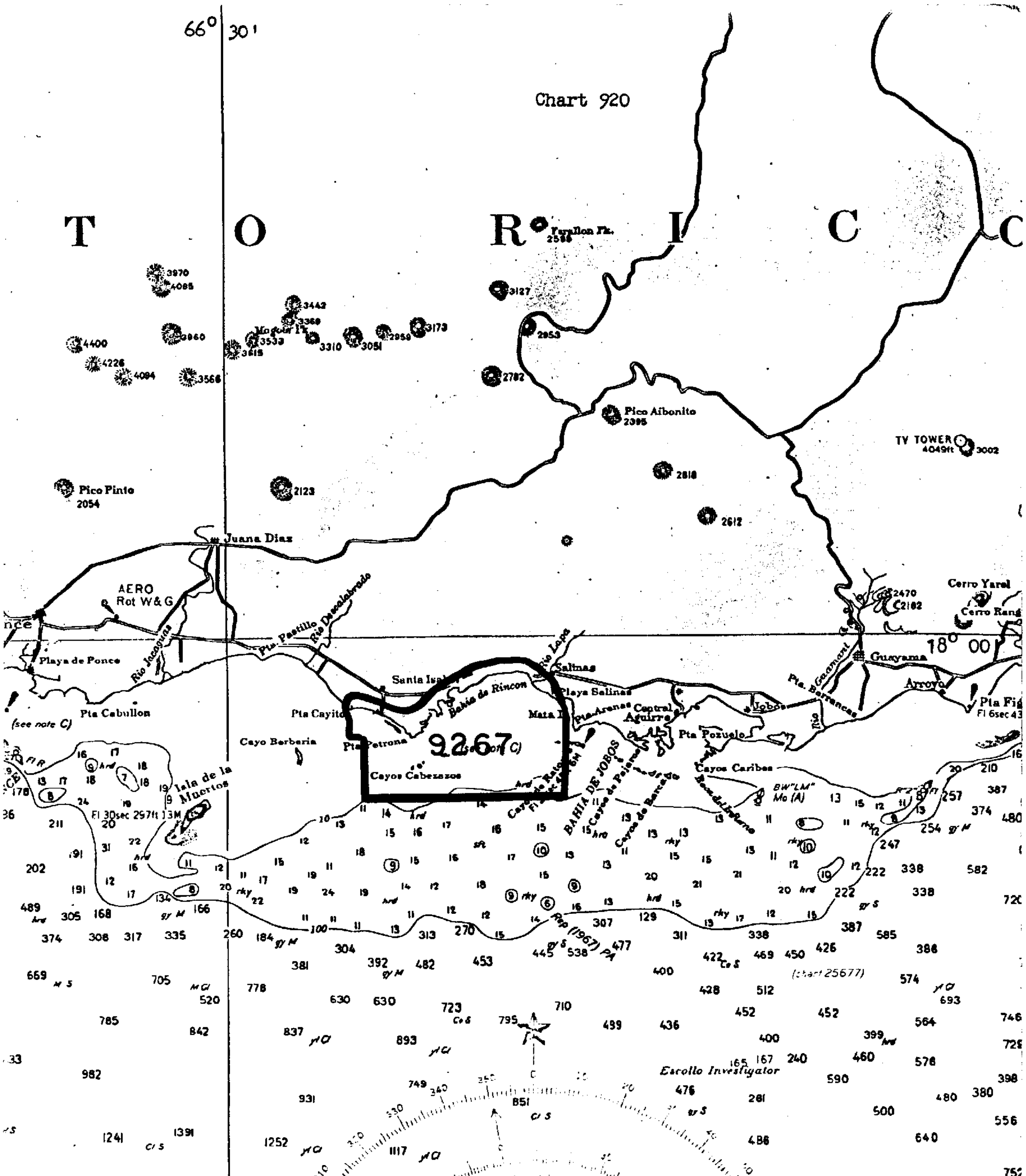
8. Reference section 7 of the Verifier's Report:

The edition of chart 25687 (formerly 909) used for comparison during verification was a later edition than the one current at the time of the survey (see provisional manual-sections 5.3.4(L) and 6.3.10). This did not affect the quality of the Verifier's Report in this particular case inasmuch as the chart had not been revised in the survey area. However, had it been revised since the date of the survey, it would have been necessary to consider each revision which, judging by past experience, could have required many additional hours of the verifier's and quality control inspector's time. Past editions of charts which are not available at the Marine Center should be ordered from the Physical Science Services Branch (C513) at Rockville.

9. Section 7a of the Verifier's Report does not address the pier charted in lat. 17°57'39", long. 66°17'54" but not appearing on the present survey. Section 7a is supplemented by the following:

(24) The pier charted in lat. 17°57'39", long. 66°17'54" originates with Chart Ltr. 322/74. It was not investigated on the present survey and should be retained as charted.

10. Dashed-circled Presurvey Review items are indicated thus to direct attention to particular soundings requiring specific investigation. It is not necessary to include specific comments in the Verifier's Report in cases where such dashed-circled items are verified and adequately developed with shoaler depths shown on the present survey. Several items included in section 7a of the Verifier's Report [e.g., items (6)-(10), (13)-(15), (17), (18), (21), and (22)] refer to such dashed-circled P.S.R. items verified by the present survey and are therefore considered superfluous therein. Comments concerning dashed-circled items included in the Verifier's Report should be limited to items not verified or disproved by the present survey and which, therefore, require further consideration and/or retention on the present survey.


66° 30'
Chart 920
T O R I C C
Farallon Pk. 2588
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TV TOWER 4049ft
Pico Pinto 2054
Juana Diaz
AERO Rot W & G
Cerro Yarel
Playa de Ponce
Rio Jacaguas
Pta Pastillo
Rio Descalabrado
Santa Isabel
Bahia de Rincon
Rio Lapa
Salinas
Playa Salinas
Pta Arenas
Central Aguirre
Mata B
Pta Cabullon
(see note C)
Pta Cayito
Pta Petrona
Cayo Berberia
Cayos Cabezazos
9267
Isla de la Muertos
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Pta Pozuelo
Cayos Caribes
Guayama
Arroyo
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FORM C&GS-8352
(3-25-63)

NAUTICAL CHART DIVISION

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. 9267

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
25687	6/7/78	JAY Sherman	~~Full~~ Part ~~Before~~ After Verification Review (Quality control) Inspection Signed Via
(909)			Drawing No. Appld critical curves & sdgs only
25687	21 sept 79	Alex. Radialevich	Full ~~Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. 9, Q.C. APPLIED directly to the chart.
926 (25685)	5-21-80	B. Fernandes	Full ~~Part Before~~ After Verification Review Inspection Signed Via
			Drawing No.
25677	2-6-81	B. Fernandes	Full ~~Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. Quality Controlled
25640	6-28-82	R. Richter	Full ~~Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. Quality Control
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
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