

# 10083

Diagram No. 901-2 & 920

NOAA FORM 76-35A

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

## DESCRIPTIVE REPORT

Type of Survey ... Hydrographic

Field No. .... MI-80-3-83

Office No. .... H-10083

### LOCALITY

State ..... Puerto Rico

General Locality .. Atlantic Ocean

Locality ..... Offshore—PTA Sardina

..... to San Juan

..... 19 83

..... CHIEF OF PARTY  
..... CAPT J.A. Yeager

### LIBRARY & ARCHIVES

DATE ..... February 21, 1985

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

HCPG

CHTS

25640

25668

25671

} to sign off see  
Record of Application

# 10083

## HYDROGRAPHIC TITLE SHEET

H-10083

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

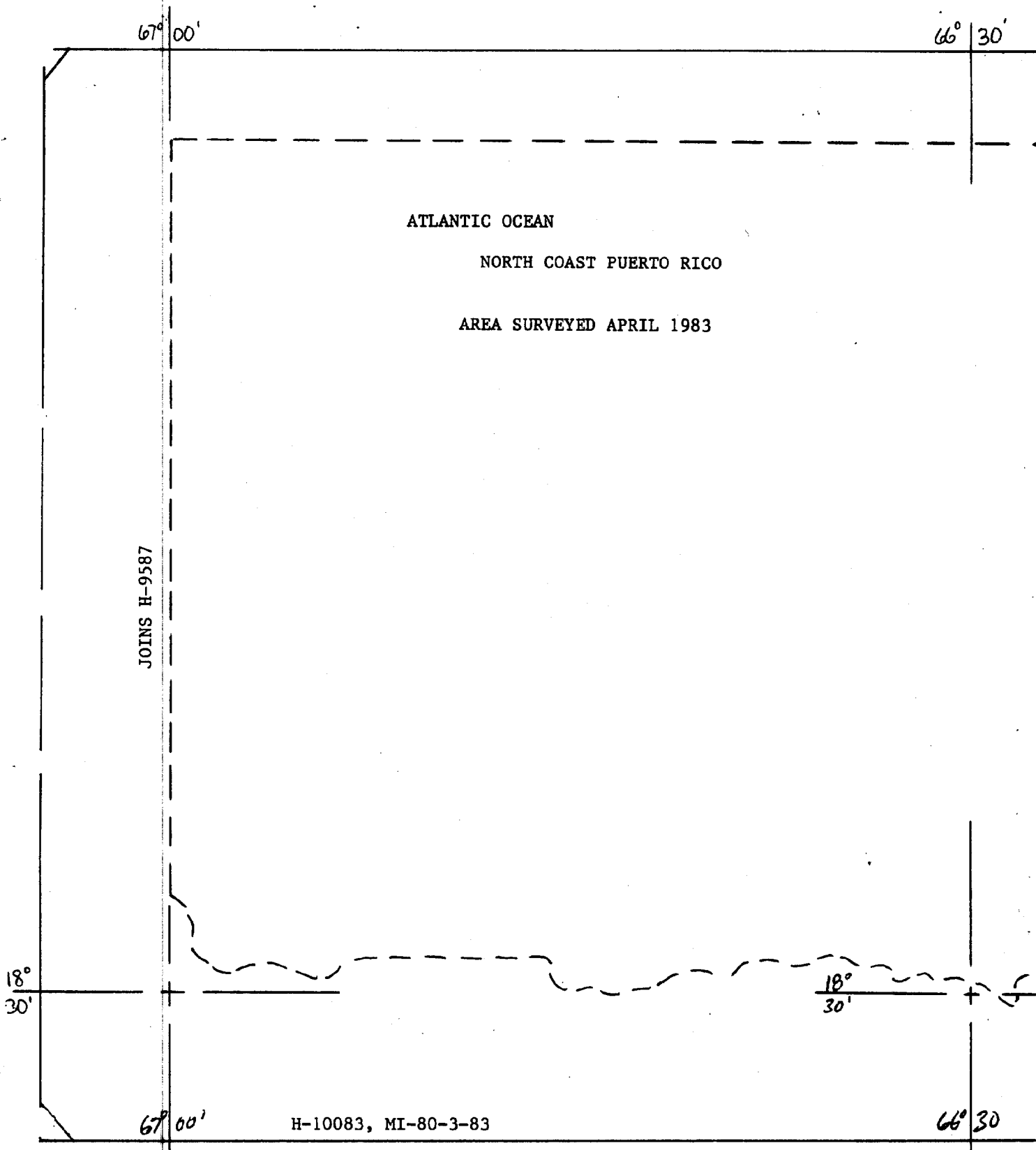
FIELD NO.

MI-80-3-83

State Puerto RicoGeneral locality Atlantic OceanLocality ~~North Coast of Puerto Rico~~ OFFSHORE - PTA SARDINA, Quebradillas to San JuanScale 1:80,000Date of survey 10 April 1983 - 20 April 1983Instructions dated 1 December 1982Project No. OPR-1149-MI-83Vessel NOAA Ship MT MITCHELL S-222 (VESNO 2220)Chief of party J. Austin Yeager CAPT/NOAASurveyed by Ship's Officers (see remarks)Soundings taken by echo sounder, hand lead, pole echo sounderGraphic record scaled by RW, EM, UG, RC, EM, MS, BJGraphic record checked by RW, EM, UG, RC, EM, MS, BJProtracted by XYNETICS 1201 PLOTTER (AMC)  
Automated plot by AMC Digital PlotterSoundings <sup>VERIFIED BY</sup> penciled by M.W. HollowaySoundings in fathoms feet at MLW MLLW Fathoms at MLLWREMARKS: LCDR L.<sup>N</sup> Lapine (XO)LT R.<sup>L</sup> Parsons (FOO)LT D.<sup>R</sup> RiceLT(jg) G.<sup>R</sup> YatesENS B.<sup>L</sup> CoakleyENS C.<sup>N</sup> McLeanENS D.<sup>I</sup> Crews (OIC)ENS J.<sup>A</sup> MillerENS J.<sup>L</sup> Hendrix

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

STANDARDS CK'D 2-25-85C. LOYAWOIS + SURF checks M&M 9/23/85ENS W. Sites



PROGRESS SKETCH HYDROGRAPHIC OPERATIONS OPR-1149-MI-83  
NOAA SHIP MT. MITCHELL S-222, J. AUSTIN YEAGER, CAPT., NOAA

SCALE OF CHART 25640  
SHEET 1 of 2

66° 30'

ATLANTIC OCEAN

NORTH COAST OF PUERTO RICO

AREA SURVEYED APRIL 1983

JOINS H-10076

JOINS H-10078

18°  
30'

18°  
30'

H-10083, MI-80-3-83

66° 30'

PROGRESS SKETCH (CONTD)

SCALE OF CHART 25640  
SHEET 2 of 2

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\* FILED WITH ORIGINAL FIELD RECORDS.

A. PROJECT

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

B. AREA SURVEYED

THE SURVEY AREA IS BOUNDED ON THE NORTH BY LATITUDE  $19^{\circ}01.4N$ , ON THE WEST BY LONGITUDE  $67^{\circ}01.3W$ , ON THE SOUTH BY THE <sup>APPROXIMATE 50</sup> 100 FATHOM CURVE AND ON THE EAST BY LONGITUDE  $66^{\circ}06.3W$  (SURVEY H-10078) AND LONGITUDE  $66^{\circ}11.5W$  (SURVEY H-10076). THE SURVEY WAS CONDUCTED FROM 10 APRIL 1983 (JD 100) TO 20 APRIL 1983 (JD 110). SURVEY DATA WAS COLLECTED ON EACH DAY.

C. SOUNDING VESSEL

SOUNDINGS WERE OBTAINED FOR THE SURVEY BY NOAA SHIP MT MITCHELL S-222 (VESNO 2220).

D. SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO SOUNDINGS

ALL SOUNDINGS WERE MADE IN FATHOMS USING THE TRANSDUCER LOCATED IN SOUNDING ROOM TWO, LOCATED 6 METERS AFT OF THE ANTENNA. THE DISTANCE BETWEEN THE ANTENNA AND TRANSDUCER (ANDIST) IS CORRECTED FOR ON THE PARAMETER TAPES. THE FOLLOWING SOUNDING EQUIPMENT WAS USED IN GATHERING SOUNDING DATA:

<u>EQUIPMENT</u>	<u>SERIAL NUMBER</u>
UNIVERSAL GRAPHIC RECORDER MODEL 196C	184
EDO WESTERN DIGITRAK MODEL 261C	226
RAYTHEON PTR	008
ROSS MODEL 5000 FINELINE DEPTH RECORDER	1050
ROSS MODEL 6000 DIGITIZER	1104
ROSS MODEL 4000 TRANSCEIVER	1104

SURVEY RECORDS WERE SCANNED BY TRAINED SURVEY DEPARTMENT PERSONNEL AND OFFICERS, AND REVIEWED BY THE OFFICER-IN-CHARGE. PEAKS AND DEEPS CONSIDERED SIGNIFICANT, WHICH OCCURRED BETWEEN SOUNDINGS, WERE INSERTED ON THE ELECTRONIC CORRECTOR TAPES. DIGITIZING ERRORS WERE ALSO CORRECTED VIA THE ELECTRONIC CORRECTOR TAPE. SOUNDINGS IN WATER LESS THAN 200 FATHOMS WERE OBTAINED USING THE UGR AND SUPPLEMENTED WITH DATA FROM THE ROSS FINELINE DEPTH RECORDER IF THE DEPTHS DIFFERED SIGNIFICANTLY. DUE TO ELECTRONIC PROBLEMS WHICH NECESSITATED SECURING THE SHIP'S ONLINE COMPUTER SYSTEM, SOME SOUNDING DATA WAS OBTAINED USING THE UGR AND LOGGED USING A HYDROGRAPHIC LOGGER. THE LOGGER DATA WAS THEN REFORMATED INTO MASTER TAPE FORMAT. THIS OCCURRED BETWEEN Pos. 124 AND Pos. 155 ON JD 101 (DISCUSSED FURTHER IN SECTION G).

UGR PHASE CHECKS WERE MADE FREQUENTLY ONLINE. ADJUSTMENTS WERE MADE WHEN NECESSARY AND NOTED IN THE SOUNDING VOLUME, ON THE FATHOGRAM AND ON THE COMPUTER PRINTOUT. DEPARTURES OF THE TRACE FROM THE CALIBRATION WERE CORRECTED IN THE SCANNING PROCESS. FREQUENT SCALE CHECKS WERE MADE ON THE UGR.

VELOCITY CORRECTIONS FOR THE SURVEY ARE BASED ON A NANSEN CAST TAKEN 26 MARCH 1983 AT LATITUDE 18°59.0N, LONGITUDE 66°31.4W. A PRINTOUT OF VELOCITY TABLE III AND ITS ASSOCIATED VELOCITY CURVE APPEARS IN APPENDIX D.

THE TRANSDUCER DRAFT FOR SOUNDING ROOM NUMBER TWO WAS DETERMINED ON 15 FEBRUARY 1983 IN SAN JUAN HARBOR, PUERTO RICO. A TRANSDUCER DRAFT OF 2.25 FATHOMS WAS DETERMINED BY MEASURING THE DISTANCE FROM THE SHIP'S RAIL TO THE WATERLINE, AND THEN SUBTRACTING THIS DISTANCE FROM THE KNOWN DISTANCE OF THE RAIL TO THE TRANSDUCER. THIS TRA CORRECTION OF 2.3 FATHOMS WAS APPLIED TO ALL SOUNDINGS VIA THE ELECTRONIC CORRECTOR TAPE.

SETTLEMENT AND SQUAT CORRECTORS FOR THE SOUNDING VESSEL WERE DETERMINED 26 JULY 1981 OFF CAPE CHARLES, VIRGINIA. A COPY OF THE SETTLEMENT AND SQUAT REPORT IS INCLUDED IN APPENDIX D. A TC/TI TAPE WAS PREPARED FROM THIS DATA AND IS INCLUDED WITH THE SURVEY DATA. SETTLEMENT AND SQUAT CORRECTIONS ARE TO BE APPLIED IN THE FINAL PROCESSING STAGE BY MOA23, PROCESSING DIVISION, ATLANTIC MARINE CENTER.

THE SURVEY WAS PERFORMED USING PREDICTED TIDES BASED ON DAILY TIDE PREDICTION AT SAN JUAN, PUERTO RICO (TIDE STATION 975-5731) WITH TIDAL ZONING TO BE APPLIED IN ACCORDANCE WITH PROJECT INSTRUCTIONS OPR I 149-MI-83. SMOOTH TIDES WERE REQUESTED IN A LETTER DATED 23 APRIL 1983 FROM THE CHIEF, TIDES AND WATER LEVELS BRANCH, (N/OMS12). PREDICTED TIDES WERE APPLIED DURING SOUNDING OPERATION USING RK 112.

#### E. HYDROGRAPHIC SHEETS

THE SURVEY WAS PLOTTED ON THREE MYLAR SHEETS PREPARED BY MT MITCHELL'S HYDROPLOT SYSTEM USING PROGRAM RK 201.

<u>NUMBER OF SHEETS</u>	<u>TYPE</u>	<u>SKEW</u>
3	MAINScheme, CROSSLINES, DEVELOPMENTS	90,21,36



SOUNDINGS ON FIELD SHEETS ARE CORRECTED FOR DRAFT, PREDICTED TIDES, DIGITIZING ERRORS AND SOUND VELOCITY. PROCESSING DIVISION, ATLANTIC MARINE CENTER (MOA23), NORFOLK, VIRGINIA WILL APPLY SMOOTH TIDES AND SETTLEMENT AND SQUAT CORRECTORS IN PLOTTING FINAL SMOOTH SHEETS.

ALL FIELD RECORDS AND THE FOLLOWING TAPES HAVE BEEN FORWARDED BY THE AMC PROCESSING DIVISION FOR VERIFICATION AND SMOOTH PLOTTING:

RANGE/RANGE MASTER TAPES  
ELECTRONIC CORRECTOR TAPES  
VELOCITY CORRECTOR TAPE  
PARAMETER TAPES  
SIGNAL TAPE  
TC/TI TAPE

F. CONTROL STATIONS

HYDROTRAC EQUIPMENT WAS SET UP AT THE FOLLOWING CONTROL STATIONS:

<u>STATION</u>	<u>NAME</u>	<u>LATITUDE (N)</u>	<u>LONGITUDE (W)</u>
020	LIGHTHOUSE RM3, 1983	18°21 01.332	65°37 07.586
302	HELECHO ECC, 1983	18°14 52.669	66°48 43.064

THE STATIONS WERE ESTABLISHED USING THIRD ORDER CLASS I SURVEY METHODS BASED ON THE PUERTO RICAN DATUM 1927. LIGHT HOUSE RM3 WAS ESTABLISHED BY PERSONNEL FROM OPERATIONS DIVISION, ATLANTIC MARINE CENTER AND IS A MONUMENTED STATION. HELECHO ECC WAS ESTABLISHED BY SHIP'S PERSONNEL AND IS NOT MONUMENTED. A COMPLETE LIST OF STATIONS AND THE GEOGRAPHIC POSITIONS FOR EACH IS INCLUDED AS APPENDIX F OF THIS REPORT.

G. HYDROGRAPHIC POSITION CONTROL

POSITION CONTROL FOR THE SURVEY WAS OBTAINED USING HYDROTRAC, MANUFACTURED BY ODOM OFFSHORE SURVEYS INC., OPERATED IN THE RANGE/RANGE MODE.

THE FOLLOWING HYDROTRAC EQUIPMENT, OPERATING AT A FREQUENCY OF 1718.59 KHZ, WAS USED IN CONDUCTING THE SURVEY:

<u>MASTER</u>		<u>SERIAL NUMBER</u>
STATION 20	RECEIVER/SLAVE DRIVE UNIT	226
	LINEAR POWER AMPLIFIER	540
	COUPLER	131
	POWER SUPPLY	620
STATION 302	RECEIVER/SLAVE DRIVE UNIT	215
	LINEAR POWER AMPLIFIER	537
	COUPLER	722
	POWER SUPPLY	754
VESNO 2220	HYDROTRAC RECEIVER	326
	SAWTOOTH RECORDER	8501
	LINEAR POWER AMPLIFIER	538
	MASTER DRIVE UNIT	122

LANE COUNTS AND PARTIAL CORRECTORS WERE DETERMINED USING THREE POINT SEXTANT FIX AT THE SAN JUAN HARBOR ENTRANCE AND OFFSHORE AT ARECIBO. LANE CHECKS WERE MADE BY STEERING A KNOWN RANGE AND OBTAINING ANGLES TO A POINT WHILE ON RANGE. THE SAWTOOTH RECORDER WAS MONITORED THROUGHOUT THE PERIOD OF HYDROGRAPHY, WITH THE COUNT MARKED ON THE SAWTOOTH RECORD. THE SAWTOOTH WAS COMPARED TO THE DIGITAL READOUT ON THE HYDROTRAC RECEIVER DURING SURVEY OPERATIONS.

BEGINNING AT POSITION 157 ON JD 101, AN INTERMITTENT ERROR MESSAGE (NAVERR 01) WAS BEING REGISTERED BY THE HYDROPLOT SYSTEM. A NAVERR 01 OCCURS WHENEVER EITHER OF THE LOP'S EXCEED THE SPEED ALLOWED BY THE INPUT PARAMETERS. SINCE NEITHER THE ACTUAL SPEED OF THE VESSEL NOR THE MOTION OF THE HYDROTRAC ANTENNA COULD ACCOUNT FOR THIS ERROR MESSAGE, THE SURVEY CONTINUED WHILE AN ATTEMPT TO SOLVE THE PROBLEM WAS MADE.

ON CLOSE INSPECTION OF THE TELETYPE PRINTOUT, IT WAS NOTED THAT THE PATTERN FROM STATION 2 (HELECHO ECC) WAS NOT CHANGING AT A CONSISTENT RATE AS SHOULD HAVE BEEN OCCURRING. THE PATTERNS AS SHOWN ON THE HYDROTRAC DIGITAL DISPLAY WERE PROPERLY CHANGING, GIVEN THE SHIP'S COURSE AND SPEED AT THE TIME, BUT THE PATTERNS RECEIVED BY THE COMPUTER WERE NOT THE SAME. THE TELETYPE RECORD SHOWED THAT THE PATTERN DIFFERENCES BETWEEN CONSECUTIVE SOUNDINGS WERE VARYING BETWEEN TWO AND FOUR LANES. THE RECORD WAS ANALYZED, THE CORRECT LANE CHANGE DIFFERENCES WERE DETERMINED, AND THE MASTER DATA TAPE BETWEEN POSITION 157 (JD 101) AND POSITION 301 (JD 102) WAS EDITED TO REFLECT THESE CORRECTIONS.

IT WAS DETERMINED THAT THIS PROBLEM WAS CAUSED BY AN ELECTRONIC MALFUNCTION IN THE SERIAL/PARALLEL INTERFACE (S-P/SAW MODEL 900, S/N 103), WHICH CAUSED THE SERIAL DATA FROM PATTERN TWO OF THE HYDROTRAC TO BE INCORRECTLY CONVERTED TO PARALLEL DATA. AS A RESULT OF THIS MALFUNCTION, MANY OF THE DIGITS IN THE UNIT'S POSITION WERE EITHER ONE LANE HIGH OR ONE LANE LOW. THIS PROBLEM WAS CORRECTED AND NO CORRECTIONS TO THE DATA WERE NEEDED AFTER POSITION 301 (JD 102).

#### H. SHORELINE

NO SHORELINE APPEARS IN THE SURVEY AREA.

I. CROSSLINES

CROSSLINES WERE RUN BETWEEN 45° AND 90° TO THE MAINSCHEME. THE CROSSLINES AMOUNTED TO 7% OF THE MAINSCHEME HYDROGRAPHY. AGREEMENT BETWEEN CROSSLINES AND MAINSCHEME HYDROGRAPHY WAS EXCELLENT.

J. JUNCTION SURVEYS *SEE SECTION 5 OF THE EVALUATION REPORT.*

THIS SURVEY JUNCTIONS WITH THE FOLLOWING SURVEYS:

<u>SURVEY</u>	<u>SCALE</u>	<u>YEAR</u>	<u>AREA OF JUNCTION</u>
H-9587	1:125,000	1976	WESTERN LIMIT
H-10076	1:80,000	1983	EASTERN LIMIT
H-10078	1:20,000	1983	SOUTHEASTERN CORNER

SURVEY H-9587 JUNCTION AGREES VERY WELL WITH THE CURRENT SURVEY. NO MAJOR DISCREPANCIES ARE NOTED.

SURVEY H-10076 AND THIS SURVEY ARE CONTIGUOUS SURVEYS RUN DURING THE SAME SEASON. THE AGREEMENT BETWEEN JUNCTIONED SOUNDINGS IS EXCELLENT.

SURVEY H-10078 AND THE CURRENT SURVEY JUNCTION ARE CONTIGUOUS. THE AGREEMENT BETWEEN JUNCTIONED SOUNDINGS IS EXCELLENT.

K. COMPARISON TO PRIOR SURVEYS *SEE SECTION 6 OF THE EVALUATION REPORT.*

THE SURVEY WAS COMPARED TO THE FOLLOWING PRIOR SURVEYS:

<u>SURVEY</u>	<u>SCALE</u>	<u>DATE</u>
H-2677	1:20,000	1904
H-2934	1:20,000	1908
H-2935	1:20,000	1908
H-2936	1:20,000	1908
H-2937	1:20,000	1908
H-3006	1:326,856	1909
<i>H-2874</i>	<i>1:80,000</i>	<i>1907</i>

COMPARISON WITH H-2677 WAS VERY LIMITED DUE TO THE SMALL AREA OF THE CURRENT SURVEY COVERED BY THE PRIOR SURVEYS. LESS THAN 10% OF THE SELECTED SOUNDINGS MET THE  $\pm 1\%$  CRITERION AS SPECIFIED BY THE HYDROGRAPHIC MANUAL. FIFTY-THREE PERCENT OF SOUNDINGS DISAGREED BY MORE THAN  $\pm 1\%$ , BUT BY LESS THAN 50 FATHOMS. THIRTY PERCENT AGREED BETWEEN 50 FATHOMS AND 100 FATHOMS. THE REMAINDER DISAGREED BY 100 FATHOMS OR MORE. NO PATTERN OF CHANGE WAS DISCERNABLE IN THE AREA CONCERNED.

COMPARISON BETWEEN H-2934 AND THE CURRENT SURVEY SHOWED AN AGREEMENT OF  $\pm 1\%$  IN 39% OF SELECTED DEPTHS COMPARED. FORTY-TWO PERCENT DISAGREED BY MORE THAN  $\pm 1\%$  BUT LESS THAN 50 FATHOMS. TWELVE PERCENT DISAGREED BY 50 FATHOMS BUT LESS THAN 100 FATHOMS. THREE PERCENT DISAGREED BY 100 FATHOMS BUT LESS THAN 200 FATHOMS. FOUR PERCENT DISAGREED BY 200 FATHOMS OR MORE.

SELECTED SOUNDINGS COMPARED BETWEEN H-2935 AND THE SURVEY SHOWED THAT 31% AGREED WITHIN  $\pm 1\%$  OF THE SURVEY DEPTH. FIFTY-EIGHT PERCENT OF COMPARED SOUNDINGS DISAGREED BY MORE THAN 1% BUT LESS THAN 50 FATHOMS. SIXTEEN PERCENT DISAGREED FROM 50 TO 100 FATHOMS. NO DISAGREEMENT BY MORE THAN 100 FATHOMS WAS OBSERVED BETWEEN THE CURRENT AND PRIOR SURVEY.

H-2936 AND THE SURVEY SHOWED THAT 35% OF THE SOUNDINGS AGREE TO  $\pm 1\%$ . FIFTY-SEVEN PERCENT DISAGREED BY MORE THAN 1%, BUT LESS

THAN 50 FATHOMS. SEVEN PERCENT DISAGREED BY 50 FATHOMS OR MORE, BUT LESS THAN 100 FATHOMS. AGAIN, NO COMPARED SOUNDINGS DISAGREED BY MORE THAN 100 FATHOMS.

H-2937 AGREED WITH THE CURRENT SURVEY WITHIN  $\pm 1\%$  OF CHARTED DEPTH IN 33% OF THE COMPARED SOUNDINGS. DISAGREEMENT OF MORE THAN 1% BUT LESS THAN 50 FATHOMS OCCURRED IN 58% OF COMPARISONS. EIGHT PERCENT DISAGREED BY MORE THAN 50 FATHOMS BUT LESS THAN 100 FATHOMS. NO SOUNDINGS WERE IN DISAGREEMENT BY MORE THAN 100 FATHOMS.

H-3006 CONSISTED OF A VERY LIMITED NUMBER OF SOUNDINGS IN VERY DEEP WATER (700+ FATHOMS). THE DEPTHS AGREE TO WITHIN  $\pm 1\%$  OF COMPARED SOUNDINGS. THIRTY-EIGHT PERCENT DISAGREE BY MORE THAN 1% BUT LESS THAN 50 FATHOMS. DISAGREEMENT OF 50 FATHOMS OR MORE BUT LESS THAN 100 FATHOMS, 100 FATHOMS OR MORE BUT LESS THAN 200 FATHOMS, AND 200 FATHOMS OR MORE, EACH REPRESENT 17% OF ALL COMPARED SOUNDINGS. THERE IS NO APPARENT PATTERN TO INDICATE ANY CONSISTENT BOTTOM CHANGE.

L. CHART COMPARISON *SEE SECTION 7. OF THE EVALUATION REPORT.*

THE SURVEY WAS COMPARED TO THE FOLLOWING CHARTS:

<u>CHART</u>	<u>SCALE</u>	<u>EDITION</u>	<u>DATE</u>
25640	1:326,856	29TH	AUG. 22, 1981
25668	1:100,000	11TH	AUG. 28, 1982
25671	1:100,000	14TH	JUNE 14, 1980

THE FOLLOWING COMPARISONS OCCURRED BETWEEN THE SURVEY AND CHART NUMBER 25640:

- 13%: WITHIN  $\pm 1\%$  OF CHARTED DEPTH.
- 51%: MORE THAN  $\pm 1\%$ , BUT LESS THAN 100 FATHOMS.
- 19%: 100 FATHOMS OR MORE, BUT LESS THAN 200 FATHOMS.
- 11%: 200 FATHOMS OR MORE, BUT LESS THAN 300 FATHOMS.
- 5%: 300 FATHOMS OR MORE.

DEPTHS ON THE CHART SOUTH OF  $18^{\circ}35.0N$  HAVE BEEN TRANSFERRED FROM PRIOR SURVEYS REVIEWED EARLIER IN THIS REPORT. WITH THE EXCEPTION OF SOUNDINGS TRANSFERRED FROM SURVEY H-3006, NO SOUNDINGS NORTH OF  $18^{\circ}35N$  HAVE BEEN PREVIOUSLY COMPARED. IT IS BELIEVED THE DEPTHS IN THE AREA NORTH OF  $18^{\circ}35N$  ARE TRANSFERRED FROM BRITISH AND DUTCH MID-NINETEENTH CENTURY CHARTS AND SURVEYS WHICH WERE NOT AVAILABLE TO THE HYDROGRAPHER. THE DIFFERENCES BETWEEN THE CHART AND THE SURVEY DO NOT OCCUR IN ANY DISCERNABLE PATTERN OR ORDER.

THE FOLLOWING ARE COMPARISONS BETWEEN THE SURVEY AND CHART NUMBER 25668:

- 27%: WITHIN  $\pm 1\%$  OF CHARTED DEPTH.
- 46%: MORE THAN  $\pm 1\%$ , BUT LESS THAN 50 FATHOMS.
- 16%: 50 FATHOMS OR MORE, BUT LESS THAN 100 FATHOMS.
- 8%: 100 FATHOMS OR MORE, BUT LESS THAN 200 FATHOMS.
- 3%: 200 FATHOMS OR MORE.

THE DIFFERENCES WERE DISPERSED THROUGHOUT THE SURVEY AREA AND IN NO DISCERNABLE PATTERN.

THE COMPARISON OF THE SURVEY TO CHART NUMBER 25671 SHOWED THE FOLLOWING DIFFERENCES:

21%: WITHIN  $\pm 1\%$ .

64%: MORE THAN  $\pm 1\%$ , BUT LESS THAN 50 FATHOMS.

14%: 50 FATHOMS OR MORE, BUT LESS THAN 100 FATHOMS.

THE AREA OF THE SURVEY COVERED BY CHART NUMBER 25671 IS SMALL. THEREFORE, ONLY A VERY LIMITED NUMBER OF DEPTHS WERE AVAILABLE FOR COMPARISON.

#### M. ADEQUACY OF THE SURVEY

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

#### N. AIDS TO NAVIGATION

*FIXED OR FLOATING*  
NO AIDS TO NAVIGATION APPEAR IN THE SURVEY AREA.

#### O. STATISTICS

LINEAR MILES MAINSCHEME HYDROGRAPHY	1880.55
LINEAR MILES CROSSLINES	136.2
LINEAR MILES DEVELOPMENT	69.25
TOTAL LINEAR MILES HYDROGRAPHY	2086
TOTAL SQUARE MILES HYDROGRAPHY	1548
TOTAL MISCELLANEOUS MILES	364.05
TOTAL MILES	2450.05
TOTAL NUMBER OF POSITIONS	1753
NANSEN CASTS	1
TIDE STATIONS	1
BOTTOM SAMPLES	0



P. MISCELLANEOUS

NO BOTTOM SAMPLES WERE GATHERED FOR THE SURVEY DUE TO THE STEEP SLOPE AND GREAT DEPTH IN THE SURVEY AREA. *BOTTOM CHARACTERISTICS WERE CARRIED FORWARD FROM PRIOR SURVEYS*

Q. RECOMMENDATIONS

IT IS RECOMMENDED THAT THIS SURVEY SUPERSEDE ALL PRIOR SURVEYS FOR CHARTING.

R. AUTOMATED DATA PROCESSING

		<u>DATE</u>
RK 112	RANGE/RANGE REAL TIME PLOT	08-04-81
RK 201	GRID, SIGNAL & LATTICE	04-18-75
RK 211	RANGE/RANGE NON-REAL TIME PLOT	02-02-81
RK 300	UTILITY COMPUTATIONS	10-21-80
RK 330	DATA REFORMAT AND CHECK	05-04-75
RK 360	ELECTRONIC CORRECTOR TAPE ABSTRACT	02-02-76
RK 409	GEODETIC UTILITY PACKAGE	09-20-78
AM 500	PREDICTED TIDE GENERATOR	11-10-72
RK 530	VELOCITY CORRECTIONS COMPUTATIONS	05-10-76
RK 561	GEODETIC CALIBRATION	02-19-76
AM 602	EXTENDED LINE ORIENTED EDITOR	05-20-75

S. REFERENCE TO REPORTS

COAST PILOT REPORT  
HORIZONTAL CONTROL REPORT  
HUMPBACK WHALE SURVEY REPORT

RESPECTFULLY SUBMITTED,

*Donald I. Crews*

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DONALD I. CREWS, ENSIGN, NOAA

APPENDIX F  
LIST OF STATIONS

## Signal Name List

Survey H-10083

MI-80-3-83

020 LIGHTHOUSE RM3, 1983

~~053 CAPITOL DOME SAN JUAN CAPITOL CUPOLA, 1927~~~~060 ST. AUGUSTINE CHURCH SPIRE CATHEDRAL CUPOLA, 1927~~~~070 MORRO LIGHTHOUSE 1900~~~~080 CATANO FRONT RANGE RR LIGHT, 1938~~~~090 CATANO REAR RANGE RR LIGHT, 1938~~~~140 LEVITTOWN MUN. TANK, 1964~~~~270 ARECIBO LIGHTHOUSE USOS, 1901~~~~274 ARECIBO CHURCH, 1901~~~~275 QUEBRAS 1901~~~~276 ARECIBO CENTRAL CAMBALCHE STACK, 1966~~~~302 HELECHO ECC, 1983~~~~065 SAN JUAN USCG PORT RAD BERRON, 1966~~

102 ISLA DE CABRAS LT, 1983

Signal GP List Survey H-10083 MI-80-3-83

020	4	18	23	01332	065	37	07586	250	0000	171859
053	4	18	28	07568	066	06	22738	139	0000	000000
060	4	18	28	02903	066	05	57971	139	0000	000000
070	4	18	28	22774	066	07	26371	139	0000	000000
080	4	18	27	24242	066	07	49410	139	0000	000000
090	4	18	26	44315	066	07	55044	139	0000	000000
140	4	18	27	02164	066	10	50239	139	0000	000000
270	4	18	29	02277	066	41	56707	139	0000	000000
274	4	18	28	26907	066	42	55989	139	0000	000000
275	4	18	28	57777	066	46	37363	139	0000	000000
276	4	18	27	25043	066	42	05938	139	0000	000000
302	4	18	14	52669	066	48	43064	250	0702	171859

065 4 18 28 13623 066 07 02540 139

102 4 18 28 37242 066 08 24527 139

APPENDIX I  
LANDMARKS FOR CHARTS  
(There were no landmarks in this survey area)

APPENDIX J  
APPROVAL SHEET

Approval Sheet

Date May 13, 1983

Survey H-10083

Field No. MI-80-3-83

The field work for this survey was conducted under my daily review and supervision. I have reviewed this report with the final field sheet and approve them and the accompanying records. Together they represent a complete survey adequate to supercede all prior surveys for charting purposes, with exceptions noted in the body of this report.

*J. Austin Yeager*  
Captain J. Austin Yeager, NOAA  
Commanding,  
NOAA SHIP MT MITCHEL

DATE: October 4, 1983

*Orig in H10073 files*

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

TIDE NOTE FOR HYDROGRAPHIC SHEET

Processing Division: Atlantic Marine Center:

Hourly heights are approved for

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

Period: April 10 - 20, 1983

HYDROGRAPHIC SHEET: H-10083

OPR: 1149

Locality: Offshore Island of Puerto Rico

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

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

REMARKS: Recommended Zoning:

1. West of longitude  $66^{\circ}30.0'$  apply - 15 minute time correction.
2. East of  $66^{\circ}30.'$  zone direct.

*James R. Hubbard*  
Chief, Tidal Datums Section, Tides & Water  
Levels Branch



## GEOGRAPHIC NAMES

H-10083

Name on Survey

A 255640 NO. 255684  
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 (title)

PUERTO RICO (title)

PUNTA SARDINA (title)

SAN JUAN (title)

Approved:

Chief Geographer -

NOV 21 1984

**HYDROGRAPHIC SURVEY STATISTICS**  
**REGISTRY NO.: H-10083**

Number of positions	<u>1743</u>
Number of soundings	<u>9591</u>
Number of control stations	<u>14</u>

	<u>TIME-HOURS</u>	<u>DATE COMPLETED</u>
Preprocessing Examination	<u>18</u>	<u>6/01/83</u>
Verification of Field Data	<u>176</u>	<u>11/09/84</u>
Quality Control Checks	<u>77</u>	
Evaluation and Analysis	<u>70</u>	<u>12/18/84</u>
Final Inspection	<u>10</u>	<u>12/14/84</u>
TOTAL TIME	<u>351</u>	
Marine Center Approval		<u>12/18/84</u>

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

ATLANTIC MARINE CENTER  
EVALUATION REPORT

SURVEY NO.: H-10083

FIELD NO.: MI-80-3-83

Atlantic Ocean, Offshore -- Pta Sardina to San Juan

SURVEYED: 10 April through 20 April 1983

SCALE: 1:80,000

PROJECT NO.: OPR-II49-MI-83

SOUNDINGS: Raytheon Universal  
Graphics Recorder (UGR),  
Ross Digital Echo Sounder

CONTROL: Odom Offshore  
Hydrotrac  
(Range/Range)

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

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

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

1. INTRODUCTION

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

2. CONTROL AND SHORELINE

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

3. HYDROGRAPHY

- a. Soundings at crossings agree within the criteria stated in sections 4.6.1 and 6.3.4.3 of the Hydrographic Manual and section 6.6 of the Project Instructions.

b. Except in the junctional area where only segments of the 30, 40, 50 and 100 fathom curves could be drawn, the standard curves were drawn in their entirety.

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

#### 4. CONDITIONS OF SURVEY

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

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

b. Standards of accuracy for supplemental control were not met as required by section 3.2.2 of the Project Instructions. The hydrographer used a steel tape and magnetic compass to determine a station for electronic control.

c. No bottom samples were taken as required by sections 1.6.3 and 4.7.1 of the Hydrographic Manual and section 8.1. However, see section P. of the hydrographer's Descriptive Report.

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

e. New velocity graphs were drawn and velocity correctors were revised during office processing. Data presentation was inadequate for determining accuracy of values plotted and scaled.

f. Data for horizontal control was not complete; only nine (9) of twelve (12) stations had supporting data and dates of establishment were omitted on the signal listing.

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

#### 5. JUNCTIONS

H-9587 (1976) to the west

H-10076 (1983) to the east

H-10078 (1983) to the southeast

The comparison between a copy of H-9587 and the present survey smooth sheet shows excellent agreement between soundings in the junctional area. The smooth sheet for H-9587 is archived at Headquarters and a standard junction could not be made.

Excellent junctions were made with H-10076 and H-10078 and the junctional curves are complete and require no further consideration.

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

#### 6. COMPARISON WITH PRIOR SURVEYS

H-2677 (1904) 1:20,000  
H-2874 (1907) 1:80,000  
H-2934 (1908) 1:20,000  
H-2935 (1908) 1:20,000  
H-2936 (1908) 1:20,000  
H-2937 (1908) 1:20,000  
H-3006 (1909) 1:326,856

With the exception of H-3006, the above surveys taken together cover a small portion along the southern part of the present survey from the 400 fathom curve to the 40 fathom curve. H-3006 covers an area across the center of the present survey in a line from the vicinity of Latitude 18°43'30"N, Longitude 66°13'00"W to Latitude 18°41'00"N, Longitude 67°01'00"W.

H-2874 covers only a very small portion of the southeastern edge of the present survey and shows good agreement.

H-2677 agrees well with the present survey. The present survey shows scattered soundings of three (3) to fifteen (15) fathoms deeper than the prior survey.

H-2934 shows good agreement with the present survey. Scattered soundings on the present survey show a difference of three (3) fathom deeper to fifty-one (51) fathoms shoaler.

H-2935 agrees well with the present survey. A few scattered soundings on the present survey show a difference of five (5) fathoms to thirty-nine (39) fathoms that fall between to 100 and 200 fathom curve. These soundings could be in good agreement with a slight change to the depth curves of the prior survey.

H-2936 agrees well with the present survey. Scattered soundings along the 100 fathom and 200 fathom curve show a difference of six (6) fathoms to twenty-two (22) fathoms. These soundings would be in good agreement with a slight shift to the north of the 200 fathom curve from the prior survey.

H-3006 consists of a limited number of soundings across the central portion of the present survey. Present survey depths range from seventy (70) fathoms deeper to 100 fathoms shoaler than the prior survey depths.

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

## 7. COMPARISON WITH CHARTS

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

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

No. 25671 (14th Edition, June 14, 1980)

### a. Hydrography

A small part of the charted hydrography, mainly those soundings within the 400 fathom depth curve, and a limited number of soundings within the 1100 fathom curve originate with the previously discussed prior surveys and is adequately discussed under those comparisons. The remaining charted hydrography probably originates with British Admiralty and Defense Mapping Agency Charts.

Beyond the 400 fathom depth curve, charted soundings range from scattered instances of good agreement to extremes of 300 fathoms shoaler to 428 fathoms deeper than the present survey depths. These differences can be attributed to charting sources of varying ages and accuracies.

Attention is directed to the following:

1) A charted 30 fathom sounding at Latitude 18°30'33"N, Longitude 66°19'12" on Chart No. 25668 is in error. The sounding originates with prior survey H-2934 (1908) and should be charted as 80 fathoms.

2) Charted soundings in the dumpsite located in the vicinity of Latitude 18°30'30"N, Longitude 66°43'15"W should be revised to reflect the present survey.

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

### b. Aids to Navigation

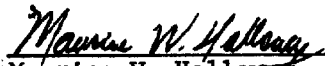
There are no fixed or floating aids to navigation within the limits of the present survey.

## 8. COMPLIANCE WITH INSTRUCTIONS

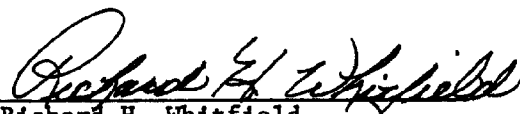
Except as listed elsewhere in this report, this survey adequately complies with the Project Instructions.

9. ADDITIONAL FIELD WORK

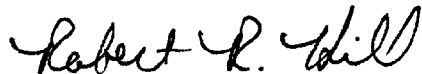
This is an adequate basic survey and no additional field work is recommended. However, for the purpose of bathymetric mapping, additional development and reduced line spacing would have been desirable for defining ridges and troughs.



Maurice W. Holloway  
Cartographic Technician  
Verification of Field Data



Richard H. Whitfield  
Cartographic Technician  
Evaluation and Analysis

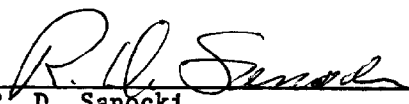


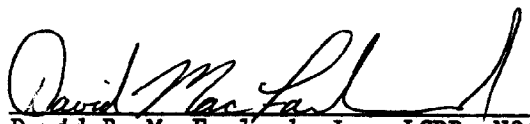
Robert R. Hill  
Senior Cartographic Technician  
Verification Check

Inspection Report  
H-10083


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 Surveys  
Processing Section  
Hydrographic Surveys Branch

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

Approved December 18, 1984

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





## RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10083

## 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.

[illegible]