

H10845

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey Hydrographic / Side Scan Sonar

Field No. WH-10-15-98

Registry No. H10845

LOCALITY

State North Carolina

General Locality North Atlantic Ocean

Locality 6.7 NM Southeast of Fort Macon

1998

CHIEF OF PARTY
LCDR J. W. Humphrey

LIBRARY & ARCHIVES

DATE APR 19 1999

REGISTRY NUMBER:

H10845

HYDROGRAPHIC TITLE SHEET

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

FIELD NUMBER:

WH-10-15-98

State: North Carolina

General locality: North Atlantic Ocean

Locality: Approaches to Morehead City 6.7 NM Southeast of Fort Macon

Scale: 1: 10,000 Date of survey: September 19, 1998 to October 28, 1998

Instructions dated: February 20, 1998 Project Number: OPR-F344-WH

Vessel: NOAA Ship WHITING

Chief of Party: LCDR John W. Humphery

Surveyed by: LCDR John W. Humphery, LT T.A. Haupt, LT(jg) L. Krepp, M.J. Annis, C. Clemens, R. Corson, F.R. Cruz, U.L. Gardner, P.G. Lewit

Soundings taken by echo sounder, hand lead-line, or pole: DSF 6000N fathometer

Graphic record scaled by: WHITING Personnel

Graphic record checked by: WHITING Personnel

Protracted by: N/A Automated plot by: HP 750 (Field) / Hewlett Packard Design Jet 2500C Plotter (Office)

Verification by: Hydrographic Surveys Branch Personnel

Soundings in: Feet: Fathoms: Meters: at MLW: MLLW: (*):

Remarks: Time Zone Used, 0 (UTC)

Basic Hydrographic and 200% Side Scan Sonar

** Notes in Descriptive Report were made in Red
During Office Processing,*

AWOIS/SURFV 3/26/99 SJV

OPR-F344-WH APPROACHES TO MOREHEAD CITY, NC Sheet Layout

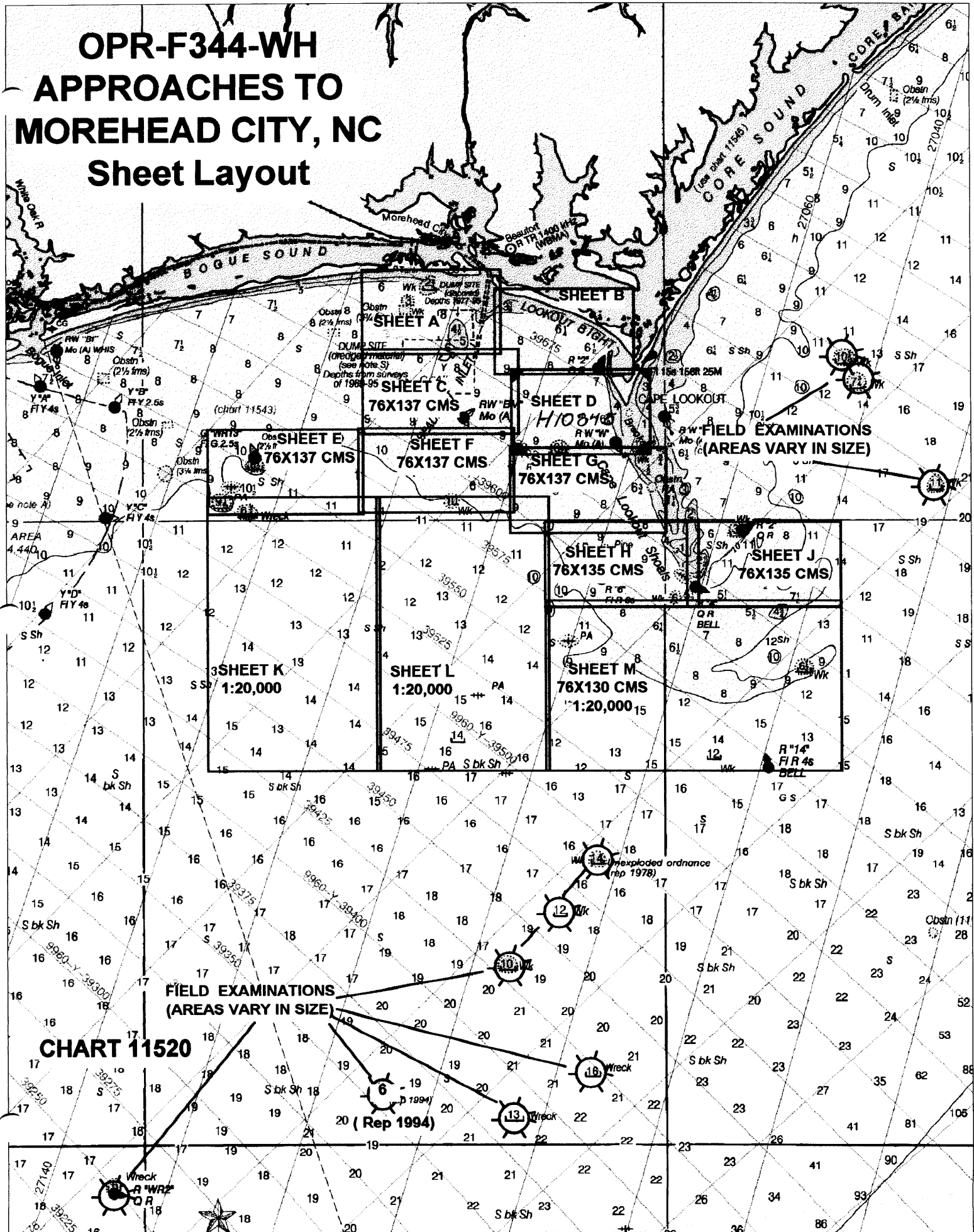


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APPENDICES

SEPARATES

A. PROJECT

A.1 This survey was conducted in accordance with Hydrographic Project Instructions OPR-F344-WH, basic hydrographic survey, Atlantic Ocean, Approaches to Morehead City, North Carolina.

A.2 The original instructions are dated February 20, 1998.

A.3 There have been two changes to the original project instructions. The first change is dated June 30, 1998, and the second change is dated September 02, 1998.

A.4 This Descriptive Report covers H10845 (sheet "D") of OPR-F344-WH. H10845 lies 6.7 nautical miles southeast of Fort Macon, North Carolina. See section B.2 for exact survey boundaries.

A.5 Project OPR-G344-WH responds to a request from the Fifth U.S. Coast Guard District. The USCG is conducting a Port Access Route Study for Morehead City, North Carolina. The study will determine the need for fairways and/or traffic separation schemes for the area. The port of Morehead City is the primary embarkation point for the 2nd Division, U.S. Marine Corps. The area is also host to commercial vessels transporting hazardous cargo such as petroleum products and fertilizers.

B. AREA SURVEYED

B.1 This survey comprises one sheet with the following boundaries, starting at the NW corner and proceeding counterclockwise:

Sheet "D":

1. 34°37'18"N 076°38'54"W
2. 34°33'06"N 076°38'54"W
3. 34°33'06"N 076°32'31"W
4. 34°37'18"N 076°33'46"W

B.2 Data collection for this survey began on September 19, 1998 (DN 262). Data collection ended on October 28, 1998 (DN 301).

C. SURVEY VESSELS

C.1 The following vessels were used during this survey:

VESSEL	EDP NUMBER	PRIMARY FUNCTION
NOAA Ship WHITING	2930 (WTEW)	Hydrography and Side Scan Operations
NOAA Launch WH-1	2931 (1015)	Hydrography and Side Scan Operations
NOAA Launch WH-2	2932 (1014)	Hydrography and Side Scan Operations

C.2 No unusual vessel configurations were used during this survey.

D. AUTOMATED DATA ACQUISITION AND PROCESSING *see also Evaluation Report.*

D.1 All software used for data acquisition and processing is contained on the **HYDROSOFT 8.2 (plus updates as of 4/22/98)** compact disc provided by Atlantic Hydrographic Branch (N/CS33). The following is a list of software used from this disc:

HYPACK for Windows version 7.1a
HSD Utilities
Hydrographic Processing System
HPTools

D.2 The SEABIRD SBE-19 Profiler (CTD) unit was utilized with **SEASOFT 3.3M** and **SEACAT 2.0** software. The program **VELOCITY** (Version 3.1, February 1998) was used to process the collected data and calculate velocity corrections.

E. SONAR EQUIPMENT

E.1 WHITING and its launches conducted all side scan sonar operations using an EG&G Model 260 image-corrected side scan sonar recorder and a 100 kHz Model 272-T towfish.

E.2 The towfish was configured with a 20° beam depression, which is the normal setting and yields the optimum beam correction.

E.3 The 100 kHz frequency was used throughout the survey.

E.4 a. During survey preparation, it was determined that the depth of water in the survey area would require 80 meter line spacing to accommodate a 100 meter side scan sonar range scale. This line spacing and range scale combination was used to obtain complete (200%) area coverage and provided optimal contact resolution. The line spacing is in accordance with the value specified in section 7.3.2.1 (MARCH 1994) of the Field Procedures Manual (FPM). Data collected with an Expected Position Error (EPE) of 30 or greater were rejected or smoothed during post processing, so the maximum line spacing was never exceeded.

E.4 b. Confidence checks were obtained during passes by bottom features such as sand waves, scours, substrate density changes and buoy anchors. These features were annotated on the sonargram.

E.4 c. Any holidays with a length of 200 meters or less not covered with 200% side scan sonar were covered with 100% side scan sonar. In all other areas, two hundred percent side scan coverage was completed. All side scan coverage was checked with swath plots to ensure proper overlap between adjoining lines.

E.4 d. There were no degraded data returns collected during this survey.

E.4 e. On NOAA Ship WHITING, the SSS towfish was deployed from a Reuland winch using one of two armored cables in conjunction with an A-frame on the stern. The armored cable was connected to the SSS recorder by a slip-ring assembly. On launches 1014 and 1015 the SSS towfish was deployed using a Superwinch in conjunction with an adjustable davit arm on the stern. The SSS towfish was towed with a vinyl coated Kevlar cable and was connected to the recorder by a slip-ring assembly.

E.5 Significant side scan sonar contacts were investigated using side scan sonar at a reduced range scale. Singlebeam echosounder data were also utilized for contact investigation. Development survey lines were routinely run with side scan sonar at 50 and 75 meter range scale. Detailed descriptions of all AWOIS items and investigated contacts falling within the navigable area are addressed in the ITEM INVESTIGATION REPORTS in section N.

E.6 All overlap was checked and holidays identified during post processing using **HPS_MI**, a MapBasic program provided by Hydrographic Surveys Division (N/CS32) to accompany **MapInfo** software **Version 4.5**.

F. SOUNDING EQUIPMENT

F.1 All hydrographic depths were acquired using a Raytheon Model 6000N Digital Survey Echosounder.

F.2 No other sounding equipment was used.

F.3 There were no faults in sounding equipment that affected the accuracy or quality of the data.

F.4 Both high (100 kHz) and low (24 kHz) frequency sounding data were recorded during data acquisition. Only high frequency soundings were plotted.

G. CORRECTIONS TO SOUNDINGS

G.1 a. Sound Velocity Correctors

The velocity of sound through water was calculated using measurements taken from a SEABIRD SBE 19 SEACAT Profiler (CTD) (s/n 196093-1060). SEACAT Data Quality Assurance Tests were conducted after each velocity cast to ensure that the unit was operating within tolerance.

All sound velocity data were processed using program **VELOCITY**. Computed velocity correctors were entered into the HPS sound velocity table and re-applied during post-processing to both high and low frequency soundings.

The following is a list of sound velocity casts performed for H10845:

Table Number	Day Number	Vessel Covered	Position of Cast		Days Covered
			Latitude	Longitude	
38	263	WHITING	34°34'06"N	076°35'54"W	262-268
39		1015			
40	272	WHITING	34°33'11"N	076°38'30"W	272-279
41		1014/1015			
44	286	WHITING	34°33'12"N	076°39'00"W	286-291
45		1014/1015			
51	301	1014	34°35'57"N	076°36'39"W	301

c. The **DAILYDQA** program used in conjunction with the ship's barometer was used to assure that the MOD III Diver Least Depth Gauge was working properly. Daily results fell within specified operating ranges. CTD casts were used in the **SMLGAUGE** program (v3.1) to calculate least depth measurements.

d. Leadline Comparison

A dual leadline comparison with the DSF-6000N was conducted for WHITING during OPR-F344-WH (H10845) on:

DN 286 at 34°35'18"N and 076°36'54"W (51 ft. depths).

A leadline comparison was performed for WHITING launches on:

DN 286 at 34°35'53"N and 076°33'12"W (36 ft. depths)

DN 286 at 34°35'58"N and 076°33'02"W (24 ft. depth).

Weather and sea conditions were calm and proved ideal for performing the leadline comparisons. No corrections to soundings were needed. See the fathometer records on the above listed day for actual DSF 6000 readings.

Leadlines used were calibrated on January 13, 1998 and the calibration confirmed that the leadline error was negligible. Copies of the leadline check data and calibration forms are included in the Separates, section IV.*

f. Static Draft

The static draft correction for launches 1014 and 1015 is 0.55 meters, and was measured on July 28, 1993. The corrector was entered into HPS Offset Tables 2 and 1, respectively. The correction for static draft for WHITING is 3.2 meters, an historical value which WHITING divers confirmed with a MOD III Diver Least Depth Gauge on May 11, 1995. The corrector was entered into Offset Table 9. Static draft correctors were applied during data processing for each survey platform.

g. Dynamic Draft (Settlement and Squat Correctors)

Settlement and squat values for launch 1014 were determined on March 16, 1998, and were entered into HPS Offset Table 2. Settlement and squat values for launch 1015 were determined on March 16, 1998, and were entered into HPS Offset Table 1. Settlement and squat values for WHITING were determined on March 26, 1996, and were entered into HPS Offset Table 9. The settlement and squat correctors were applied to the sounding data in real time for each survey platform. Refer to Separate IV for data records.*

* DATA Filed with Field Records.

h. Heave, Roll, and Pitch Correctors

Heave correctors for data acquired by WHITING were determined by a TSS Dynamic Motion Sensor DMS-05. Heave correctors were collected during data acquisition and applied to raw data during the **HPTools** conversion process. Serial numbers for these sensors were as follows:

Vessel	Serial Number
2930	2066
2931	2062
2932	2068

G.2 WHITING and its launches employed no unusual or unique methods or instruments to correct echo soundings.

G.6 Tide Correctors

a. The tidal datums for this project are Mean Lower Low Water (MLLW) and Mean High Water (MHW). Soundings are referenced to MLLW. Heights of bridges and cables are referenced to MHW. The operating tide station (865-6483) at Duke Marine Laboratory, Beaufort, North Carolina served as control for datum determination.

b. Tidal zones are controlled by the Duke Marine Lab gauge (865-6483). Due to the limitations of HPS and for ease of data processing, zone SEC85 correctors were applied to all H10845 data using predicted tides provided by the Atlantic Hydrographic Branch and entered using the DPAS tide utilities in HPS. All proper zones will be applied through HPS upon receipt of smooth tides from N/OES234. See the following page for location of zone SEC85.

Smooth tides for H10845 were requested from N/OES234 in a letter mailed and dated November 6, 1998.

All sounding correctors were applied to both the narrow (100 kHz) and wide (24 kHz) DSF-6000N beams. Zoning for this project is consistent with the project instructions. * *Approved Tides AND Zones were applied During Office Processing.*

H. CONTROL STATIONS

H.1 The horizontal datum for this survey is the North American Datum of 1983 (NAD 83). No horizontal control stations were established for this survey.

I. HYDROGRAPHIC POSITION CONTROL

I.1 This survey was conducted using the Global Positioning System (GPS) corrected by the U.S. Coast Guard (USCG) Differential GPS reference station network. The launches and the ship used an Ashtech Sensor GPS receiver with a CSI MBX1 beacon receiver supplying USCG correctors for DGPS navigation. Ashtech receivers were automatically initialized by HSDutils and the CSI MBX1 units were preset to the appropriate station and frequency.

I.2 Accuracy requirements were met as specified by the Hydrographic Manual and Field Procedures Manual (FPM). The Horizontal Dilution of Precision (HDOP) and Expected Position Error (EPE) specified by the FPM were monitored during on-line data collection. If the positioning degraded beyond the acceptable limits while on-line, the data were either smoothed or rejected.

I.3 Differential GPS Equipment:

The serial numbers of the Ashtech Sensor and CSI MBX1 receivers on the data acquisition platforms are as follows:

<u>Vessel</u>	<u>Device</u>	<u>Serial Number</u>
2930 (WTEW)	Ashtech Sensors	700417B1203 (system A) 700417B1191 (system B)
	CSI MBX1	X-1318 (system A) X-1081 (system B)
2931 (1015)	Ashtech Sensor	700417B1194
	CSI MBX1	X-1088
2932 (1014)	Ashtech Sensor	700417B1055
	CSI MB X1	X-1079

I.4 Correctors were received from the Fort Macon, NC and Charleston, SC radiobeacons.

I.5 a. DGPS performance checks on NOAA Ship WHITING and its launches were determined by using the "P"-Check program from the Hydrossoft version 8.2 disk. DGPS positions from WHITING Launch 1014 and Launch 1015 were taken while secured in the davits using correctors from the Fort Macon, NC DGPS beacon. Simultaneous HYPACK positions were compared with WHITING. An offset in distance and azimuth was then calculated between the ship and launch systems. A summary of the DGPS performance checks is included in the Separates, section III.* All DGPS performance checks confirmed that the equipment was working properly.

I.7 a. There were no unusual methods used to operate or calibrate electronic positioning equipment.

I.7 b. There were no equipment malfunctions.

I.7 c. No unusual atmospheric conditions affected data quality.

I.7 d. No systematic errors were detected which required adjustments.

I.7 e. The maximum allowed HDOP value of 4.0 was never exceeded.

I.7 f. DGPS antennae offsets were measured on March 19, 1993, for WHITING. Offsets and laybacks were measured using the high frequency echosounder transducer as the reference. Correctors were entered into Offset Table 9. The DGPS antennae were installed on launches 1014 and 1015 on April 2, 1996, directly over the echosounder transducer. Antenna heights were also measured on the above dates, using the water line as the reference. Correctors were entered into Offset Table 1 for launch 1015 and Table 2 for launch 1014. A minimum of four satellites were used during survey H10845 providing altitude unconstrained positioning.

I.8 g. Offset, layback and height corrections for the launches aft towing boom were measured on July 28, 1993, verified on April 5, 1994, and applied by HPS during post processing. Correctors were entered into Offset Table 1 for launch 1015 and Table 2 for launch 1014. Offset, layback and height for WHITING's A-frame were measured on March 18, 1998, using the forward high frequency transducer as the reference. Correctors were entered into Offset Table 9.

These offsets, along with the cable length, towfish height, and depth of water, were used by the HPS system to compute the position of the towfish. Copies of HPS Offset Tables 1, 2 and 9 are contained in the Separates, section III.*

* DATA filed with Field Records.

J. SHORELINE *See Also Evaluation Report.*

No shoreline is contained within the assigned survey limits.

K. CROSSLINES

A combined total of 30.74 linear nautical miles of crosslines were acquired for this survey representing 9.12% of the 337 computed linear nautical miles of mainscheme hydrography.

A plot of all mainscheme soundings in feet, superimposed with crosslines, was used to conduct mainscheme-to-crossline comparisons. Depths at intersections were compared to all other depths within a 5mm (50-meter) radius. Based on this procedure, agreement between mainscheme and crossline depths was found to be excellent. The majority of compared depths fell within 1 to 2 feet of each other.

L. JUNCTIONS *See Also Evaluation Report.*

L.1 On its northern edge survey H10845 junctions with survey H10832, sheet "B". On its western edge survey H10845 junctions with H10825, sheet "C" and H10826, sheet "F". On its southern edge survey H10845 junctions with H10824, sheet "G". H10824 is an ongoing survey of OPR-F344-WH. All surveys listed are 1:10,000 scale. A comparison of data collected on H10845 to that on H10824, H10825, H10826 and H10832 proved no significant differences between soundings exist. Generally, agreement was excellent, with occasional 1 to 2 foot differences observed.

M. COMPARISON WITH PRIOR SURVEYS *See Also Evaluation Report.*

A comparison with prior surveys is not required for this survey, due to completion of 200% side scan sonar coverage.

APPENDIX VII

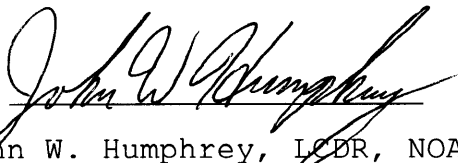
APPROVAL SHEET

LETTER OF APPROVAL

REGISTRY NO. H10845

Field operations contributing to the accomplishment of this basic hydrographic survey were conducted under my direct supervision with frequent personal checks of progress and adequacy. All field sheets and reports were reviewed in their entirety and all supporting records were checked as well.

This survey is more than adequate to supersede ALL prior surveys in common areas. This survey is considered complete and adequate for nautical charting.


John W. Humphrey, LCDR, NOAA
Commanding Officer
NOAA Ship WHITING

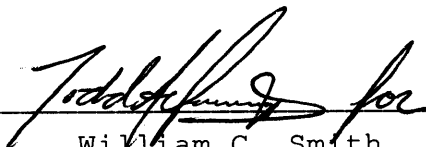
APPENDIX III

LIST OF HORIZONTAL CONTROL STATIONS

No horizontal control stations were needed for this survey since differential GPS employed exclusively for all positioning control. The geographic positions for the two differential GPS radio beacons used during this survey are as follows:

Fort Macon, NC	Lat. 36° 41.9' N
294 KHZ	Long. 076° 41.0' W
Charleston, SC	Lat. 32° 45.5' N
298 KHz	Long. 079° 50.6' W

This report and the accompanying field sheets are respectfully submitted.

A handwritten signature in cursive script, appearing to read "W.C. Smith for", is written over a horizontal line.

William C. Smith
Physical Scientist
Atlantic Hydrographic Branch

U. REFERRAL TO REPORTS

No reports or data are referred to in this Descriptive Report that are not included with this survey.

Q. AIDS TO NAVIGATION

Q.2 There are two floating aids to navigation within the survey limits of H10845.

Detached Positions			
Nav Aid	Light List	Description	Difference Between Charted and Survey Positions
RW "W" Mo (A)	Yes	Red and white stripes with red spherical topmark Mo (A)	10 meters
R "2"	Yes	Red Qk Fl R	80 meters

R. STATISTICS

- R.1 a. Number of Non-Rejected Positions 18285
- b. Linear Nautical Miles of Sounding Lines:
 - Nautical Miles of Side Scan Sonar 464.63
 - Nautical Miles Hydrography 31.40
- R.2 a. Square Nautical Miles of Hydrography 18.12
- b. Days of Production 14
- c. Detached Positions 2
- d. Bottom Samples 12
- e. Tide Stations. 1
- g. Velocity Casts 4

S. MISCELLANEOUS

S.1 Bottom samples were taken at 2000 meter intervals. Samples were examined for composition and consistency, then stored in plastic bags and sent to the Smithsonian Institution.

T. RECOMMENDATIONS

T.1 No further survey work is recommended.

O. COMPARISON WITH THE CHART *see also Evaluation Report.*

O.1 Four charts are affected by this survey (H10845):

Chart 11520
"Cape Hatteras to Charleston"
37th Ed. 20 Dec 1997
Scale: 1:432,720

Chart 11543
"Cape Lookout to New River"
20th Ed. 11 July 1992
Scale: 1:80,000

Chart 11544
"Portsmouth Island to Beaufort"
34th Ed. 11 May 1996
Scale: 1:80,000

Chart 11545
"Beaufort Inlet and Part of Core Sound"
57th Ed. 18 Jan 1997
Scale: 1:40,000

O.2 a. No dangers to navigation were found during the course of this survey.

O.3 a. Survey depths were converted from meters to feet and overlaid on the largest scale chart of the area using MapInfo software. Depending on geographic area, depths generally showed minor shoaling and deepening when compared to charted soundings. There were no survey depths deeper than charted soundings by 4 feet or more.

O.3 b. In general, survey depths correlated well with charted soundings within the area with occasional differences of 1 to 2 feet. Any survey depth that showed significant deviation from the charted soundings was investigated with singlebeam echosounder. Upon development at 20 meter line spacing, these areas showed no significant deviation from the charted soundings.

P. ADEQUACY OF SURVEY *see also Evaluation Report.*

This survey is complete and fully adequate to supersede prior survey data within common areas.

Contact #: 20813.3p

Item Description: Contact #: 2083.3p

Source: H10845

AWOIS Position: N/A

Required Investigation: None Radius: None

Charts Affected: 11520, 11543, 11544, 11545

INVESTIGATION

Date(s): 28 October 1998 (DN 301)

Position Numbers: 3348.7

Investigation Used: S2, ES

Surveyed Position: Lat. 34°37'04.023"N Lon. 076°33'50.278"W

Position Determined By: Differential GPS

Investigation Summary: During mainscheme hydrography, contact 20813.3p was found. A subsequent side scan sonar and echosounder investigation of 20813.3p yielded a least depth (corrected with predicted tides) of ~~39.03~~⁴¹ feet (~~11.9~~^{12.4} meters). Bottom depths surrounding this contact are in the 42-43 foot range. * on edge of channel

CHARTING RECOMMENDATION

Recommendation: Based on the results of this survey, the hydrographer recommends updating the chart with survey depths. Shallow draft, small pleasure craft (18-30 ft.) are the most common vessels using this area. Cancun

N. ITEM INVESTIGATION REPORTS

AWOIS #: 1494

Item Description: Sounding

Source: H8247

AWOIS Position: 34°35'58.19"N 076°36'39.53"W

Required Investigation: ES,MB,S2,BD,DI **Radius:** 200

Charts Affected: 11520, 11543, 11544

INVESTIGATION

Date(s): 28 October 1998 (DN 301)

Position Numbers: 3310

Investigation Used: S2, DI

Surveyed Position: 34°35'57.765"N 076°36'39.149"W

Position Determined By: Differential GPS

Investigation Summary: During mainscheme hydrography, contact 40810.2C was found. During an investigation of 40810.2C, divers found a rock ledge rising a few feet from the sandy bottom. The rock ledge contained small amounts of coral and seaweed. Least depth was taken on the shoalest rock outcropping along the ledge. A least depth, corrected with ^{APPROVED} predicted tides, of ~~45.59~~ ⁴⁴ feet (~~13.9~~ ^{14.5} meters) was taken on the item. Bottom depths surrounding this contact are in the 53-56 foot range.

*FKM
4-1-99*

CHARTING RECOMMENDATION

Recommendation: Based on the results of this survey, the hydrographer recommends charting a "shoal sounding on isolated rocks" with a least depth (corrected with ^{APPROVED} predicted tides) of ~~45.6~~ ⁴⁴ feet. *CONCUR*

Chart 44 RK



TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: February 1, 1999

HYDROGRAPHIC BRANCH: Atlantic

HYDROGRAPHIC PROJECT: OPR-F344-WH

HYDROGRAPHIC SHEET: H-10845

LOCALITY: North Carolina, Atlantic Ocean Approaches
To Morehead City

TIME PERIOD: September 19, 1998 - October 28, 1998

TIDE STATION USED: 865-6590 Atlantic Beach, Triple "S" Pier, NC
Lat. $34^{\circ} 41.9'N$ Lon. $76^{\circ} 42.7'W$

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.207 meters

TIDE STATION USED: 865-6483 Duke Marine Lab, Beaufort Inlet, NC
Lat. $34^{\circ} 43.2'N$ Lon. $76^{\circ} 40.2'W$

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 0.966 meters

REMARKS: RECOMMENDED ZONING

Use zone(s) identified as: SEC85, SEC86 & SEC89.

Refer to attachments for zoning information.

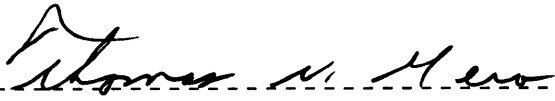
Note 1: Provided time series data are tabulated in metric units (meters), relative to MLLW and on Greenwich Mean Time.

Note 2: Use tide data from the appropriate station with applicable zoning correctors for each zone according to the order in which they are listed in the Tidezone corrector files. For example, tide station one (TS1) would be the first choice for an applicable zone followed by TS2, etc. when data are not available.

Note 3: Atlantic Beach, Triple "S" Pier (865-6590) is the preferred tide data set for hydrography offshore, Atlantic Ocean Approaches to Morehead City. Unfortunately, a significant portion of the collected data was declared invalid do to unresolved gauge problems. Data collected at this station starting October 28, 1998 are valid based on data analyses. However, due



to pier construction, vertical stability verification through SOP differential leveling could not be conducted either at the maintenance activity or at the end of data collection for this project. As a result, uncertainty still exists, however, the accuracy is within the requirement for NOS hydrographic surveying operations. Therefore data from the Atlantic Beach station (TS1) should be used when available. The second choice station for this project is Duke Marine Lab 865-6483 (TS2).


----- 2/1/99 -----
CHIEF, REQUIREMENTS AND ENGINEERING BRANCH

GEOGRAPHIC NAMES

H-10845

Name on Survey	A ON CHART NO. 11544, 11545 B ON PREVIOUS SURVEY 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											
	CAPE LOOKOUT	X		X								
CAPE LOOKOUT SHOALS	X		X									2
CAPE POINT	X		X									3
MOREHEAD CITY (Title)	X		X									4
NORTH ATLANTIC OCEAN	X		X									5
NORTH CAROLINA	X		X									6
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Dennis J. Roeschke
Chief Comptroller
NOV 25 1998

N/CS33-16-99

LETTER TRANSMITTING DATA

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

ORDINARY MAIL AIR MAIL

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TO:

CHIEF, DATA CONTROL GROUP, N/CS3x1
NOAA/NATIONAL OCEAN SERVICE
STATION 6815, SSMC3
1315 EAST-WEST HIGHWAY
SILVER SPRING, MARYLAND 20910-3282

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

H10845

NORTH CAROLINA, 6.7 NM SOUTHEAST OF FORT MACON

(ONE) TUBE CONTAINING THE FOLLOWING:

- 1 SMOOTH SHEET FOR SURVEY H10845
- 1 ORIGINAL DESCRIPTIVE REPORT
- 2 DRAWING HISTORY FORMS (NOAA FORM #76-71)
FOR CHART #11545 AND #11543
- 2 H-DRAWING FOR NOS CHART 11545
- 1 H-DRAWING FOR NOS CHARTCHART 11543
- 2 COMPOSITE DRAWING FOR NOS CHART 11545
- 1 COMPOSITE DRAWING FOR NOS CHART 11543

FROM: (Signature)

ROBERT R. HILL

RECEIVED THE ABOVE

(Name, Division, Date)

Return receipted copy to:

ATLANTIC HYDROGRAPHIC BRANCH
N/CS33
439 WEST YORK STREET
NORFOLK, VA 23510-1114

03/16/99

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: H10845

NUMBER OF CONTROL STATIONS		2
NUMBER OF POSITIONS		18285
NUMBER OF SOUNDINGS		18285
	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	6	11/19/98
VERIFICATION OF FIELD DATA	36	02/25/99
EVALUATION AND ANALYSIS	4	
FINAL INSPECTION	4	02/08/99
COMPILATION	62	03/16/99
TOTAL TIME	112	
ATLANTIC HYDROGRAPHIC BRANCH APPROVAL		02/22/99

**ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT FOR H10845 (1998)**

This Evaluation Report has been written to supplement and/or clarify the original Descriptive Report. Sections in this report refer to the corresponding sections of the Descriptive Report.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

The following software was used to process data at the Atlantic Hydrographic Branch:

Hydrographic Processing System
NADCON, version 2.10
SiteWorks, version 2.01
MicroStation 95, version 5.05
I/RAS B, version 5.01

The smooth sheet was plotted using an Hewlett Packard DesignJet 2500CP plotter.

H. CONTROL STATIONS

Horizontal control used for this survey during data acquisition is based upon the North American Datum of 1983 (NAD 83). Office processing of this survey is based on these values. The smooth sheet has been annotated with ticks showing the computed mean shift between the NAD 83 and the North American Datum of 1927 (NAD 27).

To place this survey on the NAD 27, move the projection lines 0.592 seconds (18.251 meters or 1.82 mm at the scale of the survey) north in latitude, and 1.269 seconds (32.350 meters or 3.23 mm at the scale of the survey) east in longitude.

J. SHORELINE

Brown shoreline shown on the smooth sheet is for orientation purposes only and originates with National Ocean Survey chart 11543 (20th Edition, July 11, 1992).

L. JUNCTIONS

H10824 (1998) to the south
H10825 (1998) to the northwest
H10826 (1998) to the southwest
H10832 (1998) to the north

Standard junctions were effected between the present survey and surveys H10824 (1998), H10825 (1998), H10826 (1998), and H10832 (1998).

There are no junctional surveys to the east. Present survey depths are in harmony with the charted hydrography to the east.

M. COMPARISON WITH PRIOR SURVEYS

A comparison with prior surveys was not done during office processing in accordance with section 4. of the memorandum titled "Changes to Hydrographic Survey Processing", dated May 24, 1995.

- O. COMPARISON WITH CHART 11545 (57th Edition, Jan.18/97)**
11544 (34th Edition, May 11/96)
11543 (20th Edition, July 11/92)

Hydrography

The charted hydrography originates with the prior surveys and requires no further consideration. The hydrographer makes adequate chart comparisons in sections N. and O. of the Descriptive Report.

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

P. ADEQUACY OF SURVEY

This is an adequate hydrographic/side scan sonar survey. No additional work is recommended.

S. MISCELLANEOUS

Chart compilation was done by Atlantic Hydrographic Branch personnel, in Norfolk, Virginia. Compilation data will be forwarded to Marine Chart Division, Silver Spring, Maryland.

The following NOS Charts are used for compilation of the present survey:

- 11543 (21th Ed., Aug. 15/98)
 11545 (57th Ed., Jan. 18/97)

Robert Snow

Robert Snow
Cartographic Technician
Verification of Field Data
Evaluation and Analysis

**APPROVAL SHEET
H-10845**

Initial Approvals:

The completed survey has been inspected with regard to survey coverage, delineation of depth curves, development of critical depths, cartographic symbolization, and verification or disproof 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 digital data for this survey. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.

Robert R. Hill Jr. Date: 2/19/99
Robert R. Hill Jr.
Cartographer
Atlantic Hydrographic Branch

I have reviewed the smooth sheet, accompanying data, and reports. This survey and accompanying digital data meet or exceed NOS requirements and standards for products in support of nautical charting except where noted in the Evaluation Report.

Robert A. Beaver Date: 2/22/1999
For Andrew A. Beaver,
LCDR, NOAA
Chief, Atlantic Hydrographic Branch

Final Approval:

Approved: Samuel P. De Bow, Jr. Dated: APRIL 19, 1999
Samuel P. De Bow, Jr.
Commander, NOAA
Chief, Hydrographic Surveys Division

MARINE CHART BRANCH
RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H 10 8 45

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
11545	2/27/99	<i>Robert Bell</i>	Full Part Before After Marine Center Approval Signed Via Drawing No.
11543	2/27/99	<i>Robert Bell</i>	Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
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