

H10827

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-10-10-98

Registry No. H10827

LOCALITY

State North Carolina

General Locality Onslow Bay

Sublocality Approaches to Morehead City

19 98

CHIEF OF PARTY

LCDR John W. Humphrey, NOAA

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DATE MAR 29 1999

REGISTRY NUMBER:

H10827

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-10-10-98

State: North Carolina

General locality: North Atlantic Ocean **Onslow Bay**

Locality: Approaches to Morehead City

Scale: 1: 10,000 Date of survey: July 8 - September 19, 1998

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

Vessel: NOAA Ship WHITING

Chief of Party: LCDR John W. Humphrey

Surveyed by: LCDR J.W. Humphrey, LT T. Haupt, Ltjg L. Krepp, MJ. Annis, R. Corson, F.R. Cruz, U.L. Gardner, P.G. Lewit, K.B. Shaver

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

Record scaled by: WHITING Personnel

Graphic record checked by: WHITING Personnel

Protracted by: N/A Automated plot by: HP 750C (FIELD)

Verification by: Hydrographic Surveys Branch **Personnel** HP 2500C (OFFICE)

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

Remarks: Time Zone Used, 18 (UTC)

Basic Hydrographic and 200% Side Scan Sonar

* Notes in the Descriptive Report were made in Red during office processing.

AWOIS ✓ & SURF ✓ 3-16-99 by MBH

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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/side scan sonar 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 dated June 30, 1998 and September 2, 1998.

A.4 This Descriptive Report covers H10827 (sheet "A") of OPR-F344-WH. H10827² lies 2.5 nautical miles southwest of Ft. Macon, North Carolina. See section B.2 for exact survey boundaries. H10287 lies south of Bogue Banks.

A.5 Project OPR-F344-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 cargoes such as petroleum products and fertilizers.

B. AREA SURVEYED

B.1 This survey covers the navigable area of the Approaches to Morehead City, North Carolina. It is bounded on the west by approximate longitude 76°^{47'30" W}56' W, and to the east by 76°^{47'30" W}47'30" W. It is bounded by ^{Bogue Banks} Cape Lookout shoals at the north end, and longitude 76°20' W to the southeast. The southern limit is latitude 34°^{37'30" N}18' N.

B.2 The survey comprises one sheet with the following boundaries, starting at the SW corner and proceeding clockwise:

Sheet "A":

Starting at position 34°37'55"N 076°47'28"W, due north to the 18' curve, following the 18' curve east along Bogue Banks across the Beaufort Inlet Channel to longitude 76°39'24"W, south to position 34°37'55"N 076°39'24"W, then west to the starting position.

B.3 Data collection for this survey began on July 8, 1998

(DN 189). Data collection ended on September 19, 1998 (DN 262).

C. SURVEY VESSELS

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

Vessel	EDP Number	Primary Function
NOAA Ship Whiting	2930 (WTEW)	Bottom Samples
NOAA Launch WH-2	2932 (1014)	Hydrography and Side Scan Operations
NOAA Launch WH-1	2931 (1015)	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 are 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 launches 1014 and 1015 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 and 60 meter line spacing to accommodate a 75 meter side scan sonar range scale. These line spacing and range scale combinations were 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 of the Field Procedures Manual (FPM). Data collected with an EPE of 30 or greater was 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 Whiting 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 Singlebeam echosounder was utilized for contact investigation. Development survey lines were routinely run with line spacing of 10 meters. Detailed descriptions of all AWOIS items and investigated contacts falling within the Navigable Area are addressed in the ITEM INVESTIGATION REPORTS found 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 Sea-Bird SBE 19 Seacat Profiler (CTD) (s/n 196093-1060). Seacat Data Quality Assurance Tests were conducted after each respective 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 H10827:

Table (Cast) Number	DOY	Vessels Covered	Cast Location		Days Covered
			Latitude	Longitude	
2 (1)	188	Launches 1014/1015	34°39'12" N	076°44'12" W	189-196
11 (6)	208	Launches 1014/1015	34°39'50" N	076°42'08" W	208-211
16 (9)	217	Launch 1015	34°39'07" N	076°44'07" W	217-223
23 (14)	229	Launch 1014	34°39'11" N	076°44'02" W	228-229
32 (18)	259	Launches 1014/1015	34°39'30" N	076°44'06" W	259-262

d. Leadline Comparison

A leadline comparison was performed for the Whiting launches on:

DN 191 at 34°41'58"N and 076°40'52"W (25 ft depths)
DN 191 at 34°40'13"N and 076°39'01"W (17 ft depths)

Weather and sea conditions were fair and proved satisfactory for performing the ~~and leadline~~ comparisons. No corrections to soundings were needed. Copies of the leadline check data 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. 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. 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.*

h. Heave, Roll, and Pitch Correctors

Heave correctors for data acquired by Whiting launches 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 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 at Duke Marine Laboratory, Beaufort, North Carolina (865-6483) served as control for datum determination.

b. Tidal zones are controlled by the Duke Marine Laboratory, gauge (865-6483). Due to the limitations of HPS and for ease

* Data filed with field records.

of data processing, zone SEC86 correctors were applied to all H10827 data using unverified actual 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. **Approved tides and zones were applied during office processing.*

Smooth tides for H10827 were requested from N/OES234 in a letter mailed and dated September 20, 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.

H. CONTROL STATIONS - *See also Evaluation Report -*

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 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:

Vessel	Device	Serial Number
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 (1016)	Ashtech Sensor	700417B1055
	CSI MBX1	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 Hydrosoft version 8.2 disk. DGPS positions from the Whiting, launch 1014 and launch 1015 were taken while secured in the WHITING 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 system. 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.8 f. The DGPS antennae were installed on launches 1014 and 1015 on April 2, 1996, directly over the echosounder transducer. Antenna height was also measured on the same date shown above, 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 H10827 providing altitude unconstrained positioning.

I.9.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.

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* and 2 are contained in Separate III.*

J. SHORELINE

Shoreline verification was not required as per project instructions. No shoreline is contained within the assigned survey limits of hydrography of this survey.

K. CROSSLINES

A combined total of 46.3 linear nautical miles of crosslines were acquired for this survey representing 12.8% of the 360.8 computed linear nautical miles of mainscheme hydrography.

A plot of all main scheme soundings in feet, superimposed with cross lines, was used to conduct main scheme-to-cross line comparisons. Depths at intersections were compared to all other depths within a 5-m (50-meter) radius. Based on this procedure, agreement between main scheme and cross line depths was found to be excellent. The majority of compared depths fell within 1 foot of each other.

L. JUNCTIONS - See also Evaluation Report

L.1 This survey (H10827) junctions with survey H10832, sheet "B" to the east and survey H10825, sheet "C" to the south. All of these surveys are 1:10,000 scale. A comparison of data collected on H10832 and H10825 to that on H10827 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

Full bottom coverage, 200% side scan sonar, was completed in all waters deeper than the 30' curve. A comparison with prior surveys is not required for this area of the survey, due to completion of 200% side scan sonar coverage. Basic hydrography was completed in the area between the 18' and 30' curve as per project instructions. Prior survey H09432, a 1:5000 scale survey completed in June of 1974 was used for comparison against H10832. In general correlation of soundings was good with average differences of two to three feet observed. However, both sides of the Beaufort Inlet channel (just south of Ft. Macon to the west and just south of Shackelford Point to the east) showed significant deepening. This area near the entrance is constantly shifting and therefore would explain the differences recorded between survey depths and charted soundings.

N. ITEM INVESTIGATION REPORTS

AWOIS #: 607

Item Description: Wreck (PARKINS)

Source: AWOIS Listing

AWOIS Position: 34°41'09.2"N 076°43'17.7"W

Required Investigation: ES,MD,S2,BD,DI,SD

Radius: 250m

Charts Affected: 11520, 11543, 11545, 11547

INVESTIGATION

Date(s): 16 September 1998 (DN 259)

Position Numbers: 14280

Investigation Used: S2, DI

Surveyed Position: Lat. 34°41'09.759"N Lon. 076°43'17.710"W

Position Determined By: Differential GPS

Investigation Summary: During mainscheme hydrography, AWOIS 607 was found. Contact 7115.75 was logged and investigated by divers to find the deteriorated remains of the wreck PARKINS resting in 31 feet of water. Rusted deck machinery and portions of the anchor chain were the only recognizable items in the debris. A least depth of 29.52 feet (9.0 meters), with ~~unverified~~ actual tides applied was taken on the tallest pile of debris.

CHARTING RECOMMENDATION

Recommendation: Based on the results of this survey, the hydrographer recommends deleting charted "dangerous wreck, least depth known" with a least depth of 17 feet at lat. 34°41'09.18"N, lon. 076°43'17.53"W. Also recommend charting a "dangerous wreck, least depth known" with a least depth of 29.5 feet at the surveyed position. *Concur*

*Delete (17) WK
Chart (Add) (29) WK*

AWOIS #: 9955

Item Description: Wreck (THEODORE PARKER)

Source: AWOIS Listing

AWOIS Position: 34°40'18.05"N 076°44'41.27"W

Required Investigation: ES, MB, S2, BD, DI, SD

Radius: 150 m

Charts Affected: 11520, 11543, 11545, 11547

INVESTIGATION

Date(s): 16 September 1998 (DN 259)

Position Numbers: ~~14279~~ 33042+1

Investigation Used: S2, ES, DI

Surveyed Position: Lat. 34°40'^{20.088}~~19.260~~"N Lon. 076°44'^{41.593}~~40.476~~"W

Position Determined By: Differential GPS

Investigation Summary: During mainscheme hydrography, AWOIS 9955 was found. Many contacts were logged as AWOIS 9955. AWOIS 9955 matches the description and position of a wreck listed in the NORTH CAROLINA ARTIFICIAL REEF GUIDE as the 440' Navy Liberty Ship THEODORE PARKER. The ship is one of many items purposely sunk to make North Carolina Artificial Reef AR315 and marked by an unlit yellow buoy labeled as AR315. Contact #4150.9P was investigated by divers which confirmed AWOIS 9955 as the steel ship THEODORE PARKER resting in 50 feet of water. This diver investigation yielded a least depth of 24.6⁵ feet (7.5⁴ meters) with ~~unverified~~ actual tides applied. However, due to the limited visibility conditions and size of the ship, it was uncertain whether this was the absolute least depth or not. Therefore, an echosounder development of the item was conducted utilizing 5 meter line spacing. This investigation yielded the same least depth as the diver investigation, but 37 meters to the northwest. Neither of these investigations yielded a least depth equal to or less than the charted 17 foot least depth.

CHARTING RECOMMENDATION

Recommendation: Based on the results of this survey, the hydrographer recommends no charting changes for this item. Depiction of this item is incorrect on chart 11545.

NOTE: Recommend changing solid line depth curve around 17 foot WK sounding to a 17 foot "dangerous wreck, least depth known" symbol. *Concur with conditions.*

Delete (17) WK
Add (24) WK

AWOIS #: 9958

Item Description: Wreck

Source: AWOIS Listing

AWOIS Position: 34°40'34.58"N 076°40'14.74"W

Required Investigation: ES,MB,S2,BD,DI,SD

Radius: 250

Charts Affected: 11520, 11543, 11544, 11545, 11547

INVESTIGATION

Date(s): 30 July, 5,7-8 September 1998 (DN 211,217,219-220)

Position Numbers:

Investigation Used: S2

Surveyed Position:

Position Determined By: Differential GPS

Investigation Summary: During mainscheme hydrography, AWOIS 9958 was covered with 200% side scan sonar. No contacts were found that were associated with this AWOIS.

CHARTING RECOMMENDATION

Recommendation: Based on the results of this survey, the hydrographer recommends no charting changes. Also, recommend updating the AWOIS listing to reflect AWOIS 9958 as DISPROVED. *Concur with conditions,*

Delete (H+) PA

Contact #: 4149.2S

Item Description: F-4 aircraft

Source: North Carolina Artificial Reef Guide (NC ARG)

NC ARG Position: 34°40'21"N 076°44'39"W

Required Investigation: None Radius: None

Charts Affected: 11520, 11543, 11545, 11547

INVESTIGATION

Date(s): 16 August 1998 (DN 228)

Position Numbers: 12433

Investigation Used: S2, DI

Surveyed Position: Lat. 34°40'20.734"N Lon. 076°44'38.366"W

Position Determined By: Differential GPS

Investigation Summary: During mainscheme hydrography, contact 4149.2S was found. During an investigation, divers found the remains of the center section of an F-4 fighter aircraft fuselage resting on a sandy bottom in 50 feet of water. The least depth was taken on the east end of the section. This investigation yielded a least depth of 46.58 feet (14.2 meters) with ~~un~~verified actual tides applied. This aircraft section matches the description and position of an aircraft section listed in the NORTH CAROLINA ARTIFICIAL REEF GUIDE. The aircraft section is one of many items purposely sunk to make North Carolina Artificial Reef AR315 and marked by an unlit yellow buoy labeled as AR315.

CHARTING RECOMMENDATION

Recommendation: Based on the results of this survey, the hydrographer recommends charting an "obstruction, least depth known" with a least depth (corrected with ~~un~~verified, actual tides) of 46.8 feet at the surveyed position. *Concur*

Add (46.8) Obstrn

Contact #: 4321.0

Item Description: Barge

Source: North Carolina Artificial Reef Guide (NC ARG)

NC ARG Position: 34°40'24"N 076°44'29"W

Required Investigation: None Radius: None

Charts Affected: 11520, 11543, 11545, 11547

INVESTIGATION

Date(s): 10 August 1998 (DN 222)

Position Numbers: 32288

Investigation Used: S2, DI

Surveyed Position: Lat. 34°40'24.496"N Lon. 076°44'27.954"W

Position Determined By: Differential GPS

Investigation Summary: During mainscheme hydrography, contact 4321.0 was found. During an investigation, divers found a 60'x30'x10' steel barge sitting upright and filled with concrete slabs in 50 feet of water. The least depth was taken on one of the towing bits. This investigation yielded a least depth of ~~38.4~~^{37.7} feet (11.7⁵ meters) with ~~un~~verified actual tides applied. This barge matches the description and position of a barge listed in the NORTH CAROLINA ARTIFICIAL REEF GUIDE. The barge is one of many items purposely sunk to make North Carolina Artificial Reef AR315 and marked by an unlit yellow buoy labeled as AR315.

CHARTING RECOMMENDATION

Recommendation: Based on the results of this survey, the hydrographer recommends charting a "dangerous wreck, least depth known" with a least depth (corrected with ~~un~~verified, actual tides) of ~~38.4~~^{37.7} feet at the surveyed position.

Add (37.7) wk

Contact #: 3773.3P

Item Description: Barge

Source: North Carolina Artificial Reef Guide (NC ARG)

NC ARG Position: 34°39'22"N 076°43'39"W

Required Investigation: None Radius: None

Charts Affected: 11520, 11543, 11545, 11547

INVESTIGATION

Date(s): 10 August 1998 (DN 222)

Position Numbers: 32289

Investigation Used: S2, DI

Surveyed Position: Lat. 34°40'14.292"N Lon. 076°44'35.598"W

Position Determined By: Differential GPS

Investigation Summary: During mainscheme hydrography, contact 3773.3P was found. During an investigation, divers found a 60'x30'x10' steel barge sitting upright and filled with concrete slabs in 50 feet of water. The least depth was taken on one of the towing bits. This investigation yielded a least depth of ~~37.72~~ ^{38.0} feet (11.56 meters) with unverified actual tides applied. This barge matches the description and position of a barge listed in the NORTH CAROLINA ARTIFICIAL REEF GUIDE. The barge is one of many items purposely sunk to make North Carolina Artificial Reef AR315 and marked by a yellow buoy labeled as AR315.

CHARTING RECOMMENDATION

Recommendation: Based on the results of this survey, the hydrographer recommends charting a "dangerous wreck, least depth known" with a least depth (corrected with unverified, actual tides) of ~~37.7~~ ^{38.0} feet at the surveyed position.

Add (38) WK

Contact #: 30554.4P

Item Description: Contact #30554.4P

Source: H10827

AWOIS Position: N/A

Required Investigation: None Radius: None

Charts Affected: 11520, 11543, 11544, 11545, 11547

INVESTIGATION

Date(s): 16 September 1998 (DN 259)

Position Numbers: 14282

Investigation Used: S2, DI

Surveyed Position: Lat. 34°40'09.566"N Lon. 076°40'48.625"W

Position Determined By: Differential GPS

Investigation Summary: During mainscheme hydrography, contact 30554.4P was found. During an investigation, divers found an extensive debris field in 24 feet of water. The debris consisted of metal cylinders, pipes and flat pieces scattered over an approximate area of 120'x30'. The least depth was taken on a piece of sheet metal. This investigation yielded a least depth of 24.93 feet (7.6 meters) with ~~un~~verified actual tides applied.

CHARTING RECOMMENDATION

Recommendation: Based on the results of this survey, the hydrographer recommends charting an "obstruction, least depth known" with a least depth (corrected with ~~un~~verified, actual tides) of 24.9 feet at the surveyed position. This recommendation is based on the large volume of commercial net fishing activity in the area. *Do not concur. Obstruction least depth is 25ft, surrounding soundings are 23 feet. No change in*
It is recommended that the area be updated with present survey depths.

Contact #: 30986.3P

Item Description: Contact #30986.3P

Source: H10827

AWOIS Position: N/A

Required Investigation: None Radius: None

Charts Affected: 11520, 11543, 11544, 11545, 11547

INVESTIGATION

Date(s): 16 September 1998 (DN 259)

Position Numbers: 14281

Investigation Used: S2, DI

Surveyed Position: Lat. 34°40'30.694"N Lon. 076°40'23.603"W

Position Determined By: Differential GPS

Investigation Summary: During mainscheme hydrography, contact 30986.3P was found. During an investigation, divers found a pile of rubble consisting of large boulders and a portion of anchor chain resting in 17 feet of water. The least depth was taken on a rock on top of the pile. This investigation yielded a least depth of ~~14.1~~^{13.8} feet (4.~~7~~² meters) with ~~un~~verified actual tides applied.

CHARTING RECOMMENDATION

Recommendation: Based on the results of this survey, the hydrographer recommends charting an "obstruction, least depth known" with a least depth (corrected with ~~un~~verified, actual tides) of ~~14.1~~^{13.8} feet at the surveyed position.

Add (14) Obstrn

O. COMPARISON WITH THE CHART . See also Evaluation Report

O.1 Five charts are affected by this survey (H10827):

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

Chart 11547
"Morehead City Harbor"
32nd Ed. 07 Feb 1998
Scale: 1:12,500

O.3 a. Overall, the depths collected for this survey correlated well with charted soundings. 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. Survey depths deeper than charted soundings by 4 feet or greater were investigated by splitting the 60 to 80 meter line spacing mainscheme hydrography. This resulted in 30 to 40 meter line spacing in these areas, respectfully.

O.3 b. In general, survey depths correlated well with charted soundings within the area with occasional differences of 1 to 2 feet, except near the Beaufort Inlet Channel. Both sides of the channel (just south of Ft. Macon to the west and just south of Shakelford Point to the east) showed significant deepening. These areas were developed with hydro at a line spacing of 20 meters. This area near the entrance is constantly shifting and therefore would explain the differences recorded between survey depths and charted soundings.

O.3 g. The Beaufort Inlet Channel is a maintained channel. Survey depths were compared to the controlling and tabulated soundings from Chart 11547. Survey depths correlated well with the tabulated soundings with occasional differences of 1 to 2 feet.

P. ADEQUACY OF SURVEY - See also Evaluation Report

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

Q. AIDS TO NAVIGATION

Q.2 There are nine floating aids to navigation within the survey limits of H01827.

Aid	Charted Position		Surveyed Position		DP#
	Latitude	Longitude	Latitude	Longitude	
G"7" Fl G 2.5s	34°38'53.4"N	076°40'38.1"W	34°38'53.2"N	076°40'38.3"W	23204
R"8" Fl R 2.5s	34°38'52.3"N	076°40'31.8"W	34°38'52.1"N	076°40'31.7"W	23203
G"9" Fl G 4s	34°39'46.3"N	076°40'25.4"W	34°39'46.4"N	076°40'25.4"W	14276
R"10" Fl R 4s	34°39'45.4"N	076°40'19.0"W	34°39'45.6"N	076°40'18.7"W	14277
G"11" Fl G 2.5s	34°40'35.1"N	076°40'13.7"W	34°40'30.4"N	076°40'14.7"W	14274
R"12" Fl R 2.5s	34°40'29.2"N	076°40'08.3"W	34°40'28.0"N	076°40'09.1"W	14275
R"14" Fl R 4s	34°40'48"N	076°40'01"W	34°40'47.0"N	076°40'01.0"W	14273
G"15" Fl G 4s	34°41'00"N	076°40'22"W	34°41'00.7"N	076°40'07.9"W	14272
Y"AR315"	N/A	N/A	34° ^{40'20.7"} 38'52.1"N	076° ^{44'40.6"} 40'31.7"W	14278

The Y"AR315" floating aid is an unlit yellow ball buoy marking an artificial reef set by the state of North Carolina. This floating aid is not listed in the Light List or charted.

GKH
1/4/00

R. STATISTICS

R.1 a. Number of Non-Rejected Positions 27685
b. Linear Nautical Miles of Sounding Lines:
 Nautical Miles of Side Scan Sonar 503.84
 Nautical Miles Hydrography 175.04
R.2 a. Square Nautical Miles of Hydrography 19.68
b. Days of Production 21
c. Detached Positions 16
d. Bottom Samples 15
e. Tide Stations. 1
g. Velocity Casts 5

S. MISCELLANEOUS - See also Evaluation Report

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.

S.2 During the course of work on H10832, operations were suspended due to hurricane Bonnie making landfall near the survey area. A series of hydrographic cross lines were run when WHITING resumed operations after Bonnie made landfall. A comparison between soundings collected before and after hurricane Bonnie passed through the area revealed no change in depth occurred as a result of the hurricane.

Not Necessary

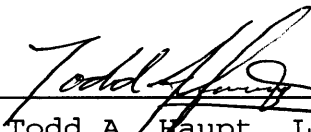
T. RECOMMENDATIONS

T.1 No further survey work is recommended.

U. REFERRAL TO REPORTS

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

This report and the accompanying field sheets are respectfully submitted.



Todd A. Haupt, LT, NOAA
Operations 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° 55.5' N
289 KHZ	Long. 076° 00.4' W
Charleston, SC	Lat. 32° 45.5' N
298 KHz	Long. 079° 50.6' W

APPENDIX VII

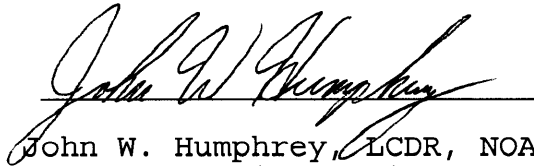
APPROVAL SHEET

LETTER OF APPROVAL

REGISTRY NO. H10827

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



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Silver Spring, Maryland 20910

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: January 21, 1999

HYDROGRAPHIC BRANCH: Atlantic

HYDROGRAPHIC PROJECT: OPR-F344-WH

HYDROGRAPHIC SHEET: H-10827

LOCALITY: North Carolina, Atlantic Ocean Approaches
To Morehead City

TIME PERIOD: July 8, 1998 - September 19, 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: SEC86.

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).

Thomas V. Mero 1/21/99

CHIEF, REQUIREMENTS AND ENGINEERING BRANCH

Final tide zone node point locations for OPR-F344-WH-98,
Sheet H-10827.

Format: Longitude in decimal degrees (negative value denotes
Longitude West),
Latitude in decimal degrees
Tide Station (in recommended order of use)
Average Time Correction (in minutes)
Range Correction

	Tide Station Order	AVG Time Correction	Range Correction
Zone SEC86			
-76.553316 34.614162	865-6590	0	1.00
-76.54751 34.649844	865-6483	-54	1.22
-76.657373 34.688497			
-76.695358 34.696226			
-76.790541 34.698624			
-76.900257 34.685349			
-77.16484 34.496165			
-76.957503 34.446746			
-76.89935 34.493201			
-76.730339 34.560916			
-76.553316 34.614162			

GEOGRAPHIC NAMES

H-10827

Name on Survey	A ON CHART NO. 11545 11547 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
BEAUFORT INLET	X		X												1
BOGUE BANKS	X		X												2
MOREHEAD CITY (Title)	X		X												3
NORTH ATLANTIC OCEAN	X		X												4
NORTH CAROLINA (Title)	X		X												5
ONSLow BAY	X		X												6
SHACKLEFORD BANKS	X		X												7
SHACKLEFORD POINT	X		X												8
															9
															10
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Dennis Rosenberg
 Chief Geographer

NOV 18 1998

N/CS33-15-99

LETTER TRANSMITTING DATA

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

- ORDINARY MAIL
- REGISTERED MAIL
- GBL (Give number) _____
- AIR MAIL
- EXPRESS

DATE FORWARDED

MARCH 12, 1999

NUMBER OF PACKAGES

ONE TUBE

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.

H10827

NORTH CAROLINA, ONSLOW BAY, APPROACHES TO MOREHEAD CITY

(ONE) TUBE CONTAINING THE FOLLOWING:

- 1 SMOOTH SHEET FOR SURVEY H10827 ORIGINAL DESCRIPTIVE REPORT
- 2 DRAWING HISTORY FORMS (NOAA FORM #76-71) 1 EACH FOR NOS CHARTS 11547 AND 11545
- 1 RECORD OF APPLICATION TO CHART FORM (NOAA FORM #75-96) FOR SURVEY H10827
- 1 H-DRAWING FOR NOS CHART 11547
- 1 H-DRAWING FOR NOS CHART 11545
- 1 COMPOSITE DRAWING FOR NOS CHART 11547
- 1 COMPOSITE DRAWING FOR NOS CHART 11545

FROM: (Signature)

DEBORAH A. BLAND

RECEIVED THE ABOVE

(Name, Division, Date)

Return receipted copy to:

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

03/12/99

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: H10827

NUMBER OF CONTROL STATIONS		2
NUMBER OF POSITIONS		28744
NUMBER OF SOUNDINGS		28744
	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	20	10/30/98
VERIFICATION OF FIELD DATA	74	02/17/99
EVALUATION AND ANALYSIS	11.50	
FINAL INSPECTION	1	02/17/99
COMPILATION	58	03/03/99
TOTAL TIME	179	
ATLANTIC HYDROGRAPHIC BRANCH APPROVAL		03/03/99

**ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT FOR H10827 (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 0.585 seconds (18.017 meters or 1.80 mm at the scale of the survey) north in latitude, and 1.245 seconds (31.700 meters or 3.17 mm at the scale of the survey) east in longitude.

J. SHORELINE

Brown shoreline originates with NOS chart 11543, 20th edition, dated July 11, 1992, and is for orientation purposes only.

Shoreline changes are apparent from the limits of hydro in the vicinity of Shackelford Point. The field did not indicate the limits of the changes. The shoreline in the area in question has been omitted from the smooth sheet.

L. JUNCTIONS

H10825 (1998) to the South
H10832 (1998) to the East

Standard junctions were effected between the present survey and survey H10825 (1998), H10832 (1998). There are no junctional surveys to the North, or to the West. Present survey depths are in harmony with the charted hydrography to the north and to the west.

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 11543 (20th Edition, July 11/92)
11545 (57th Edition, Jan 18/97)
11547 (32nd Edition, Feb 07/98)**

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 following should be noted:

1) A charted submerged pile, originating with an unknown source, in the vicinity of Latitude 34°40'32.6"N, Longitude 76°39'42.8"W was disproved by the present survey and junctional survey H10832 combined. It is recommended that the submerged pile be deleted from the chart and that the area be updated with present survey depths.

2) AWOIS ITEM #9959, a charted dangerous submerged wreck (PA), originating with Local Notice to Mariners 11 of 1993 (LNM11/93), in Latitude 34°38'18.0"N, Longitude 76°39'24.0"W was salvaged prior to the present survey, but remains charted. This wreck was further disproved by the present survey and junctional survey H10832 combined. It is recommended that the dangerous submerged wreck (PA) be deleted from the chart and that the area be updated with present survey depths.

Controlling Depths

There are no conflicts between the tabulation shown on the above listed charts and the present survey depths.

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:

11545	(57 th Ed., January 18/97)	1:40,000
11547	(32 nd Ed., February 07/98)	1:12,500

Robert Snow

Robert Snow

Cartographic Technician
Verification of Field Data
Evaluation and Analysis

APPROVAL SHEET
H10827

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.

Deborah A. Bland

Date: 2-5-99

Deborah A. Bland
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.

Andrew L. Beaver

Date: 2/15/99

Andrew L. Beaver
Lieutenant Commander, NOAA
Chief, Atlantic Hydrographic Branch

Final Approval:

Approved: Samuel P. De Bow, Jr.

Date: 3/26/99

Samuel P. De Bow, Jr.
Commander, NOAA
Chief, Hydrographic Surveys
Division

