H11032

NOAA FORM 76-35A

U.S. DEPARTMENT OF COMMERCE

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SERVICE

Descriptive Report

Type of Survey *Side Scan Sonar and Vertical Beam Hydrographic*
Field No. *OPR-F336-KR-01 Sheet A*
Registry No. *H11032*

Locality

State *North Carolina*
General Locality *Pamlico & Croatan Sounds*
Sub locality *Weir Point to Stumpy Point*

2002

CHIEF OF PARTY

George G. Reynolds

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Date……..

NOAA FORM 77-28 [11-72]
U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

HYDROGRAPHIC TITLE SHEET

REGISTER NO. *H11032*

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. *OPR-F336-KR-01*

State *North Carolina*

General Locality *Pamlico & Croatan Sounds*

Locality *Weir Point to Stumpy Point*

Scale *1:20,000* Date of Survey *June 9 to October 3, 2002*

Instructions Dated *July 13, 2001* Project No. *OPR-F336-KR-01*

Vessel *Willing II*

Chief of Party *George G. Reynolds*

Surveyed By *Russell S. Watson, Richard J. Stanowski*

Soundings taken by (*Echo Sounder*) *Innerspace Model 448*

Graphic Record Scaled by *N/A*

Graphic Record Checked by *N/A*

Protracted by *N/A* Automated Plot by *David T. Somers*
Hewlett Packard Design Jet 2500 CP (office)

Verification by ~~*Michael J. Engels, Margaret H. Sano*~~
Atlantic Hydrographic Branch Personnel

Soundings in *Feet*(*LWD*)

REMARKS: ***Red, bold, italic notes in descriptive report were made during office processing.***
All Times Recorded in UTC
Substitution of Item Investigations for AWOIS on 9/6/02
Final Modification of period of performance on 1/16/03
Contractor: Ocean Surveys, Inc.
91 Sheffield St.
Old Saybrook, CT. 06475
Subcontractor: Sonalysts, Inc.
215 Parkway North
Waterford, CT. 06385

THE INFORMATION PRESENTED IN THIS REPORT AND THE ACCOMPANYING PRELIMINARY SMOOTH SHEET REPRESENTS THE RESULTS OF A SURVEY PERFORMED BY OCEAN SURVEYS INC. BETWEEN 9 JUNE AND 3 OCTOBER 2002 AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS EXISTING AT THAT TIME. REUSE OF THIS INFORMATION BY CLIENT OR OTHERS BEYOND THE SPECIFIC SCOPE OF WORK FOR WHICH IT WAS ACQUIRED SHALL BE AT THE SOLE RISK OF THE USER AND WITHOUT LIABILITY TO OSI.

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**** Filed with the Original Field Records.***

Descriptive Report
to Accompany
Hydrographic Survey H11032

Field Number OPR-F336-KR-01
Scale 1:20,000
June – October 2002
Ocean Surveys, Inc. – Willing II
Chief of Party: George G. Reynolds

INTRODUCTION

This survey was conducted in accordance with the Statement of Work for OPR- F336-KR-01, Weir Point to Stumpy Point, Pamlico and Croatan Sounds, North Carolina. The original date of the Statement of Work is July 13, 2001. This sheet was designated by the Statement of Work as Sheet "A".

The following changes were made to the Statement of Work:

06 Sept. 2002	AWOIS item investigation requirement was removed and replaced with authorization to conduct additional investigation of 26 items recommended by OSI and 4 additional contact investigations requested by NOAA (via EMAIL, from Jeffrey Ferguson, NOAA)

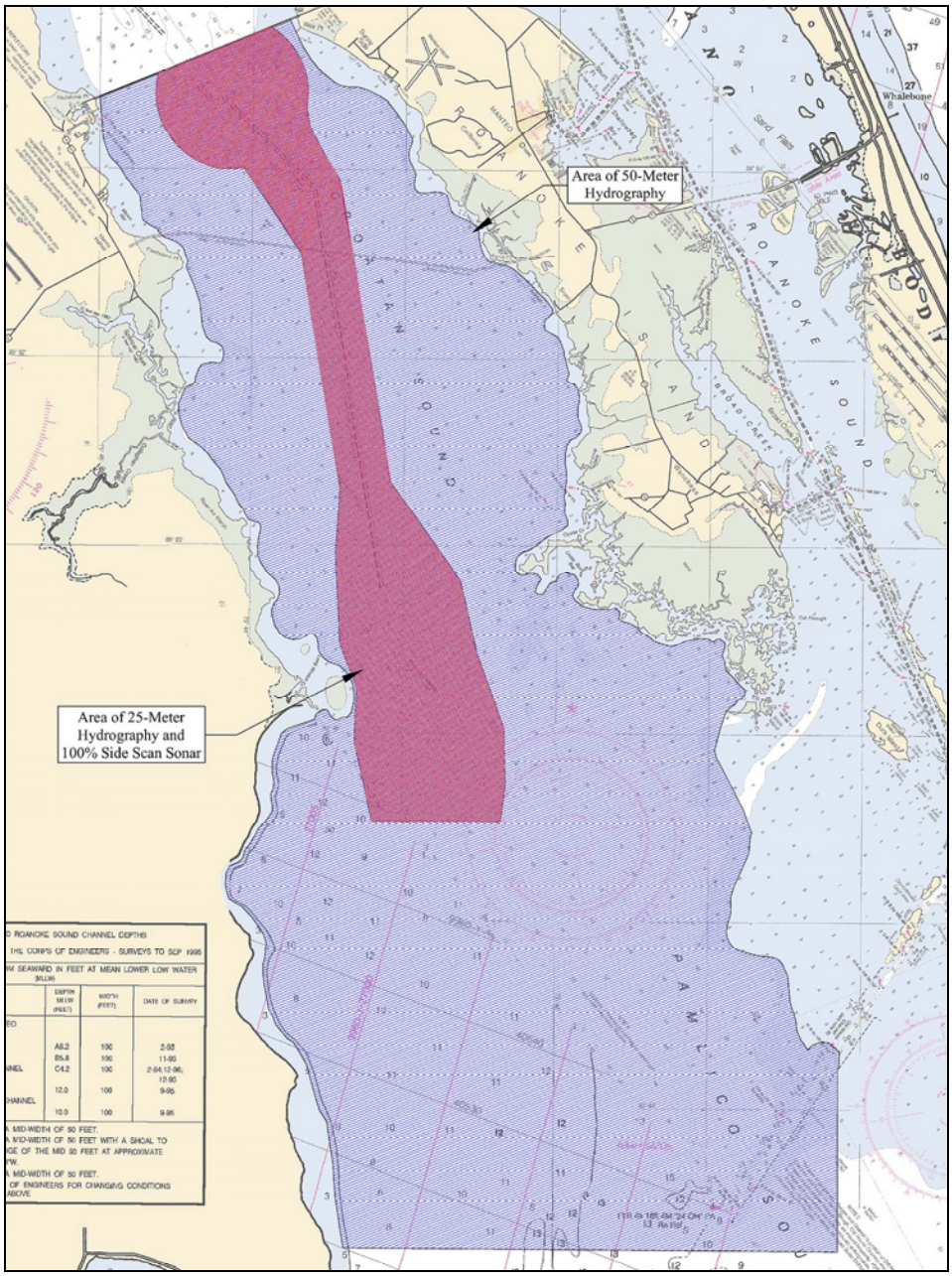
16 Jan. 2003	(Modification 3, supercedes Modification 2) extends the period of performance from December 31, 2002 through March 28, 2003.

The purpose of this survey is to provide NOAA with modern, accurate hydrographic survey data with which to update the nautical charts of portions of Pamlico and Croatan Sounds.

A. AREA SURVEYED

The H11032 survey area encompasses parts of Pamlico and Croatan Sounds. The northern boundary is the Rt. 64 - 264 bridge between Weir Point, Roanoke Island and Redstone Point. The southern boundary is an east-west line at N35° 42' 30" approximately 0.8 km south of U.S.C.G. navigation light "24 OH" located at the southwest end of Old House Channel. The western border of the survey site generally follows the 5 foot contour along the western shore of Croatan Sound while the eastern border follows, approximately, the 5 foot contour along the eastern shore of Croatan Sound and northern portions of Pamlico Sound from the southern tip of Roanoke Island to approximately 2.5 km east-southeast of U.S.C.G. navigation light "24 OH".

Vertical beam soundings were acquired over the entire site along tracklines spaced at 50-meter intervals oriented approximately perpendicular to the Croatan Sound Navigation Channel and run between the 5 ft. contours along each shore. In a selected area centered on the Croatan Sound Navigation Channel, line spacing was reduced to 25 meters. Additionally, in this selected area side scan sonar imagery and vertical beam soundings were obtained along tracklines spaced at 25-meter intervals oriented parallel to the channel. The resulting line plan formed a 25-meter grid within the designated side scan sonar area.



Additional data were acquired as part of 30 contact investigations. These item investigations were conducted at the request of NOAA, in lieu of AWOIS item investigations originally specified in the SOW.

B. DATA ACQUISITION AND PROCESSING ***See also the Evaluation Report.***

B.1 Equipment

The equipment listed in the table below was employed in collecting hydrographic, side scan sonar, and water level data for survey H11032.

Equipment	Manufacturer	Model
Single Beam Depth Sounder	Innerspace	448
Side Scan Sonar Deck Console and Tow Fish	Klein	595
Primary Navigation GPS	Trimble	4000 DS
Backup Navigation and comparison GPS	Trimble	4000 DS
U.S.C.G. Differential Beacon Receivers	Magnavox	MX-51R
Real Time Kinematic (RTK) GPS	Trimble	7400 Msi
Motion Sensor	TSS	DMS 2-05
Digital Compass/Autopilot	Robertson	Autopilot AP35
Primary and Secondary Sound Velocity Profiler	Seabird	Seacat SBE 19
Water Level Recorder	Coastal	Macro/Mini
Side Scan Sonar Data Acquisition	Triton Elics	Isis
Hydrographic Data Acquisition	Coastal Oceanographics	Hypack Max

All hydrographic survey operations associated with this survey were conducted from the R/V "Willing II". Willing II (Connecticut registration number of CT 2716 AM) is a fiberglass vessel with a 25-foot LOA, 10-foot beam and 2.5-foot draft and is powered by twin 150 HP outboard engines. A second vessel, a 19-foot fiberglass skiff, was used throughout the project to support tri-weekly tide staff observations at offshore tide gauging stations.

During operations, two survey vessel configurations were used. For side scan data acquisition, the side scan sonar was towed from the bow and the single beam transducer was mounted over the starboard side. For the remainder of this report, this combined side scan sonar and hydrographic data survey configuration will be referred as "SSS/Hydro". For all tracklines that were run to acquire hydrography data only, an in-hull transducer was employed. This configuration will be referred to as "Hydro-Only". These configurations are described in detail in the Data Acquisition and Processing Report. No deviations to the configuration or equipment were used.

B.2 QUALITY CONTROL

Sounding data were found to be of a high quality and repeatability. Approximately 82 lineal nautical miles of north-south "Hydro-Only" lines and 668 nautical miles of north-south "SSS/Hydro" lines provided a total of 750 miles of soundings for cross line comparison analyses with the primary east-west oriented lines. This represents approximately 32% of the total main-scheme, east-west sounding line mileage (2352 nm). NOAA specifications call for at least 8% crossing lines for single beam sounding surveys. All cross lines were collected using the same vessel and equipment as was used along main-scheme lines.

Several methods were used to complete the cross-line analysis. Surface models were generated using the TIN method and compared within AUTOCAD. The x,y,z values of the two data sets (east-west lines and north-south lines) were exported from CARIS and compared by calculating the difference of the two surface models in AUTOCAD. There were several iterations of this procedure, first on the non-tide corrected data then on the final data set. Early iterations (on non-tide corrected data) identified isolated depth flyers and gaps from processing errors that were then corrected. After water level corrections were applied, the AUTOCAD/TIN method was used to recheck every intersection and insure that the data set was internally consistent. Very few significant differences at crossings (>0.2m) were identified in the tide-corrected data set. Each of these differences was investigated and the majority were identified as channel side slope or sand wave areas. The remaining few were determined to be isolated depth flyers and were edited out of the data.

In CARIS, a digital terrain model (DTM) was generated using only east-west lines, and designated check lines were compared to the resulting DTM surface. This comparison indicated a very small (<.04m) positive bias in the mean differences, i.e. soundings from the north-south lines were slightly deeper than soundings from the east-west lines. Although this small bias is well within the overall error budget, further analyses were conducted to identify possible sources of the bias. Using the intersections routine within HYPACK and Excel for statistical analysis, separate comparisons were made on crossing lines with the same vessel configuration (SSS/Hydro vs. SSS/Hydro and Hydro-Only vs. Hydro-Only) and crossing lines with different vessel configurations. Also, comparisons of intersections within each of the four tidal areas were completed. The highest differences were noted when comparing crossing lines with different vessel configurations. No significant difference by tidal area was apparent in the data. Detailed results are presented in Separate V*. It is important to note that the overall differences measured are less than 10% of the overall error budget.
Filed with the original field records.

B.2.1 Error Budget Considerations

Errors inherently introduced to the hydrographic survey platform were identified and corrected or minimized as follows:

Measurement Error: The Innerspace 448 depth sounder is a modern, solid state, digital instrument, therefore measurement error is minimal. Regular sound velocity casts (CTDs

described below) were conducted to measure water mass speed of sound for daily instrument calibration and to document incremental changes in water mass speed of sound throughout the day. Bar checks were conducted daily to confirm the proper calibration of the depth sounder. During a bar check, the sounder digitized the "bar" at the known fixed depth below the sounder transducer. The "bar check" was performed once daily at varying depths over the range of depths encountered on a given survey day.

The seafloor in the survey site was generally well digitized by the depth sounder. Instances of interference from natural phenomenon such as weeds or fish were infrequent and easily discerned from the seafloor. These anomalous soundings were edited during the post processing phase.

Transducer Draft Error: The static draft was measured at the dock in calm water at the beginning of each survey day. Measurements were recorded from a fixed reference point (RP) on the vessel's aluminum superstructure to the water line. During the measurement, the vessel was held as steady as possible (no undue roll or pitch). The vessel movement was observed in real-time on the vessel's motion sensor display. The measured draft values were recorded in a daily log and incorporated into the final data during post processing utilizing CARIS. The static draft measured throughout the survey varied by 0.02 meters.

Settlement and Squat Error: Prior to the start of survey operations settlement and squat measurements were recorded over a range of vessel speeds and fuel loading levels. Settlement and squat curves were developed and values were entered into the vessel configuration file for post processing in CARIS. During testing, it was determined that settlement and squat values were unstable when the vessel was operating at transition speeds (the speed at which the vessel begins to plane). For this reason, hydrographic data were not collected at vessel speeds around the transition speed. Hydrographic data were acquired at low speeds in areas that required caution due to shallow water or obvious obstructions and data were obtained at higher speeds in areas of open water.

Sound Velocity Error: The speed of sound through the water column was monitored with CTD casts. Daily bar checks also confirmed the validity of the average sound velocity, which was programmed into the echo sounder.

CTD casts were performed to determine the sound velocity and the changes in velocity, if any, in the water column. At the beginning of the survey the field crew completed 3-4 CTD casts per day. After the crew developed a good understanding of the sound velocity variation within the study area, CTD casts were completed at least once daily. Sound velocity profiles, calculated from conductivity, temperature, and depth values collected during a given cast, were applied in post processing to the raw sounding data in CARIS. The average velocity from the first cast of a given day was input to the Innerspace 448 and the Isis system.

In addition to daily CTD casts, the surface water in the vicinity of the transducer was monitored in real-time to monitor sound velocity changes. An alarm feature was utilized in a secondary data-logging platform that notified the hydrographer if the sound velocity of the surface water changed by an amount greater than a user specified value. If a change of more

than +/-6 m/s in the surface sound velocity was detected, the line was stopped. The hydrographer would then either continue running lines within the original water mass or stop and conduct another CTD cast and reset the sound velocity values in the echo sounder.

Although some variability in sound speed was noted throughout the survey period, the methods described above, accurately documented the changes. Also, any errors resulting from spatial or temporal changes in sound speed were minimal, because of the shallow water depths within the survey site.

Heave, Pitch and Roll Error: Pitch and roll errors were minimized by conducting survey operations only in good weather. The pitch and roll values were recorded by the motion sensor and monitored during operations although correctors were not applied to the sounding data. The roll was usually less than 5 degrees and the pitch was less than 4 degrees, neither of which would introduce a significant error given the use of a narrow beam (8°) depth sounder transducer operating in the shallow waters of the survey area.

Heave measurements were recorded during survey operations and applied during post processing in CARIS. The stated accuracy of the heave sensor employed on this survey is 5 cm or 5% of the wave amplitude whichever is greater. In the case of this shallow water, inland survey, heave amplitude did not exceed one meter. Therefore, the accuracy of the heave sensor is 5 cm. The maximum heave value recorded during the survey was 0.31m.

Tide/Water Level Error: There are 2 main components of tide/water level error. The first is potential measurement and processing errors of the gauge/sensor. OSI carefully followed standard procedures in order to minimize these errors. The accuracy of the water level measurements was monitored using several methods. Backup gauges were co-located with primary gauges at each station. Water level measurements from each gauge were plotted and compared to insure there was no significant difference between the two station gauges. Tide staffs were installed at each station and frequent tide staff water level observations were recorded and compared to gauge measurements. Pre- and post-survey calibrations of the water level gauges were performed to confirm that calibration values did not change throughout the survey period. These monitoring efforts helped to insure that measurement and processing errors were minimized.

The second main component of tide/water level error is in the computation of tidal datum and application of tidal zoning. NOAA CO-OPS performed these tasks by analyzing water level data acquired by OSI at the subordinate stations during the period of the survey. As stated in the final tide note provided by NOAA, the survey area has a mean tide range less than one foot. Therefore, short-term weather conditions may play a potentially greater role in water level variability. To best account for water-level changes in both time and space, NOAA has established four zones for the survey area based on the four subordinate stations located throughout the site during the survey period. This scheme serves to minimize potential errors associated with tidal zoning due to meteorological events.

B.2.2 Survey Junctions: There were no junctions for this survey. ***Concur.***

B.2.3 Unusual Conditions/Factors Affecting Corrections to Soundings: There were no unusual operational or equipment conditions encountered during this survey. Nor were there any deficiencies that affected the accuracy or quality of sounding data beyond the normal, inherent factors discussed above.

B.3 Corrections to Echo Soundings: There are no deviations to information described in the "Corrections to Echo Soundings" section of the "Data Acquisition and Processing Report". ***Data filed with the original field records.***

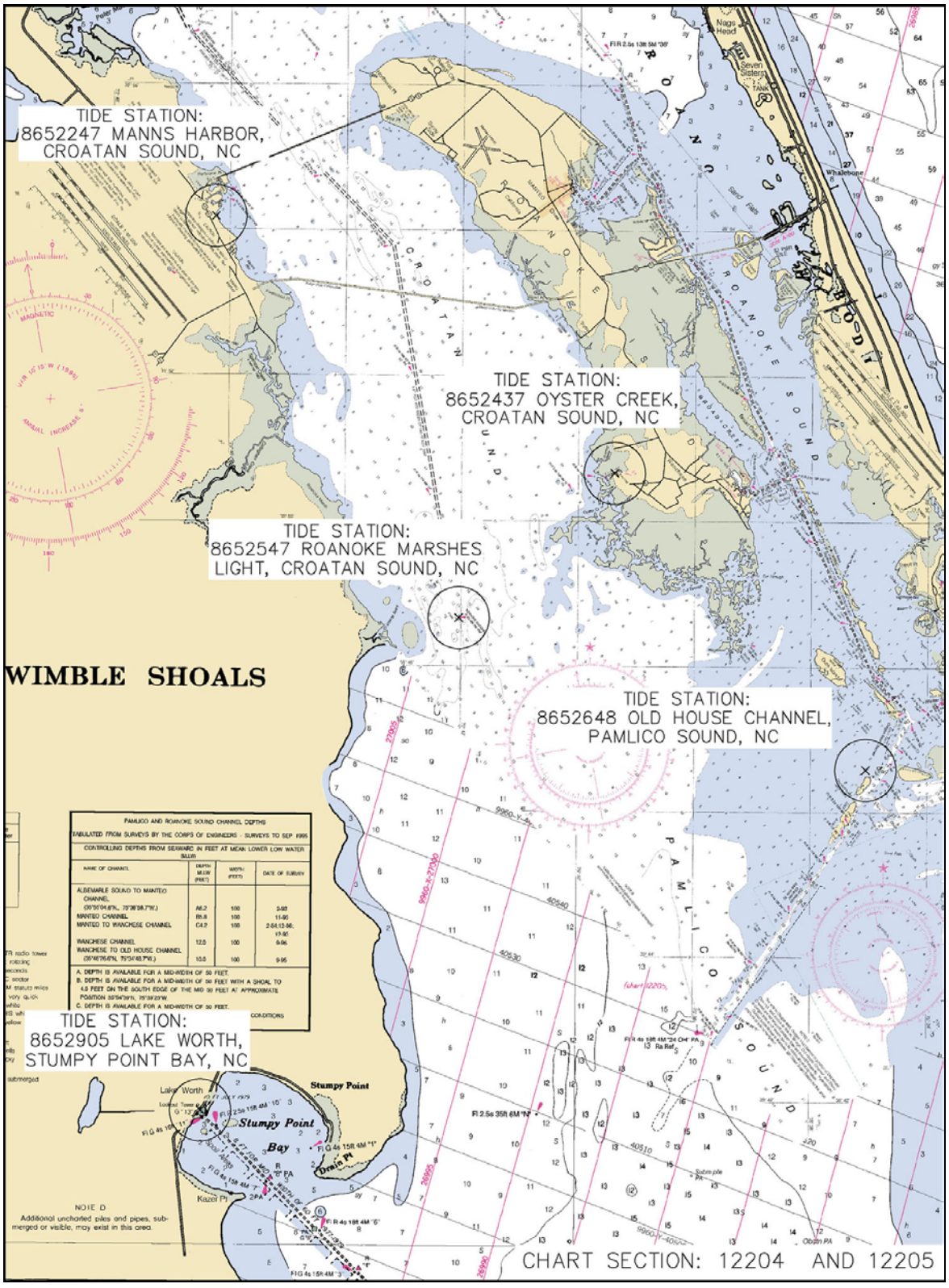
C. VERTICAL AND HORIZONTAL CONTROL

C.1 Application of Water Level Corrections to Soundings:

All tide records are referenced to Universal Coordinated Time (UTC). Soundings are referenced to Low Water Datum (LWD), which was computed by subtracting 0.5 feet from Mean Water Level (MWL).

Five subordinate water level gauging stations were installed throughout the survey area. Stations were located at Oyster Creek, Manns Harbor, Old House Channel, Lake Worth and Roanoke Marshes (see figure below.) Water level stations were installed consistent with NOS specifications and maintained for the duration of the survey. Water level data from each subordinate station were delivered to CO-OPS on a weekly basis.

NOAA used water level data collected by OSI to determine final water level correctors and zones. The final zoning schemes and tide notes were delivered to Ocean Surveys, Inc. in a letter dated 2/19/03 from NOAA. The associated correspondence is included in Appendix IV of the Descriptive Report. The final zoning scheme is based on four of the five subordinate tide stations (Data from Oyster Creek were not used in final zoning.) These final water levels were applied to the sounding data, utilizing the CARIS HIPS Tide Zoning utility**.** ***Verified tides using final tidal zoning were applied by the contractor. No re-application of AHB Final Tides was required.***



Locations of Subordinate Water level Stations installed during the survey.

C.1.1 Real Time Kinematic Water Levels

Ocean Surveys logged Real Time Kinematic (RTK) water levels throughout the period of the survey. The purpose for acquiring RTK was to provide NOAA with data for a study of the applicability of RTK water levels in the production of hydrographic surveys. Detailed information about the setup and procedures for RTK data acquisition can be found in the accompanying document, "Vertical and Horizontal Control Report".

C.2 Horizontal Datum and Horizontal Control: ***See also the Evaluation Report.***

The horizontal datum for this project is the North American Datum of 1983 (NAD83). All project data are referenced to Latitude/Longitude and Universal Transverse Mercator (UTM) Zone 18, in meters. All horizontal data were acquired referenced to WGS-84, and converted to NAD83 in post acquisition data processing.

Position information was obtained and monitored with two independent systems. Each system consisted of a Global Positioning System (GPS) receiver coupled to a U.S. Coast Guard Differential beacon receiver. The following table lists DGPS broadcast stations used during survey operations along with control points used for horizontal confidence checks.

Type	Name	Frequency or PID
Primary DGPS Corrector	New Bern, NC	294 KHz
Reference DGPS Corrector	Driver, VA	289 KHz
Control Point	DAR 24	AH9292

DG+0.
PS horizontal positioning accuracy was verified prior to commencement of operations and on a daily basis during the course of the survey. Confidence check procedures are discussed in the project "Vertical and Horizontal Control" report.

D. RESULTS AND RECOMMENDATIONS ***See also the Evaluation Report.***

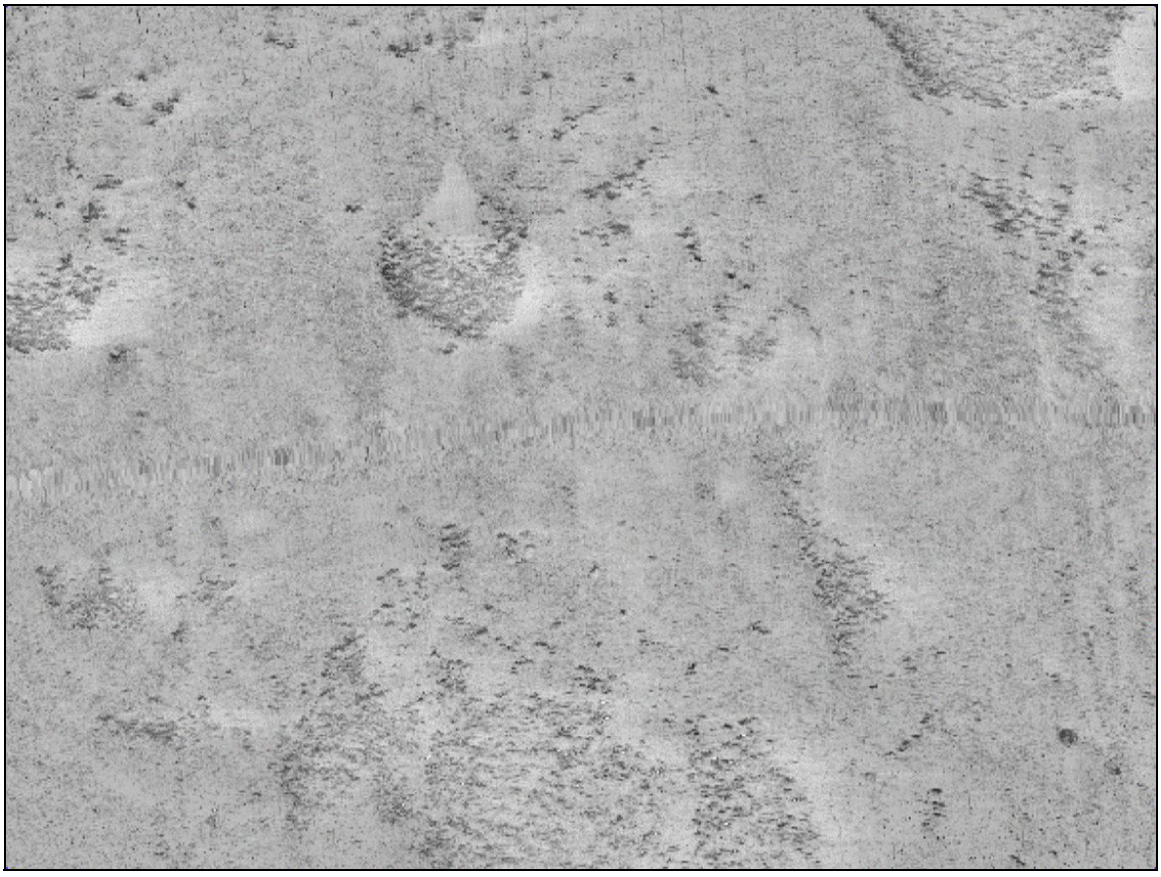
D.1 Chart Comparison:

The survey area lies within the boundaries of Chart 12204 and Chart 12205 pages C and D. Comparison to charts herein is made to Chart 12204 34th Edition published 4/21/01 and Chart 12205 27th Edition published 7/1/02. These charts supercede the 33rd and 26th editions of the above referenced charts listed in the Statement of Work. Charts were updated weekly based on Notice to Mariners (NTM). The last NTM reviewed during the survey was the 5th District Local Notice To Mariners No. 40/02, October 1, 2002. All NTM items within the survey area were changes in characteristics or locations of aids to navigation. These changes and references to the specific NTM are included in the discussion of aids to navigation in Section D.2.1. The 35th Edition of Chart 12204 was published 1/1/03. This edition was also referred to for comparison where noted below.

D.1.1 Survey Depths

In general, the survey data match the charted soundings to within 2 feet. Survey depths are within 1 foot of charted depths throughout much of the southern half of the survey area. The general contour trends of the present survey coincide with the charted contours.

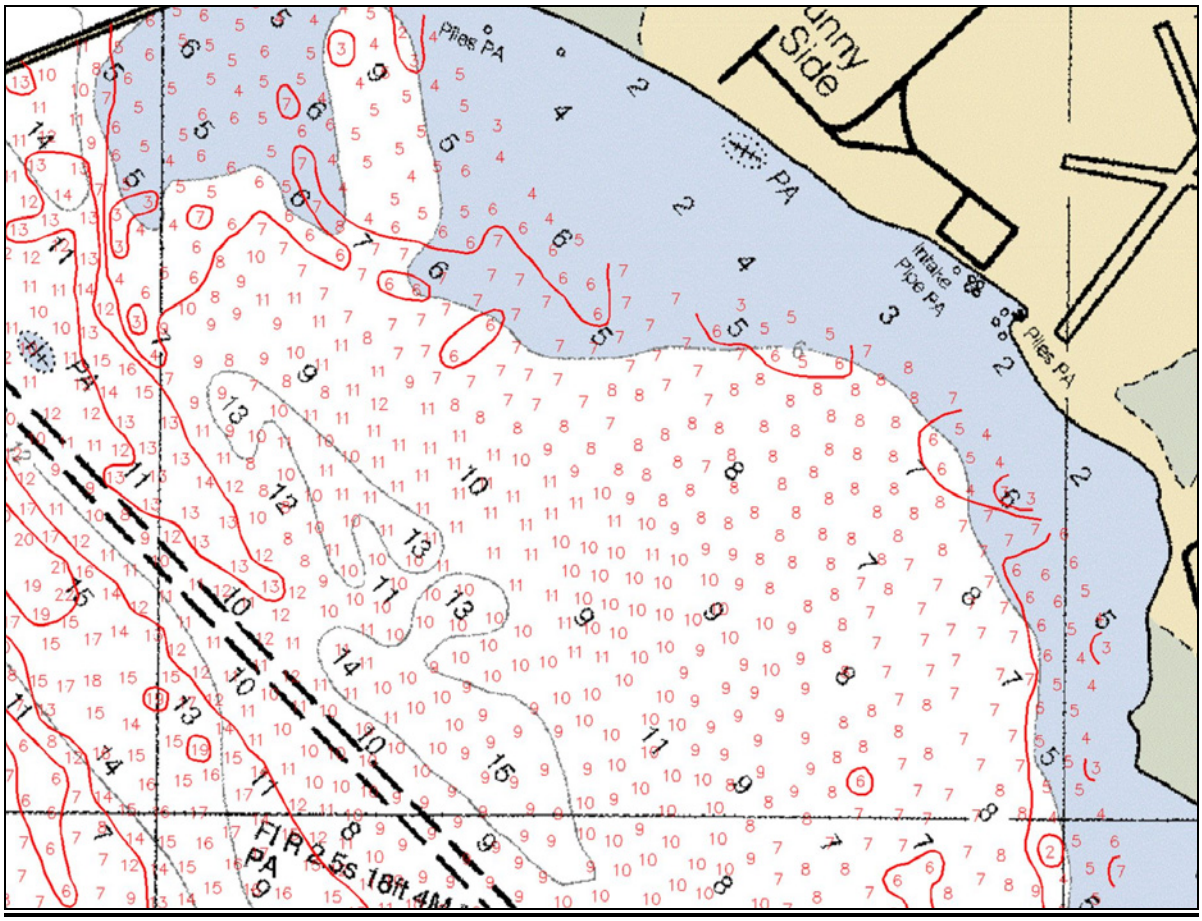
In the Roanoke Marshes area there were some significant differences between charted depths and present survey depths. The present survey results indicates an alternating pattern of deeper and shoaler survey depths than charted. This may be the result of more accurate positioning of previously charted isolated shoal soundings and/or identification of additional isolated objects/coarse material during this survey. The figure below is a section of side scan sonar imagery in this area, showing the coarse material. The most significant of these piles of material were identified and further investigated, as documented in Item Investigation reports below (FC576, FC575/OC26). ***See pages 68 to 71 of this report. See also section D.1.2.1 of the Evaluation Report.***



Side scan sonar imagery showing areas of coarse material as well as scattered objects.

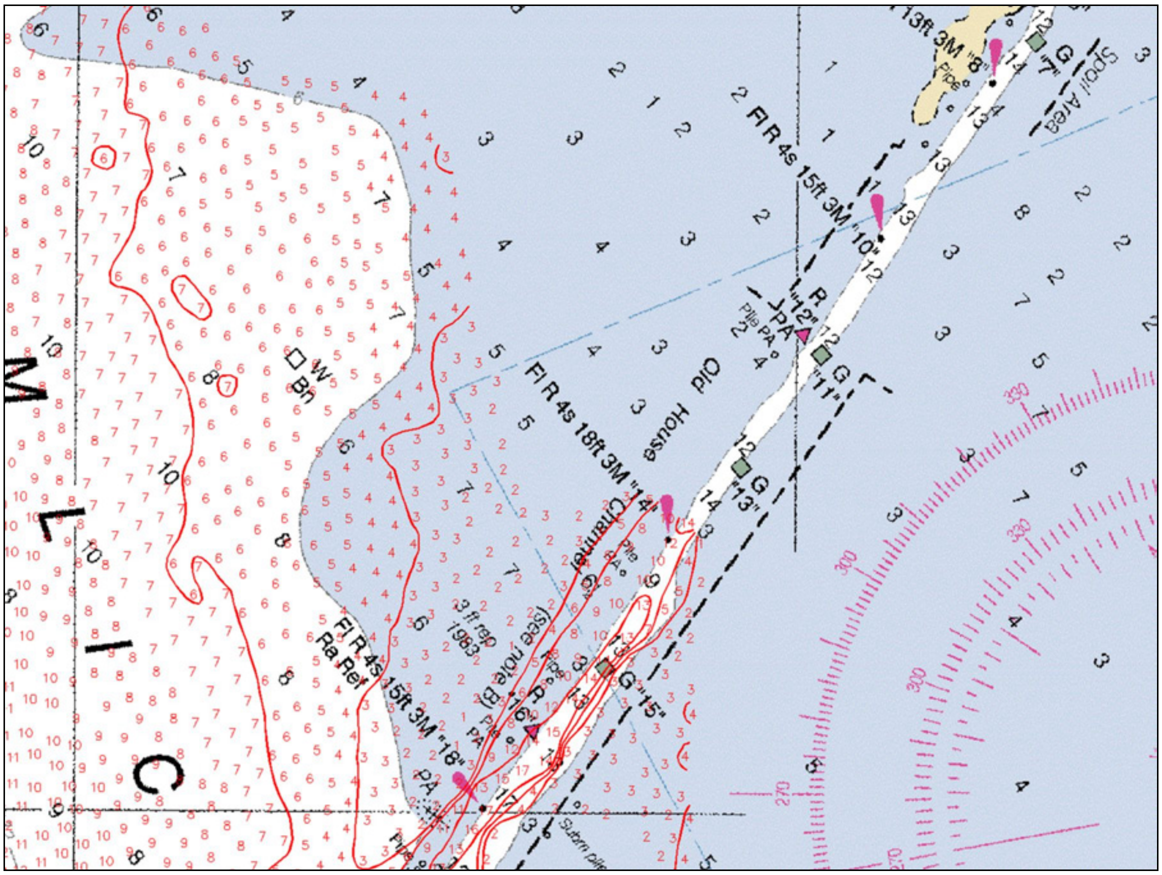
In the northeast corner of the site, survey depths are sometimes shoaler than previously charted. Within this area there are several 2 and 3 foot shoal soundings. Side scan sonar records show sand waves are present throughout the area. The 3 foot sounding located at 35°

54’ 52.16”N, 75° 44’ 02.78”W appears to be the crest of a particularly high sand wave. The figure below illustrates the present survey results. ***Concur.***



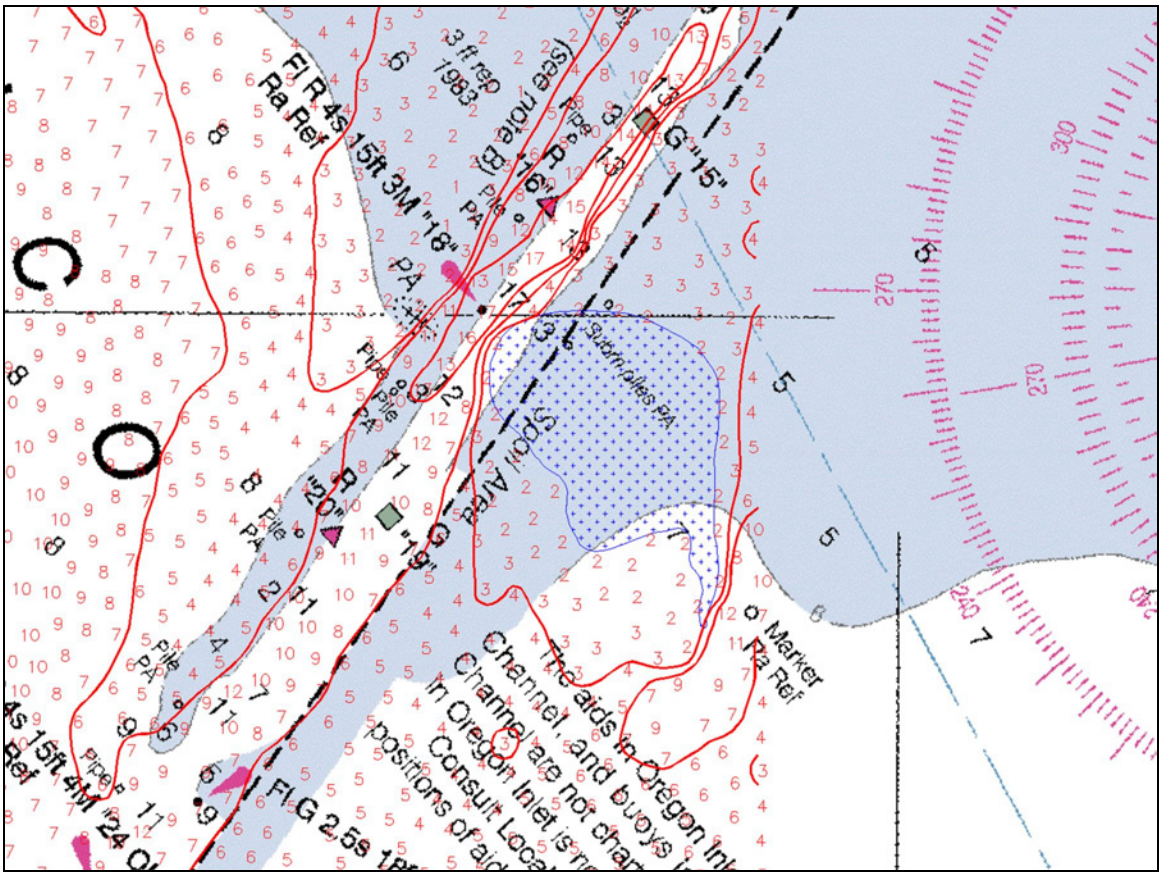
Northeast corner of survey site, shoal soundings in sand wave area. Present survey depths and contours are in red. Chart 12205 (27th ed.) in background.

In the southeastern corner of the survey site, near Old House Channel, the present survey depths are consistently shoaler than charted depths. The 6 foot contour in this area is further west of the currently charted 6 foot contour. The following figure illustrates the survey results from this area. ***Concur.***



Old House Channel area, present survey depths, new 6ft contour in red.
Chart 12205 (27th ed.) in background.

In addition to the shoaling north of Old House Channel, a significant spoil area was observed just south of the channel between buoy “15” and buoy “19”. The dredge vessel “Mindy-1” was operating in the area during survey operations. Maintenance dredging is an ongoing operation within the Old House Channel. The spoil area appears to be actively used for dredge spoils. The survey vessel maneuvered around the spoil area, surveying in as shallow water as safely possible. Some survey lines were terminated early due to shallow water conditions. The figure below shows the extents of the spoil area. The background chart shows a long rectangular area labeled “spoil area” rather than the actual size and shape of the present spoil area. ***Concur. See also section D.1.1 of the Evaluation Report.***



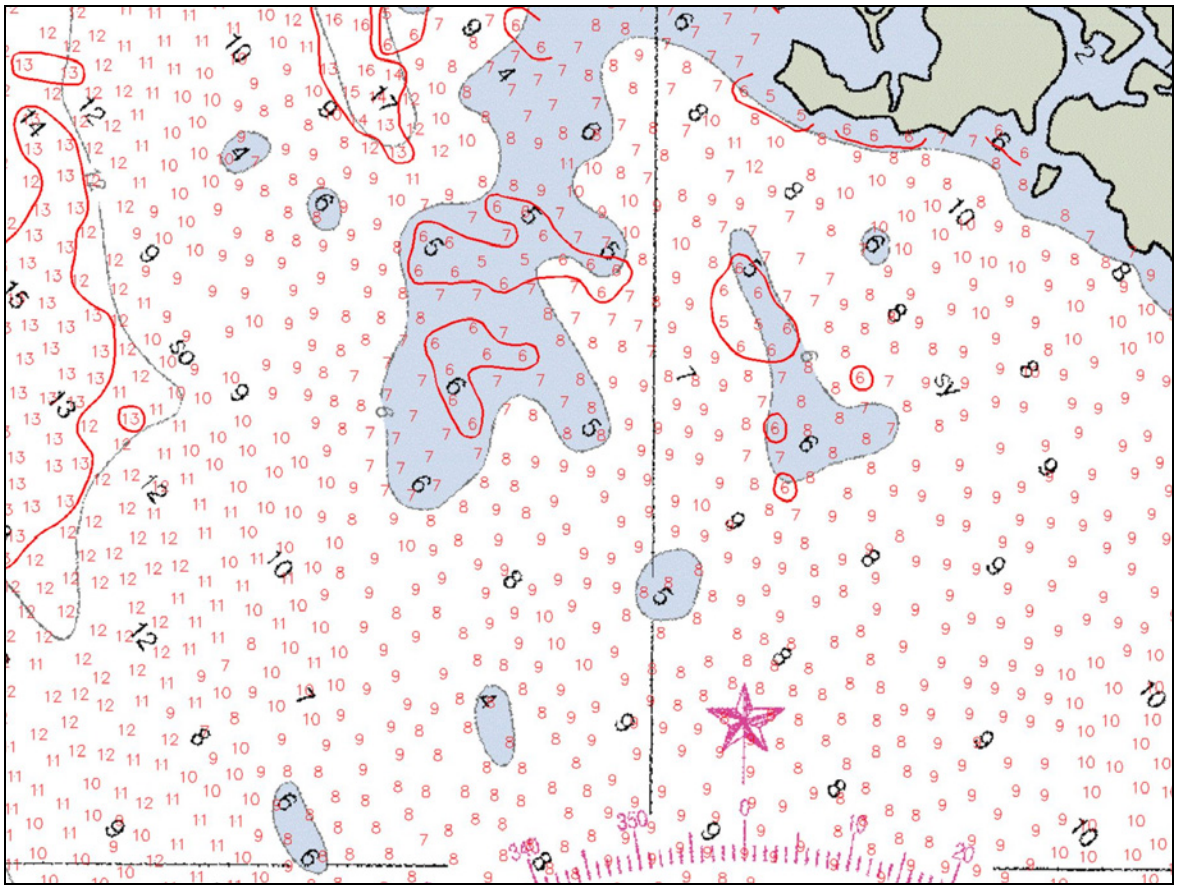
Area south of Old House Channel, Spoil Area outlined in blue.
Chart 12205 27th Ed. In background.

D.1.2 Charted Features and Significant Charted Depths

Several previously charted isolated shoal areas have been verified in the present survey. In some cases, previously charted shoal areas were not found and/or new, isolated shoals have been identified. These areas have been contoured appropriately on the smooth sheet.

Significant charted depths that have been disproved are detailed below:

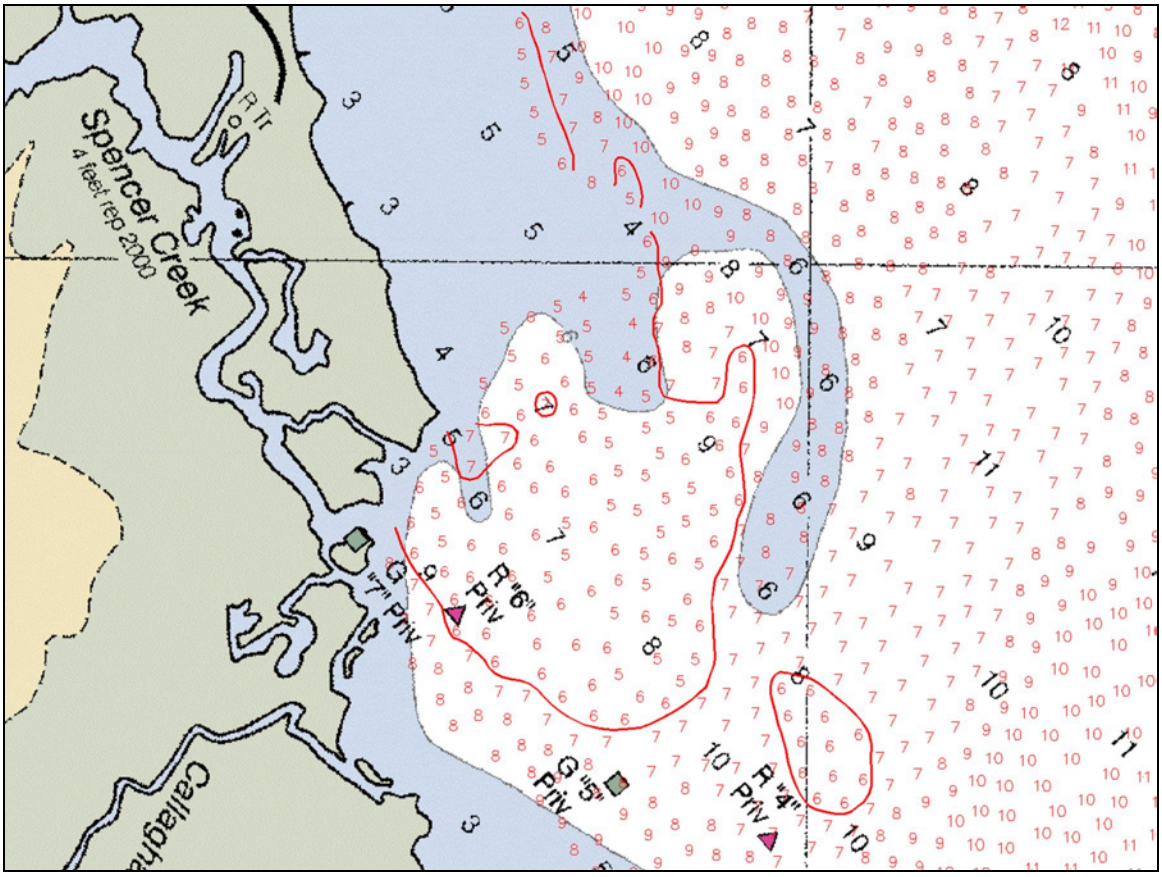
- Charted 4 foot sounding west northwest of Oyster Creek: present survey depths 7-8 feet. ***Concur. Lat. 35/50/24.71 N Long. 75/40/10.44 W***
- Charted 4 foot sounding west of Cedar Bush Bay: present survey depths 7-~~8~~ feet. ***Concur. Lat. 35/49/27.33 N Long. 75/40/20.37 W***
- Charted "5 rk" southwest of southern end of the Croatan Sound channel was not found. This is in the Roanoke Marshes area where several side scan sonar targets were identified and investigated (see Item Investigation reports) but no soundings as shoal as 5 feet were found within the area. ***Concur. See section D.1.2.1 of the E&A Report.***
- Several charted isolated shoals (less than 6 feet) offshore of Cedar Bush Bay all disproved, large charted shoal defined by 6 foot contour west of Cedar Bush Bay encompasses much smaller area than previously charted. The figure below illustrates these findings. ***Concur. In the vicinity of Lat. 35/49/00 N Long. 75/40/00 W***



Cedar Bush Bay area, present survey soundings, 6 foot contour in red.

Chart 12205 (27th ed) in background shows previously charted shoals.

- Charted shoal east of Spencer Creek, defined by a finger shaped 6ft contour and several 6 foot soundings, has been disproved. The present survey depths are 7-9 feet. Just west of this area, closer to shore, survey depths are 5-7 feet, shoaler than charted. The figure below shows this area. ***Concur. Lat. 35/52/00N Long. 75/44/00W.***



Area near Spencer Creek, present survey depths, 6 foot contour in red.
Chart 12205 (27th Ed) in background.

Several charted features were not found during this survey. All of those features are included in the table below. This list includes all of the charted features containing the label PA, ED, PD, or Rep as well as one other feature.

Charted Features Not Found

Feature	Charted Location (NAD83)*		Comments
	Latitude	Longitude	
Pilings PA	N 35° 52' 45.88"	W 075° 40' 23.24"	***Nothing observed (Outside of survey area)*** ***AWOIS 10848 – revise to Subm Pilings PA*** ***(see section D.1.2.6 of the E&A report)***
	N 35° 52' 46.57"	W 075° 40' 21.70"	
	N 35° 52' 47.41"	W 075° 40' 19.97"	
	N 35° 52' 48.36"	W 075° 40' 18.69"	
Pile PA*	N 35° 44' 32.61"	W 075° 36' 28.49"	Nothing observed [1]***AWOIS 10859***
Pile PA*	N 35° 44' 09.89"	W 075° 36' 47.21"	Nothing observed [1]***AWOIS 10857***
Subm piles PA*	N 35° 44' 01.19"	W 075° 36' 35.81"	Nothing observed [1]***AWOIS 10861***
Subm piles PA*	N 35° 43' 57.04"	W 075° 36' 40.87"	Nothing observed [1]***AWOIS 10860***
Pile PA*	N 35° 43' 52.22"	W 075° 37' 02.55"	Nothing observed [1]***AWOIS 10862***
Pile PA*	N 35° 43' 37.75"	W 075° 37' 14.14"	Nothing observed [1]***AWOIS 10855***
Pile PA*	N 35° 43' 20.36"	W 075° 37' 29.11"	Nothing observed [1] ***AWOIS 10854***
Pile PA*	N 35° 55' ~~27.86~~" 28.26"	W 075° 43' ~~26.62~~" 25.29"	Nothing observed [2]***AWOIS 10843***
PA Wk*	N 35° 54' 48.92"	W 075° 44' 16.06"	Nothing observed [3]***AWOIS 10842***
PA Wk*	N 35° 43' 59.70"	W 075° 36' 59.82"	Nothing observed [3]***AWOIS 10851***
Pipe*	N 35° 44' 17.97"	W 075° 36' 40.48"	Nothing observed [1]***AWOIS 10858***
Pipe*	N 35° 43' 52.94"	W 075° 37' 01.68"	Nothing observed [1]***AWOIS 10856***
Pipe*	N 35° 43' 11.83"	W 075° 37' 36.28"	Nothing observed [1]***AWOIS 10853***
Pipes (surrounding Roanoke Light Tower)	N 35° 48' 41.25"	W 075° 42' 05.00"	Believed to be in reference to the corners of the Old Roanoke Marshes Light Tower, but the coordinates do not match, and no other pipes were observed [1]***AWOIS 10847***
	N 35° 48' 41.54"	W 075° 42' 01.44"	
	N 35° 48' 39.30"	W 075° 42' 00.55"	
	N 35° 48' 37.71"	W 075° 42' 02.21"	
	N 35° 48' 39.00"	W 075° 42' 05.18"	

1 – Item is adequately disproved, delete from chart. See section D.1.2.2 of the E&A report.

2 - revise to Subm Piles PA. See also section D.1.2.4 of the E&A report.

3- Item is adequately disproved, delete from chart.

*Positions from Chart 12204, 34th Edition, Published 04/21/2001

D.1.3 Observed Features Not Charted ***See also the Evaluation Report.***

Several features observed in the field were not charted on either of the NOAA charts of the area. These features fall within 2 categories: fishing stakes and privately maintained buoys. All of these features are included on the preliminary smooth sheet. Eight instances of fish stakes marking fish trap areas were identified within the survey areas. These ranged from single, isolated stakes to areas of several stakes. The following table details the fish stake areas, with photographs where available.

Uncharted Fish Stakes Observed

Description	Location (NAD83)
Group of fish trap stakes located on the west shore between Mann's Harbor Lights #1 and #2 - stakes extend from the shore out approx. 400 meters - approx. width north-south varies from 40-60 meters	Approximate centerline (E-W): N 35° 54' 34.83" W 075° 45' 46.87" to N 35° 54' 30.78" W 075° 46' 01.37" ***Concur.***
Two stakes marked "Benny Rippons 0728" located approx. 400 meters southeast of the Mann's Harbor Bridge -possible gill net set between the stakes, which are approx. 220 meters apart	Approximate locations: Eastern Stake N 35° 54' 44.58" W 075° 45' 19.01" Western Stake N 35° 54' 41.92" W 075° 45' 27.29" ***Concur.***
Group of fish trap stakes located to the west of the 25m study area, about 800 meters north of the Croatan Sound bridge - stakes extend NE-SW, approximately 830 meters - approximate width varies from 10-30 meters (see Picture 1)	Approximate centerline (E-W): N 35° 53' 56.64" W 075° 44' 06.61" to N 35° 53' 43.58" W 075° 44' 35.66" ***Concur.***

Description	Location (NAD83)
 **Picture 1** - Fish trap stakes approximately 800 meters north of Croatan Sound bridge	
Pound net area with sign labeled "W.L. Craddock PN617167" located on the west shore above Roanoke Marshes Light and south of Daymarker "SC1"- stakes extend from shore out approximately 200 meters - width is widest at the eastern end, approx. 35 meters, with the spacing of approx. 20 meters (see Picture 2)	Approximate centerline (E-W): N 35° 49' 30.23" W 075° 43' 33.68" to N 35° 49' 28.05" W 075° 43' 41.18" ***Concur.***
 **Picture 2** - Pound net area located on west shore above Roanoke Marshes Light	

Description	Location (NAD83)
Single stake marked "Proposed Pound Net Set" 375 meters east-northeast of "W.L. Craddock PN617167" pound net area (see Picture 3)	N 35° 49' 32.61" W 075° 43' 18.67" ***Concur.***
 **Picture 3** - Single stake east of "W.L. Craddock PN617167"	
North-south oriented line of fish trap stakes below Roanoke Island, approx. 3600 meters southeast of Roanoke Island West Side Light 2 - stakes extend south from shore approx. 200 meters	Approximate centerline (N-S): N 35° 48' 59.42" W 075° 38' 30.51" to N 35° 48' 52.57" W 075° 38' 30.41" ***Concur.***
Pound net area with sign labeled "W.L. Craddock P.NO. 03612" located on the west shore approximately 3300 meters southwest of Roanoke Marshes Light - stakes extend from shore approx. 650 meters - most of the width is 1-10 meters wide, with a 45x45 meter area on the eastern most end (see Picture 4)	Approximate centerline (E-W): N 35° 47' 18.06" W 075° 43' 25.65" to N 35° 47' 15.55" W 075° 43' 38.01" to N 35° 47' 11.42" W 075° 43' 50.59" ***Concur.***

Description	Location (NAD83)
 **Picture 4** - Pound net area on the west shore southwest of Roanoke Marshes Light	
Fish trap area of stakes, nets, and wires located on the west shore approximately 5600 meters southwest of Roanoke Marshes Light and 2500 meters south of "W.L. Craddock P.NO. 03612" - stakes extend from shore approx. 850 meters - north-south width varies from 45-80 meters (see Picture 5) ***Concur.***	Polygon bounded as follows: N 35° 45' 48.75" W 075° 43' 57.84" to N 35° 45' 51.65" W 075° 43' 42.84" to N 35° 45' 53.54" W 075° 43' 31.12" to N 35° 45' 51.99" W 075° 43' 30.73" to N 35° 45' 49.35" W 075° 43' 47.12" to N 35° 45' 45.95" W 075° 43' 57.95"
 **Picture 5** - Fish trap area of stakes, nets, and wires on the west shore	

In addition to the fish trap areas, nine privately maintained buoys were identified in the survey area that were not previously charted. These buoys are detailed in the following table.

Uncharted Buoys Observed

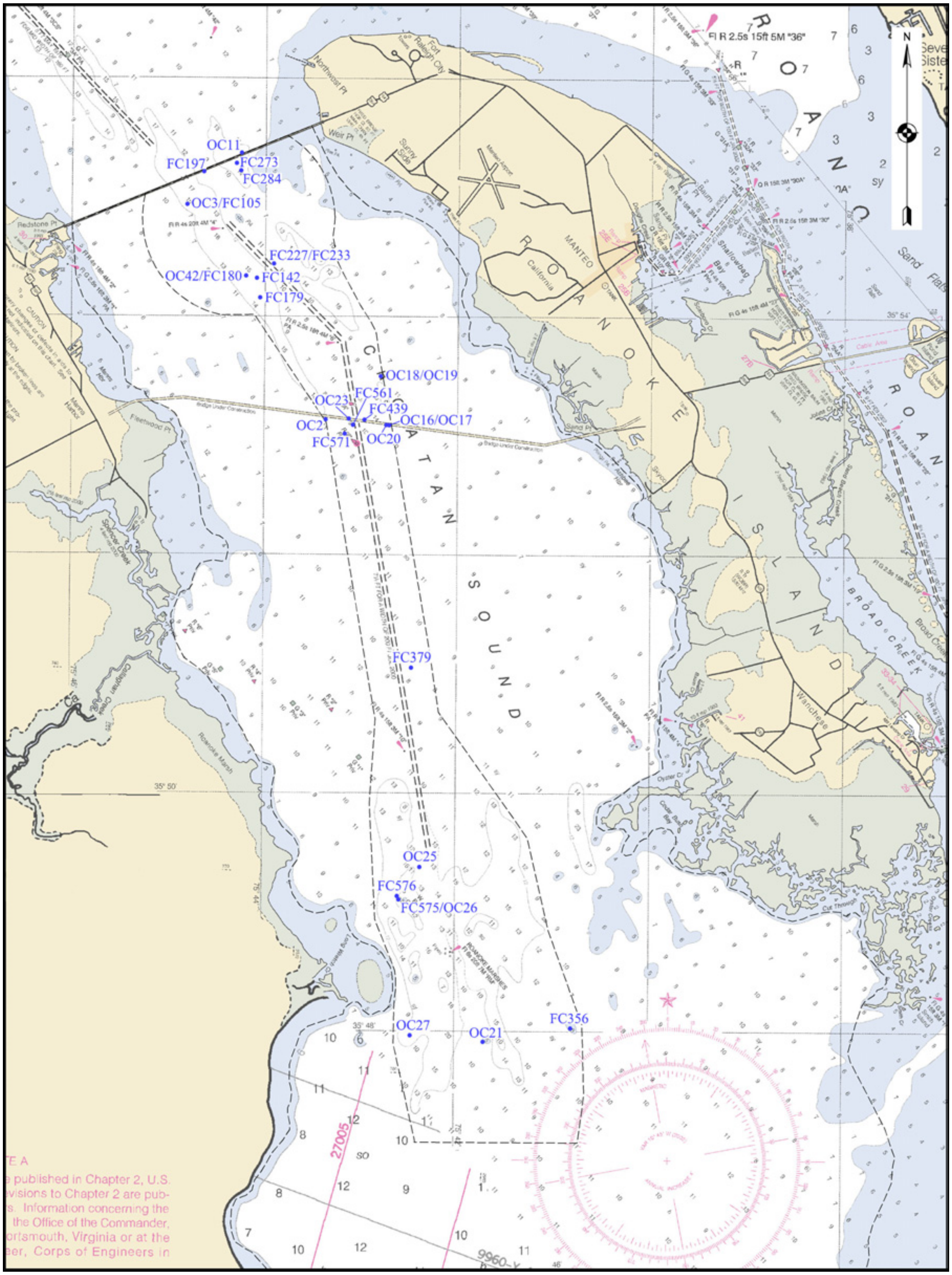
Marker	Description	Location (NAD83)
	White marker buoy "Management - Seed Oysters" - located near Oyster Creek entrance	N 35° 50' 23.56" W 075° 39' 50.83" ***Concur.***
	Yellow marker buoy "Public - Bed - Oyster" - located ~2800 meters south of Oyster Creek entrance marker #2 along eastern shore	N 35° 49' 15.24" W 075° 39' 14.96" ***Concur.***
	Yellow marker buoy "Public - Bed - Oyster" - located ~2800 meters south of Oyster Creek entrance marker #2 along eastern shore	N 35° 49' 17.09" W 075° 39' 13.80" ***Concur.***
	White marker buoy "Management - Seed Oyster - Area" - located ~3950 meters south of Oyster Creek entrance marker #2 along eastern shore	N 35° 49' 00.08" W 075° 38' 18.25" ***Concur.***

Marker	Description	Location (NAD83)
	White marker buoy "Artificial - Reef - North Carolina DMF" - located ~5050 meters south-southeast of Oyster Creek entrance marker #2 and about 1400 meters west of eastern shore	N 35° 48’ 11.99” W 075° 38’ 23.98” ***Concur.***
	White marker buoy "Artificial - Reef - North Carolina DMF" - located ~5050 meters south-southeast of Oyster Creek entrance marker #2 and about 1400 meters west of eastern shore	N 35° 48’ 14.69” W 075° 38’ 27.28” ***Concur.***
	White marker buoy "Artificial - Reef - North Carolina DMF" - located ~5050 meters south-southeast of Oyster Creek entrance marker #2 and about 1400 meters west of eastern shore	N 35° 48’ 15.96” W 075° 38’ 25.20” ***Concur.***
	White marker buoy "Seed Oyster Mgmt Area" - located ~2000 meters east of Roanoke Marshes	N 35° 48’ 37.46” W 075° 40’ 41.99” ***Concur.***
	White marker buoy "No Boats" - located between R20 and G19 in Old House Channel	N 35° 43’ 38.13” W 075° 37’ 07.86” ***Concur.***

D.1.4 Item Investigations:

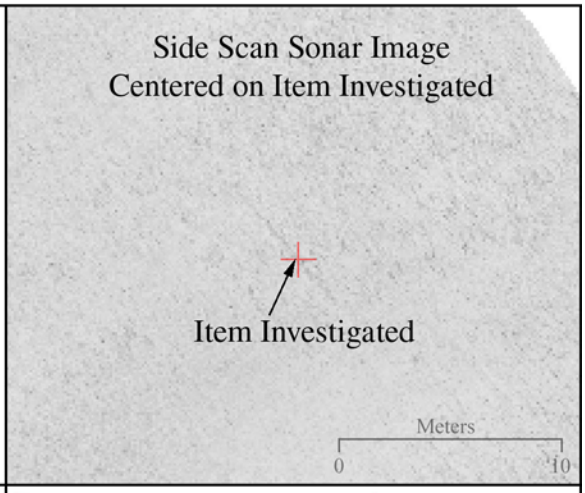
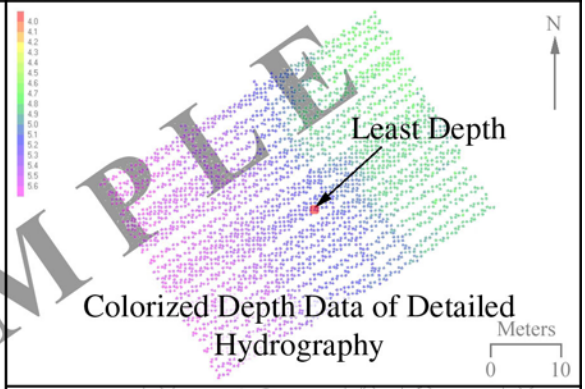
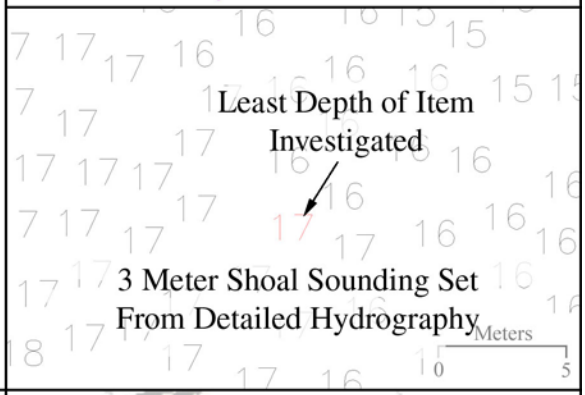
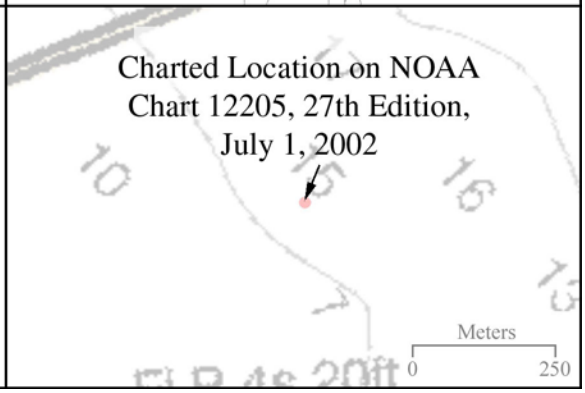
Preliminary survey operations identified numerous contacts. There were hundreds of crab pots set within the survey area and these were often imaged on the side scan sonar records. Objects of the approximate size and shape of crab pots were not considered for further investigation. All other significant contacts were submitted to NOAA along with a recommendation for further investigation. Based on this information, 30 items were selected for investigation in lieu of AWOIS "Investigation Items". All data pertaining to item investigations are contained in this report.

A chart showing the locations of item investigations is provided below. An annotated example (legend) of the item investigation forms precedes the individual reports. In some cases, results of the detailed survey indicate that the shoal depth associated with the item investigated will not appear on the preliminary smooth sheet because surrounding depths from the primary survey are shoaler. In other words the shoal point of the item investigation is not a plotted sounding on the smooth sheet. In these cases no specific charting recommendation is given for the area since the shoal depth does not represent a sounding that will be charted.


OC11
FC197
FC273
FC284
OC3/FC105
FC227/FC233
OC42/FC180
FC142
FC179
OC18/OC19
FC561
OC23
FC439
OC16/OC17
OC2
OC20
FC571
FC379
OC25
FC576
FC575/OC26
FC356
OC27
OC21
ROANOKE ISLAND
CROATAN SOUND
MANTEO

Item Investigation Designation

OC3/FC105

Side Scan Sonar Information	Side Scan Sonar Image Centered on Item Investigated
Line: S25914136200 **Ping:** 312 **Lat:** N 35° 54' 55.88" **Lon:** W 075° 44' 48.00" **Contact Dimensions (m):** **H:** 0.10 **W:** 0.68 **L:** 5.75 **Correlating Contacts:** **Line:** S25914176201 **Ping:** 424 **Line:** S25914226202 **Ping:** 430 **Line:** S25914286203 **Ping:** 410	
Least Depth Information **Least Depth:** 5.12 m **Least Depth (sounding):** 17 **Line:** H27315455203 **Ping:** 271 **LD Lat:** N 35° 54' 55.90" **LD Lon:** W 075° 44' 48.12" Least Depth Information Based On Detailed Hydrography (1.5 Meter Spaced Survey Lines) Over the Item Investigation Area	 
Chart Recommendations Based on Item Investigation Findings **Chart Recommendations:** N/A - surrounding depths are shoaler than least depth observed in item investigation.	

OC2
Item Investigation Report

Item Description: Uncharted boat shaped depression

Source: 2002RV16511443_1208.XTF **Ping:** 365

Observed Position: N 35° 53' 07.85" W 075° 43' 21.64"

Charts Affected: 12204, 34th Edition, April 21, 2001
12205, 27th Edition, July 1, 2002

Investigation

Date/Day Number: 16 September 2002/Julian Day 259 **Survey Vessel:** RV Willing II

Investigation Method: Side Scan Sonar, Single Beam Hydrography

Surveyed Position (NAD83): N 35° 53' 07.78" W 075° 43' 21.27"

Position Determined By: Side Scan Sonar

Position Line/Time: S25911536601/11:53 (center of target area) **Ping:** 250
(Raw file name: 2002RV2591153_6601.XTF)

Investigation Summary: Side scan sonar data acquired along 4 tracklines oriented in a box pattern verified the presence of a depression. Single beam hydrographic data were acquired along a series of parallel tracklines spaced at 1.5 meter intervals within the investigation area. The sounding information confirmed the presence of a depression. This item investigation is resolved and requires no further study.

Charting Recommendation

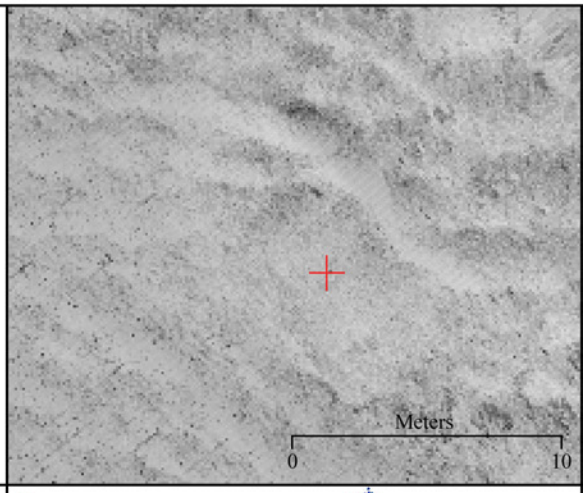
N/A - not a shoal feature.

Recommended Least Depth: N/A

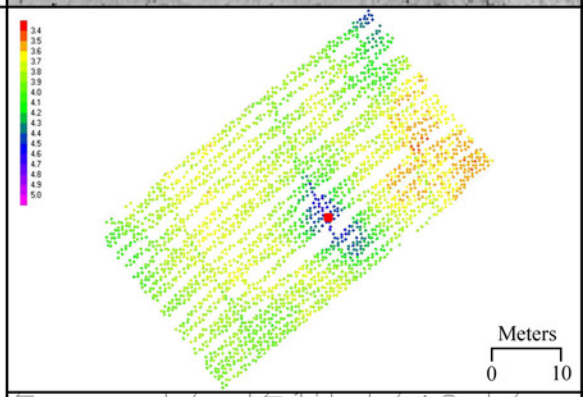
Office Use: ***Concur.***

OC2

Line: S25911536601
Ping: 250
Lat: N 35° 53' 07.78"
Lon: W 075° 43' 21.27"
Contact Dimensions (m):
H: n/a **W:** 3.84 **L:** 7.54
Correlating Contacts:
Line: S25911406600 **Ping:** 253
Line: S25912106602 **Ping:** 298
Line: S25912206603 **Ping:** 483



Least Depth: n/a
Least Depth: n/a
Line: n/a **Ping:** n/a
LD Lat: n/a
LD Lon: n/a



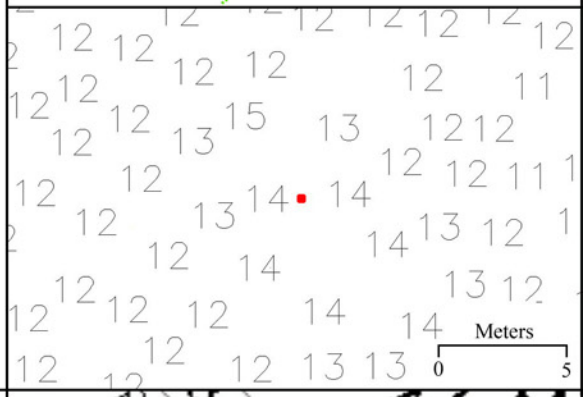
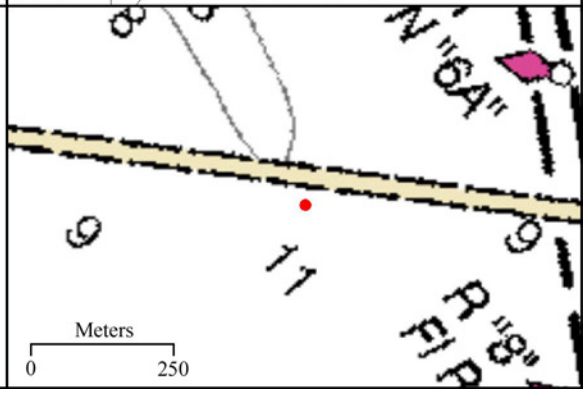


Chart Recommendations:
N/A - not a shoal feature.



OC3/FC105
Item Investigation Report

Item Description: Uncharted linear object

Source: 2002RV1651443_1208.XTF **Ping:** 28178
2002RV1651638_1207.XTF **Ping:** 2749

Observed Position: N 35° 54' 55.97" W 075° 44' 48.34"
N 35° 54' 56.01" W 075° 44' 48.21"

Charts Affected: 12204, 34th Edition, April 21, 2001
12205, 27th Edition, July 1, 2002

Investigation

Date/Day Number: 30 September 2002/Julian Day 273 **Survey Vessel:** RV Willing II

Investigation Method: Side Scan Sonar, Single Beam Hydrography

Surveyed Position (NAD83): N 35° 54' 55.90" W 075° 44' 48.12"

Position Determined By: Single Beam Hydrography

Position Line/Time: H27315455203/15:45 (point of least depth) **Ping:** 271
(Raw file name: 2002RV2731545_5203.XTF)

Investigation Summary: Side scan sonar data acquired along 4 tracklines oriented in a box pattern, verified the presence of a linear object. Single beam hydrographic data were acquired along a series of parallel tracklines spaced at 1.5 meters intervals within the investigation area. Shoal depth determined from these data was deeper than shoal depths observed on the primary hydro lines nearby. This item investigation is resolved and requires no further study.

Charting Recommendation

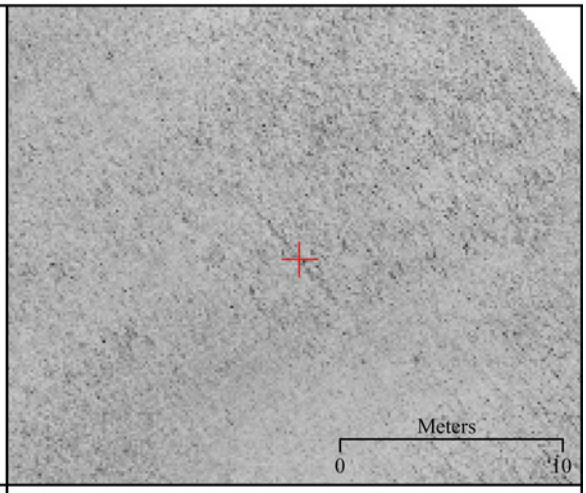
N/A – surrounding depths on preliminary smooth sheet are shoaler than least depth observed in item investigation.

Recommended Least Depth: N/A

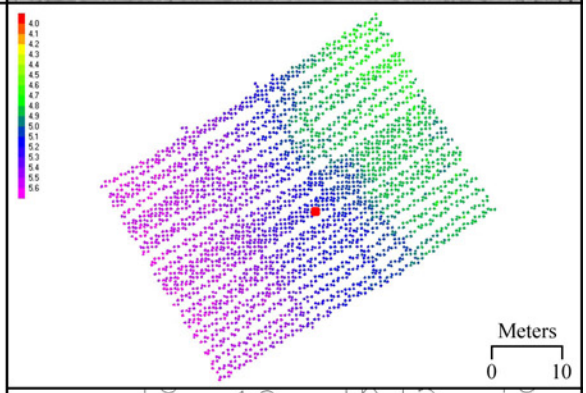
Office Use: ***Concur.***

OC3/FC105

Line: S25914136200
Ping: 312
Lat: N 35° 54' 55.88"
Lon: W 075° 44' 48.00"
Contact Dimensions (m):
H: 0.10 **W:** 0.68 **L:** 5.75
Correlating Contacts:
Line: S25914176201 **Ping:** 424
Line: S25914226202 **Ping:** 430
Line: S25914286203 **Ping:** 410



Least Depth: 5.12 m
Least Depth (sounding): 17
Line: H27315455203 **Ping:** 271
LD Lat: N 35° 54' 55.90"
LD Lon: W 075° 44' 48.12"



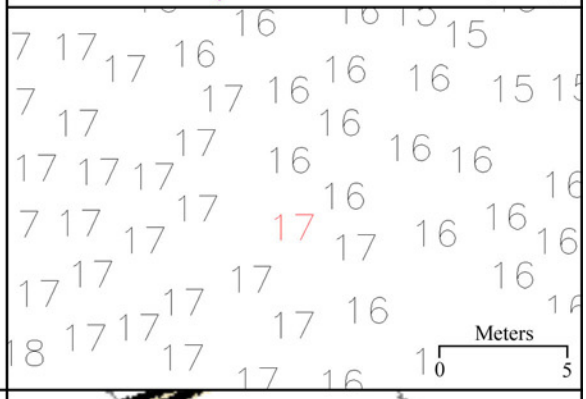
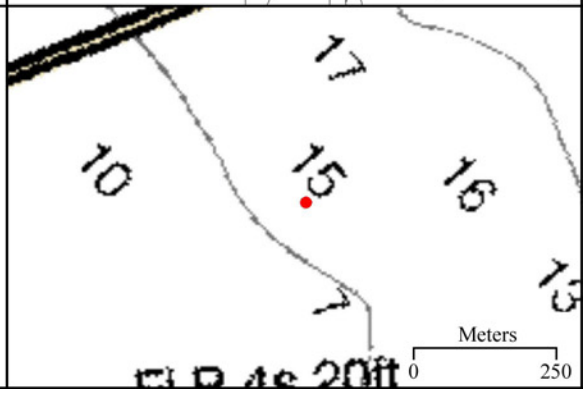


Chart Recommendations:
N/A - surrounding depths are shoaler than least depth observed in item investigation.



OC42/FC180
Item Investigation Report

Item Description: Uncharted scour ending in hull shaped depression

Source: 2002RV1661411_1200.XTF **Ping:** 10921
2002RV1661919_1201.XTF **Ping:** 15674

Observed Position: N 35° 54' 20.18" W 075° 44' 11.54"
N 35° 54' 19.86" W 075° 44' 11.30"

Charts Affected: 12204, 34th Edition, April 21, 2001
12205, 27th Edition, July 1, 2002

Investigation

Date/Day Number: 18 September 2002/Julian Day 261 **Survey Vessel:** RV Willing II

Investigation Method: Side Scan Sonar box pattern, Single Beam Hydrography

Surveyed Position (NAD83): N 35° 54' 20.09" W 075° 44' 11.30"

Position Determined By: Single Beam Hydrography

Position Line/Time: H26120185230/20:19 (point of least depth) **Ping:** 597
(Raw file name: 2002RV2612018_5230.XTF)

Investigation Summary: Side scan sonar data acquired along 4 tracklines oriented in a box pattern, verified the presence of a depression. Single beam hydrographic data were acquired along a series of parallel tracklines spaced at 1.5 meters intervals within the investigation area. Least depth was identified. This item investigation is resolved and requires no further study.

Charting Recommendation

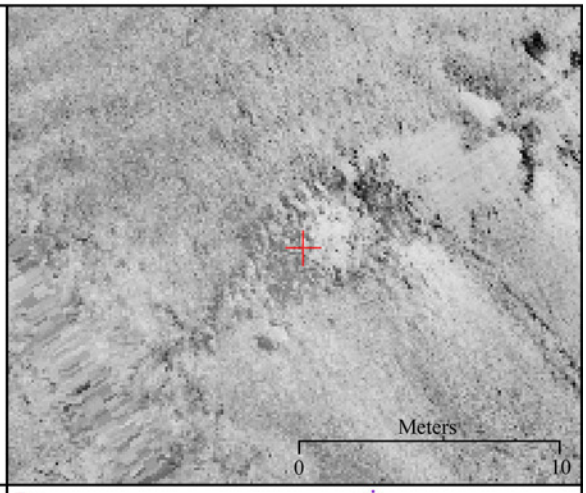
Refer to accompanying preliminary smooth sheet for depth and contour modifications.

Recommended Least Depth: 15 ft. sounding at N 35° 54' 20.09", W 075° 44' 11.30".

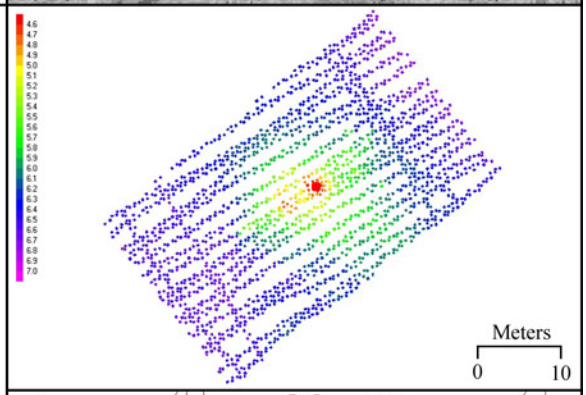
Office Use: ***Concur with clarification, chart representative soundings within the common area.***

OC42/FC180

Line: S26012586225
Ping: 292
Lat: N 35° 54' 20.17"
Lon: W 075° 44' 11.57"
Contact Dimensions (m):
H: 1.86 **W:** 8.94 **L:** 3.84
Correlating Contacts:
Line: S26012386227 **Ping:** 357
Line: S26012466228 **Ping:** 369
Line: S26012536226 **Ping:** 341



Least Depth: 4.61 m
Least Depth (sounding): 15 ft
Line: H26120185230 **Ping:** 597
LD Lat: N 35° 54' 20.09"
LD Lon: W 075° 44' 11.30"



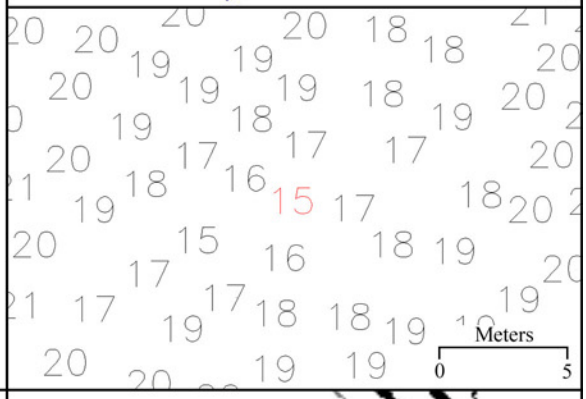
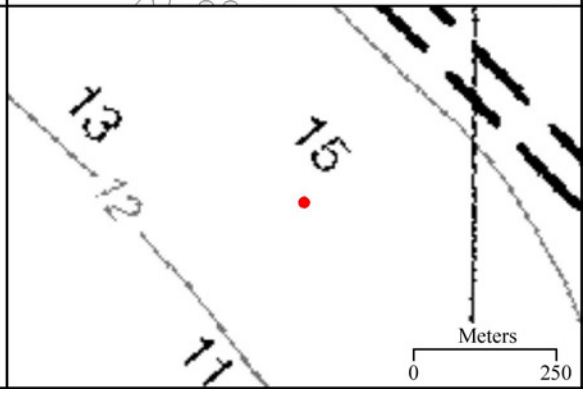


Chart Recommendations:
Refer to accompanying preliminary smooth sheet for depth and contour modifications.



FC142
Item Investigation Report

Item Description: Uncharted object, possible fish, good shadow but target not solid

Source: 2002RV1661428_1196.XTF **Ping:** 14221

Observed Position: N 35° 54' 19.02" W 075° 44' 04.83"

Charts Affected: 12204, 34th Edition, April 21, 2001
12205, 27th Edition, July 1, 2002

Investigation

Date/Day Number: 18 September 2002/Julian Day 261 **Survey Vessel:** RV Willing II

Investigation Method: Side Scan Sonar, Single Beam Hydrography

Surveyed Position (NAD83): N 35° 54' 19.12" W 075° 44' 04.64"

Position Determined By: Single Beam Hydrography

Position Line/Time: H26118285629/18:29 (point of least depth) **Ping:** 640
(Raw file name: 2002RV2611828_5629.XTF)

Investigation Summary: Side scan sonar data acquired along 4 tracklines oriented in a box pattern verified presence of a mound. Single beam hydrographic data were acquired along a series of parallel tracklines spaced at 1.5 meters intervals within the investigation area. Least depth was identified. This item investigation is resolved and requires no further study.

Charting Recommendation

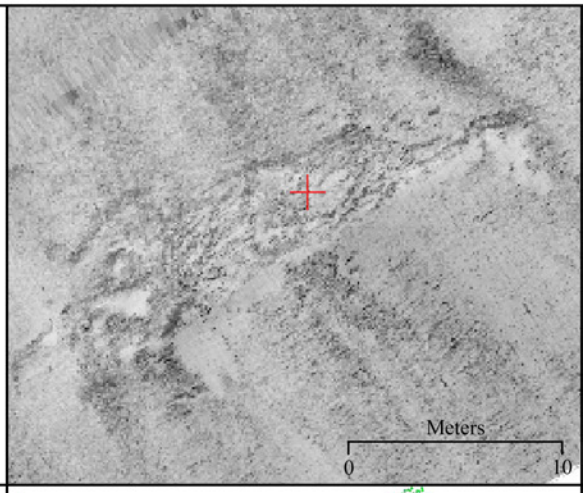
Refer to accompanying preliminary smooth sheet for depth modifications.

Recommended Least Depth: 14 ft. sounding at N 35° 54' 19.12", W 075° 44' 04.64".

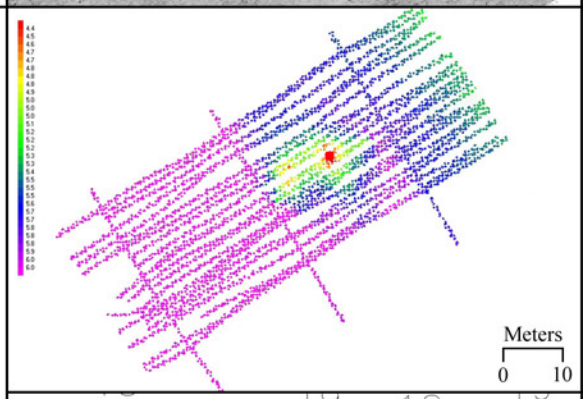
Office Use: ***Concur.***

FC142

Line: S25913516627
Ping: 353
Lat: N 35° 54' 19.18"
Lon: W 075° 44' 04.82"
Contact Dimensions (m):
H: 1.37 **W:** 4.78 **L:** 22.76
Correlating Contacts:
Line: S25913396625 **Ping:** 319
Line: S25913456626 **Ping:** 349
Line: S25914016628 **Ping:** 371



Least Depth: 4.42 m
Least Depth (sounding): 14 ft
Line: H26118285629 **Ping:** 640
LD Lat: N 35° 54' 19.12"
LD Lon: W 075° 44' 04.64"



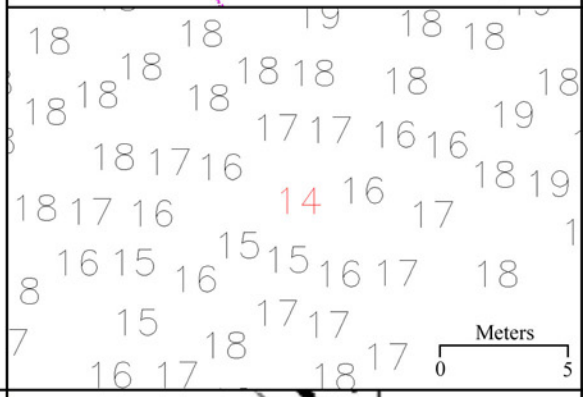
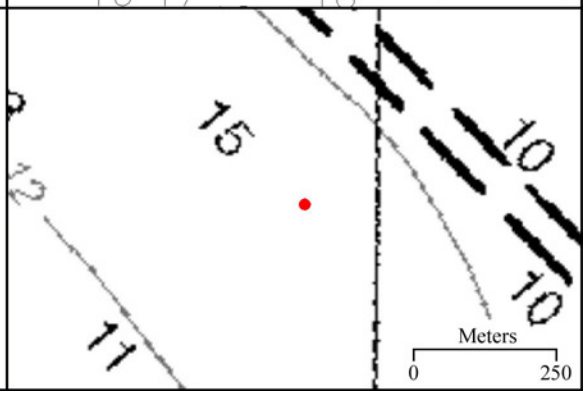


Chart Recommendations:
Refer to accompanying preliminary smooth sheet for depth modifications.



FC179
Item Investigation Report

Item Description: uncharted hull shaped depression pile of material, shadow

Source: 2002RV1661919_1201.XTF **Ping:** 13285

Observed Position: N 35° 54' 09.12" W 075° 44' 02.66"

Charts Affected: 12204, 34th Edition, April 21, 2001
12205, 27th Edition, July 1, 2002

Investigation

Date/Day Number: 29 September 2002/Julian Day 272 **Survey Vessel:** RV Willing II

Investigation Method: Side Scan Sonar, Single Beam Hydrography

Surveyed Position (NAD83): N 35° 54' 09.23" W 075° 44' 02.99"

Position Determined By: Single Beam Hydrography

Position Line/Time: H27212595283/13:00 (point of least depth) **Ping:** 347
(Raw file name: 2002RV2721259_5283.XTF)

Investigation Summary: Side scan sonar data acquired along 4 tracklines oriented in a box pattern verified the presence of a mound. Single beam hydrographic data were acquired along a series of parallel tracklines spaced at 1.5 meters intervals within the investigation area. Least depth was identified. This item investigation is resolved and requires no further study.

Charting Recommendation

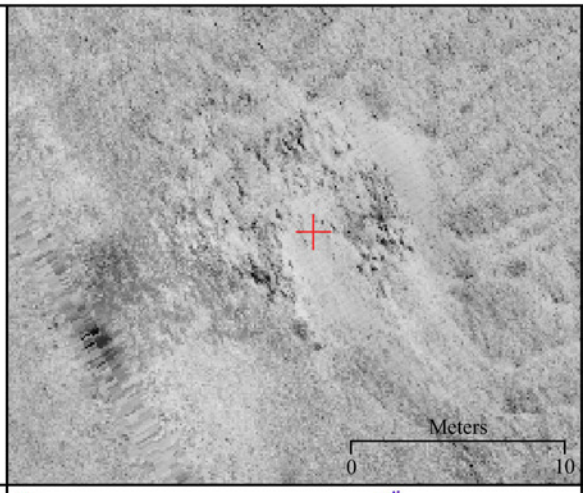
Refer to accompanying preliminary smooth sheet for depth modifications.

Recommended Least Depth: 14 ft. sounding at N 35° 54' 09.23", W 075° 44' 02.99".

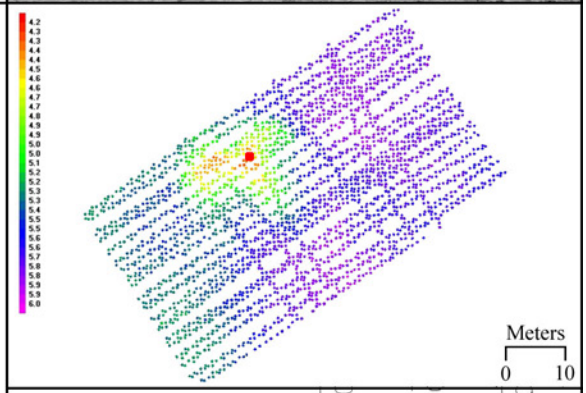
Office Use: ***Concur.***

FC179

Line: S25813196275
Ping: 223
Lat: N 35° 54' 09.33"
Lon: W 075° 44' 03.03"
Contact Dimensions (m):
H: 0.34 **W:** 15.58 **L:** 8.36
Correlating Contacts:
Line: S25813256276 **Ping:** 448
Line: S25814086277 **Ping:** 266
Line: S25814216278 **Ping:** 355



Least Depth: 4.28 m
Least Depth (sounding): 14 ft
Line: H27212595283 **Ping:** 347
LD Lat: N 35° 54' 9.23"
LD Lon: W 075° 44' 2.99"



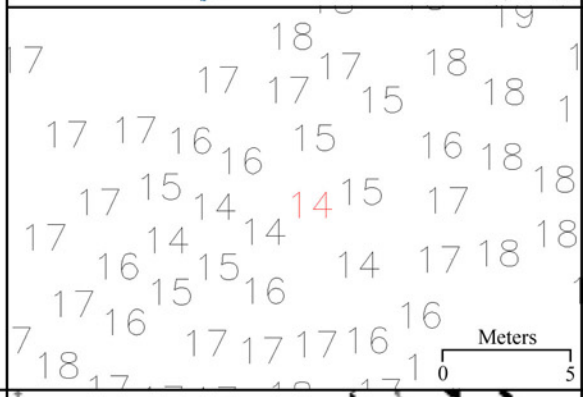
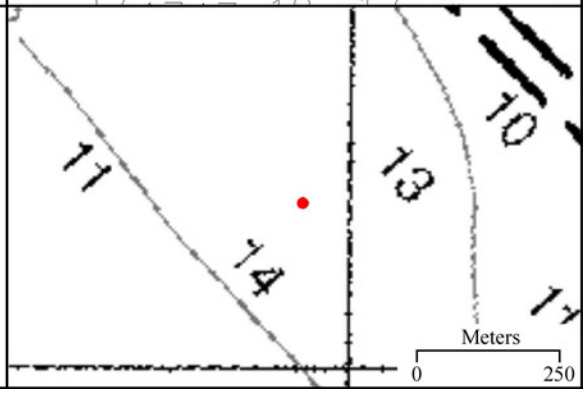


Chart Recommendations:
Refer to accompanying preliminary smooth sheet for depth modifications.



FC197
Item Investigation Report

Item Description: Uncharted object, larger than a crab pot in all dimensions

Source: 2002RV1671149_1188.XTF **Ping:** 25182

Observed Position: N 35° 55' 12.56" W 075° 44' 38.00"

Charts Affected: 12204, 34th Edition, April 21, 2001
12205, 27th Edition, July 1, 2002

Investigation

Date/Day Number: 16 September 2002/Julian Day 259 **Survey Vessel:** RV Willing II

Investigation Method: Side Scan Sonar

Surveyed Position (NAD83): N/A

Position Determined By: N/A

Position Line/Time: N/A **Ping:** N/A

Investigation Summary: Side scan sonar data acquired along 4 tracklines oriented in a box pattern, no target observed in area. This item investigation is resolved and requires no further study.

Charting Recommendation

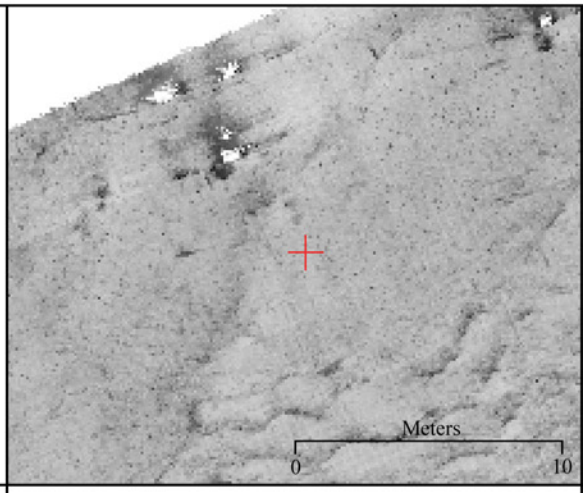
N/A – no objects or features observed.

Recommended Least Depth: N/A

Office Use: ***Concur.***

FC197

Line: S25914406177
Ping: n/a
Lat: N 35° 55' 12.56"
Lon: W 075° 44' 38.00"
Contact Dimensions (m):
H: n/a **W:** n/a **L:** n/a
Correlating Contacts:
Line: S25914356178 **Ping:** n/a
Line: S25914456176 **Ping:** n/a
Line: S25914556175 **Ping:** n/a

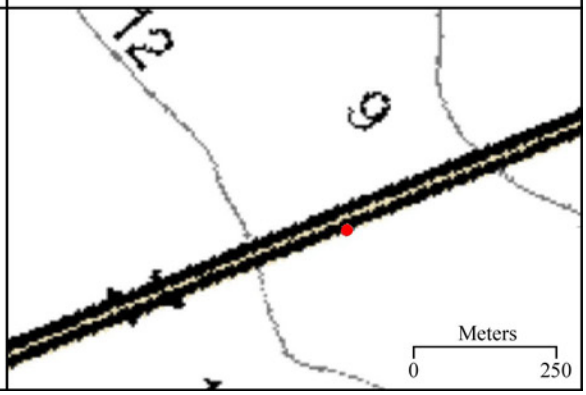


Least Depth: n/a
Least Depth (sounding): n/a
Line: n/a **Ping:** n/a
LD Lat: n/a
LD Lon: n/a

Contact was not observed in side scan item investigation data. Further Echo Sounder information was not warranted.

Contact was not observed in side scan item investigation data. Further Echo Sounder information was not warranted.

Chart Recommendations:
N/A - no objects or features observed.



FC227/FC233
Item Investigation Report

Item Description: Uncharted linear feature

Source: 2002RV1671623_1182.XTF **Ping:** 15553
2002RV1671702_1181.KTF **Ping:** 14221

Observed Position: N 35° 54' 26.29" W 075° 43' 54.35"
N 35° 54' 26.07" W 075° 43' 54.15"

Charts Affected: 12204, 34th Edition, April 21, 2001
12205, 27th Edition, July 1, 2002

Investigation

Date/Day Number: 20 September 2002/Julian Day 263 **Survey Vessel:** RV Willing II

Investigation Method: Side Scan Sonar, Single Beam Hydrography

Surveyed Position (NAD83): N 35° 54' 26.34" W 075° 43' 54.31"

Position Determined By: Single Beam Hydrography

Position Line/Time: H26315325260/15:32 (point of least depth) **Ping:** 548
(Raw file name: 2002RV2631532_5260.XTF)

Investigation Summary: Side scan sonar data acquired along 4 tracklines oriented in a box pattern, verified the presence of a linear object. Single beam hydrographic data were acquired along a series of parallel tracklines spaced at 1.5 meters intervals within the investigation area. Shoal depth determined from these data was deeper than shoal depths observed on the primary hydro lines nearby. This item investigation is resolved and requires no further study.

Charting Recommendation

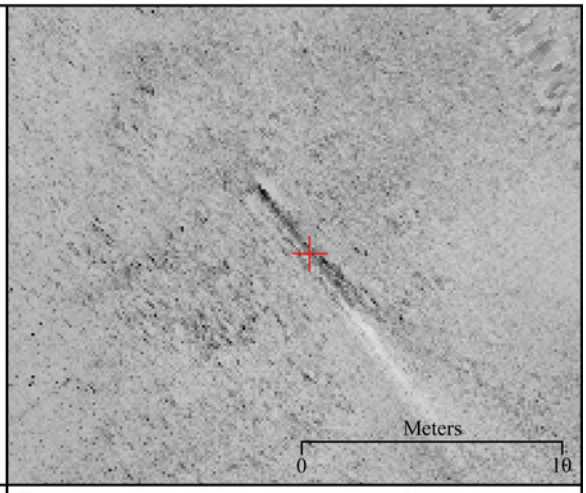
N/A – surrounding depths are shoaler than least depth observed in item investigation.

Recommended Least Depth: N/A

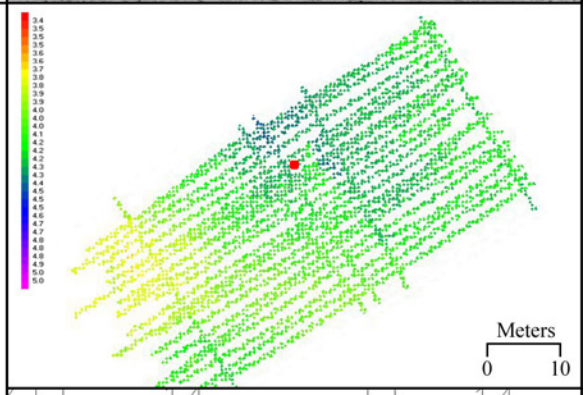
Office Use: ***Concur.***

FC227/FC233

Line: S26012026251
Ping: 232
Lat: N 35° 54' 26.46"
Lon: W 075° 43' 54.46"
Contact Dimensions (m):
H: 0.15 **W:** 0.74 **L:** 5.31
Correlating Contacts:
Line: S26011576250 **Ping:** 431
Line: S26012166253 **Ping:** 357
Line: S26012266252 **Ping:** 376



Least Depth: 4.10 m
Least Depth (sounding): 13 ft
Line: H26315325260 **Ping:** 548
LD Lat: N 35° 54' 26.34"
LD Lon: W 075° 43' 54.31"



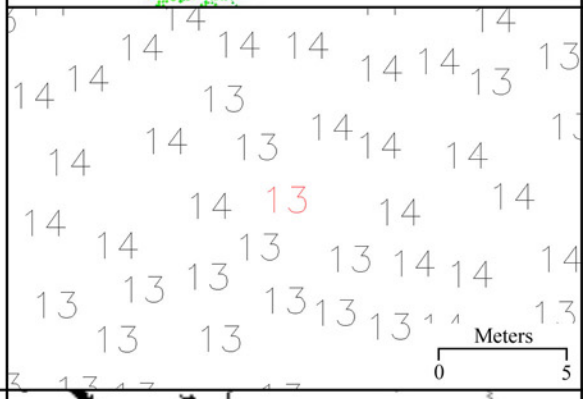
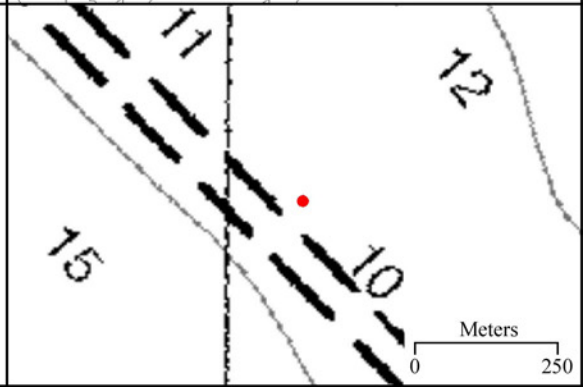


Chart Recommendations:
N/A - surrounding depths are shoaler than least depth observed in item investigation.



FC273
Item Investigation Report

Item Description: Possible school of fish

Source: 2002RV1681307_1168.XTF **Ping:** 24424

Observed Position: N 35° 55' 16.87" W 075° 44' 17.68"

Charts Affected: 12204, 34th Edition, April 21, 2001
12205, 27th Edition, July 1, 2002

Investigation

Date/Day Number: 17 September 2002/Julian Day 260 **Survey Vessel:** RV Willing II

Investigation Method: Side Scan Sonar

Surveyed Position (NAD83): N/A

Position Determined By: N/A

Position Line/Time: N/A **Ping:** N/A

Investigation Summary: Side scan sonar data acquired along 4 tracklines oriented in a box pattern no target observed in area. This item investigation is resolved and requires no further study.

Charting Recommendation

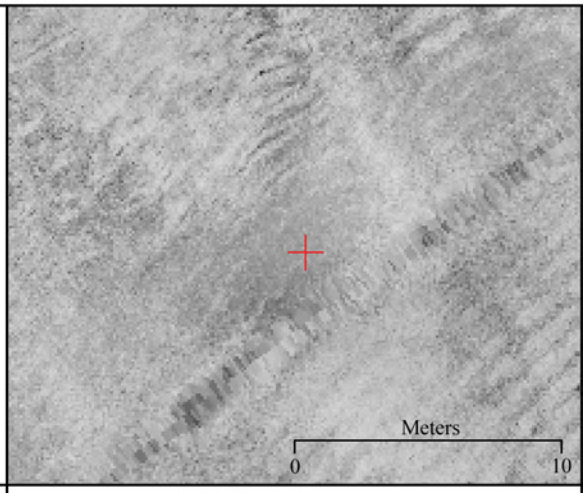
N/A – no objects or features observed.

Recommended Least Depth: N/A

Office Use: ***Concur.***

FC273

Line: S26014106128
Ping: n/a
Lat: N 35° 55' 16.87"
Lon: W 075° 44' 17.68"
Contact Dimensions (m):
H: n/a **W:** n/a **L:** n/a
Correlating Contacts:
Line: S26013526126 **Ping:** n/a
Line: S26013596125 **Ping:** n/a
Line: S26014036127 **Ping:** n/a

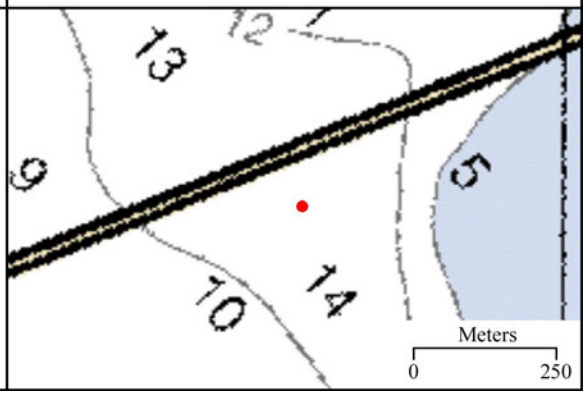


Least Depth: n/a
Least Depth (sounding): n/a
Line: n/a **Ping:** n/a
LD Lat: n/a
LD Lon: n/a

Contact was not observed in side scan item investigation data. Further Echo Sounder information was not warranted.

Contact was not observed in side scan item investigation data. Further Echo Sounder information was not warranted.

Chart Recommendations:
N/A - no objects or features observed.



FC284
Item Investigation Report

Item Description: Possible school of fish

Source: 2002RV1681344_1167.XTF **Ping:** 23908

Observed Position: N 35° 55' 13.18" W 075° 44' 15.05"

Charts Affected: 12204, 34th Edition, April 21, 2001
12205, 27th Edition, July 1, 2002

Investigation

Date/Day Number: 17 September 2002/Julian Day 260 **Survey Vessel:** RV Willing II

Investigation Method: Side Scan Sonar

Surveyed Position (NAD83): N/A

Position Determined By: N/A

Position Line/Time: N/A **Ping:** N/A

Investigation Summary: Side scan sonar data acquired along 4 tracklines oriented in a box pattern, no target observed in area. This item investigation is resolved and requires no further study.

Charting Recommendation

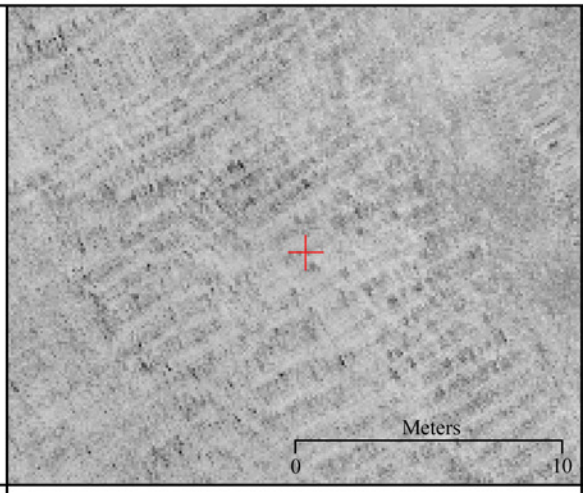
N/A – no objects or features observed.

Recommended Least Depth: N/A

Office Use: ***Concur.***

FC284

Line: S26013276151
Ping: n/a
Lat: N 35° 55' 13.18"
Lon: W 075° 44' 15.05"
Contact Dimensions (m):
H: n/a **W:** n/a **L:** n/a
Correlating Contacts:
Line: S26013226150 **Ping:** n/a
Line: S26013356152 **Ping:** n/a
Line: S26013456153 **Ping:** n/a

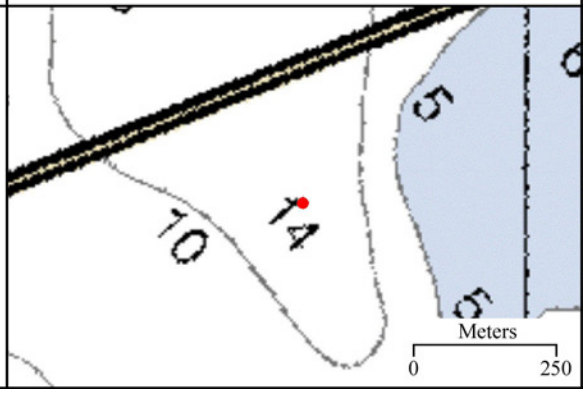


Least Depth: n/a
Least Depth (sounding): n/a
Line: n/a **Ping:** n/a
LD Lat: n/a
LD Lon: n/a

Contact was not observed in side scan item investigation data. Further Echo Sounder information was not warranted.

Contact was not observed in side scan item investigation data. Further Echo Sounder information was not warranted.

Chart Recommendations:
N/A - no objects or features observed.



OC11
Item Investigation Report

Item Description: Ragged top, possible fish or water column

Source: 2002RV1681504_1161.XTF **Ping:** 69

Observed Position: N 35° 55' 22.13" W 075° 44' 14.61"

Charts Affected: 12204, 34th Edition, April 21, 2001
12205, 27th Edition, July 1, 2002

Investigation

Date/Day Number: 17 September 2002/Julian Day 260 **Survey Vessel:** RV Willing II

Investigation Method: Side Scan Sonar

Surveyed Position (NAD83): N/A

Position Determined By: N/A

Position Line/Time: N/A **Ping:** N/A

Investigation Summary: Side scan sonar data acquired along 4 tracklines oriented in a box pattern, no target observed in area. This item investigation is resolved and requires no further study.

Charting Recommendation

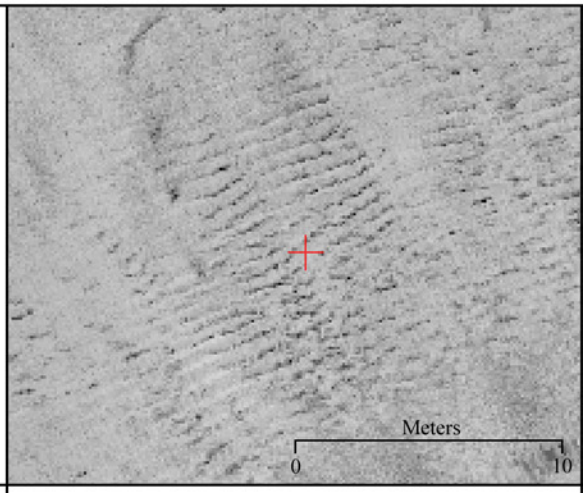
N/A – no objects or features observed.

Recommended Least Depth: N/A

Office Use: ***Concur.***

OC11

Line: S26014446103
Ping: n/a
Lat: N 35° 55' 22.13"
Lon: W 075° 44' 14.61"
Contact Dimensions (m):
H: n/a **W:** n/a **L:** n/a
Correlating Contacts:
Line: S26014286101 **Ping:** n/a
Line: S26014336100 **Ping:** n/a
Line: S26014396102 **Ping:** n/a

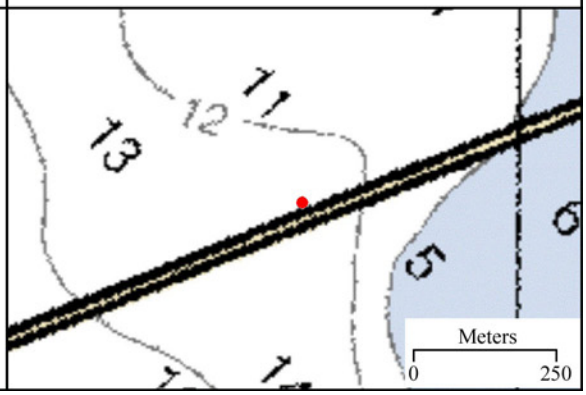


Least Depth: n/a
Least Depth (sounding): n/a
Line: n/a **Ping:** n/a
LD Lat: n/a
LD Lon: n/a

Contact was not observed in side scan item investigation data. Further Echo Sounder information was not warranted.

Contact was not observed in side scan item investigation data. Further Echo Sounder information was not warranted.

Chart Recommendations:
N/A - no objects or features observed.



FC356
Item Investigation Report

Item Description: Either small tall object or possible gain artifact

Source: 2002RV1701315_1008.XTF **Ping:** 8417

Observed Position: N 35° 48' 01.55" W 075° 40' 47.30"

Charts Affected: 12204, 34th Edition, April 21, 2001
12205, 27th Edition, July 1, 2002

Investigation

Date/Day Number: 13 September 2002/Julian Day 256 **Survey Vessel:** RV Willing II

Investigation Method: Side Scan Sonar

Surveyed Position (NAD83): N/A

Position Determined By: N/A

Position Line/Time: N/A **Ping:** N/A

Investigation Summary: Side scan sonar data acquired along 4 tracklines oriented in a box pattern, no target observed in area. This item investigation is resolved and requires no further study.

Charting Recommendation

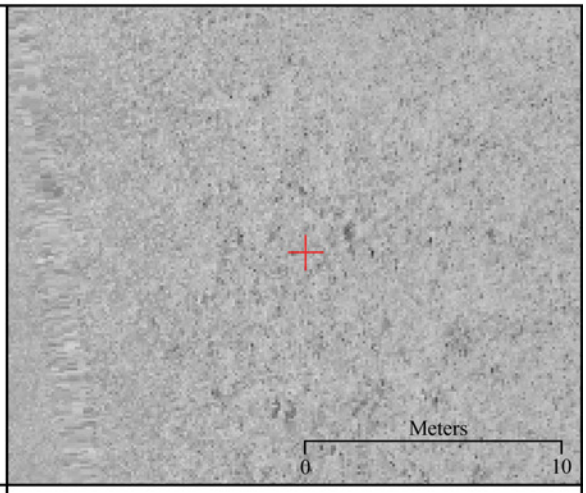
N/A – no objects or features observed.

Recommended Least Depth: N/A

Office Use: ***Concur.***

FC356

Line: S25618496575
Ping: n/a
Lat: N 35° 48' 01.55"
Lon: W 075° 40' 47.30"
Contact Dimensions (m):
H: n/a **W:** n/a **L:** n/a
Correlating Contacts:
Line: S25618316577 **Ping:** n/a
Line: S25618346578 **Ping:** n/a
Line: S25618436576 **Ping:** n/a

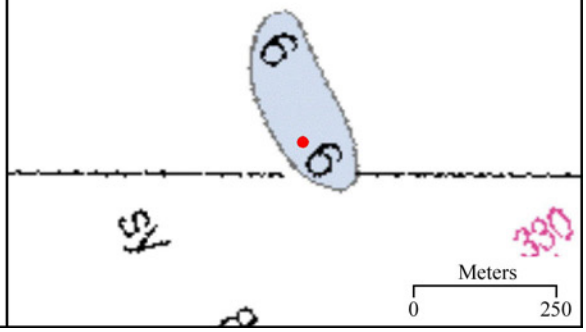


Least Depth: n/a
Least Depth (sounding): n/a
Line: n/a **Ping:** n/a
LD Lat: n/a
LD Lon: n/a

Contact was not observed in side scan item investigation data. Further Echo Sounder information was not warranted.

Contact was not observed in side scan item investigation data. Further Echo Sounder information was not warranted.

Chart Recommendations:
N/A no objects or features observed.



OC16/OC17
Item Investigation Report

Item Description: Uncharted rock or debris

Source: 2002RV1731317_1059.XTF **Ping:** 20146
2002RV1731317_1059.XTF **Ping:** 20199

Observed Position: N 35° 53' 05.04" W 075° 42' 42.08"
N 35° 53' 05.29" W 075° 42' 41.97"

Charts Affected: 12204, 34th Edition, April 21, 2001
12205, 27th Edition, July 1, 2002

Investigation

Date/Day Number: 19 September 2002/Julian Day 262 **Survey Vessel:** RV Willing II

Investigation Method: Side Scan Sonar, Single Beam Hydrography

Surveyed Position (NAD83): N 35° 53' 05.11" W 075° 42' 42.06"

Position Determined By: Single Beam Hydrography

Position Line/Time: H26215275405/15:28 (point of least depth) **Ping:** 646
(Raw file name: 2002RV2621527_5405.XTF)

Investigation Summary: Side scan sonar data acquired along 4 tracklines oriented in a box pattern, verified the presence of debris or a mound. Single beam hydrographic data were acquired along a series of parallel tracklines spaced at 1.5 meters intervals within the investigation area. Least depth was identified. This item investigation is resolved and requires no further study.

Charting Recommendation

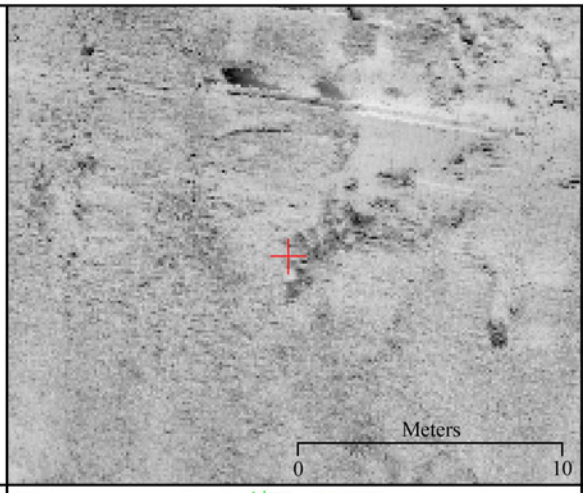
Refer to accompanying preliminary smooth sheet for depth modifications.

Recommended Least Depth: 10 ft. sounding at N 35° 53' 05.11", W 075° 42' 42.06".

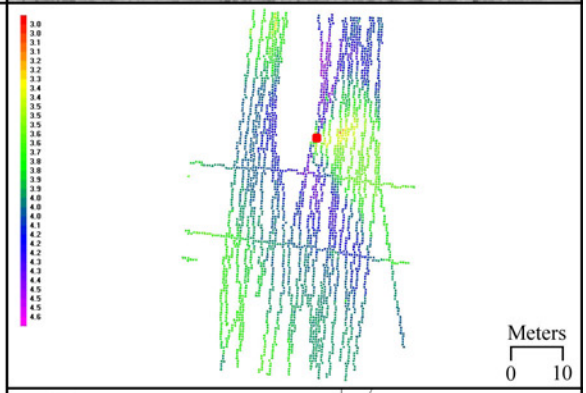
Office Use: ***Chart representative soundings within the common area.***

OC16/OC17

Line: S25812186378
Ping: 599
Lat: N 35° 53' 05.03"
Lon: W 075° 42' 42.19"
Contact Dimensions (m):
H: 0.27 **W:** 2.18 **L:** 3.91
Correlating Contacts:
Line: S25811446379 **Ping:** 858
Line: S25811506380 **Ping:** 389
Line: S25812136377 **Ping:** 703



Least Depth: 3.07 m
Least Depth (sounding): 10 ft
Line: H26215275405 **Ping:** 646
LD Lat: N 35° 53' 05.11"
LD Lon: W 075° 42' 42.06"



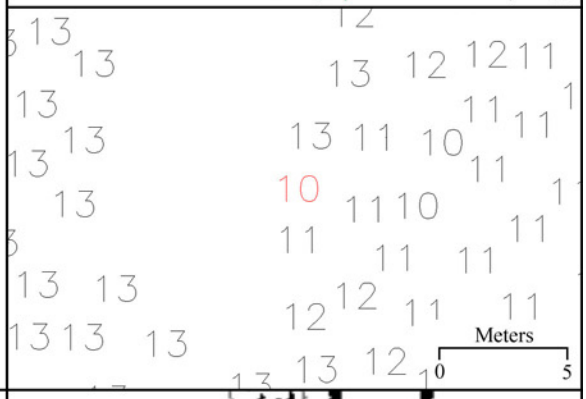
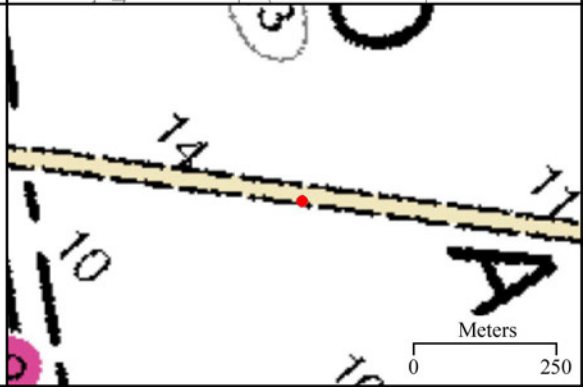


Chart Recommendations:
Refer to accompanying preliminary smooth sheet for depth modifications.



OC18/OC19
Item Investigation Report

Item Description: Pole with vertical projection at one end

Source: 2002RV1731317_1059.XTF **Ping:** 25003
2002RV1731533_1060.XTF **Ping:** 9160

Observed Position: N 35° 53' 29.70" W 075° 42' 47.49"
N 35° 53' 29.70" W 075° 42' 47.45"

Charts Affected: 12204, 34th Edition, April 21, 2001
12205, 27th Edition, July 1, 2002

Investigation

Date/Day Number: 15 September 2002/Julian Day 258 **Survey Vessel:** RV Willing II

Investigation Method: Side Scan Sonar

Surveyed Position (NAD83): N/A

Position Determined By: N/A

Position Line/Time: N/A **Ping:** N/A

Investigation Summary: Side scan sonar data acquired along 4 tracklines oriented in a box pattern, no target observed in area. This item investigation is resolved and requires no further study.

Charting Recommendation

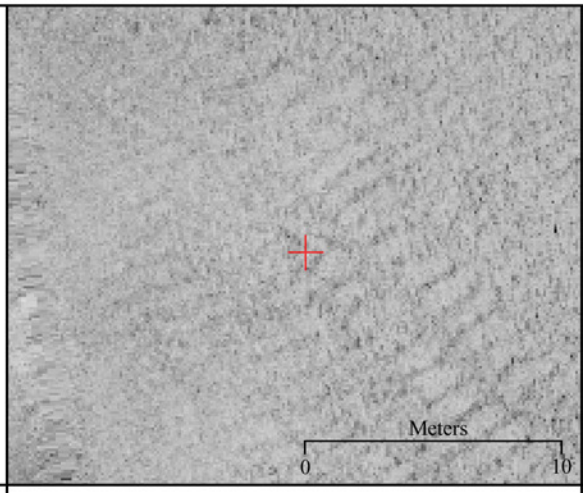
N/A – no objects or features observed.

Recommended Least Depth: N/A

Office Use: ***Concur.***

OC18/OC19

Line: S25812276300
Ping: n/a
Lat: N 35° 53' 29.72"
Lon: W 075° 42' 47.47"
Contact Dimensions (m):
H: n/a **W:** n/a **L:** n/a
Correlating Contacts:
Line: S25812326301 **Ping:** n/a
Line: S25812376302 **Ping:** n/a
Line: S25812426303 **Ping:** n/a

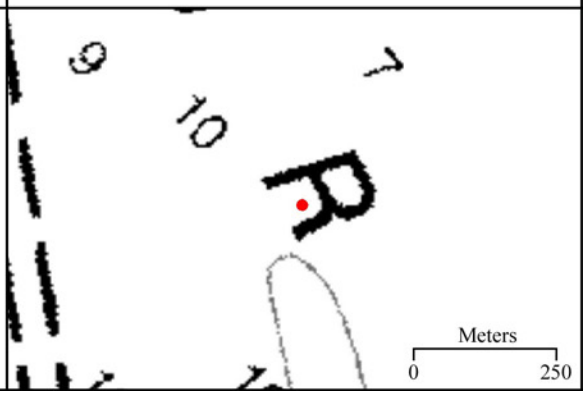


Least Depth: n/a
Least Depth (sounding): n/a
Line: n/a **Ping:** n/a
LD Lat: n/a
LD Lon: n/a

Contact was not observed in side scan item investigation data. Further Echo Sounder information was not warranted.

Contact was not observed in side scan item investigation data. Further Echo Sounder information was not warranted.

Chart Recommendations:
N/A - no objects or features observed.



OC20
Item Investigation Report

Item Description: Uncharted rock or debris

Source: 2002RV1731716_1061.XTF **Ping:** 25951

Observed Position: N 35° 53' 05.18" W 075° 42' 43.91"

Charts Affected: 12204, 34th Edition, April 21, 2001
12205, 27th Edition, July 1, 2002

Investigation

Date/Day Number: 19 September 2002/Julian Day 262 **Survey Vessel:** RV Willing II

Investigation Method: Side Scan Sonar, Single Beam Hydrography

Surveyed Position (NAD83): N 35° 53' 05.31" W 075° 42' 43.41"

Position Determined By: Single Beam Hydrography

Position Line/Time: H26218005384/18:00 (point of least depth) **Ping:** 699
(Raw file name: 2002RV2621800_5384.XTF)

Investigation Summary: Side scan sonar data acquired along 4 tracklines oriented in a box pattern, verified the presence of a mound. Single beam hydrographic data were acquired along a series of parallel tracklines spaced at 1.5 meters intervals within the investigation area. Shoal depth determined from these data was deeper than shoal depths observed on primary hydro lines nearby. This item investigation is resolved and requires no further study.

Charting Recommendation

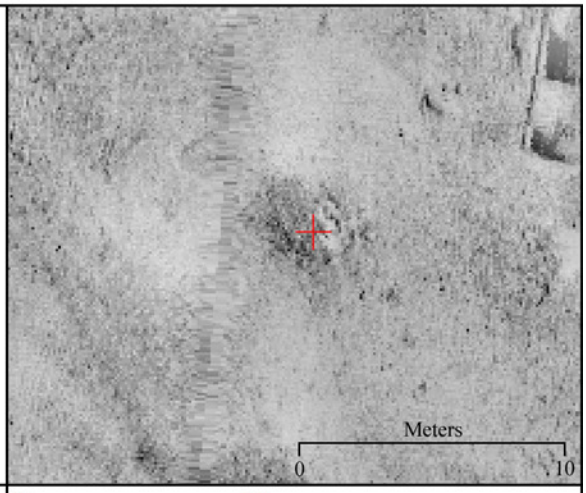
N/A – surrounding depths on preliminary smooth sheet are shoaler than least depth observed in item investigation.

Recommended Least Depth: N/A

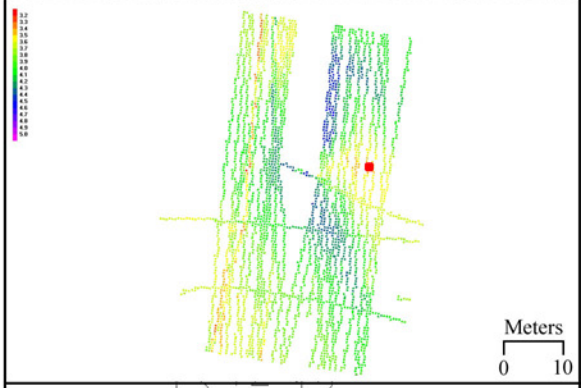
Office Use: ***Concur.***

OC20

Line: S25812016375
Ping: 514
Lat: N 35° 53' 05.17"
Lon: W 075° 42' 43.84"
Contact Dimensions (m):
H: 0.46 **W:** 1.11 **L:** 2.89
Correlating Contacts:
Line: S25811446379 **Ping:** 239
Line: S25811506380 **Ping:** 1034
Line: S25812076376 **Ping:** 650



Least Depth: 3.35 m
Least Depth (sounding): 11 ft
Line: H26218005384 **Ping:** 699
LD Lat: 35° 53' 5.31"
LD Lon: 075° 42' 43.41"



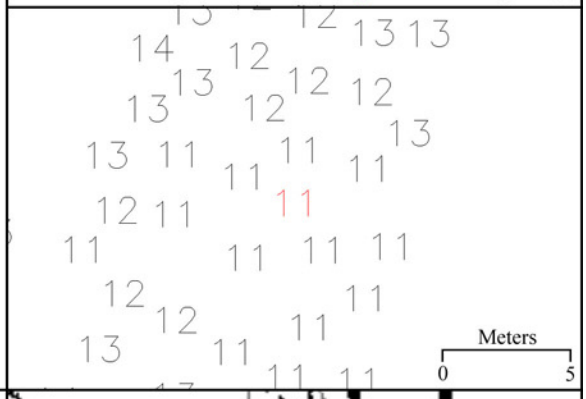
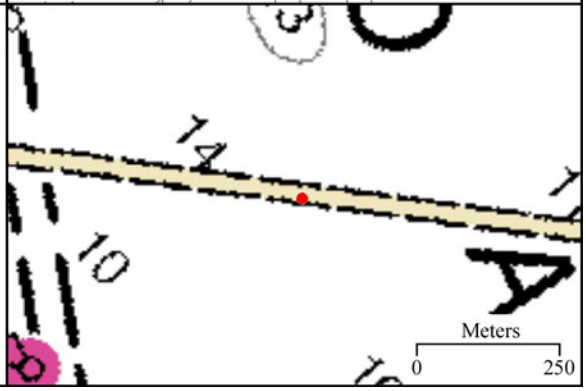


Chart Recommendations:
N/A - surrounding depths are shoaler than least depth observed in item investigation.



OC21
Item Investigation Report

Item Description: Mound or fish

Source: 2002RV1731812_1065.XTF **Ping:** 28383

Observed Position: N 35° 47' 54.45" W 075° 41' 41.42"

Charts Affected: 12204, 34th Edition, April 21, 2001
12205, 27th Edition, July 1, 2002

Investigation

Date/Day Number: 18 September 2002/Julian Day 261 **Survey Vessel:** RV Willing II

Investigation Method: Side Scan Sonar, Single Beam Hydrography

Surveyed Position (NAD83): N 35° 47' 54.03" W 075° 41' 41.51"

Position Determined By: Single Beam Hydrography

Position Line/Time: H26113185554/13:20 (point of least depth) **Ping:** 650
(Raw file name: 2002RV2611318_5554.XTF)

Investigation Summary: Side scan sonar data acquired along 4 tracklines oriented in a box pattern, verified the presence of a mound. Single beam hydrographic data were acquired along a series of parallel tracklines spaced at 1.5 meters intervals within the investigation area. Least depth identified. This item investigation is resolved and requires no further study.

Charting Recommendation

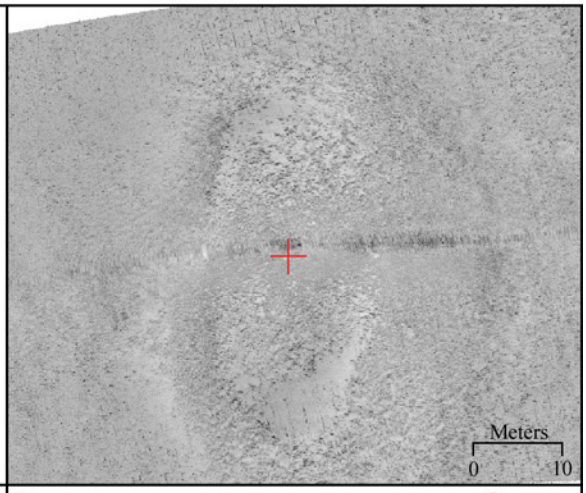
Refer to accompanying preliminary smooth sheet for depth modifications.

Recommended Least Depth: 7ft sounding N 35° 47' 54.03", W 075° 41' 41.51".

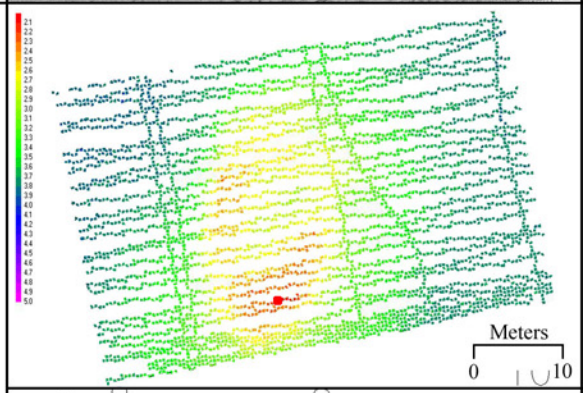
Office Use: ***Concur. Chart 7 ft. sounding.***

OC21

Line: S25617506554
Ping: 650
Lat: N 35° 47' 54.42"
Lon: W 075° 41' 41.44"
Contact Dimensions (m):
H: 0.43 **W:** 26 **L:** 43
Correlating Contacts:
Line: S25617566555 **Ping:** 698
Line: S25618016553 **Ping:** 588
Line: S25618076550 **Ping:** 425
Line: S25618166551 **Ping:** 402
Line: S25618216552 **Ping:** 432



Least Depth: 2.09 m
Least Depth (sounding): 7 ft
Line: H26113185554 **Ping:** 650
LD Lat: N 35° 47' 54.03"
LD Lon: W 075° 41' 41.51"



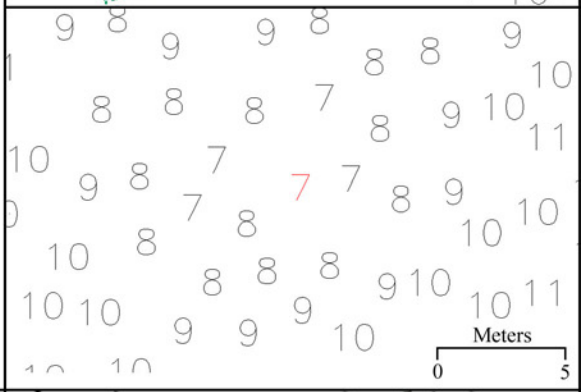
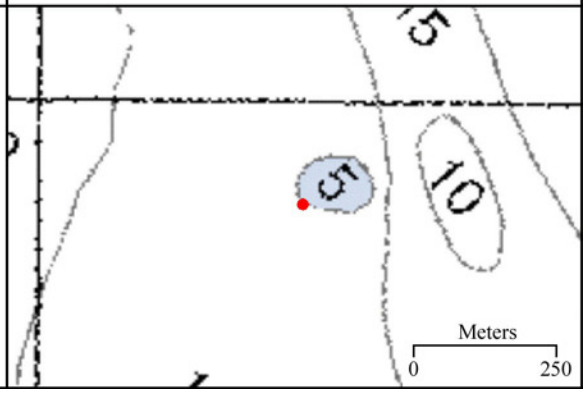


Chart Recommendations:
Refer to accompanying preliminary smooth sheet for depth modifications.



FC379
Item Investigation Report

Item Description: Unknown small target, may be gain artifact

Source: 2002RV1741110_1069.XTF **Ping:** 29460

Observed Position: N 35° 51' 03.03" W 075° 42' 27.55"

Charts Affected: 12204, 34th Edition, April 21, 2001
12205, 27th Edition, July 1, 2002

Investigation

Date/Day Number: 13 September 2002/Julian Day 256 **Survey Vessel:** RV Willing II

Investigation Method: Side Scan Sonar

Surveyed Position (NAD83): N/A

Position Determined By: N/A

Position Line/Time: N/A **Ping:** N/A

Investigation Summary: Side scan sonar data acquired along 4 tracklines oriented in a box pattern, no target observed in area. This item investigation is resolved and requires no further study.

Charting Recommendation

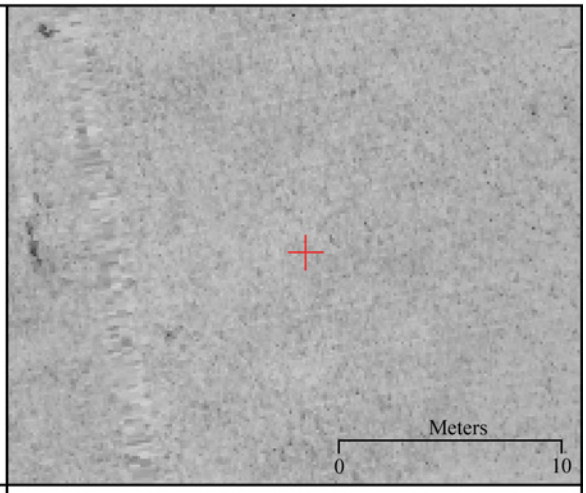
N/A – no objects or features observed.

Recommended Least Depth: N/A

Office Use: ***Concur.***

FC379

Line: S25620256425
Ping: n/a
Lat: N 35° 51' 03.03"
Lon: W 075° 42' 27.55"
Contact Dimensions (m):
H: n/a **W:** n/a **L:** n/a
Correlating Contacts:
Line: S25620396427 **Ping:** n/a
Line: S25620436428 **Ping:** n/a
Line: S25620476426 **Ping:** n/a

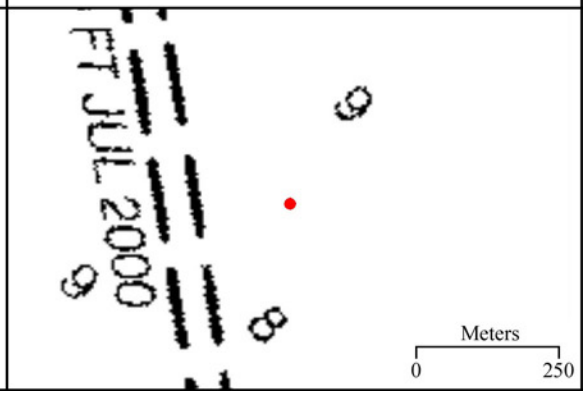


Least Depth: n/a
Least Depth (sounding): n/a
Line: n/a **Ping:** n/a
LD Lat: n/a
LD Lon: n/a

Contact was not observed in side scan item investigation data. Further Echo Sounder information was not warranted.

Contact was not observed in side scan item investigation data. Further Echo Sounder information was not warranted.

Chart Recommendations:
N/A - no objects or features observed.



FC439
Item Investigation Report

Item Description: Uncharted object larger than shadow

Source: 2002RV1751105_1074.XTF **Ping:** 24616

Observed Position: N 35° 53' 07.77" W 075° 42' 57.40"

Charts Affected: 12204, 34th Edition, April 21, 2001
12205, 27th Edition, July 1, 2002

Investigation

Date/Day Number: 31 September 2002/Julian Day 274 **Survey Vessel:** RV Willing II

Investigation Method: Side Scan Sonar, Single Beam Hydrography

Surveyed Position (NAD83): N 35° 53' 07.85" W 075° 42' 57.34"

Position Determined By: Single Beam Hydrography

Position Line/Time: H27414417541/14:43 (point of least depth) **Ping:** 835
(Raw file name: 2002RV2741441_7541.XTF)

Investigation Summary: Side scan sonar data acquired along 4 tracklines oriented in a box pattern, verified the presence of a mound or high spot. Single beam hydrographic data were acquired along a series of parallel tracklines spaced at 1.5 meters intervals within the investigation area. Least depth was identified. This item investigation is resolved and requires no further study.

Charting Recommendation

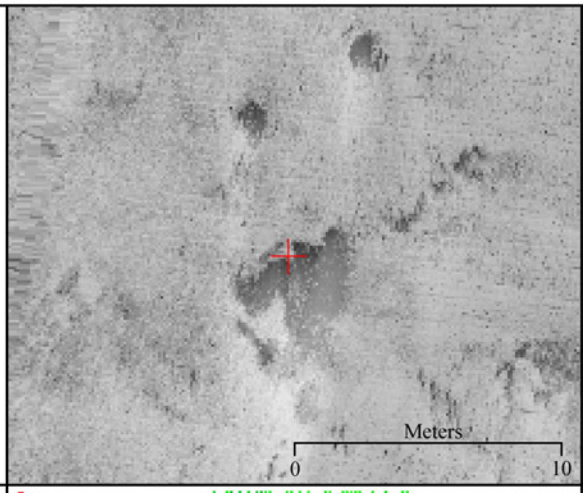
Refer to accompanying preliminary smooth sheet for depth modifications.

Recommended Least Depth: 8 ft sounding at N 35° 53' 07.85" W 075° 42' 57.34".

Office Use: ***Concur.***

FC439

Line: S25712536350
Ping: 488
Lat: N 35° 53' 07.93"
Lon: W 075° 42' 57.41"
Contact Dimensions (m):
H: 1.14 **W:** 4.12 **L:** 4.46
Correlating Contacts:
Line: S25712256352 **Ping:** 371
Line: S25712296353 **Ping:** 338
Line: S25712416351 **Ping:** 439



Least Depth: 2.38 m
Least Depth (sounding): 8 ft
Line: H27414417541 **Ping:** 835
LD Lat: N 35° 53' 7.85"
LD Lon: W 075° 42' 57.34"

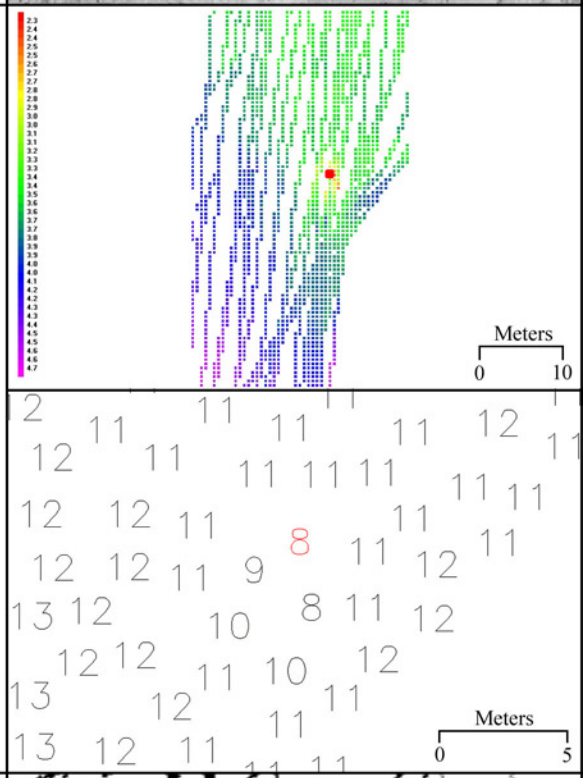
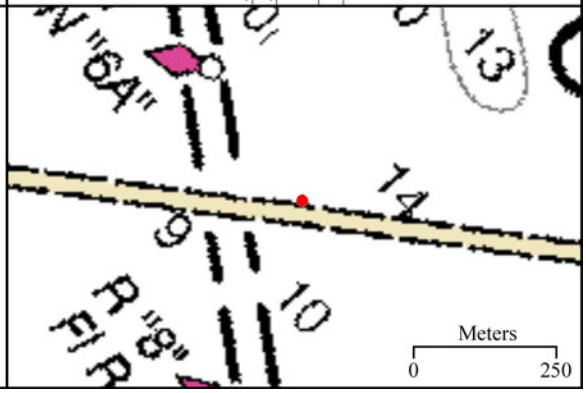


Chart Recommendations:
Refer to accompanying preliminary smooth sheet for depth modifications.



OC23
Item Investigation Report

Item Description: Vertical pipe shadow may be gain artifact

Source: 2002RV1771205_1083.XTF **Ping:** 4901

Observed Position: N 35° 53' 08.30" W 075° 43' 07.14"

Charts Affected: 12204, 34th Edition, April 21, 2001
12205, 27th Edition, July 1, 2002

Investigation

Date/Day Number: 16 September 2002/Julian Day 259 **Survey Vessel:** RV Willing II

Investigation Method: Side Scan Sonar

Surveyed Position (NAD83): N/A

Position Determined By: N/A

Position Line/Time: N/A **Ping:** N/A

Investigation Summary: Side scan sonar data acquired along 4 tracklines oriented in a box pattern, no target observed in area. This item investigation is resolved and requires no further study.

Charting Recommendation

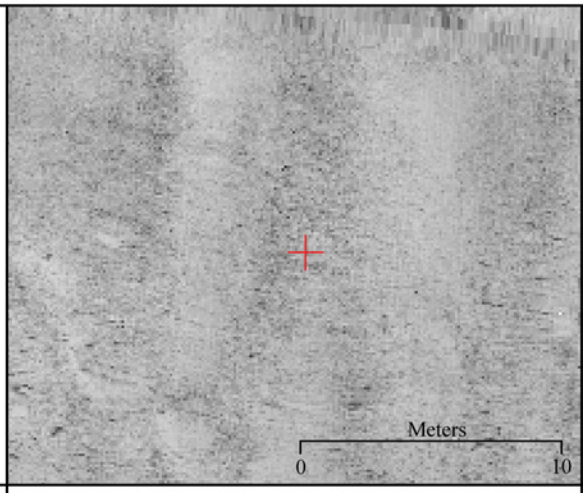
N/A – no objects or features observed.

Recommended Least Depth: N/A

Office Use: ***Concur.***

OC23

Line: S25913176328
Ping: n/a
Lat: N 35° 53' 08.30"
Lon: W 075° 43' 07.14"
Contact Dimensions (m):
H: n/a **W:** n/a **L:** n/a
Correlating Contacts:
Line: S25912506325 **Ping:** n/a
Line: S25912586326 **Ping:** n/a
Line: S25913056326 **Ping:** n/a
Line: S25913226327 **Ping:** n/a

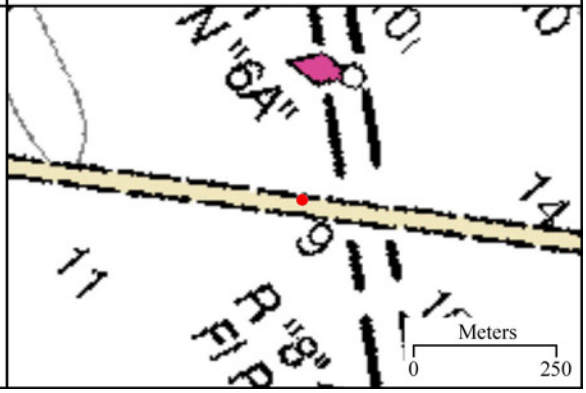


Least Depth: n/a
Least Depth (sounding): n/a
Line: n/a **Ping:** n/a
LD Lat: n/a
LD Lon: n/a

Contact was not observed in side scan item investigation data. Further Echo Sounder information was not warranted.

Contact was not observed in side scan item investigation data. Further Echo Sounder information was not warranted.

Chart Recommendations:
N/A - no objects or features observed.



OC25
Item Investigation Report

Item Description: Small target shadow width matches target size

Source: 2002RV1801118_1084.XTF **Ping:** 27186

Observed Position: N 35° 49' 22.49" W 075° 42' 21.44"

Charts Affected: 12204, 34th Edition, April 21, 2001
12205, 27th Edition, July 1, 2002

Investigation

Date/Day Number: 13 September 2002/Julian Day 256 **Survey Vessel:** RV Willing II

Investigation Method: Side Scan Sonar box

Surveyed Position (NAD83): N/A

Position Determined By: N/A

Position Line/Time: N/A **Ping:** N/A

Investigation Summary: Side scan sonar data acquired along 4 tracklines oriented in a box pattern, no target observed in area. This item investigation is resolved and requires no further study.

Charting Recommendation

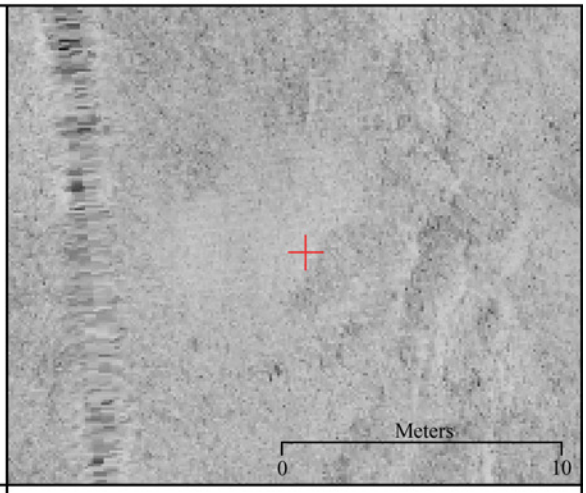
N/A – no objects or features observed.

Recommended Least Depth: N/A

Office Use: ***Concur.***

OC25

Line: S25619556450
Ping: n/a
Lat: N 35° 49' 22.49"
Lon: W 075° 42' 21.44"
Contact Dimensions (m):
H: n/a **W:** n/a **L:** n/a
Correlating Contacts:
Line: S25620006451 **Ping:** n/a
Line: S25620056452 **Ping:** n/a
Line: S25620086453 **Ping:** n/a

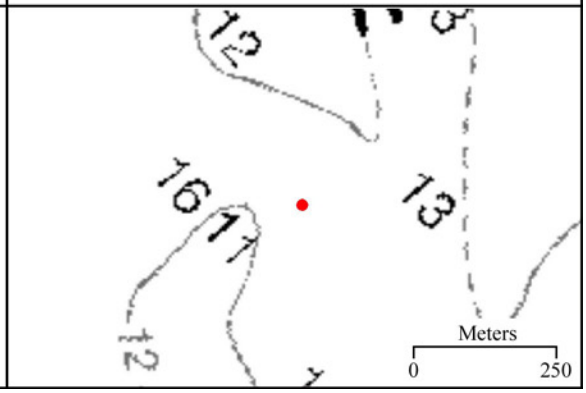


Least Depth: n/a
Least Depth (sounding): n/a
Line: n/a **Ping:** n/a
LD Lat: n/a
LD Lon: n/a

Contact was not observed in side scan item investigation data. Further Echo Sounder information was not warranted.

Contact was not observed in side scan item investigation data. Further Echo Sounder information was not warranted.

Chart Recommendations:
N/A -no objects or features observed.



FC561
Item Investigation Report

Item Description: Debris near bridge, possible detached swimmer

Source: 2002RV1801215_1081.XTF **Ping:** 2954

Observed Position: N 35° 53' 05.20" W 075° 43' 04.44"

Charts Affected: 12204, 34th Edition, April 21, 2001
12205, 27th Edition, July 1, 2002

Investigation

Date/Day Number: 28 September 2002/Julian Day 271 **Survey Vessel:** RV Willing II

Investigation Method: Side Scan Sonar, Single Beam Hydrography

Surveyed Position (NAD83): N 35° 53' 05.34" W 075° 43' 04.58"

Position Determined By: Single Beam Hydrography

Position Line/Time: H27112125678/12:12 (point of least depth) **Ping:** 796
(Raw file name: 2002RV2711212_5678.XTF)

Investigation Summary: Side scan sonar data acquired along 4 tracklines oriented in a box pattern, verified the presence of a mound or high spot. Single beam hydrographic data were acquired along a series of parallel tracklines spaced at 1.5 meters intervals within the investigation area. Shoal depth determined from these data was deeper than shoal depths observed on primary hydro lines nearby. This item investigation is resolved and requires no further study.

Charting Recommendation

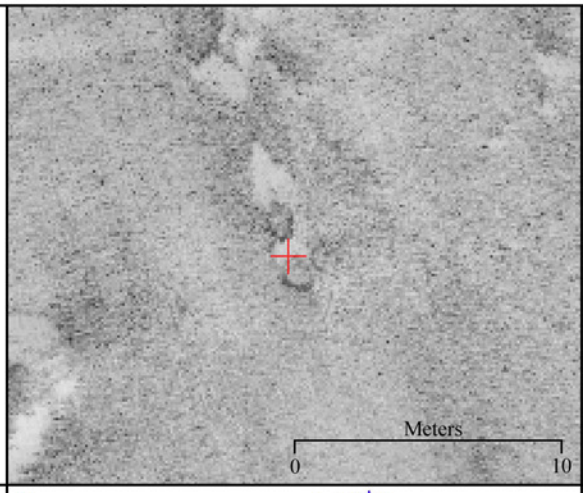
N/A – surroundings depths on preliminary smooth sheet are shoaler than least depth observed in item investigation.

Recommended Least Depth: N/A

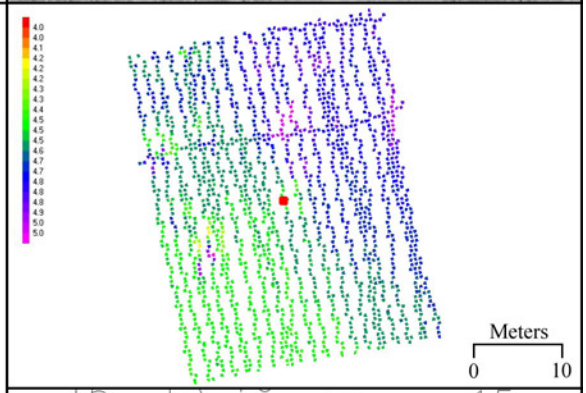
Office Use: ***Concur.***

FC561

Line: S25712196678
Ping: 316
Lat: N 35° 53' 05.26"
Lon: W 075° 43' 04.69"
Contact Dimensions (m):
H: 0.48 **W:** 1.47 **L:** 1.10
Correlating Contacts:
Line: S25711586677 **Ping:** 369
Line: S25712096675 **Ping:** 394
Line: S25712146676 **Ping:** 285



Least Depth: 4.33 m
Least Depth (sounding): 14 ft
Line: H27112125678 **Ping:** 796
LD Lat: N 35° 53' 05.34"
LD Lon: W 075° 43' 04.58"



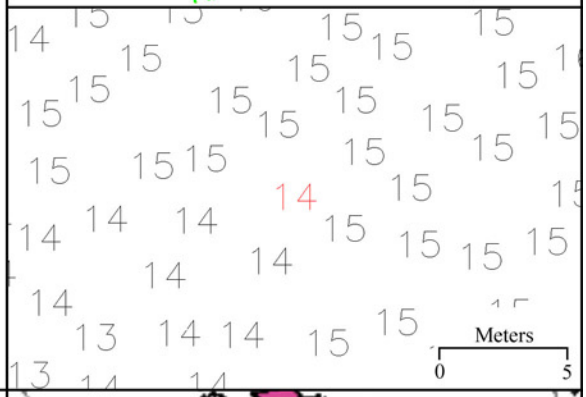
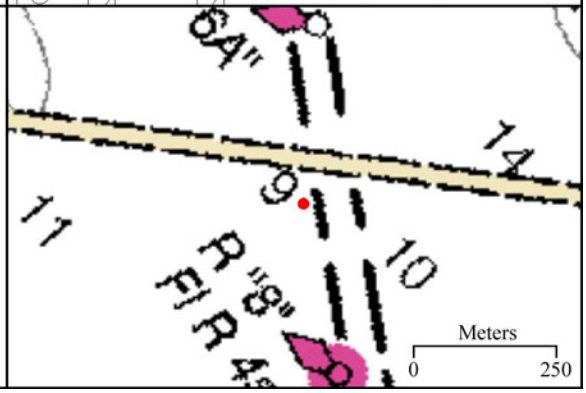


Chart Recommendations:
N/A - surrounding depths are shoaler than least depth observed in item investigation.



FC571
Item Investigation Report

Item Description: Soft target, variable height

Source: 2002RV1801552_1087.XTF **Ping:** 4059

Observed Position: N 35° 53' 00.73" W 075° 43' 09.71"

Charts Affected: 12204, 34th Edition, April 21, 2001
12205, 27th Edition, July 1, 2002

Investigation

Date/Day Number: 29 September 2002/Julian Day 272 **Survey Vessel:** RV Willing II

Investigation Method: Side Scan Sonar, Single Beam Hydrography

Surveyed Position (NAD83): N 35° 53' 00.68" W 075° 43' 09.68"

Position Determined By: Single Beam Hydrography

Position Line/Time: H27216465658/16:47 (point of least depth) **Ping:** 268
(Raw file name: 2002RV2721646_5658.XTF)

Investigation Summary: Side scan sonar data acquired along 4 tracklines oriented in a box pattern, verified the presence of a mound or high spot. Single beam hydrographic data were acquired along a series of parallel tracklines spaced at 1.5 meters intervals within the investigation area. Shoal depth determined from these data was deeper than shoal depths observed on the primary hydro lines nearby. This item investigation is resolved and requires no further study.

Charting Recommendation

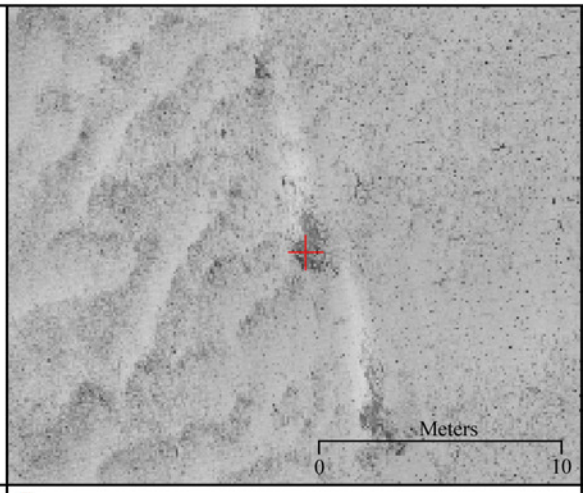
N/A – surrounding depths on preliminary smooth sheet are shoaler than least depth observed in item investigation.

Recommended Least Depth: N/A

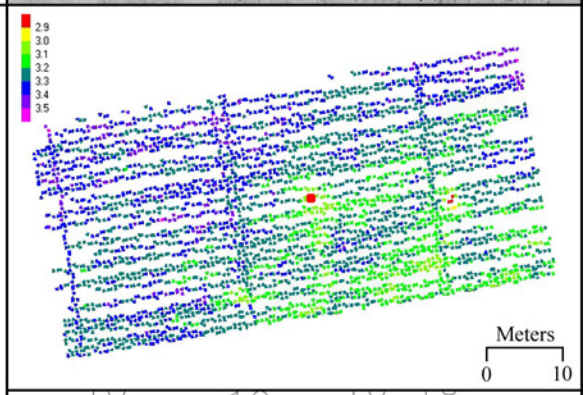
Office Use: ***Concur.***

FC571

Line: S25711476650
Ping: 275
Lat: N 35° 53' 00.57"
Lon: W 075° 43' 09.64"
Contact Dimensions (m):
H: 0.10 **W:** 1.29 **L:** 3.92
Correlating Contacts:
Line: S25711356653 **Ping:** 404
Line: S25711416652 **Ping:** 407
Line: S25711526651 **Ping:** 304



Least Depth: 2.92 m
Least Depth (sounding): 9 ft
Line: H27216465658 **Ping:** 268
LD Lat: N 35° 53' 00.68"
LD Lon: W 075° 43' 09.68"



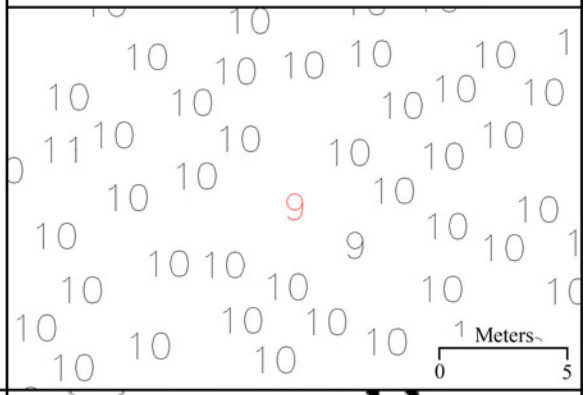
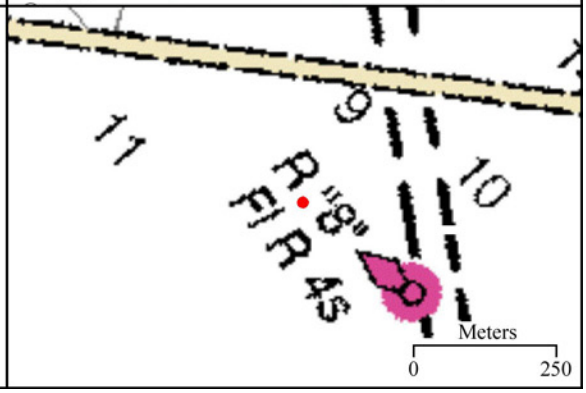


Chart Recommendations:
Refer to accompanying preliminary smooth sheet for depth modifications.



FC576
Item Investigation Report

Item Description: Fish or mound

Source: 2002RV1801703_1101.XTF **Ping:** 13174

Observed Position: N 35° 49' 07.81" W 075° 42' 35.29"

Charts Affected: 12204, 34th Edition, April 21, 2001
12205, 27th Edition, July 1, 2002

Investigation

Date/Day Number: 20 September 2002/Julian Day 263 **Survey Vessel:** RV Willing II

Investigation Method: Side Scan Sonar, Single Beam Hydrography

Surveyed Position (NAD83): N 35° 49' 07.71" W 075° 42' 35.33"

Position Determined By: Single Beam Hydrography

Position Line/Time: H26312065478/12:06 (point of least depth) **Ping:** 302
(Raw file name: 2002RV2631206_5478.XTF)

Investigation Summary: Side scan sonar data acquired along 4 tracklines oriented in a box pattern, verified the presence of a mound or high spot. Single beam hydrographic data were acquired along a series of parallel tracklines spaced at 1.5 meters intervals within the investigation area. Least depth determined from these data was deeper than shoal depths observed on primary hydro lines nearby. This item investigation is resolved and requires no further study.

Charting Recommendation

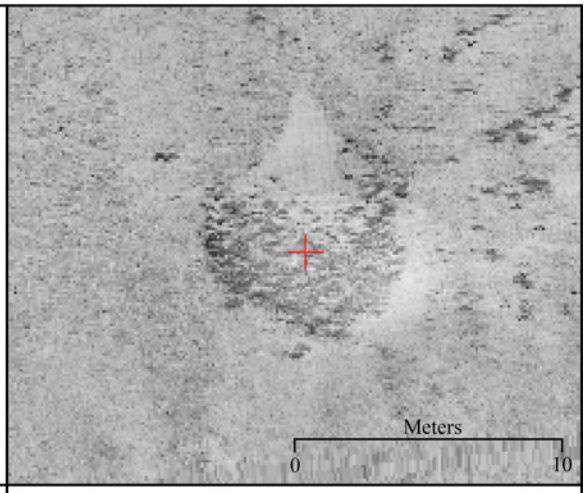
N/A – surrounding depths on preliminary smooth sheet are shoaler than least depth observed in item investigation.

Recommended Least Depth: N/A

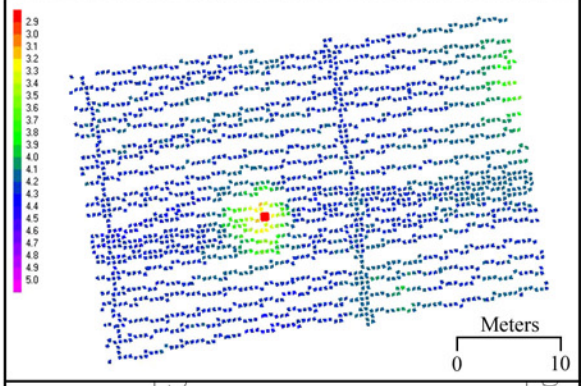
Office Use: ***Concur.***

FC576

Line: S25619336478
Ping: 284
Lat: N 35° 49' 07.67"
Lon: W 075° 42' 35.50"
Contact Dimensions (m):
H: 0.82 **W:** 5.14 **L:** 7.26
Correlating Contacts:
Line: S25619406477 **Ping:** 318
Line: S25619456476 **Ping:** 297
Line: S25619506475 **Ping:** 254



Least Depth: 2.96 m
Least Depth (sounding): 9 ft
Line: H26312065478 **Ping:** 302
LD Lat: N 35° 49' 07.71"
LD Lon: W 075° 42' 35.33"



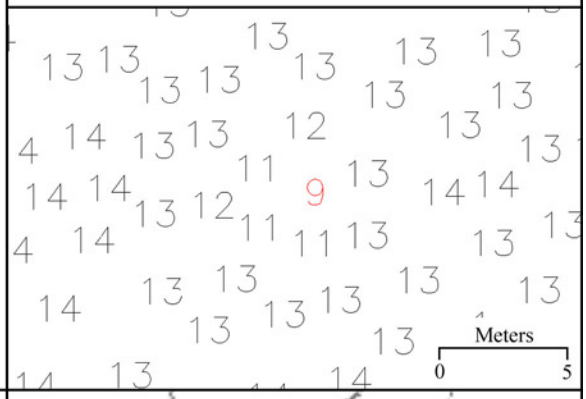
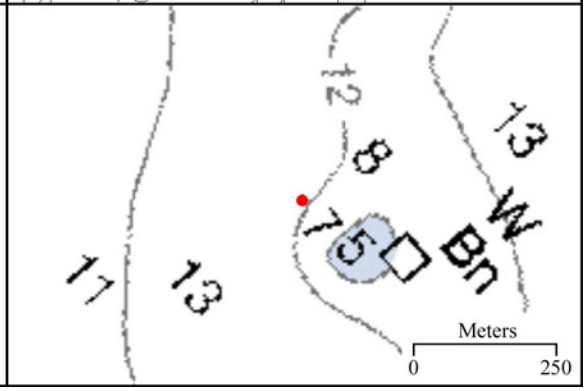


Chart Recommendations:
N/A - surrounding depths are shoaler than least depth observed in item investigation.



FC575/OC26
Item Investigation Report

Item Description: Fish or mound

Source: 2002RV1801703_1101.XTF **Ping:** 13487
2002RV1821743_1100.XTF **Ping:** 18505

Observed Position: N 35° 49' 06.02" W 075° 42' 34.33"
N 35° 49' 06.00" W 075° 42' 34.33"

Charts Affected: 12204, 34th Edition, April 21, 2001
12205, 27th Edition, July 1, 2002

Investigation

Date/Day Number: 19 September 2002/Julian Day 262 **Survey Vessel:** RV Willing II

Investigation Method: Side Scan Sonar, Single Beam Hydrography

Surveyed Position (NAD83): N 35° 49' 05.84" W 075° 42' 34.37"

Position Determined By: Single Beam Hydrography

Position Line/Time: H26212005505/12:00 (point of least depth) **Ping:** 244
(Raw file name: 2002RV2621200_5505.XTF)

Investigation Summary: Side scan sonar data acquired along 4 tracklines oriented in a box pattern, verified the presence of a mound. Single beam hydrographic data were acquired along a series of parallel tracklines spaced at 1.5 meters intervals within the investigation area. Least depth was identified. This item investigation is resolved and requires no further study.

Charting Recommendation

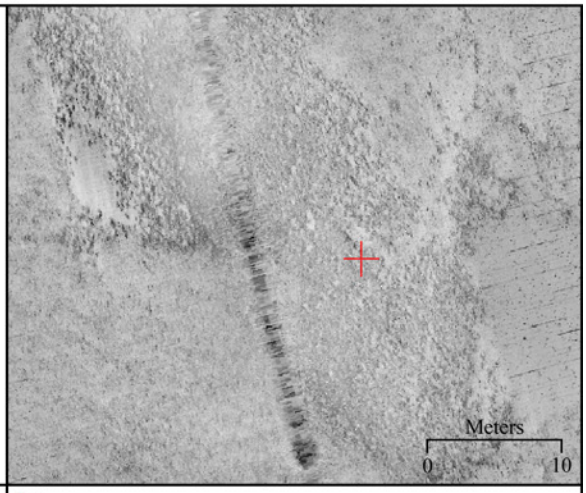
Refer to accompanying preliminary smooth sheet for depth modifications.

Recommended Least Depth: 8 ft. sounding at N 35° 49' 05.84", W 075° 42' 34.37".

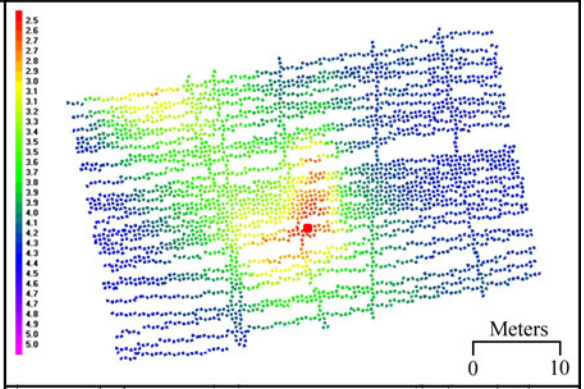
Office Use: ***Concur.***

FC575/OC26

Line: S25619106500
Ping: 401
Lat: N 35° 49' 06.21"
Lon: W 075° 42' 34.79"
Contact Dimensions (m):
H: 0.71 **W:** 21 **L:** 39
Correlating Contacts:
Line: S25619206501 **Ping:** 361
Line: S25619266503 **Ping:** 260
Line: S25619306502 **Ping:** 448



Least Depth: 2.48 m
Least Depth (sounding): 8 ft
Line: H26212005505 **Ping:** 244
LD Lat: N 35° 49' 05.84"
LD Lon: W 075° 42' 34.37"



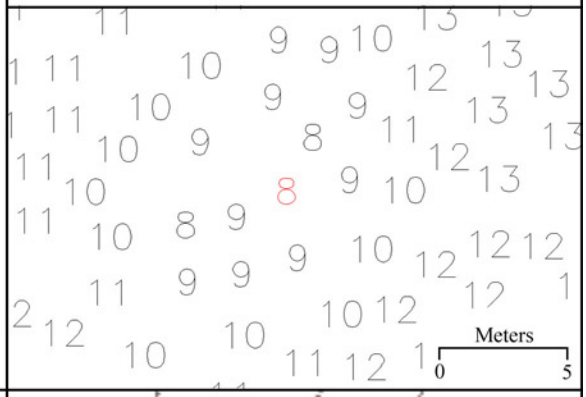
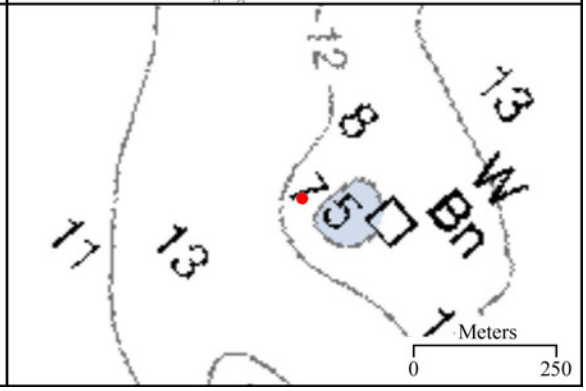


Chart Recommendations:
Refer to accompanying preliminary smooth sheet for depth modifications.



OC27
Item Investigation Report

Item Description: Good shadow, higher than most pots

Source: 2002RV1831122_1107.XTF **Ping:** 10197

Observed Position: N 35° 47' 57.27" W 075° 42' 26.70"

Charts Affected: 12204, 34th Edition, April 21, 2001
12205, 27th Edition, July 1, 2002

Investigation

Date/Day Number: 13 September 2002/Julian Day 256 **Survey Vessel:** RV Willing II

Investigation Method: Side Scan Sonar, Single Beam Hydrography

Surveyed Position (NAD83): N/A

Position Determined By: N/A

Position Line/Time: N/A **Ping:** N/A

Investigation Summary: Side scan sonar data acquired along 4 tracklines oriented in a box pattern, no target observed in area. Single beam hydrographic data were acquired along a series of parallel tracklines spaced at 1.5 meters intervals within the investigation area. This item investigation is resolved and requires no further study.

Charting Recommendation

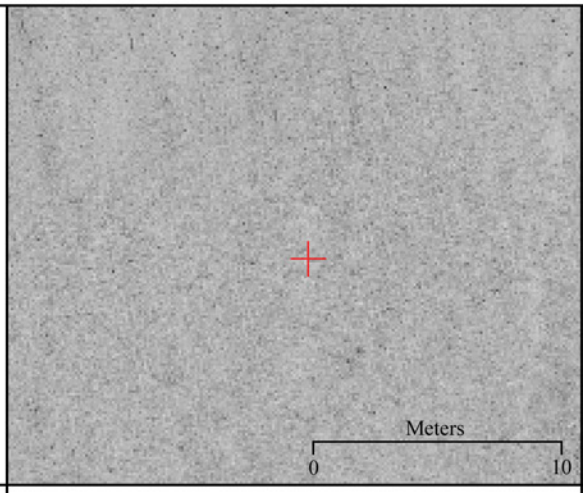
N/A – no objects or features observed.

Recommended Least Depth: N/A

Office Use: ***Concur.***

OC27

Line: S25617255528
Ping: n/a
Lat: N 35° 47' 57.57"
Lon: W 075° 42' 26.70"
Contact Dimensions (m):
H: n/a **W:** n/a **L:** n/a
Correlating Contacts:
Line: S25617125526 **Ping:** n/a
Line: S25617175527 **Ping:** n/a
Line: S25617325525 **Ping:** n/a



Least Depth: n/a
Least Depth (sounding): n/a
Line: n/a **Ping:** n/a
LD Lat: n/a
LD Lon: n/a

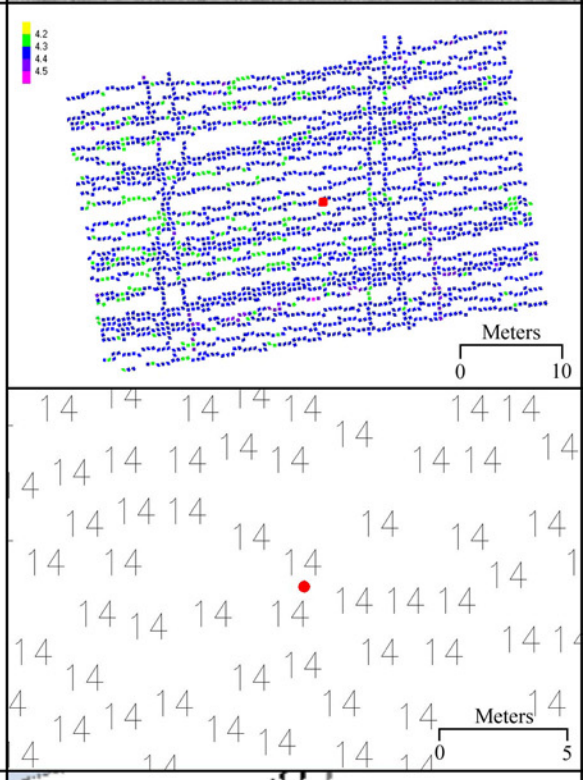
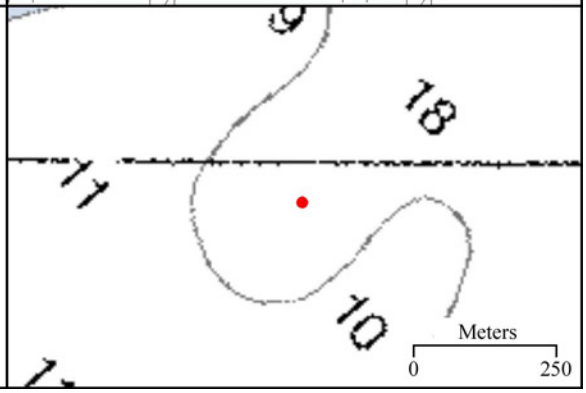


Chart Recommendations:
N/A - no objects or features observed.



D.1.5 Danger to Navigation Report ***See also the Evaluation Report.***

There was one "Danger to Navigation" report generated as a result of this survey. This report refers to a single 7ft sounding within the Croatan Sound Channel which has a controlling depth of 7 ½ ft for a width of 200 feet. This Danger to Navigation Report is included in Appendix I. ***Concur. Appended to the E&A Report.***

In addition to the danger to navigation reported, OSI also notified NOAA that Croatan Sound Navigation Channel buoys 6A and 8 were not deployed in their published positions. NOAA subsequently issued Notice To Mariners (43/02 and 44/02) to reflect the surveyed positions. It should be noted that the electronic version of chart 12205 27th edition shows buoy 6A along the Croatan Sound Channel (much closer to the surveyed position than shown on the paper copy of the same version chart). Buoy 8 has been changed to a light and relocated and Buoy 6A has been deleted as posted in the Local NTM no. 04/03. Copies of relevant correspondence and NTMs are included in Appendix V ***(filed with field records). Concur. Submitted as a Danger to Navigation, appended to the E&A report. Defer to MCD Update Services Branch for charting recommendations for Aids to Navigation.***

D.2 Additional Results:

Shoreline verification was not required per the Statement of Work.

Comparison to prior surveys was not required per the Statement of Work.

D.2.1 Aids to Navigation ***See also the Evaluation Report.***

Aids to navigation located within the survey area were investigated. Field observations of location and characteristics of these aids were compared to published locations and characteristics. The published information includes any changes reported through the last Notice to Mariners reviewed during the survey period.

The following table lists the fixed and floating aids to navigation surveyed within the area that were found to have different positions and/or characteristics than published. This table does not include the uncharted privately maintained buoys already discussed above. The surveyed locations of these aids to navigation are included on the preliminary smooth sheet. In most cases the only characteristic that differed from published information was the height. The observed heights have been referenced to high water, based on the final water levels and low water to high water conversion provided by NOAA for each tidal zone. (See final tide note for conversion values.) All observed heights were rounded to the nearest foot. Any height that was at least one foot different than published is listed and a recommendation has been made to chart as observed.

At the time of this survey it appears that all aids to navigation within the survey area serve their intended purpose. ***Concur. Defer to MCD Update Services Branch for charting recommendations for Aids to Navigation.***

Aids to Navigation Changes

Aid to Navigation	Chart or NTM	Published Position (NAD83)	Observed Position (NAD83)	Chart Recommendations
Croatan Sound Light 4	37/02+ 09/10/02	N 35° 54' 43.92" W 075° 44' 26.56" Height: 20 ft	N 35° 54' 44.06" W 075° 44' 26.44" Height: 17 ft	No position change Chart at observed height
Croatan Sound Light 6	Chart 12205 27th	N 35° 53' 46.44" W 075° 43' 14.43" Height: 18 ft	N 35° 53' 46.41" W 075° 43' 14.46" Height: 17 ft	No position change Chart at observed height
Croatan Sound Buoy 6A	Chart 12205 27th	N 35° 53' 15.26" W 075° 43' 03.68"	N 35° 53' 22.78" W 075° 43' 05.61"	Chart at observed location
Croatan Sound Lighted Buoy 8	40/02+ 10/01/02	N 35° 52' 50.82" W 075° 42' 55.69"	N 35° 52' 56.79" W 075° 43' 02.31"	Chart at observed location
Croatan Sound Light 10	37/02+ 09/10/02	N 35° 50' 21.10" W 075° 42' 31.57" Height: 15 ft	N 35° 50' 21.18" W 075° 42' 31.42" Height: 16 ft	No position change Chart at observed height
Spencer Creek Daybeacon 1	Chart 12205 27th	N 35° 50' 17.71" W 075° 42' 59.66" Marking: “1”	N 35° 50' 29.59" W 075° 43' 00.98" Marking: “SC1”	Chart at observed location Label chart with observed “SC1”
Spencer Creek Daybeacon 2	Chart 12205 27th	N 35° 50' 41.83" W 075° 43' 16.80" Marking: “2”	N 35° 50' 38.08" W 075° 43' 16.87" Marking: “SC2”	Chart at observed location Label chart with observed “SC2”
Spencer Creek Daybeacon 3	Chart 12205 27th	N 35° 50' 44.72" W 075° 43' 40.59" Marking: “3”	N 35° 50' 44.81" W 075° 43' 40.49" Marking: “SC3”	No position change Label chart with observed “SC3”

Spencer Creek Daybeacon 4	Chart 12205 27th	N 35° 50' 55.80" W 075° 44' 04.86" Marking: “4”	N 35° 50' 56.12" W 075° 44' 05.55" Marking: “SC4”	Chart at observed location Label chart with observed “SC4”
Spencer Creek Daybeacon 5	Chart 12205 27th	N 35° 51' 01.73" W 075° 44' 25.60" Marking: “5”	N 35° 51' 02.13" W 075° 44' 25.47" Marking: “SC5”	No position change Label chart with observed “SC5”
Spencer Creek Daybeacon 6	Chart 12205 27th	N 35° 51' 20.57" W 075° 44' 47.71" Marking: “6”	N 35° 51' 20.57" W 075° 44' 47.71" Marking: “SC6”	No position change Label chart with observed “SC6”
Old House Channel Light 18	Chart 12205 27th	N 35° 44' 00.54" W 075° 36' 51.62" Height: 15 ft	N 35° 44' 00.82" W 075° 36' 52.40" Height: 18 ft	Chart at observed location Chart at observed height
Old House Channel Light 21	Chart 12205 27th	N 35° 43' 10.55" W 075° 37' 26.47" Height: 18 ft	N 35° 43' 12.84" W 075° 37' 25.69" Height: 19 ft	Chart at observed location Chart at observed height
Old House Channel Light 24 OH	Chart 12205 27th	N 35° 43' 01.09" W 075° 37' 39.58" Height: 15.0 ft	N 35° 43' 01.07" W 075° 37' 39.89" Height: 21 ft	No position change Chart at observed height

+ Changes in reference to chart #12204, 34th Edition, Published 04/21/2001 and chart #12205, 27th Edition, Published 07/01/2002

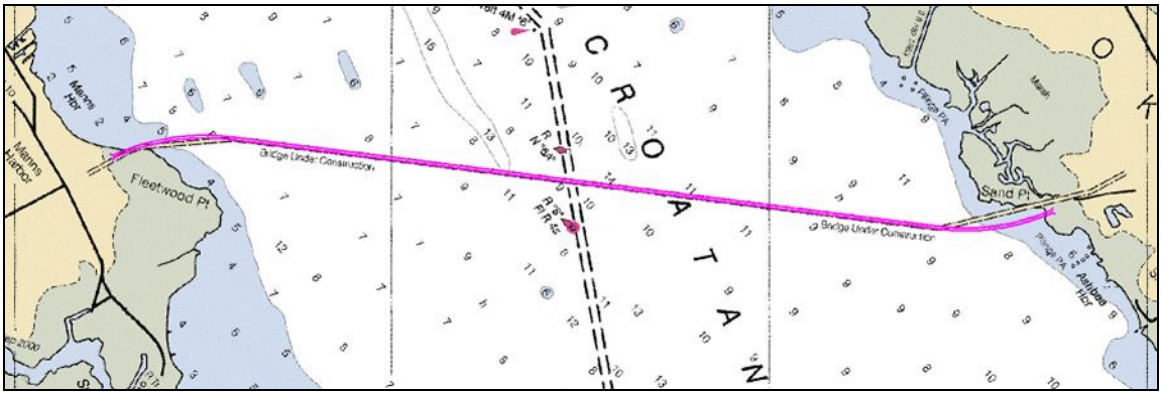
Note: The last NTM number relevant to this survey was 40/02, dated October 1, 2002.

D.2.2 Bridges

There are two bridges that span the survey area. The Rte 64-264 bridge marks the northern limits of the survey area. A second bridge located approximately 2.5 nm south of the existing bridge was under construction during the survey period. Both bridges were surveyed as part of the field investigation as described below. ***Concur.***

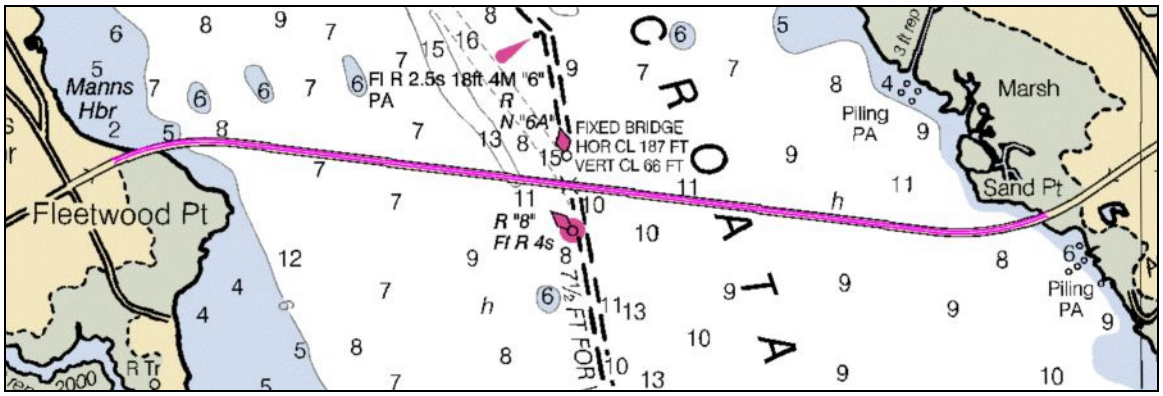
A Trimble 7400 rover receiver w/radio link was set up in a vehicle with the GPS antenna mounted on the right side of the roof rack above the passenger door. This system was set to output GGK positions to a laptop computer running Hypack Max. All system offsets were set to 0, 0 and the ZDA message was used to eliminate system latency. The vehicle was driven to the eastern end of the Mann's Harbor Bridge and stopped to allow the RTK GPS system to acquire RTK-FIXED mode data. The distance from the antenna to the outer edge of the bridge was measured and entered into the daily log. The van was then driven across the bridge while maintaining, as close as possible, the measured distance between the antenna and the outer edge of the bridge. Position data were logged at a rate of one per second by the Hypack Max computer resulting in position data points spaced at approximately 27-foot intervals. This process was repeated on the opposite side of the bridge and again along both sides of the new bridge located near the center of the project area.

The resultant trackline data were processed in Hypack Max and exported as a .DXF drawing file. The tracklines were then offset (in AutoCAD) by the measured distance. Field observations of bridge location and signage agree with the charted characteristic of the Rte 64-264 bridge. Surveyed positions on the new bridge agree with those charted along the western half of the bridge but differ along the eastern half. The differences in position are illustrated below.



Surveyed position of newly constructed Bridge (magenta)
Chart 12205 27th Ed., in background

The charted position of the new bridge on Chart 12204, 35th edition, published on 1/1/2003, after the completion of the survey period, matches the surveyed position. The following figure shows the surveyed positions overlain on the newest chart. ***Concur.***



Surveyed position of newly constructed Bridge (magenta)
Chart 12204 35th Ed., in background

No submarine cables or pipelines or associated signage are charted within the survey area and none were noted in the field during survey operations. ***Concur.***

No drilling structures were noted on the charts or in the field within the survey area. ***Concur.***

D.2.3 Results of RTK Study

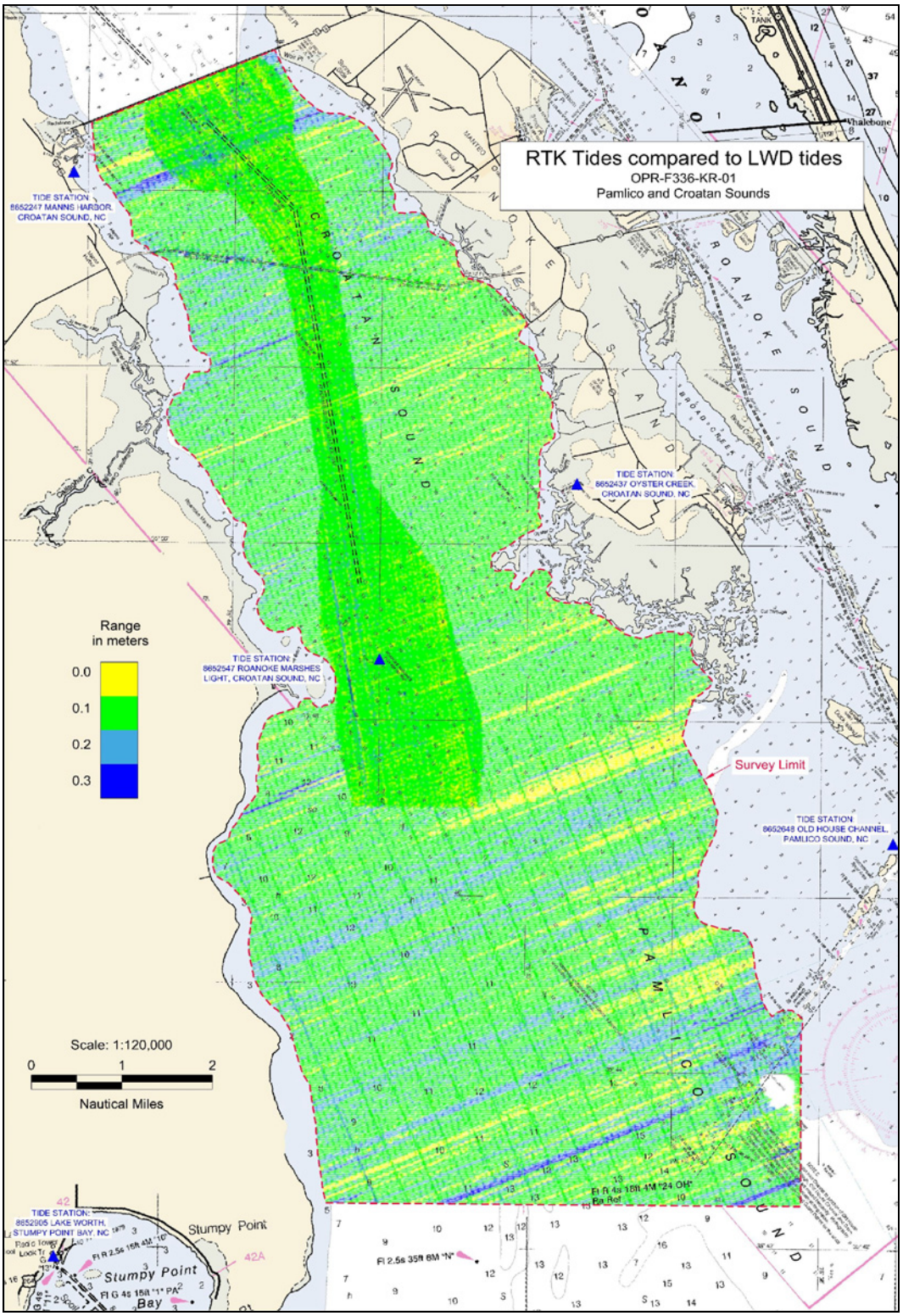
Throughout the course of the survey, OSI acquired "On the Fly" (OTF) Real Time Kinematic (RTK) data in support of NOAA's interest in the applicability of RTK elevation data in the production of hydrographic charts. Additionally, OSI used the RTK information during interim data processing as a quality control aid.

A brief description of the equipment installation, operation, and data processing procedures used to acquire and process the RTK data is discussed below. A more in-depth description is included in Section A.6 of the Project Vertical and Horizontal Control Report, Descriptive Report, Volume III.

Prior to survey operations, a Kinematic Tide Datum (KTD) file was created based on the Geoid height reported at 14 control stations in the vicinity of the study area. The control point information was either published by NGS or established by ESP Associates under this contract. The Geoid height data were contoured and overlaid with a 2000-meter grid. Based on the contour data an interpolated Geoid height was assigned to each grid node and the node values exported in KTD file format for use by the data collection software.

OSI deployed a RTK base station antenna, "RTK Base–2002," on a tower located on the Spencer Marine Property, Wanchese, NC. The coordinates of the base station were established and verified based on a nearby NCGS control monument. The RTK correctors broadcast from this station could be received by the onboard RTK GPS receiver anywhere within the project area. RTK position and elevation data along with USCG DGPS, motion sensor, compass and depth values were logged by the Hypack Max computer. These data were then edited, processed, and adjusted to NAVD 88 employing the Hypack SB-Max editor.

A surface model of the RTK data set was then developed along with a corresponding model of final LWD depth values. A difference surface was then created by overlaying the RTK and LWD surfaces. A plot of the difference surface is shown below.



At the time of this report, the difference between NAVD88 and LWD at each of the four tide gauge stations used to develop the final sounding set had not been developed. Therefore, a direct comparison between published NAVD88 and LWD datums was not possible. However, as the survey was conducted in a non-tidal area the comparative results are not biased by the effects of extreme water level fluctuations and the associated spatial variations of tide amplitude versus time.

In overview, assuming that LWD and NAVD88 are very close to the same plane, the general trends of the data agree remarkably well, typically within 0.1 meters. The somewhat random, and greater differences of 0.3-meter could be a function of wind setup near the gauge stations. Further study of these data by NOAA Scientists could be helpful in developing an overall understanding of how RTK tide data may be used in support of future charting projects. The raw RTK data are available in the project Hypack Max data files and can be processed using the Hypack SB Max editor.

E. APPROVAL SHEET

APPROVAL SHEET

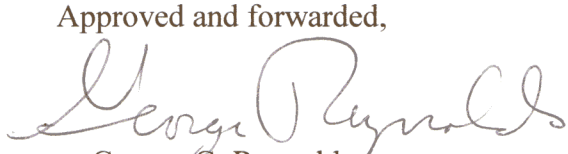
FOR

H11032

Standard field surveying and processing procedures were followed in producing this survey in accordance with both the Statement of Work, Shallow Water Multibeam Sonar and Side Scan Sonar Survey Services, dated 7/13/01 and NOS Hydrographic Surveys, Specifications and Deliverables dated June 2000 provided for this project. Company, equipment, and software specific procedures were established and followed throughout the survey. These procedures are outlined in the field collection and office processing manuals. All data were continuously reviewed both onboard the vessel and at the processing center for quality and completeness.

The preliminary smooth sheet, Descriptive Report (including appendices and separates), Data Acquisition and Processing Report, Vertical and Horizontal Control Report, digital data, plots, and all other supporting documents have been reviewed by me, and are considered complete and adequate for charting purposes, and are approved. I personally supervised every phase of work associated with this survey. All records are forwarded for final review and processing to Atlantic Hydrographic Branch.

Approved and forwarded,



George G. Reynolds
Ocean Surveys, Inc.
Chief of Party – H11032

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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: February 12, 2003

HYDROGRAPHIC BRANCH: Atlantic
HYDROGRAPHIC PROJECT: OPR-F336-KR-2001
HYDROGRAPHIC SHEET: H11032
LOCALITY: Pamlico Sound, NC
TIME PERIOD: June 18 - October 1, 2002

*******Datum References are based on the 1983 - 2001 Tidal Epoch, please see notes 2 and 3 for details.*******

TIDE STATION USED: 865-2247 Manns Harbor, NC
Lat. 35° 54.2'N Lon. 075° 46.2'W
PLANE OF REFERENCE (LOW WATER DATUM): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 0.202 meters

TIDE STATION USED: 865-2905 Lake Worth, Stumpy Point, NC
Lat. 35° 41.9'N Lon. 075° 46.4'W
PLANE OF REFERENCE (LOW WATER DATUM): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 0.298 meters

TIDE STATION USED: 865-2648 Old House Channel, NC
Lat. 35° 46.6'N Lon. 075° 35.1 W
PLANE OF REFERENCE (LOW WATER DATUM): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 0.247 meters

TIDE STATION USED: 865-2547 Roanoke Marsh, NC
Lat. 35° 48.7'N Lon. 075° 42.0 W
PLANE OF REFERENCE (LOW WATER DATUM): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 0.214 meters

REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: PAM503, PAM610, PAM611 & PAM612.

Refer to attachments for zoning information.

TIDE NOTE FOR HYDROGRAPHIC SURVEY Sheet H11032 cont.

Note 1: Survey OPR-F336-KR-01, Sheet H11032 falls within an area in Pamlico Sound where the mean tide range is less than one foot. In this area of Pamlico Sound, the plane of reference for depth measurements is Low Water Datum (LWD). LWD is determined by subtracting one half foot (0.152 m) from Mean Sea Level (MSL). MSL is determined from the arithmetic mean of hourly heights observed over the National Tidal Datum Epoch (NTDE). The new 1983-2001 NTDE will be used for this project.

Note 2: Before the end of March 2003, **retrieve verified six minute water level data on MSL datum** for all applicable stations from the CO-OPS Home Page at http://www.co-ops.nos.noaa.gov/. **A corrector of 0.074 meters must be added to all verified water level time series data for all stations to place the data on LWD.** This corrector includes the adjustment from the 1960-1978 Epoch to the new 1983-2001 Epoch, as well as the one half foot (0.152 m) below MSL adjustment to place the data on LWD.

Note 3: Water level time series data retrieved from the CO-OPS Home Page after March 2003 will automatically be adjusted to the 1983-2001 Epoch. This change will be clearly noted on the CO-OPS Home Page. **However, please call CO-OPS to confirm that the new Epoch is officially in use.** Therefore, after the Epoch change after March 2003, **add one half foot (0.152 m)to all water level data retrieved on MSL datum to establish the verified water level data on LWD.**

Thomas M. Meso 2/19/03

CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION

ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT FOR H11032 (2002)

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.

B. AUTOMATED DATA ACQUISITION AND PROCESSING

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

MapInfo, version 6.5
MicroStation J, version 7.01.04.16
CARIS HIPS/SIPS Ver 5.3 SP1
IRAS B, version 07.01.000.18

C.2 HORIZONTAL DATUM AND HORIZONTAL CONTROL

Horizontal control used for this survey during data acquisition is based upon the North American Datum of 1983 (NAD 83).

D. RESULTS AND RECOMMENDATIONS

D.1 CHART COMPARISONS

12204 (35th Edition, Jan 01/03)
Corrected through NM Jan 11/03
Corrected through LNM Dec 24/02
12205 (28th Edition, Aug 01/03)
Corrected through NM Aug 2/03
Corrected through LNM Jul 22/03

The charted hydrography originates with discussed prior surveys and requires no further consideration. The hydrographer makes an adequate chart comparison in Section D.1 of the Descriptive Report. The following should be noted:

D.1.1 Survey Depths

The charted Spoil Area, centered in the vicinity of Latitude 35 43'49.00"N, Longitude 75 36'36.00"W, is encroaching on the Old House Channel. It is recommended that the limits of the shoal area be charted as shown on the present survey.

D.1.2 Charted Features and Significant Charted Depths

1. The charted 5-ft rock shown on chart 12204 in Latitude 35 49'04.43"N Longitude 75 42'31.32"W is charted as a 5-ft sounding on chart 12205. Side scan images show this to be bottom configuration. The present survey shows soundings of 8 feet. It is recommended the charted 5-ft rock be deleted from the chart and the present survey depths supercede the charts in the common area. See also Item Investigation Report FC576 and FC575/OC26, pages 68-71 of the Descriptive Report.

2. The hydrographer lists several charted features on page 16 of the Descriptive Report that were not found during survey operations. E-mail between the contractor and Contracting Officer's Technical Representative (COTR) indicates that these charted items were not investigated.

United States Coast Guard (USCG) Aids to Navigation Team salvage documentation concerning removal of charted features within the common area of Old House Channel and around the Roanoke Marshes Light Tower was confirmed via a telephone conversation with Chief Warrant Officer (CWO) Midgett by office personnel on May 23, 2003. CWO Midget's address is as follows:

CWO Midgett
Cape Hatteras Aids to Navigation Team
USCG Group Cape Hatteras
P.O. Box 383, Bld. 34
Buxton, NC 27920-0383
252-986-2177 or 2178
Email address: wmidgett@anthatteras.uscg.mil

CWO Midget explained that when a navigational aid, pile or pipe requires replacement, normal procedure includes removal of the aid. A wire drag or sweep covering either side of the feature, extending outward from 30 feet (10 m)to 150 feet (50 m) to confirm removal of all remaining portions of broken pile or pipes follows.

CWO Midget has been with the Cape Hatteras ATON Team for the past three years and stated that the eleven items in the vicinity of Old House Channel (including AWOIS 10852) and the five pipes in the vicinity of Roanoke Marshes Light have been removed and wire drag conducted in those common areas. It is recommended that these items be removed from the charts based on this information.

3. Automated Wreck and Observation Information System (AWOIS) Item #10852, a charted Pile PA, in Latitude 35 43'02.39"N, Longitude 75 37'44.54"W, originates with Local Notice to Mariners number 9 of 1984 (LNM9/84). It is recommended that the Pile PA be deleted based on USCG salvage documentation.

4. AWOIS Item #10843 is three charted Piles PA, in the vicinity of Latitude 35 55'24.49"N, Longitude 75 43'16.03"W. The hydrographer discussed the Pile inside the survey limits on page 16 of the Descriptive Report. The additional two Piles PA were not visually identified by the hydrographer. It is recommended that the following Piles PA be revised to Submerged Piles PA.

Feature	Latitude (N)	Longitude (W)
1. Pile	35 55'28.26"	75 43'25.29"
2. Pile	35 55'24.49"	75 43'16.03"
3. Pile	35 55'21.62"	75 43'06.07"

5. AWOIS Item #10850, a charted note 3 ft Rep 1983, in the vicinity of Latitude 35 44'24.79"N, Longitude 75 36'54.31"W, on chart 12205 and in Latitude 35 44'26.95"N, Longitude 75 36'43.23"W on chart 12204, is considered disproved. It is recommended that the notation 3 ft Rep 1983 be removed from the chart.

6. AWOIS 10848, four Pilings PA, in the vicinity of Latitude 35 52'45.88"N, Longitude 75 40'23.24"W, was not observed. It is recommended these features be revised to Subm Pilings PA.

Southeast of AWOIS 10848, off Ashbee Harbor, in the vicinity of Latitude 35 52'41.75"N, Longitude 75 '12.66"W, chart 12205 shows pier ruins and chart 12204 shows a single Piling PA. This feature was not investigated by the hydrographer. It is recommended the pier ruins be retained as charted on 12205 and the note Piling PA on chart 12204 be deleted. The revised note Subm Pilings PA for AWOIS 10848 should be positioned to apply to this feature as well as AWOIS 10848.

7. The charted four Piling PA north of the new bridge in the vicinity of Latitude 35 53'32.11"N, Longitude 75 41'14.34"W, were not investigated by the hydrographer. It is recommended that the four Piling PA be retained as charted.

D.1.3 Observed Features Not Charted

1. Numerous uncharted fish stakes shown on the present survey were located and discussed by the hydrographer on pages 17-20 of the Descriptive Report. It is recommended these items not be charted.

2. Numerous uncharted private buoys shown on the present survey were located and discussed by the hydrographer on pages 21 and 22 of the Descriptive Report. It is recommended these buoys not be charted.

D.1.5. Danger to Navigation Report

Two Danger to Navigation Reports were noted by the hydrographer, brought to the attention of office personnel and submitted by AHB to the Marine Chart Division, N/CS3x1, Silver Spring, Maryland. Copies of these reports are appended to this report.

D.2.1 AIDS TO NAVIGATION

Conflicts exist between the correct cartographic symbolization on the PSS, Light List Volume II 2003 Edition, and the Local Notice to Mariner No.04/03. Areas of concerns specifically include Croatan Sound Channel, Old House Channel, Spencer Creek Channel, and Manns Harbor. In the Descriptive Report the contractor states that aids to navigation were replaced after survey completion. The submitted contractor Preliminary Smooth Sheet shows aid to navigation positions through the USCG Fifth District LNM4/03.

A Marker Ra Ref at Latitude 35 43'30.05"N, Longitude 75 '17.98" on chart 12204 southeast of the Old House Channel was not addressed by the hydrographer but is noted as a private marker on the smooth sheet. It is recommended this Marker Ra Ref be retained as charted.

CONTROLLING DEPTHS

The charted note, 7½ FT FOR A WIDTH OF 200 FT JUL 2000-OCT 2002, in the vicinity of Latitude 35 52'00"N, Longitude 75 42'45"W, shows the depth for the associated channel. A depth of 7 feet, in Latitude 35 52'49.62"N, Longitude 75 42'59.20"W was noted during office processing and submitted as a DTON by office personnel. A copy of the DTON report is appended to this report. This sounding has already been charted on the latest editions of

the charts.

COMPARISON WITH PRIOR SURVEYS

H08765 (1962) 1:10,000
H09733 (1977) 1:20,000

H08765 compared very well to the present survey. Prior survey soundings are in excellent agreement with present survey soundings.

H09733 compared well with the present survey. Prior survey soundings varied up to one foot in most areas with the exception of the entrance to Old House Channel in the vicinity of Latitude 35 42'49"N, Longitude 75 37'53"W. Dredging operations were observed during present survey operations in the general location of Old House Channel.

The present survey is adequate to supersede the prior surveys in the common area.

ADEQUACY OF SURVEY

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

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 were used for compilation of the present survey:

12204 (35th Edition, Jan 01/03)
Corrected through NM Jan 11/03
Corrected through LNM Dec 24/02
12205 (28th Edition, Aug 01/03)
Corrected through NM Aug 2/03
Corrected through LNM Jul 22/03

Bryan Chauveau

Bryan Chauveau
Contract Hydrographer
Verification of Data
Evaluation and Analysis

APPROVAL SHEET
H11032 (2002)

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. 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.

R. H. Whitfield

Date: 3/25/04

Richard H. Whitfield
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.

Approved: Emily B. Christman

Date: 5/11/04

Emily B. Christman
Commander, NOAA
Chief, Atlantic Hydrographic Branch

AWOIS ✓ & SURF ✓ 5/24/04 by MBH

REPORT OF DANGERS TO NAVIGATION

Hydrographic Survey Registry Number: H11032

Survey Title: State: North Carolina
Locality: Pamlico and Croatan Sounds
Sublocality: Weir Point to Stumpy Point

Project Number: OPR-F336-KR

Field Unit: Ocean Surveys Inc. (OSI)

Survey Dates: June, 2002 and Ongoing

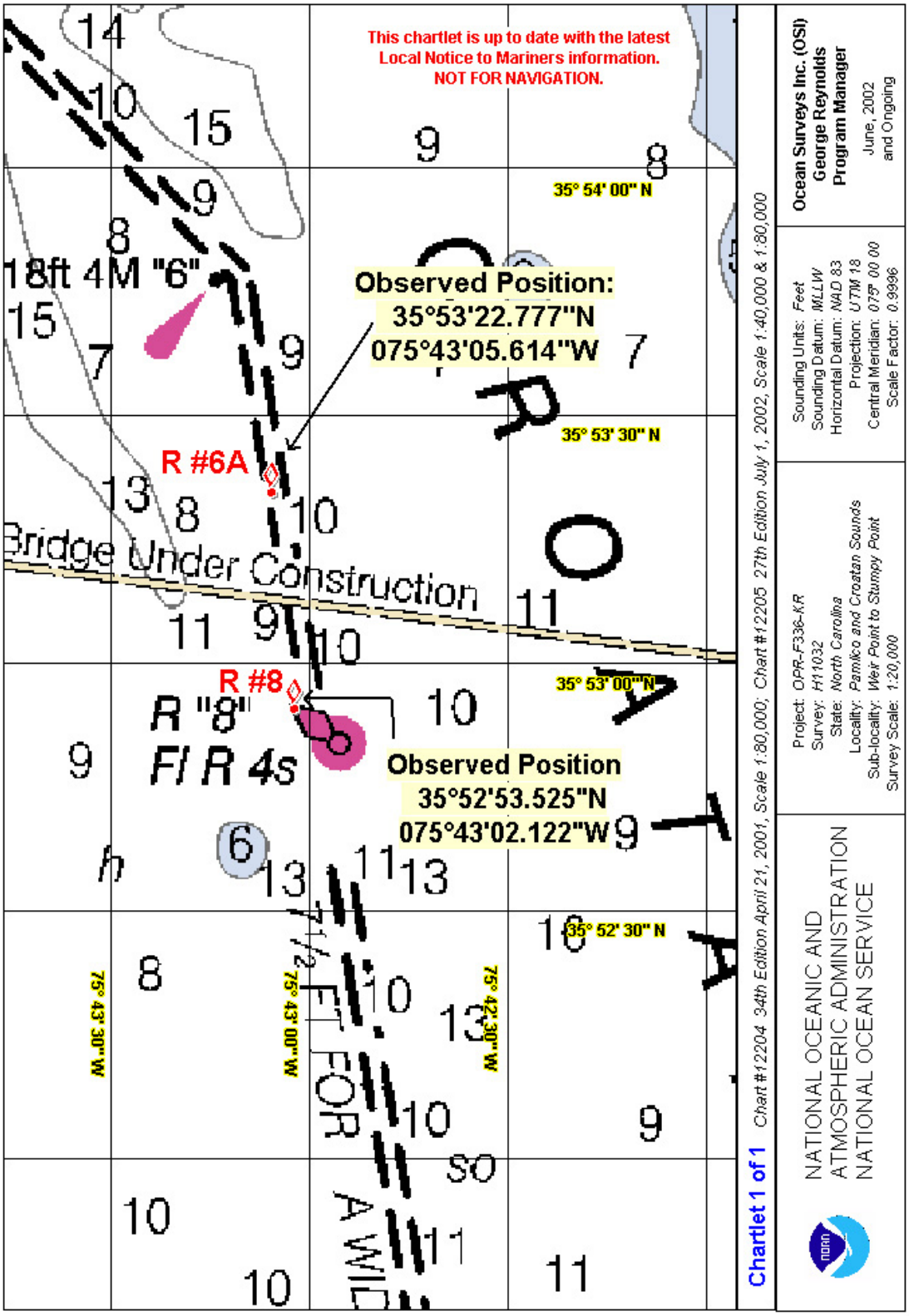
Horizontal datum is North American Datum 83 (NAD 83).

Charts affected: 12204 34th Edition April 21, 2001, Scale 1:80,000, NAD 83
12205 27th Edition July 1, 2002, Scale 1:40,000 & 1:80,000, NAD 83

DANGERS TO NAVIGATION

	Latitude (N)	Longitude (W)
1. Navigational Aid R #6A (Off Station) Observed Position	35°53'22.777"	075°43'05.614
2. Navigational Aid R #8 (Off Station) Observed Position	35°52'56.525"	075°43'02.122

Questions concerning this report should be directed to the Chief, Atlantic Hydrographic Branch at (757) 441-6746.


This chartlet is up to date with the latest
Local Notice to Mariners information.
NOT FOR NAVIGATION.
35° 54' 00" N
35° 53' 30" N
35° 53' 00" N
35° 52' 30" N
75° 43' 30" W
75° 43' 00" W
75° 42' 30" W
18ft 4M "6"
Observed Position:
35°53'22.777"N
075°43'05.614"W
R #6A
Bridge Under Construction
R #8
R "8"
Fl R 4s
Observed Position
35°52'53.525"N
075°43'02.122"W
Chartlet 1 of 1
Chart #12204 34th Edition April 21, 2001, Scale 1:80,000; Chart #12205 27th Edition July 1, 2002, Scale 1:40,000 & 1:80,000
Project: OPR-F336-KR
Survey: H11032
State: North Carolina
Locality: Pamlico and Croatan Sounds
Sub-locality: Weir Point to Stumpy Point
Survey Scale: 1:20,000
Sounding Units: Feet
Sounding Datum: MLLW
Horizontal Datum: NAD 83
Projection: UTM 18
Central Meridian: 075° 00 00
Scale Factor: 0.9996
Ocean Surveys Inc. (OSI)
George Reynolds
Program Manager
June, 2002
and Ongoing
NATIONAL OCEANIC AND
ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SERVICE

DANGERS TO NAVIGATION : H11032

FEATURE	LATITUDE (N)	LONGITUDE (W)
1. Navigational Aid R #6A		
Observed Position	35 53'22.777"	075 43'05.614
2. Navigational Aid R #8		
Observed Position	35 52'56.525"	075 43'02.122

REPORT OF DANGERS TO NAVIGATION

Hydrographic Survey Registry Number: H11032

Survey Title: State: North Carolina
Locality: Pamlico and Croatan Sounds
Sublocality: Weir Point to Stumpy Point

Project Number: OPR-F336-KR

Field Unit: Ocean Surveys Inc. (OSI)

Survey Dates: June, 2002 and Ongoing

Horizontal datum is North American Datum 83 (NAD 83).

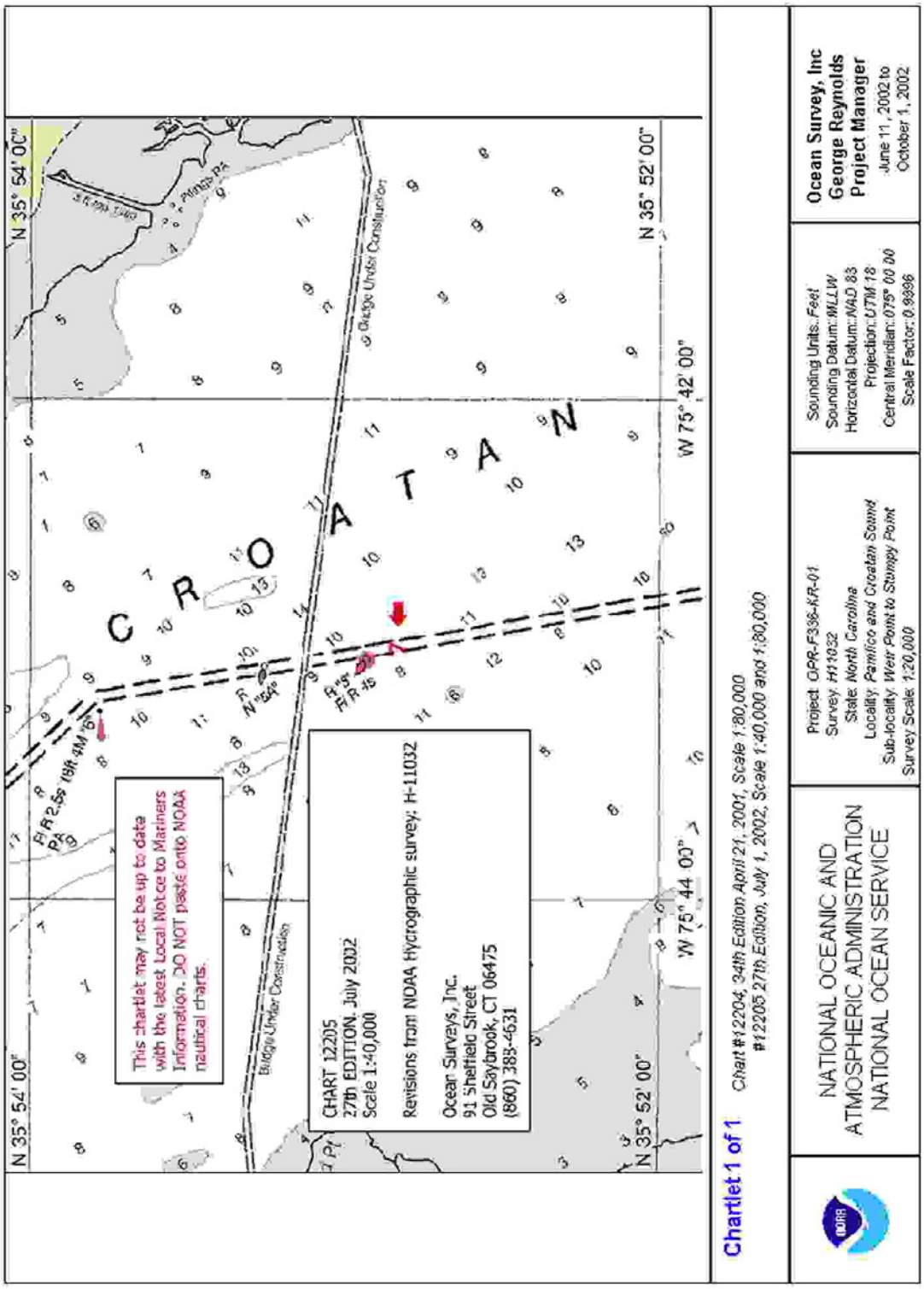
Charts affected: 12204 34th Edition April 21, 2001, Scale 1:80,000, NAD 83
12205 27th Edition July 1, 2002, Scale 1:40,000 & 1:80,000, NAD 83

DANGERS TO NAVIGATION

1.	Feature	Depth (FT)	Latitude (N)	Longitude (W)
	Sounding	7	35°52'49.62"	75°42'59.20"

Survey H11032 discovered a shoal sounding within Croatan Sound Channel, presently charted as "7 ½ ft depth for width of 200 ft. Please refer to attached chartlet.

Questions concerning this report should be directed to the Chief, Atlantic Hydrographic Branch at (757) 441-6746.


N 35° 54' 00"
N 35° 52' 00"
W 75° 42' 00"
W 75° 44' 00"
CROATAN
This chartlet may not be up to date with the latest Local Notice to Mariners Information. DO NOT paste onto NOAA nautical charts.
CHART 12205
27th EDITION. July 2002
Scale 1:40,000
Revisions from NOAA Hydrographic survey: H-11032
Ocean Surveys, Inc.
91 Shettield Street
Old Saybrook, CT 06475
(860) 388-4631
Chartlet 1 of 1
Chart #12204, 34th Edition April 21, 2001, Scale 1:80,000
#12205 27th Edition, July 1, 2002, Scale 1:40,000 and 1:80,000
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SERVICE
Project: OPR-F336-KR-01
Survey: H11032
State: North Carolina
Locality: Pamlico and Croatan Sound
Sub-locality: Weir Point to Stumpy Point
Survey Scale: 1:20,000
Sounding Units: Feet
Sounding Datum: MLLW
Horizontal Datum: NAD 83
Projection: UTM 18
Central Meridian: 075° 00 00
Scale Factor: 0.9996
Ocean Survey, Inc
George Reynolds
Project Manager
June 11, 2002 to
October 1, 2002

H11032 Danger to Navigation XYZ

FEATURE	DEPTH(FT)	LATITUDE (N)	LONGITUDE (W)
Sounding	7	35/52/49.62	075/42/59.20

NOAA FORM 75-96
(10-83)

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

MARINE CHART BRANCH

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H11032

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
12205	3/5/2004	Bryan Chauveau	Full ~~Part Before~~ After Marine Center Approval Signed Via (kapp 532)
			Drawing No.
12205	3/25/2004	Bryan Chauveau	Full ~~Part Before~~ After Marine Center Approval Signed Via (kapp 531)
			Drawing No.
12204	3/23/2004	Bryan Chauveau	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No.
12205	7/14/04	Paul Powers	Full ~~Part Before~~ After Marine Center Approval Signed Via
kapp 532			Drawing No.
12205	7/14/04	Paul Powers	Full ~~Part Before~~ After Marine Center Approval Signed Via
kapp 531			Drawing No.
12204	7/14/04	Paul Powers	Full ~~Part Before~~ After Marine Center Approval Signed Via
kapp 527			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.

SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED