H12601

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Ocean Survey

# DESCRIPTIVE REPORT

| | |
|---|---|
| Type of Survey: | Navigable Area |
| Registry Number: | H12601 |

## LOCALITY

| | |
|---|---|
| State(s): | New York |
| General Locality: | Vicinity of Southern Long Island |
| Sub-locality: | Vicinity of Shinnecock Inlet |

**2013**

CHIEF OF PARTY
Ransom C. White III

LIBRARY & ARCHIVES

Date:

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

REGISTRY NUMBER:

# HYDROGRAPHIC TITLE SHEET

# H12601

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

| | |
|---|---|
| State(s): | **New York** |
| General Locality: | **Vicinity of Southern Long Island** |
| Sub-Locality: | **Vicinity of Shinnecock Inlet** |
| Scale: | **20000** |
| Dates of Survey: | **10/11/2013 to 02/12/2014** |
| Instructions Dated: | **06/27/2013** |
| Project Number: | **OPR-C331-KR-13** |
| Field Unit: | **Williamson & Associates, Inc.** |
| Chief of Party: | **Ransom C. White III** |
| Soundings by: | **Multibeam Echo Sounder** |
| Imagery by: | **Side Scan Sonar** |
| Verification by: | **Pacific Hydrographic Branch** |
| Soundings Acquired in: | **meters at Mean Lower Low Water** |

Remarks:

***The purpose of this survey is to provide contemporary surveys to update National Ocean Service (NOS) nautical charts. All separates are filed with the hydrographic data. Notes in red were generated during office processing. The processing branch concurs with all information and recommendations in the DR unless otherwise noted. Page numbering may be interrupted or non-sequential. All pertinent records for this survey, including the Descriptive Report, are archived at the National Geophysical Data Center (NGDC) and can be retrieved via http://www.ngdc.noaa.gov/.***

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# Descriptive Report to Accompany Survey H12601

Project: OPR-C331-KR-13

Locality: Vicinity of Southern Long Island

Sublocality: Vicinity of Shinnecock Inlet

Scale: 1:20000

October 2013 - February 2014

**Williamson & Associates, Inc.**

Chief of Party: Ransom C. White III

# A. Area Surveyed

Williamson & Associates, Inc. conducted a hydrographic survey in the southern waters off of Long Island, NY. The sub-locality of this survey is described as Vicinity of Shinnecock Inlet.

The survey encompassed an area of approximately 13 square nautical miles and was assigned registry number H12601. Project instructions required object detection coverage in 2-4 meters of water with 100% SSS and concurrent MBES and backscatter. Object detection coverage was required as well in 4-20 meters of water with 200% SSS and concurrent MBES and backscatter. Complete MBES and backscatter were the only requirements in water depths greater than 20 meters.

It should be noted that the appendices and separates for this report were created using the XML Schema format from XMLDR v13.1 released in June 2013 and will not follow the layout described in HSSD 2012. This was approved through email correspondence with our COTR on 4/10/2013, see correspondence in Appendix II.

## A.1 Survey Limits

Data were acquired within the following survey limits:

| Northwest Limit | Southeast Limit |
|---|---|
| 40° 51' 23.02" N<br>72° 25' 0.76" W | 40° 46' 29.03" N<br>72° 31' 6.29" W |

*Table 1: Survey Limits*

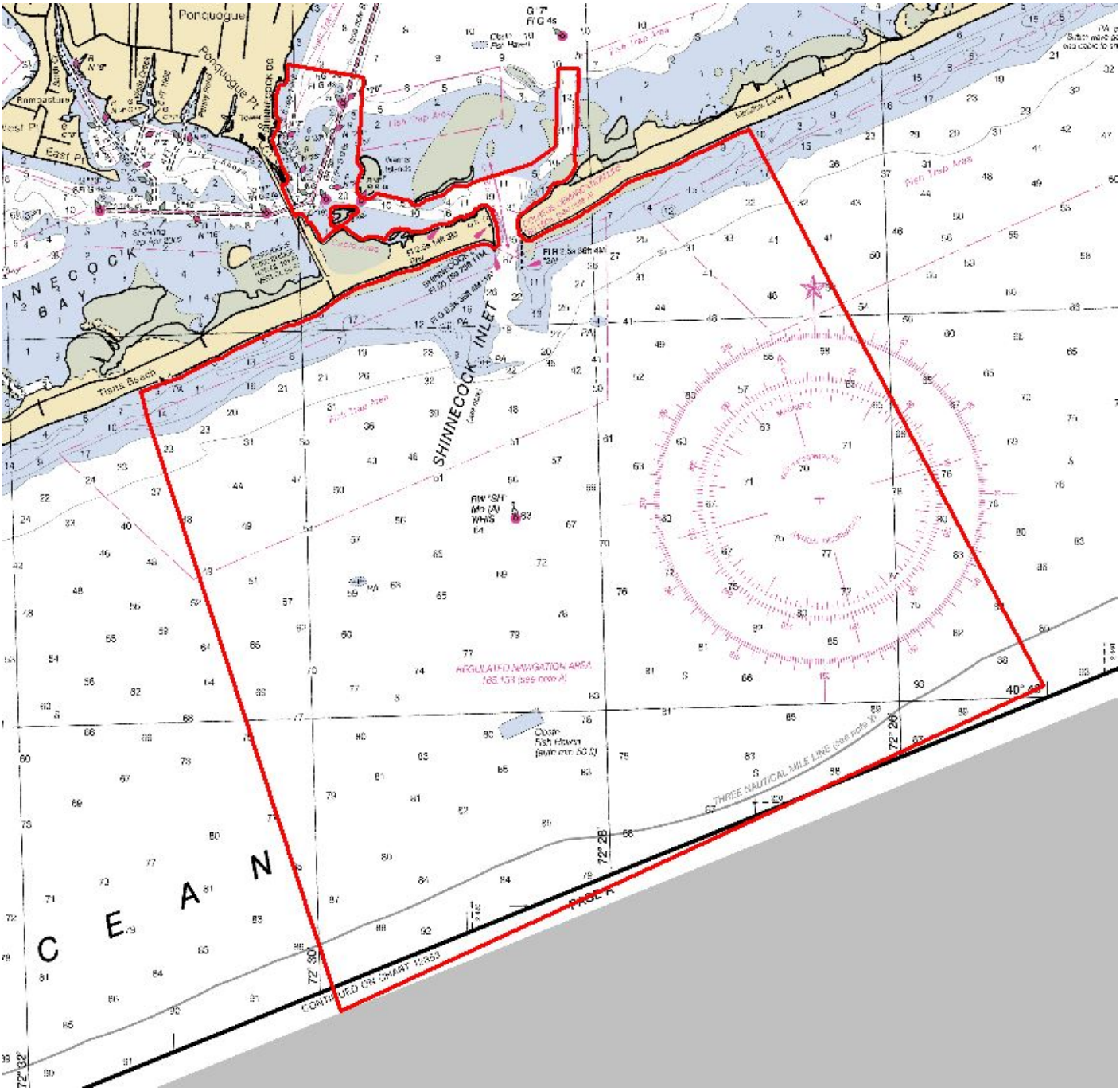


*Figure 1: H12601 Sheet Boundaries Overlaid on Chart 12352*

***The coverage requirement for the 2-4m depth range was revised to 100% SSS with concurrent set line spacing SBES or MBES and backscatter.***

Survey Limits were acquired in accordance with the requirements in the Project Instructions and the HSSD.

## A.2 Survey Purpose

As per the project instructions: The purpose of this project is to provide contemporary surveys to update National Ocean Service (NOS) nautical charting products. This project is in response to different user group needs following Hurricane Sandy landfall. Specifically these data will adjoin updated shoreline, address the need for updated bathymetry for inundation modeling, and help identify marine debris for potential removal.

## A.3 Survey Quality

The entire survey is adequate to supersede previous data.

Survey quality was reviewed mainly by utilizing daily checks for data matchup, swath density, and motion/ refraction artifacts. Sounding density was found to meet or exceed the object detection and single line spacing requirements out to roughly 40-45 degrees from nadir which was deemed acceptable given that our requirements called for skunk stripe MBES as a gap filler for 100% and 200% SSS. A full MBES coverage plan would include at least a 20% swath overlap, which is not possible with a set line spacing. Motion artifacts, when found, were due to excessive weather conditions. Latency values were checked and the motion artifacts were measured. The majority of motion artifacts found fell under our IHO Order 1a error budget and were located well offshore in easily navigable waters. Considering the consistently poor working conditions during the winter months, motion artifacts became somewhat frequent, however they posed little threat to the usefulness of the data as expected vessel traffic in the area consists of no vessels that draw more than 2-3 meters.

In-depth crossline comparisons were performed. The results of the crossline comparison can be found in section B.2.1 of this report. The crossline comparisons consisted of analyzing each individual crossline with the finalized CUBE surface using the CARIS surface report tool. Once a CARIS surface report was generated, the results were inserted into a spreadsheet for total calculations of the survey area. The surface report informs the user of the percentage of soundings across the swath in increments set by the user that fall within the desired IHO specifications, in our case 10 degree increments, within IHO Order 1a. Areas that did not pass the IHO order 1a specification were due to shifting bathy near the inlets and can be reviewed in section B.2.6 of this report.

Survey quality is acceptable to supersede previous bathymetric, shoreline, overhead and submerged feature data within the project bounds.

## A.4 Survey Coverage

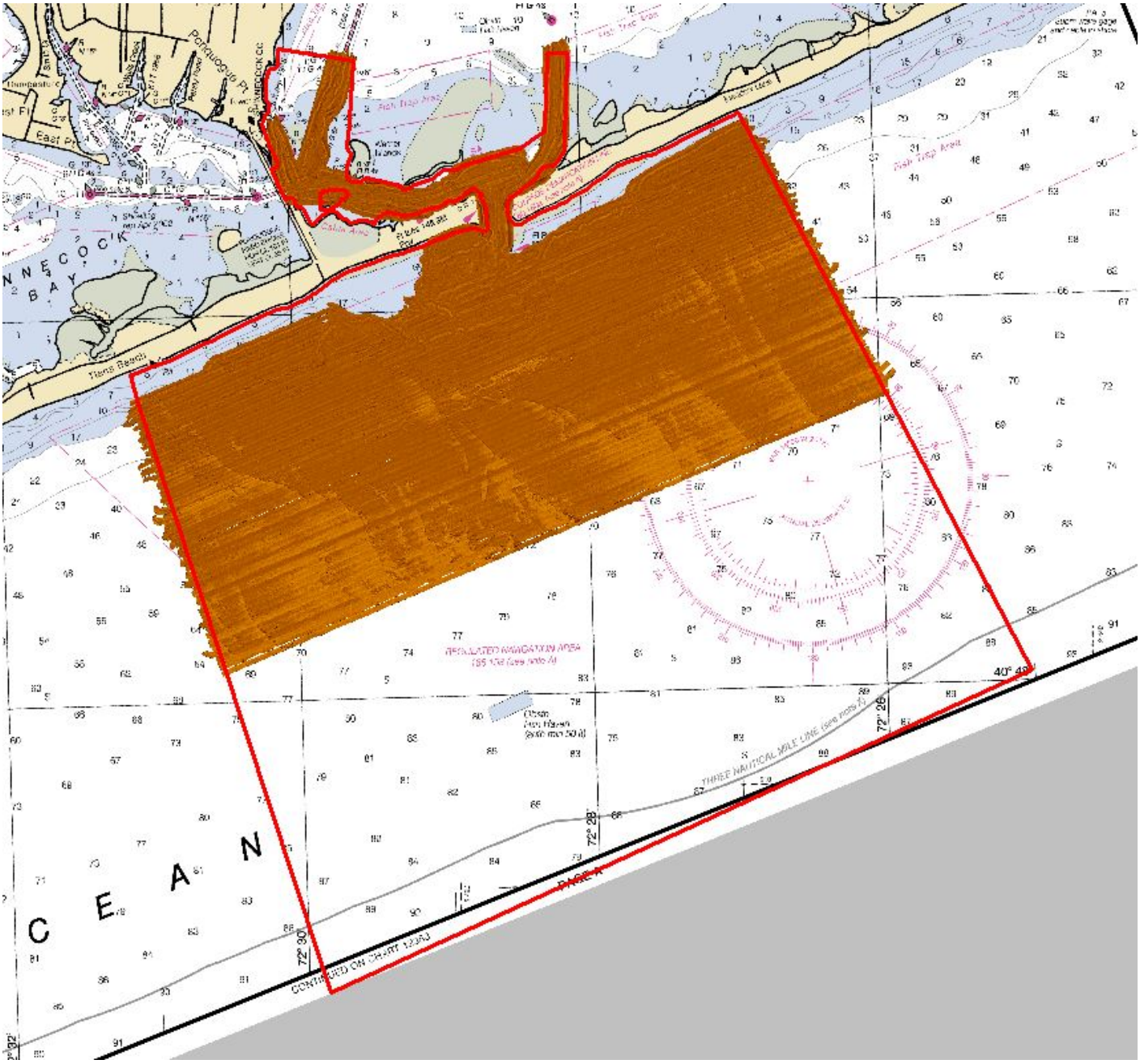


*Figure 2: H12601 SSS Mosaic of all Data Acquired Overlaid on Chart 12352*

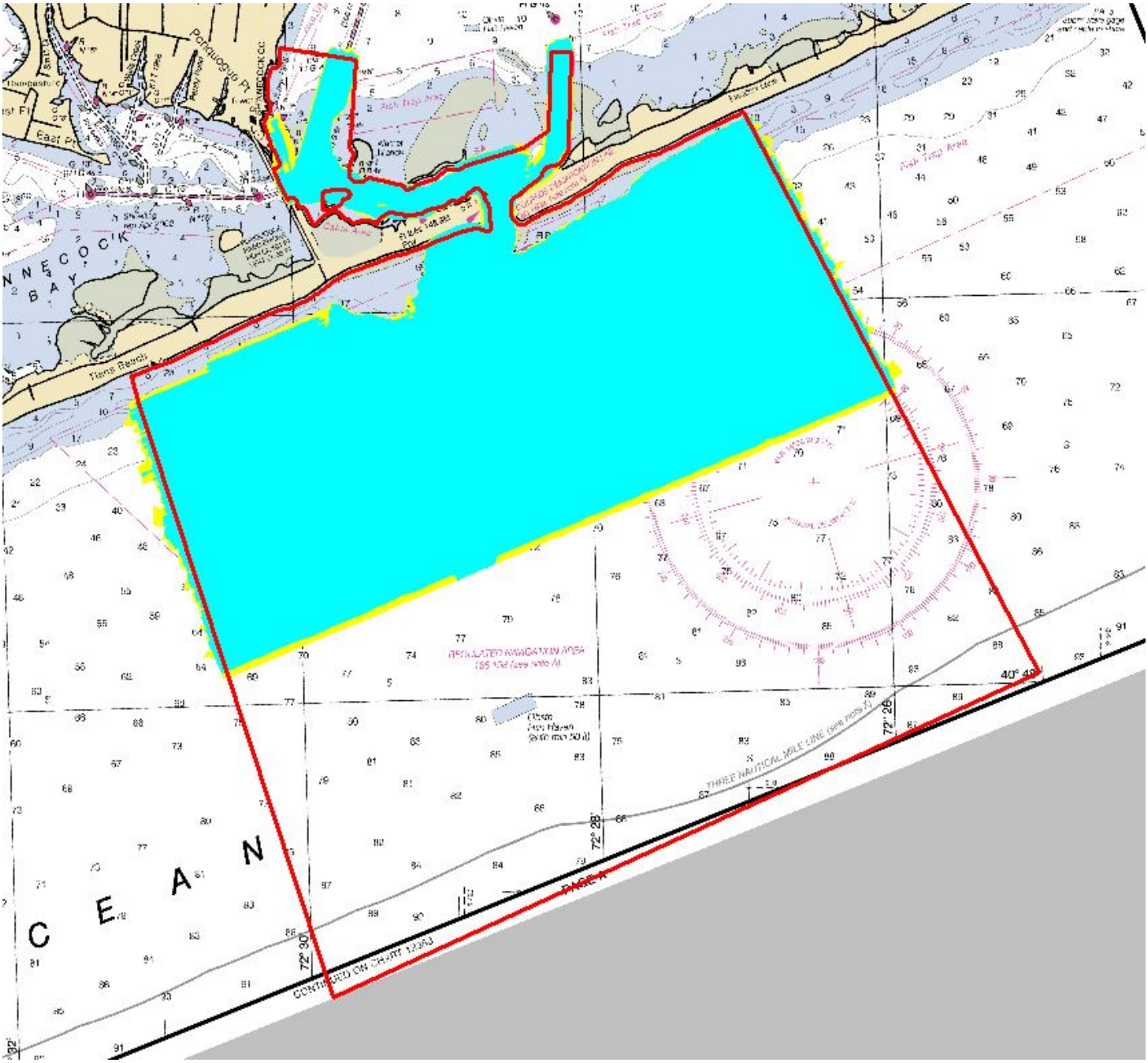


*Figure 3: H12601 SSS Coverage Depicting percent of coverage: Yellow = 100%, Cyan = 200%*

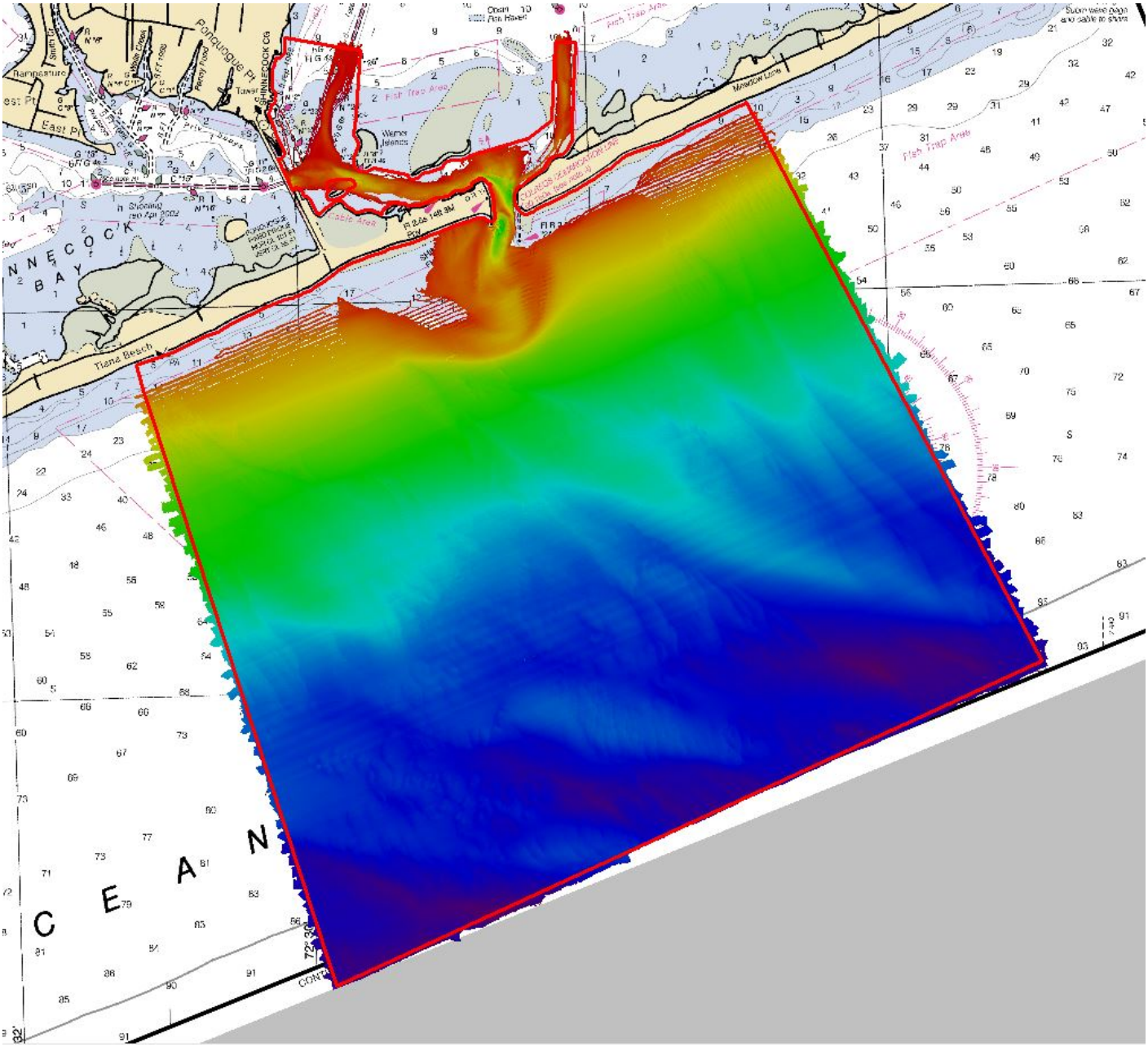


*Figure 4: H12601 MBES Coverage Overlaid on Chart 12352*

Due to changing morphology and a combination of shoal and swell conditions, coverage gaps are present in SSS data. Vessel and crew safety is a priority and was always taken into consideration. There are six coverage gaps located on this sheet. A coverage gap is present along the beach near Shinnecock Inlet, due to shoal conditions and shallow waters. Another gap is located east of Ponquogue Point as a result of a shoal area. An additional gap is located northwest of the Inlet due to the presence of a raft of dredge pipe. There are three smaller coverage gaps present north of the inlet, all of which are due to shifting morphology and shoals.

Please refer to section D.1.3 "AWOIS Items" fro information on survey coverage gaps.

It should be noted that during initial acquisition the survey line plan used was designed to obtain full multibeam coverage in shoal water depths. A new survey line plan was set in place on October 23rd containing line spacing to result in 200% SSS coverage with skunk stripe MBES. The line plan was implemented on October 25th and was confirmed by the COTR via email on October 30th. Please refer to Appendix II of this report for email communications.

***The email correspondence is attached.***

## A.5 Survey Statistics

The following table lists the mainscheme and crossline acquisition mileage for this survey:

| | HULL ID | *HEW46077J708* | *Total* |
|---|---|---|---|
| **LNM** | **SBES Mainscheme** | 0 | 0 |
| | **MBES Mainscheme** | 201.25 | 201.25 |
| | **Lidar Mainscheme** | 0 | 0 |
| | **SSS Mainscheme** | 0 | 0 |
| | **SBES/SSS Mainscheme** | 0 | 0 |
| | **MBES/SSS Mainscheme** | 327.19 | 327.19 |
| | **SBES/MBES Crosslines** | 19.76 | 19.76 |
| | **Lidar Crosslines** | 0 | 0 |
| **Number of Bottom Samples** | | | 10 |
| **Number of AWOIS Items Investigated** | | | 4 |
| **Number Maritime Boundary Points Investigated** | | | 0 |
| **Number of DPs** | | | 0 |
| **Number of Items Investigated by Dive Ops** | | | 0 |
| **Total SNM** | | | 12.37 |

*Table 2: Hydrographic Survey Statistics*

The following table lists the specific dates of data acquisition for this survey:

| Survey Dates | Day of the Year |
|---|---|
| 10/11/2013 | 284 |
| 10/12/2013 | 285 |
| 10/14/2013 | 287 |
| 10/15/2013 | 288 |
| 10/17/2013 | 290 |
| 10/23/2013 | 296 |
| 11/02/2013 | 306 |
| 11/11/2013 | 315 |
| 12/08/2013 | 342 |
| 12/10/2013 | 344 |
| 01/09/2014 | 9 |
| 01/10/2014 | 10 |
| 01/15/2014 | 15 |
| 01/16/2014 | 16 |
| 01/17/2014 | 17 |
| 01/21/2014 | 21 |
| 01/29/2014 | 29 |
| 01/30/2014 | 30 |
| 02/01/2014 | 32 |
| 02/02/2014 | 33 |
| 02/04/2014 | 35 |
| 02/06/2014 | 37 |
| 02/08/2014 | 39 |
| 02/09/2014 | 40 |
| 02/11/2014 | 42 |
| 02/12/2014 | 43 |

*Table 3: Dates of Hydrography*

***The survey statistics were changed to report accurate values calculated during office review.***

# B. Data Acquisition and Processing

## B.1 Equipment and Vessels

Refer to the Data Acquisition and Processing Report (DAPR) for a complete description of data acquisition and processing systems, survey vessels, quality control procedures and data processing methods. Additional information to supplement sounding and survey data, and any deviations from the DAPR are discussed in the following sections.

### B.1.1 Vessels

The following vessels were used for data acquisition during this survey:

| **Hull ID** | ***HEW46077J708*** |
|---|---|
| **LOA** | 7.32 meters |
| **Draft** | 1.2 meters |

*Table 4: Vessels Used*


*Figure 5: M/V Nooit Volmaakt from the port side. The pole mount on the bow for the Edge Tech SSS can be seen.*

*Figure 6: M/V Nooit Volmaakt from the starboard bow. The pole mount on the bow for the Edge Tech SSS can be seen.*

### B.1.2 Equipment

The following major systems were used for data acquisition during this survey:

| Manufacturer | Model | Type |
|---|---|---|
| R2Sonic | 2024 | MBES |
| EdgeTech | 4600 | SSS |
| Applanix | POS MV 320 | Positioning and Attitude System |
| Valeport | MiniSVS | Sound Speed System |
| SeaBird | SBE19 | Conductivity, Temperature and Depth Sensor |
| SeaBird | SBE19+ | Conductivity, Temperature and Depth Sensor |

*Table 5: Major Systems Used*

The M/V Nooit Volmaakt acquired all multibeam data with a pole mounted R2Sonic 2024 at 400kHz and a pole mounted EdgeTech 4600 at 540 kHz using a POSMV for position, orientation and motion corrections. For more detailed information on equipment and vessel please refer to OPR-C331-KR-13 DAPR submitted under a different cover.

## B.2 Quality Control

### B.2.1 Crosslines

Crosslines acquired for this survey totaled 4% of mainscheme acquisition.

Quality control crosslines were planned so that most main scheme lines would intersect with at least one crossline, they were well distributed geographically, and that total crossline nautical miles ran would total more than 4 % of the main scheme nautical miles (a specification set forth by the HSSD 2012). Our quantification of required crossline distance in this sheet was complicated by a change in our line plan to a set line spacing from full MBES coverage, causing skunk striping in the shallower areas. Survey that had taken place prior to the line plan change caused there to be far more line miles of data than what the new line plan called for. The quantification for line miles of crosslines was based on the new line plan, which had fewer lines. Therefore, the percentage of crosslines to total main line mileage will appear to be less than what was required, however, the true percentage should be determined as described above.

Total crossline length surveyed for task order OPR-C331-KR-13 sheet H12601 was 21.42 nautical miles or 4.43% of the total main scheme distance (483.27 nautical miles). All crosslines were compared to the main scheme line CUBE, using the CARIS HIPS QC Report process for individual lines. The swath was split by swath angles in 10 degree increments for the crossline analysis. The seabed near the inlet was so dynamic, being current driven, that it changed significantly from day to day. Two crosslines obtained near the inlet failed to meet the standards set forth by the HSSD (more information can be found in section B.2.6, Factors Affecting Soundings). These lines were deemed unacceptable due to seabed shift and not used resulting in a crossline mileage of 4.29% of the main scheme lines. Without these outliers included in the average the vast majority of beams passed within the IHO Order 1a specifications at a 95% confidence level or better with an overall confidence level average of 99.82% and a standard deviation of 0.57%. (See Separate II). Lines that covered both the 50cm (0-20m water depth) and the 2m (18-40m water depth) surfaces were analyzed independently for each surface.

***Crosslines totaled 19.76 LNM which equaled 3.87% of the mainscheme mileage.***

### B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

| Measured | Zoning |
|---|---|
| 0 meters | 0.1504 meters |

*Table 6: Survey Specific Tide TPU Values*

| Hull ID | Measured - CTD | Measured - MVP | Surface |
|---|---|---|---|
| HEW46077J708 | 1.5 meters/second | | 0.2 meters/second |

*Table 7: Survey Specific Sound Speed TPU Values*

Refer to the Data Acquisition and Processing Report (DAPR) for a complete description of the uncertainty values used for processing sheet H12601.

Tidal uncertainty values reported by JOA Surveys at the 95% confidence level was 0.295m and includes the estimated gauge measurement error, tidal datum computation error and tidal zoning error. The reported error value was then divided by 1.96 because CARIS assumes TPU values to be 1 sigma (Field Procedures Manual April 2013) resulting in a value of 0.15m. The tidal uncertainty field labeled in CARIS as “measured” was left at zero as the reported error value of 0.295m included the estimated gauge measurement error and the tidal datum computation error as well as the tidal zoning error. Any max uncertainty measurements exceeding IHO Order 1a specifications are due to shifting sand bars and seabed morphology and are explained in section B.2.6 (Factors Affecting Soundings).

### B.2.3 Junctions

There are no contemporary surveys that junction with this survey.

### B.2.4 Sonar QC Checks

Sonar system quality control checks were conducted as detailed in the quality control section of the DAPR.

### B.2.5 Equipment Effectiveness

Motion Correction System

B.2.5.2 POS MV 320. The POS MV 320 functioned adequately throughout the survey. The average sea state during the majority of survey days was a 1m swell. Depending on the direction of the swell, some attitude artifacting resulted, mostly in deeper areas of the survey. These lines were not rejected as no latency was found to exist and QC showed the lines to still be within spec using cross-line analysis. This was concluded to be the result of a small survey vessel in large enough seas to challenge the accuracy of the IMU.

B.2.5.3 On Julian Day 306 (November 2nd), there was a software problem caused by a Windows firewall issue. When the system was rebooted, the POS MV was not restarted, causing eight lines to be surveyed in Shinnecock Bay without a POS MV heave input. The waters were calm and the data was not compromised so the lines were used.

### B.2.6 Factors Affecting Soundings

Shifting Sand Waves / Bars / Features

Sand features in waters more shoal than 10 meters are constantly shifting, as much as 25cm per day in some areas. Areas concentrated around the inlet are subject to the strongest and most rapid tidal currents, as a result these areas experience the most morphological shifting resulting in poor data alignment, especially if overlapping acquisition was separated by as much as 5-10 days. Due to this effect on the data overlapping, the timing of acquisition was strongly considered in planning.

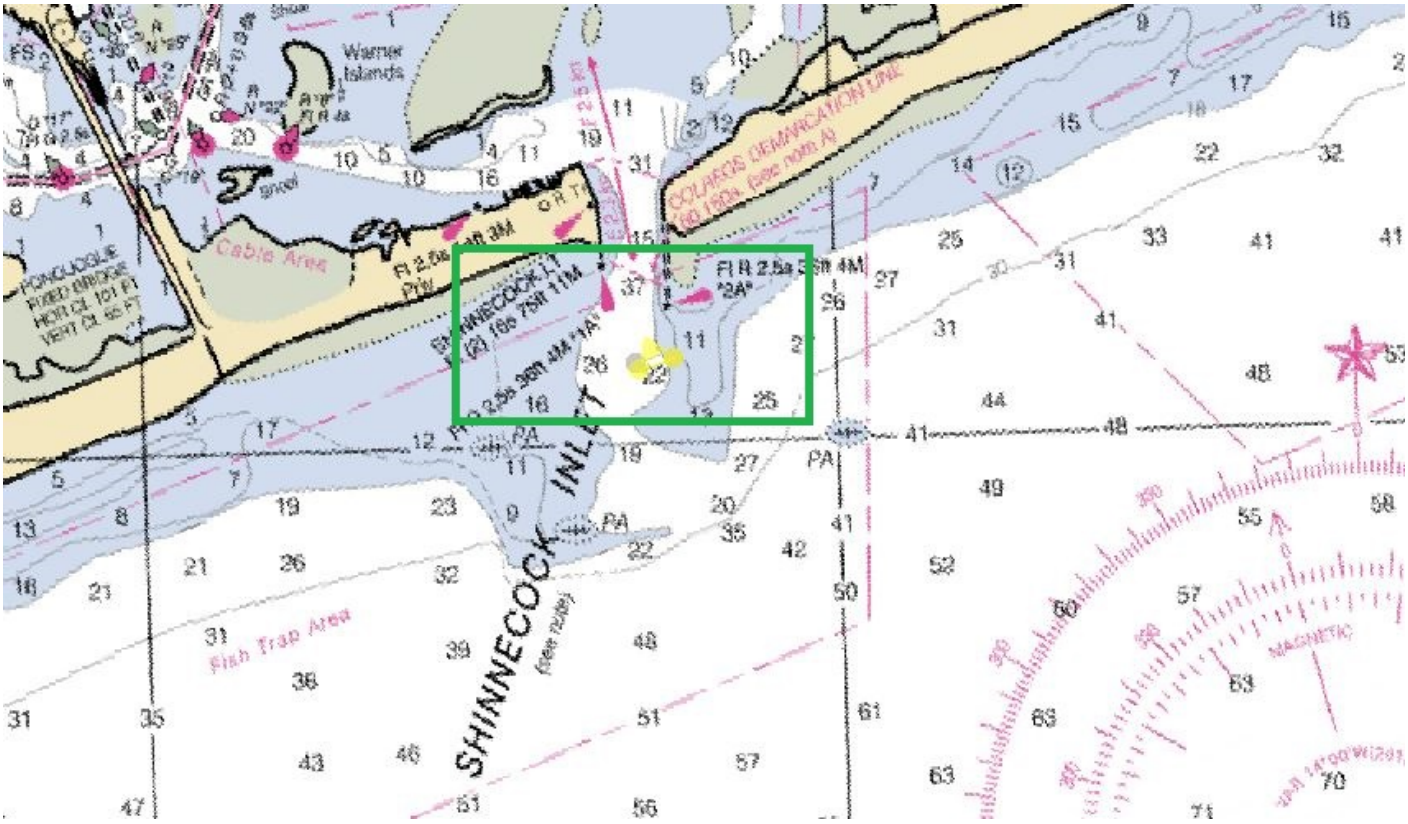


*Figure 7: Overhead view of the western area of H12601 showing chart 12352. The area of shifting bathy shown in the following figures is highlighted by the green box.*

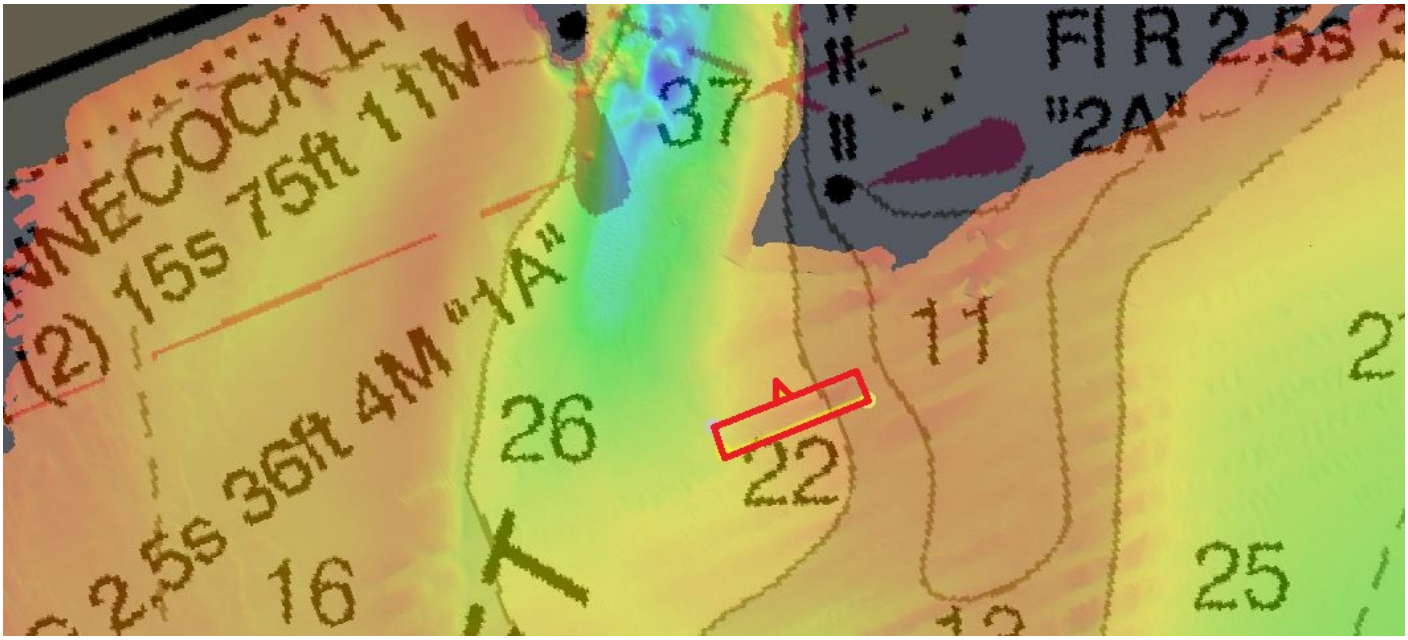


*Figure 8: Overhead view showing the area within the green box highlighted in the previous figure with the MBES data overlaid with chart 12352. The area shown in the following figures is highlighted by the red box with the direction of view represented by the red carrot.*

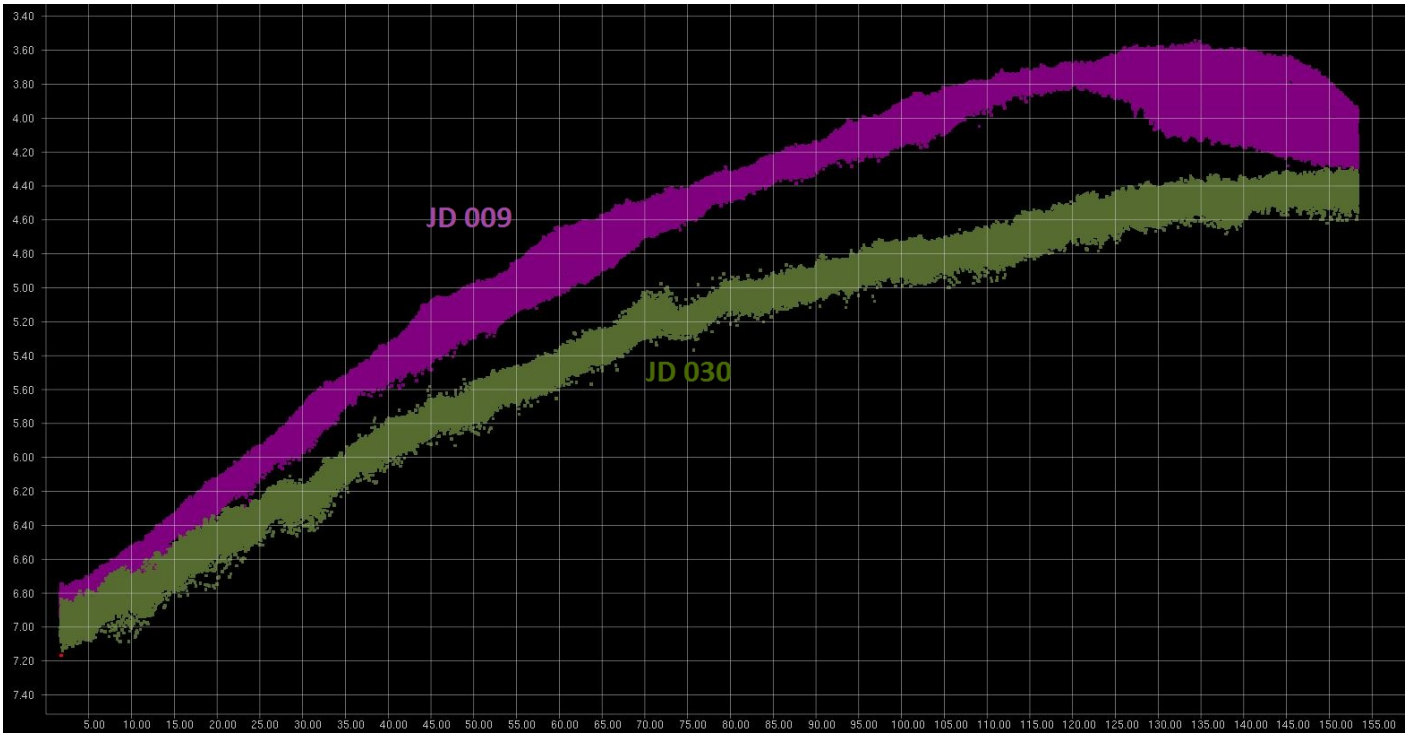


*Figure 9: 2D view of shifting sand features, the purple line was acquired on Julian Day 009 while the green line was acquired on Julian Day 030, a 21 day separation.*

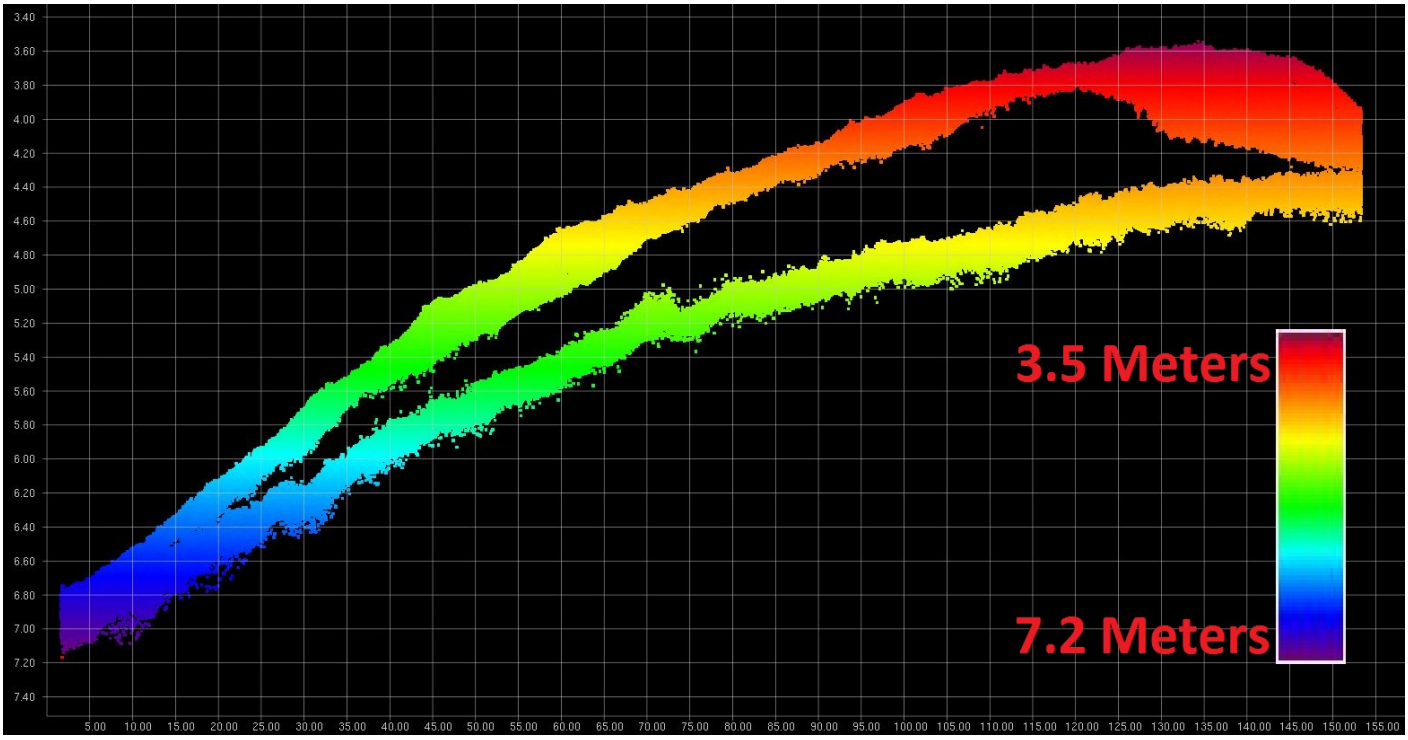


*Figure 10: 3D view of shifting sand features, showing the depths for each line. Each horizontal grid line represents 20cm.*

### B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: 4 hours

A Sea-Bird CTD was used every 2-4 hours depending on variation in the surface sound velocity was. As per the HSSD casts were taken if the surface sound velocity changed by more than 2 m/s. Two Sea-Bird CTDs were used aboard the survey vessel, a SBE 19 and SBE 19+.

Sound Velocity was close to homogeneous from day to day. No significant sound velocity errors were encountered.

### B.2.8 Coverage Equipment and Methods

All equipment and survey methods were used as detailed in the DAPR.

## B.3 Echo Sounding Corrections

### B.3.1 Corrections to Echo Soundings

All data reduction procedures conform to those detailed in the DAPR.

### B.3.2 Calibrations

The following calibrations were conducted after the initial system calibration discussed in the DAPR:

| Calibration Type | Date | Reason |
|---|---|---|
| MBES | 2013-10-02 | Vessel ran sensor aground on Sand Bar. |
| MBES | 2013-10-06 | Vessel ran sensor aground on Sand Bar. |
| MBES | 2013-10-15 | Vessel ran sensor aground on Sand Bar. |
| MBES | 2013-10-18 | Vessel ran sensor aground on Sand Bar. |
| MBES | 2013-11-05 | Vessel ran sensor aground on Sand Bar. |
| MBES | 2013-11-11 | Vessel ran sensor hard aground on Sand Bar. |
| MBES | 2014-01-04 | Vessel ran sensor aground on Sand Bar. |

*Table 8: Calibrations not discussed in the DAPR.*

Multiple calibration patch tests were conducted for the MBES system after the initial calibration. These were conducted to account for small shifts in the mounting flange. No resulting issues were found to adversely affect the data.

## B.4 Backscatter

Backscatter was converted to HDCS file format and is included with the data submitted to the Branch.

## B.5 Data Processing

### B.5.1 Software Updates

There were no software configuration changes after the DAPR was submitted.

The following Feature Object Catalog was used: 5.2

There were no software configuration changes after the DAPR was submitted.

### B.5.2 Surfaces

The following surfaces and/or BAGs were submitted to the Processing Branch:

| Surface Name | Surface Type | Resolution | Depth Range | Surface Parameter | Purpose |
|---|---|---|---|---|---|
| H12601_West_MB_50cm_MLLW_Final | CUBE | 0.5 meters | 0 meters - 20 meters | NOAA_0.5m | Object Detection |
| H12601_Central_MB_50cm_MLLW_Final | CUBE | 0.5 meters | 0 meters - 20 meters | NOAA_0.5m | Object Detection |
| H12601_East_MB_50cm_MLLW_Final | CUBE | 0.5 meters | 0 meters - 20 meters | NOAA_0.5m | Object Detection |
| H12601_MB_2m_MLLW_Final | CUBE | 2 meters | 18 meters - 30 meters | NOAA_2m | Complete MBES |
| H12601_AWOIS_7943_MB_50cm_MLLW_Final | CUBE | 0.5 meters | 15 meters - 19.79 meters | NOAA_0.5m | Object Detection |
| H12601_SSS_1m_100%_A | SSS Mosaic | 1 meters | 0 meters - 30 meters | N/A | 100% SSS |
| H12601_SSS_1m_100%_B | SSS Mosaic | 1 meters | 0 meters - 30 meters | N/A | 100% SSS |

*Table 9: Submitted Surfaces*

As per the project instructions a 1m SSS mosaic resolution was used. The 200% SSS coverage was split into 100% coverage mosaics. The MBES data was gridded at 0.5 meters for water depths ranging between 0-20 meters, and gridded at 2 meters in water depths between 18-40m. Multiple 50cm surfaces were created in lieu of one large surface to reduce the file size and allow for quicker localized surface loading. Separate surfaces were created for the AWOIS areas that extended into water depths greater than 20m, as the required resolution for data at depths greater than 20m (2m resolution) differ from that required for AWOIS coverage (50cm resolution).

# C. Vertical and Horizontal Control

Additional information discussing the vertical or horizontal control for this survey can be found in the accompanying HVCR.

## C.1 Vertical Control

The vertical datum for this project is Mean Lower Low Water.

Standard Vertical Control Methods Used:

Discrete Zoning

The following National Water Level Observation Network (NWLON) stations served as datum control for this survey:

| Station Name | Station ID |
|---|---|
| Ponquogue Point | 8512451 |
| Shinnecock Inlet Open Coast | 8512354 |

*Table 10: NWLON Tide Stations*

| File Name | Status |
|---|---|
| 8512354.tid | Final Approved |
| 8512451.tid | Final Approved |

*Table 11: Water Level Files (.tid)*

| File Name | Status |
|---|---|
| JOA-C331KR2013-SHINNECOCK BAY - 20140424.zdf | Final |

*Table 12: Tide Correctors (.zdf or .tc)*

Two subordinate tide gages, 8512451 and 8512354 were installed for final use in sheet H12601. An auxiliary pressure gage was used just offshore of the inlet to aid in finalized zoning procedures. Staff observations were performed for gage 8512354 once per week for a 2 hour period weather permitting. Refer to Appendix I for tide notes.

***The Validation of Zoning Memo is attached.***

## C.2 Horizontal Control

The horizontal datum for this project is North American Datum of 1983 (NAD83). Data were acquired in WGS84, as shown in the HVF, but were converted to NAD83 for processing and delivery. See DAPR A.3 and B.1.

The projection used for this project is 18N.

The following DGPS Stations were used for horizontal control:

| DGPS Stations |
|---|
| Moriches, Broadcast Site<br>ID: 803; Frequency 293kHz |

*Table 13: USCG DGPS Stations*

# D. Results and Recommendations

## D.1 Chart Comparison

### D.1.1 Raster Charts

The following are the largest scale raster charts, which cover the survey area:

| Chart | Scale | Edition | Edition Date | LNM Date | NM Date |
|---|---|---|---|---|---|
| 12352 | 1:40000 | 34 | 09/2012 | 04/16/2014 | 04/16/2014 |
| 12353 | 1:80000 | 19 | 11/2011 | 04/16/2014 | 04/16/2014 |

*Table 14: Largest Scale Raster Charts*

12352

H12601 survey data was compared to Raster Chart 12352. In general the area inshore of the inlet has undergone deepening ranging from 1-5 feet. The northwestern-most corner of the inshore area was found to have no navigable depth (see following figures). A charted foul land area just east of the Ponquogue Bridge was surveyed and found to be a partially navigable area (see following figures). Offshore of the inlet depths were found to be as charted with insignificant shifting of sand features being the only variable.

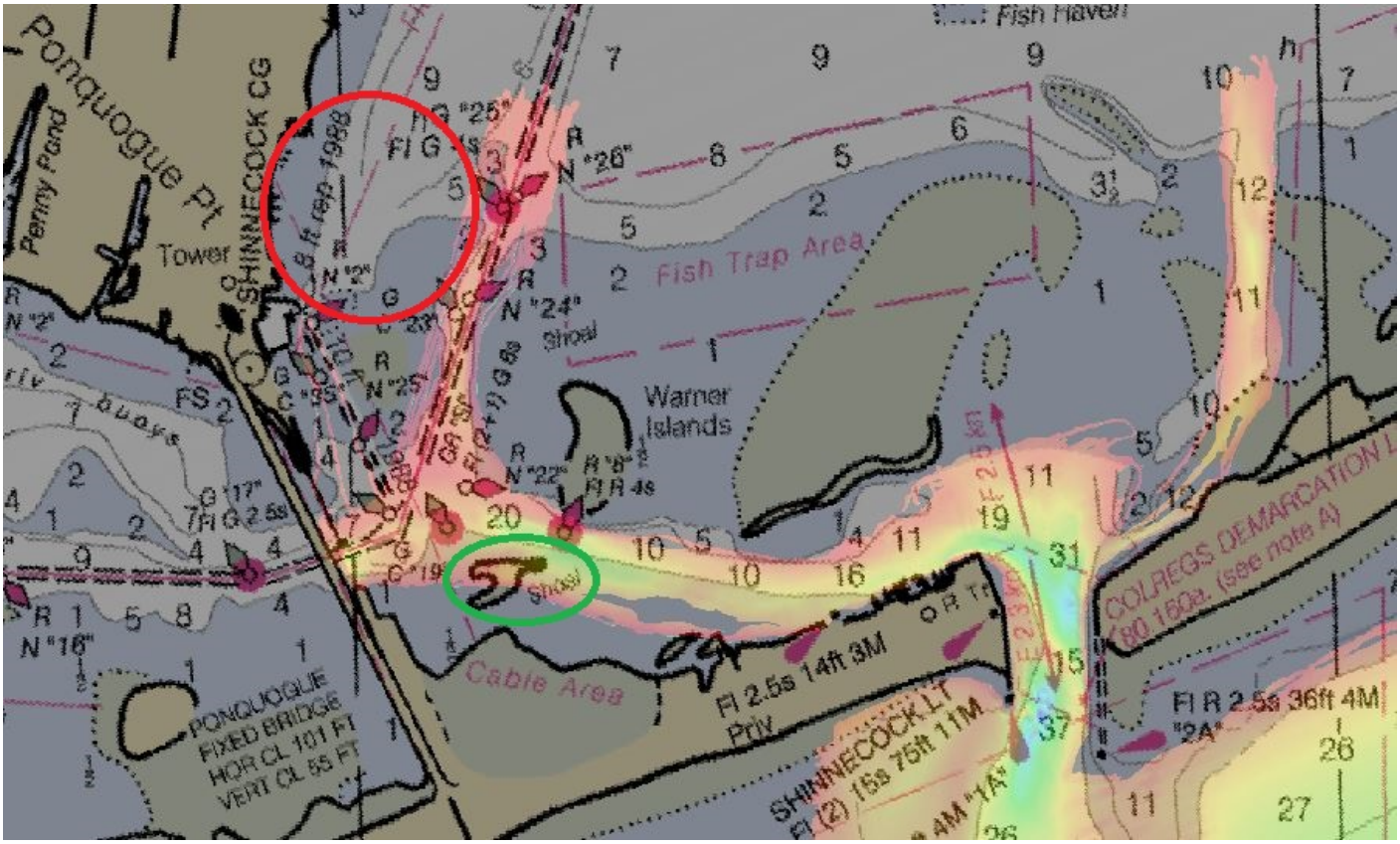


*Figure 11: Chart 12352 overlaid with MBES data. The red circle highlights the area where no navigable depth was found. The green circle highlights the area where a charted land area no longer exists and is now partially navigable.*

12353

Refer to the above discussion for chart 12353 comparison.

### D.1.2 Electronic Navigational Charts

The following are the largest scale ENCs, which cover the survey area:

| ENC | Scale | Edition | Update Application Date | Issue Date | Preliminary? |
|---|---|---|---|---|---|
| US4NY53M | 1:20000 | 10 | 12/05/2012 | 03/27/2013 | NO |
| US5NY52M | 1:40000 | 10 | 12/27/2013 | 03/12/2013 | NO |

*Table 15: Largest Scale ENCs*

US4NY53M

H12601 survey data was compared to Electronic Charts US4NY53N. Results were very similar to the above comparisons with Raster Chart 12352. See discussion for Chart 12352 for chart comparison.

US5NY52M

H12601 survey data was compared to Electronic Charts US5NY52M. Results were very similar to the above comparisons with Raster Chart 12352. See discussion for Chart 12352 for chart comparison.

### D.1.3 AWOIS Items

The four AWOIS items investigated were items 15108, 15109, 15110, and 7943. The search radii for items 15108 and 15109 contained one near significant feature within sheet H12601. The closest significant feature to AWOIS items 15108 and 15109 was located 212.4 meters at a 99° heading from the central AWOIS item location for 15108 and 349.1 meters at a 335° heading from the central AWOIS item location for 15109. The search radius for item 15108 contained three insignificant features; a possible wreck, a possible mast associated with the wreck, and partially buried linear debris. These contacts are most likely not AWOIS item 15108. The search area for item 15110 did not contain any significant features. The search area for item # 7943 contained one significant wreck within sheet H12601. This wreck was located 35.11 meters at a 132° heading from the central AWOIS item location for 7943. The dimensions are roughly 16.3 x 27.9 meters, sitting 2.6 meters off the bottom. The other contacts in this area are insignificant linear debris possibly associated with the wreck.

As discussed in section A.4 regarding shoal and swell conditions degrading survey data, there were some AWOIS items with nodes containing less than the required number of soundings. Seas did not always allow many passes over locations. We did achieve 200% SSS coverage in these areas and operated under the assumption that this would make up for small discrepancies of this nature.

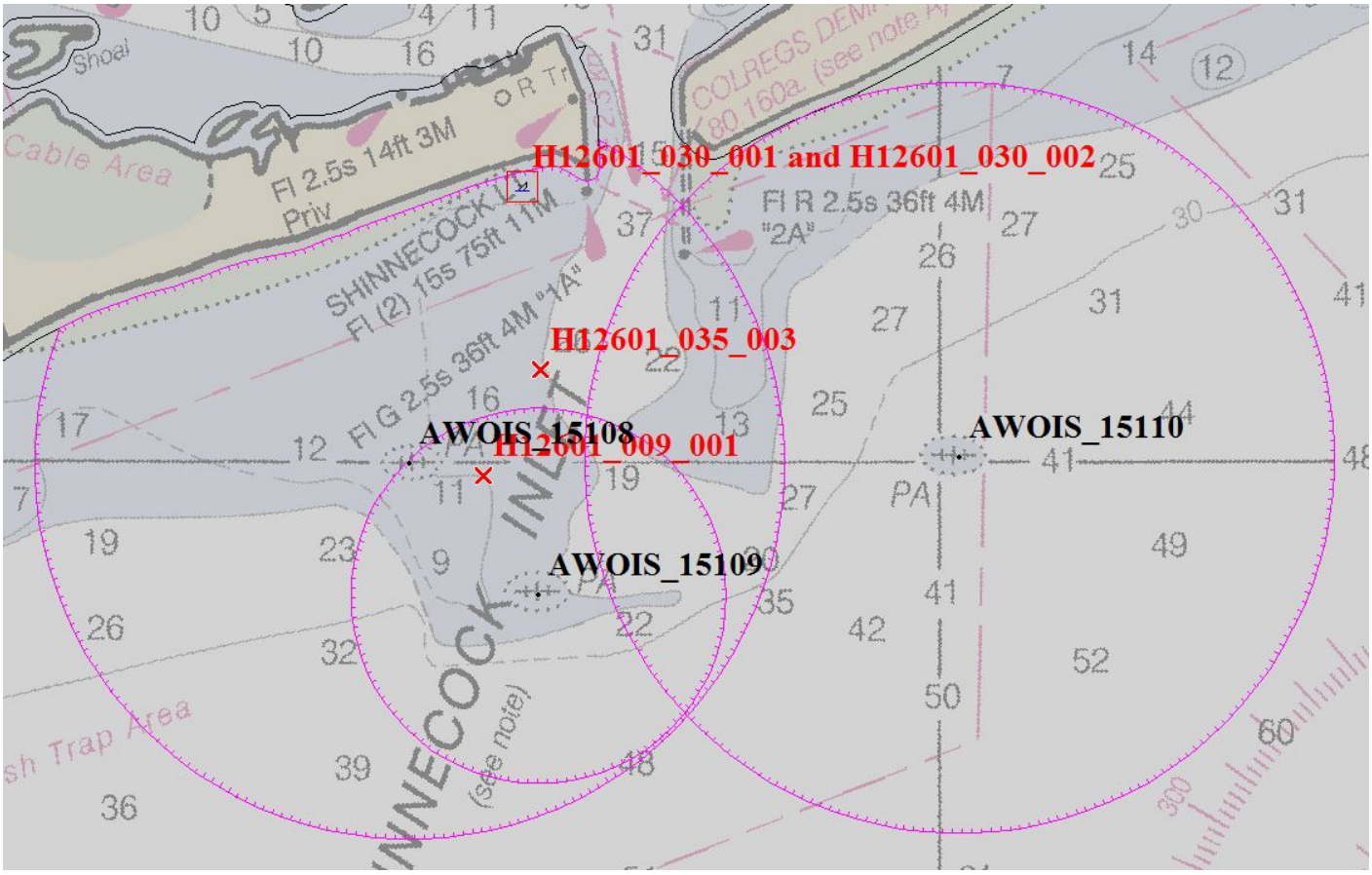


*Figure 12: Overhead view of Chart 12352 overlaid with AWOIS search radius for items 15108, 15109, and 15110; and the associated contact locations for H12601.*

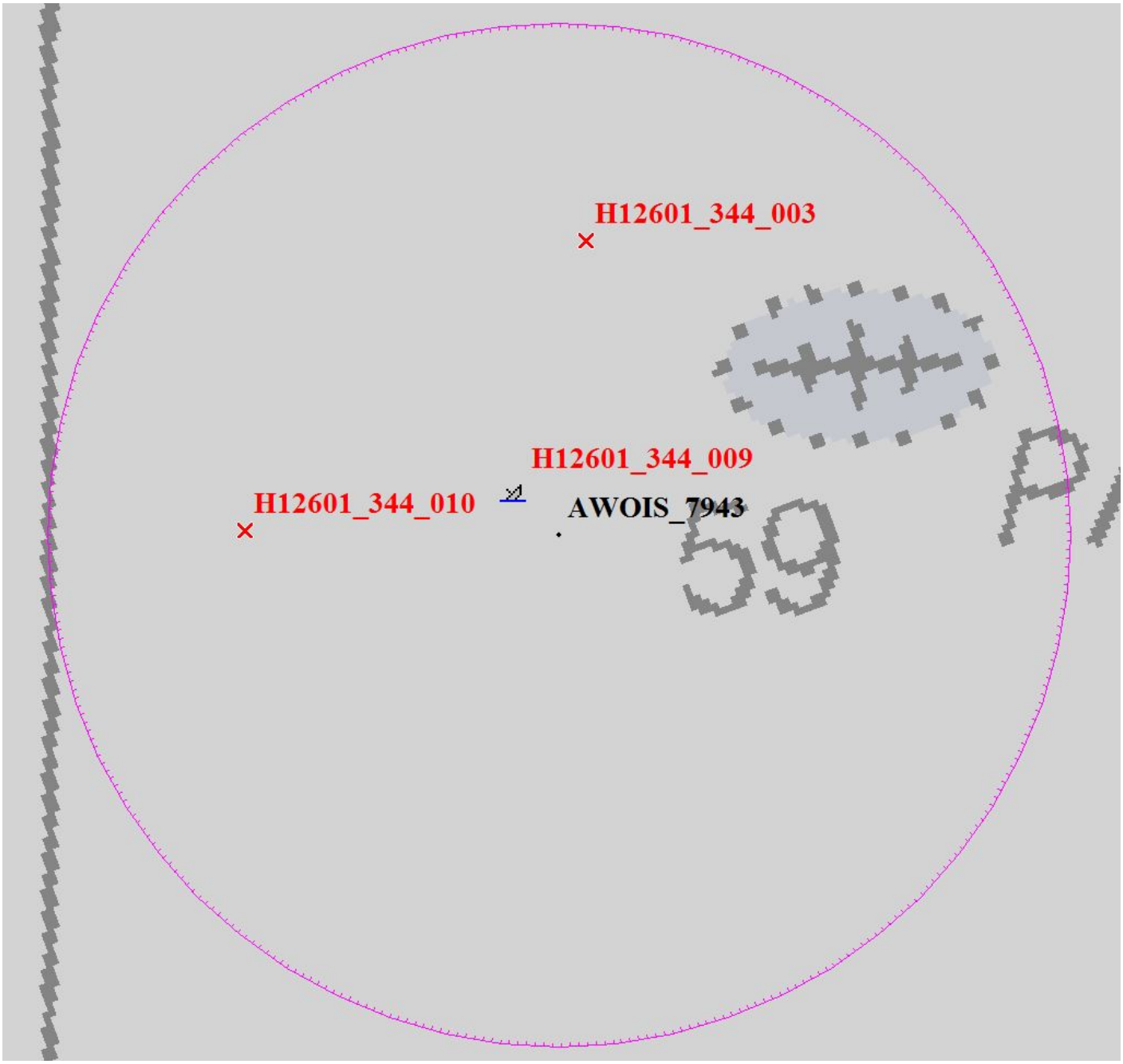


*Figure 13: Overhead view of Chart 12352 overlaid with AWOIS search radius for item 7943 ; and the associated contact locations for H12601.*

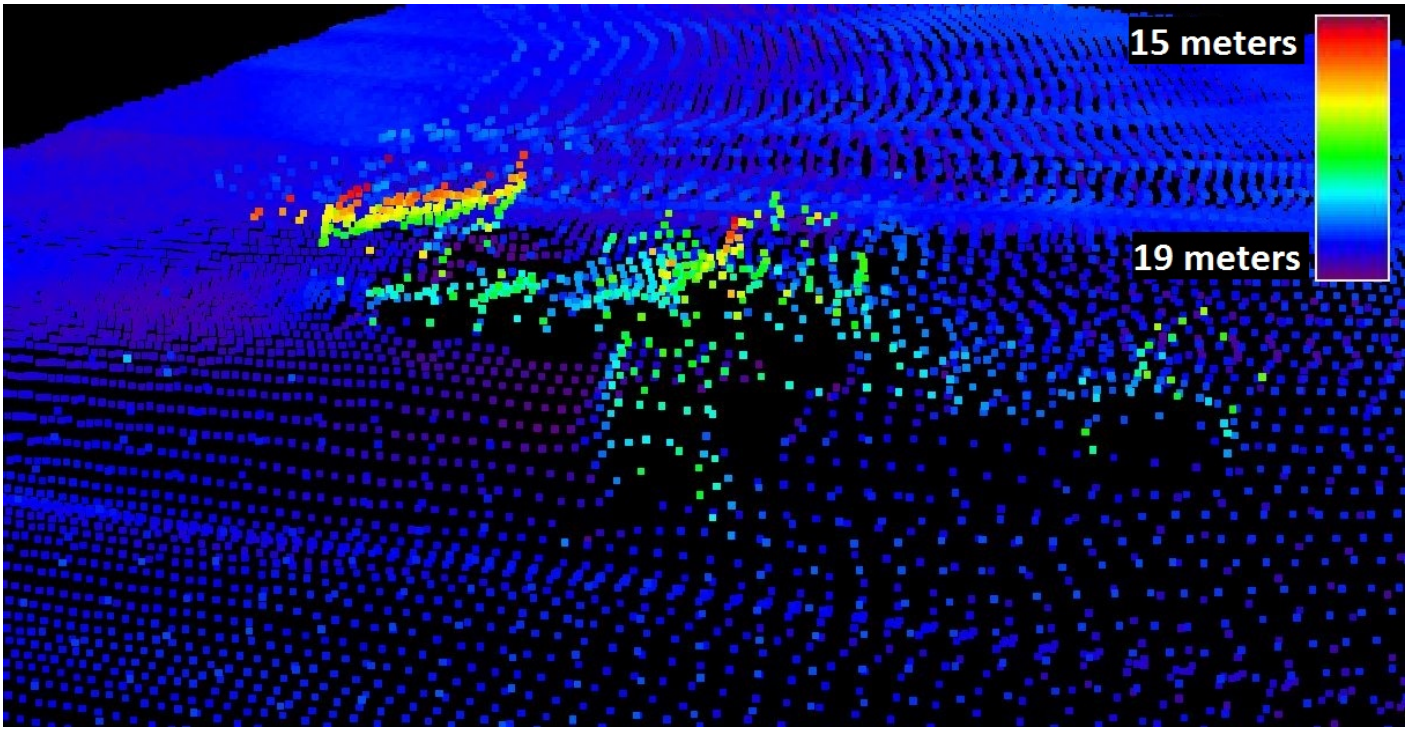


*Figure 14: Multibeam image showing the wreck that is believed to be AWOIS # 7943.*

***See attached AWOIS and Wreck Report.***

### D.1.4 Maritime Boundary Points

No Maritime Boundary Points were assigned for this survey.

### D.1.5 Charted Features

H12601 contained five wrecks labeled PA and one fish haven, all flagged as assigned S-57 features.

Refer to AWOIS discussion for a description concerning charted wrecks within AWOIS areas 15108, 15109, 15110, and 7943. One wreck was not located within the bounds of an AWOIS search radius. This wreck is charted at 40-49-45.31N, 072-30-56.06W. This position was unsurveyable due to shoal depths, however as a shoreline feature any significant wreck would have been awash and visible from the survey vessel. No wreckage was found for this location from shore or satellite imagery. The charted fish haven bounding box is not located over the debris and is offset to the southwest by approximately 385 meters. The center of the fish haven box should be relocated to 40-48-08.49N, 072-28-31.40W.

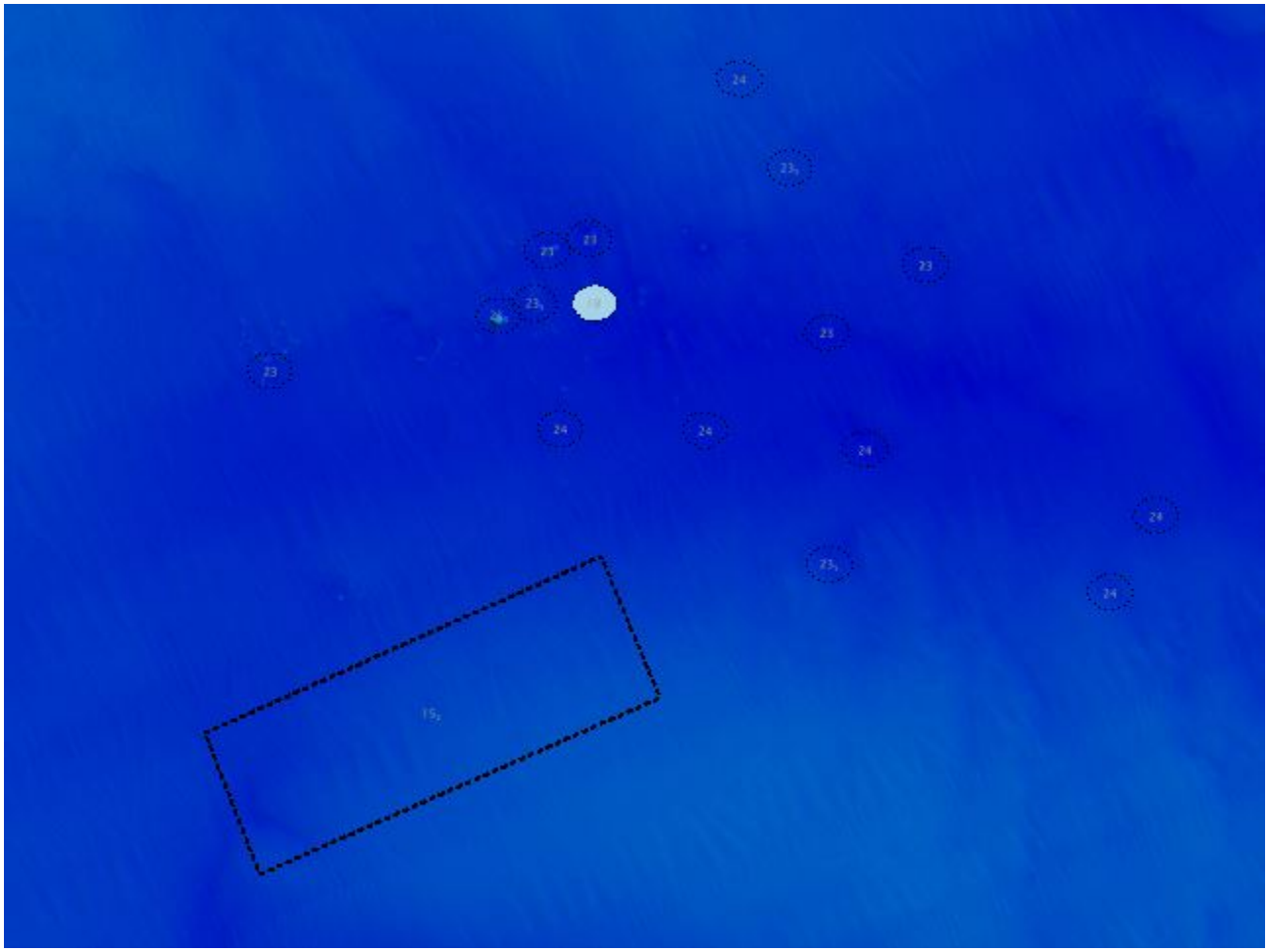

*Figure 15: Overhead image of fish haven within H12601 showing offset of charted bounding box and actual location of debris.*

### D.1.6 Uncharted Features

Seven uncharted features (four wrecks, two rocks, and one debris field) were found within H12601. The features reported here are considered significant as they sit more than one meter off bottom. All significant features are included in the H12601 Final Feature File included in the digital deliverables.

### D.1.7 Dangers to Navigation

Danger to Navigation Reports are included in Appendix II of this report.

***The DTONs noted were not reported to NOAA's Marine Chart Division. The features associated with the DTONs were addressed during office processing and included in the chart update product as appropriate.***

### D.1.8 Shoal and Hazardous Features

No shoals or potentially hazardous features exist for this survey.

***The entrance to Shinnecock inlet is a dynamic area with frequently changing depths.***

### D.1.9 Channels

The Channels inshore of the inlet have undergone a general deepening. The USCG channel has shoaled, especially northeast of the USCG station where water depths are unnavigable for most marine vessel traffic. Refer to Section D.1.1 Raster Charts.

### D.1.10 Bottom Samples

***Ten bottom samples were acquired.***

## D.2 Additional Results

### D.2.1 Shoreline

Many slight shoreline differences are evident inshore of the inlet when compared to chart 12352. The shoreline shifts seen in this area do not present any immediate danger as the shoreline in these areas have been eroded landward to widen any channel that would have been affected. The most significant of these is the shift of the charted foul land area just east of the Ponquogue Point Bridge and is discussed in section D.1.1. Please refer to the figure below.

Sheet H12601 contains areas where the NALL requirements were not achieved. Any areas that were not satisfied were due to safety concerns with swell or sand bar impacts on the vessel. The sonar was grounded several times, so the crew became more cautious of shallow water as the survey continued. In some areas, however, survey coverage exceeded NALL because water depths were deeper than previously charted due to Sandy.

The area located near Shinnecock Inlet was drastically changed and proved to contain a number of new sand bars and shoal areas. The largest of unsatisfied NALL areas are located south of the inlet and run parallel to the shoreline. Another NALL area not surveyed is located northwest of the inlet. Both areas are a direct result of shallow water depths and shoal characteristics.

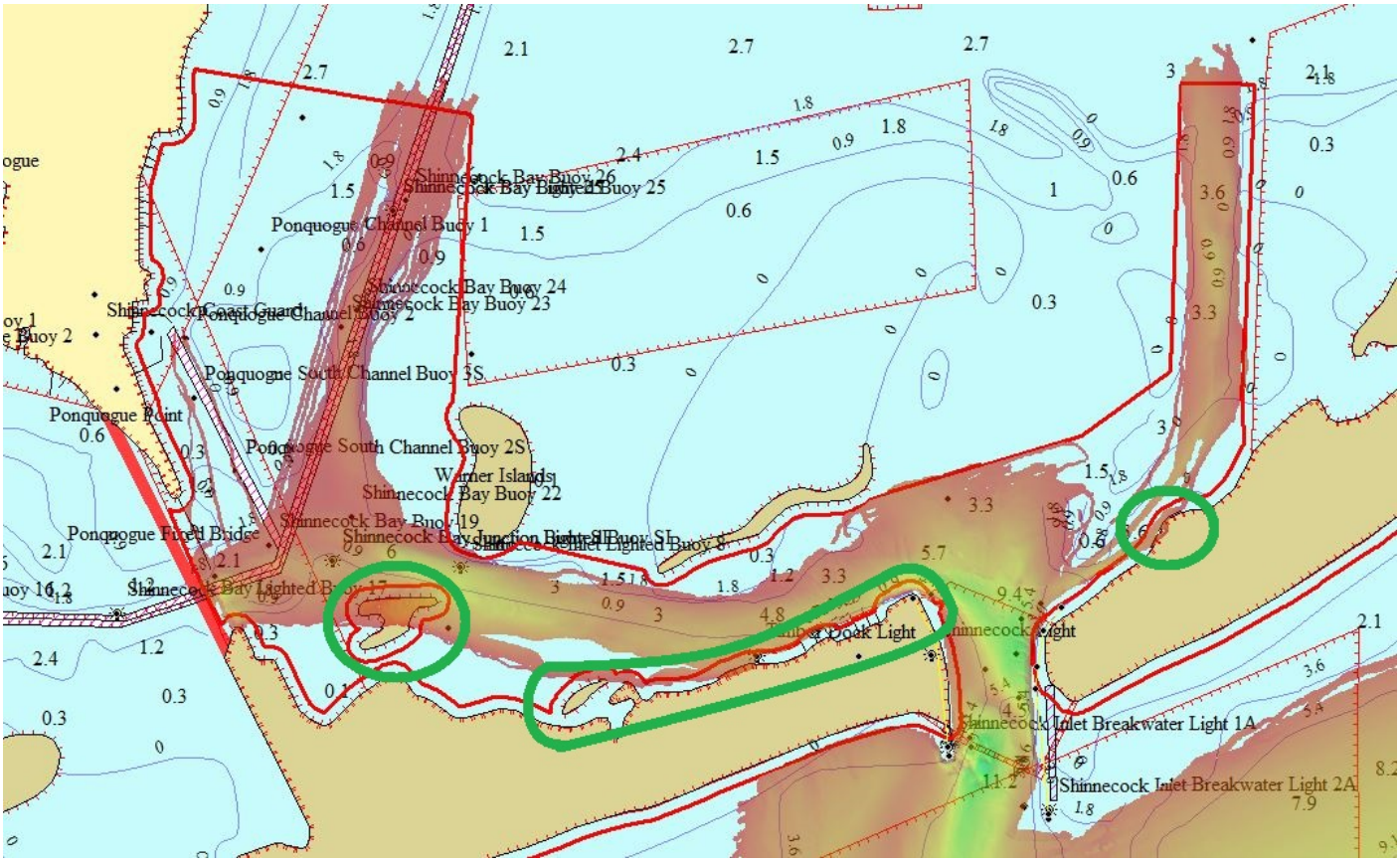


*Figure 16: Chart US5NY52M overlaid with MBES data. Areas of shoreline shift are highlighted within the green circles.*

### D.2.2 Prior Surveys

No prior survey comparisons exist for this survey.

### D.2.3 Aids to Navigation

Near the end of the acquisition period in sheet H12601, a green buoy was placed just offshore of the inlet. This buoy contained no light or horn and was not charted. For this reason it was submitted as a DTON. Refer to Appendix II for DTON submittal.

All other ATONS were found in place and serving their intended purpose.

***The buoy was not submitted as a DTON. The buoy was reported to the Coast Guard during office processing.***

### D.2.4 Overhead Features

Overhead features do not exist for this survey.

### D.2.5 Submarine Features

One pipeline/cable was found running parallel and just to the west of the Ponquogue Bridge. This pipeline/ cable was found to be within a charted cable crossing area however there was significant scouring of the seabed beneath. A distance of 1.4 meters was found between the bottom of the pipeline/cable and the sea floor in the central channel.

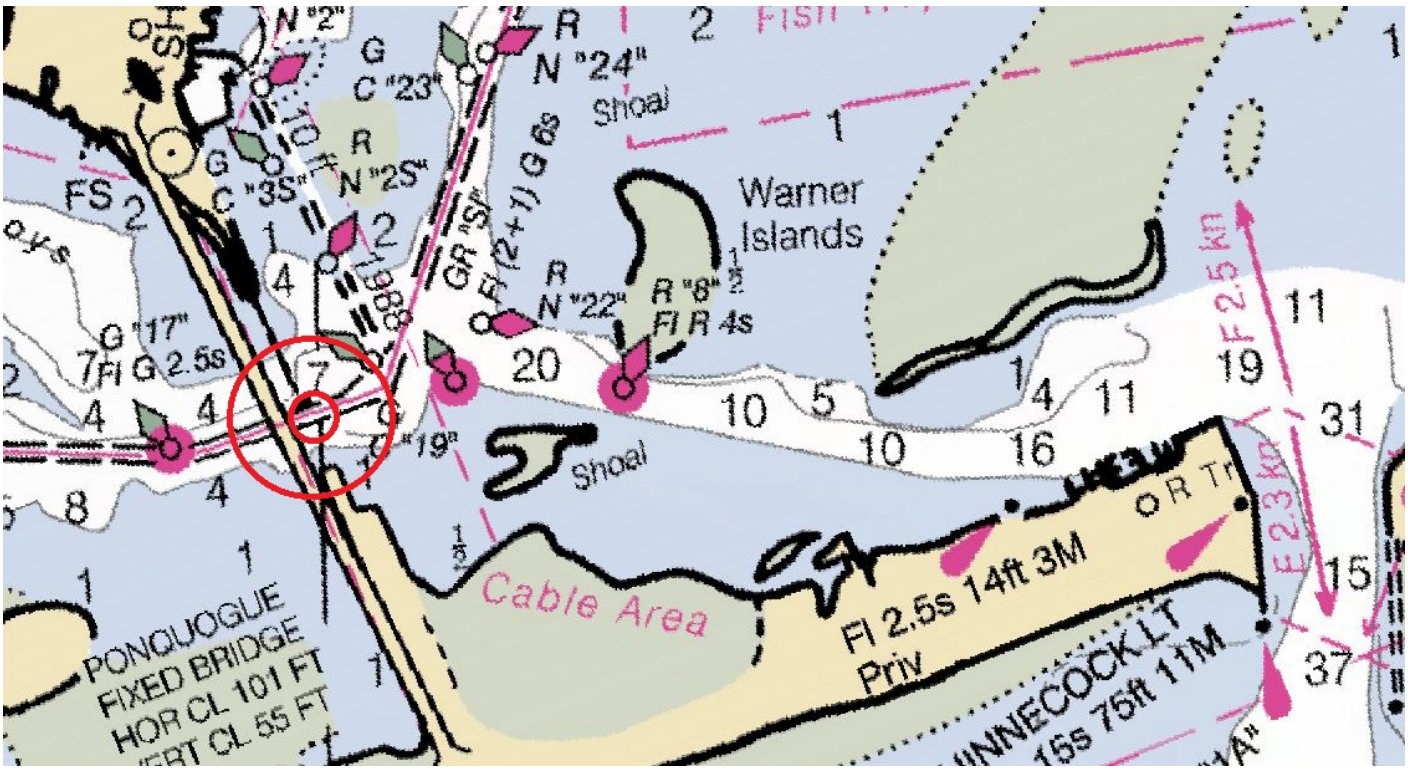


*Figure 17: Image showing chart 12352. The red circles highlight the area where the seabed has been scoured from beneath the pipeline/cable.*

### D.2.6 Ferry Routes and Terminals

No ferry routes or terminals exist for this survey.

### D.2.7 Platforms

No platforms exist for this survey.

### D.2.8 Significant Features

Significant features exist for this survey, and are discussed in the previous sections labeled "Charted Features" and "Uncharted Features" .

### D.2.9 Construction and Dredging

There is no present or planned construction or dredging within the survey limits. However a dredge was anchored just west and inshore of the inlet. This did affect the vessel's survey route however coverage was achieved.

### D.2.10 New Survey Recommendation

No new surveys or further investigations are recommended for this area.

### D.2.11 Inset Recommendation

No new insets are recommended for this area.

# E. Approval Sheet

As Chief of Party, field operations for this hydrographic survey were conducted under my direct supervision, with frequent personal checks of progress and adequacy. I have reviewed the attached survey data and reports.

All field sheets, this Descriptive Report, and all accompanying records and data are approved. All records are forwarded for final review and processing to the Processing Branch.

The survey data meets or exceeds requirements as set forth in the NOS Hydrographic Surveys and Specifications Deliverables Manual, Field Procedures Manual, Standing and Letter Instructions, and all HSD Technical Directives. These data are adequate to supersede charted data in their common areas. This survey is complete and no additional work is required with the exception of deficiencies noted in the Descriptive Report.

| Approver Name | Approver Title | Approval Date | Signature |
|---|---|---|---|
| Ransom C. White III | Chief of Party | 11/20/2014 |  |
| Curtis Clement | Project Manager | 11/20/2014 |  |

# F. Table of Acronyms

| Acronym | Definition |
|---|---|
| **AHB** | Atlantic Hydrographic Branch |
| **AST** | Assistant Survey Technician |
| **ATON** | Aid to Navigation |
| **AWOIS** | Automated Wreck and Obstruction Information System |
| **BAG** | Bathymetric Attributed Grid |
| **BASE** | Bathymetry Associated with Statistical Error |
| **CO** | Commanding Officer |
| **CO-OPS** | Center for Operational Products and Services |
| **CORS** | Continually Operating Reference Staiton |
| **CTD** | Conductivity Temperature Depth |
| **CEF** | Chart Evaluation File |
| **CSF** | Composite Source File |
| **CST** | Chief Survey Technician |
| **CUBE** | Combined Uncertainty and Bathymetry Estimator |
| **DAPR** | Data Acquisition and Processing Report |
| **DGPS** | Differential Global Positioning System |
| **DP** | Detached Position |
| **DR** | Descriptive Report |
| **DTON** | Danger to Navigation |
| **ENC** | Electronic Navigational Chart |
| **ERS** | Ellipsoidal Referenced Survey |
| **ERZT** | Ellipsoidally Referenced Zoned Tides |
| **FFF** | Final Feature File |
| **FOO** | Field Operations Officer |
| **FPM** | Field Procedures Manual |
| **GAMS** | GPS Azimuth Measurement Subsystem |
| **GC** | Geographic Cell |
| **GPS** | Global Positioning System |
| **HIPS** | Hydrographic Information Processing System |
| **HSD** | Hydrographic Surveys Division |
| **HSSD** | Hydrographic Survey Specifications and Deliverables |

| Acronym | Definition |
|---|---|
| **HSTP** | Hydrographic Systems Technology Programs |
| **HSX** | Hypack Hysweep File Format |
| **HTD** | Hydrographic Surveys Technical Directive |
| **HVCR** | Horizontal and Vertical Control Report |
| **HVF** | HIPS Vessel File |
| **IHO** | International Hydrographic Organization |
| **IMU** | Inertial Motion Unit |
| **ITRF** | International Terrestrial Reference Frame |
| **LNM** | Local Notice to Mariners |
| **LNM** | Linear Nautical Miles |
| **MCD** | Marine Chart Division |
| **MHW** | Mean High Water |
| **MLLW** | Mean Lower Low Water |
| **NAD 83** | North American Datum of 1983 |
| **NAIP** | National Agriculture and Imagery Program |
| **NALL** | Navigable Area Limit Line |
| **NM** | Notice to Mariners |
| **NMEA** | National Marine Electronics Association |
| **NOAA** | National Oceanic and Atmospheric Administration |
| **NOS** | National Ocean Service |
| **NRT** | Navigation Response Team |
| **NSD** | Navigation Services Division |
| **OCS** | Office of Coast Survey |
| **OMAO** | Office of Marine and Aviation Operations (NOAA) |
| **OPS** | Operations Branch |
| **MBES** | Multibeam Echosounder |
| **NWLON** | National Water Level Observation Network |
| **PDBS** | Phase Differencing Bathymetric Sonar |
| **PHB** | Pacific Hydrographic Branch |
| **POS/MV** | Position and Orientation System for Marine Vessels |
| **PPK** | Post Processed Kinematic |
| **PPP** | Precise Point Positioning |
| **PPS** | Pulse per second |

| Acronym | Definition |
|---|---|
| **PRF** | Project Reference File |
| **PS** | Physical Scientist |
| **PST** | Physical Science Technician |
| **RNC** | Raster Navigational Chart |
| **RTK** | Real Time Kinematic |
| **SBES** | Singlebeam Echosounder |
| **SBET** | Smooth Best Estimate and Trajectory |
| **SNM** | Square Nautical Miles |
| **SSS** | Side Scan Sonar |
| **ST** | Survey Technician |
| **SVP** | Sound Velocity Profiler |
| **TCARI** | Tidal Constituent And Residual Interpolation |
| **TPE** | Total Porpagated Error |
| **TPU** | Topside Processing Unit |
| **USACE** | United States Army Corps of Engineers |
| **USCG** | United Stated Coast Guard |
| **UTM** | Universal Transverse Mercator |
| **XO** | Executive Officer |
| **ZDA** | Global Positiong System timing message |
| **ZDF** | Zone Definition File |

**UNITED STATES DEPARTMENT OF COMMERCE**
**National Oceanic and Atmospheric Administration**
**Center for Operational Oceanographic Products and Services**
**Silver Spring, MD 20910**

Date: July 16, 2014

TO: LCDR Michael Gonsalves
Chief, Operations Branch
Hydrographic Services Division
Office of Coast Survey

FROM: Gerald Hovis
Chief, Products and Services Branch
Oceanographic Division
CO-OPS

HOVIS.GERALD.THOMAS.1365860250
Digitally signed by HOVIS.GERALD.THOMAS.1365860250
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=OTHER, cn=HOVIS.GERALD.THOMAS.1365860250
Date: 2014.07.17 10:03:37 -04'00'

RE: Validation of Zoning supplied in support of OPR-C331-KR-2013, Vicinity of Southern Long Island, NY

John Oswald & Associates (JOA) submitted discrete tidal zoning for validation by CO-OPS based on subordinate water level data collected at Fire Island (851-5186), Moriches Inlet (851-3398), Moriches Coast Guard Station (851-3388), Shinnecock Inlet (851-2354), and Ponquogue Point (851-2451). CO-OPS finds the water level data as well as discrete zoning submitted in support of OPR-C331-KR-2013 to be valid and meet the requirements under NOS Specifications and Deliverables.

CO-OPS bases its validation of the contractor supplied zoning on the following reasons:

1. JOA's method to develop final zoning geometry and tide correctors is reasonable
2. The estimate of total propagated error within the survey area using JOA's final tidal zoning and provided zoning station water level data (BMPGs and Seaview Ferry (851-4779)) is within 0.26 meters.

CC:
Jeff Ferguson
Patrick Burke
Michael Brown
Matthew Jaskoski
Castle "Gene" Parker
LCDR Ben Evans
Laura Rear McLaughlin
Corey Allen
Cristina Urizar
Grant Froelich
Colleen Fanelli

# (no subject)

2 messages

**Ransom White** <ransom.white@gmail.com> Mon, Oct 28, 2013 at 1:51 PM
To: Megan Greenaway - NOAA Federal <Megan.Greenaway@noaa.gov>, Marc Moser <marc.s.moser@noaa.gov>
Cc: Brian Bunge <bbunge@wassoc.com>, Art Wright <artw@wassoc.com>, Colin Stewart <cstewart@wassoc.com>, Curtis Clement <curtisc@wassoc.com>

Hi Megan,

I just wanted to confirm some of the changes we have implemented as per our conversation last week. The line plan has changed significantly. Our line spacing in the shallows has been increased almost 3 fold in order to achieve the project instructions specifications while not exceeding them.

Our line plan spacing and side scan range values associated with depth are as below:

| Water Depth | SSS Range | Line Spacing/Coverage |
|---|---|---|
| 2-4m (Shoreline) | 30m | 40m / 100% |
| 4-15m | 50m | 40m / 200% |
| 15-20m | 75m | 60m / 200% |
| >20m | Backscatter | 60m / Full MBES |

We are surveying to the 4 meter contour at MLLW offshore (within safety) and the 2 meter contour inshore. The line plan was also created using the boundaries included in the PRF file. I am attaching a dxf of the line file for your review.

Please let me know if you have any concerns of questions and thanks again for clarifying our questions.

Cheers

Ransom

--
Ransom C. White III
941.730.6729

**opr-c331-kr-13_AllSheets_lineplan.dxf**

1209K

---

**Megan Greenaway - NOAA Federal** <megan.greenaway@noaa.gov> Wed, Oct 30, 2013 at 2:27 PM
To: Ransom White <ransom.white@gmail.com>
Cc: Marc Moser <marc.s.moser@noaa.gov>, Brian Bunge <bbunge@wassoc.com>, Art Wright <artw@wassoc.com>, Colin Stewart <cstewart@wassoc.com>, Curtis Clement <curtisc@wassoc.com>

Ransom,
Yes, I agree with the changes you have described in this email. Thanks for the update.
Megan
[Quoted text hidden]

# H12601 AWOIS and Wreck Report

**Registry Number:** H12601
**State:** New York
**Locality:** Vicinity of Southern Long Island
**Sub-locality:** Vicinity of Shinnecock Inlet
**Project Number:** OPR-C331-KR-13
**Survey Dates:** 20131011 - 20140212

## Charts Affected

| Number | Edition | Date | Scale (RNC) | RNC Correction(s)* |
|---|---|---|---|---|
| 12352 | 34th | 09/01/2012 | 1:40,000 (12352_1) | USCG LNM: 11/11/2014 (12/9/2014)<br>CHS NTM: None (11/28/2014)<br>NGA NTM: None (12/20/2014) |
| 12353 | 18th | 11/01/2003 | 1:80,000 (12353_1) | [L]NTM: ? |
| 12300 | 47th | 05/01/2008 | 1:400,000 (12300_1) | [L]NTM: ? |
| 13006 | 34th | 05/01/2007 | 1:675,000 (13006_1) | [L]NTM: ? |
| 5161 | 13th | 10/01/2003 | 1:1,058,400 (5161_1) | [L]NTM: ? |
| 13003 | 49th | 04/01/2007 | 1:1,200,000 (13003_1) | [L]NTM: ? |

* Correction(s) - *source: last correction applied (last correction reviewed--"cleared date")*

## Features

| Feature Type | Survey Depth | Survey Latitude | Survey Longitude |
|---|---|---|---|
| Wreck | 14.90 m | 40° 48' 39.6" N | 072° 29' 48.0" W |
| Wreck | [None] | 40° 49' 59.9" N | 072° 28' 60.0" W |
| Wreck | [None] | 40° 49' 48.7" N | 072° 28' 45.8" W |
| Wreck | [None] | 40° 50' 01.1" N | 072° 27' 58.5" W |
| Wreck | 3.92 m | 40° 50' 35.7" N | 072° 29' 10.9" W |
| Wreck | 4.10 m | 40° 50' 35.8" N | 072° 29' 00.8" W |

# 1 - Wreck Features

## 1.1) Wreck - AWOIS 7943

### Survey Summary

| | |
|---|---|
| **Survey Position:** | 40° 48' 39.6" N, 072° 29' 48.0" W |
| **Least Depth:** | 14.90 m (= 48.88 ft = 8.147 fm = 8 fm 0.88 ft) |
| **TPU (±1.96σ):** | **THU (TPEh)** [None] ; **TVU (TPEv)** [None] |
| **Timestamp:** | 2014-043.00:00:00.000 (02/12/2014) |
| **Dataset:** | H12106_AWOIS.000 |
| **FOID:** | US 0000077471 00001(022600012E9F0001) |
| **Charts Affected:** | 12352_1, 12353_1, 12300_1, 13006_1, 5161_1, 13003_1 |

**Remarks:**

The wreck was located SW of the charted position.

### Hydrographer Recommendations

Update wreck with new position and least depth.

### S-57 Data

| | |
|---|---|
| **Geo object 1:** | Wreck (WRECKS) |
| **Attributes:** | CATWRK - 2:dangerous wreck |
| | NINFOM - Chart wreck. AWOIS 7943. |
| | QUASOU - 6:least depth known |
| | SORDAT - 20140212 |
| | SORIND - US,US,graph,H12601 |
| | TECSOU - 3:found by multi-beam |
| | VALSOU - 14.900 m |
| | WATLEV - 3:always under water/submerged |

### Office Notes

Concur.

## 1.2) Wreck - AWOIS 15108

### Survey Summary

| | |
|---|---|
| **Survey Position:** | 40° 49' 59.9" N, 072° 28' 60.0" W |
| **Least Depth:** | [None] |
| **TPU (±1.96σ):** | **THU (TPEh)** [None] ; **TVU (TPEv)** [None] |
| **Timestamp:** | 2006-060.00:00:00.000 (03/01/2006) |
| **Dataset:** | H12106_AWOIS.000 |
| **FOID:** | US 0000077518 00001(022600012ECE0001) |
| **Charts Affected:** | 12352_1, 12353_1, 12300_1, 13006_1, 5161_1, 13003_1 |

**Remarks:**

Not fully investigated.

### Hydrographer Recommendations

Retain wreck.

### S-57 Data

| | |
|---|---|
| **Geo object 1:** | Wreck (WRECKS) |
| **Attributes:** | CATWRK - 2:dangerous wreck |
| | NINFOM - Retain wreck PA. AWOIS 15108. |
| | QUASOU - 2:depth unknown |
| | SORDAT - 20060300 |
| | SORIND - US,US,graph,Chart 12352 |
| | WATLEV - 3:always under water/submerged |

### Office Notes

Concur. Retain charted Wreck PA.

## 1.3) AWOIS 15109

### Survey Summary

| | |
|---|---|
| **Survey Position:** | 40° 49' 48.7" N, 072° 28' 45.8" W |
| **Least Depth:** | [None] |
| **TPU (±1.96σ):** | **THU (TPEh)** [None] ; **TVU (TPEv)** [None] |
| **Timestamp:** | 1981-001.00:00:00.000 (01/01/1981) |
| **Dataset:** | H12106_AWOIS.000 |
| **FOID:** | US 0000007763 00001(022600001E530001) |
| **Charts Affected:** | 12352_1, 12353_1, 12300_1, 13006_1, 5161_1, 13003_1 |

**Remarks:**

Search radius covered with 200% SSS and Multibeam. No evidence of wreck.

### Hydrographer Recommendations

Delete charted wreck.

### S-57 Data

| | |
|---|---|
| **Geo object 1:** | Cartographic symbol ($CSYMB) |
| **Geo object 2:** | Wreck (WRECKS) |

### Office Notes

Concur.

## 1.4) AWOIS 15110

### Survey Summary

| | |
|---|---|
| **Survey Position:** | 40° 50' 01.1" N, 072° 27' 58.5" W |
| **Least Depth:** | [None] |
| **TPU (±1.96σ):** | **THU (TPEh)** [None] ; **TVU (TPEv)** [None] |
| **Timestamp:** | 1981-001.00:00:00.000 (01/01/1981) |
| **Dataset:** | H12106_AWOIS.000 |
| **FOID:** | US 0000077612 00001(022600012F2C0001) |
| **Charts Affected:** | 12352_1, 12353_1, 12300_1, 13006_1, 5161_1, 13003_1 |

**Remarks:**

Search radius covered with 200% SSS and Multibeam. No evidence of wreck.

### Hydrographer Recommendations

Delete charted wreck.

### S-57 Data

| | |
|---|---|
| **Geo object 1:** | Cartographic symbol ($CSYMB) |
| **Geo object 2:** | Wreck (WRECKS) |

### Office Notes

Concur.

## 1.5) New Wreck

### Survey Summary

| | |
|---|---|
| **Survey Position:** | 40° 50' 35.7" N, 072° 29' 10.9" W |
| **Least Depth:** | 3.92 m (= 12.86 ft = 2.143 fm = 2 fm 0.86 ft) |
| **TPU (±1.96σ):** | **THU (TPEh)** [None] ; **TVU (TPEv)** [None] |
| **Timestamp:** | 2014-043.00:00:00.000 (02/12/2014) |
| **Dataset:** | Wrecks.000 |
| **FOID:** | US 0000077523 00001(022600012ED30001) |
| **Charts Affected:** | 12352_1, 12353_1, 12300_1, 13006_1, 5161_1, 13003_1 |

**Remarks:**

Uncharted wreck.

### Hydrographer Recommendations

Chart new wreck.

### S-57 Data

| | |
|---|---|
| **Geo object 1:** | Wreck (WRECKS) |
| **Attributes:** | CATWRK - 2:dangerous wreck |
| | NINFOM - Chart wreck |
| | QUASOU - 6:least depth known |
| | SORDAT - 20140212 |
| | SORIND - US,US,graph,H12601 |
| | TECSOU - 3:found by multi-beam |
| | VALSOU - 3.919 m |
| | WATLEV - 3:always under water/submerged |

### Office Notes

Concur

## 1.6) New Wreck

### Survey Summary

| | |
|---|---|
| **Survey Position:** | 40° 50' 35.8" N, 072° 29' 00.8" W |
| **Least Depth:** | 4.10 m (= 13.46 ft = 2.244 fm = 2 fm 1.46 ft) |
| **TPU (±1.96σ):** | **THU (TPEh)** [None] ; **TVU (TPEv)** [None] |
| **Timestamp:** | 2014-043.00:00:00.000 (02/12/2014) |
| **Dataset:** | Wrecks.000 |
| **FOID:** | US 0000077517 00001(022600012ECD0001) |
| **Charts Affected:** | 12352_1, 12353_1, 12300_1, 13006_1, 5161_1, 13003_1 |

**Remarks:**

Uncharted wreck.

### Hydrographer Recommendations

Chart new wreck.

### S-57 Data

| | |
|---|---|
| **Geo object 1:** | Wreck (WRECKS) |
| **Attributes:** | CATWRK - 2:dangerous wreck |
| | NINFOM - Chart wreck |
| | QUASOU - 6:least depth known |
| | SORDAT - 20140212 |
| | SORIND - US,US,graph,H12601 |
| | TECSOU - 3:found by multi-beam |
| | VALSOU - 4.103 m |
| | WATLEV - 3:always under water/submerged |

### Office Notes

Concur.

APPROVAL PAGE

H12601

Data meet or exceed current specifications as certified by the OCS survey acceptance review process. Descriptive Report and survey data except where noted are adequate to supersede prior surveys and nautical charts in the common area.

The following products will be sent to NGDC for archive

- H12601_DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- H12601_GeoImage.pdf

The survey evaluation and verification has been conducted according current OCS Specifications.


Approved:_____

**Pete Holmberg**
Cartographic Team Lead, Pacific Hydrographic Branch

The survey has been approved for dissemination and usage of updating NOAA's suite of nautical charts.


Approved:_____

**CDR Benjamin K. Evans, NOAA**
Chief, Pacific Hydrographic Branch