

H12628

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

**DESCRIPTIVE REPORT**

Type of Survey: Navigable Area

Registry Number: H12628

**LOCALITY**

State(s): New York

General Locality: Approaches to New York

Sub-locality: Offshore - 11NM NE of Shark River Inlet

**2013**

CHIEF OF PARTY  
LCDR Marc S. Moser, NOAA

LIBRARY & ARCHIVES

Date:

**HYDROGRAPHIC TITLE SHEET**

**H12628**

**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: **Approaches to New York**

Sub-Locality: **Offshore - 11NM NE of Shark River Inlet**

Scale: **40000**

Dates of Survey: **10/21/2013 to 11/06/2013**

Instructions Dated: **09/19/2013**

Project Number: **OPR-B310-FH-13**

Field Unit: **NOAA Ship *Ferdinand R. Hassler***

Chief of Party: **LCDR Marc S. Moser, NOAA**

Soundings by: **Multibeam Echo Sounder**

Imagery by: **Multibeam Echo Sounder Backscatter Side Scan Sonar**

Verification by: **Atlantic 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. Any revisions to the Descriptive Report (DR) generated during office processing are shown in bold red italic text. The processing branch maintains the DR as a field unit product, therefore, all information and recommendations within the body of the DR are considered preliminary unless otherwise noted. The final disposition of surveyed features is represented in the OCS nautical chart update products. All pertinent records for this survey, including the DR, 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 H12628

Project: OPR-B310-FH-13

Locality: Approaches to New York

Sublocality: Offshore - 11NM NE of Shark River Inlet

Scale: 1:40000

October 2013 - November 2013

**NOAA Ship *Ferdinand R. Hassler***

Chief of Party: LCDR Marc S. Moser, NOAA

### A. Area Surveyed

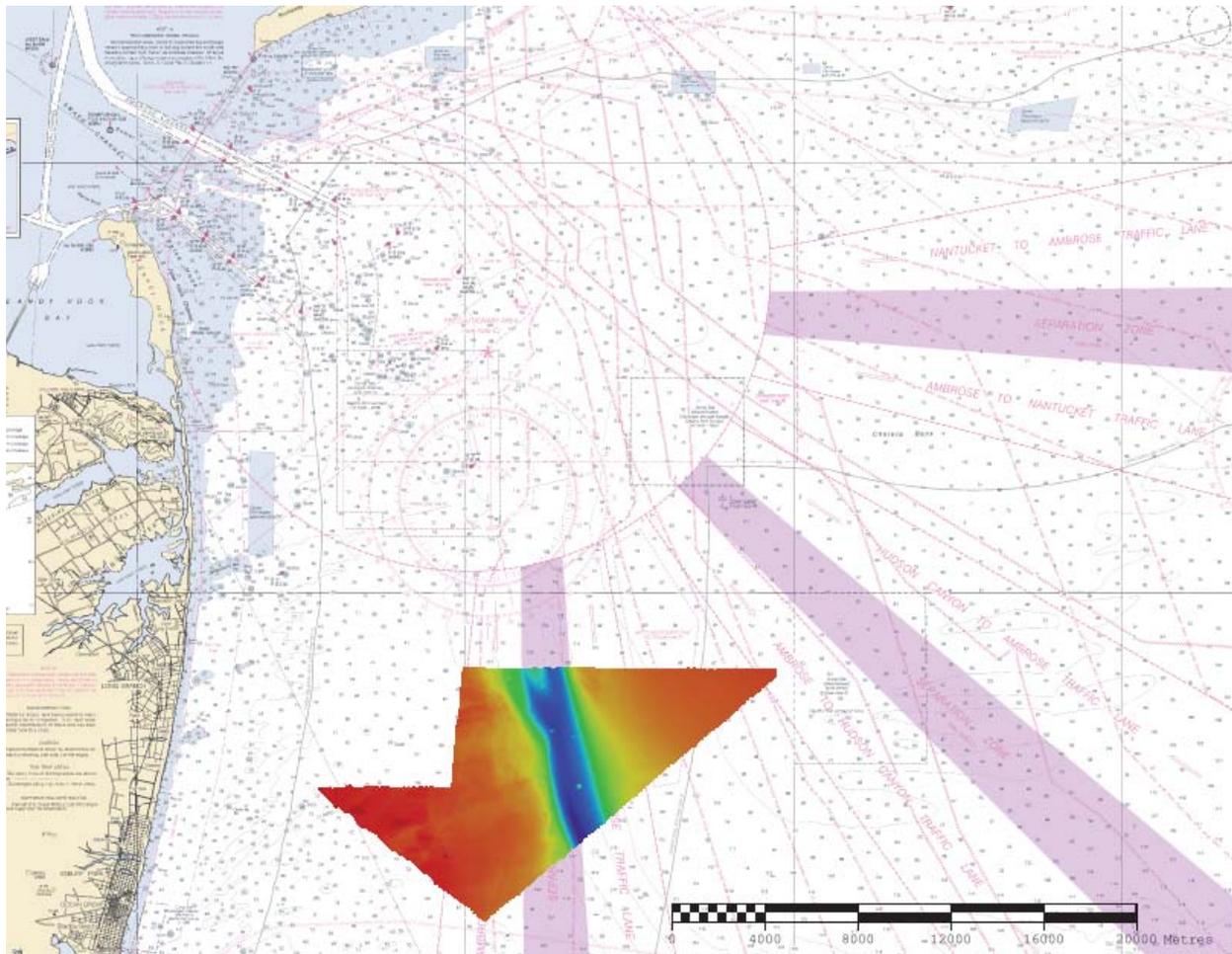
H12628 is located in the approaches to New York Harbor in the northern section of the Barnegat/Ambrose traffic lane. Figure 1 shows the general locality of data being submitted as H12628.

#### A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
40° 18" 35.79' N 73° 55" 9.58' W	40° 11" 58.92' N 73° 39" 58.63' W

*Table 1: Survey Limits*



*Figure 1: General locality of survey H12628*

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

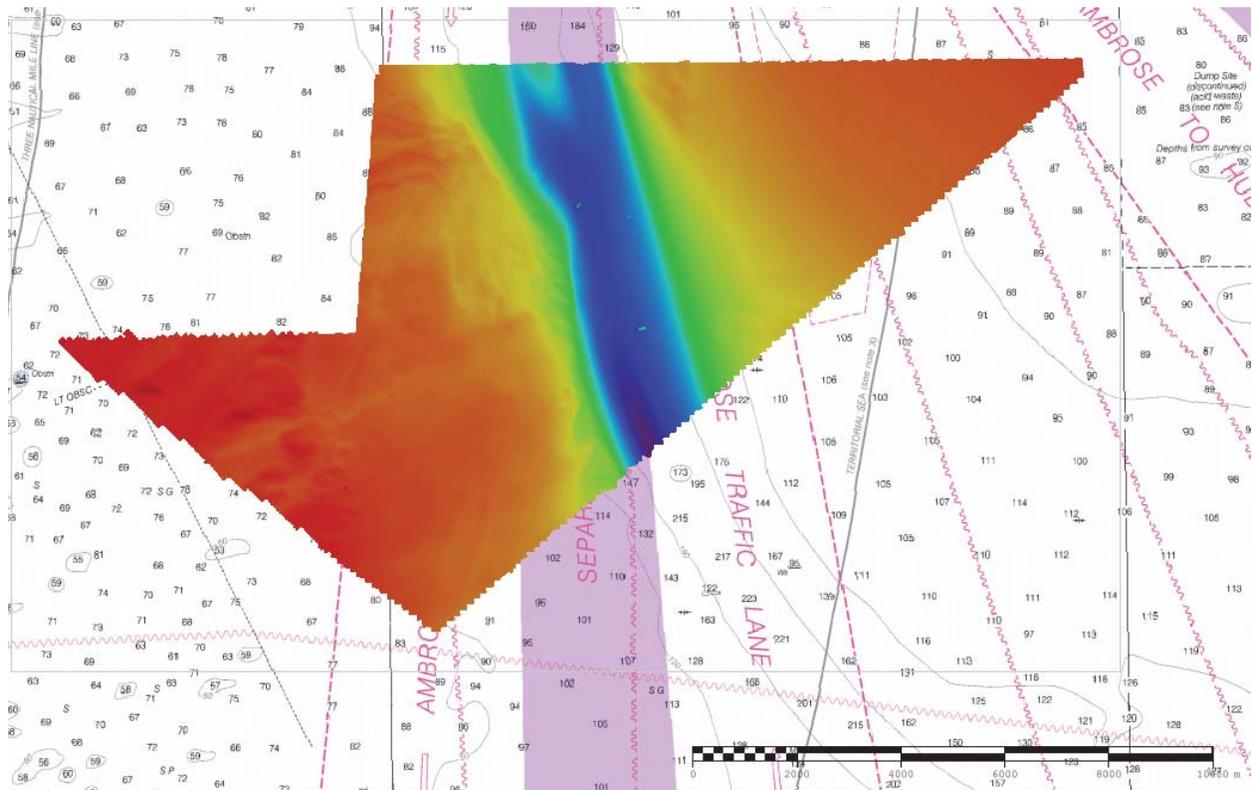
## **A.2 Survey Purpose**

The purpose of this project is to provide contemporary surveys to update National Ocean Service (NOS) nautical charting products.

## **A.3 Survey Quality**

The entire survey is adequate to supersede previous data.

## A.4 Survey Coverage



*Figure 2: Survey coverage for project OPR-B310-FH-13.*

Complete multibeam echosounder (MBES) coverage was achieved within the limits of hydrography as defined in the Project Instructions (Figure 2) with one exception:

One 2x6 meter holiday exists in the 2-meter surface on the northeast of H12628. This gap in coverage is covered by data submitted as H12627 and is considered insignificant (Figure 3).

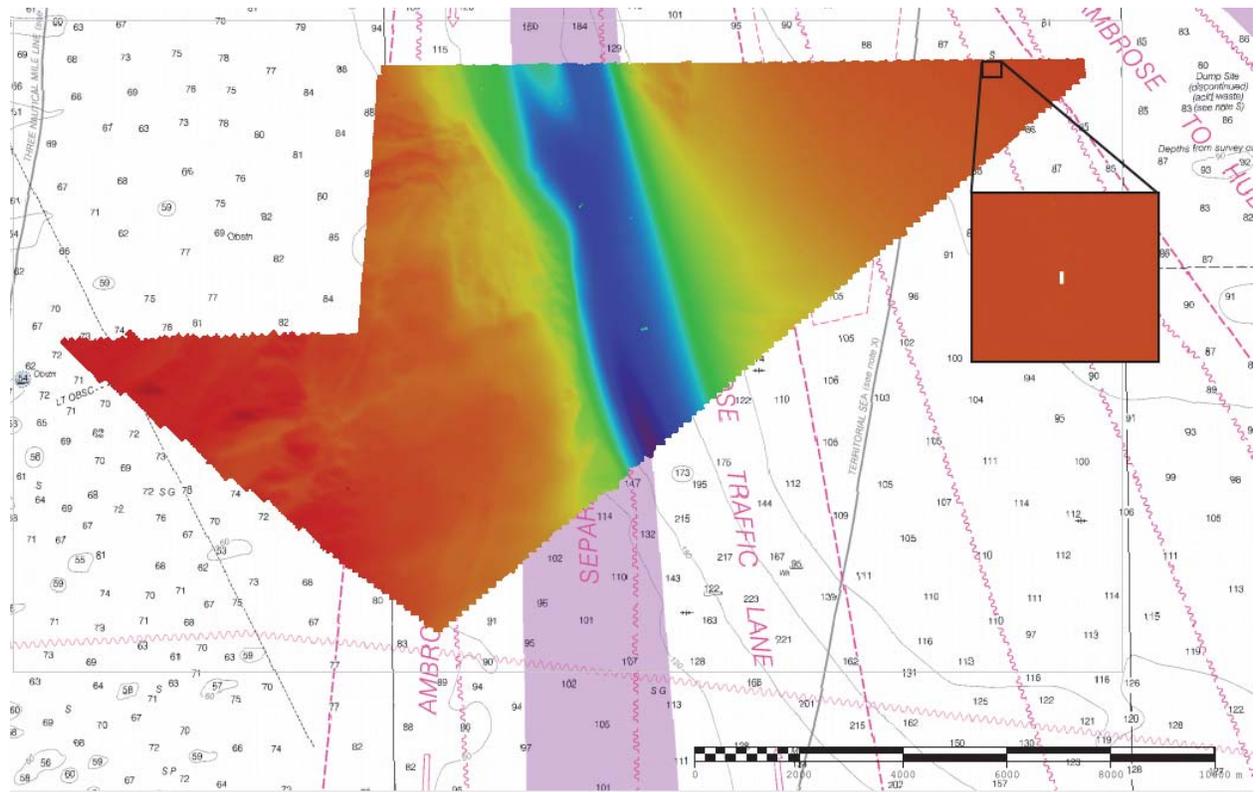


Figure 3: Holiday located within H12628

## A.5 Survey Statistics

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

	Vessel	<i>Total</i>
<b>LNM</b>	<b>SBES Mainscheme</b>	0
	<b>MBES Mainscheme</b>	417.24
	<b>Lidar Mainscheme</b>	0
	<b>SSS Mainscheme</b>	1
	<b>SBES/MBES Combo Mainscheme</b>	0
	<b>SBES/SSS Combo Mainscheme</b>	0
	<b>MBES/SSS Combo Mainscheme</b>	0
	<b>SBES/MBES Combo Crosslines</b>	19.61
	<b>Lidar Crosslines</b>	0
	<b>Number of Bottom Samples</b>	0
<b>Number AWOIS Items Investigated</b>	3	
<b>Number Maritime Boundary Points Investigated</b>	0	
<b>Number of DPs</b>	0	
<b>Number of Items Items Investigated by Dive Ops</b>	0	
<b>Total Number of SNM</b>	28.9	

Table 2: Hydrographic Survey Statistics

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

<b>Survey Dates</b>	<b>Julian Day Number</b>
10/21/2013	294
11/01/2013	305
11/02/2013	306
11/03/2013	307
11/06/2013	310

*Table 3: Dates of Hydrography*

Survey lines were run with a dual-head multibeam echosounder. Linear nautical miles for the dual-head system were calculated using statistics from the starboard head.

## **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:

<b>Hull ID</b>	<i>S250</i>
<b>LOA</b>	37.7 meters
<b>Draft</b>	3.80 meters

*Table 4: Vessels Used*

NOAA Ship FERDINAND R. HASSLER (S250) acquired all data within the limits of H12628.

## B.1.2 Equipment

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

<b>Manufacturer</b>	<b>Model</b>	<b>Type</b>
Reson	7125	MBES
Klein	5000 V2	SSS
Applanix	POS M/V 320 V5	Positioning and Attitude System
Hemisphere	MBX-4	Positioning System
Brooke Ocean	MVP-30	Sound Speed System
Reson	SVP 70	Sound Speed System
AML	MicroCTD	Conductivity, Temperature, and Depth Sensor

*Table 5: Major Systems Used*

## B.2 Quality Control

### B.2.1 Crosslines

Crosslines, acquired for this survey, totalled 4.7% of mainscheme acquisition.

A geographic plot of crosslines is shown in Figure 4. To evaluate crossline agreement, the crossline data were filtered to 45 degrees from nadir and two 2-meter surfaces were created: one from crossline soundings, the other from mainscheme soundings. These two surfaces were differenced using CARIS HIPS and SIPS. The statistical analysis of the differences between the mainscheme and crossline surfaces is shown in Figure 5. The average difference between the surfaces is 0.00 meters with a standard deviation of 0.07 meters; 95% of all differences are less than 0.13 meters from the mean.

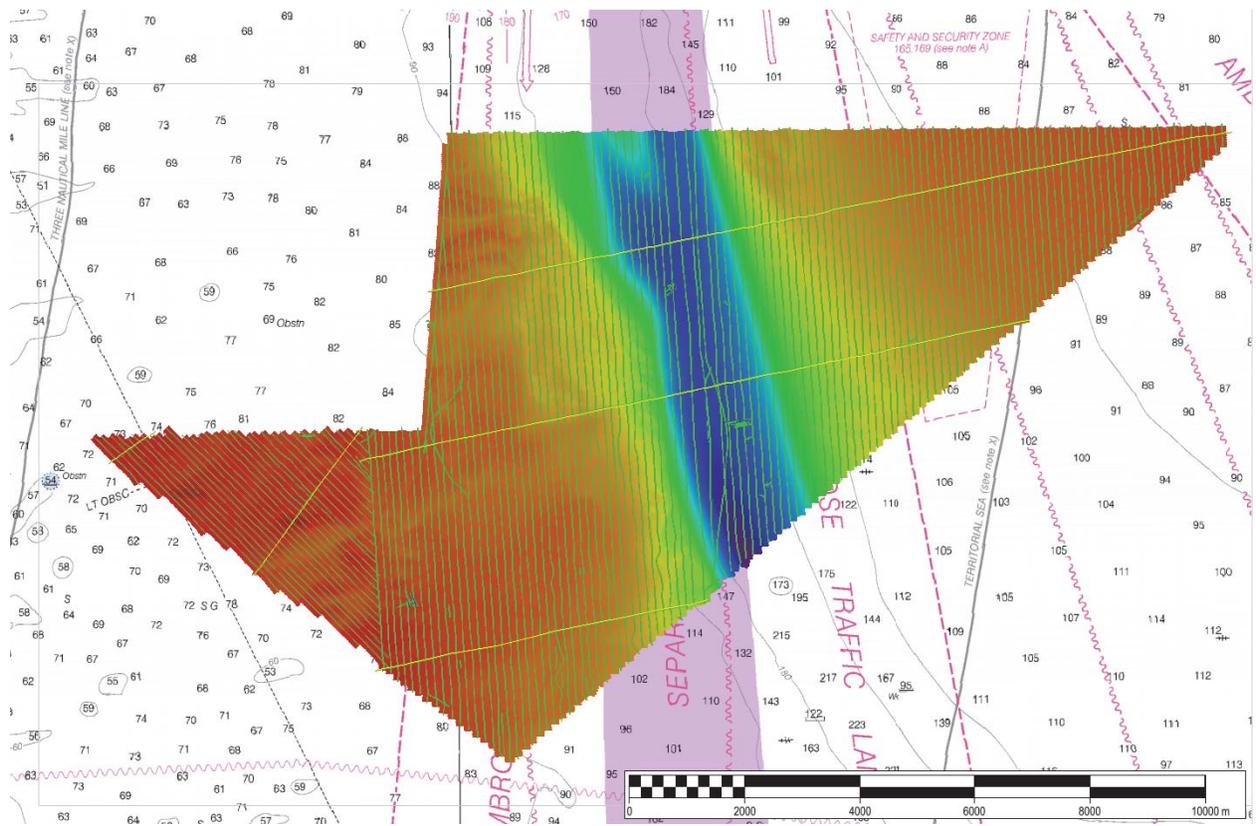


Figure 4: Location of crosslines, shown in yellow, and mainscheme data for H12628.

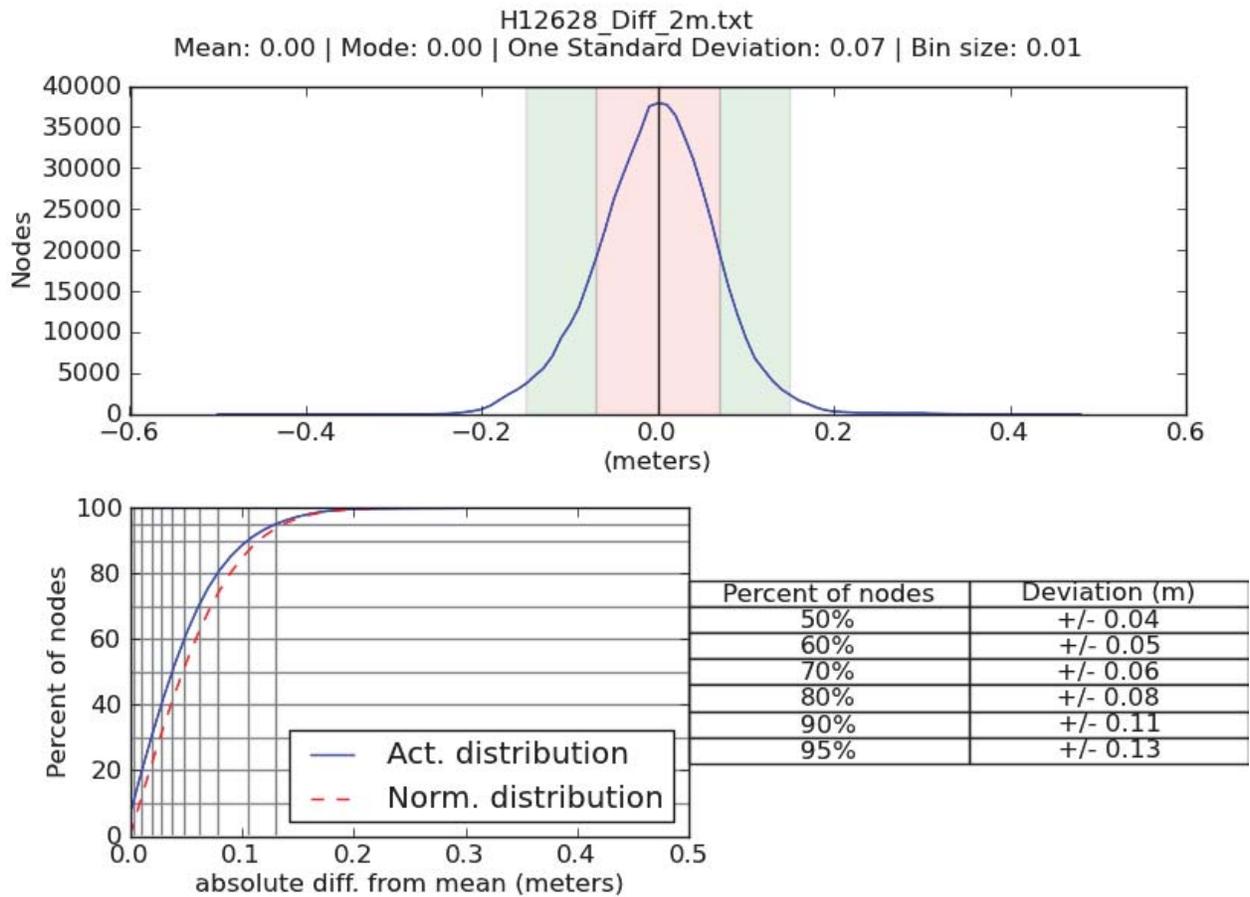


Figure 5: H1268 crossline difference statistics: mainscheme minus crossline

### B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Measured	Zoning
0.01 meters	0.16 meters
0.01 meters	0.093 meters

Table 6: Survey Specific Tide TPU Values

Hull ID	Measured - CTD	Measured - MVP	Surface
S250	1.0 meters/second	1.0 meters/second	2.0 meters/second

Table 7: Survey Specific Sound Speed TPU Values

There are two tide zoning uncertainty values listed above: an uncertainty of 0.16 meters (provided by CO-OPS) was applied to data reduced by discrete zoning and an uncertainty value of 0.093 meters (provided by OPS in the Project Instructions) was applied to data reduced by VDatum.

Nine lines were corrected with zoned tides and received the discrete tide uncertainty value. Refer to section B.3.1 for the list of lines reduced to chart datum using zoned water levels. For these lines, SMRMSG files were loaded using only attitude and horizontal position uncertainties. Vertical uncertainty is applied from True Heave.

All other survey lines were corrected with GPS tides and received the VDatum tide uncertainty value. For all lines except those noted in section B.3.1, True Heave RMS records were manually deleted from CARIS HDCS folders to allow down RMS values to load from the SMRMSG files. SMRMSG files were loaded using attitude, vertical, and horizontal position uncertainties.

The surface sound speed value of 2.0 meters per second was used to account for the faulty sound speed sensor on the starboard sonar head. This issue is discussed in more detail in Section B.2.5. The value was determined after analyzing the differences between three hour averages of concurrently logged SBE 45 MicroTSG Thermosalinograph data for the entire duration of acquisition. Two meters per second is a high estimation value of the uncertainty associated with surface sound speed while remaining within the instructions of section 4.2.3.8 of the Field Procedures Manual (2013). For this project, it was found the surface sound speed was slow to change geographically and the error for using the surface sound speed obtained from the MVP (as discussed in Section B.2.5) does not exceed 2.0 m/s.

### B.2.3 Junctions

The areas of overlap between H12628 and its junction surveys, shown in Figure 6, were reviewed in CARIS Subset Editor. The junction surfaces were subtracted from the surface of H12628 to assess sounding consistency.

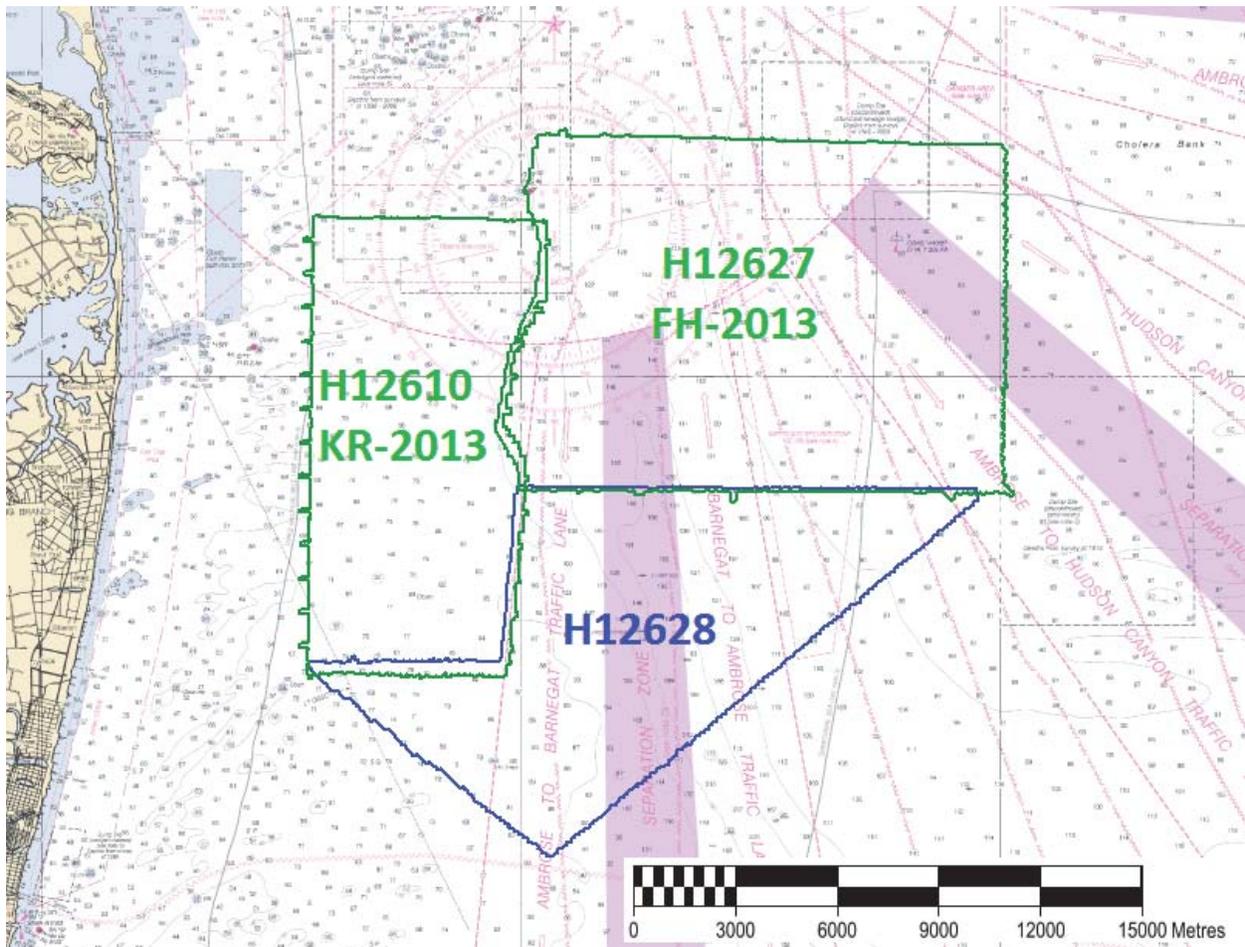


Figure 6: H12628 Junctions

The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
H12627	1:40000	2013	NOAA Ship FERDINAND R. HASSLER	N
H12610	1:20000	2013	C & C Technologies, Inc.	NW

Table 8: Junctioning Surveys

H12627

This survey was assigned as a part of project OPR-B310-FH-13. The location is shown in Figure 6. A 4-meter resolution surface of H12627 was subtracted from the 4-meter resolution surface of H12628. Of the 91 thousand overlapping nodes, the average difference is -0.01 with a standard deviation of 0.07 meters. 95% of all differences are less than 0.14 meters from the mean, as show in Figure 7.

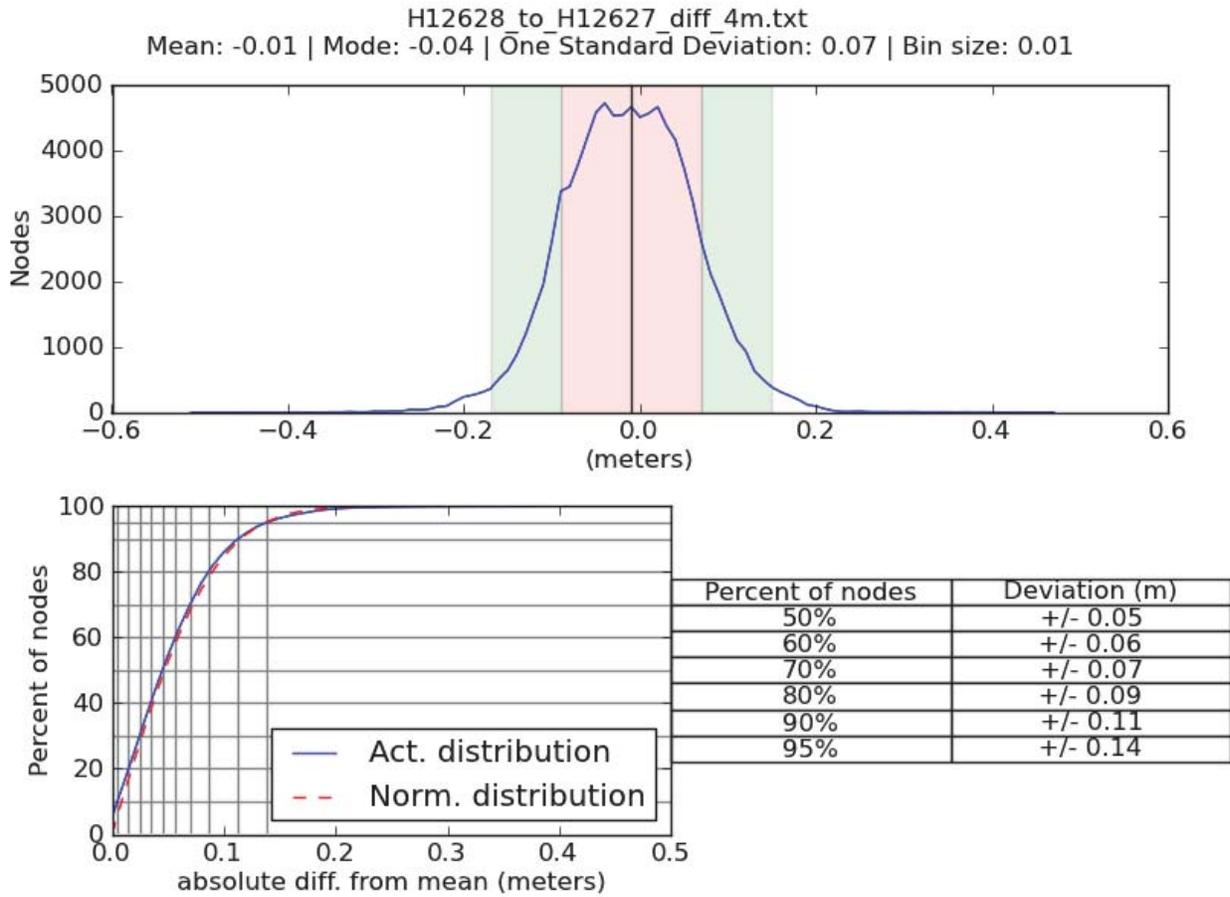


Figure 7: Differenced surface statistics - H12628 minus H12627

H12610

This survey was assigned to C & C Technologies, Inc. as a part of project OPR-C319-KR-13. The location is shown in Figure 6. A 2-meter resolution surface of H12610 was subtracted from the 2-meter resolution surface of H12628. Of the 921 thousand overlapping nodes, the average difference is -0.06 with a standard deviation of 0.11 meters. 95% of all differences are less than 0.20 meters from the mean, as shown in Figure 8.

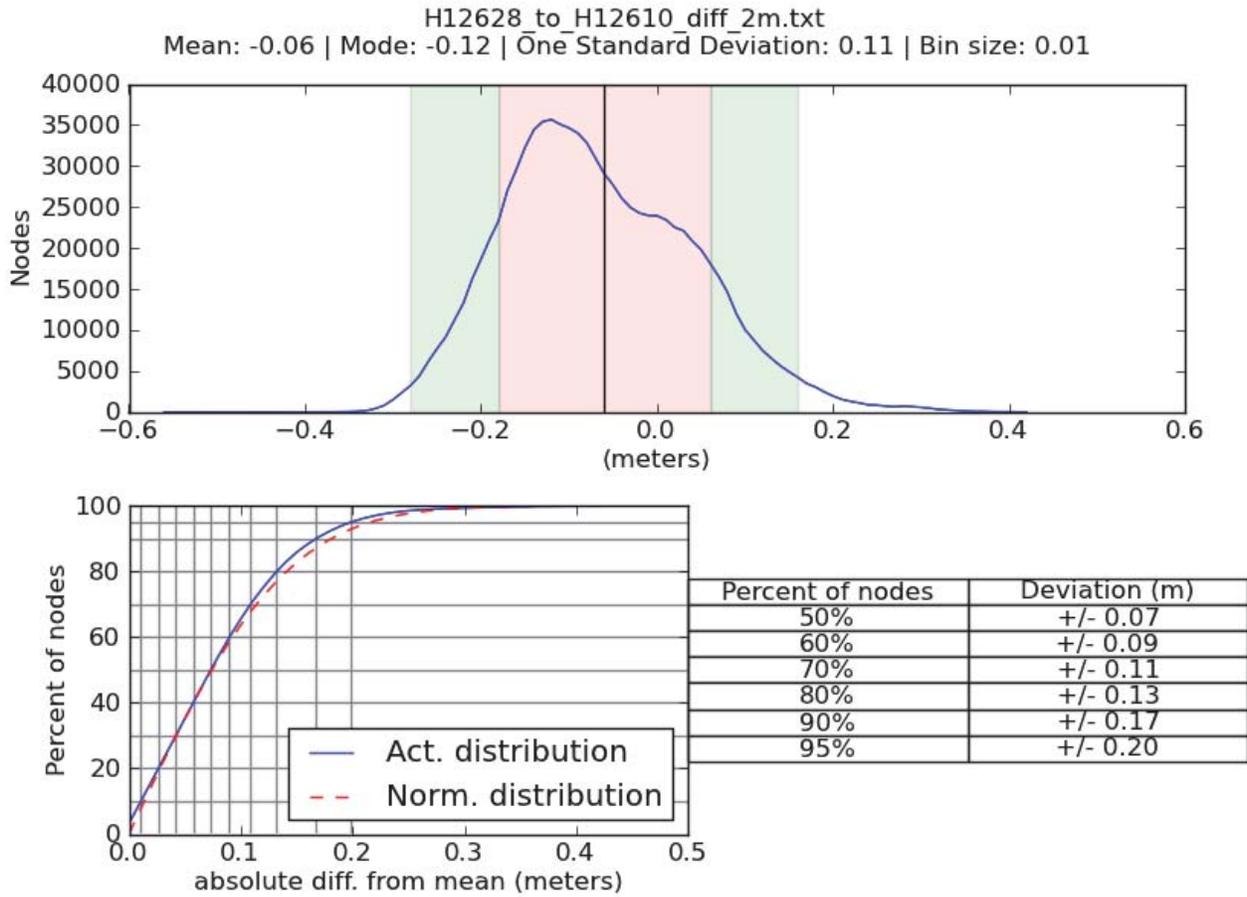


Figure 8: Differenced surface statistics - H12628 minus H12610

### 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

#### SVP70 - Surface Sound Speed

It was observed early during acquisition on OPR-B310-FH-13 that the starboard SVP-70, which is the master unit that feeds its sound speed to the slave (port), was in error of approximately five meters per second. This error resulted in a ‘S’ shaped artifact seen on data from both port and starboard multibeam systems. The starboard SVP-70 was determined to be in error after simultaneous comparison with MVP, TSG and Port SVP-70 values. Values from these three sources all agreed within the manufacturers specified accuracies. Unfortunately, at the same time of this error, the port SVP-70 was experiencing unexplainable intermittent failures, resulting in the complete loss of sound speed values. This made switching input between the SVP-70 sensors unreliable.

A solution to fix the erroneous sound speed values was researched and applied via the CARIS Sound Velocity Correction tool. Because FERDINAND R. HASSLER routinely collects and processes bathymetric data in Reson .s7k format (7004/7006 records), the “Perform an additional recomputation of the steered beam angles based on a new surface sound speed that will be interpolated from the sound velocity profile” option was available. When checked, this option will overwrite the surface sound speed values collected real-time with values from the MVP profiles. Due to the surface sound speed being relatively constant during acquisition this tool greatly reduced the sound speed artifacts in the data.

The technique described above was utilized for all data within the limits of H12628.

## B.2.6 Factors Affecting Soundings

There were no other factors that affected corrections to soundings.

## B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: Casts were taken approximately every 3 hours.

The sound speed correction Nearest in Distance with Time of 3 hours was used for the entire survey. The geographic distribution of sound speed casts and the survey lines they are applied to are shown in Figure 9.

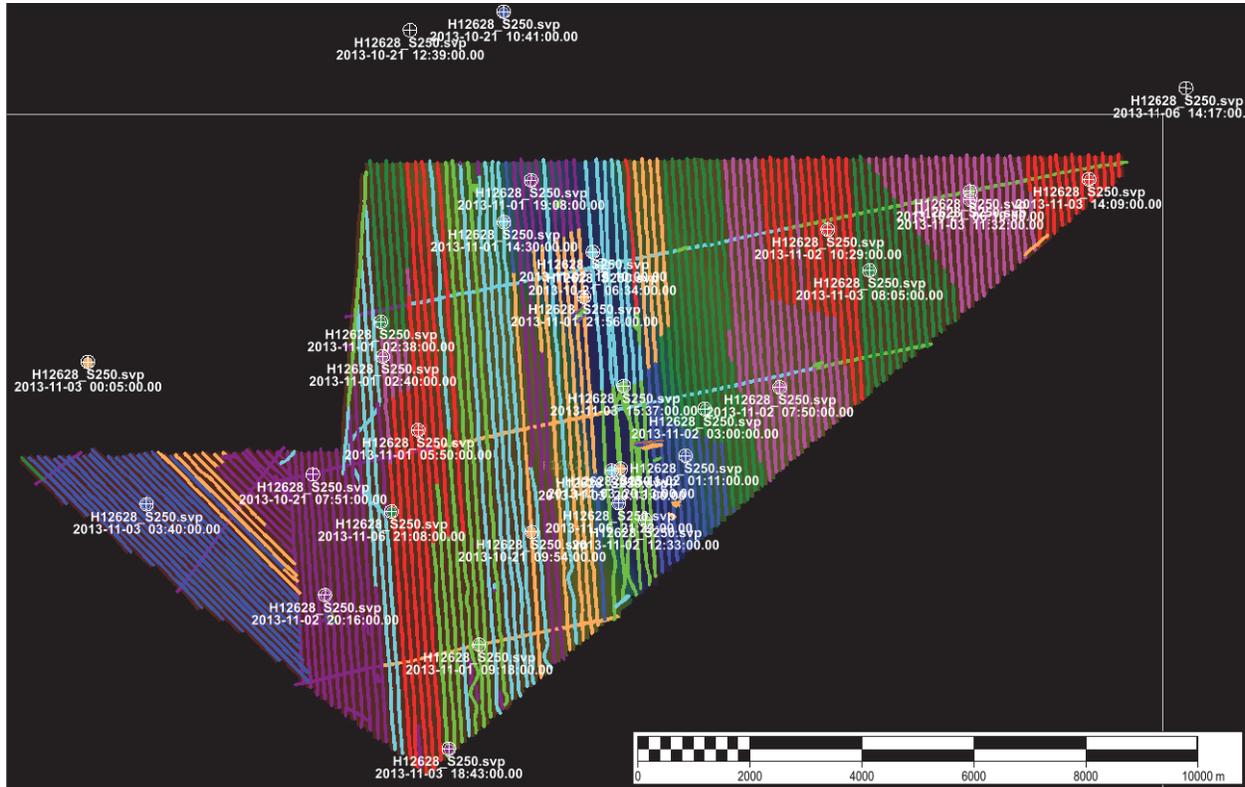


Figure 9: H12628 SVP locations and survey lines colored by cast.

## B.2.8 Coverage Equipment and Methods

A density analysis was run to calculate the number of soundings per surface node. Five or more soundings per node were present in over 99.97% of the 2-meter and 4-meter surfaces. For additional detail refer to the H12628\_Standards\_Compliance report submitted in Appendix II of this report.

## B.3 Echo Sounding Corrections

### B.3.1 Corrections to Echo Soundings

In limited areas throughout the survey, errors in the GPS-derived vertical position solution led to vertical errors in the associated soundings. The attitude errors were located by examining the surface for areas of high standard deviation. CARIS Subset Editor and Attitude Editor were used to isolate the error in these cases to a GPS height error.

The errors are most apparent in the “GPS Tide” record generated in CARIS. The record is calculated during the “Calculate GPS Tide” process by removing the inertial generated heave record (True Heave) from the post-processed GPS height solution (from the applied SBET) and applying the datum-ellipsoid transformation model. The resultant record should contain both the tidal signal and any loading or dynamic draft effects. When an apparent vertical error occurred in the corrected soundings, the GPS Tide record was examined in Attitude Editor. For anomalies of short duration (< 12 mins.) which occur within the line, GPS Tide anomalies were rejected and the resultant gap was linearly interpolated. As a result, the vertical error in the corrected soundings was eliminated. Sections of the following lines were handled in this way. See Figure 10 for an overview:

Port (Total of 4 lines): 20131101\_022537, 20131102\_071731, 20131103\_021625, 20131101\_131454

Starboard (Total of 9 lines): 20131102\_225009, 20131102\_184645, 20131102\_161853, 20131021\_074950, 20131101\_022538, 20131102\_071733, 20131101\_162818, 20131102\_021043, 20131101\_131454

Figures 12, 13, 14, and 15 show an example of the interpolation for port side line 20131101\_022537 on Dn305.

On occasions where the anomalies were longer than 12 minutes, or at the beginning or end of a line, lines were reduced to MLLW with verified tides. The following lines were handled in this way, see Figure 11 for an overview:

Port (Total of 2 lines): 20131021\_055701, 20131021\_074950

Starboard (Total of 7 lines): 20131021\_055710, 20131101\_044606, 20131102\_041044, 20131102\_043833, 20131103\_021639, 20131103\_060314, 20131103\_075716

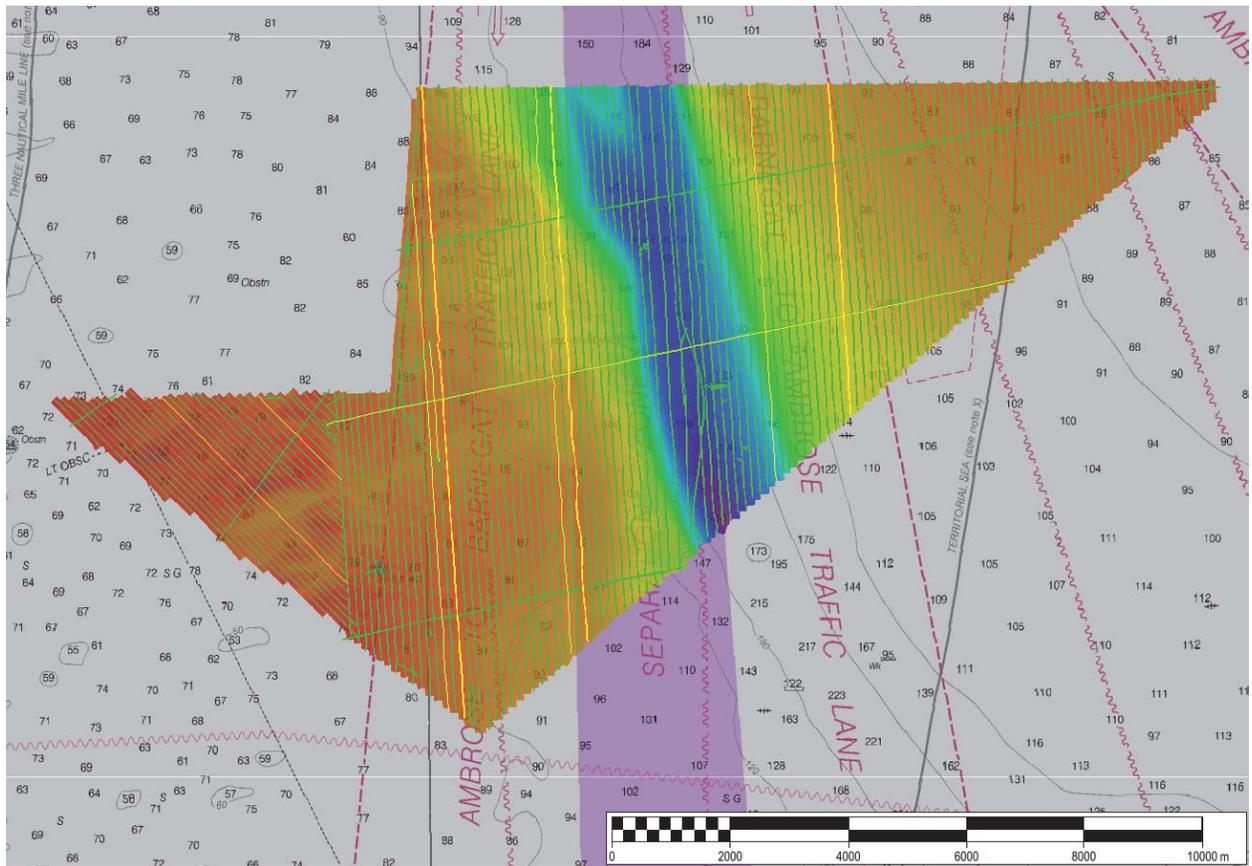


Figure 10: H12628 survey lines with GPS tide anomalies rejected and linearly interpolated (yellow).

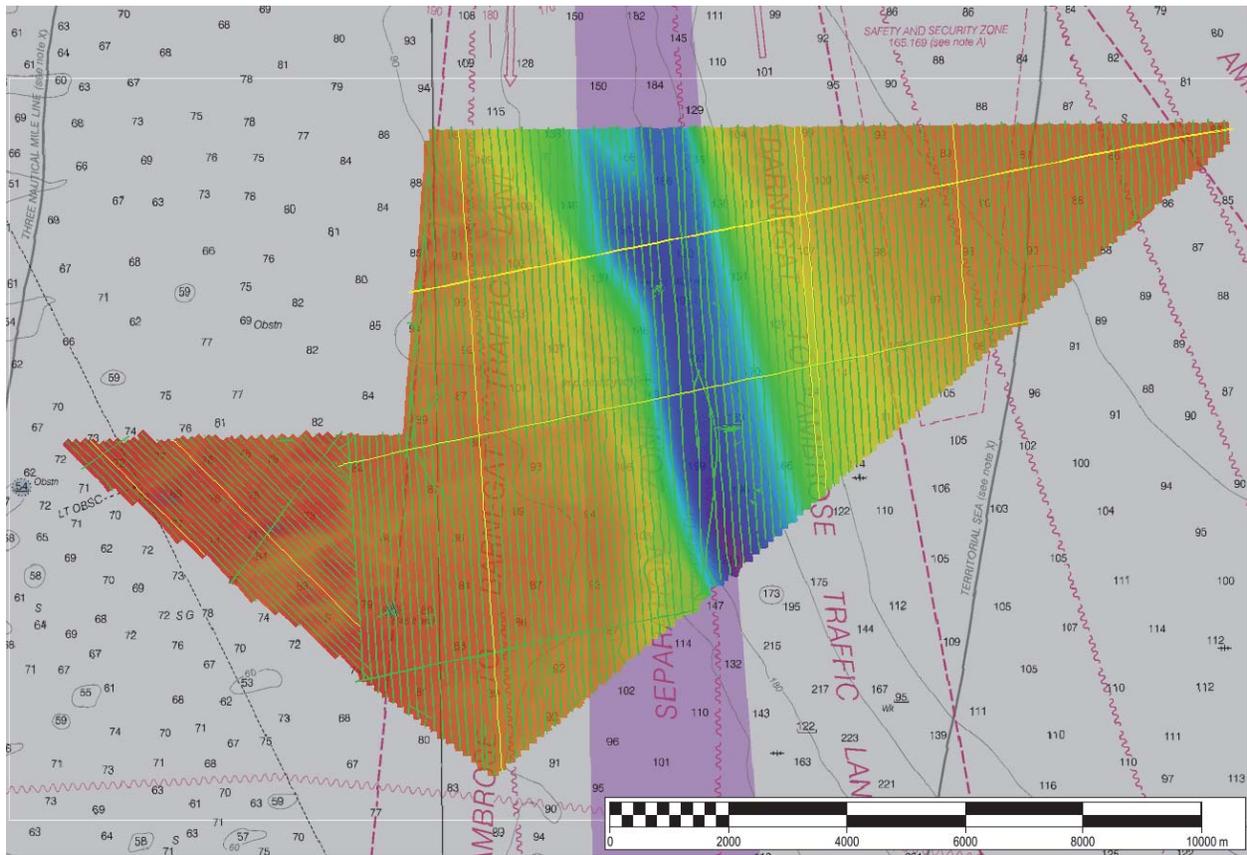


Figure 11: H12628 survey lines reduced to MLLW with verified tides (yellow).

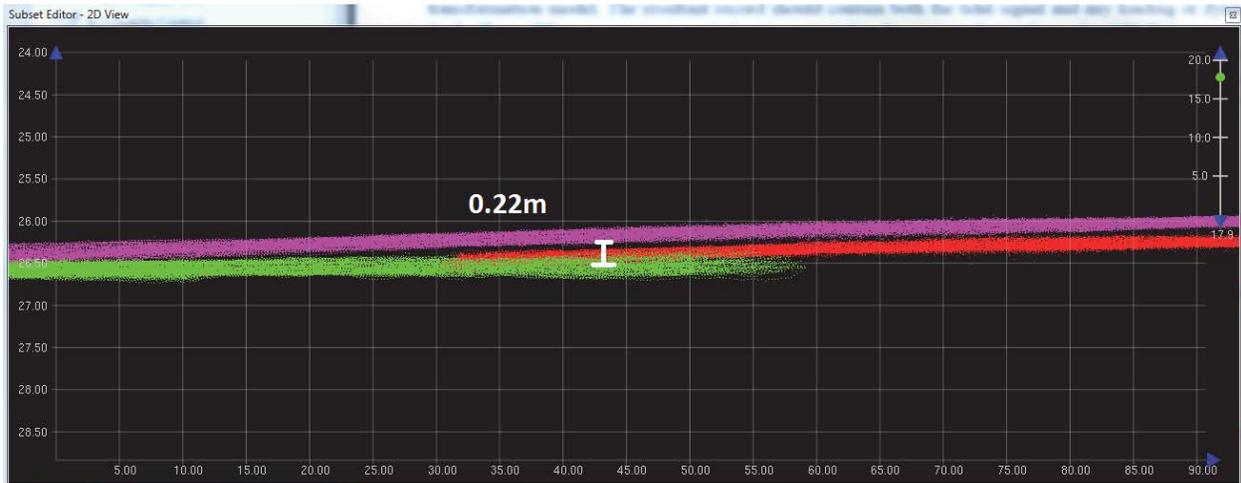


Figure 12: Line 20131101\_022537 (magenta) prior to attitude interpolation in CARIS subset editor.

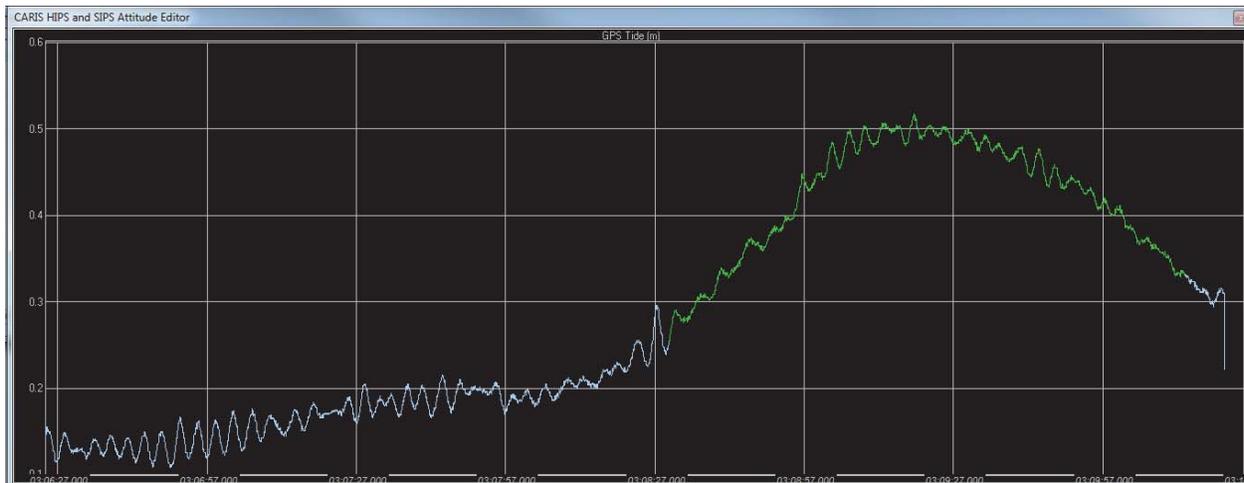


Figure 13: Line 20131101\_022537 prior to attitude interpolation in CARIS attitude editor.

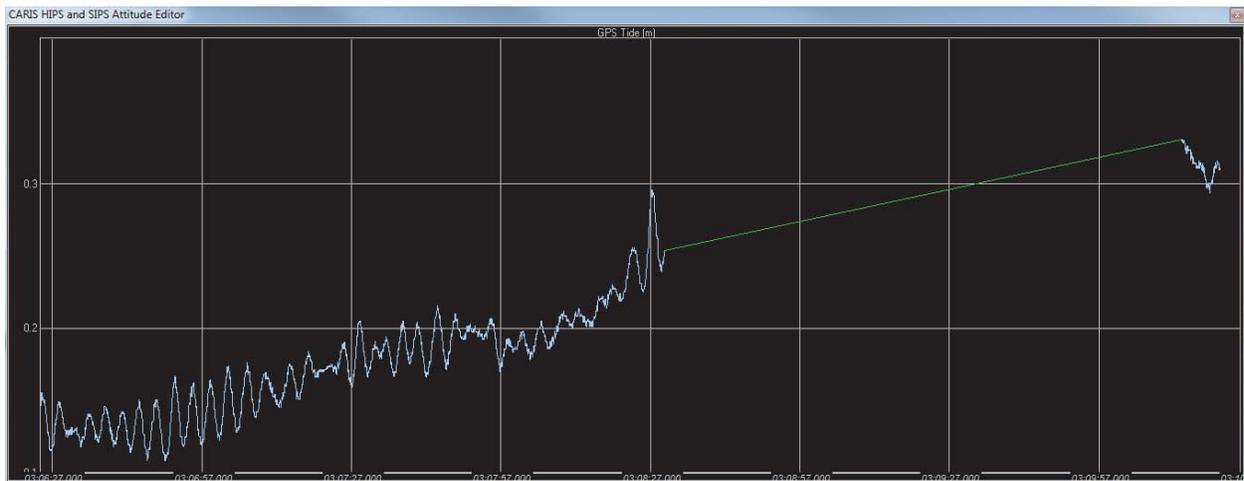


Figure 14: Line 20131101\_022537 attitude interpolation.

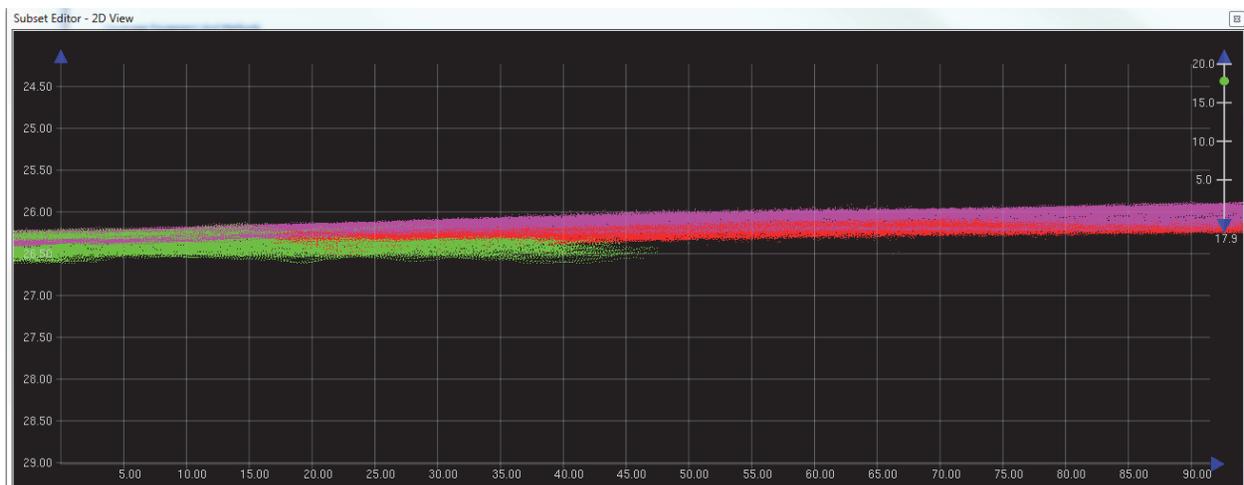


Figure 15: Line 20131101\_022537 (magenta) after attitude interpolation in CARIS subset editor.

### B.3.2 Calibrations

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

Calibration Type	Date	Reason
Abbreviated Patch Test	2013-10-24	Roll artifacts noticed in acquired bathymetry

*Table 9: Calibrations not discussed in the DAPR.*

Multibeam data collected during the first few days of acquisition on project OPR-B310-FH-13 contained offsets appearing to be contributed to a roll error. To determine if this was the issue an abbreviated patch test was performed, utilizing roll lines only. From analysis of these roll lines new roll values were computed and entered in the HIPS Vessel File (HVF). There is no good explanation for the significant change in roll angle values. FERDINAND R. HASSLER will implement new procedures after an analysis to determine the optimal frequency for conducting patch tests.

### B.4 Backscatter

Backscatter was logged in the Reson datagram 7008 snippets record in the raw .s7k files. The .s7k file also holds the navigation record and bottom detections for all lines of survey H12628. The files were paired with the CARIS HDCS data, imported and processed using Fledermaus Geocoder Toolbox.

The GSF files containing the extracted backscatter are submitted with the data in this survey. The processed mosaic is saved as a GeoTiff and also submitted.

## 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: NOAA Profile Version 5.3.2

### 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
H12628_MB_2m_MLLW	CUBE	2 meters	18.41 meters - 66.38 meters	NOAA_2m	Complete MBES
H12628_MB_4m_MLLW	CUBE	4 meters	18.61 meters - 66.28 meters	NOAA_4m	Complete MBES
H12628_MB_2m_MLLW_Final	CUBE	2 meters	18.40 meters - 40.00 meters	NOAA_2m	Complete MBES
H12628_MB_4m_MLLW_Final	CUBE	4 meters	36.00 meters - 66.28 meters	NOAA_4m	Complete MBES

*Table 10: Submitted Surfaces*

In a 1-meter resolution CUBE surface, five nodes shoaler than 20 meters exist within H12628. These soundings occur on a wreck identified as AWOIS item 1524. The hydrographer is confident the least depth is accurately preserved in the 2-meter resolution grid, therefore a 1-meter surface for H12628 was not submitted.

### B.5.3 Designated Soundings

Eighteen soundings were flagged as designated within the limits of survey H12628, shown in Figure 16. Of the eighteen soundings, seventeen soundings were flagged as designated for feature creation and one was to preserve the shoal depth of the finalized surface.

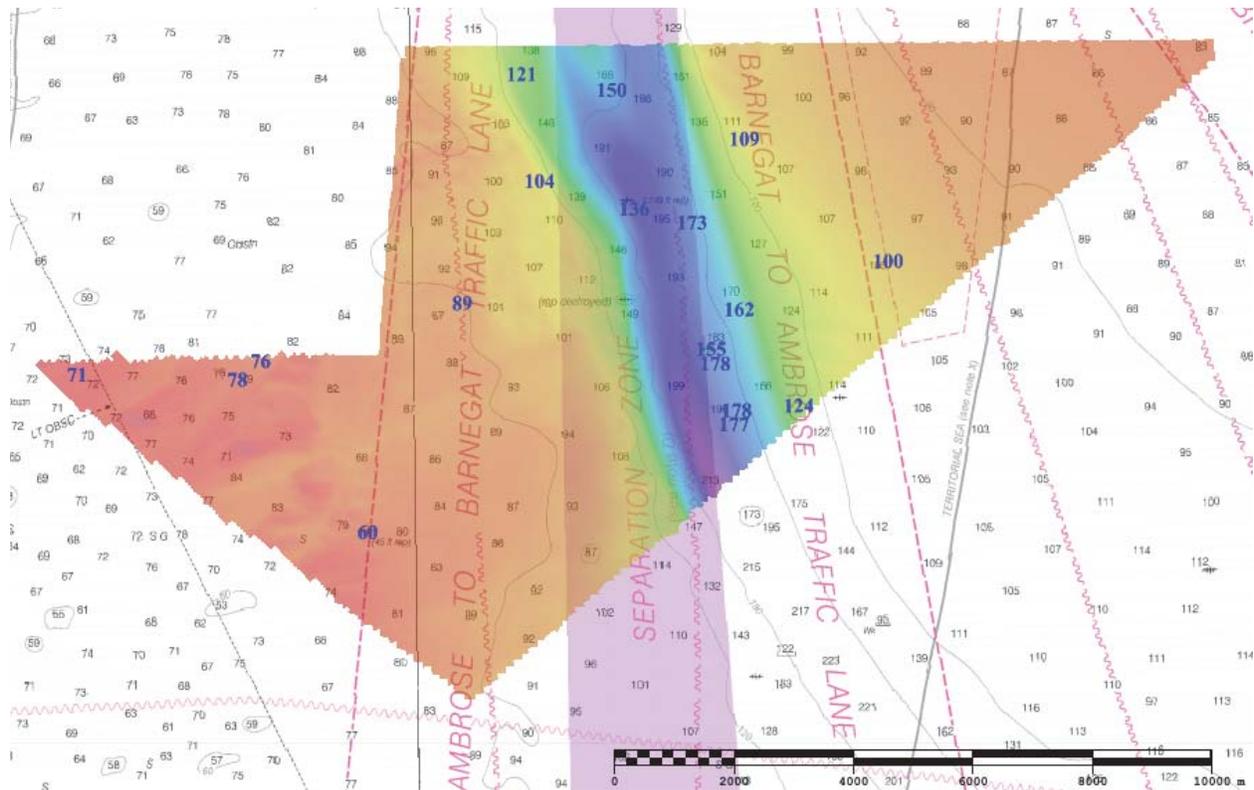


Figure 16: Soundings flagged as designated for H12628.

#### B.5.4 Rejection of data outside final survey area

Crossline data were rejected in areas where mainscheme coverage was not obtained and mainscheme data were rejected when logged through turns, shown in Figure 17. These data were rejected using CARIS HIPS and SIPS Swath Editor and should not be accepted.

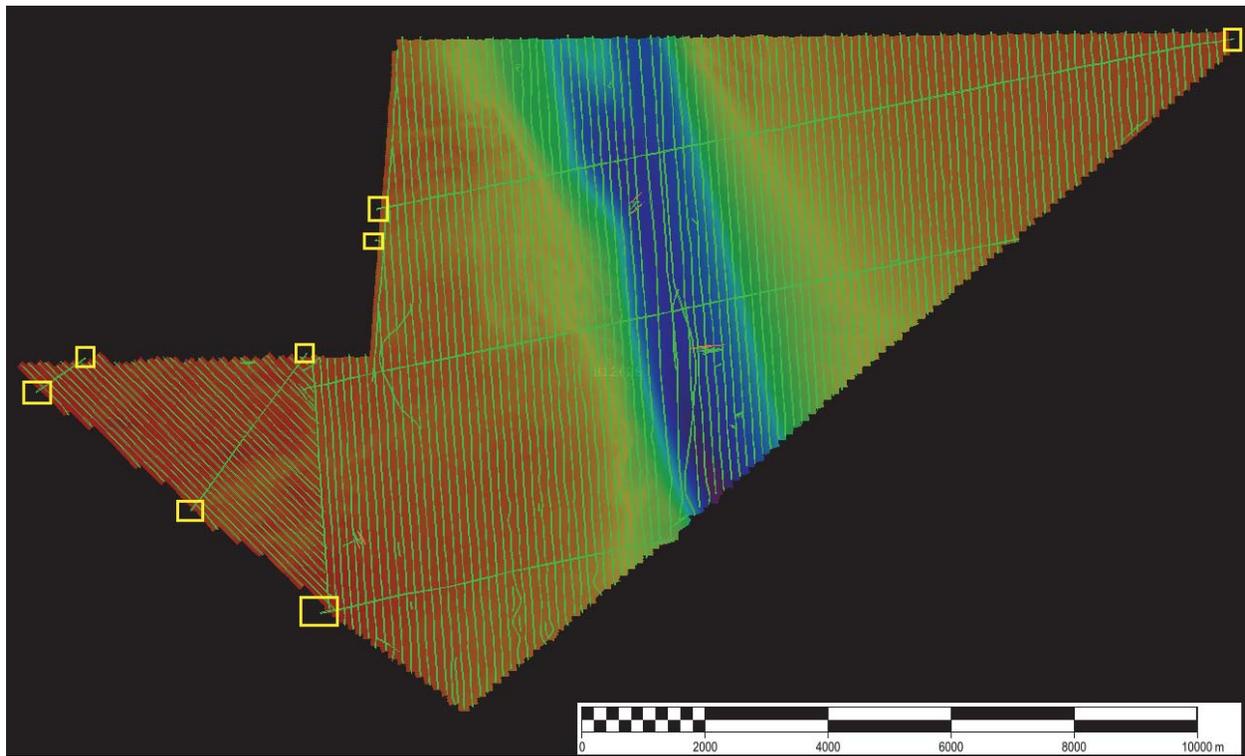


Figure 17: Areas of rejected soundings for H12628.

### B.5.5 Total Vertical Uncertainty Analysis

A custom layer (IHO\_Order\_1) was created for all finalized surfaces showing the uncertainty of individual nodes in relation to the allowable uncertainty for their depths. This layer was examined in CARIS and exported to ASCII format for a statistical analysis with a custom Python script. 100% of nodes within survey H12628 met the vertical uncertainty standards of section 5.1.3 of the HSSD 2013. See H12628\_Standards\_Compliance report submitted in Appendix II of this report.

## C. Vertical and Horizontal Control

All vertical and horizontal control activities conducted during the course of this survey are fully addressed in the following sections. Therefore, no separate HVCR is submitted.

### 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
Sandy Hook	8531680

*Table 11: NWLON Tide Stations*

File Name	Status
8531680.tid	Verified Observed

*Table 12: Water Level Files (.tid)*

File Name	Status
B310FH2013CORP.zdf	Final

*Table 13: Tide Correctors (.zdf or .tc)*

A request for final approved tides was sent to N/OPS1 on 11/15/2013. The final tide note was received on 11/27/2013.

Preliminary zoning is accepted as the final zoning for survey project OPR-B310-FH-2013, H12628, from October 21 to November 6, 2013. See tide note included in Appendix I of this report.

#### Non-Standard Vertical Control Methods Used:

VDatum

#### Ellipsoid to Chart Datum Separation File:

2013\_B310\_VDatum\_NAD83Ellip\_MLLW.xyz

H12628 is referenced to MLLW by ellipsoidal methods using the Ellipsoid to Chart Separation File, with the exceptions of the lines discussed in Section B.3.1 which were reduced to chart datum using zoned water levels.

Per the Project Instructions, a VDatum evaluation was performed and submitted to HSD prior to H12628 final processing. Based on this evaluation, the hydrographer recommended VDatum for final datum

reduction. The Chief, Hydrographic Surveys Division, approved the use of VDatum for H12628. See Appendix II for correspondence associated with this decision. The VDatum evaluation report was sent to OPS on 1/3/2014. The memo approving the recommendations was received on 2/28/2014.

## **C.2 Horizontal Control**

The horizontal datum for this project is North American Datum of 1983 (NAD83).

The projection used for this project is UTM zone 18N.

The following PPK methods were used for horizontal control:

Smart Base

All data submitted with H12628 have SBETs and SMRMSGs applied for post-processed position/attitude and associated uncertainty values, respectively. Lines referenced to MLLW listed in section B.3.1 have SMRMSG but only use horizontal positioning and attitude uncertainty values. Note, DGPS was used for real time horizontal control only.

The following CORS Stations were used for horizontal control:

<b>HVCR Site ID</b>	<b>Base Station ID</b>
MORICHES 5 East Moriches, NY	MOR5
MORICHES 6 East Moriches, NY	MOR6
BROOKLYN PIER Brooklyn, NY	NYBR
SANDY HOOK 6 Sandy Hook, NJ	SHK6
NJDY Dayton, NJ	NJDY
NEPTUNE TOWNSHIP Neptune Township, NJ	NJNT
NJOC Toms River, NJ	NJOC
QUEENS Queens, NY	NYQN
CENTRAL ISLIP Central Islip, NY	NYCI
SANDY HOOK 5 Sandy Hook, NJ	SHK5
RIVERHEAD Riverhead, NY	NYRH
NEW YORK WAAS 1 New York, NY	ZNY1
R STOCKTON COLL Galloway Township, NJ	NJGT
MIDDLE TOWNSHIP Middle Township, NJ	NJCM

*Table 14: CORS Base Stations*

The following DGPS Stations were used for horizontal control:

<b>DGPS Stations</b>
Moriches, New York (293 kHz)
Sandy Hook, New Jersey (286 kHz)

*Table 15: 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	LNLM Date	NM Date
12326	1:80000	52	06/2013	12/17/2013	12/28/2013

*Table 16: Largest Scale Raster Charts*

#### 12326

In general, soundings from H12628 agree within 1 to 3 feet of charted depths from RNC 12326. Surveyed contours agree with charted depth curves except as noted in Figure 18.

The 90 foot depth contour which runs through the south bound Ambrose to Barnegat traffic lane has changed. The northern section contains a shoal which shifted southeast by approximately 675 meters. A shoal in the central section has expanded west approximately 2300 meters and the entire southern section of the 90 foot contour has shifted approximately 350 meters west.

In the western most point of the survey, the shoal of 71 feet has shifted to the northeast approximately 350 meters and has decreased in depth by 2-4 feet, shown in Figure 19.

The 87 foot shoal in the southeast section of the separation zone was not found with multibeam echosounder, shown in Figure 20.

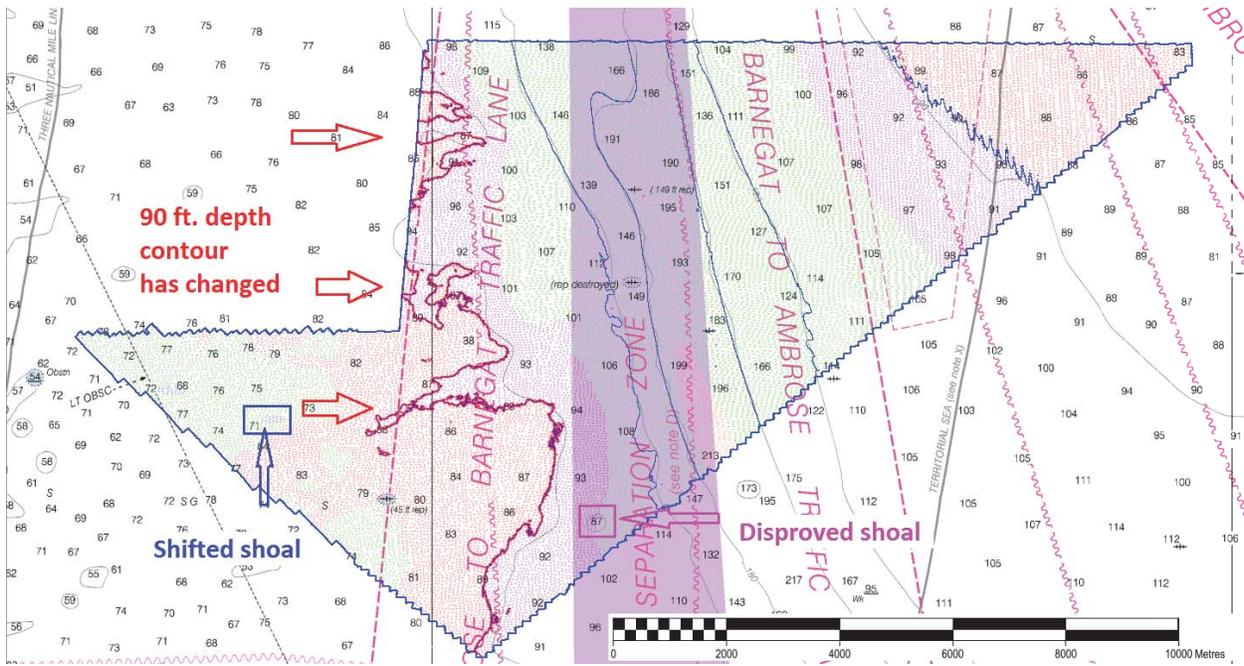


Figure 18: H12628 Soundings and contours compared to charted (12326) depths and depth curves; black = charted depths and depth curves, red = updated 90 ft. depth contour, blue = updated depth contours and shifted shoal, pink = disproved shoal.

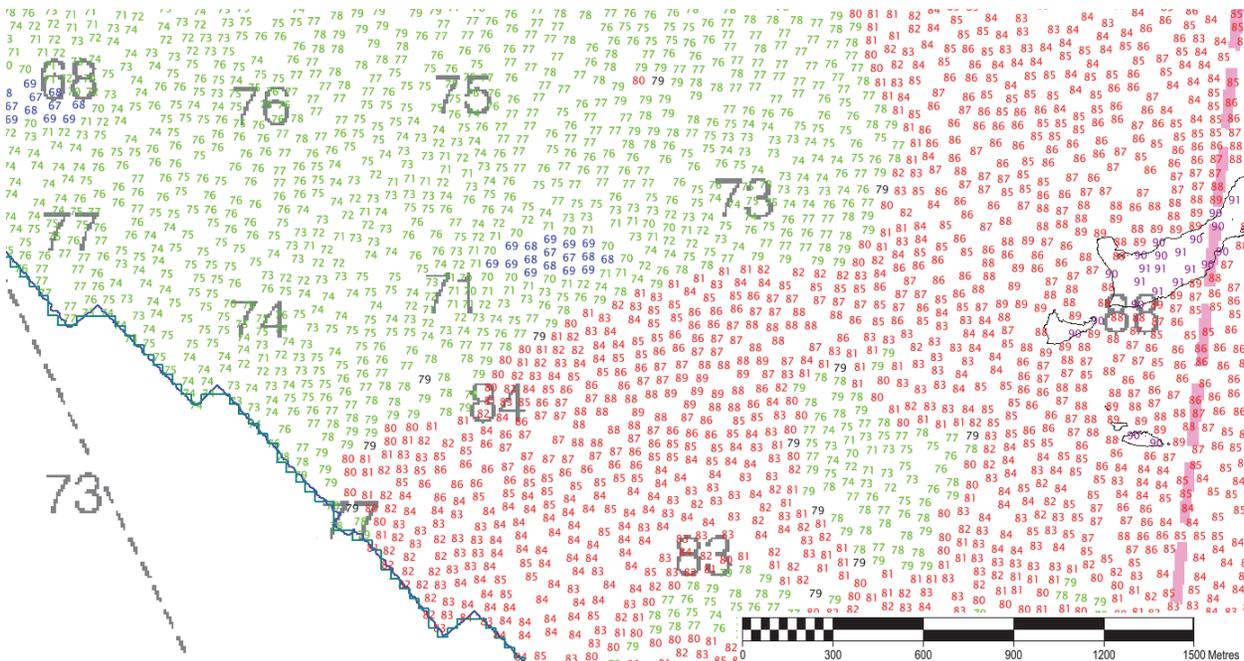


Figure 19: Larger scale of shifted shoal in western section of H12628.

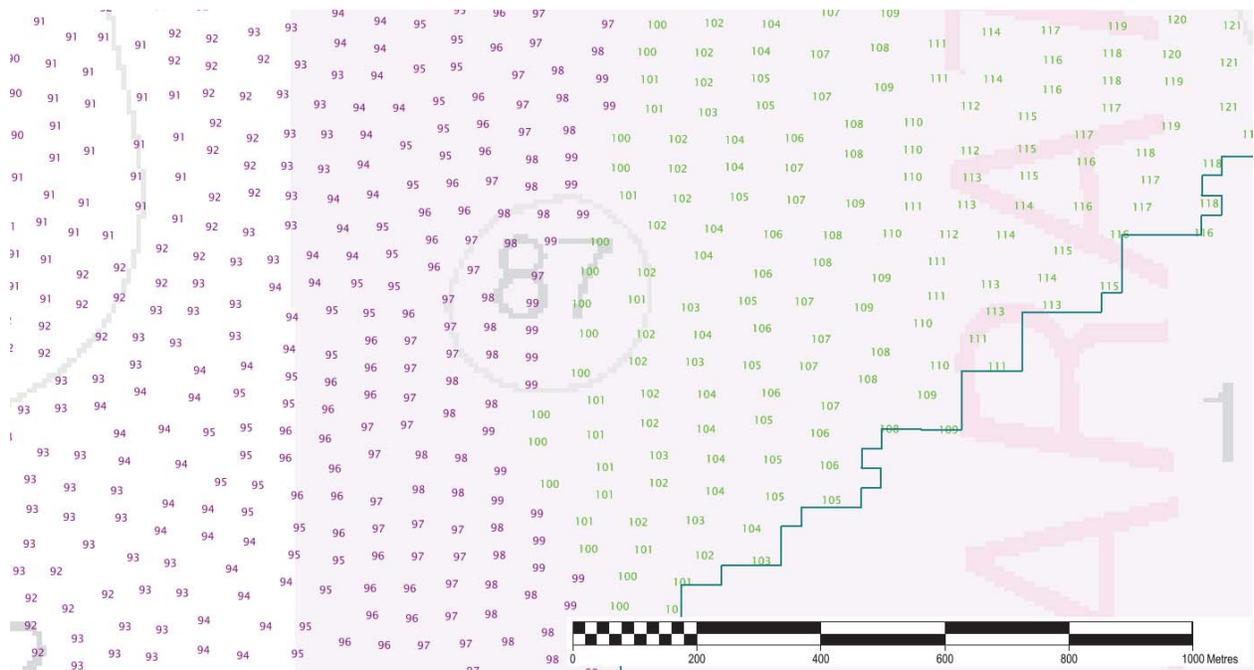


Figure 20: Larger scale of disproved shoal in southeastern section of H12628.

### D.1.2 Electronic Navigational Charts

The following are the largest scale ENC's, which cover the survey area:

ENC	Scale	Edition	Update Application Date	Issue Date	Preliminary?
US4NY1AM	1:80000	27	09/19/2013	01/29/2014	NO

Table 17: Largest Scale ENC's

#### US4NY1AM

ENC US4NY1AM contains minimal differences in charted depths (~ 1 ft.) and no difference in depth curves from the RNC 12326. See previous discussion for comparison with RNC 12326.

### D.1.3 AWOIS Items

There were three AWOIS items assigned for full investigation by OPS for survey H12628, shown in Figure 21. Two of the three AWOIS items were found within the search radii and one was disproved. For the two AWOIS items which were found, there is 100% side scan sonar coverage over the wreck and multibeam echosounder coverage over the entire search radii. Side scan sonar was used to support least

depth determination of potential masts or other narrow objects protruding from the vessel. The positions and least depths were derived from the multibeam echosounder soundings.

The northern most AWOIS item (number 4740) is a charted wreck with a reported depth of 149 ft. The AWOIS history states the wreck is the "CHOAPA", AWOIS item number 1521. The AWOIS item was found approximately 185 m SE of the charted location and the depth is shoaler than the charted depth. See Final Feature File for position, least depth, and further remarks.

The central AWOIS item (number 1529) is a charted wreck with a "rep destroyed". The AWOIS history states the wreck was a cargo vessel and has been reported demolished. The AWOIS item was not found within the limits of survey H12628. See Final Feature File for further remarks.

The southwestern AWOIS item (number 1524) is a charted wreck with a reported depth of 45 ft. The AWOIS history states the wreck is a Dutch M/V "PINTA" which lies in a north-south direction. The AWOIS item was found at the charted position however the shoal depth was deeper than the charted depth. See Final Feature File for position, least depth and further remarks.

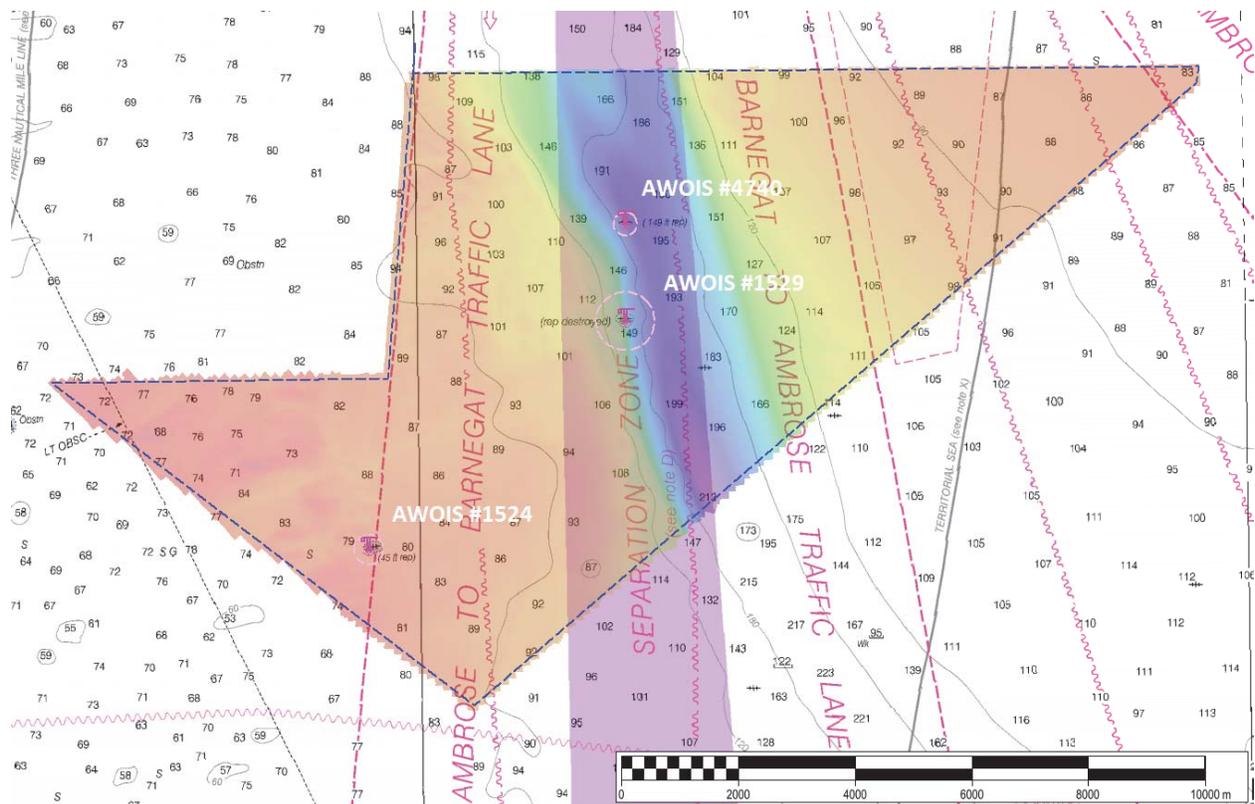


Figure 21: AWOIS items for H12628

#### D.1.4 Maritime Boundary Points

No Maritime Boundary Points were assigned for this survey.

### **D.1.5 Charted Features**

In general, charted features (when found) within the limits of survey H12628 agree with the RNC 12326 positions. See H12628 Final Feature File for updates and further information.

### **D.1.6 Uncharted Features**

Multiple new wrecks and obstructions were identified within the survey limits of H12628. All of the new wrecks and obstructions are non-dangerous and should be charted accordingly. See Figure 22 for an overview of the uncharted wrecks and obstructions.

The 76 foot obstruction in the western section of the survey is a group of mounds protruding 2 meters off the sea floor and 50 meters wide.

The 88 foot and 104 foot obstructions in the south bound Ambrose to Barnegat traffic lane are single mounds protruding 1 meter off the sea floor and are 2 meters wide. The 121 foot obstruction in the northern section of the same traffic lane is a large circular object protruding 4 meters off the sea floor with a radius of 10 meters.

The 150 foot obstruction in the north most section of the separation zone is a large obstruction protruding off the sea floor 6 meters and expands a width of 20 meters. The 137 foot wreck in the separation zone is most likely the 149 foot rep. charted wreck which is 185 meters to the northwest. The 173 foot wreck in the separations zone protrudes 2 meters off the sea floor and is approximately 50 meters long.

There are multiple obstructions in the north bound Barnegat to Ambrose traffic lane area which are narrow obstructions protruding 1-4 meters off of the sea floor; 109 foot, 155 foot, 100 foot and 177 foot obstructions.

The northern most 178 foot obstruction in the southeast section of the Barnegat to Ambrose traffic lane protrudes 2 meters off the sea floor and is approximately 10 meters wide. The southern 178 foot obstruction in the same traffic lane is also 2 meters off the sea floor but has a width of 30 meters.

Finally, the 124 foot obstruction contains two obstructions which are 30 meters apart and protrude 2 meters off of the sea floor.

See H12628 Final Feature File for further details on all uncharted features.



**D.1.10 Bottom Samples**

No bottom samples were required for this survey.

**D.2 Additional Results****D.2.1 Shoreline**

Shoreline was not assigned in the Hydrographic Survey Project Instructions or Statement of Work.

**D.2.2 Prior Surveys**

Prior survey comparisons exist for this survey, but were not investigated.

**D.2.3 Aids to Navigation**

No Aids to navigation (ATONs) exist for this survey.

**D.2.4 Overhead Features**

No overhead features exist for this survey.

**D.2.5 Submarine Features**

Charted cables were fully investigated within the limits of H12628. While no evidence of cables were found in the multibeam data, the hydrographer recommends that these be retained as charted.

**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**

No significant features exist for this survey.

**D.2.9 Construction and Dredging**

No present or planned construction or dredging exist within the survey limits.

**D.2.10 New Survey Recommendations**

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

**D.2.11 New Inset Recommendations**

No new insets are recommended for this area.

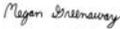
## E. Approval Sheet

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, 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.

Report Name	Report Date Sent
OPR-B310-FH-13 Data Acquisition and Processing Report	2014-02-14
OPR-B310-FH-13 VDatum Evaluation and Deliverable Recommendation	2014-01-03
Hydrographic Survey Readiness Review Memo	2013-08-15

Approver Name	Approver Title	Approval Date	Signature
LCDR Marc S. Moser, NOAA	Chief of Party	02/28/2014	 2014.02.28 16:51:01 -05'00'
LT Adam Reed, NOAA	Field Operations Officer	02/28/2014	
Megan Greenaway	Sheet Manager	02/28/2014	

## F. Table of Acronyms

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

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

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

APPENDIX I  
TIDE NOTE AND GRAPHICS



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
National Ocean Service  
Silver Spring, Maryland 20910

**TIDE NOTE FOR HYDROGRAPHIC SURVEY**

**DATE :** November 19, 2013

**HYDROGRAPHIC BRANCH:** Atlantic  
**HYDROGRAPHIC PROJECT:** OPR-B310-FH-2013  
**HYDROGRAPHIC SHEET:** H12628

**LOCALITY:** Offshore - 11NM NE of Shark River Inlet, Approaches to NY  
**TIME PERIOD:** October 21 - November 6, 2013

**TIDE STATION USED:** 853-1680 Sandy Hook, NJ  
Lat. 40° 28.0'N Long. 74° 0.5' W

**PLANE OF REFERENCE (MEAN LOWER LOW WATER):** 0.000 meters  
**HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE:** 1.492 meters

**REMARKS: RECOMMENDED ZONING**

Preliminary zoning is accepted as the final zoning for project OPR-B310-FH-2013, during the time period between October 21 - November 6, 2013.

Please use the zoning file B310FH2013CORP submitted with the project instructions for OPR-B310-FH-2013. Zones SA13 and SA14 are the applicable zones for H12628.

**Refer to attachments for grid information.**

**Note 1:** Provided time series data are tabulated in metric units (meters), relative to MLLW and on Greenwich Mean Time on the 1983-2001 National Tidal Datum Epoch (NTDE).

HOVIS.GERALD.TH  
OMAS.136586025  
0

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: 2013.11.22 12:00:18 -05'00'

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CHIEF, PRODUCTS AND SERVICES BRANCH



**Preliminary as Final Tidal Zoning for OPR-B310-FH-2013, H12628  
Offshore - 11NM NE of Shark River Inlet, Approaches to NY**

8531680 SANDY HOOK

SA14

Time Corrector -36 mins  
Range Corrector x 0.91  
Reference 8531680

SA13

Time Corrector -36 mins  
Range Corrector x 0.87  
Reference 8531680

## APPENDIX II

### SUPPLEMENTAL SURVEY RECORDS AND CORRESPONDENCE

(No supplemental Correspondence)



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
Office of Marine and Aviation Operations  
NOAA Ship *Ferdinand R. Hassler* (S-250)  
Box 638, New Castle, NH 03854

January 3, 2014

MEMORANDUM FOR: Jeffrey Ferguson  
Chief, Hydrographic Surveys Division

FROM: Lieutenant Commander Marc S. Moser, NOAA  
Commanding Officer

SUBJECT: OPR-B310-FH-13 VDatum Evaluation and Deliverable  
Recommendation

*Ferdinand R. Hassler* personnel conducted a comparison of VDatum based Ellipsoid Referenced Survey (ERS) versus discrete tidal zoning vertical transformation techniques using crossline data per the Hydrographic Survey Project Instructions (PI). In addition we conducted comparisons using the difference between crosslines and mainscheme to give a better recommendation on internal consistency. While there are differences between the two data reduction methods, there is no justification to disprove or suspect the VDatum separation model. Results and analysis of the comparison are in the attached report.

Ship personnel experienced problems in reliably processing the vessel trajectory relative to the ellipsoid. We recommend that H12627 and H12628 be submitted as hybrid surveys with the majority of data reduced by VDatum and H12629 be submitted using discrete zoned tides exclusively.

It is understood that upon review of this report, a determination will be made for the final vertical transformation technique to be used to create the final deliverables.

Attachment



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## 1.0 Introduction

This document is an interim report describing methods and results for the vertical datum analysis component of the vertical control requirements stated in the Hydrographic Survey Project Instructions for OPR-B310-FH-13 Approaches to New York (September 19, 2013). The project includes hydrographic surveys H12627, H12628, and H12629. The Project Instructions require the field unit to recommend the final vertical transformation technique after analyzing crossline data. The recommendations and supporting data included in this report are intended for use by the Hydrographic Surveys Division (HSD) to support the final decision on the use of ellipsoidally-referenced survey (ERS) methods in lieu of traditional tides for final water level correctors for the OPR-B310-FH-13 surveys.

The basis of this analysis is a comparison of discrete tidal zoning and Vertical Datum Transformation (VDatum) as methods for vertical control. Because discrete tidal zoning is the conventional and accepted method, it is regarded as a baseline for this evaluation.

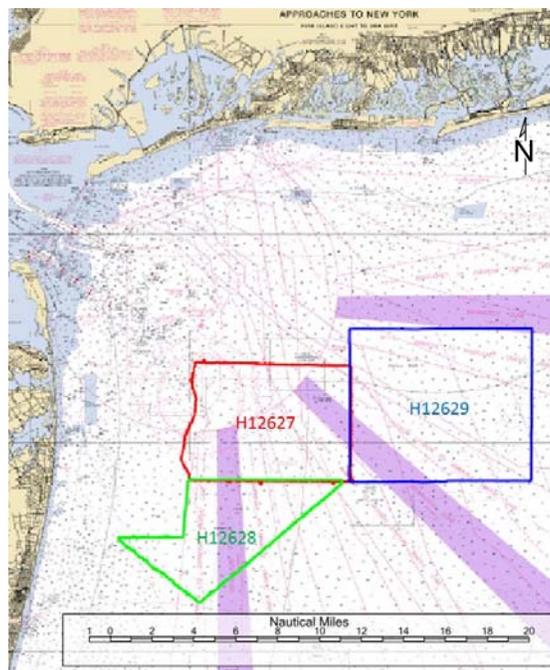
## 2.0 Procedure

The VDatum evaluation was conducted according to the instructions in Appendix 1 of the project instructions. Additional guidance found in the Pydro distribution (Pydro\Lib\site-packages\HSTP\Pydro\PostAcqTools\_CompareTSeries.docx) and followed for the direct comparison of data.

Project crossline data was reduced to Mean Lower Low Water (MLLW) via conventional discrete tidal zoning. The same set of crossline data was reduced using VDatum. Time series data for the nadir depth was extracted from both data sets and differenced using the Pydro PostAcq toolset.

In addition, CARIS surfaces of crossline and mainscheme data were analyzed in both discrete zoning and VDatum methods. This analysis was used to evaluate the internal consistency of data and detect any spatial patterns in the difference that may have suggested inconsistencies in the VDatum model.

Survey limits for the areas used in this assessment are shown in Figure 1.



**Figure 1:** Sheet limits for Project OPR-B310-FH-13. Sheets H12627, H12628 and H12629 were surveyed by *Ferdinand R. Hassler*.

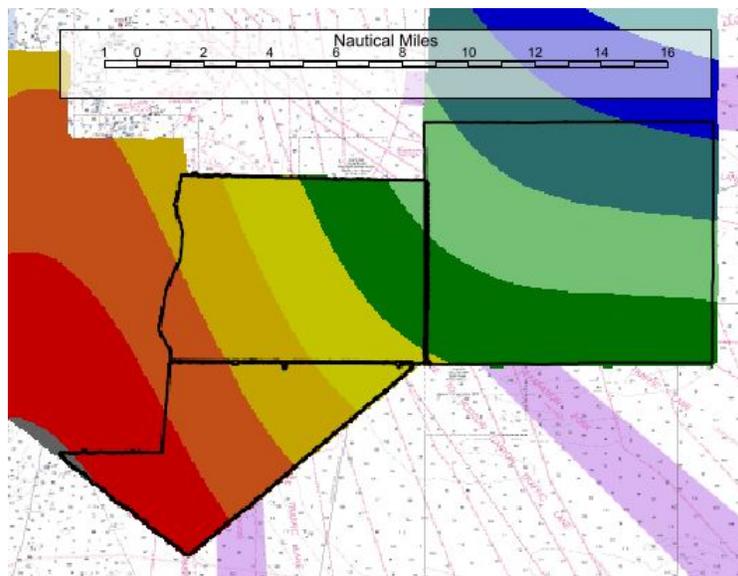
### 3.0 Results

This report will answer three questions:

- Is the VDatum model correct in the geographic location of this project?
- Is the internal consistency of the data improved by ERS methods?
- What method of vertical control is appropriate for specific surveys?

### 3.1 VDatum Model Accuracies

To analyze the VDatum model, the ellipsoid to MLLW .xyz separation file provided by HSD Operations was rendered as a surface. This was examined to assess the overall slope of the model within the survey area, and thus the magnitude of vertical error resulting from any horizontal offset. The surface was also inspected for errors that could be the result of inconsistencies within the VDatum model. This surface is shown in Figure 2.



**Figure 2.** 2013\_B310\_VDatum\_NAD83Ellip\_MLLW.xyz separation model overlaid with H12627, H12628 and H12629 survey areas. Colored bands correspond to 10 cm intervals.

As illustrated in Figure 2, the separation model is free of gaps and anomalies within the survey limits for OPR-B310-FH-13 (black outlines). Overall, the model appears adequate for use within the limits of the project.

In accordance with Appendix I of the Project Instructions, Pydro’s Post Acquisition Tool utility was used to compare the nadir depths from crossline data corrected with VDatum and with zoned tides. The results of this analysis are shown in Table 1.

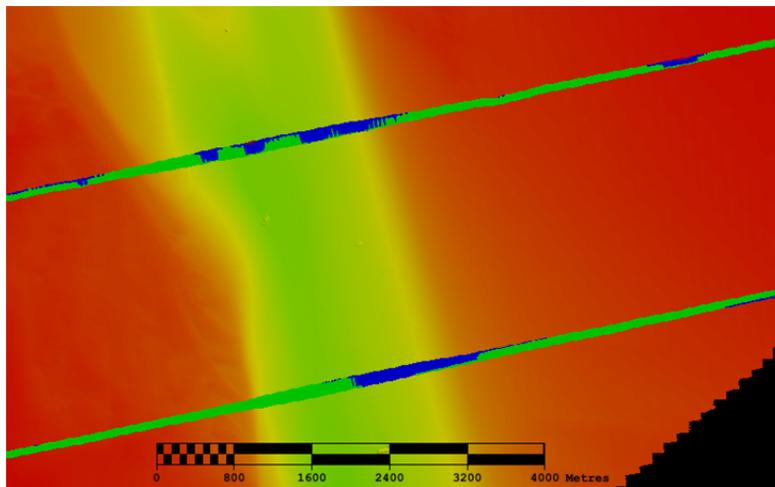
Sheet	Sonar Head	Mean	95% of nodes
H12627	Port	0.096	0.104
	Starboard	0.044	0.133
	Average	0.070	0.129
H12628	Port	0.006	0.137
	Starboard	-0.050	0.149
	Average	-0.023	0.155
H12629	Port	0.024	0.165
	Starboard	-0.053	0.333
	Average	-0.015	0.274

**Table 1.** Results of Pydro PostAcq Tools script run on OPR-B310-FH-13

The average differences of the nadir depths from crosslines range from 0.096 to -0.053 meters. These differences may arise from several different sources including: poor vertical GPS solutions, poor zoning model, errors in dynamic draft values and loading errors.

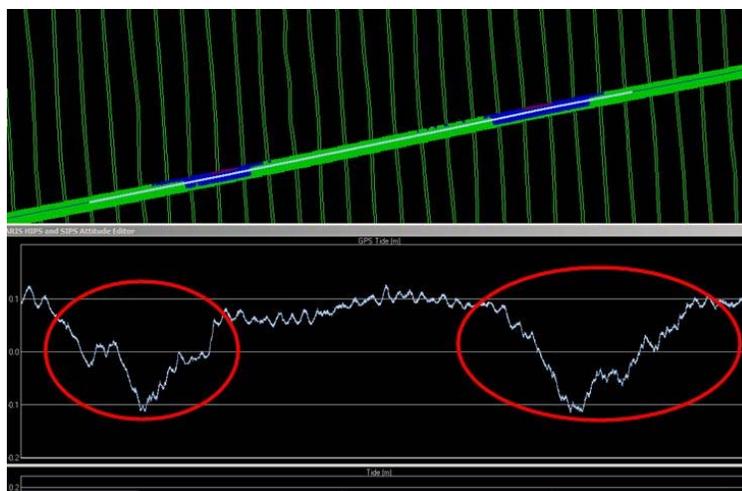
Water depths within the boundaries of this comparison range from 18 to 66 meters. The total allowable vertical uncertainty in this depth range is between 0.55 and 0.99 meters at 95% confidence, accounting for all errors. Of this total uncertainty, approximately 0.16 meters is budgeted for water level corrections. When adding the average and 95% of nodes values, the nadir crossline comparison exceeds the water level correction uncertainty budget on all sheets.

The statistics obtained for the nadir crossline comparisons alone cannot validate the VDatum model. Additional statistical analyses were performed with a differenced surface (discrete tides minus VDatum). This surface was created to examine spatial trends in the data. The crossline surfaces contain data from both port and starboard sonar heads. An image of the resulting surface for H12628 overlaid on the BASE surface is shown in Figure 3. The crossline surface is displayed with a color range file. Green indicates 'zero' (-0.01 to 0.01 m), blue displays divergence from zero (-0.2m to -0.01 and 0.01 to 0.2 m) and magenta is a further divergence from zero outside of the uncertainty budget for water level correction.



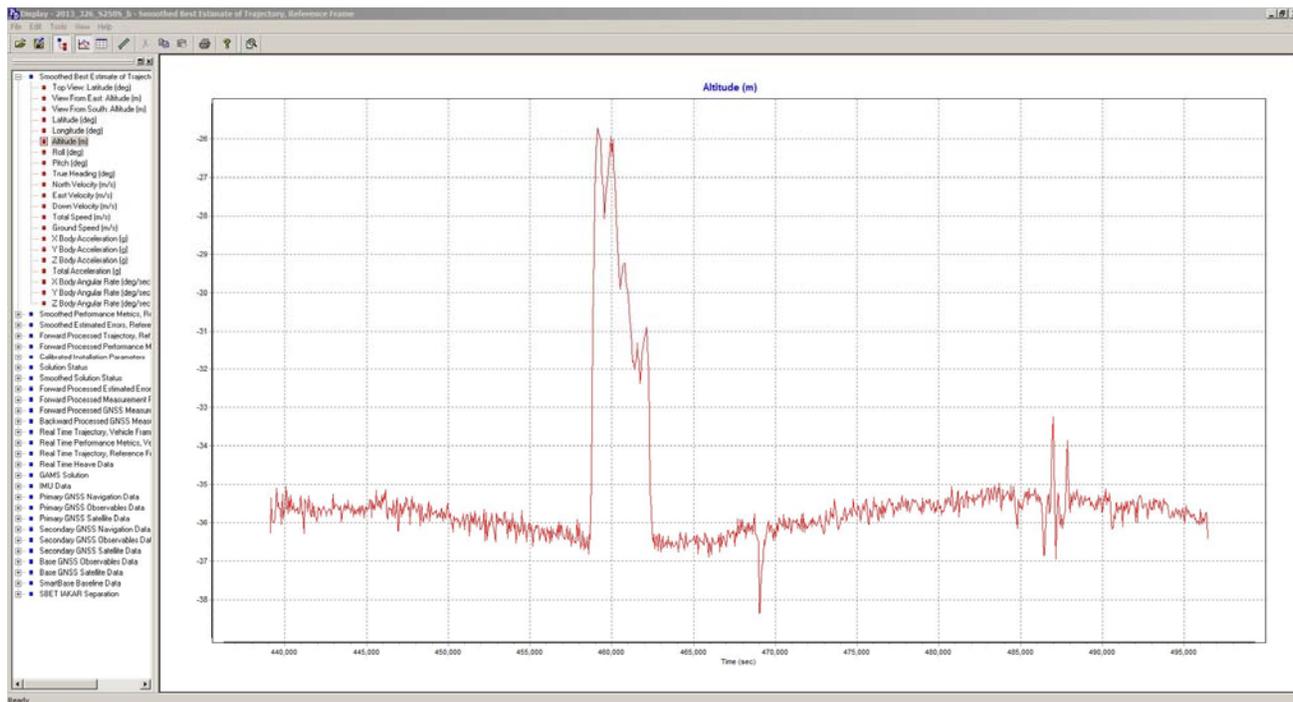
**Figure 3.** H12628 discrete zoned tides minus VDatum crossline CUBE surface.

No spatial trend is visible in the differenced crosslines. Rather, the differences appear to be random in location and of short (less than 10 minute) duration. Viewed in CARIS Attitude Editor, it is apparent that a suspect GPS tide solution correlates with these divergences from zero (Figure 4).



**Figure 4.** H12628 crossline viewed in CARIS Attitude Editor. The two areas showing divergence from zero (blue) correlate with a notable change in GPS tide (red circles).

The smooth best estimate of trajectory (SBET) contained unrealistic vertical anomalies throughout project OPR-B310-FH-13. Some GPS solutions have altitude spikes that separate from their probable correct value by 10 meters (Figure 5). The hydrographer believes these altitude spikes are responsible for higher statistical deviation between VDatum and zoned tides.



**Figure 5.** Altitude solution for 12 hours of acquisition on sheet H12629. Altitude changes exceed 10 meters from the perceived correct value.

Before this analysis was conducted some of these large vertical anomalies were interpolated using CARIS Attitude Editor. However, additional time will need to be spent by sheet managers insuring that these vertical anomalies are identified before final survey submittal. The reason for these large vertical separations is unknown. More research, time and effort will need to be allocated which goes beyond the scope of this report.

**3.2 Data Internal Consistency**

To analyze the internal consistency of ERS methods a crossline analysis was completed over the entire sheet for both discrete zoning and VDatum. The results of these differences are summarized in Table 2.

Sheet	Method	Mean	St.Dev.	95% of nodes
H12627	Discrete Zoning	-0.05	0.05	0.09
	VDatum	0.04	0.09	0.15
H12628	Discrete Zoning	-0.06	0.09	0.17
	VDatum	0.00	0.08	0.15
H12629	Discrete Zoning	-0.04	0.06	0.12
	VDatum	0.01	0.18	0.25

**Table 2.** Difference statistics for mainscheme minus crossline data.

The results show that VDatum provides the best mean difference value in all three surveys. However, the standard deviation is larger for the VDatum surfaces for two sheets (H12627 and H12629). This is likely attributed to the vertical anomalies discussed previously in this report. No interpolation was performed for survey H12629, but the reported statistics excluded approximately twenty survey lines which showed the worst post-processed solutions. Even without including these lines,

there is still much greater standard deviation when reduced with VDatum. Conversely, survey H12628 has fewer vertical anomalies than other sheets during OPR-B310-FH-13 and thus, a lower standard deviation when reduced by VDatum. Figures 6 through 8 show the distribution of differences for the three surveys.

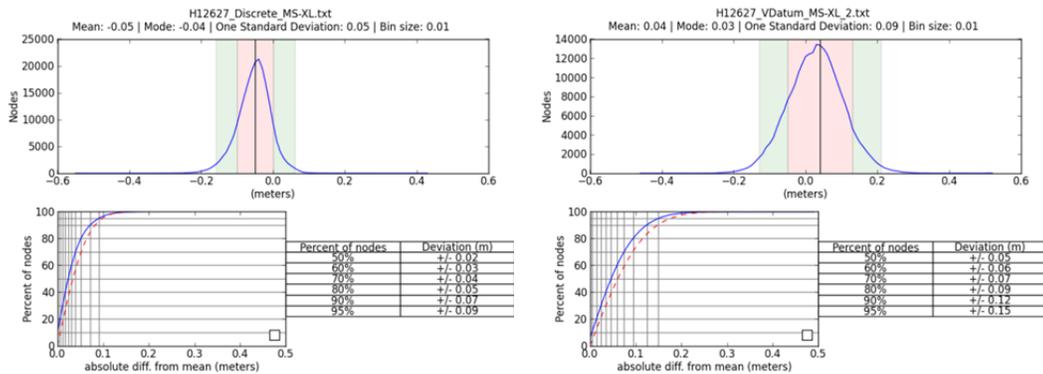


Figure 6. Distribution of differences for discrete zoning (left) and VDatum (right) for survey H12627.

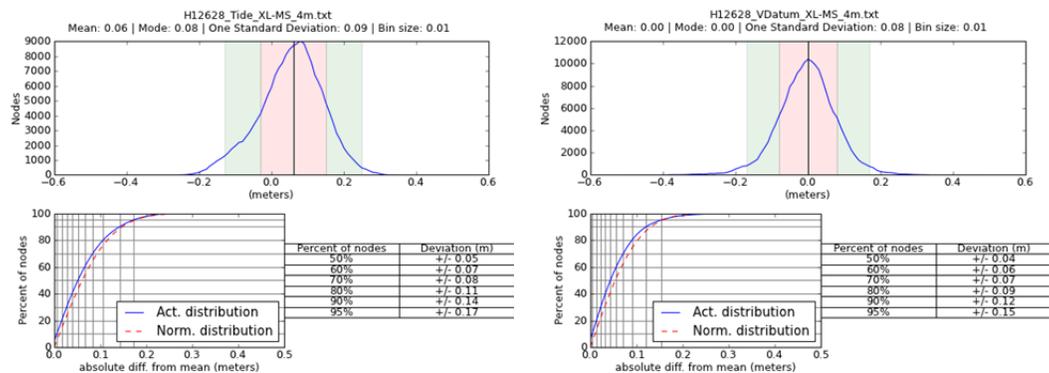


Figure 7. Distribution of differences for discrete zoning (left) and VDatum (right) for survey H12628.

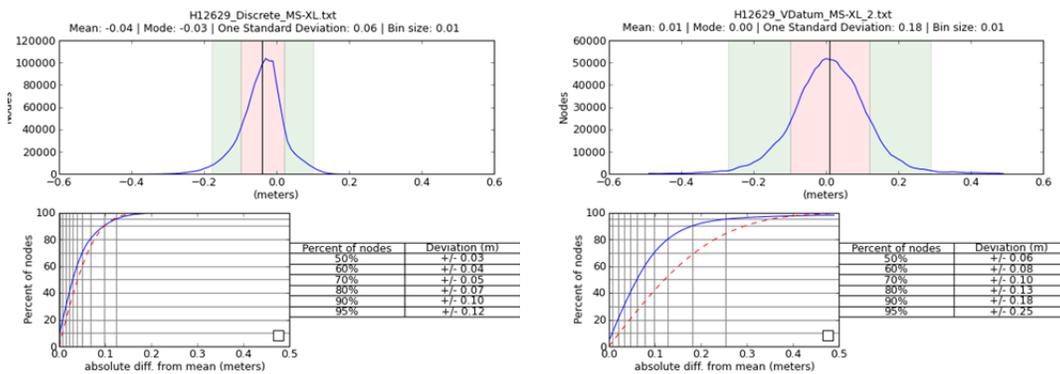


Figure 8. Distribution of differences for discrete zoning (left) and VDatum (right) for survey H12629.

#### 4.0 Discussion

The comparison between discrete tides and VDatum indicates that the VDatum model for this area accurately reduces the data to MLLW. In addition, the average internal consistency between surfaces reduced with VDatum is better than with discrete zoned tides applied. The hydrographer believes the VDatum model for this area to be accurate.

However, post-processed solutions were not consistently accurate for the entirety of OPR-B310-FH-13. After SBET application, several lines exhibited unrealistic vertical offsets during periods of low positional accuracy. The absence of good vertical solutions for the entirety of the project negatively affected the overall statistical agreement.

In the end, MLLW correctors reduced by VDatum eliminate several sources of vertical errors that can be attributed to traditional tide models and ship water line estimators, such as dynamic draft. An ERS approach is therefore desired when possible. However, ERS and VDatum require good vertical position solutions to be effective. If a survey contains excessive poor post-processed position solutions, it will be necessary to reduce with discrete zoned tides. As such, the application of VDatum should be performed on a sheet by sheet basis. The hydrographer is confident that the VDatum model in this geographic location is valid and should be used if reliable post-processed vertical solutions are available.

## 5.0 Recommendation

For surveys H12627 and H12628, the comparison between VDatum and discrete zoning is close to the acceptable range of uncertainty. Isolated areas of poor post-processed position data will need to be interpolated with CARIS Attitude Editor or reduced with discrete zoned tides resulting in the submission of a hybrid survey.

In the case of H12629, poor post-processed position data were prevalent, thus VDatum is not a valid solution. It is recommended that discrete zoned tides be used exclusively to reduce data within the sheet limits of H12629.

Table 3 summarizes the recommendations for OPR-B310-FH-13.

Sheet	Recommended Method	Reasoning
H12627	VDatum	Interpolation improves internal consistency, minimal lines will need to be reduced via discrete zoning
H12628	VDatum	Interpolation improves internal consistency, few vertical anomalies, minimal lines will need to be reduced via discrete zoning
H12629	Discrete Zoning	Interpolation required on vertical solutions would be labor-intensive as vertical anomalies are present in approximately half of the data, discrete zoning is within acceptable uncertainty

**Table 3.** Recommended MLLW reduction methods for OPR-B310-FH-13 data.

We further recommend this VDatum model be considered for use with future surveys in the area.

----- Forwarded message -----

From: **Lijuan Huang - NOAA Affiliate** <[lijuan.huang@noaa.gov](mailto:lijuan.huang@noaa.gov)>

Date: Wed, Nov 27, 2013 at 3:05 PM

Subject: Final Tide Notes for OPR-B310-FH-2013, H12627 and H12628

To: "CO.Ferdinand Hassler - NOAA Service Account" <[co.ferdinand.hassler@noaa.gov](mailto:co.ferdinand.hassler@noaa.gov)>, "OPS.Ferdinand Hassler - NOAA Service Account" <[ops.ferdinand.hassler@noaa.gov](mailto:ops.ferdinand.hassler@noaa.gov)>

Cc: "\_NOS.CO-OPS.HPT" <[nos.coops.hpt@noaa.gov](mailto:nos.coops.hpt@noaa.gov)>, Corey Allen - NOAA Federal <[corey.allen@noaa.gov](mailto:corey.allen@noaa.gov)>, Michael Gonsalves - NOAA Federal <[michael.gonsalves@noaa.gov](mailto:michael.gonsalves@noaa.gov)>, Abigail Higgins - NOAA Federal <[abigail.higgins@noaa.gov](mailto:abigail.higgins@noaa.gov)>

DATE: 11/27/2013

MEMORANDUM FOR: LCDR Benjamin K. Evans  
Commanding Officer, NOAA Ship Ferdinand Hassler

FROM: Gerald Hovis  
Chief, Products and Services Branch, N/OPS3

SUBJECT: Delivery of Tide Requirements for Hydrographic Surveys

This is notification that the preliminary zoning is accepted as the final zoning for survey project OPR-B310-FH-2013, H12627 and H12628 from October 21 to November 6, 2013. The accepted reference station for registry Nos. H12627 and H12628 is Sandy Hook, NJ (8531680). Included with this memo are the Tide Notes in .PDF format, stating the preliminary zoning has been accepted as the final zoning.

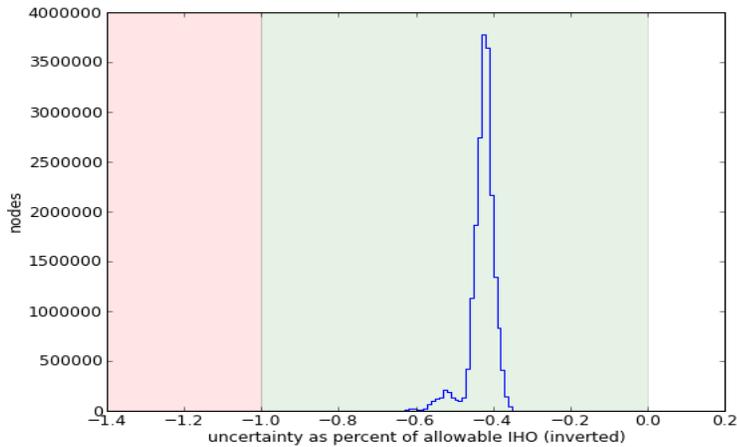
# H12628\_2m

The finalized surface has 19934042 nodes with 1189609714 soundings.

## Uncertainty Standards

**100.00% | PASS**

Nodes with Uncertainty less then or equal allowable IHO error **100.00%** (19934037/19934042).



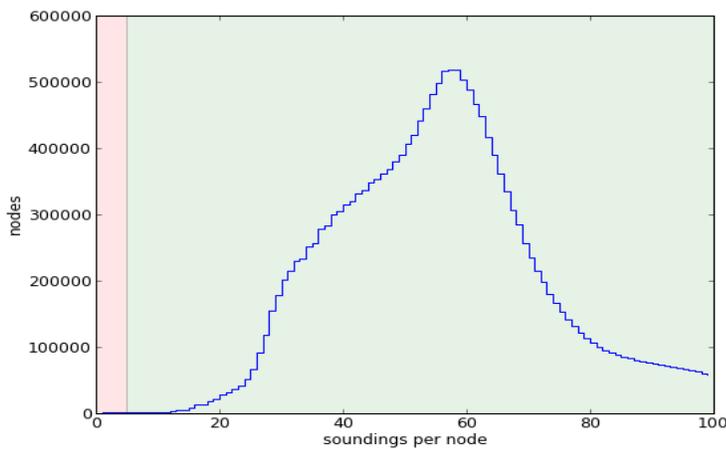
## Object Detection Coverage

**99.97% | PASS**

Nodes with 5 or more soundings **99.97%** (19928985/19934042).

Sounding count average is **59.68** soundings per node.

Sounding count mode is **58** soundings per node.



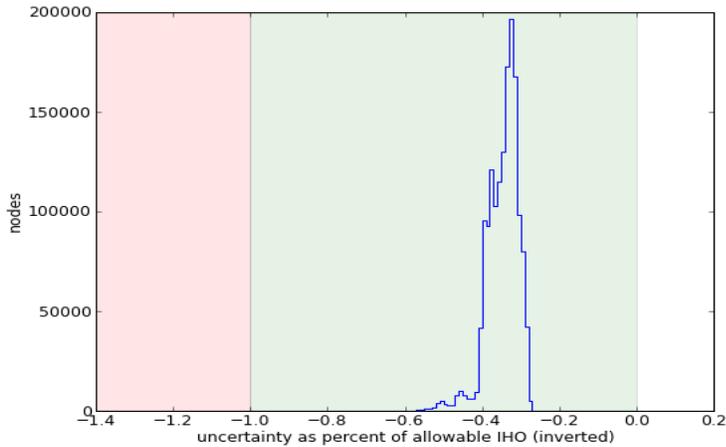
# H12628\_4m

The finalized surface has 1532957 nodes with 205632182 soundings.

## Uncertainty Standards

**100.00% | PASS**

Nodes with Uncertainty less then or equal allowable IHO error **100.00%** (1532957/1532957).



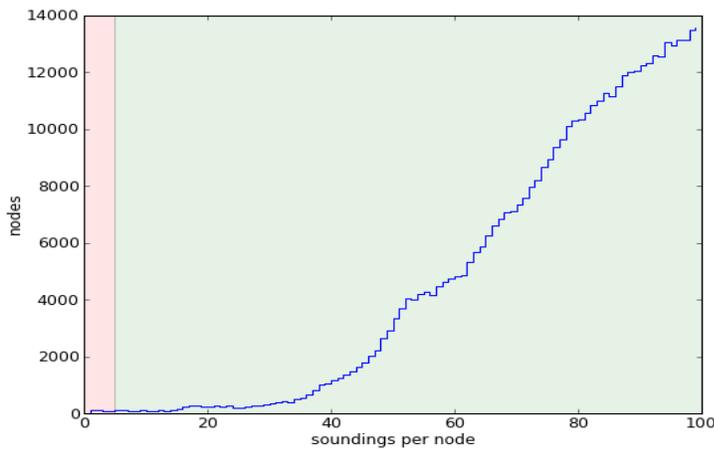
## Object Detection Coverage

**99.97% | PASS**

Nodes with 5 or more soundings **99.97%** (1532567/1532957).

Sounding count average is **134.14** soundings per node.

Sounding count mode is **100** soundings per node.



John Kidd - NOAA  
Federal <[john.kidd@noaa.gov](mailto:john.kidd@noaa.gov)> 2:44 PM (1 hour ago)  
to me

Junctions

Very Respectfully,

LTJG John Kidd  
National Oceanic and Atmospheric Administration  
NOAA Ship *Ferdinand R. Hassler*  
OPS-in-Training/NAVO  
Cell: [\(757\) 577-2905](tel:(757)577-2905)  
[john.kidd@noaa.gov](mailto:john.kidd@noaa.gov)

----- Forwarded message -----  
From: **Lucy Hick - NOAA Federal** <[lucy.hick@noaa.gov](mailto:lucy.hick@noaa.gov)>  
Date: Mon, Jan 6, 2014 at 9:43 PM  
Subject: Fwd: Request for junctioning data  
To: John Kidd - NOAA Federal <[john.kidd@noaa.gov](mailto:john.kidd@noaa.gov)>

Hi John,

Please let me know if you need anything else from C&C and I will contact them.

Best Regards,  
Lucy

----- Forwarded message -----  
From: **Nicole Kuenzel** <[nicole.kuenzel@cctechnol.com](mailto:nicole.kuenzel@cctechnol.com)>  
Date: Mon, Jan 6, 2014 at 4:35 PM  
Subject: Re: Request for junctioning data  
To: John Kidd - NOAA Federal <[john.kidd@noaa.gov](mailto:john.kidd@noaa.gov)>  
Cc: [tara.levy@cctechnol.com](mailto:tara.levy@cctechnol.com), Lucy Hick - NOAA Federal <[lucy.hick@noaa.gov](mailto:lucy.hick@noaa.gov)>, Michael Gonsalves - NOAA Federal <[michael.gonsalves@noaa.gov](mailto:michael.gonsalves@noaa.gov)>, Melissa Sampson - NOAA Federal <[melissa.r.sampson@noaa.gov](mailto:melissa.r.sampson@noaa.gov)>

Good Afternoon,

We have generated 2 meter BASE surfaces of all of H12610 and the eastern portion of H12608. These are preliminary grids; we're still in the process of reviewing the data. In contrast to the Junction image, H12609 and H12610 were split vertically instead of horizontally. H12610 should cover everything on the eastern margin. If there is anything that is not covered along the southern margin, please let us know and we can do a small grid of H12609 as well.

We have included the .csar and .csar0 files and the data is located:

[ftp://ftp.cctechnol.com/pub/outgoing/OPR-C319-KR-13\\_Junctions\\_01-06-2014.zip](ftp://ftp.cctechnol.com/pub/outgoing/OPR-C319-KR-13_Junctions_01-06-2014.zip)

Let us know if there are any other files you may require.

Thank-you,  
Nikki

On 1/6/2014 8:25 AM, John Kidd - NOAA Federal wrote:  
Tara,

Just wanted to check on the status of the requested junction surveys H12608, H12609, H126010 for project OPR-C319-KR-13, New York Harbor.

Very Respectfully,

LTJG John Kidd  
National Oceanic and Atmospheric Administration  
NOAA Ship *Ferdinand R. Hassler*  
OPS-in-Training/NAVO

Cell: [\(757\) 577-2905](tel:757-577-2905)  
[john.kidd@noaa.gov](mailto:john.kidd@noaa.gov)

On Sat, Dec 28, 2013 at 3:21 PM, Tara Levy <[tara.levy@cctechol.com](mailto:tara.levy@cctechol.com)> wrote:

Good Morning Lucy,

I hope you had a good Christmas!

We can provide you with grids for these area. Currently we are both offshore but will be back in the office Jan 2nd.

We can get them to you by the end of next week (latest) if that is okay with you.

It should not take too much effort as we already have preliminary sections done.

Thanks

Tara

On 12/27/2013 9:55 AM, Lucy Hick - NOAA Federal wrote:  
Tara & Nikki,

The *Ferdinand R. Hassler* is interested in junctioning with the following C&C Approaches to NY surveys: H12608, H12609, H12610 (OPR-C319-KR-13). In particular, they're interested in obtaining 2m resolution grids. Would it be possible for you to provide me grids for these sheets, which I could then pass on to the FH? It is too much effort to grid the entire sheets, simply providing grids for the overlapping region would be helpful. A sheet layout is attached, indicating the sheets (#1 & #2) where the FH is working.

Any help would be greatly appreciated.

Thank You,  
Lucy

--

**Lucy Hick**

Physical Scientist / COR Level 1

Hydrographic Surveys Division - Operations Branch

Office of Coast Survey

National Oceanic & Atmospheric Administration

[\(301\) 713-2702 x107](tel:301-713-2702x107)

[Lucy.Hick@noaa.gov](mailto:Lucy.Hick@noaa.gov)

---



OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov>

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## OPR-B310-FH-13; H12627 & H12628

1 message

---

OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov>

Fri, Nov 15, 2013 at 8:50 PM

To: Final Tides - NOAA Service Account <Final.Tides@noaa.gov>, Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov>, David Moehl - NOAA Federal <david.t.moehl@noaa.gov>, Adam Reed - NOAA Federal <adam.reed@noaa.gov>

Good Afternoon,  
Attached, please find final tides requests for OPR-B310-FH-13, registries H12627 & H12628.  
Thank you kindly.

Regards,  
Madeleine

Field Operations Officer, *NOAA Ship Ferdinand R. Hassler*  
29 Wentworth Road  
New Castle, NH, 03854

---

### 4 attachments

 **H12627\_Final\_Tide\_Request.pdf**  
35K

 **H12627\_Final\_Tide\_Request.zip**  
196K

 **H12628\_Final\_Tide\_Request.pdf**  
34K

 **H12628\_Final\_Tide\_Request.zip**  
155K



OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov>

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## OPR-B310-FH-13, Survey Outline

---

OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov>

Mon, Nov 25, 2013 at 6:23 PM

To: \_NOS OCS Survey Outlines <survey.outlines@noaa.gov>

Cc: Adam Reed - NOAA Federal <adam.reed@noaa.gov>, "NAV.Ferdinand Hassler - NOAA Service Account" <NAV.Ferdinand.Hassler@noaa.gov>, David Moehl - NOAA Federal <david.t.moehl@noaa.gov>, Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov>

Good Afternoon,

Attached, please find the final survey outlines for project OPR-B310-FH-13 registry H12628.

Thank you.

Kindly,

Madeleine

Field Operations Officer, *NOAA Ship Ferdinand R. Hassler*  
29 Wentworth Road  
New Castle, NH, 03854

On Sat, Nov 23, 2013 at 7:22 PM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:

[Quoted text hidden]

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 **H12628\_SurveyOutline.000**  
11K



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL OCEAN SERVICE  
Office of Coast Survey  
Silver Spring, Maryland 20910-3282

February 27, 2014

MEMORANDUM FOR: LCDR Marc S. Moser, NOAA  
Commanding Officer, NOAA Ship *Ferdinand Hassler*

FROM: Jeffrey Ferguson  
Chief, Hydrographic Surveys Division

SUBJECT: Vertical Datum Transformation Technique,  
OPR-B310-FH-13, Approaches to New York, NY

Hydrographic surveys H12627 & H12628 are approved for vertical reduction to chart datum, Mean Lower Low Water (MLLW), using the NOAA Vertical Datum Transformation (VDatum) (<http://vdatum.noaa.gov>) derived separation (SEP) model.

Approval of VDatum, in lieu of the NOAA Center for Operational Oceanographic Products and Services (CO-OPS) discrete zoning package as per the Project Instructions, is based on your recommendation and the review of comparison results you included in your attached email from January 3, 2014.

The results of the data analysis show that ellipsoidally referenced survey (ERS) techniques with VDatum used as the vertical datum reducer meet or exceed horizontal and vertical specifications for hydrographic surveys.

The comparison techniques are in line with the procedures that were developed and approved as part of the CSDL Ellipsoidally Referenced Survey (ERS) project. These procedures and deliverables were recently added to the April 2013 edition of the NOS Hydrographic Surveys Specifications and Deliverables document.

You shall include a description of your ERS processing procedures and the comparisons you conducted between ERS and traditional tides or prior survey data in the appropriate Descriptive Report (DR), Horizontal and Vertical Control Report and/or Data Acquisition and Processing Report. As appropriate in the DR, document specific vessel day(s) or line(s) that have not been processed using VDatum as the vertical reducer to MLLW where discrete zoning provides better results and/or where vertical uncertainties of your post processed vertical positional data are inaccurate.

Include this memo in the supplemental correspondence Appendix of the DR.



## APPENDIX III

### SURVEY FEATURES REPORT

DToNs - none

AWOIS - two

Wrecks - five

Maritime Boundaries - none

# H12628\_Features\_edited

**Registry Number:**

**State:**

**Locality:**

**Sub-locality:**

**Project Number:**

**Survey Dates:** 01/01/1981 - 11/06/2013

## Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
12326	50th	05/01/2006	1:80,000 (12326_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

No.	Name	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	AWOIS Item 1524	Wreck	17.45 m	40° 13' 50.8" N	073° 50' 34.4" W	1524
1.2	AWOIS Item 1529	GP	[None]	40° 15' 55.8" N	073° 47' 30.4" W	1529
1.3	AWOIS Item 4740	Wreck	41.61 m	40° 16' 44.7" N	073° 47' 22.5" W	4740
2.1	AWOIS Item 1524	Wreck	17.45 m	40° 13' 50.8" N	073° 50' 34.4" W	---
2.2	Non-dangerous 99 foot wreck	Wreck	30.16 m	40° 15' 57.5" N	073° 49' 01.7" W	---
2.3	Non-dangerous 121 foot wrecks	Wreck	37.04 m	40° 17' 58.7" N	073° 48' 41.4" W	---
2.4	Non-dangerous 150 foot wreckage	Wreck	45.76 m	40° 17' 49.4" N	073° 47' 37.4" W	---
2.5	AWOIS Item 4740	Wreck	41.61 m	40° 16' 44.7" N	073° 47' 22.5" W	---
2.6	Non-dangerous 173 foot wreck	Wreck	52.70 m	40° 16' 36.8" N	073° 46' 42.0" W	---
2.7	Non-dangerous 155 foot wreck	Wreck	47.28 m	40° 15' 28.0" N	073° 46' 29.6" W	---

## **1 - AWOIS Features**

## 1.1) AWOIS Item 1524

### Feature for AWOIS Item #1524

**Search Position:** 40° 13' 50.8" N, 073° 50' 34.4" W  
**Historical Depth:** 17.45 m  
**Search Radius:** 250  
**Search Technique:** Type: PINTA, Itemstatus: ASSIGNED, Searchtype: FULL, Technique: SSS  
 MBES VBES DI

#### Technique Notes:

#### History Notes:

##### History

HISTORY NM22/63--6/1/63; DUTCH M/V PINTA HAS SUNK IN 78 FT. OF WATER IN ì PA LAT 40-13-42N LONG 73-50-12W; WRECK IS UNMARKED LIES IN A ì NORTH-SOUTH DIRECTION AND HAS ABOUT 45 FT. OF WATER OVER IT. ì (ENTERED MSM 1/88) H9531/75--OPR-517-PE-75; PSR ITEM 6; DEVELOPED AND DIVER ì INVESTIGATED; LEADLINE LEAST DEPTH OF 58 FT.; WRECK LOCATED 600M ì NW OF CHARTED POSITION IN LAT 40-13-49.2N LONG 73-50-39.0W; ì RECOMMENDED RELOCATE WRECK ON CHART AND REVISE LEAST DEPTH.ì (UPDATED MSM 1/88) DESCRIPTION 195 LORAN C RATES PROVIDED BY MR. RICHARD TARACKA GREENWICH CT. ì POLICE DEPARTMENT TEL NO 203-622-8020; 9960-X 26880.5 9960-Y ì 43563.5. (ENTERED MSM 4/90)

### Survey Summary

**Survey Position:** 40° 13' 50.8" N, 073° 50' 34.4" W  
**Least Depth:** 17.45 m (= 57.23 ft = 9.539 fm = 9 fm 3.23 ft)  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh) [None] ; TVU (TPEv) [None]  
**Timestamp:** 2013-310.00:00:00.000 (11/06/2013)  
**Dataset:** H12628\_Features for PYDRO.000  
**FOID:** 0\_0001063366 00001(FFFE001039C60001)  
**Charts Affected:** 12326\_1, 12300\_1, 13006\_1, 5161\_1, 13003\_1

#### Remarks:

WRECKS/remrks: Wreck found with new least depth

### Feature Correlation

Source	Feature	Range	Azimuth	Status
H12628_Features for PYDRO.000	0_0001063366 00001	0.00	000.0	Primary

## Hydrographer Recommendations

Update least depth on dangerous wreck

### Cartographically-Rounded Depth (Affected Charts):

57ft (12326\_1)

9 ½fm (12300\_1, 13006\_1, 13003\_1)

17.4m (5161\_1)

### S-57 Data

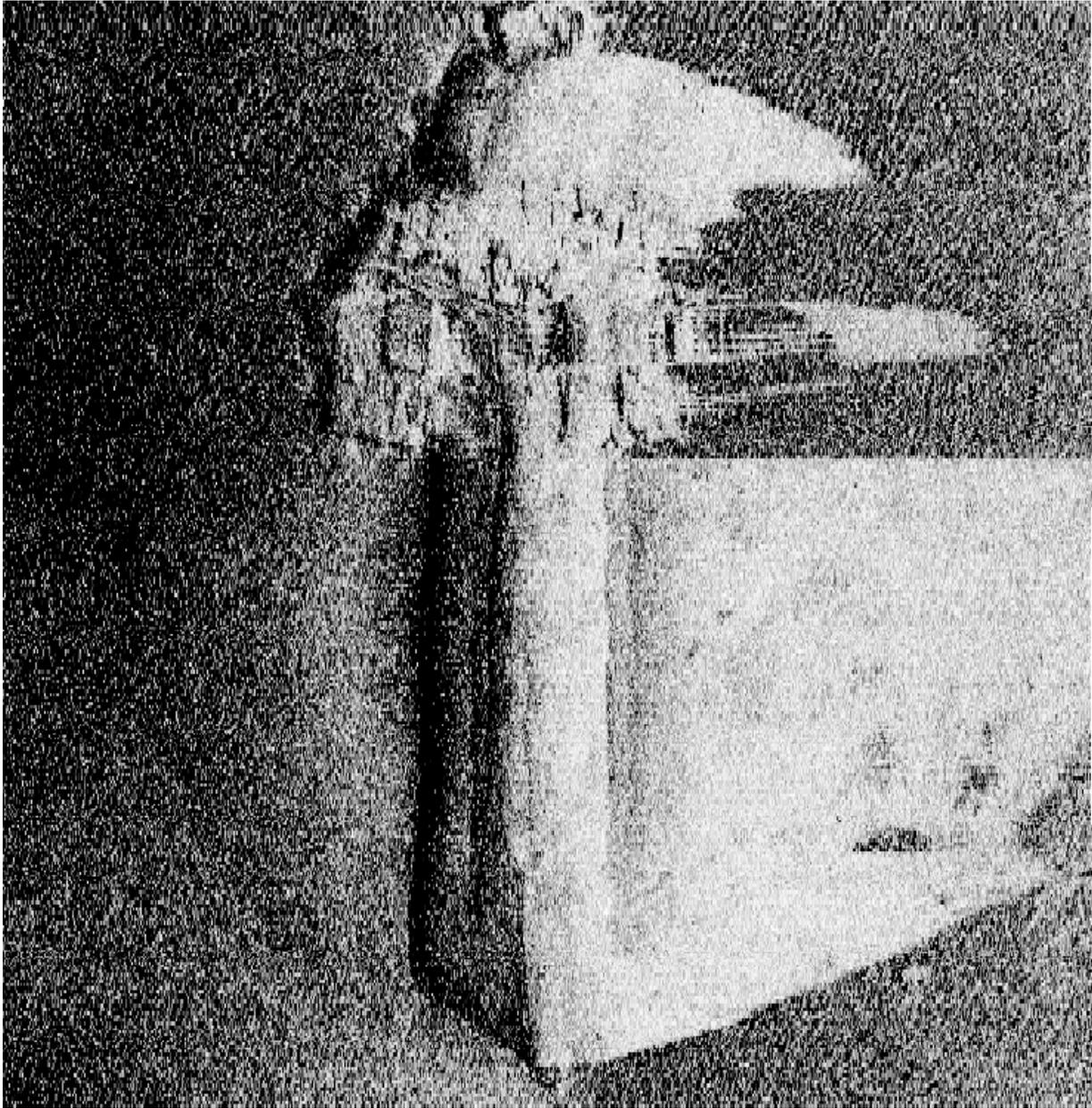
**Geo object 1:** Wreck (WRECKS)  
**Attributes:** CATWRK - 2:dangerous wreck  
NINFOM - Add wreck  
QUASOU - 6:least depth known  
SORDAT - 20131106  
SORIND - US,US,graph,H12628  
TECSOU - 3:found by multi-beam  
VALSOU - 17.445 m  
WATLEV - 3:always under water/submerged

### Office Notes

**SAR NOTES:** Concur. AWOIS item #1524 (Dutch M/V "Pinta") ensouffied with complete MBES. Feature is significant and verified as per survey data. Defer final charting exposition to AHB Compile Team.

**Compilation:** Concur. Delete charted dangerous sunken wreck symbol and add a dangerous sunken wreck, least depth 57.23 feet, in the present survey position.

## Feature Images



*Figure 1.1.1*

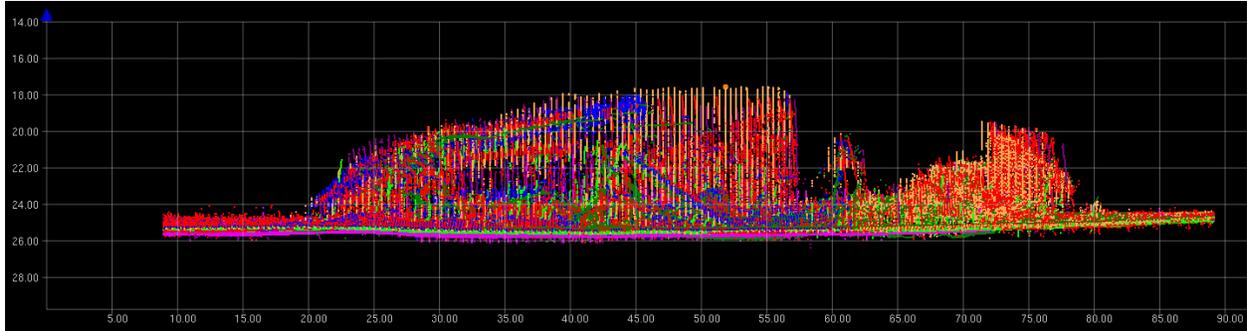


Figure 1.1.2

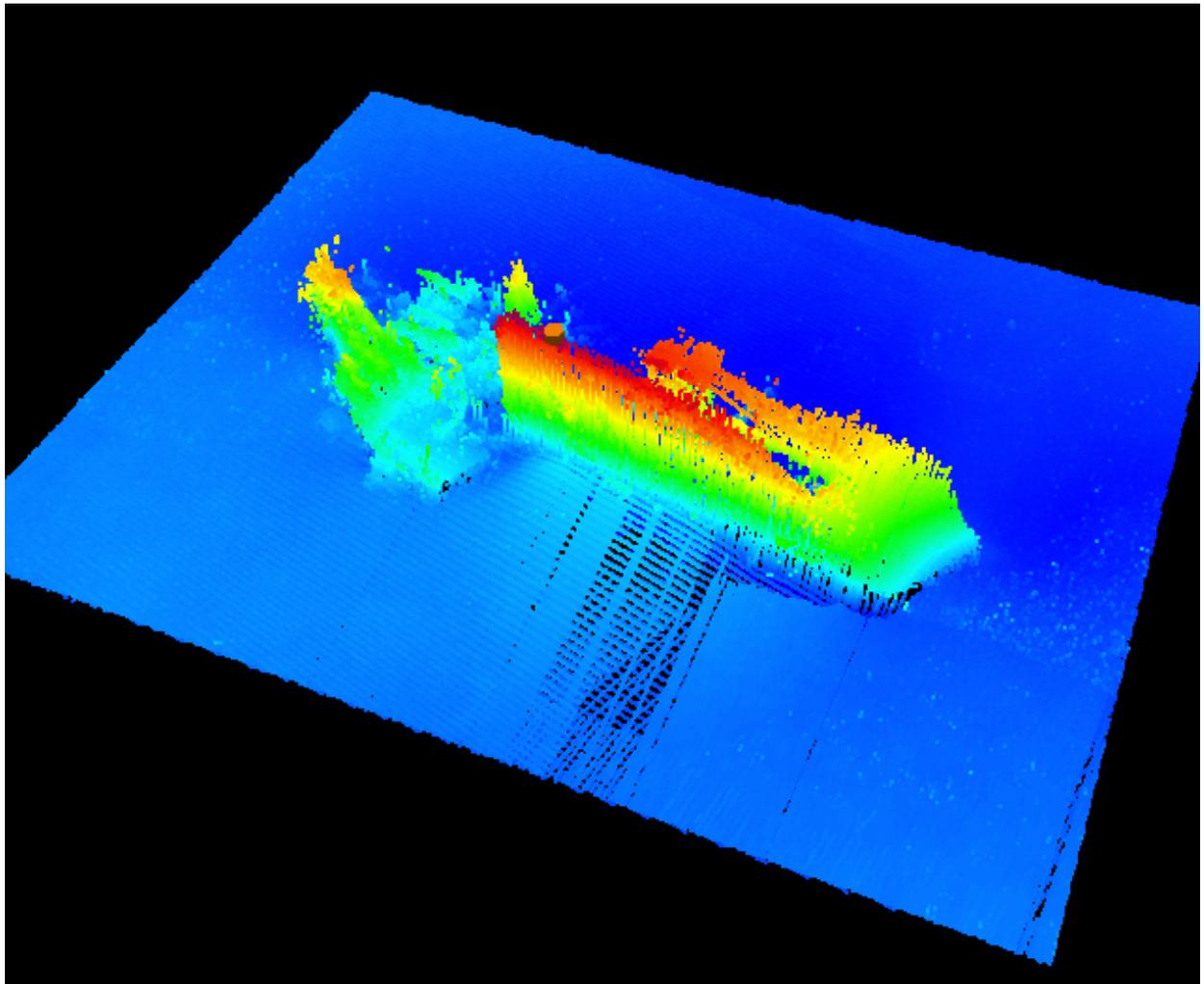


Figure 1.1.3



*Figure 1.1.4*

## 1.2) AWOIS Item 1529

### Feature for AWOIS Item #1529

**Search Position:** 40° 15' 55.8" N, 073° 47' 30.4" W  
**Historical Depth:** [None]  
**Search Radius:** 500  
**Search Technique:** Type: IONNIS P. GOULANDRIS, Itemstatus: ASSIGNED, Searchtype: FULL, Technique: SSS MBES VBES DI

**Technique Notes:**

**History Notes:**

History

DESCRIPTION 24 NO.359; CARGO 3750 GT; SUNK 10/1/42 BY MARINE CASUALTY; POSITION ACCUR ì WITHIN 1 MILE. POS.40-16-12N 73-56-31W; REPORTED DEMOLISHED (SOURCE UNK) ì REPORTED LOCATED (SOURCE UNK) 195 27 REPORTED THROUGH ESF 4/13/44 AT 40-15-54N 73-47-38W. 195 LORAN C RATES PROVIDED BY MR. RICHARD TARACKA GREENWICH ì CT. POLICE DEPARTMENT TEL NO 203-622-8020; 9960-X 26852.5 ì 9960-Y 43575.3. (ENTERED MSM 4/90)

### Survey Summary

**Survey Position:** 40° 15' 55.8" N, 073° 47' 30.4" W  
**Least Depth:** [None]  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh) [None] ; TVU (TPEv) [None]  
**Timestamp:** 1981-001.00:00:00.000 (01/01/1981)  
**Dataset:** H12628\_Features for PYDRO.000  
**FOID:** 0\_ 0001063435 00001(FFFE00103A0B0001)  
**Charts Affected:** 12326\_1, 12300\_1, 13006\_1, 5161\_1, 13003\_1

**Remarks:**

\$CSYMB/remrks: Rep. destroyed wreck (AWOIS #1529) disproved with 100% MBES.

### Feature Correlation

Source	Feature	Range	Azimuth	Status
H12628_Features for PYDRO.000	0_ 0001063435 00001	0.00	000.0	Primary

## Hydrographer Recommendations

Remove charted wreck.

### S-57 Data

**Geo object 1:** Cartographic symbol (\$CSYMB)  
**Attributes:** NINFOM - Delete charted wreck  
NTXTDS - ENC US4NY1AM,ED27,Update 8

### Office Notes

SAR NOTES: Concur. AWOIS item #1529 was ensonified with complete coverage MBES. No evidence of this feature was found. This feature is considered disproved. Defer the final charting disposition to AHB Compile Team.

COMPILATION: Concur. Delete charted dangerous wreck, depth unknown, (rep destroyed) and update the chart with present survey depths.

### 1.3) AWOIS Item 4740

#### Feature for AWOIS Item #4740

**Search Position:** 40° 16' 44.7" N, 073° 47' 22.5" W  
**Historical Depth:** 41.61 m  
**Search Radius:** 200  
**Search Technique:** Type: UNKNOWN, Itemstatus: ASSIGNED, Searchtype: FULL, Technique: MBES VBES

**Technique Notes:**

**History Notes:**

History

04740 DESCRIPTION \*\*\*\* MEMO FROM LTJG CRAIG MCLEAN; NOAA SHIP ALBATROSS IV NOTICE AN OBSTRUCTION ON THE FATHOMETER DURING A SURVEY OF A 9 SQ MI AREA OF NY BIGHT ON MAY 17 1987; 149 FT OF WATER OVER WK IN 200 FT; LOCAL FISHERMEN BELIEVE IT IS THE WK OF THE CHOAPA (AWOIS ITEM 1521); DUE TO WATER DEPTHS IT IS NOT CONSIDERED A HAZARD TO NAVIGATION; 9960 LORAN C RATES: W-15451.8; X-26863.9; Y-43590.5; Z-59827.3 (ENTERED MSM 6/87) SURVEY REQUIREMENTS NOT ASSIGNED

#### Survey Summary

**Survey Position:** 40° 16' 44.7" N, 073° 47' 22.5" W  
**Least Depth:** 41.61 m (= 136.52 ft = 22.754 fm = 22 fm 4.52 ft)  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh) [None] ; TVU (TPEv) [None]  
**Timestamp:** 2013-310.00:00:00.000 (11/06/2013)  
**Dataset:** H12628\_Features for PYDRO.000  
**FOID:** 0\_ 0001063448 00001(FFFE00103A180001)  
**Charts Affected:** 12326\_1, 12300\_1, 13006\_1, 5161\_1, 13003\_1

**Remarks:**

WRECKS/remrks: AWOIS item #4740 new location and updated depth

#### Feature Correlation

Source	Feature	Range	Azimuth	Status
H12628_Features for PYDRO.000	0_ 0001063448 00001	0.00	000.0	Primary

## Hydrographer Recommendations

Chart new location and depth of wreck

### Cartographically-Rounded Depth (Affected Charts):

136ft (12326\_1)

23ft (12300\_1, 13006\_1, 13003\_1)

41m (5161\_1)

### S-57 Data

**Geo object 1:** Wreck (WRECKS)  
**Attributes:** CATWRK - 1:non-dangerous wreck  
NINFOM - Add Wreck  
QUASOU - 6:least depth known  
SORDAT - 20131106  
SORIND - US,US,graph,H12628  
TECSOU - 3:found by multi-beam  
VALSOU - 41.612 m  
WATLEV - 3:always under water/submerged

### Office Notes

**SAR NOTES:** Concur. AWOIS item #4740 exists approx 185m SE of charted location. AWOIS item #4740 sonified with complete coverage MBES. Feature is significant and verified as per survey data. Defer the final charting disposition to AHB Compile Team.

**COMPILATION:** Concur. Delete charted non-dangerous wreck (149 ft rep). Add a non-dangerous wreck, least depth 136.52 feet, in the present survey position.

### Feature Images

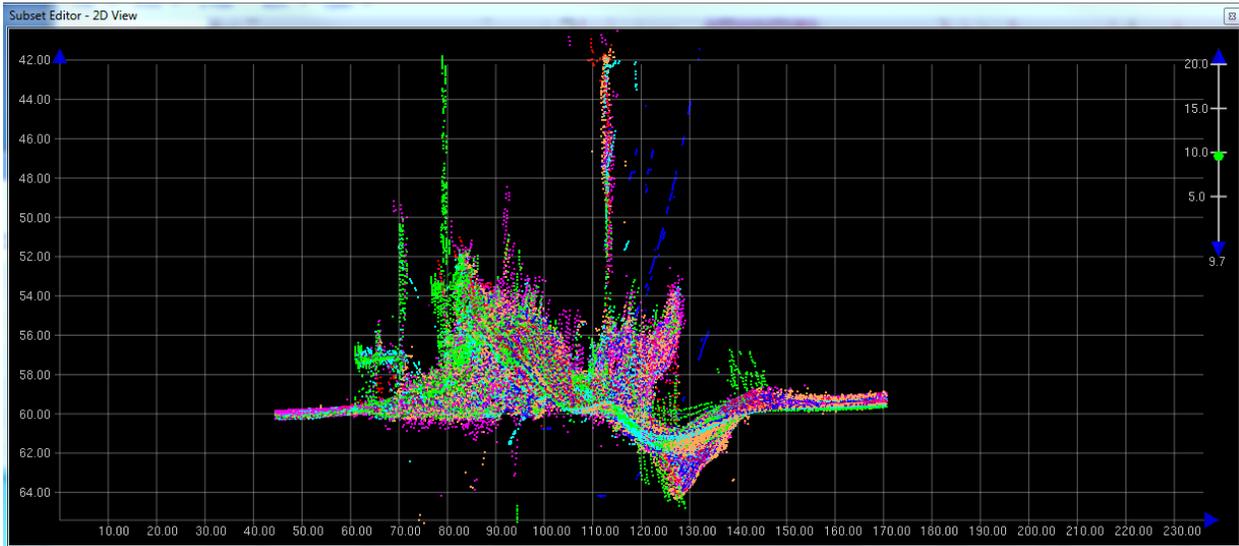
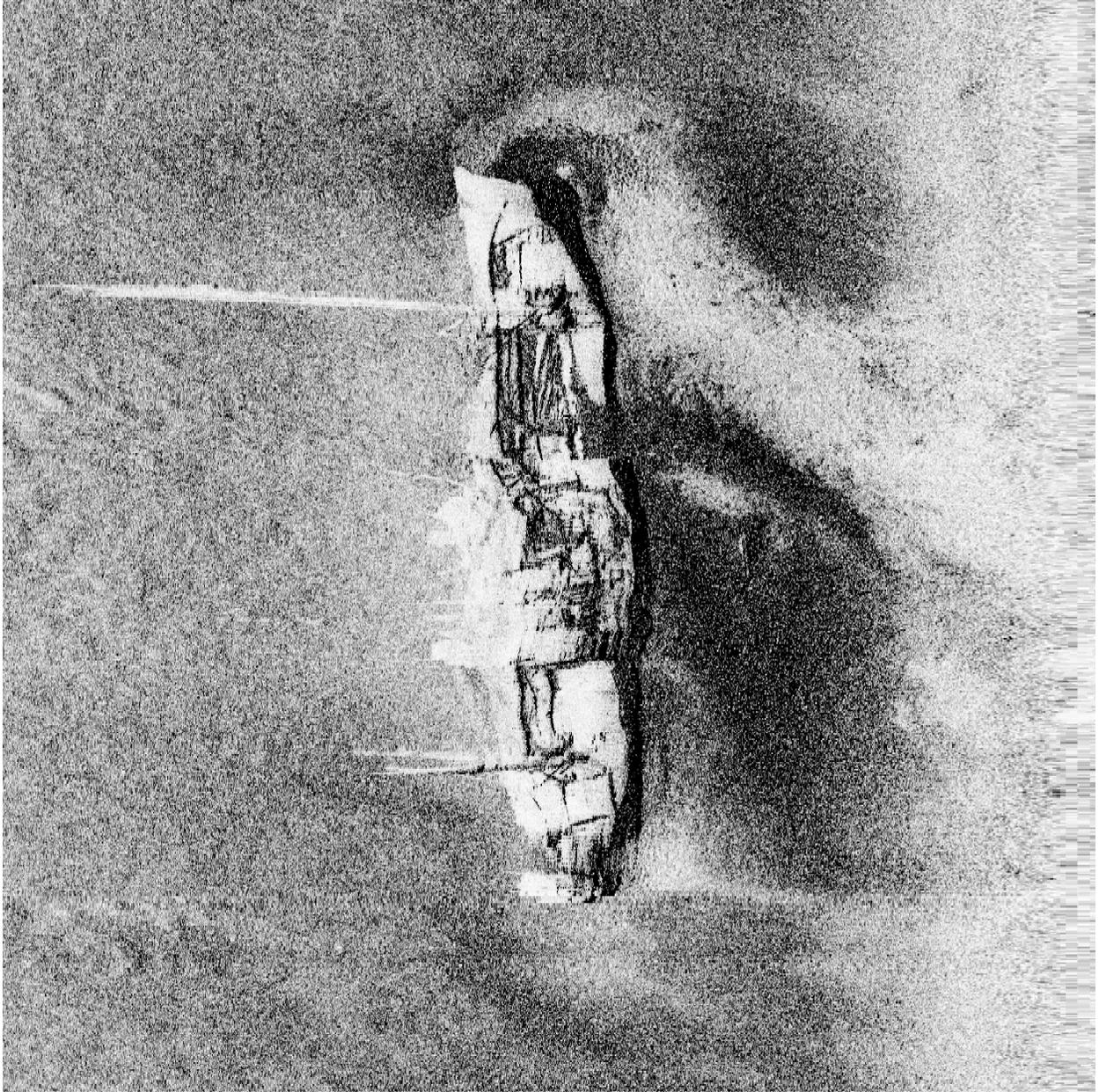


Figure 1.3.1



*Figure 1.3.2*



## **2 - Wreck Features**

## 2.1) AWOIS Item 1524 (see AWOIS 1524 above)

### Survey Summary

**Survey Position:** 40° 13' 50.8" N, 073° 50' 34.4" W  
**Least Depth:** 17.45 m (= 57.23 ft = 9.539 fm = 9 fm 3.23 ft)  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh) [None] ; TVU (TPEv) [None]  
**Timestamp:** 2013-310.00:00:00.000 (11/06/2013)  
**Dataset:** H12628\_Features for PYDRO.000  
**FOID:** 0\_0001063366 00001(FFFE001039C60001)  
**Charts Affected:** 12326\_1, 12300\_1, 13006\_1, 5161\_1, 13003\_1

#### Remarks:

WRECKS/remrks: Wreck found with new least depth

### Feature Correlation

Source	Feature	Range	Azimuth	Status
H12628_Features for PYDRO.000	0_0001063366 00001	0.00	000.0	Primary

### Hydrographer Recommendations

Update least depth on dangerous wreck

#### Cartographically-Rounded Depth (Affected Charts):

57ft (12326\_1)

9 ½fm (12300\_1, 13006\_1, 13003\_1)

17.4m (5161\_1)

### S-57 Data

**Geo object 1:** Wreck (WRECKS)  
**Attributes:** CATWRK - 2:dangerous wreck  
 NINFOM - Add wreck  
 QUASOU - 6:least depth known  
 SORDAT - 20131106  
 SORIND - US,US,graph,H12628  
 TECSOU - 3:found by multi-beam

VALSOU - 17.445 m

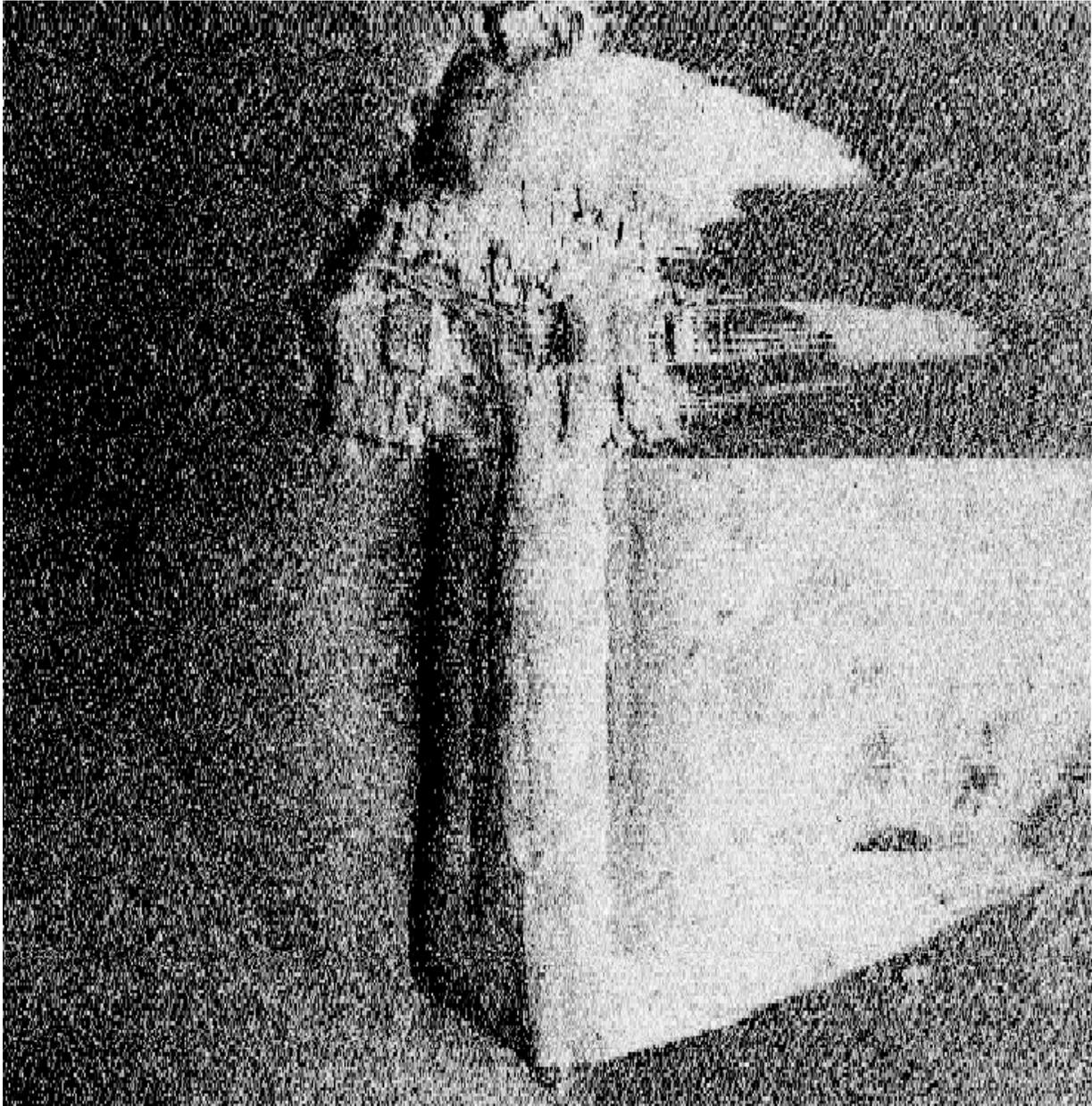
WATLEV - 3:always under water/submerged

### Office Notes

SAR NOTES: Concur. AWOIS item #1524 (Dutch M/V "Pinta") ensouffied with complete MBES. Feature is significant and verified as per survey data. Defer final charting exposition to AHB Compile Team.

Compilation: Concur. Delete charted dangerous sunken wreck symbol and add a dangerous sunken wreck, least depth 57.23 feet, in the present survey position.

## Feature Images



*Figure 2.1.1*

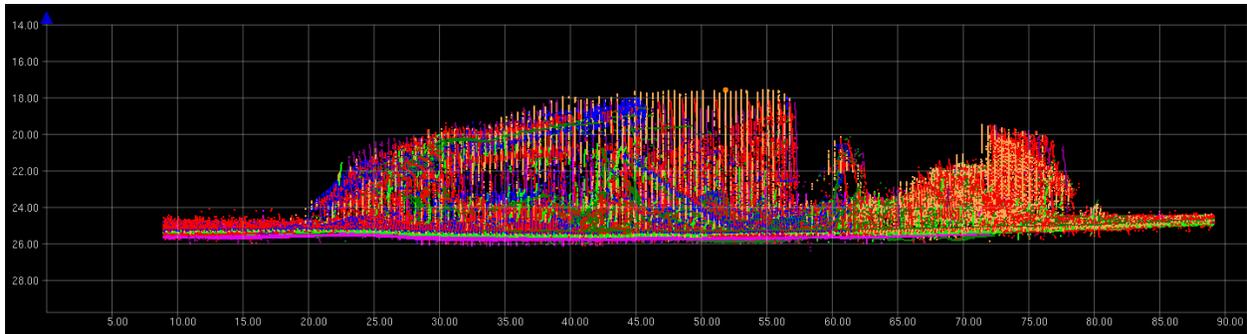


Figure 2.1.2

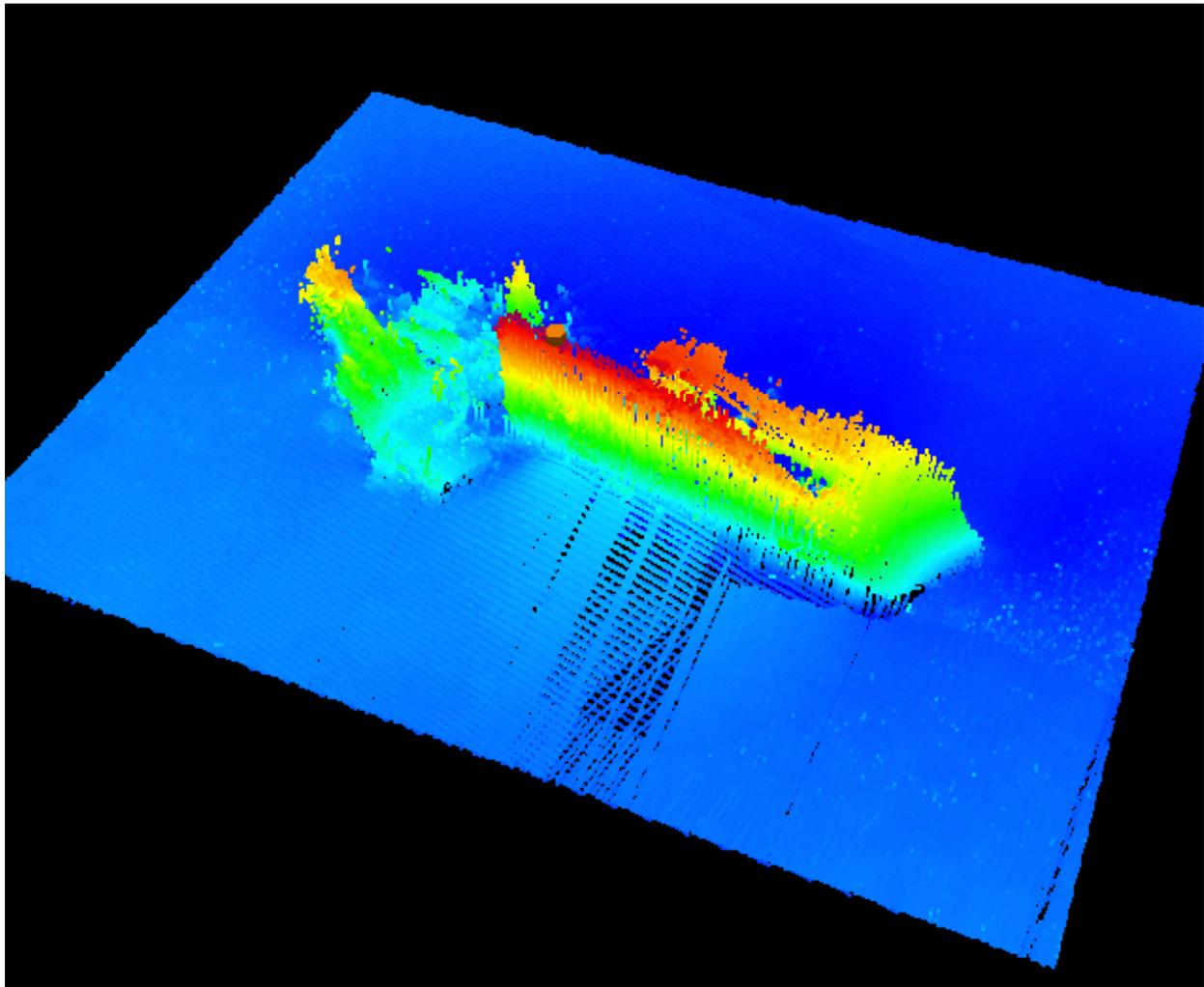
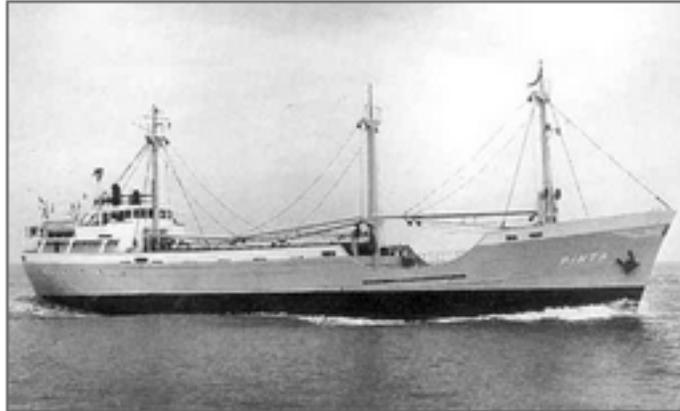


Figure 2.1.3



*Figure 2.1.4*

## 2.2) Non-dangerous 99 foot wreck

### Survey Summary

**Survey Position:** 40° 15' 57.5" N, 073° 49' 01.7" W  
**Least Depth:** 30.16 m (= 98.96 ft = 16.493 fm = 16 fm 2.96 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)** [None] ; **TVU (TPEv)** [None]  
**Timestamp:** 2013-310.00:00:00.000 (11/06/2013)  
**Dataset:** H12628\_Features for PYDRO.000  
**FOID:** 0\_0001063432 00001(FFFE00103A080001)  
**Charts Affected:** 12326\_1, 12300\_1, 13006\_1, 5161\_1, 13003\_1

#### Remarks:

WRECKS/remrks: non-dangerous wreck

### Feature Correlation

Source	Feature	Range	Azimuth	Status
H12628_Features for PYDRO.000	0_0001063432 00001	0.00	000.0	Primary

### Hydrographer Recommendations

chart as surveyed

#### Cartographically-Rounded Depth (Affected Charts):

99ft (12326\_1)

16ft (12300\_1, 13006\_1, 13003\_1)

30m (5161\_1)

### S-57 Data

**Geo object 1:** Wreck (WRECKS)  
**Attributes:** CATWRK - 1:non-dangerous wreck  
 NINFOM - Add Wreck  
 QUASOU - 6:least depth known  
 SORDAT - 20131106  
 SORIND - US,US,graph,H12628  
 TECSOU - 3:found by multi-beam

VALSOU - 30.163 m

WATLEV - 3:always under water/submerged

## Office Notes

SAR NOTES: New uncharted wreck ensonified with complete coverage MBES. Feature verified as per survey data. Not much is left of the wreck elevated above the sea floor; appears deteriorated and sunken into the sea floor. Wreck has the appearance of age based upon the deterioration, shape, and height above the sea floor. Defer the final charting disposition to AHB Compile Team.

COMPILATION: Concur. Add a non-dangerous wreck, least depth 98.96 feet, in the present survey position.

## Feature Images

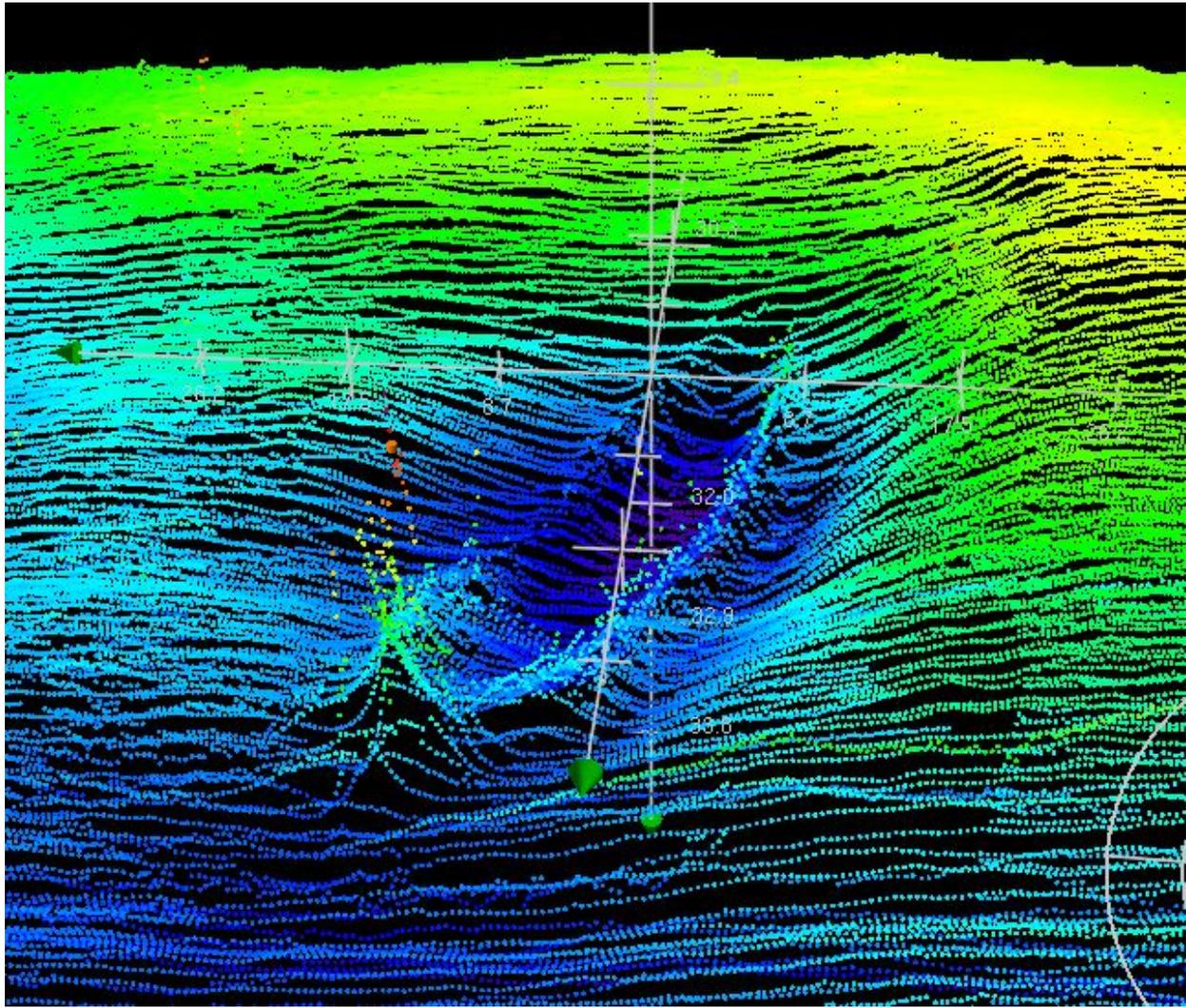


Figure 2.2.1

## 2.3) Non-dangerous 121 foot wrecks

### Survey Summary

**Survey Position:** 40° 17' 58.7" N, 073° 48' 41.4" W  
**Least Depth:** 37.04 m (= 121.53 ft = 20.255 fm = 20 fm 1.53 ft)  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh) [None] ; TVU (TPEv) [None]  
**Timestamp:** 2013-310.00:00:00.000 (11/06/2013)  
**Dataset:** H12628\_Features for PYDRO.000  
**FOID:** 0\_0001063453 00001(FFFE00103A1D0001)  
**Charts Affected:** 12326\_1, 12300\_1, 13006\_1, 5161\_1, 13003\_1

#### Remarks:

WRECKS/remrks: Pipe protruding from seaflo (field unit)

### Feature Correlation

Source	Feature	Range	Azimuth	Status
H12628_Features for PYDRO.000	0_0001063453 00001	0.00	000.0	Primary

### Hydrographer Recommendations

Chart new obstruction.

#### Cartographically-Rounded Depth (Affected Charts):

121ft (12326\_1)

20ft (12300\_1, 13006\_1, 13003\_1)

37m (5161\_1)

### S-57 Data

**Geo object 1:** Wreck (WRECKS)  
**Attributes:** CATWRK - 1:non-dangerous wreck  
 NINFOM - Add Wrecks  
 QUASOU - 6:least depth known  
 SORDAT - 20131106  
 SORIND - US,US,graph,H12628  
 TECSOU - 3:found by multi-beam

VALSOU - 37.042 m

WATLEV - 3:always under water/submerged

## Office Notes

SAR NOTES: Concur with depth, but disagree with the feature type interpretation. CARIS sub set exaggeration changed the interpretational view. Field unit attribute this feature as a well head; HTL not interpret feature as a well head, feature interpreted as a wreck approximately 27m / 88ft in length. Object sonified with complete coverage MBES. Feature is significant and verified as per survey data. Defer the final charting disposition to AHB Compile Team.

COMPILATION: Concur. Add non-dangerous Wrecks, least depth 121.53 feet, in the present survey position. Include the 129' non dangerous wreck to the north of this position inside the radius of this wreck and add the label, Wrecks.

### Feature Images

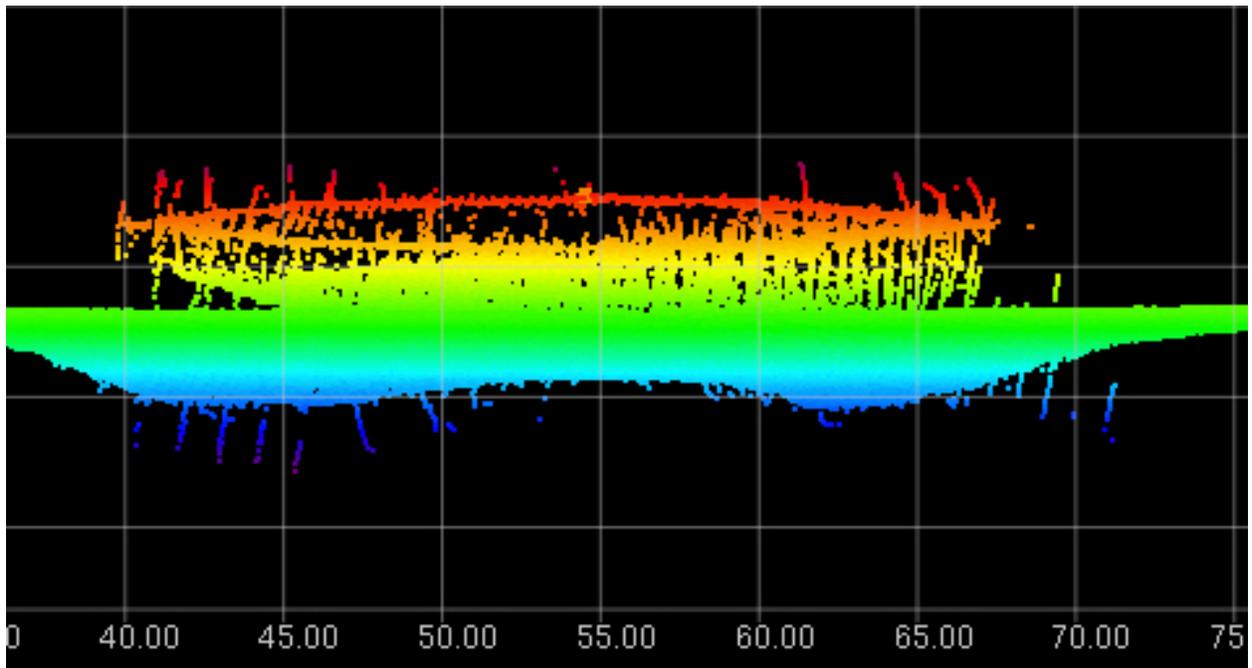


Figure 2.3.1

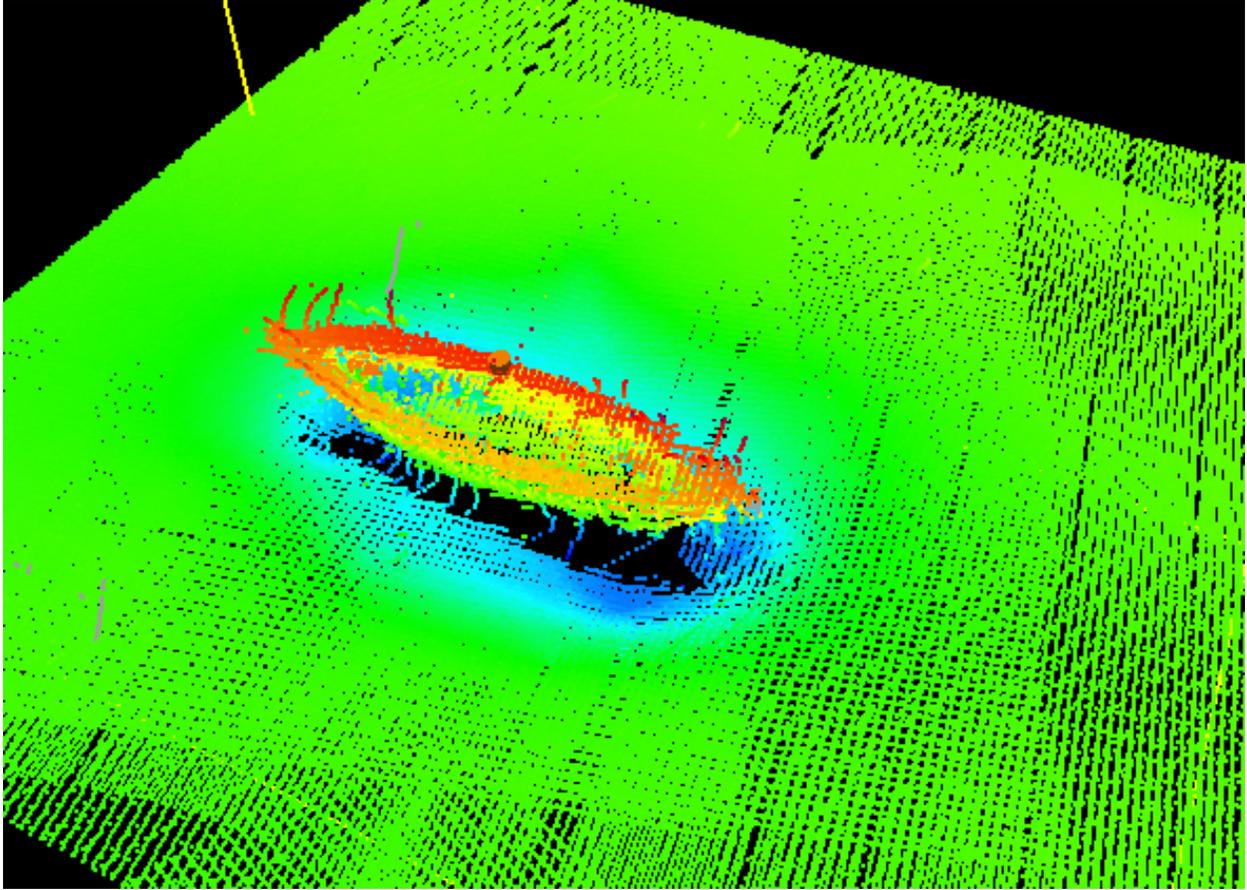


Figure 2.3.2

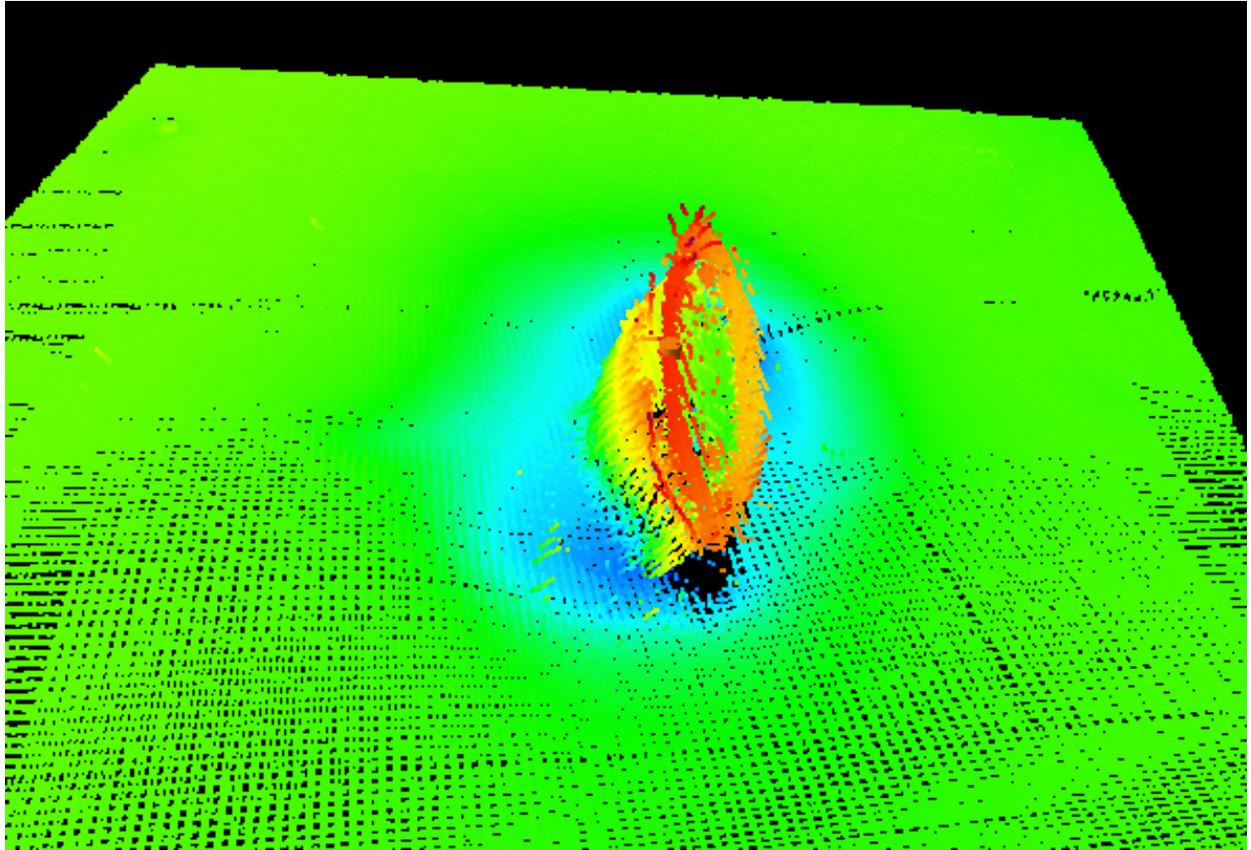


Figure 2.3.3

## 2.4) Non-dangerous 150 foot wreckage

### Survey Summary

**Survey Position:** 40° 17' 49.4" N, 073° 47' 37.4" W  
**Least Depth:** 45.76 m (= 150.12 ft = 25.021 fm = 25 fm 0.12 ft)  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh) [None] ; TVU (TPEv) [None]  
**Timestamp:** 2013-310.00:00:00.000 (11/06/2013)  
**Dataset:** H12628\_Features for PYDRO.000  
**FOID:** 0\_0001063455 00001(FFFE00103A1F0001)  
**Charts Affected:** 12326\_1, 12300\_1, 13006\_1, 5161\_1, 13003\_1

#### Remarks:

WRECKS/remrks: New non-dangerous obstruction.

### Feature Correlation

Source	Feature	Range	Azimuth	Status
H12628_Features for PYDRO.000	0_0001063455 00001	0.00	000.0	Primary

### Hydrographer Recommendations

Chart non-dangerous obstruction.

#### Cartographically-Rounded Depth (Affected Charts):

150ft (12326\_1)

25ft (12300\_1, 13006\_1, 13003\_1)

46m (5161\_1)

### S-57 Data

**Geo object 1:** Wreck (WRECKS)  
**Attributes:** CATWRK - 3:distributed remains of wreck  
 NINFOM - Add Obstruction (wreckage)  
 QUASOU - 6:least depth known  
 SORDAT - 20131106  
 SORIND - US,US,graph,H12628  
 TECSOU - 3:found by multi-beam

VALSOU - 45.758 m

WATLEV - 3:always under water/submerged

### Office Notes

SAR NOTES: Ensonified with complete coverage MBES. Feature is significant and verified as per survey data. HTL: Do not concur with interpretation as an obstruction; feature interpreted as a wreck that has deteriorated and appears to be an older vessel approximately 41m long and rises above the sea floor approximately 6.8m. Defer the final charting disposition to AHB Compile Team.

COMPILATION: Concur with conditions. Add a non-dangerous obstruction (wreckage), least depth 150.13 feet, in the present survey position.

### Feature Images

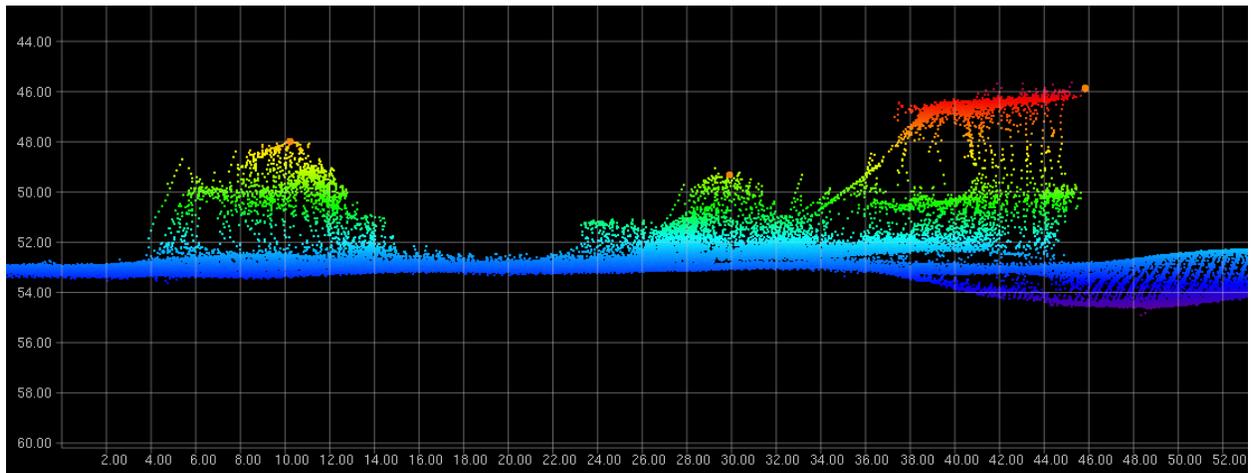


Figure 2.4.1

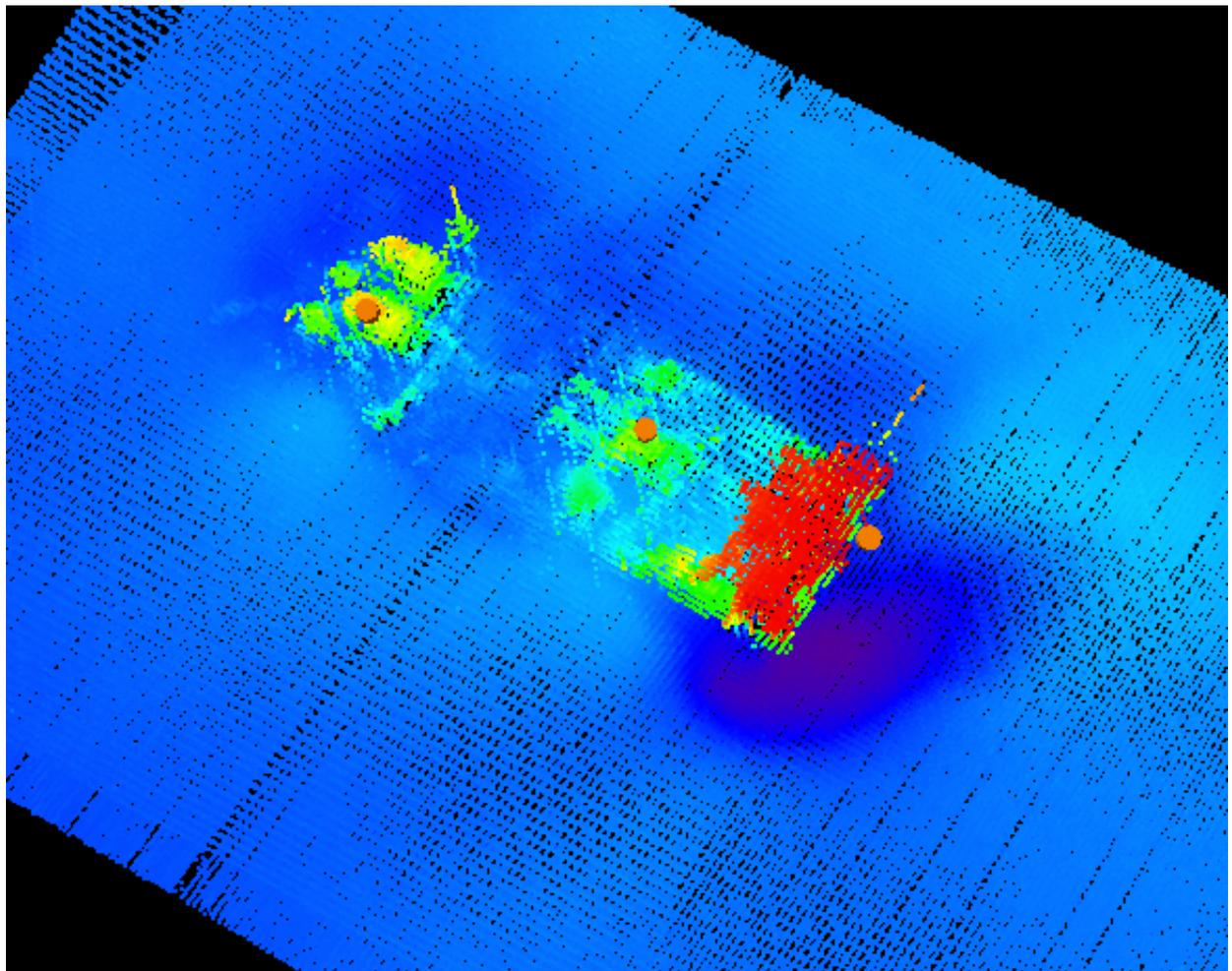


Figure 2.4.2

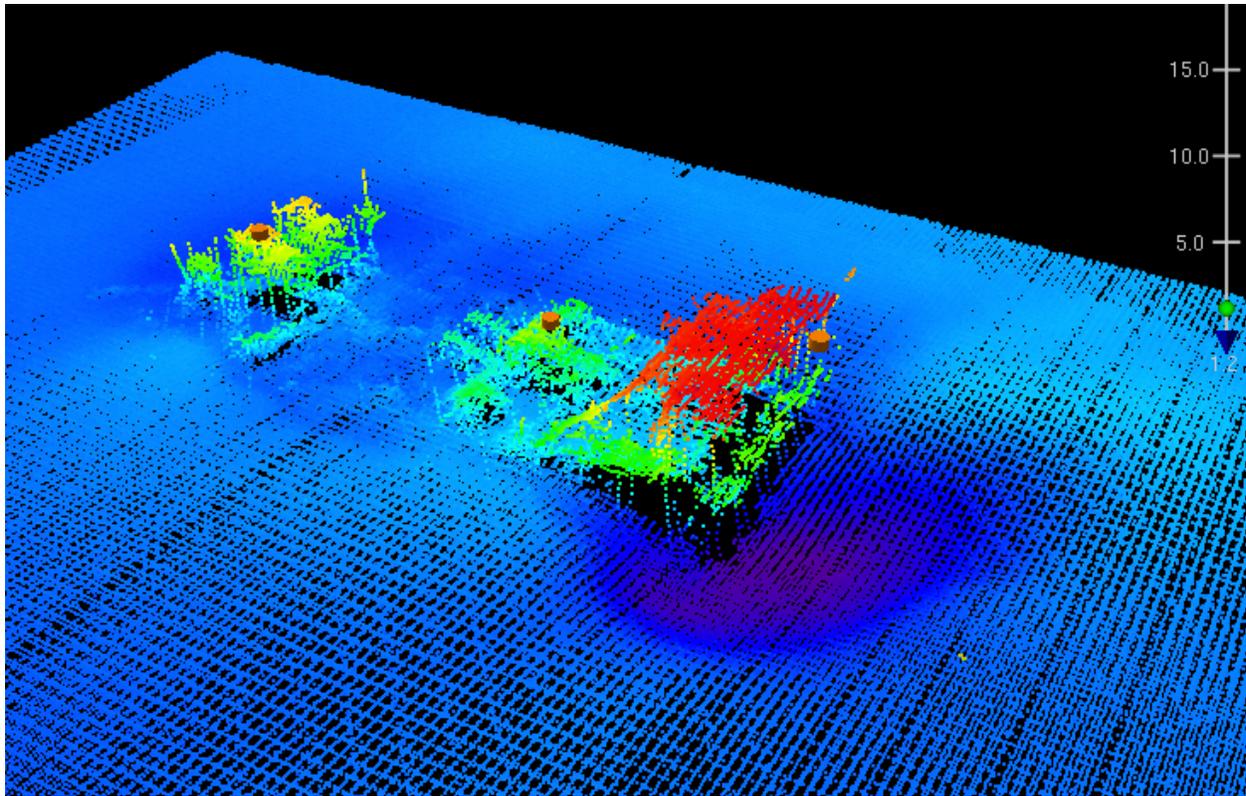


Figure 2.4.3

## 2.5) AWOIS Item 4740 (see AWOIS 4740 above)

### Survey Summary

**Survey Position:** 40° 16' 44.7" N, 073° 47' 22.5" W  
**Least Depth:** 41.61 m (= 136.52 ft = 22.754 fm = 22 fm 4.52 ft)  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh) [None] ; TVU (TPEv) [None]  
**Timestamp:** 2013-310.00:00:00.000 (11/06/2013)  
**Dataset:** H12628\_Features for PYDRO.000  
**FOID:** 0\_0001063448 00001(FFFE00103A180001)  
**Charts Affected:** 12326\_1, 12300\_1, 13006\_1, 5161\_1, 13003\_1

**Remarks:**

WRECKS/remrks: AWOIS item #4740 new location and updated depth

### Feature Correlation

Source	Feature	Range	Azimuth	Status
H12628_Features for PYDRO.000	0_0001063448 00001	0.00	000.0	Primary

### Hydrographer Recommendations

Chart new location and depth of wreck

**Cartographically-Rounded Depth (Affected Charts):**

136ft (12326\_1)

23ft (12300\_1, 13006\_1, 13003\_1)

41m (5161\_1)

### S-57 Data

**Geo object 1:** Wreck (WRECKS)  
**Attributes:** CATWRK - 1:non-dangerous wreck  
 NINFOM - Add Wreck  
 QUASOU - 6:least depth known  
 SORDAT - 20131106  
 SORIND - US,US,graph,H12628  
 TECSOU - 3:found by multi-beam

VALSOU - 41.612 m

WATLEV - 3:always under water/submerged

### Office Notes

SAR NOTES: Concur. AWOIS item #4740 exists approx 185m SE of charted location. AWOIS item #4740 ensonified with complete coverage MBES. Feature is significant and verified as per survey data. Defer the final charting disposition to AHB Compile Team.

COMPILATION: Concur. Delete charted non-dangerous wreck (149 ft rep). Add a non-dangerous wreck, least depth 136.52 feet, in the present survey position.

### Feature Images

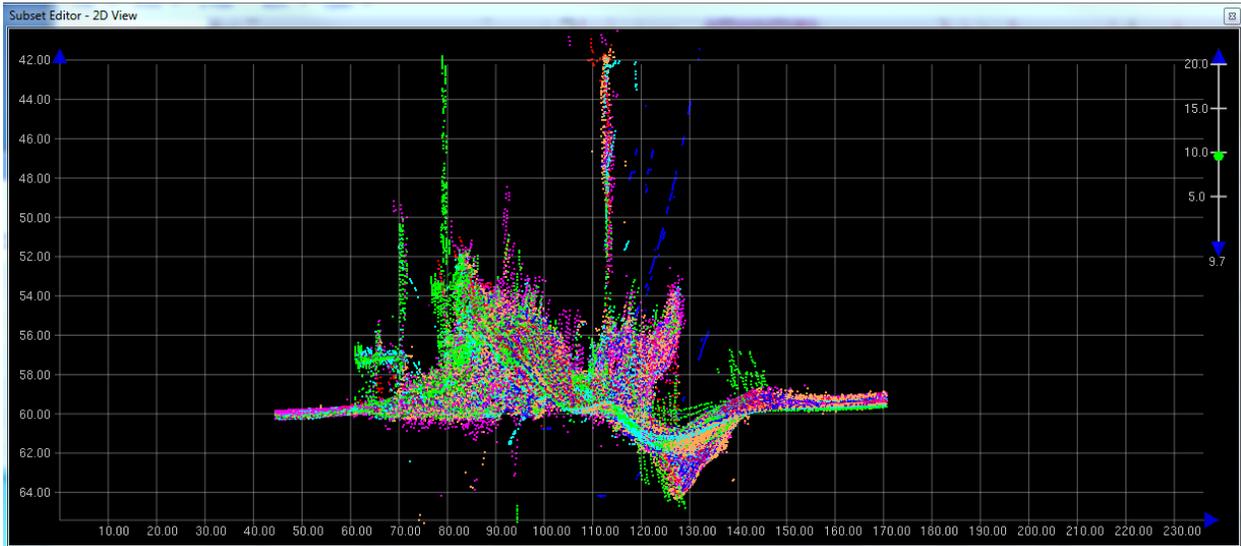
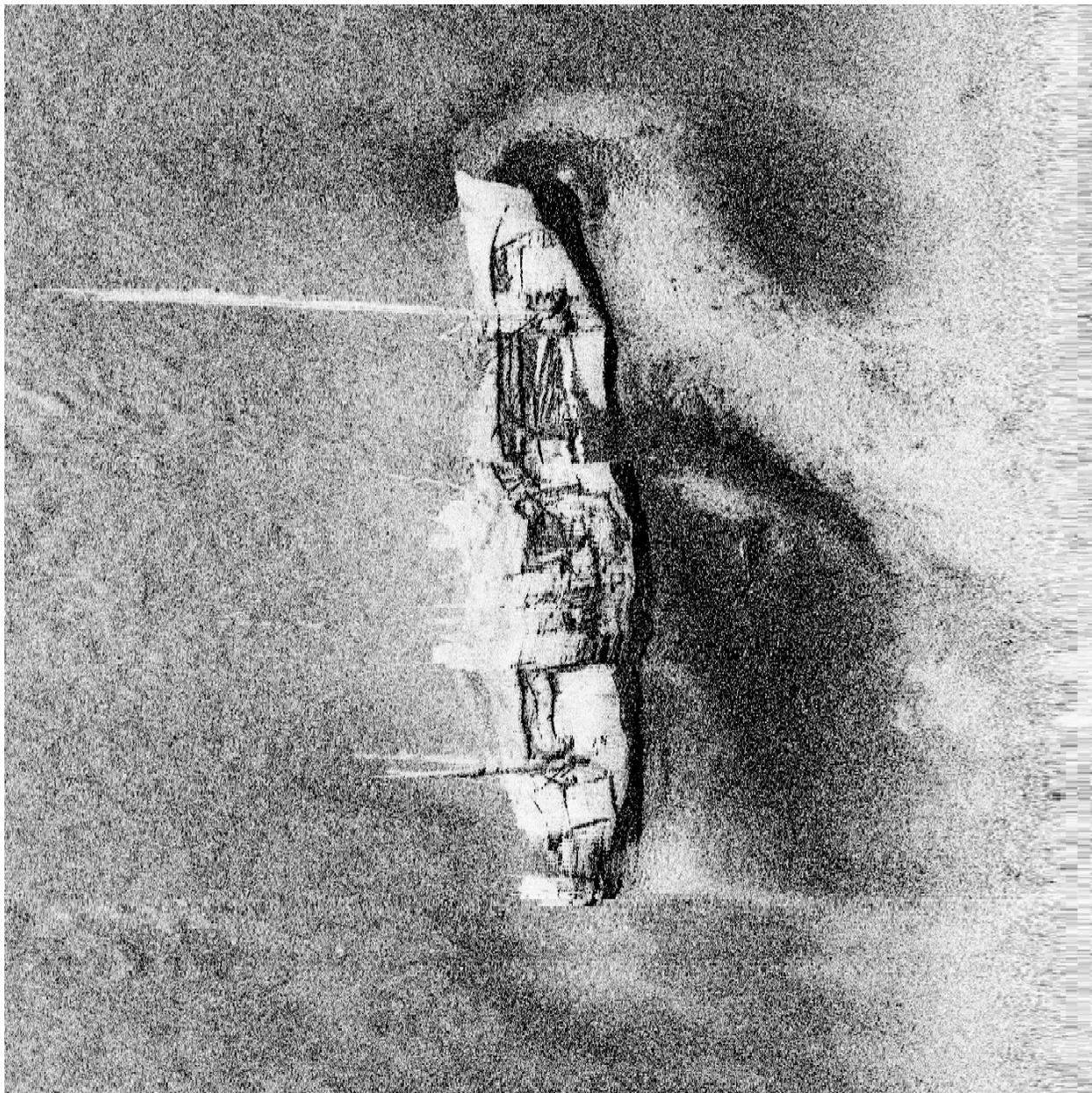


Figure 2.5.1



*Figure 2.5.2*

## 2.6) Non-dangerous 173 foot wreck

### Survey Summary

**Survey Position:** 40° 16' 36.8" N, 073° 46' 42.0" W  
**Least Depth:** 52.70 m (= 172.92 ft = 28.819 fm = 28 fm 4.92 ft)  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh) [None] ; TVU (TPEv) [None]  
**Timestamp:** 2013-310.00:00:00.000 (11/06/2013)  
**Dataset:** H12628\_Features for PYDRO.000  
**FOID:** 0\_0001063443 00001(FFFE00103A130001)  
**Charts Affected:** 12326\_1, 12300\_1, 13006\_1, 5161\_1, 13003\_1

#### Remarks:

WRECKS/remrks: New non-dangerous wreck.

### Feature Correlation

Source	Feature	Range	Azimuth	Status
H12628_Features for PYDRO.000	0_0001063443 00001	0.00	000.0	Primary

### Hydrographer Recommendations

Chart new non-dangerous wreck.

#### Cartographically-Rounded Depth (Affected Charts):

173ft (12326\_1)

29ft (12300\_1, 13006\_1, 13003\_1)

52m (5161\_1)

### S-57 Data

**Geo object 1:** Wreck (WRECKS)  
**Attributes:** CATWRK - 1:non-dangerous wreck  
 NINFOM - Add Wreck  
 QUASOU - 6:least depth known  
 SORDAT - 20131106  
 SORIND - US,US,graph,H12628  
 TECSOU - 3:found by multi-beam

VALSOU - 52.705 m

WATLEV - 3:always under water/submerged

### **Office Notes**

SAR NOTES: Ensonified with complete coverage MBES. Feature is significant and verified as per survey data. Defer the final charting disposition to AHB Compile Team.

COMPILATION: Concur. Add a non- dangerous wreck, least depth 172.92 feet, in the present survey position.

### Feature Images

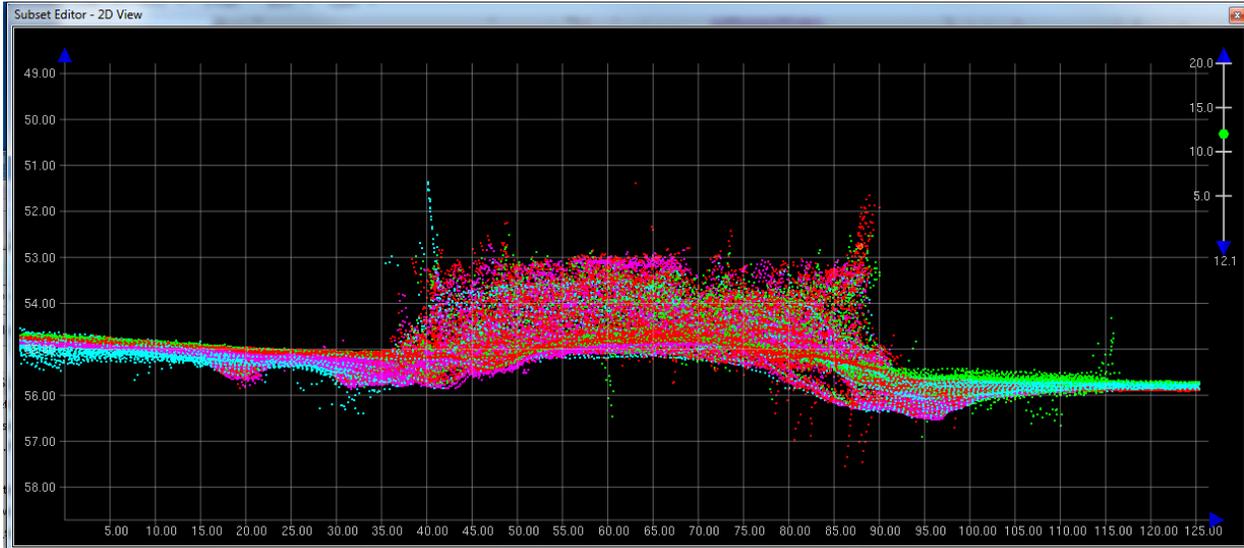


Figure 2.6.1

## 2.7) Non-dangerous 155 foot wreck

### Survey Summary

**Survey Position:** 40° 15' 28.0" N, 073° 46' 29.6" W  
**Least Depth:** 47.28 m (= 155.10 ft = 25.851 fm = 25 fm 5.10 ft)  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh) [None] ; TVU (TPEv) [None]  
**Timestamp:** 2013-310.00:00:00.000 (11/06/2013)  
**Dataset:** H12628\_Features for PYDRO.000  
**FOID:** 0\_0001063382 00001(FFFE001039D60001)  
**Charts Affected:** 12326\_1, 12300\_1, 13006\_1, 5161\_1, 13003\_1

#### Remarks:

WRECKS/remrks: Wreck found with new least depth

### Feature Correlation

Source	Feature	Range	Azimuth	Status
H12628_Features for PYDRO.000	0_0001063382 00001	0.00	000.0	Primary

### Hydrographer Recommendations

Update least depth on charted wreck.

#### Cartographically-Rounded Depth (Affected Charts):

155ft (12326\_1)

26ft (12300\_1, 13006\_1, 13003\_1)

47m (5161\_1)

### S-57 Data

**Geo object 1:** Wreck (WRECKS)  
**Attributes:** CATWRK - 1:non-dangerous wreck  
 NINFOM - Add Wreck  
 QUASOU - 6:least depth known  
 SORDAT - 20131106  
 SORIND - US,US,graph,H12628  
 TECSOU - 3:found by multi-beam

VALSOU - 47.276 m

WATLEV - 3:always under water/submerged

### **Office Notes**

SAR NOTES: Ensonified with complete coverage MBES. Feature is significant and verified as per survey data. Defer the final charting disposition to AHB Compile Team.

COMPILATION: Concur. Delete charted non-dangerous wreck, depth unknown. Add non-dangerous wreck, least depth 155.11 feet, in the present survey position.

### Feature Images

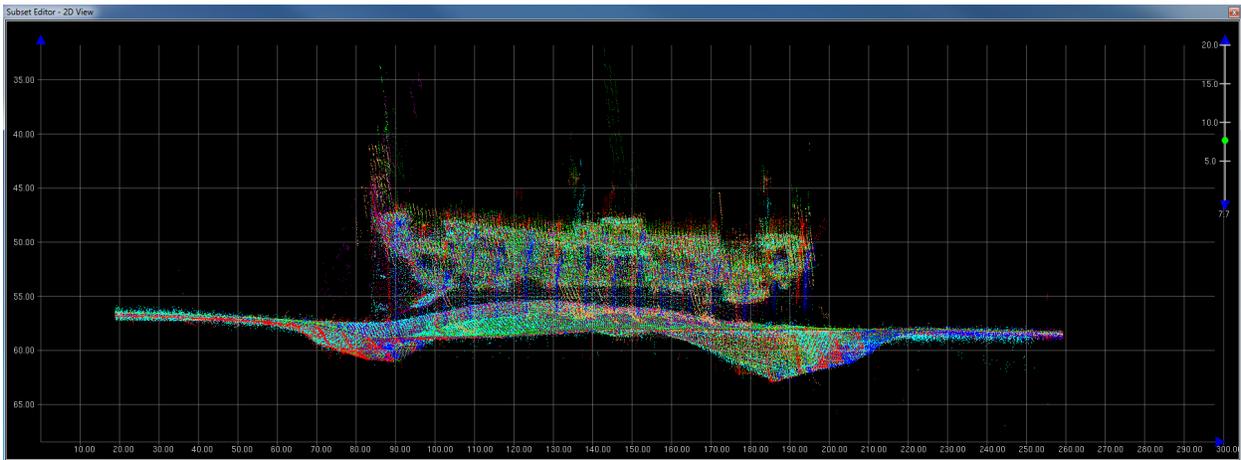


Figure 2.7.1

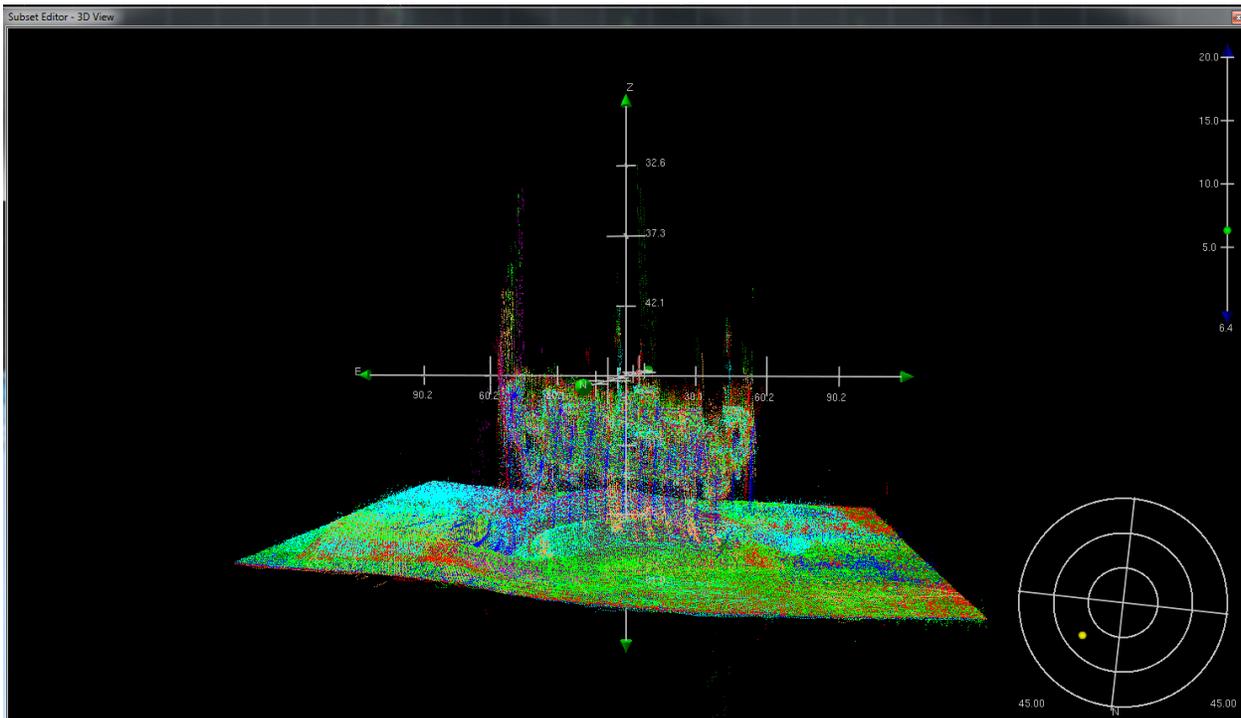
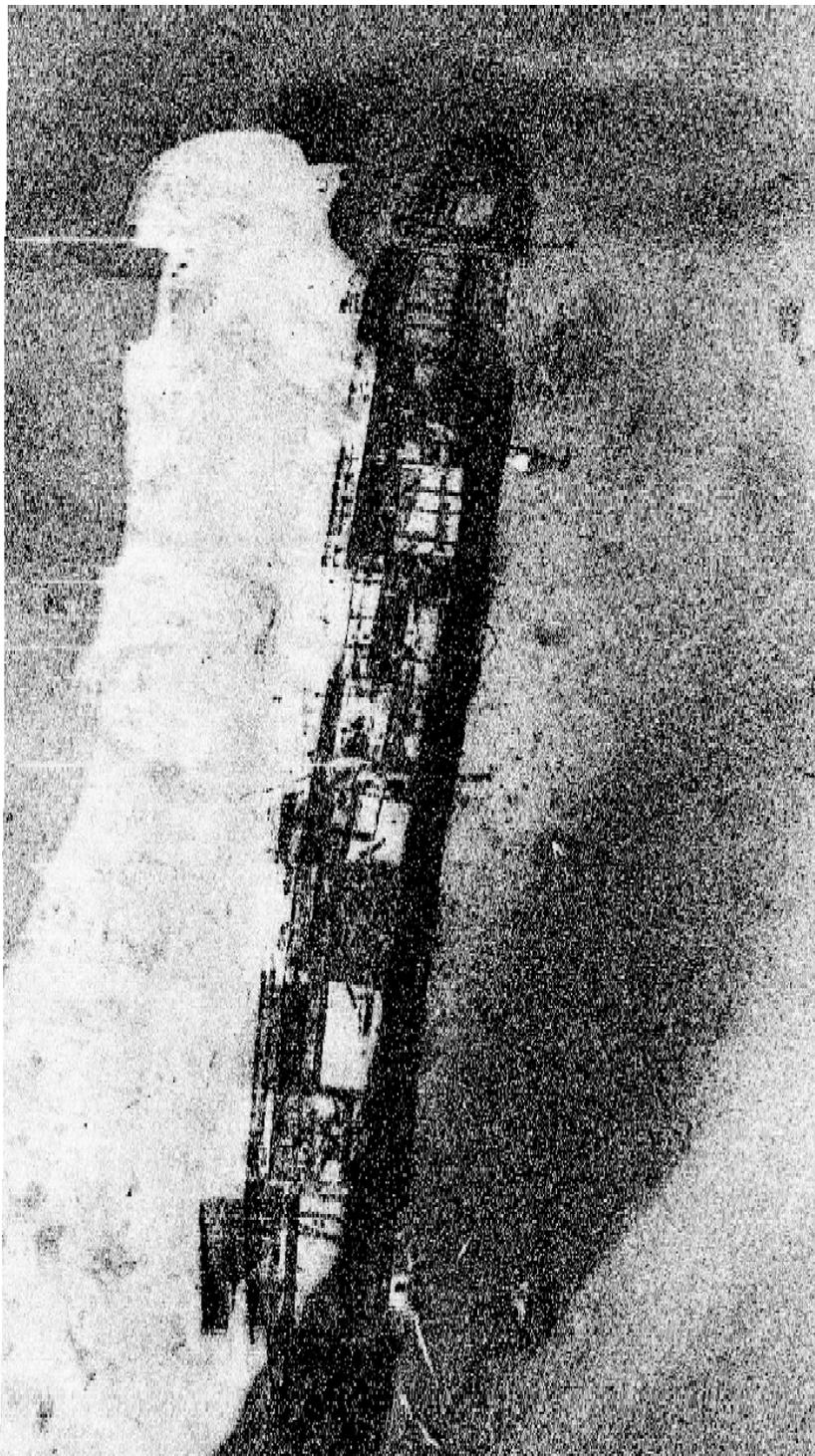


Figure 2.7.2



*Figure 2.7.3*

APPROVAL PAGE

H12628

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

- H12628\_DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- H12628\_GeoImage.pdf

The survey evaluation and verification has been conducted according to current OCS Specifications, and the survey has been approved for dissemination and usage of updating NOAA's suite of nautical charts.

Approved: \_\_\_\_\_

**Lieutenant Matthew Jaskoski, NOAA**  
Chief, Atlantic Hydrographic Branch