

**H12152**

NOAA FORM 76-35A	
U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL OCEAN SURVEY	
<b>DESCRIPTIVE REPORT</b>	
<i>Type of Survey:</i>	<b>Basic Navigable Area</b>
<i>Registry Number:</i>	<b>H12152</b>
<b>LOCALITY</b>	
<i>State:</i>	<b>Pennsylvania, Delaware, and New Jersey</b>
<i>General Locality:</i>	<b>Delaware River</b>
<i>Sub-locality:</i>	<b>Deepwater Point Range to Salem Cove</b>
<b><del>2010</del>2009</b>	
CHIEF OF PARTY <b>Bert Ho, OIC NRT5</b>	
DATE	LIBRARY & ARCHIVES

NOAA FORM 77-28 COMMERCE (11-72) NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  <div style="text-align: center;"><b>HYDROGRAPHIC TITLE SHEET</b></div>	U.S. DEPARTMENT OF  REGISTRY NUMBER:  <div style="text-align: center;"><b>H12152</b></div>
INSTRUCTIONS: The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.	
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>State: <b>Pennsylvania, Delaware, and New Jersey</b></p> <p>General Locality: <b>Delaware River</b></p> <p>Sub-Locality: <b>Deepwater Point Range to Salem Cove</b></p> <p>Scale: <b>1:10,000</b></p> <p>Instructions Dated: <b>10/02/09</b></p> <p>Change No.1 Dated: <b>N/A</b></p> <p>Change No.2 Dated: <b>N/A</b></p> <p>Vessel: <b>NOAA NRT-5, S3002</b></p> <p>Chief of Party: <b>Bert Ho, NOAA</b></p> <p>Surveyed by: <b>NOAA Navigation Response Team 5 Personnel</b></p> <p>Soundings by: <b>Kongsberg Simrad EM 3002 multibeam echosounder</b> <b>Odom Echotrac CV/200 Vertical Beam Echosounder</b></p> <p>Graphic record checked by: <b>N/A</b></p> <p>Protracted by: <b>N/A</b></p> <p>Verification by: <b>Atlantic Hydrographic Branch Personnel</b></p> <p>Soundings in: <b>Feet at MLLW *</b></p> </div> <div style="width: 45%;"> <p>Date of Survey: <b>10/26/09 to 12/08/09</b></p> <p>Project Number: <b>S-D903-NRT5-09</b></p> <p>Automated Plot: <b>N/A</b></p> </div> </div> <p style="color: red; margin-top: 10px;"><b>* H-Cell Compilation units: Feet at MLLW</b></p>	
Remarks: 1) All Times are UTC. 2) This is a Basic Navigable Area Hydrographic Survey. 3) Projection is UTM Zone 18.	

## **TABLE OF CONTENTS**

LIST OF FIGURES	5
LIST OF TABLES	5
A. AREA SURVEYED	6
B. DATA ACQUISITION AND PROCESSING	8
B.1 EQUIPMENT	8
B.2 QUALITY CONTROL	8
B.2.1 Side Scan SONAR Quality Control	8
B.2.2 Shallow Water Multibeam Quality Control	8
B.2.3 Total Propagated Error	9
B.2.4 Fieldsheet and Navigation Surfaces	9
B.2.5 Single Beam Quality Control	9
B.2.6 Crosslines	10
B.2.7 Junctions	10
B.3 CORRECTIONS TO ECHO SOUNDINGS	10
C. VERTICAL AND HORIZONTAL CONTROL	12
C.1 VERTICAL CONTROL	12
C.2 HORIZONTAL CONTROL	12
D. RESULTS AND RECOMMENDATIONS	13
D.1 CHART COMPARISON	13
D.1.1 General Agreement with Charted soundings	13
D.1.2 AWOIS Items and Significant Contacts	14
D.1.3 Dangers to Navigation (DToN)	14
D.1.4 Charted Features	14
D.1.5 Charting Recommendations	14
D.2 ADDITIONAL RESULTS	14
D.2.1 Aids to Navigation	14
D.2.2 Bridges and Overhead Cables	14
D.2.3 Submarine Cables and Pipelines	14
E. APPROVAL SHEET	15

**APPENDICES**

Appendix I – DToN Report  
Appendix II– Survey Features Report  
Appendix III– Progress Sketch  
Appendix IV– Tides and Water Levels  
Appendix V– Supplemental Survey Records and Correspondence

**LIST OF FIGURES**

FIGURE A-1: Overview of Survey Area	7
FIGURE B-1: Caris QC Report, IHO Order Oneness v. Beam Number	11

**LIST OF TABLES**

TABLE B-1: Total Propagated Error Parameters	9
TABLE B-2: Bathymetry Surfaces, and Side Scan Mosaic Resolutions	10



**DESCRIPTIVE REPORT**  
to accompany  
HYDROGRAPHIC SURVEY H12152

Scale of Survey: 1:10,000  
Year of Survey: 2009  
NOAA Navigation Response Team 5  
Bert Ho, Team Lead

## A. AREA SURVEYED

This hydrographic survey was conducted in accordance with Hydrographic Survey Letter Instructions for project S-D903-NRT5-09, H12152, Delaware River, Pennsylvania, New Jersey, and Delaware. The original instructions are dated October 2, 2009.

This Descriptive Report pertains to an area of approximately 2.00 SNM, of Delaware River from Deepwater Point Range to Salem Cove. The assigned registry number for this sheet is H12152, as prescribed in the Letter Instructions.

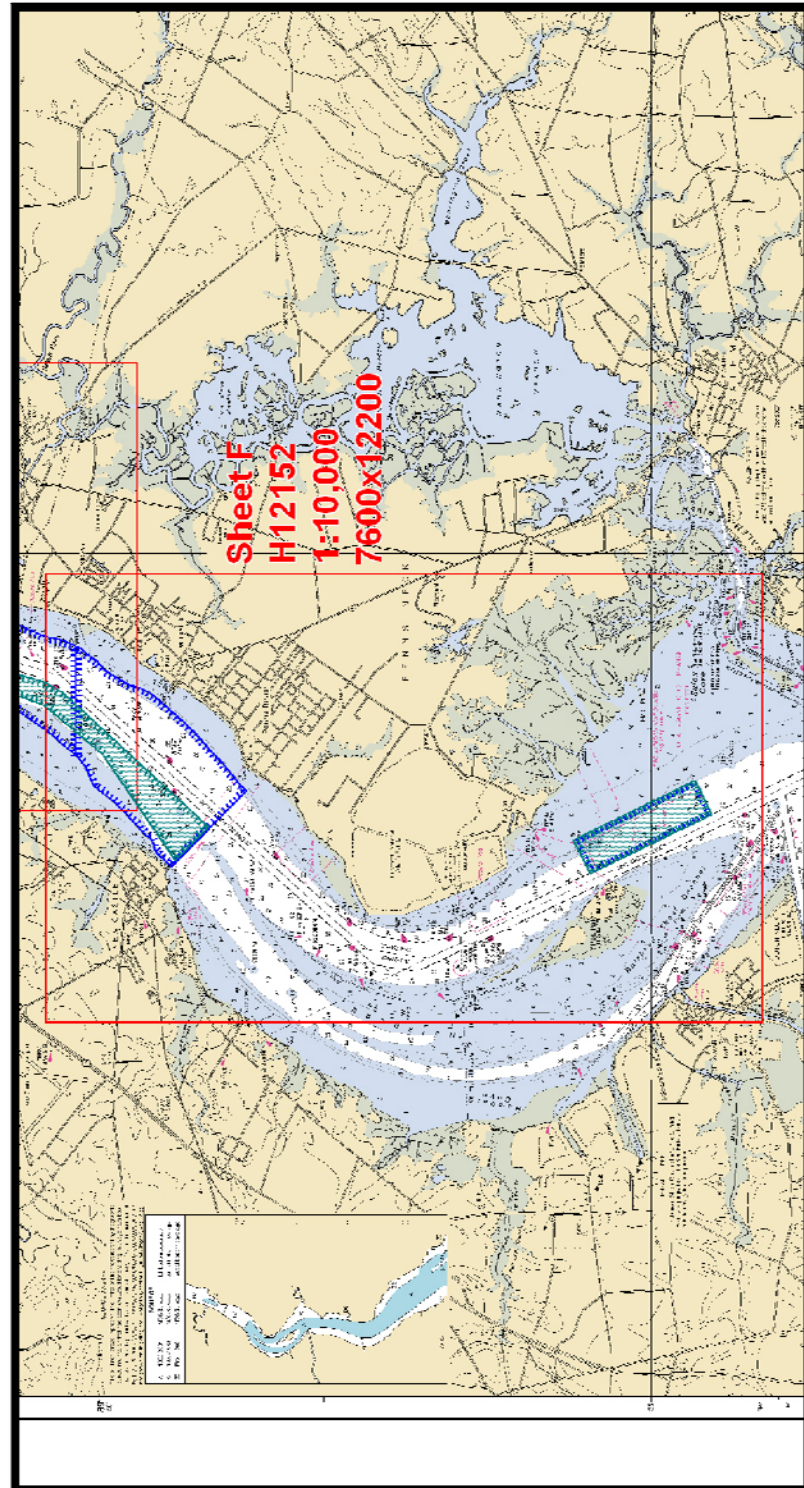
The purpose of the CY 2009-2010 operations in this area were to provide contemporary surveys to update National Ocean Service (NOS) nautical charts as the numerous ports on the Delaware River have been designated critical survey areas. *Concur.*

For complete survey limits, see figure A-1 on the following page.

Linear nautical miles of single beam only sounding lines - mainscheme only	85.69
Linear nautical miles of side scan sonar only lines - mainscheme only	59.4
Linear nautical miles of any combination of the above techniques	59.4
Linear nautical miles of crosslines from single beam and multibeam combined	6.30
Linear nautical miles of developments other than mainscheme lines	1.45
Linear nautical miles of shoreline/nearshore investigation	N/A
Number of bottom samples collected	0
Number of items investigated that required additional time/effort in the field beyond the above survey operations	NA
Total square nautical miles	2.00

Dates of acquisition: October 26, 2009 to December 8, 2009

Figure A-1: Outline of survey area



## **B. DATA ACQUISITION AND PROCESSING *See Also H-Cell Report.***

### **B.1 EQUIPMENT**

Data were acquired by NOAA NRT-5 S3002. NOAA Survey Vessel S3002 is an approximately 9m aluminum SeaArk outboard driven vessel with an average multibeam transducer draft of 0.5 meters.

NOAA S3002 acquired both bathymetry and imagery data in the project area. Side scan sonar data were acquired with a towed Klein 3000 sonar system (SSS). Bathymetry data were acquired with both an Odom Echotrac C/V 200 Vertical Beam Echosounder (VBES), and a Kongsberg Simrad EM 3002 Multibeam Echosounder (MBES). Positioning and attitude were determined with a TSS POS/MV 320 (version 4) GPS aided inertial navigation system

### **B.2 QUALITY CONTROL**

#### **B.2.1 Side Scan Sonar Quality Control**

Daily confidence checks were made by observing the outer ranges of the side scan sonar image trace. A good check consisted of distinguishing linear contacts across the entire range of the side scan trace. Navigation data were reviewed, fliers were rejected with interpolation. Significant sand waves were noted throughout bends in the Delaware River and were used for confidence checks. *Concur.*

In accordance with the project instructions, 200% SSS bottom coverage was collected for this survey at 75m range scale. A SSS image mosaic was created at 1m resolution for submission (Table B-2). *Concur.*

#### **B.2.2 Multibeam Echosounder Quality Control**

Multibeam echosounder data were acquired at 100% coverage for SSS contact development, and areas deemed navigationally significant by the hydrographer. In order to successfully operate the EM3002 with the SIS software, sound speed casts were completed at the start of the survey day (and every 4 hours afterwards) and manually entered into the SIS program as an ASVP file, which is a Simrad format created by Velocwin. Surface sound velocity was provided by a 2<sup>nd</sup> Odom Digibar and it was fed directly into the SIS program in real time. There were no faults with the MBES system which adversely effected data integrity. Navigation data were reviewed; any fliers were rejected with interpolation. A small variable Navigation Timing error was noted after review of the data in post-processing within Caris' subset editor. The Navigation error did not exceed the allowable horizontal error budget, but it should be noted that certain vertical features may appear to have multiple peaks. Least depths were taken from the shallowest

sounding. For detailed discussion of MBES system calibrations, data acquisition, and data processing refer to this project's DAPR\*. *Included with H-Cell deliverables.*

### B.2.3 Total Propagated Error

Total Propagated Error (TPE) parameters for sound speed and tide data for H12152 are shown in table B-1. The estimated tidal error contribution to the total survey error budget in the vicinity of Delaware River is included in the TCARI gird. Sound speed TPE values were used in accordance with HSTP guidelines regarding frequency of surface and water column sound speed measurements. *Concur.*

Table B-1. Total Propagated Error parameters as applied in Caris.

Total Propagated Error Values			
Tide Values		Sound Speed Values	
Measured	Zoning	Measured	Surface
0.0	0.07	4.0	0.2

### B.2.4 Fieldsheets and Navigation Surfaces

Caris HIPS combined uncertainty weighted CUBE surfaces were created for this project. For MBES data surfaces were created and submitted at 0.50m resolution. A combined uncertainty weighted CUBE surface was created for VBES data at 4.00m resolution. The MBES CUBE surface finalized weighted grid is included in the PSS. Both surfaces used the corresponding CUBE parameters for the appropriate resolution of the grid. *Concur with clarification. See SAR Verification Notes.*

### B.2.5 Single Beam Quality Control

Navigation data were reviewed, fliers were rejected with interpolation. There were no unusual events associated with the collection of VBES data for this project. Additional single beam data was acquired at the request of the Delaware River Pilots via the Navigation Manager (See special correspondence emails). The areas where additional data were acquired included an area just south of New Castle Flats on the Delaware side of Deepwater Point Range, and the survey area east of New Castle Range adjacent to Salem Cove.

Refer to this project's DAPR for detailed discussion of VBES system calibrations, data acquisition, and data processing.

Table B-2: H12152 Bathymetry surfaces and Side Scan mosaic resolutions.

<b>H12152 Bathymetry Surfaces and SSS Mosaic</b>			
Fieldsheet	Surface/Mosaic Name	Grid Type	Resolution
H12152	H12152_MBES_CUBE_50cm	Cube, Order 1	0.50m
H12152	H12152_MBES_CUBE_50cm_Final	Cube, Order 1	0.50m
H12152	H12152_VBES_CUBE_4m	Cube, Order 1	4.00m
H12152	H12152_VBES_CUBE_4m_Final	Cube, Order 1	4.00m
H12152	H12152_SSS_1m	SSS Mosaic	1.00m

### B.2.6 Crosslines

For this survey 6.3 linear NM of VBES crosslines were acquired. This is approximately 7.4% of the mainscheme VBES bathymetry linear NM. A visual examination of approximately 10% of crossline-mainscheme common areas showed agreement between crosslines and mainscheme lines to within 1-2 feet. For a list of all crosslines acquired for this project, tabulated by DN and line file name, please refer to the processing logs located in the separates section of the DR submission package. *Concur.*

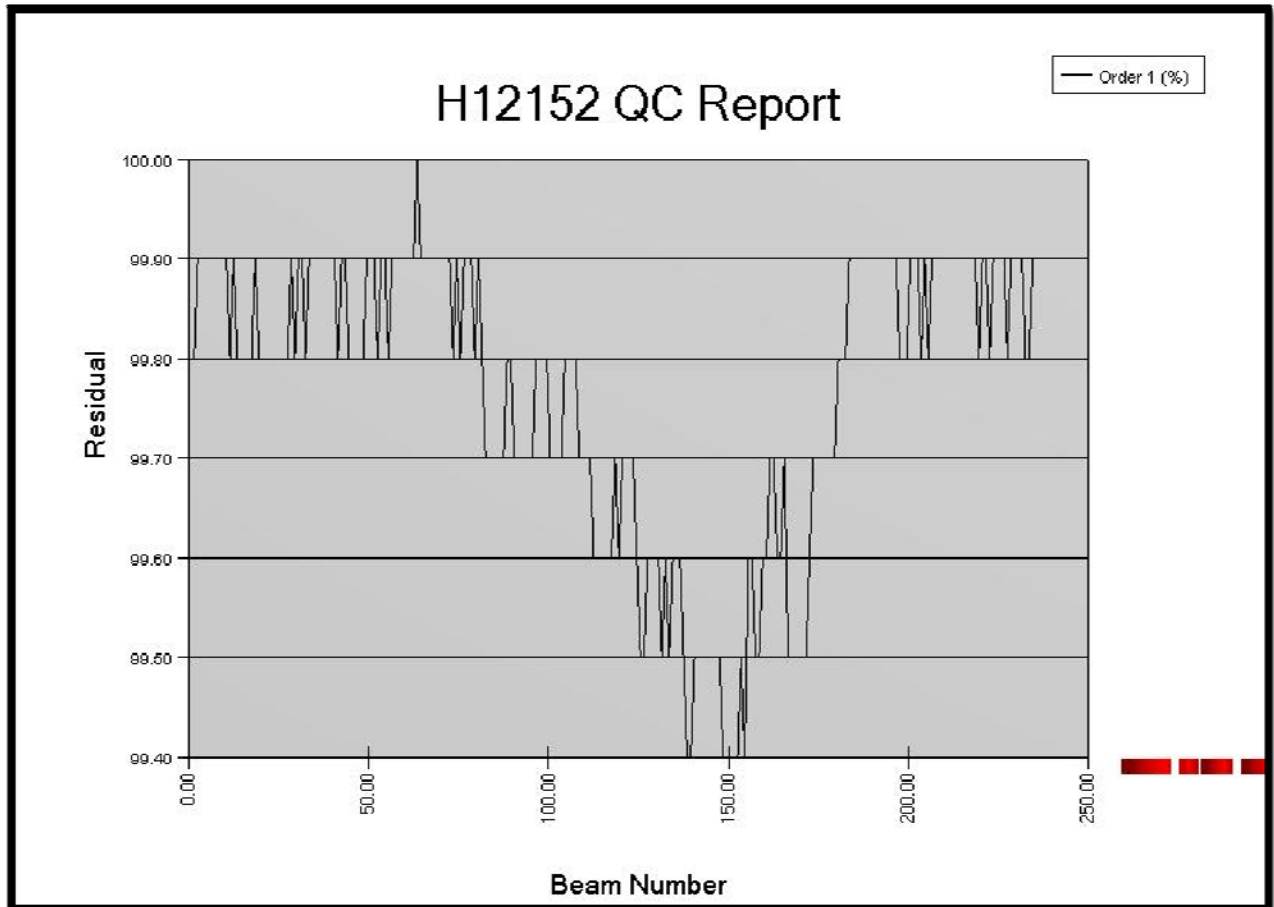
### B.2.7 Junctions

Survey H12152 junctions with contemporary survey H12151. Visual examination of all junction areas showed agreement between bathymetry data to within 1 foot. *Concur.*

## B.3 CORRECTIONS TO ECHO SOUNDING

All methods or instruments used were as described in the project DAPR. All sound velocity casts are included in the PSS. SV Casts were not used in post processing for MB data in Caris due to the acquisition software's (SiS) requirement to use an ASVP in real time. Post processing with an svp applied in Caris was found to create a double corrections of the data. See email correspondence with HSTP regarding data acceptance. *Concur.*

Figure B-1: Caris QC report, IHO order 1% vs Beam Number.



## **C. VERTICAL AND HORIZONTAL CONTROL** *See Also H-Cell Report*

### **C.1 VERTICAL CONTROL**

The tidal datum for this project is Mean Lower Low Water (MLLW). The operating National Water Level Observation Network (NWLON) stations at Reedy Point, DE (8551910) and Philadelphia, PA (8545240) served as datum control for the survey area including determination at each subordinate station. The operating stations at Marcus Hook, PA (8540433), Tacony-Palmyra (8538886), Reedy Point, DE (8551910), and Philadelphia, PA (8545240) provided residuals for this project. A Request for Approved Tides was sent to N/OPS1 on October 29, 2009 (Appendix III). Verified tides from the N/OPS1 CO-OPS website were downloaded and applied to all sounding data via TCARI in Pydro. *Concur.*

### **C.2 HORIZONTAL CONTROL**

The horizontal datum used for this survey is the North American Datum of 1983 (NAD 83), projected using UTM zone 18. *Concur.*

Sounding positional control was determined using the Global Positioning System (GPS) corrected by U.S. Coast Guard differential GPS (DGPS) beacon stations. The DGPS beacon used for this survey was Reedy Point, DE. No horizontal control stations were established for this survey.

Horizontal dilution of precision (HDOP) was monitored during acquisition, and did not exceed 4.00. Adequate satellite coverage was maintained throughout the survey period.

## **D. RESULTS AND RECOMMENDATIONS** \* *See Also H-Cell Report*

### **D.1 CHART COMPARISON**

The charts affected by this survey are:

<i>Chart Number</i>	<i>Edition</i>	<i>Edition Date</i>	<i>Scale</i>
12311	45 <sup>th</sup>	Dec. 2008	1:40,000
12277	34 <sup>th</sup>	Sep.2007	1:20,000
13003	49 <sup>th</sup>	Apr. 2007	1:1,200,2000



ENC Cell Name
US5PA11M
ENC Cell Name
US5PA12M
US5PA13M
<b>US5DE13M</b>
<b>US5MD15M</b>

### D.1.1 General Agreement with Charted soundings and RSD investigations

Sounding data generally agreed with charted depths to within 1-2 feet, navigationally significant differences from charted depths are addressed in Appendix II of this report. There were no RSD investigations in Sheet H12152. ***Do not concur. See H-Cell Report Section B.2.4.***

Additional SB data were acquired at the request of the Delaware River Pilots via the Philadelphia Navigation Manager. See email regarding Additional\_Anch\_areas. Areas of survey included an area adjacent to Deepwater Point Range and an area east of New Castle Range next to Salem Cove.

### D.1.2 AWOIS Items and Significant Contacts

There were 6 investigation AWOIS items assigned within the survey limits of H12152. The search area was covered with 200% SSS and 100% MBES when able to be confirmed. The updates to the AWOIS database were made in Pydro in the remarks and recommendations were added to the feature reports. See appendix II. ***Do not concur. See Appendix II – Survey Features Report.***

### D.1.3 Dangers to Navigation

There were no DToNs submitted for survey H12152. ***Concur.***

### D.1.4 Charted Features

Hydrographer recommended changes to charted items are listed in Appendix II of this report as well as in the PSS. All charted items not specifically addressed in Appendix II are recommended to be retained as charted by the hydrographer.

### D.1.5 Charting Recommendations



Hydrographer recommendations for discreet items are included in Appendix II of this report as well as in the PSS. Survey H12152 is complete and adequate to supersede charted soundings in their common areas. *Concur.*

## **D.2 ADDITIONAL RESULTS**

### **D.2.1 Aids to Navigation**

The hydrographer recommends no modifications to any aids to navigation to note. All were verified as accurate.

### **D.2.2 Bridges and Overhead Cables**

There is no bridge and no overhead cables in the survey area.

### **D.2.3 Submarine Cables and Pipelines**

There are two charted cable areas and no pipeline areas within the survey area.

## **E. APPROVAL SHEET**

**S-D903  
Delaware River  
Pennsylvania, New Jersey, Delaware**

**Delaware River  
Survey Registry No. H12152**

Field operations for this survey were conducted under my daily supervision with frequent checks of progress and adequacy. All fieldsheets, bathymetry models, this Descriptive Report, and all accompanying records and data are approved.

Submitted in association with this descriptive report has been a series of reports and data:

2009 Data Acquisition and Processing Report (submitted with this report)  
2009 HSRR Memo (submitted with this report)

This survey is adequate to supersede all prior surveys in common areas, and for application to the relevant NOS nautical charts.

Respectfully,

---

N/A, PST/NOAA  
NRT-5

---

Bert Ho, NOAA  
Team Lead NRT-5

**APPENDIX I**  
**DTON REPORT**

## **APPENDIX I**

### **DANGERS TO NAVIGATION REPORT**

There were no DToN's submitted for survey H12152.

## Appendix II - Survey Feature Report

**Registry Number:** H12152  
**State:** Delaware  
**Locality:** Delaware River  
**Sub-locality:** Deepwater Point Range to Salem Cove  
**Project Number:** S-D903-NRT5-09  
**Survey Dates:** 11/03/2009 - 07/11/2011

### Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
12277	34th	09/01/2007	1:20,000 (12277_1)	[L]NTM: ?
12311	45th	12/01/2008	1:40,000 (12311_1)	USCG LNM: 02/24/2009 (07/21/2009) NGA NTM: 07/18/2009 (08/01/2009)
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	17-ft Wreck - Charted	Wreck	5.27 m	39° 40' 03.9" N	075° 32' 13.7" W	---
1.2	8-ft Obstn - Modify Charted 10-ft Obstn	Obstruction	2.62 m	39° 35' 39.7" N	075° 33' 30.9" W	---
1.3	Charted 17-ft Rk- Update Depth	Rock	[None]	39° 40' 16.4" N	075° 32' 10.6" W	---
2.1	18-ft Obstn - Add to chart.	Obstruction	5.68 m	39° 40' 06.3" N	075° 32' 18.8" W	---
2.2	14-ft Obstn - Add to chart.	Obstruction	4.49 m	39° 39' 50.1" N	075° 32' 56.2" W	---
2.3	7-ft Obstn - Add to chart.	Obstruction	2.34 m	39° 35' 08.3" N	075° 33' 03.6" W	---
2.4	15-ft Wreck - Add to chart	Wreck	4.67 m	39° 34' 51.6" N	075° 32' 57.5" W	---
2.5	18-ft Wreck - Add to chart	Wreck	5.51 m	39° 34' 51.4" N	075° 32' 56.2" W	---
2.6	18ft Obstn- Add to chart.	Obstruction	5.69 m	39° 39' 30.7" N	075° 32' 45.2" W	---
3.1	AWOIS 12216 - 16-ft Obstn - Update Chart.	Obstruction	5.02 m	39° 39' 18.7" N	075° 33' 03.5" W	12216

**1 - DR\_Charted**

## 1.1) 17-ft Wreck - Charted

### Survey Summary

**Survey Position:** 39° 40' 03.9" N, 075° 32' 13.7" W  
**Least Depth:** 5.27 m (= 17.29 ft = 2.881 fm = 2 fm 5.29 ft)  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh)  $\pm 1.963$  m ; TVU (TPEv)  $\pm 0.220$  m  
**Timestamp:** 2009-307.15:21:21.222 (11/03/2009)  
**Survey Line:** h12152\_sheetf / nrt5\_s3002\_em3002\_mbes / 2009-307 / 005\_1521  
**Profile/Beam:** 280/129  
**Charts Affected:** 12311\_1, 13003\_1

#### Remarks:

Area was covered with 200% SSS and 100% MBES. TCARI tides have been applied and data has been remerged. Charted wreck.

### Feature Correlation

Address	Feature	Range	Azimuth	Status
h12152_sheetf/nrt5_s3002_em3002_mbes/2009-307/005_1521	280/129	0.00	000.0	Primary
h12152_sheetf/nrt5_s3002_klein3000_sss/2009-299/sonar_data091026170300	0002	1.19	296.2	Secondary
h12152_sheetf/nrt5_s3002_klein3000_sss/2009-299/sonar_data091026163800	0001	6.91	224.5	Secondary
ChartGPs - Digitized	2	12.65	115.1	Secondary (grouped)

### Hydrographer Recommendations

Hydrographer recommends updating the LD to what was found in the data.

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

17ft (12311\_1)

2 ¾fm (13003\_1)

### S-57 Data

**Geo object 1:** Wreck (WRECKS)  
**Attributes:** CATWRK - 2:dangerous wreck  
 QUASOU - 6:least depth known  
 SORDAT - 20091208



SORIND - US,US,graph,H12152

TECSOU - 2,3:found by side scan sonar,found by multi-beam

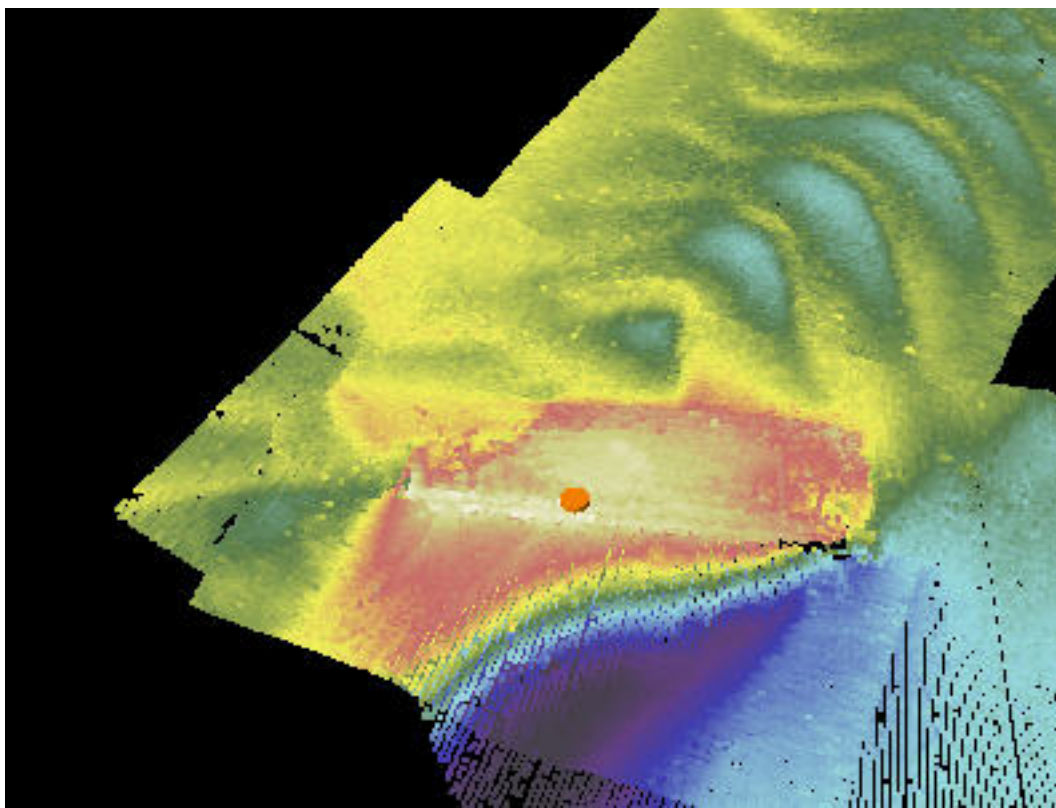
VALSOU - 5.269 m

WATLEV - 3:always under water/submerged

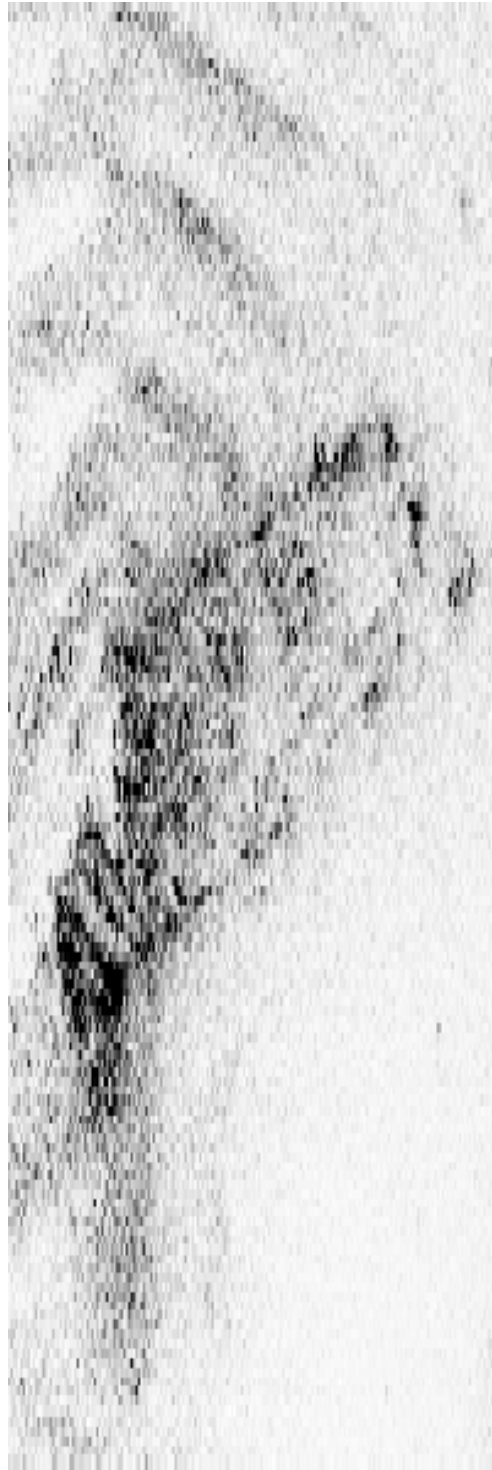
### **Office Notes**

Concur with clarification. Delete charted dangerous wreck, least depth known 18 feet. Chart dangerous wreck, least depth known 17 feet at the present survey position.

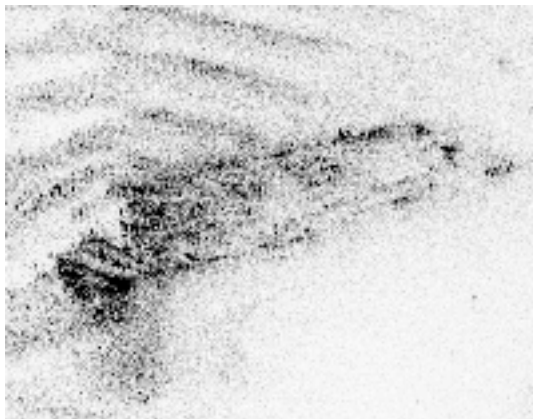
## Feature Images



*Figure 1.1.1*



*Figure 1.1.2*



*Figure 1.1.3*

[Image file h:/compilation/h12152\_d903\_nrt5/ahb\_h12152/sar/sar pss/images/sonar\_da0002\_u.tif does not exist.]

## 1.2) 8-ft Obstn - Modify Charted 10-ft Obstn

### Survey Summary

**Survey Position:** 39° 35' 39.7" N, 075° 33' 30.9" W  
**Least Depth:** 2.62 m (= 8.58 ft = 1.430 fm = 1 fm 2.58 ft)  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh)  $\pm 1.963$  m ; TVU (TPEv)  $\pm 0.218$  m  
**Timestamp:** 2009-307.15:56:38.635 (11/03/2009)  
**Survey Line:** h12152\_sheetf / nrt5\_s3002\_em3002\_mbes / 2009-307 / 019\_1556  
**Profile/Beam:** 413/127  
**Charts Affected:** 12277\_1, 12311\_1, 13003\_1

#### Remarks:

Area was covered with 200% SSS and 100% MBES. TCARI tides have been applied and data has been remerged. Charted obstruction.

### Feature Correlation

Address	Feature	Range	Azimuth	Status
h12152_sheetf/nrt5_s3002_em3002_mbes/2009-307/019_1556	413/127	0.00	000.0	Primary
h12152_sheetf/nrt5_s3002_klein3000_sss/2009-299/sonar_data091026135800	0001	0.05	000.0	Secondary (grouped)
ChartGPs - Digitized	1	2.59	272.2	Secondary (grouped)

### Hydrographer Recommendations

Item exists. Hydrographer recommends modifying the charted obstruction to reflect the LD from the data.

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

8ft (12277\_1, 12311\_1)

1 ¼fm (13003\_1)

### S-57 Data

**Geo object 1:** Obstruction (OBSTRN)  
**Attributes:** QUASOU - 6:least depth known  
 SORDAT - 20091208  
 SORIND - US,US,graph,H12152  
 TECSOU - 2,3:found by side scan sonar,found by multi-beam

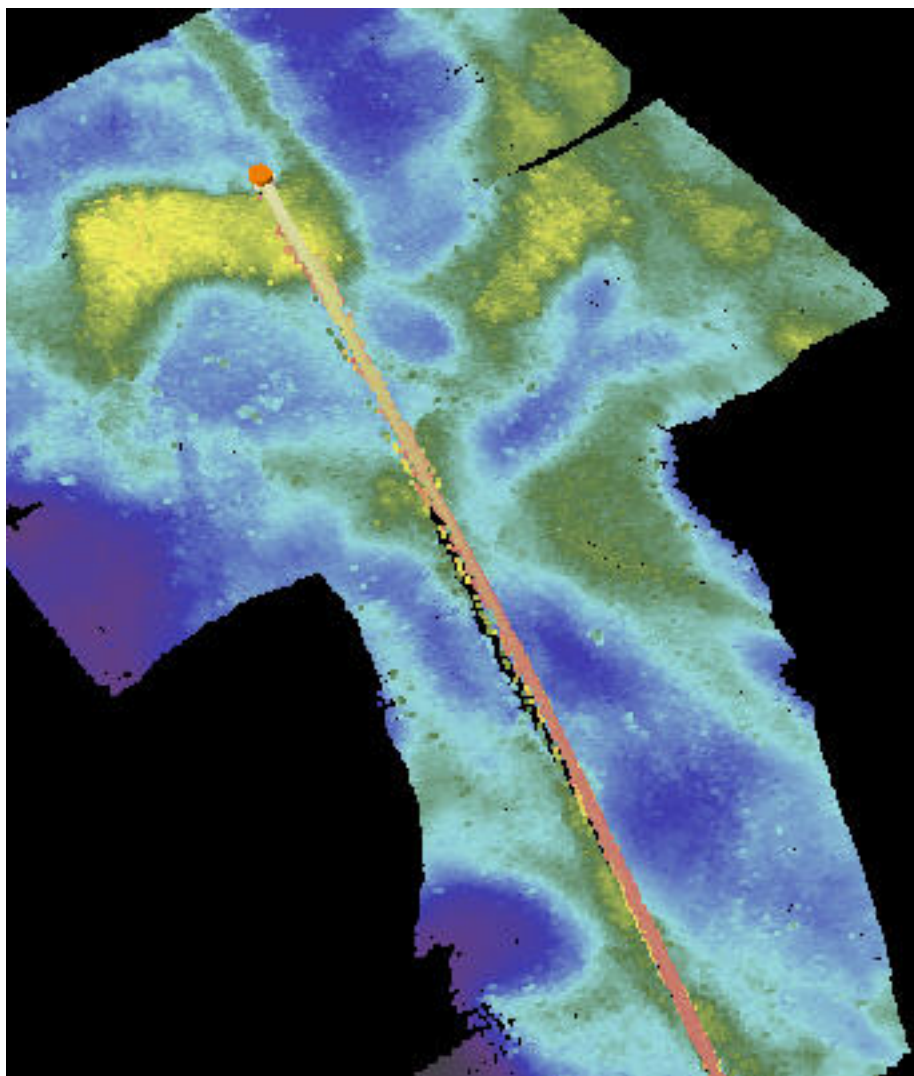
VALSOU - 2.616 m

WATLEV - 3:always under water/submerged

### **Office Notes**

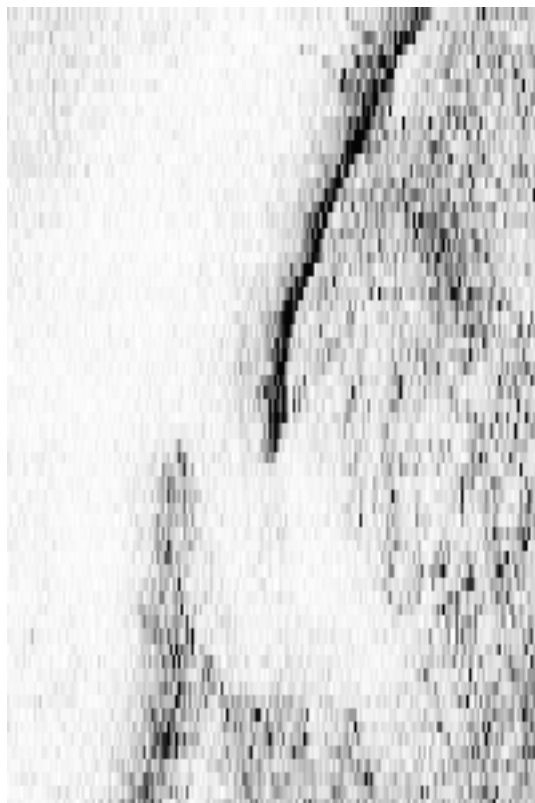
Concur with clarification. Feature appears to be sunken dredge pipe. Delete charted dangerous obstruction, least depth known 10 feet and add 8 ft obstruction at present survey position.

## Feature Images



*Figure 1.2.1*

[Image file h:/compilation/h12152\_d903\_nrt5/ahb\_h12152/sar/sar pss/images/sonar\_da0001\_m.tif does not exist.]



*Figure 1.2.2*



### 1.3) Charted 17-ft Rk- Update Depth

#### Survey Summary

**Survey Position:** 39° 40' 16.4" N, 075° 32' 10.6" W  
**Least Depth:** [None]  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh) [None] ; TVU (TPEv) [None]  
**Timestamp:** 2011-192.10:33:44 (07/11/2011)  
**GP Dataset:** ChartGPs - Digitized  
**GP No.:** 4  
**Charts Affected:** 12311\_1, 13003\_1

#### Remarks:

Item not addressed.

#### Feature Correlation

Address	Feature	Range	Azimuth	Status
ChartGPs - Digitized	4	0.00	000.0	Primary

#### Hydrographer Recommendations

Item not fully covered. Rk verified within the SS data with measured depth of 16.73228 ft. Feature found as existing, chart should be updated with new value.

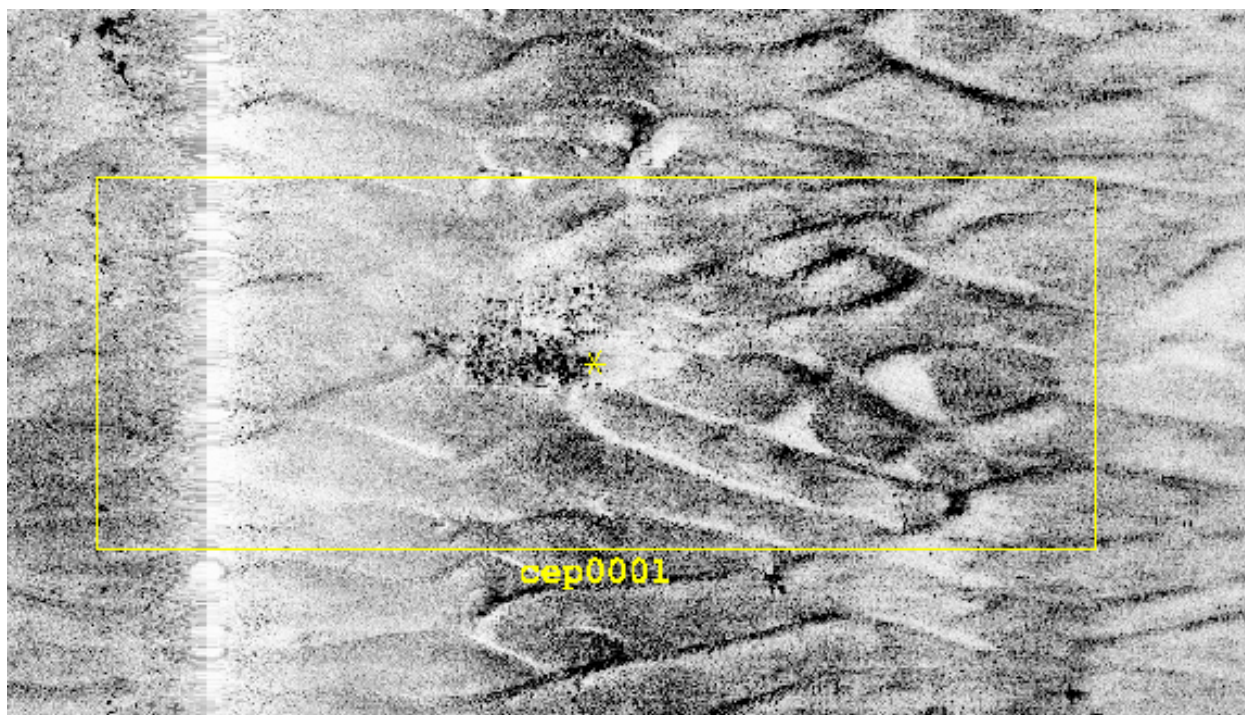
#### S-57 Data

**Geo object 1:** Underwater rock / awash rock (UWTROC)

#### Office Notes

Concur with clarification. Rock piles were verified in side scan data. Exact least depth not determined. Delete charted dangerous 17 ft underwater rock and add a 16 ft underwater rock, depth reported from ENC position.

## Feature Images



*Figure 1.3.1*



## **2 - DR\_UnCharted**

## 2.1) 18-ft Obstrn - Add to chart.

### Survey Summary

**Survey Position:** 39° 40' 06.3" N, 075° 32' 18.8" W  
**Least Depth:** 5.68 m (= 18.64 ft = 3.106 fm = 3 fm 0.64 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.964$  m ; **TVU (TPEv)**  $\pm 0.221$  m  
**Timestamp:** 2009-307.15:23:50.300 (11/03/2009)  
**Survey Line:** h12152\_sheetf / nrt5\_s3002\_em3002\_mbes / 2009-307 / 001\_1523  
**Profile/Beam:** 273/131  
**Charts Affected:** 12311\_1, 13003\_1

#### Remarks:

Area was covered with 200% SSS and 100% MBES. TCARI tides have been applied and data has been remerged. Small obstruction.

### Feature Correlation

Address	Feature	Range	Azimuth	Status
h12152_sheetf/nrt5_s3002_em3002_mbes/2009-307/001_1523	273/131	0.00	000.0	Primary
h12152_sheetf/nrt5_s3002_klein3000_sss/2009-300/sonar_data091027122500	0001	5.59	019.2	Secondary

### Hydrographer Recommendations

Current surrounding depths show feature to be significant. Defer to compilation for charting recommendation.

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

18ft (12311\_1)

3fm (13003\_1)

### S-57 Data

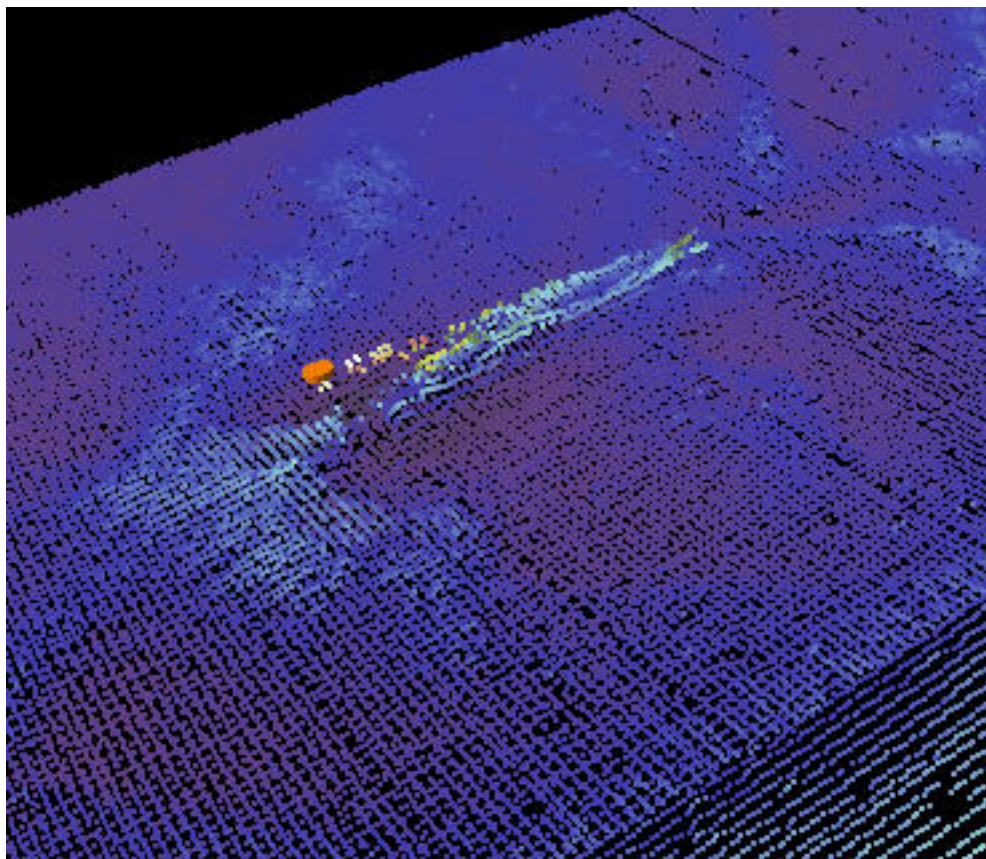
**Geo object 1:** Obstruction (OBSTRN)  
**Attributes:** QUASOU - 6:least depth known  
 SORDAT - 20091208  
 SORIND - US,US,graph,H12152  
 TECSOU - 2,3:found by side scan sonar,found by multi-beam  
 VALSOU - 5.680 m

WATLEV - 3:always under water/submerged

### **Office Notes**

Concur with clarification. Chart dangerous obstruction, least depth known 18 feet at the present survey position.

## Feature Images

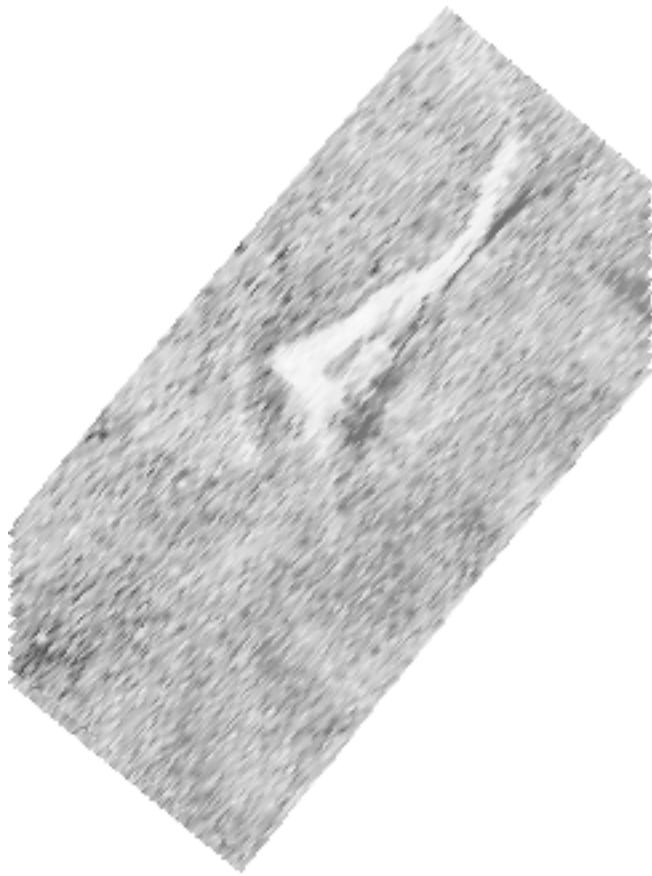


*Figure 2.1.1*



*Figure 2.1.2*





*Figure 2.1.3*

## 2.2) 14-ft Obstrn - Add to chart.

### Survey Summary

**Survey Position:** 39° 39' 50.1" N, 075° 32' 56.2" W  
**Least Depth:** 4.49 m (= 14.73 ft = 2.456 fm = 2 fm 2.73 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.967$  m ; **TVU (TPEv)**  $\pm 0.216$  m  
**Timestamp:** 2009-307.15:32:30.312 (11/03/2009)  
**Survey Line:** h12152\_sheetf / nrt5\_s3002\_em3002\_mbes / 2009-307 / 009\_1532  
**Profile/Beam:** 221/25  
**Charts Affected:** 12311\_1, 13003\_1

#### Remarks:

Area was covered with 200% SSS and 100% MBES. TCARI tides have been applied and data has been remerged. Ridge.

### Feature Correlation

Address	Feature	Range	Azimuth	Status
h12152_sheetf/nrt5_s3002_em3002_mbes/2009-307/009_1532	221/25	0.00	000.0	Primary
h12152_sheetf/nrt5_s3002_klein3000_sss/2009-300/sonar_data091027133900	0001	7.60	195.9	Secondary

### Hydrographer Recommendations

Hydrographer recommends not charting this feature because LD is not significant enough to pose a hazard.

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

14ft (12311\_1)

2 ½fm (13003\_1)

### S-57 Data

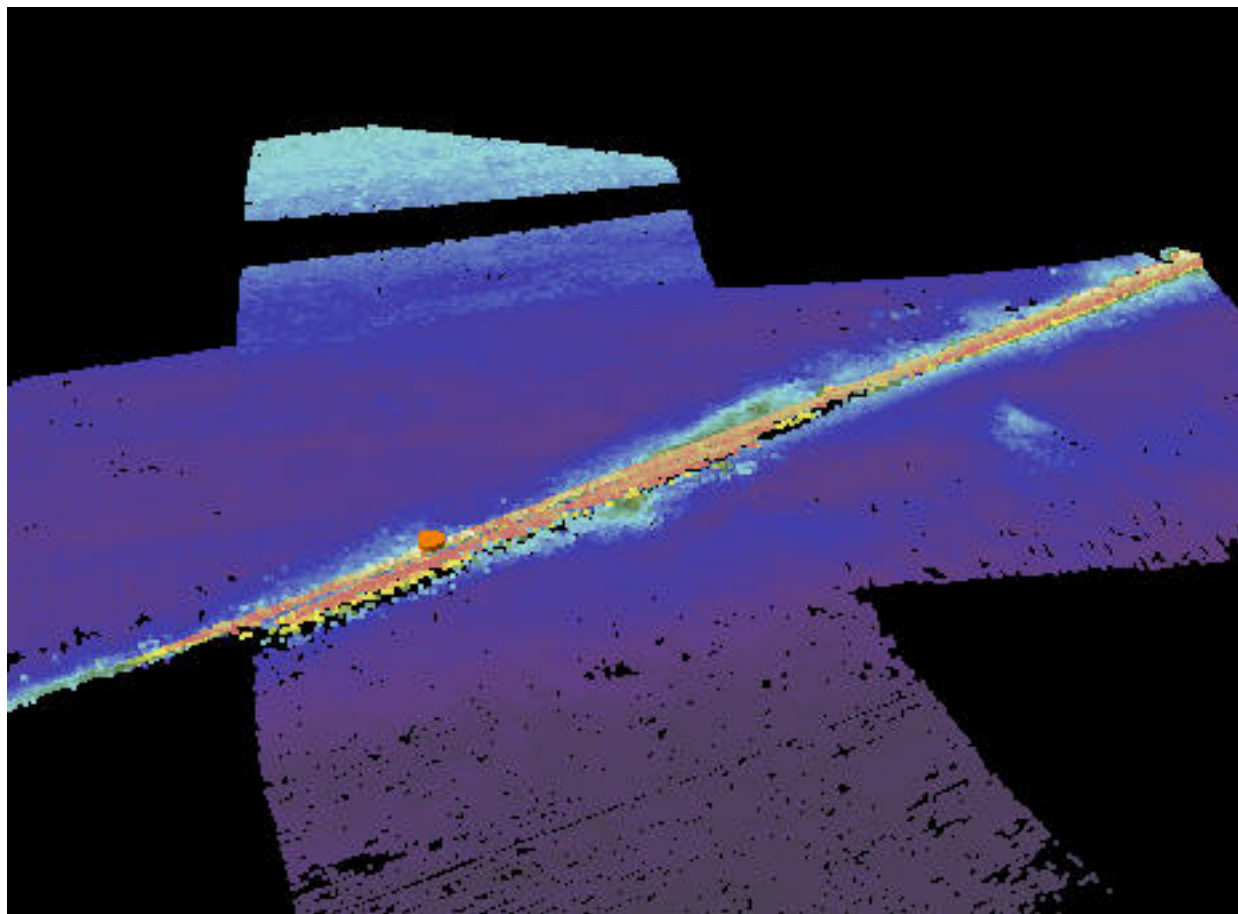
**Geo object 1:** Obstruction (OBSTRN)  
**Attributes:** QUASOU - 6:least depth known  
 SORDAT - 20091208  
 SORIND - US,US,graph,H12152  
 TECSOU - 2,3:found by side scan sonar,found by multi-beam  
 VALSOU - 4.491 m

WATLEV - 3:always under water/submerged

### **Office Notes**

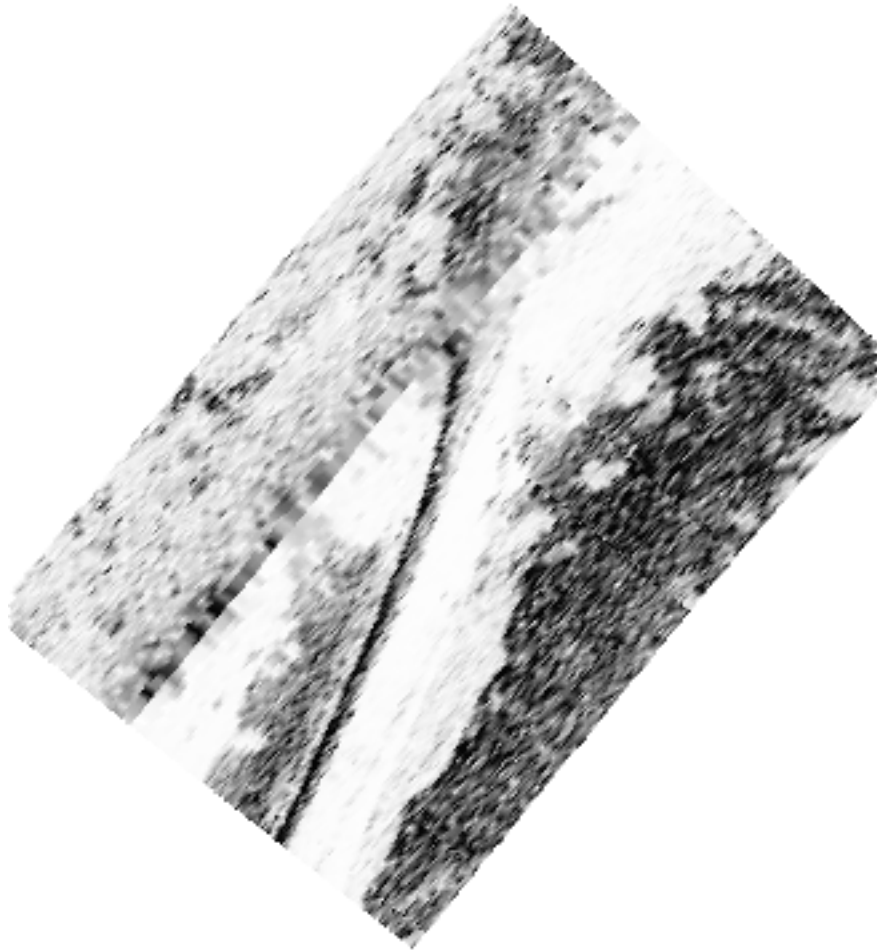
Do not concur. Feature is a linear obstruction which appears to be a sunken dredge pipe laying horizontally on the river bottom approximately 30 m in length and 1.5 m in width positioned in a north/south orientation. The feature was not completely ensonified during multibeam development, therefore the shoal depth of 14 ft could not be confirmed as the shoalest point or least depth on the obstruction. Chart dangerous linear obstruction, depth known 14 ft at the survey position.

## Feature Images



*Figure 2.2.1*

[Image file h:/compilation/h12152\_d903\_nrt5/ahb\_h12152/sar/sar pss/images/sonar\_da0001\_m.tif does not exist.]



*Figure 2.2.2*

## 2.3) 7-ft Obstn - Add to chart.

### Survey Summary

**Survey Position:** 39° 35' 08.3" N, 075° 33' 03.6" W  
**Least Depth:** 2.34 m (= 7.68 ft = 1.281 fm = 1 fm 1.68 ft)  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh)  $\pm 1.966$  m ; TVU (TPEv)  $\pm 0.207$  m  
**Timestamp:** 2009-307.16:09:32.091 (11/03/2009)  
**Survey Line:** h12152\_sheetf / nrt5\_s3002\_em3002\_mbes / 2009-307 / 030\_1609  
**Profile/Beam:** 94/208  
**Charts Affected:** 12277\_1, 12311\_1, 13003\_1

#### Remarks:

Area was covered with 200% SSS and 100% MBES. TCARI tides have been applied and data has been remerged. Significant obstruction.

### Feature Correlation

Address	Feature	Range	Azimuth	Status
h12152_sheetf/nrt5_s3002_em3002_mbes/2009-307/030_1609	94/208	0.00	000.0	Primary
h12152_sheetf/nrt5_s3002_klein3000_sss/2009-299/sonar_data091026145000	0003	11.30	286.8	Secondary

### Hydrographer Recommendations

Hydrographer recommends charting this obstruction with LD from data at location within data.

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

7ft (12277\_1, 12311\_1)

1 ¼fm (13003\_1)

### S-57 Data

**Geo object 1:** Obstruction (OBSTRN)  
**Attributes:** QUASOU - 6:least depth known  
 SORDAT - 20091208  
 SORIND - US,US,graph,H12152  
 TECSOU - 2,3:found by side scan sonar,found by multi-beam  
 VALSOU - 2.342 m

WATLEV - 3:always under water/submerged

### **Office Notes**

Concur with clarification. Chart dangerous obstruction, least depth known 7 feet at the present survey position.

## Feature Images

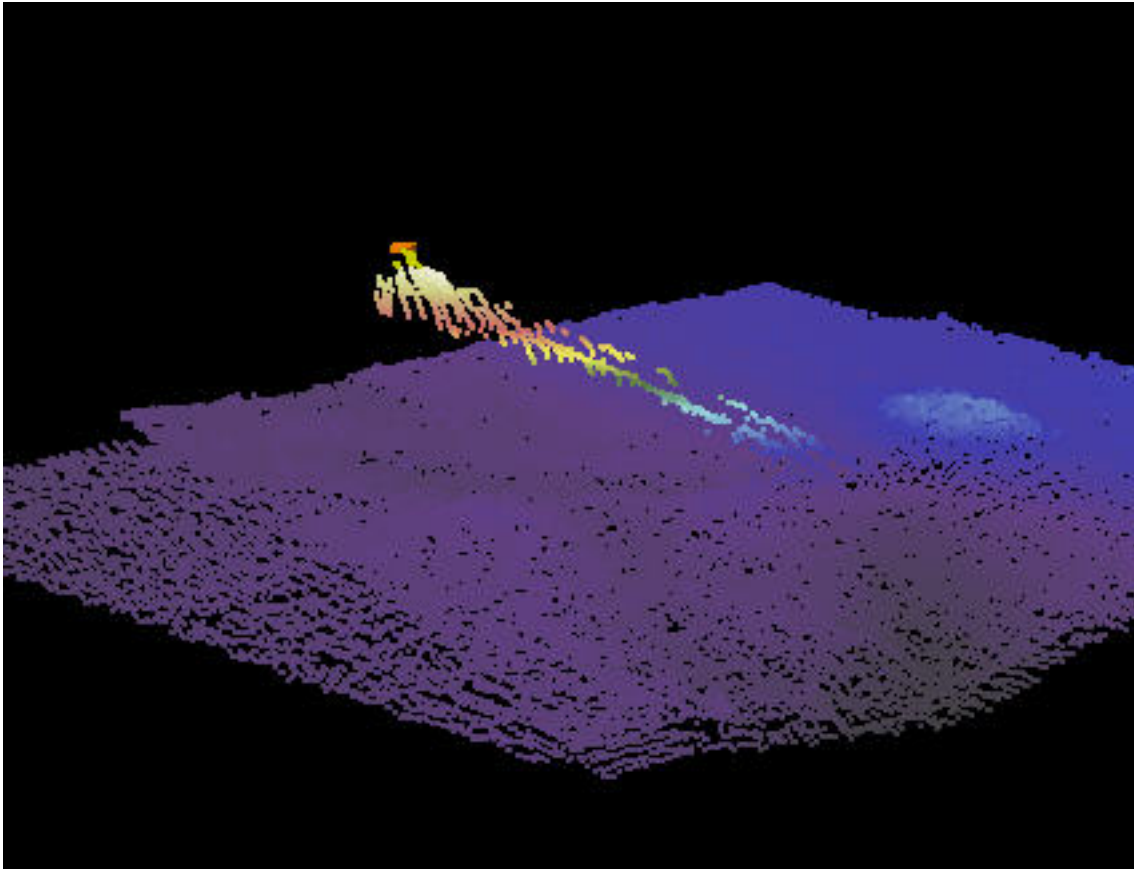


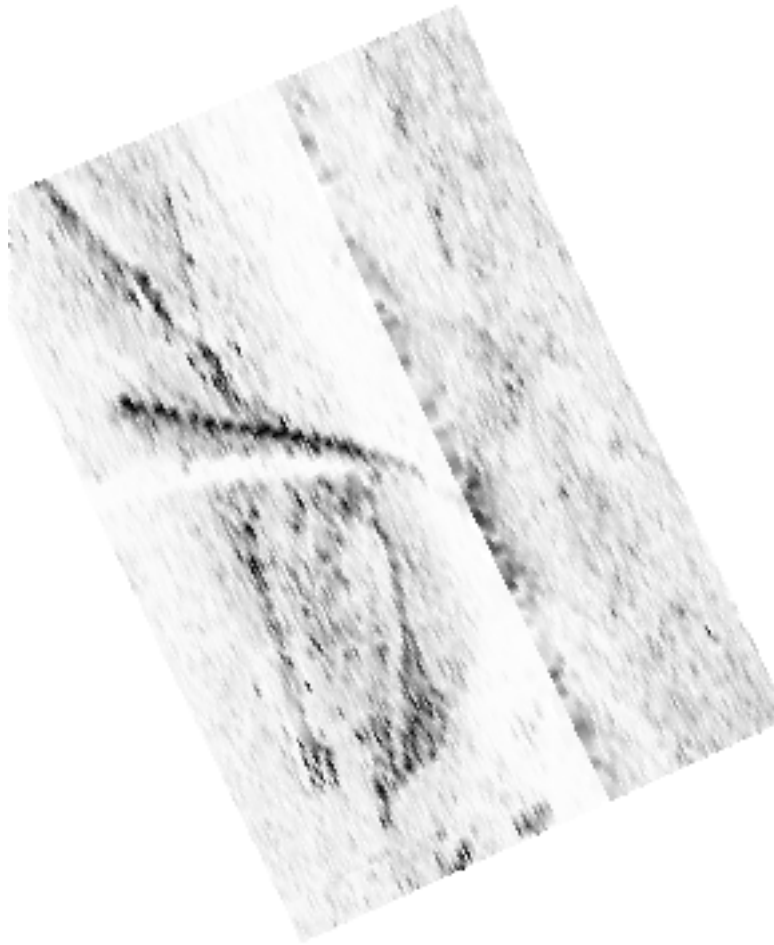
Figure 2.3.1

[Image file h:/compilation/h12152\_d903\_nrt5/ahb\_h12152/sar/sar pss/images/sonar\_da0003\_u.tif does not exist.]

[Image file h:/compilation/h12152\_d903\_nrt5/ahb\_h12152/sar/sar pss/images/sonar\_da0003\_m.tif does not exist.]

[Image file h:/compilation/h12152\_d903\_nrt5/ahb\_h12152/sar/sar pss/images/sonar\_da0003\_s.tif does not exist.]





*Figure 2.3.2*

## 2.4) 15-ft Wreck - Add to chart

### Survey Summary

**Survey Position:** 39° 34' 51.6" N, 075° 32' 57.5" W  
**Least Depth:** 4.67 m (= 15.31 ft = 2.552 fm = 2 fm 3.31 ft)  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh)  $\pm 1.969$  m ; TVU (TPEv)  $\pm 0.225$  m  
**Timestamp:** 2009-307.16:22:08.744 (11/03/2009)  
**Survey Line:** h12152\_sheetf / nrt5\_s3002\_em3002\_mbes / 2009-307 / 041\_1622  
**Profile/Beam:** 7/1  
**Charts Affected:** 12277\_1, 12311\_1, 13003\_1

#### Remarks:

Area was covered with 200% SSS and 100% MBES. TCARI tides have been applied and data has been remerged. Wreck next to another wreck.

### Feature Correlation

Address	Feature	Range	Azimuth	Status
h12152_sheetf/nrt5_s3002_em3002_mbes/2009-307/041_1622	7/1	0.00	000.0	Primary
h12152_sheetf/nrt5_s3002_klein3000_sss/2009-299/sonar_data091026143700	0002	3.69	103.8	Secondary

### Hydrographer Recommendations

Hydrographer recommends charting wreck at location within data with LD from data.

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

15ft (12277\_1, 12311\_1)

2 ½fm (13003\_1)

### S-57 Data

**Geo object 1:** Wreck (WRECKS)  
**Attributes:** CATWRK - 2:dangerous wreck  
 QUASOU - 6:least depth known  
 SORDAT - 20091208  
 SORIND - US,US,graph,H12152  
 TECSOU - 2,3:found by side scan sonar,found by multi-beam

VALSOU - 4.668 m

WATLEV - 3:always under water/submerged

### **Office Notes**

Concur with clarification. The dangerous wreck, least depth 15 ft is approximately 31 meters offshore to the west of another dangerous wreck with a least depth of 18 ft. Since both features are within a 75 meter diameter danger circle centered on the shoalest depth of the 15 ft wreck the features should be charted as plural wrecks, with a least depth known of 15 ft. Chart dangerous wrecks (plural), least depth known 15 feet and text "Wrecks" at the present survey position. See also Feature 2.5 - "18-ft Wreck - Wreck - Add to chart".

## Feature Images

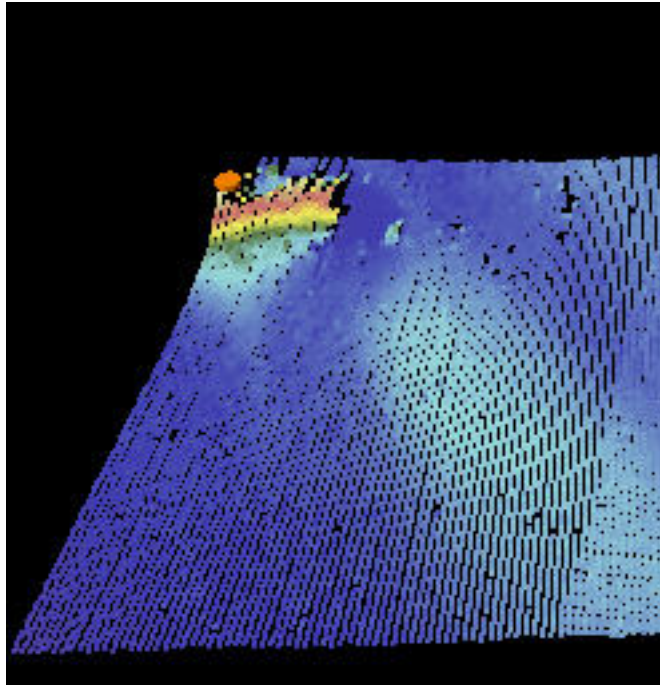
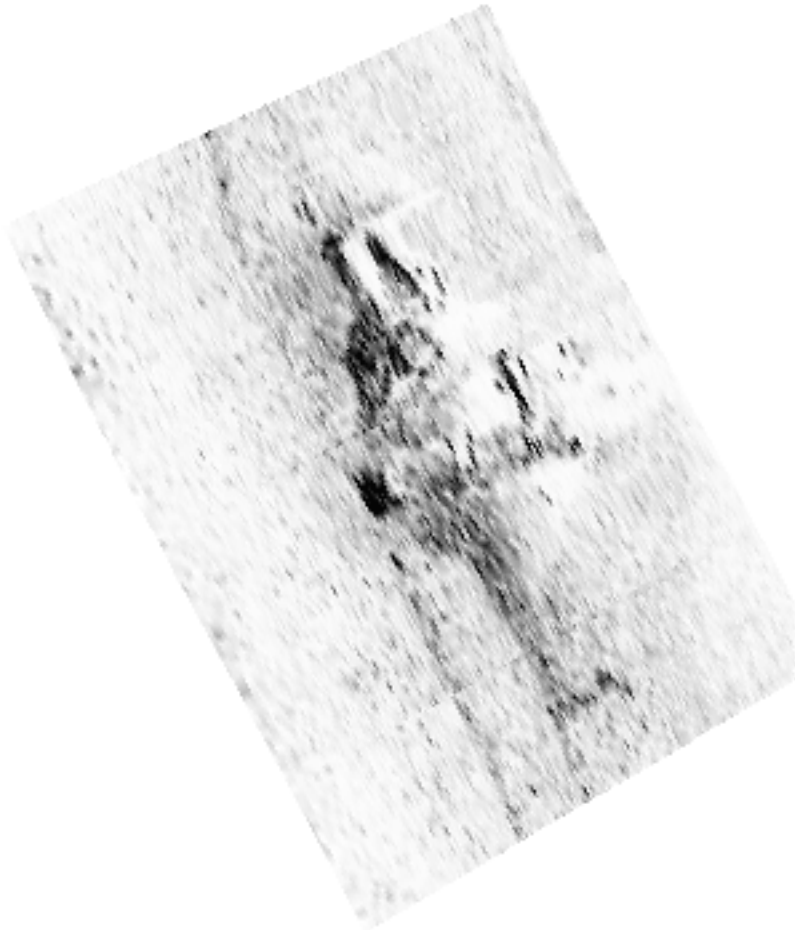


Figure 2.4.1

[Image file h:/compilation/h12152\_d903\_nrt5/ahb\_h12152/sar/sar pss/images/sonar\_da0002\_u.tif does not exist.]

[Image file h:/compilation/h12152\_d903\_nrt5/ahb\_h12152/sar/sar pss/images/sonar\_da0002\_m.tif does not exist.]

[Image file h:/compilation/h12152\_d903\_nrt5/ahb\_h12152/sar/sar pss/images/sonar\_da0002\_s.tif does not exist.]



*Figure 2.4.2*

## 2.5) 18-ft Wreck - Add to chart

### Survey Summary

**Survey Position:** 39° 34' 51.4" N, 075° 32' 56.2" W  
**Least Depth:** 5.51 m (= 18.08 ft = 3.013 fm = 3 fm 0.08 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.965$  m ; **TVU (TPEv)**  $\pm 0.220$  m  
**Timestamp:** 2009-307.16:22:17.887 (11/03/2009)  
**Survey Line:** h12152\_sheetf / nrt5\_s3002\_em3002\_mbes / 2009-307 / 041\_1622  
**Profile/Beam:** 135/109  
**Charts Affected:** 12277\_1, 12311\_1, 13003\_1

#### Remarks:

Area was covered with 200% SSS and 100% MBES. TCARI tides have been applied and data has been remerged. Wreck, adjacent to another wreck.

### Feature Correlation

Address	Feature	Range	Azimuth	Status
h12152_sheetf/nrt5_s3002_em3002_mbes/2009-307/041_1622	135/109	0.00	000.0	Primary
h12152_sheetf/nrt5_s3002_klein3000_sss/2009-299/sonar_data091026143700	0003	2.83	028.2	Secondary
h12152_sheetf/nrt5_s3002_klein3000_sss/2009-299/sonar_data091026142600	0002	4.64	297.8	Secondary

### Hydrographer Recommendations

Hydrographer recommends charting this wreck at the location within data with the LD from data.

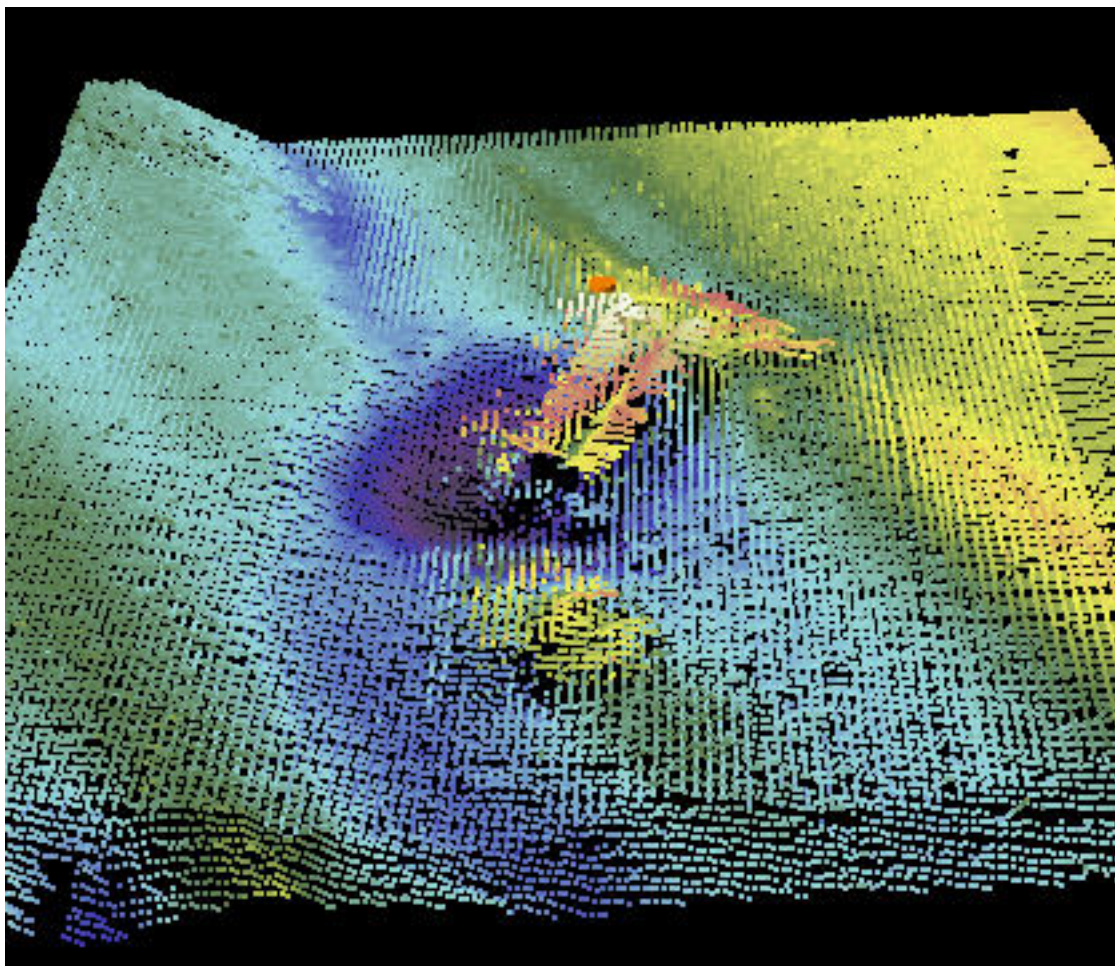
### S-57 Data

**Geo object 1:** Wreck (WRECKS)  
**Attributes:** CATWRK - 2:dangerous wreck  
 QUASOU - 6:least depth known  
 SORDAT - 20091208  
 SORIND - US,US,graph,H12152  
 TECSOU - 2,3:found by side scan sonar,found by multi-beam  
 VALSOU - 5.511 m  
 WATLEV - 3:always under water/submerged

## Office Notes

Concur with clarification. The dangerous wreck, least depth 18 ft is approximately 31 meters inshore to the east of another dangerous wreck with a least depth of 15 ft. Since both features are within a 75 meter diameter danger circle centered on the shoalest depth of the 15 ft wreck the features should be charted as plural wrecks, with a least depth known of 15 ft. Do not chart 18 ft Wreck deirectly. Chart dangerous wrecks (plural), least depth known 15 feet and text "Wrecks" at the present survey position of the 15 ft dangerous wreck. See also Feature 2.4 - "15-ft Wreck - Add to Chart".

## Feature Images

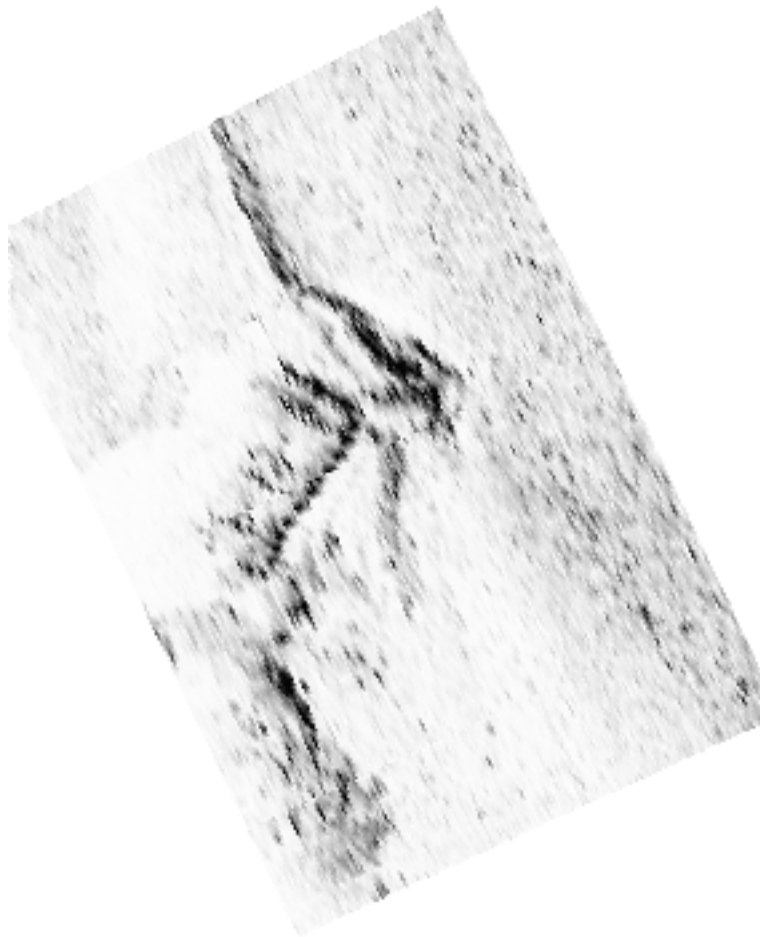


*Figure 2.5.1*





*Figure 2.5.2*



*Figure 2.5.3*

## 2.6) 18ft Obstn- Add to chart.

### Survey Summary

**Survey Position:** 39° 39' 30.7" N, 075° 32' 45.2" W  
**Least Depth:** 5.69 m (= 18.66 ft = 3.111 fm = 3 fm 0.66 ft)  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh)  $\pm 1.968$  m ; TVU (TPEv)  $\pm 0.223$  m  
**Timestamp:** 2009-307.15:38:00.462 (11/03/2009)  
**Survey Line:** h12152\_sheetf / nrt5\_s3002\_em3002\_mbes / 2009-307 / 013\_1537  
**Profile/Beam:** 73/228  
**Charts Affected:** 12311\_1, 13003\_1

#### Remarks:

Area was covered with 200% SSS and 100% MBES. TCARI tides have been applied and data has been remerged.

### Feature Correlation

Address	Feature	Range	Azimuth	Status
h12152_sheetf/nrt5_s3002_em3002_mbes/2009-307/013_1537	73/228	0.00	000.0	Primary
h12152_sheetf/nrt5_s3002_klein3000_sss/2009-299/sonar_data091026160100	0001	33.12	027.0	Secondary

### Hydrographer Recommendations

Add 18-ft Obstn to chart. Item exists.

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

18ft (12311\_1)

3fm (13003\_1)

### S-57 Data

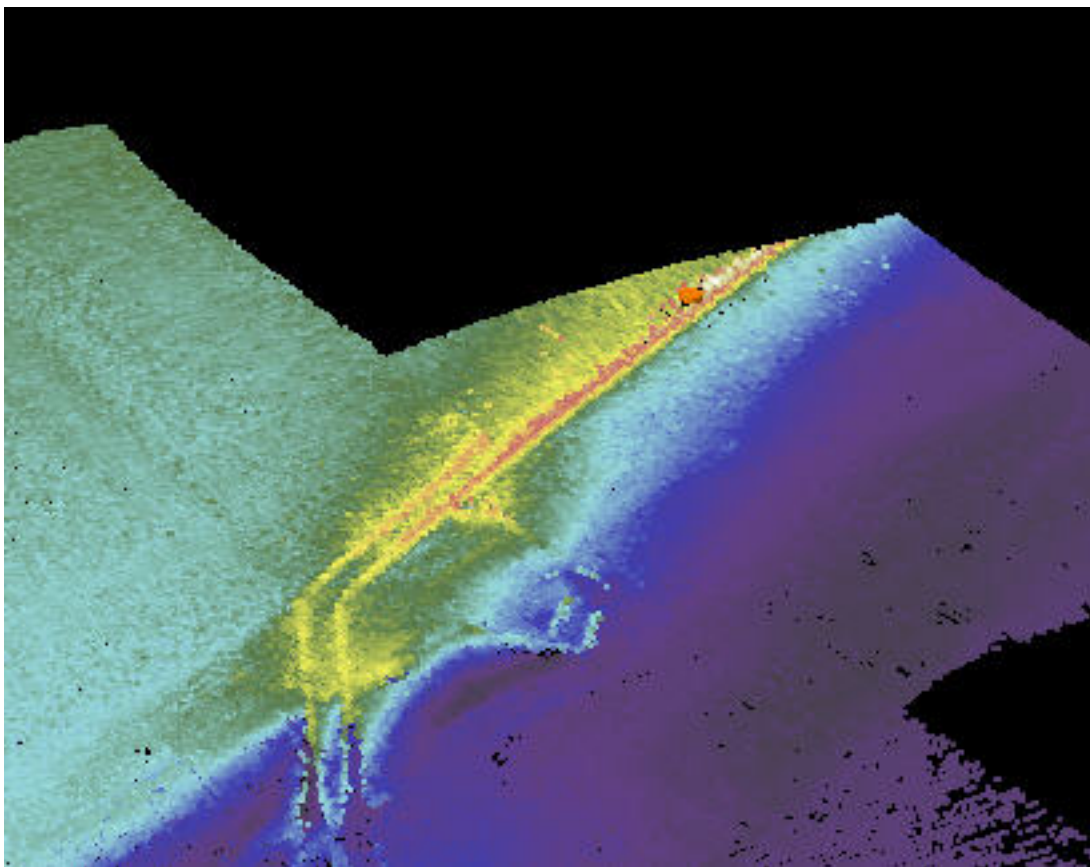
**Geo object 1:** Obstruction (OBSTRN)  
**Attributes:** QUASOU - 6:least depth known  
 SORDAT - 20091208  
 SORIND - US,US,graph,H12152  
 TECSOU - 2,3:found by side scan sonar,found by multi-beam  
 VALSOU - 5.689 m

WATLEV - 3:always under water/submerged

### **Office Notes**

Concur with clarification. Chart dangerous obstruction, least depth known 18 feet at the present survey position.

## Feature Images



*Figure 2.6.1*



*Figure 2.6.2*



**3 - DR\_AWOIS**

### 3.1) AWOIS 12216 - 16-ft Obstn - Update Chart.

#### Primary Feature for AWOIS Item #12216

**Search Position:** 39° 39' 18.9" N, 075° 33' 03.3" W  
**Historical Depth:** 5.49 m  
**Search Radius:** 50  
**Search Technique:** S2,MB,ES  
**Technique Notes:** [None]

#### History Notes:

H111023/01--OPR-D307-KR; FOUND AN OBSTRUCTION IN LAT. 39/39/18.91N, LONG. 075/33/03.32W (NAD83) WITH A LEAST DEPTH OF 18' MLLW. (ENTERED 2/04 BY MBH)

#### Survey Summary

**Survey Position:** 39° 39' 18.7" N, 075° 33' 03.5" W  
**Least Depth:** 5.02 m (= 16.48 ft = 2.747 fm = 2 fm 4.48 ft)  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh)  $\pm 1.968$  m ; TVU (TPEv)  $\pm 0.225$  m  
**Timestamp:** 2009-307.15:40:59.542 (11/03/2009)  
**Survey Line:** h12152\_sheetf / nrt5\_s3002\_em3002\_mbes / 2009-307 / 017\_1540  
**Profile/Beam:** 393/9  
**Charts Affected:** 12311\_1, 13003\_1

#### Remarks:

Area was covered with 200% SSS and 100% MBES. TCARI tides have been applied and data has been remerged. Charted obstruction. AWOIS item #12216.

#### Feature Correlation

Address	Feature	Range	Azimuth	Status
h12152_sheetf/nrt5_s3002_em3002_mbes/2009-307/017_1540	393/9	0.00	000.0	Primary
S-D903-NRT5-09awois	AWOIS # 12216	9.18	212.9	Secondary
h12152_sheetf/nrt5_s3002_klein3000_sss/2009-299/sonar_data091026164900	0001	34.15	226.9	Secondary



## Hydrographer Recommendations

Hydrographer recommends modifying this charted obstruction to reflect the LD from the data. -bsh

SAR: Confirm item exists. Defer to compilation for charting recommendations.

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

16ft (12311\_1)

2 ¾fm (13003\_1)

## S-57 Data

**Geo object 1:** Obstruction (OBSTRN)

**Attributes:** NINFOM - AWOIS 12216 - 16ft Obstrn - Modify Chart

QUASOU - 6:least depth known

SORDAT - 20091208

SORIND - US,US,graph,H12152

TECSOU - 2,3:found by side scan sonar,found by multi-beam

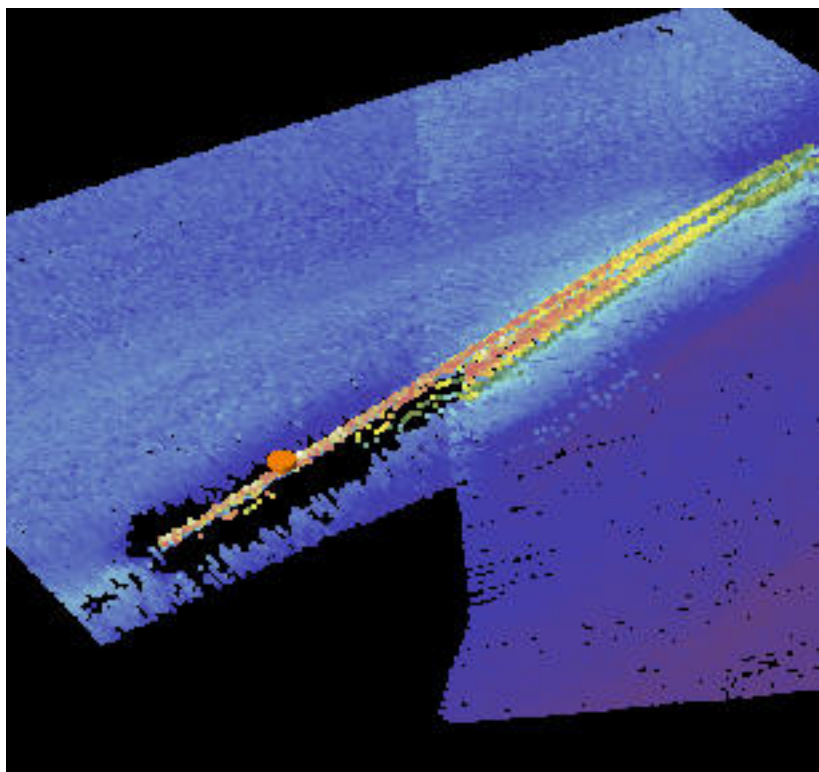
VALSOU - 5.023 m

WATLEV - 3:always under water/submerged

## Office Notes

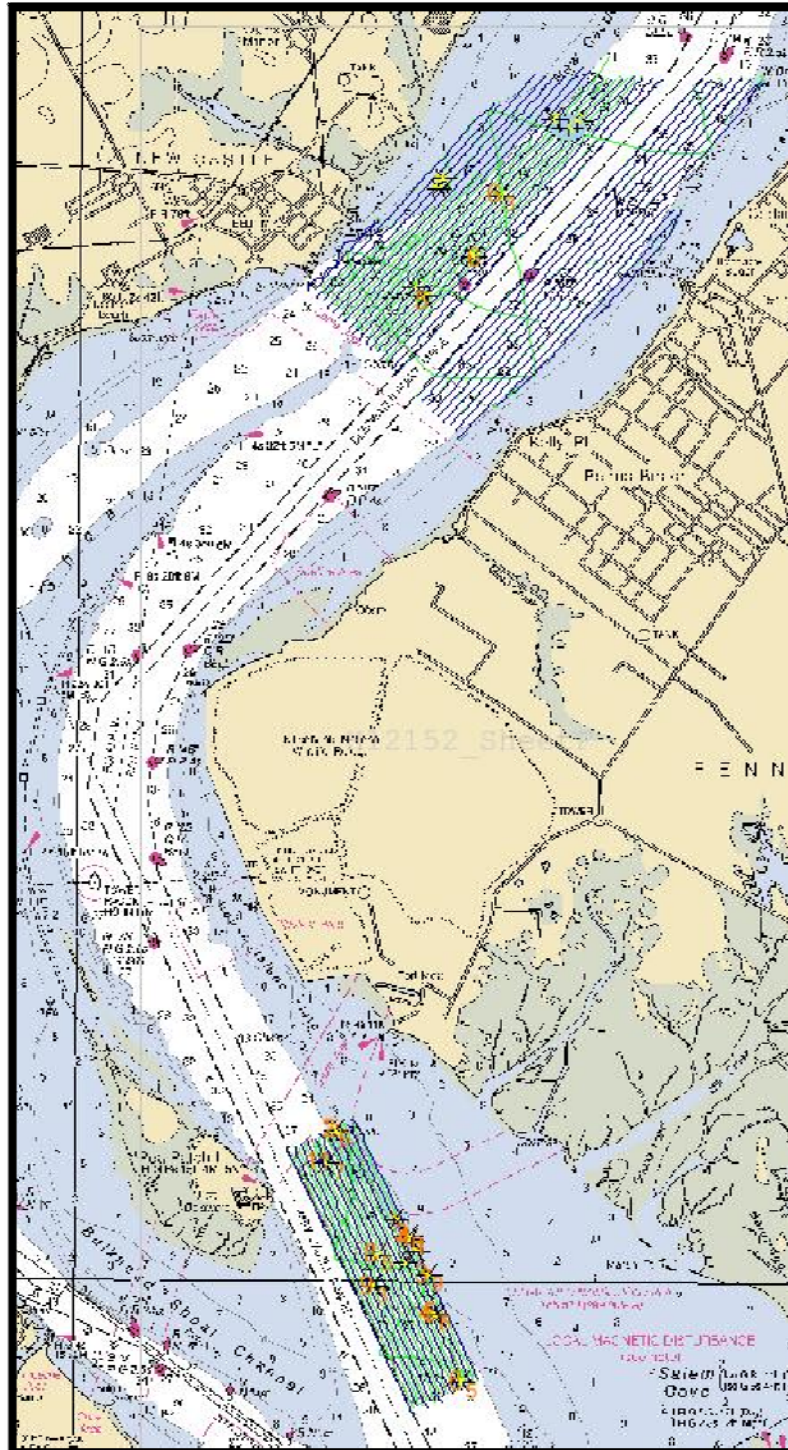
Concur with clarification. Feature is AWOIS Item #12216. Delete charted dangerous obstruction, least depth 18 ft. Chart dangerous obstruction least depth 16 ft at the present survey position. Update AWOIS database.

## Feature Images



*Figure 3.1.1*

**APPENDIX III**  
**PROGRESS SKETCH**

**APPENDIX III****PROGRESS SKETCH**

## **APPENDIX IV**

### **TIDES AND WATER LEVELS**



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NOAA NRT-5 (N/CS53x5)  
3 Chapel Ave, Port Liberte, c/o USACE  
Jersey City, NJ 07305

November 03, 2009

MEMORANDUM FOR: Chief, Requirements and Development Division, N/OPS1

FROM: LT Matthew Jaskoski, NOAA NRT-5 (N/CS53x5)

SUBJECT: Request for Approved Tides/Water Levels

Please provide the following data:

1. Tide Note
2. Final TCARI grid
3. Six Minute Water Level data (Co-ops web site)

Transmit data to the following:

NOAA/NOS/Atlantic Hydrographic Branch  
N/CS33, Building #2  
439 West York Street  
Norfolk, VA 23510  
ATTN: Chief AHB

These data are required for the processing of the following hydrographic survey:

Project No.: S-D903-NRT5-09  
Registry No.: H12152  
State: Delaware  
Locality: New Castle, DE  
Sublocality: Delaware River

Attachments containing:

- 1) an Abstract of Times of Hydrography,
- 2) digital MID MIF files of the track lines from Pydro

cc: N/CS33



Year_DOY	Min Time	Max Time
2009_299	12:51:35	17:15:52
2009_300	12:25:06	18:11:16
2009_307	15:19:10	16:26:12



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

**TIDE NOTE FOR HYDROGRAPHIC SURVEY**

**DATE :** December 29, 2009

**HYDROGRAPHIC BRANCH:** Atlantic  
**HYDROGRAPHIC PROJECT:** S-D903-NRT5-2009  
**HYDROGRAPHIC SHEET:** H12152

**LOCALITY:** Delaware River, New Castle, DE

**TIME PERIOD:** October 26 - December 8, 2009

**TIDE STATION USED:** Tacony-Palmyra Bridge, NJ 853-8886  
Lat. 40° 0.7' N Long. 75° 2.6' W

**PLANE OF REFERENCE (MEAN LOWER LOW WATER):** 0.000 meters  
**HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE:** 2.028 meters

**TIDE STATION USED:** Marcus Hook, PA 854-0433  
Lat. 39° 48.7' N Long. 75° 24.6' W

**PLANE OF REFERENCE (MEAN LOWER LOW WATER):** 0.000 meters  
**HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE:** 1.720 meters

**TIDE STATION USED:** Philadelphia, PA 854-5240  
Lat. 39° 56.0' Long. 75° 8.5'

**PLANE OF REFERENCE (MEAN LOWER LOW WATER):** 0.000 meters  
**HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE:** 1.887 meters

**TIDE STATION USED:** Reedy Point, DE 855-1910  
Lat. 39° 33.5' Long. 75° 34.4'

**PLANE OF REFERENCE (MEAN LOWER LOW WATER):** 0.000 meters  
**HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE:** 1.683 meters

**REMARKS: RECOMMENDED Grid**

Please use the TCARI grid "D903NRT52009Final" as the final grid for project S-D903-NRT5-2009, H12152, during the time period between October 26 - December 8, 2010.

**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).

**Note 2:**

**Peter J. Stone**

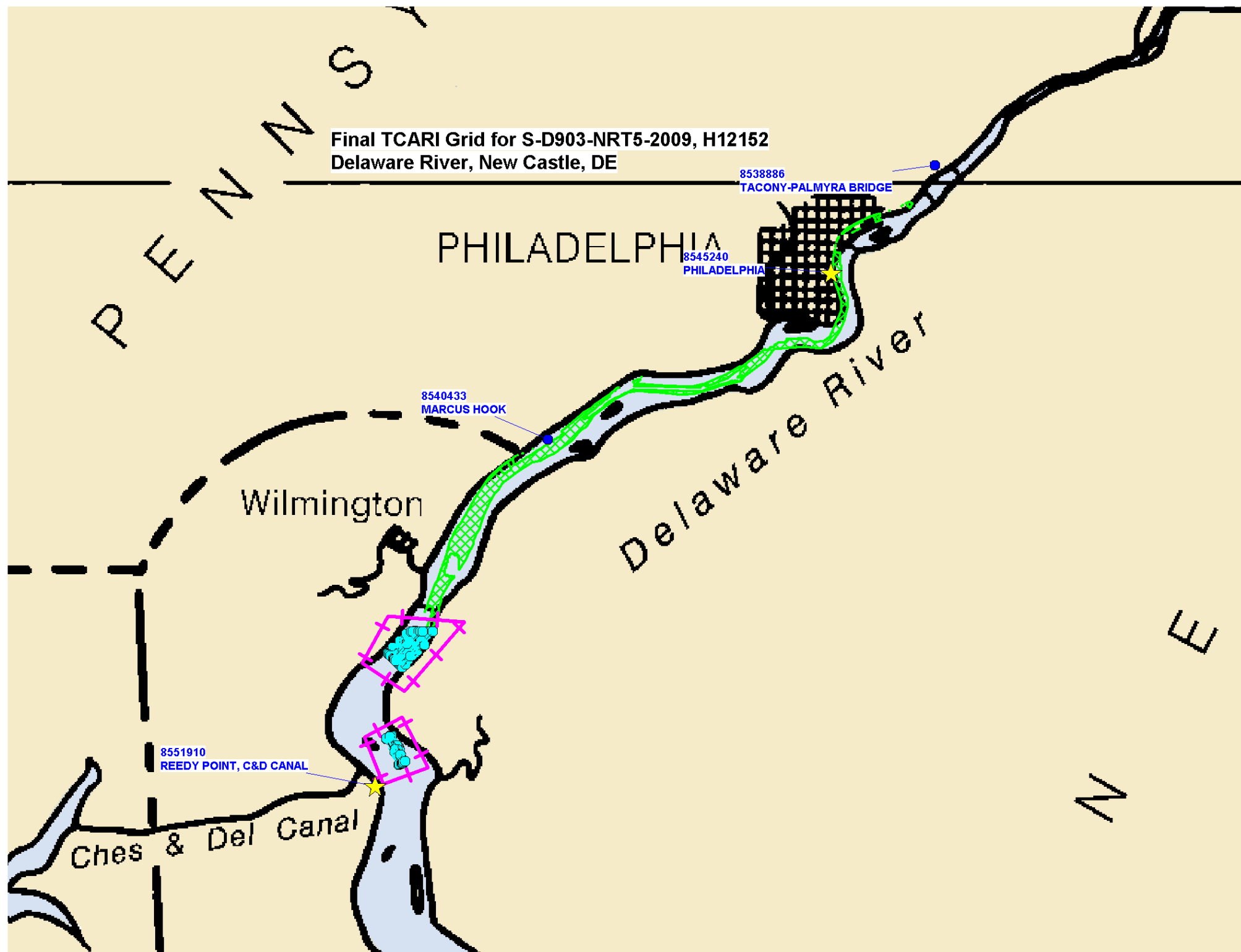
Digitally signed by Peter J. Stone  
DN: cn=Peter J. Stone, o=Oceanographic Division, ou=NOAA/  
NOS/CO-OPS, email=peter.stone@noaa.gov, c=US  
Date: 2009.12.29 11:24:09 -05'00'

CHIEF, OCEANOGRAPHIC DIVISION





Final TCARI Grid for S-D903-NRT5-2009, H12152  
Delaware River, New Castle, DE



Preliminary TCARI Grid for S-D903-NRT5-2009  
Delaware River, DE



**APPENDIX V**  
**SUPPLEMENTAL SURVEY RECORDS AND CORRESPONDENCES**

**APPENDIX V**  
**SUPPLEMENTAL SURVEY RECORDS AND CORRESPONDENCES**

**V.1. COAST PILOT REPORT, NOAA FORM 77-6**

No corrections or additions required.

**V.2. BOTTOM SAMPLE, NOAA FORM 75-44**

No bottom samples were taken.

**V.3. AIDS TO NAVIGATION, NOAA FORM 76-40**

The hydrographer recommends no modifications to any aids to navigation to note. All were verified as accurate.

Subject:  
[Pw%20D903NRT52009 Error Correction]  
From:  
"christopher.hare" <Christopher.Hare@noaa.gov>  
Date:  
Mon, 16 Nov 2009 10:28:25 -0500  
To:  
Bert.Ho@noaa.gov  
What do you think?

Subject:  
D903NRT52009 Error Correction  
From:  
David Wolcott <David.Wolcott@noaa.gov>  
Date:  
Fri, 13 Nov 2009 15:40:57 -0500  
To:  
Christopher Hare <Christopher.Hare@noaa.gov>  
CC:  
Gerald Hovis <Gerald.Hovis@noaa.gov>

Hi Chris,  
I have a question for you.  
There is an issue with the D903 project and it might mean that the final tides will be a few days late. When I created the error model for the Project Instructions TCARI grid, the units used for the datum error were feet instead of meters. Unless it would cause a processing headache, a modified grid with the corrected datum error values can be created and we could send it with the smooth tides by the end of next week. Would you have an issue with making the correction and sending it with the final tides or have you already started processing the data?  
Let me know what you think.

Thanks,  
David  
--  
David Wolcott  
Hydrographic Planning Team  
NOS CO-OPS  
p. (310) 713-2890 x.153

Chris Hare <christopher.hare@noaa.gov>  
Physical Scientist  
Navigation Services Division  
Office Of Coast Survey  
D903NRT52009 Error Correction.eml

Content-Type:  
message/rfc822  
Content-Encoding:  
7bit



**Subject:** Anch areas  
**From:** Howard Danley <Howard.Danley@noaa.gov>  
**Date:** Tue, 10 Nov 2009 14:58:14 -0500  
**To:** Bert Ho <Bert.Ho@noaa.gov>

See the graphics below

----- Original Message -----  
Date: Mon, 08 Jun 2009 10:12:59 -0400  
From: Stephen Roberts <[s.a.roberts@comcast.net](mailto:s.a.roberts@comcast.net)>  
To: [Howard.Danley@noaa.gov](mailto:Howard.Danley@noaa.gov)

Howard,

It was good to see you the other day at the Mariner's Advisory Committee meeting in Philadelphia. We really appreciate NOAA's and your support for our area. With the resignation of Tom Sharp as Chairman, I was appointed to the position by Capt. Jim Roche. It should be announced sometime this week.

Thank you for your offer of tasking some out of channel surveying in our area. I have attached some images of charts with areas outlined in blue that we are interested in for the creation of new anchorages. We are also interested in a couple of areas to create emergency turning basins off of Tioga Marine Terminal and below the Tacony-Palmyra Bridge.

I look forward to a long and fruitful relationship with all of our friends at NOAA. Please feel free to contact me with any questions or if there is anything we can do for you.

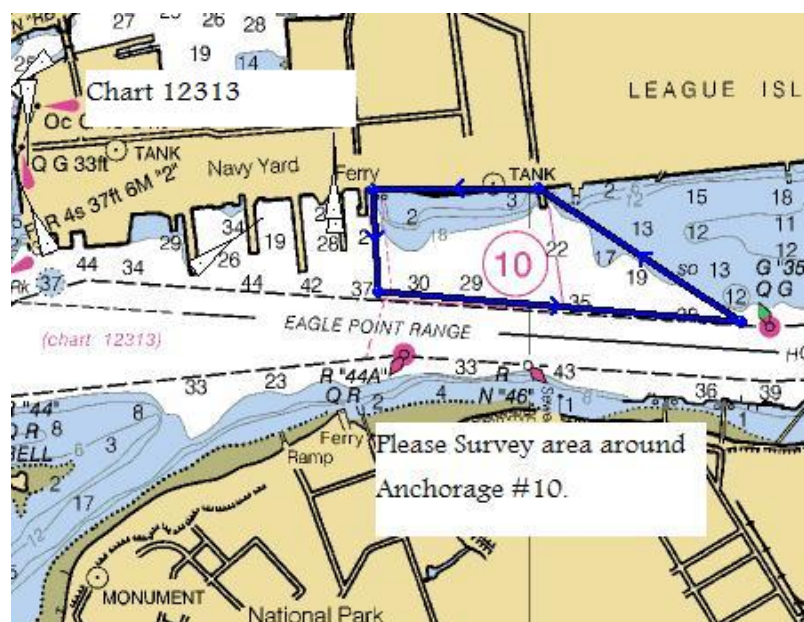
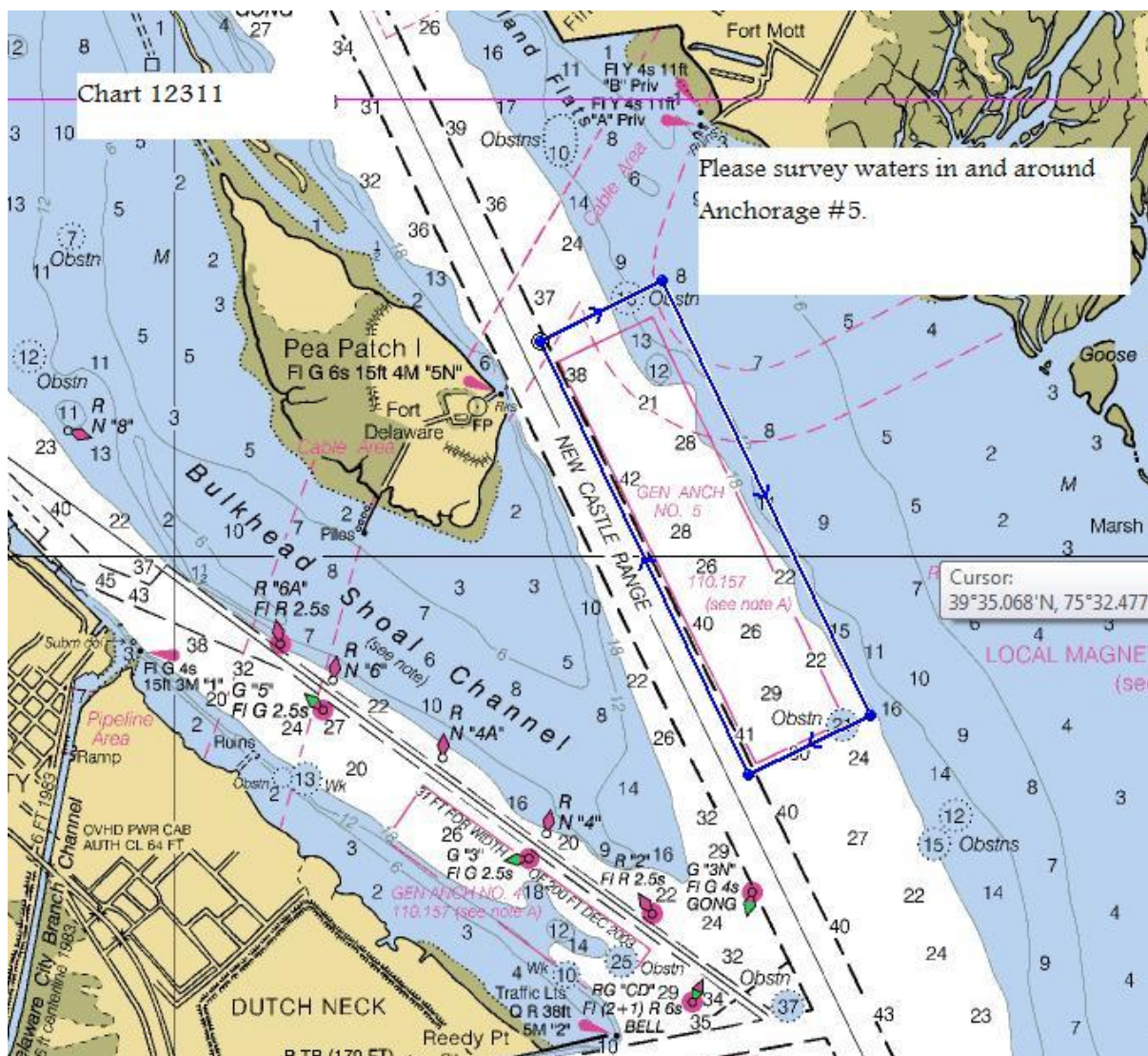
Best regards,

Steve Roberts

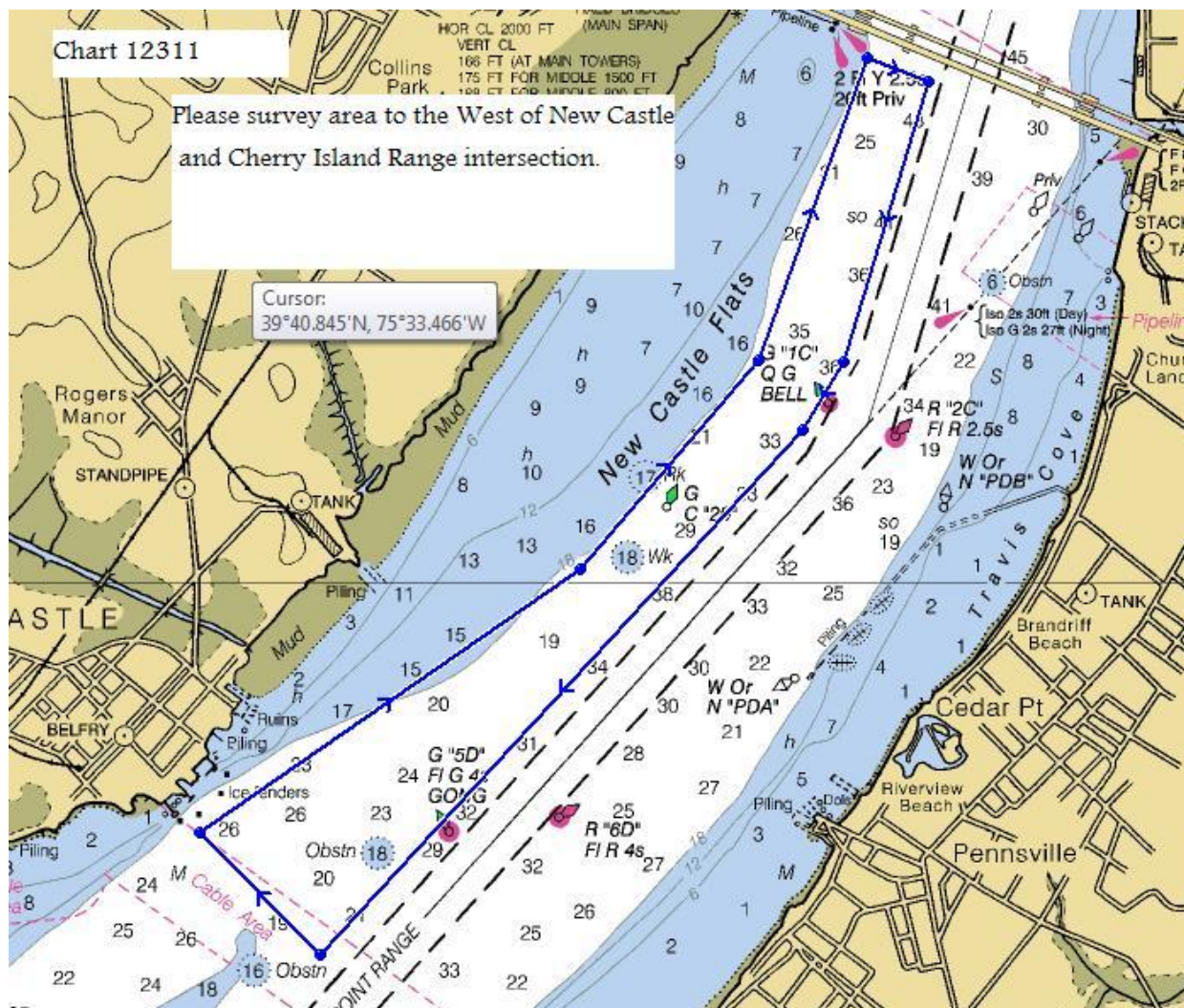
---







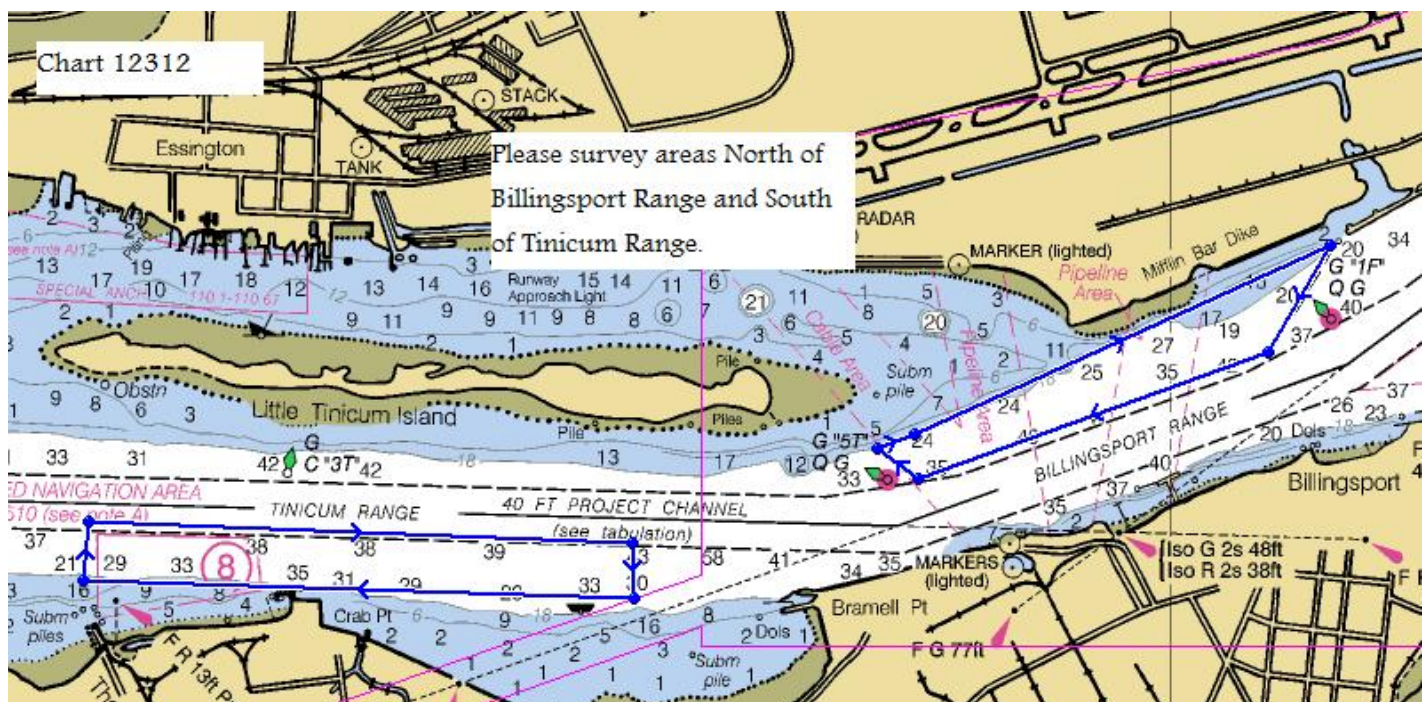




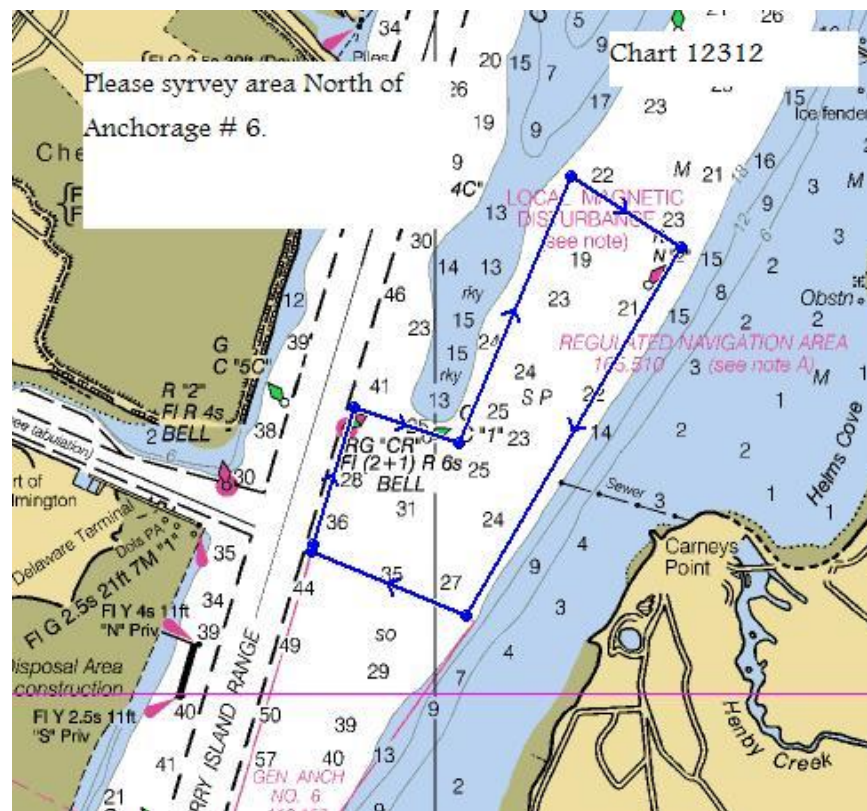
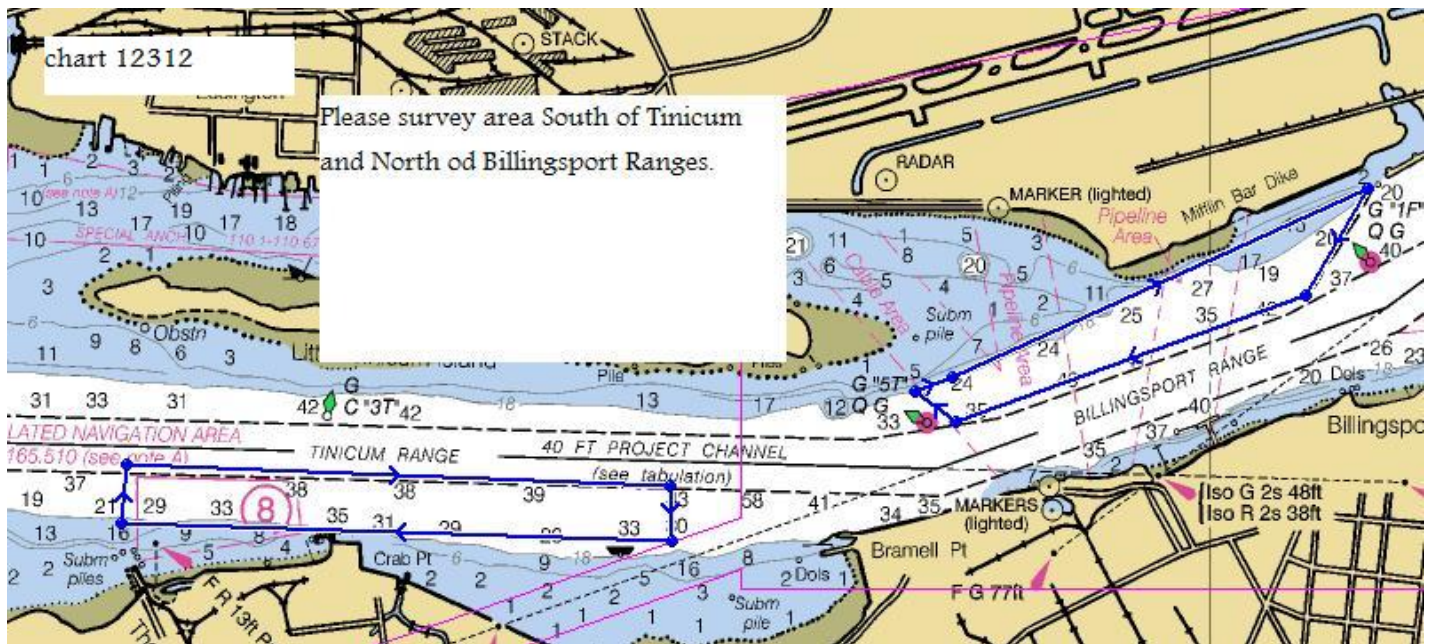












Bellevue Marcuss Hook.jpg

Content-Type: image/jpeg

Content-Encoding: base64

<b>General Anchorage #5.jpg</b>	<b>Content-Type:</b> image/jpeg <b>Content-Encoding:</b> base64
---------------------------------	--

---

<b>Navy Yard Anchorage.jpg</b>	<b>Content-Type:</b> image/jpeg <b>Content-Encoding:</b> base64
--------------------------------	--

---

<b>New Castle Cherry Island.jpg</b>	<b>Content-Type:</b> image/jpeg <b>Content-Encoding:</b> base64
-------------------------------------	--

---

<b>Petty Island 2.jpg</b>	<b>Content-Type:</b> image/jpeg <b>Content-Encoding:</b> base64
---------------------------	--

---

<b>Tacony.jpg</b>	<b>Content-Type:</b> image/jpeg <b>Content-Encoding:</b> base64
-------------------	--

---

<b>Tinicum 2.jpg</b>	<b>Content-Type:</b> image/jpeg <b>Content-Encoding:</b> base64
----------------------	--

---

<b>Tinnicum Billingsport.jpg</b>	<b>Content-Type:</b> image/jpeg <b>Content-Encoding:</b> base64
----------------------------------	--

---

<b>wilmington anchorage.jpg</b>	<b>Content-Type:</b> image/jpeg <b>Content-Encoding:</b> base64
---------------------------------	--

## AHB COMPILATION LOG

General Survey Information	
REGISTRY No.	H12152
PROJECT No.	S-D903-NRT5-09
FIELD UNIT	NOAA NRT-5
DATE OF SURVEY	20091026 - 20091208
LARGEST SCALE CHART	<i>12277 1, edition 35, 20100701, 1:20,000</i>
ADDITIONAL CHARTS	<i>12311 1, edition 45, 20081201, 1:40,000</i>
SOUNDING UNITS	<b>FEET AT MLLW</b>
COMPILER	Dinah O. Morris

Source Grids	File Name H:\Compilation\H12152_D903_NRT5\AHB_H12152\SAR Final Products\GRIDS
	<b>H12152_MB_Devs_50cm_Cube_Final.csar</b> <b>H12152_VB_4m_Shoal_Extracted.bag</b>
Surfaces	File Name H:\Compilation\H12152_D903_NRT5\AHB_H12152\COMPILE\Working
<i>Combined</i>	<b>H12152_4m_Combined.csar</b>
<i>Interpolated TIN</i>	\Interpolated TIN\H12152_12m_InterpTIN.csar
<i>Shifted Interpolated TIN</i>	\Shifted Surface\H12152_12m_InterpTIN_Shifted.csar
Final HOBs	File Name H:\Compilation\H12152_D903_NRT5\AHB_H12152\COMPILE\Final_Hobs
<i>Survey Scale Soundings</i>	<b>H12152_SS_Soundings.hob</b>
<i>Chart Scale Soundings</i>	<b>H12152_CS_Soundings.hob</b>
<i>Contour Layer</i>	<b>H12152_Contours.hob</b>
<i>Feature Layer</i>	<b>H12152_Features.hob</b>
<i>Meta-Objects Layer</i>	<b>H12152_MetaObjects.hob</b>
<i>Blue Notes</i>	<b>H12152_BlueNotes.hob</b>
<i>ENC Retain Soundings</i>	N/A

Meta-Objects Attribution	
Acronym	Value
<b>M_COVR</b>	
CATCOV	1 – coverage available
SORDAT	20091208
SORIND	US,US,graph, H12152
<b>M_QUAL</b>	
CATZOC	6 – zone of confidence U (data not assessed)
INFORM	NOAA NRT-5 S3002
POSACC	10.0 m
SORDAT	20091208
SORIND	US,US,graph,H12152
SUREND	20091208
SURSTA	20091026
<b>DEPARE</b>	
DRVALV 1	7.684 ft
DRVALV2	54.144 ft
SORDAT	20091208
SORIND	US,US,graph, H12152
<b>M_CSCL</b>	

CSCALE	1:40,000
SORDAT	20091208
SORIND	US,US,graph,H12152

SPECIFICATIONS:

- I. COMBINED SURFACE:
  - a. Number of SAR Final Grids: 2
  - b. Resolution of Combined (m): 4 m
- II. SURVEY SCALE SOUNDINGS (SS):
  - a. Attribute Name: Depth
  - b. Selection criteria: Radius, Shoal bias
  - c. Radius value is: mm at map scale
    - i. Use single-defined radius: N/A
    - ii. And/Or use radius table file: H12152\_SS\_SSR\_20k.txt



0	1.8288	0.7
1.82881	3.6576	0.8
3.65761	5.4864	0.9
5.48641	9.1440	0.95
9.1440	18.2880	1.0

H12152\_SS\_SSR\_40k.txt



0	1.8288	0.7
1.82881	3.6576	0.75
3.65761	5.4864	0.8
5.48641	9.1440	0.85
9.1440	18.2880	0.9

- d. Queried Depth of All Soundings
  - i. Minimum: 7.684 ft
  - ii. Maximum: 54.144 ft

- III. INTERPOLATED TIN SURFACE:
  - a. Resolution (m): 12 m
  - b. Interpolation method: Natural Neighbor
  - c. Shift value: -0.75 ft
- IV. CONTOURS:
  - a. Attribute Name: Depth
  - b. Use a Depth List: H12152\_depth\_contours.txt
  - c. Output Options: Create contour lines
    - i. Line Object: DEPCNT
    - ii. Value Attribute: VALDCO



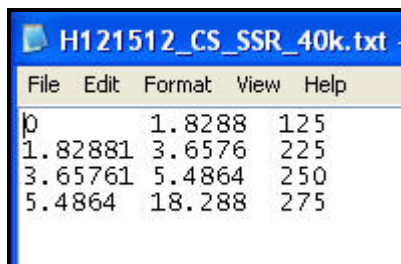
- V. FEATURES:
- a. Number of Chart Features: 11
  - b. Number of Non-Chart Features: 6

- VI. CHART SURVEY SOUNDINGS (CS):
- a. Number of ENC CS Soundings: 89
  - b. Attribute Name: Depth
  - c. Selection criteria: Radius, Shoal bias
  - d. Radius value is: Distance on the ground (m)
    - i. Use single-defined radius: N/A
    - ii. And/Or use radius table file: H12152\_CS\_SSR\_20k.txt



File	Edit	Format	View	Help
0		1.8288	75	
1.82881		3.6576	90	
3.65761		5.4864	120	
5.48641		9.1440	145	
9.14401		18.2880	150	

H12152\_CS\_SSR\_40k.txt



File	Edit	Format	View	Help
0		1.8288	125	
1.82881		3.6576	225	
3.65761		5.4864	250	
5.4864		18.288	275	

- e. Number Survey CS Soundings: 87

VII. NOTES:

**ATLANTIC HYDROGRAPHIC BRANCH  
H-CELL REPORT to ACCOMPANY  
SURVEY H12152 (2009)**

This H-Cell Report has been written to supplement and/or clarify the original Descriptive Report (DR) and pass critical compilation information to the cartographers in the Marine Chart Division. Sections in this report refer to the corresponding sections of the Descriptive Report.

**A. AREA SURVEYED**

**B. DATA ACQUISITION AND PROCESSING**

**B.2 QUALITY CONTROL**

The AHB source depth grids for the survey's nautical chart update consisted of one 0.5m resolution MBES development BASE surface and one 4m resolution vertical beam shoal layer BASE surface, which were combined at 4m resolution. The survey scale soundings were created from the combined surface covering the respective area of the survey (Chart 12277\_1 ~ 1:20,000; Chart 12311\_1 ~ 1:40,000) using two sounding spacing range (SSR) files (all SSR values are included in the AHB Compilation Log section of this Descriptive Report). The survey scale soundings were imported into a "point cloud" grid. The chart scale soundings were derived directly from the survey scale soundings point cloud grid to preserve absolute continuity between the charted depths, the survey scale soundings, and the original source grid. The chart scale soundings were selected using a sounding spacing range (SSR) file. The chart scale soundings are a subset of the survey scale soundings. The surface model was referenced when selecting the chart scale soundings, to ensure that the selected soundings portray the bathymetry within the common area.

A UTM projected TIN surface was created from the survey scale soundings point cloud grid, from which an interpolated surface of 12m resolution was generated. The interpolated TIN surface of 12m resolution was shifted by the NOAA sounding rounding value of -0.75 feet. The shifted interpolated TIN was used to generate depth contours in feet (12 and 18). The depth contours are forwarded to MCD for reference only. The contours were utilized during chart scale sounding selection and quality assurance efforts at AHB. The depth contours are incorporated into the SS H-Cell product as per 2009 H-Cell Specifications.

The compilation products (Final \*.HOB files) for this survey are detailed in the H12152 AHB Compilation Log contained within this document. The Final HOB files include depth areas (DEPARE), depth contours (DEPCNT), soundings (SOUNDG), meta-objects (M\_COVR, M\_QUAL, and M\_CSCL), cartographic Blue Notes (\$CSYMB), and features (OBSTRN, WRECKS, UWTROC).

As dictated by Hydrographic Technical Directive 2008-8, the Final HOB files were combined into two separate H-Cell files in S-57 format. Both S-57 files were exported from

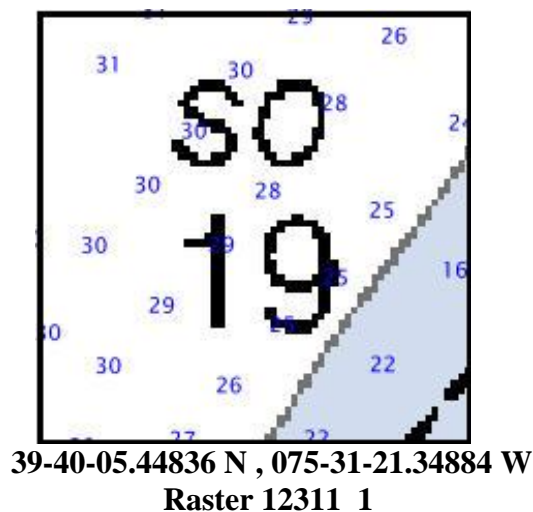
CARIS S-57 Composer in feet. Quality assurance and topology checks were conducted using CARIS S-57 Composer and DKART Inspector validation tests.

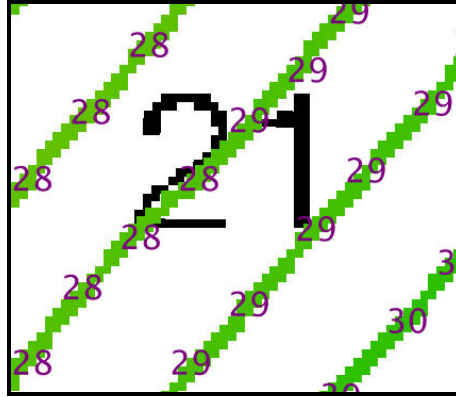
The final H-Cell products are two S-57 files, in Lat/Long NAD-83. The contents of these two H-Cell deliverables are listed in the table below:

TABLE 1 - Contents of H-Cell Files			
H12152_CS.000		Scale 1:20,000	
Object Class Types	Geographic	Cartographic	Meta
S-57 Object Acronyms	DEPARE	\$CSYMB	M_COVR
	OBSTRN		M_QUAL
	SBDARE		M_CSCL
	SOUNDG		
	UWTROC		
	WRECKS		
H12151_SS.000		Scale 1:10,000	
Object Class Types	Geographic		
S-57 Object Acronyms	DEPCNT		
	SOUNDG		

#### B.2.4 Junctions and Prior Surveys

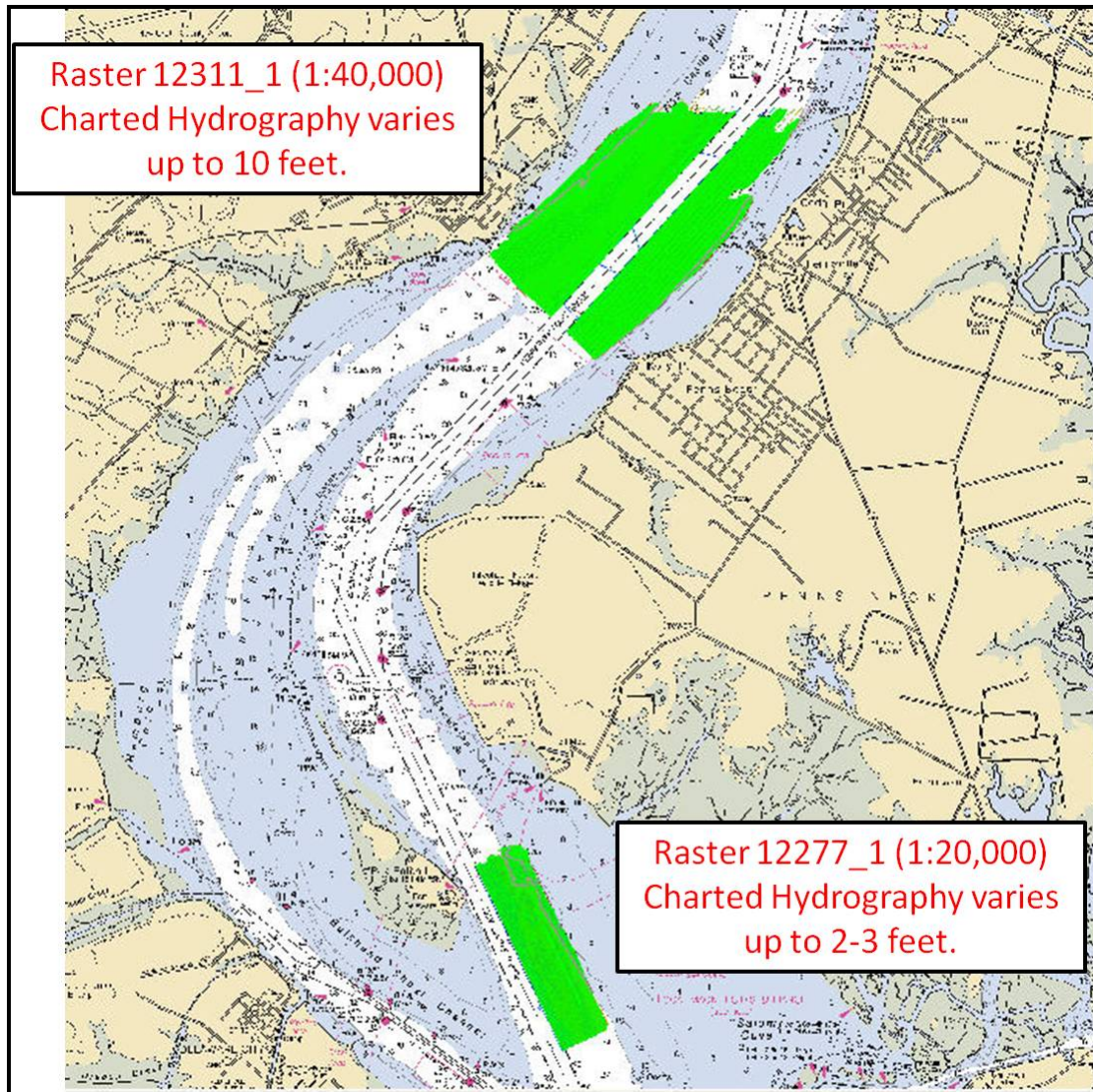
Survey H12152 (2009) junctions with survey and H12151 (2010) to the north. Most present survey depths compare within 2 to 3 feet of charted hydrography to the north and south of the southern depth area (1:20,000). Charted hydrography varies as much as 10 feet in some areas of to the south of the northernmost depth area (1:40,000). See images below.





39-39-37.57044N, 075-31-53.44987W

Raster 12311\_1



Depth Areas H12152

## **B.4 DATA PROCESSING**

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

CARIS Bathy DataBase version 3.2/HF2

CARIS HIPS/SIPS version 7.1/HF2

CARIS S-57 Composer version 2.2/SP1/HF4

DKART Inspector version 5.1

HSTP Pydro version 11.8 (r3585)

## **C. HORIZONTAL AND VERTICAL CONTROL**

The hydrographer makes adequate mention of horizontal and vertical control used for this survey in section C of the DR. The sounding datum for this survey is Mean Lower Low Water (MLLW), and the vertical datum is Mean High Water (MHW). Horizontal control used for this survey during data acquisition is based upon the North American Datum of 1983 (NAD83), UTM projection zone 18 North.

## **D. RESULTS AND RECOMMENDATIONS**

### **D.1 CHART COMPARISON**

#### **12277 1 (35<sup>th</sup> Edition, JUL/10)**

Chesapeake and Delaware Canal  
Corrected through NM 08/20/2011  
Corrected through LNM 08/16/2011  
Scale 1:20,000

#### **12311 1 (45<sup>th</sup> Edition, DEC/08)**

Delaware River Smyrna River to Wilmington  
Corrected through NM 08/27/2011  
Corrected through LNM 08/23/2011  
Scale 1:40,000

### **ENC COMPARISON**

#### **US5DE13M**

Delaware River Smyrna to Wilmington  
Edition 21  
Application Date 2011/08/17  
Issue Date 2011/08/17  
Chart 12311

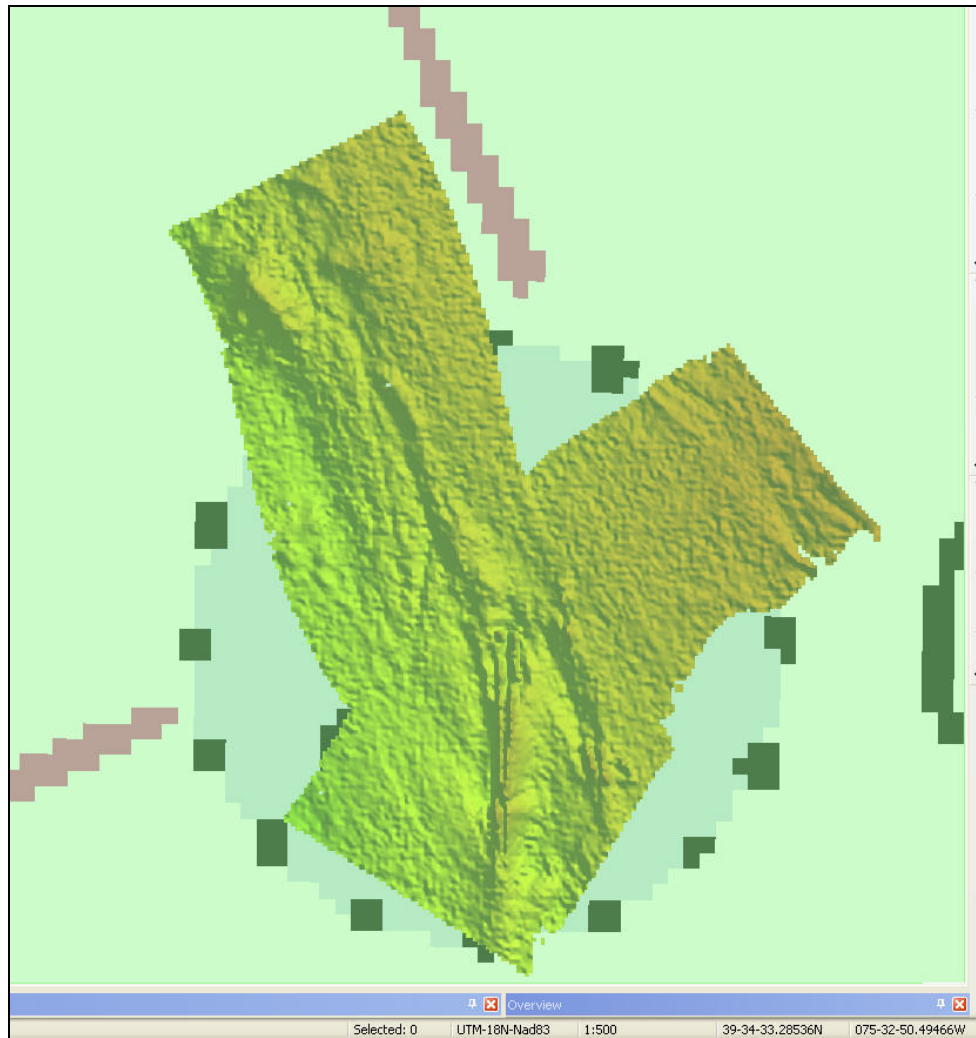
#### **US5MD15M**

Chesapeake and Delaware Canal  
Edition 21  
Application Date 2011/07/27  
Issue Date 2011/07/27  
Chart 12277

## **D.2 ADDITIONAL RESULTS**

The charted hydrography originates with prior surveys and requires no further consideration. The hydrographer makes adequate chart comparisons in section D and Appendix I and II of the DR. The hydrographer recommends that any charted features not specifically addressed either in the H-Cell files or the Blue Notes should be retained as charted. The following exceptions are noted:

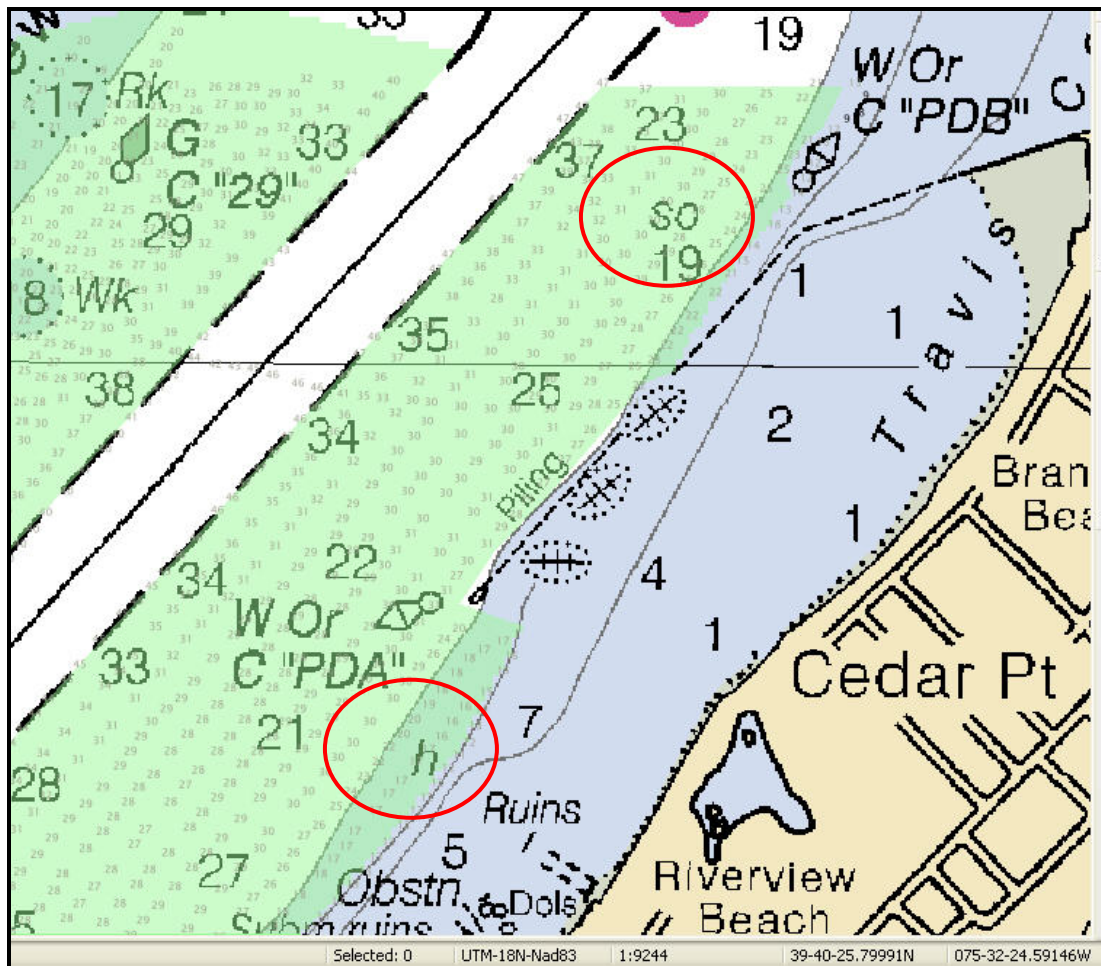
- a. A charted 21 foot dangerous obstruction is charted on raster 12277\_1 (1:20,000) at the southeastern corner of a general anchorage area. Multi-beam development data portrays this as a shoal point on a natural hard seafloor bottom. A 21 foot chart scale sounding has been added in the current position and the charted obstruction has been recommended to be deleted.



**Lat: 39-34-33.28536N , Long: 075-32-50.49466W**

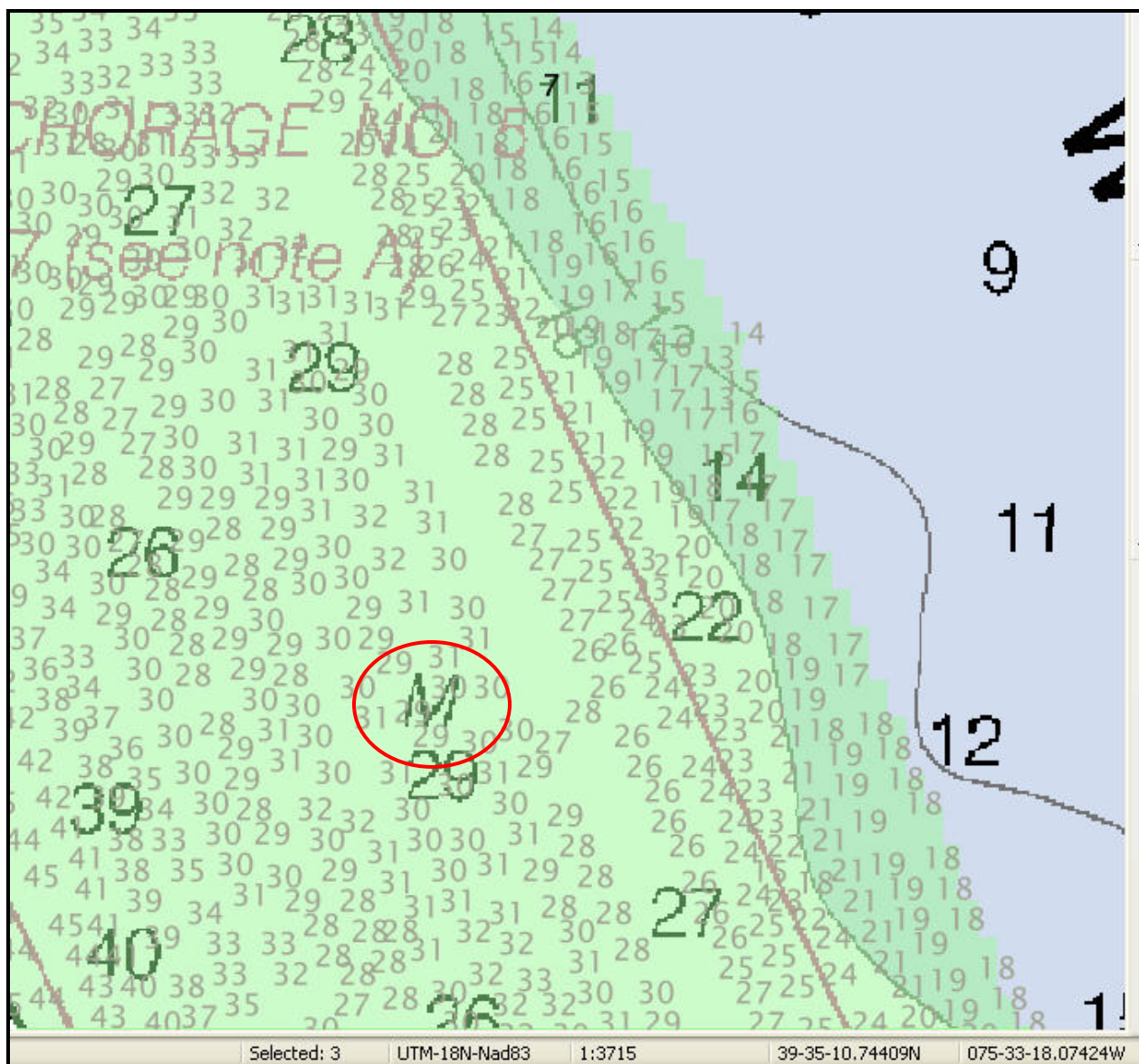


- b. There were no bottom samples collected by the field. Three currently charted seabed areas were retained.



**Raster 12311\_1 (1:40,000)**

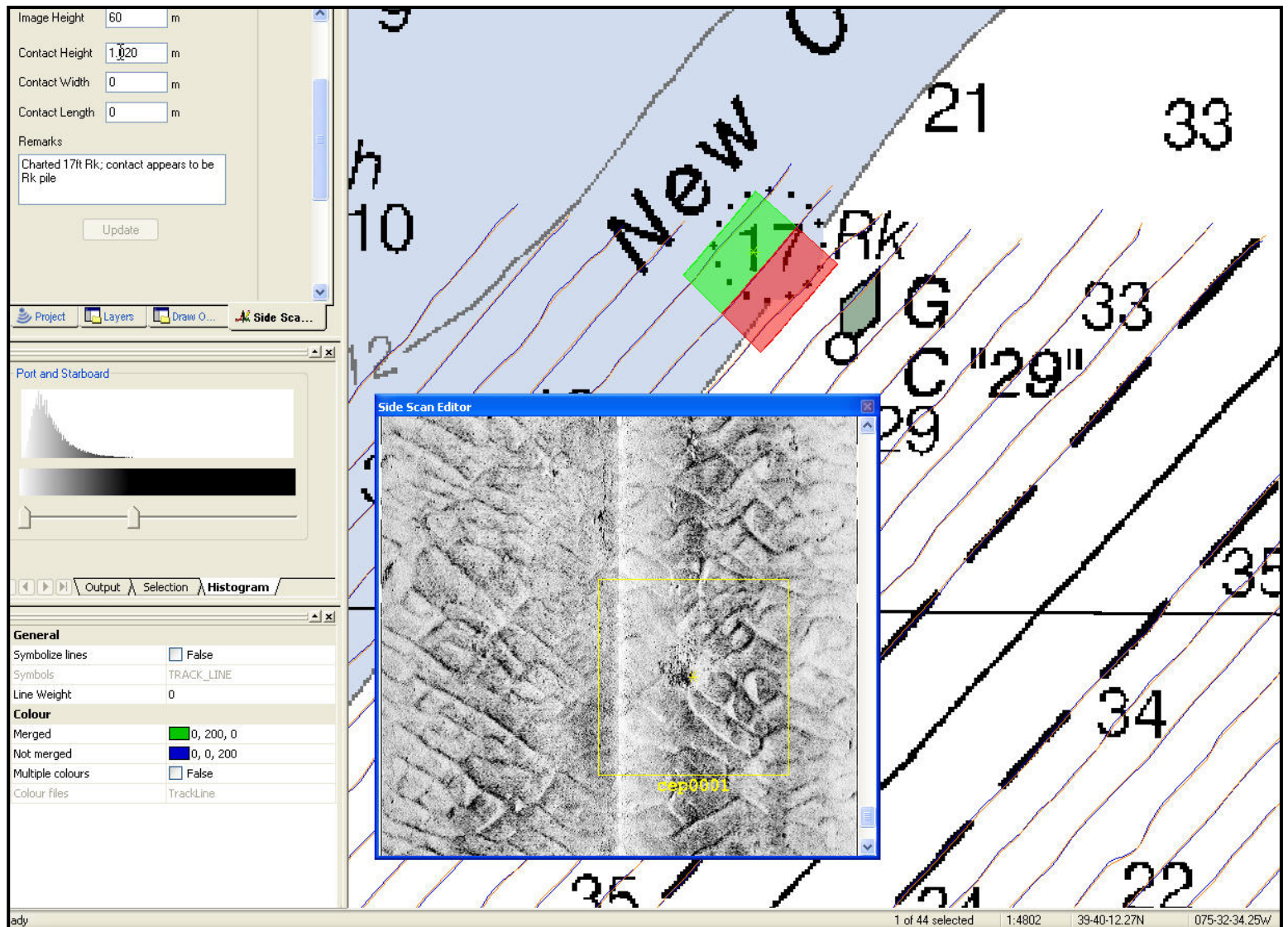
**Lat 39-40-25.79991N , Long. 075-32-24.59146W**

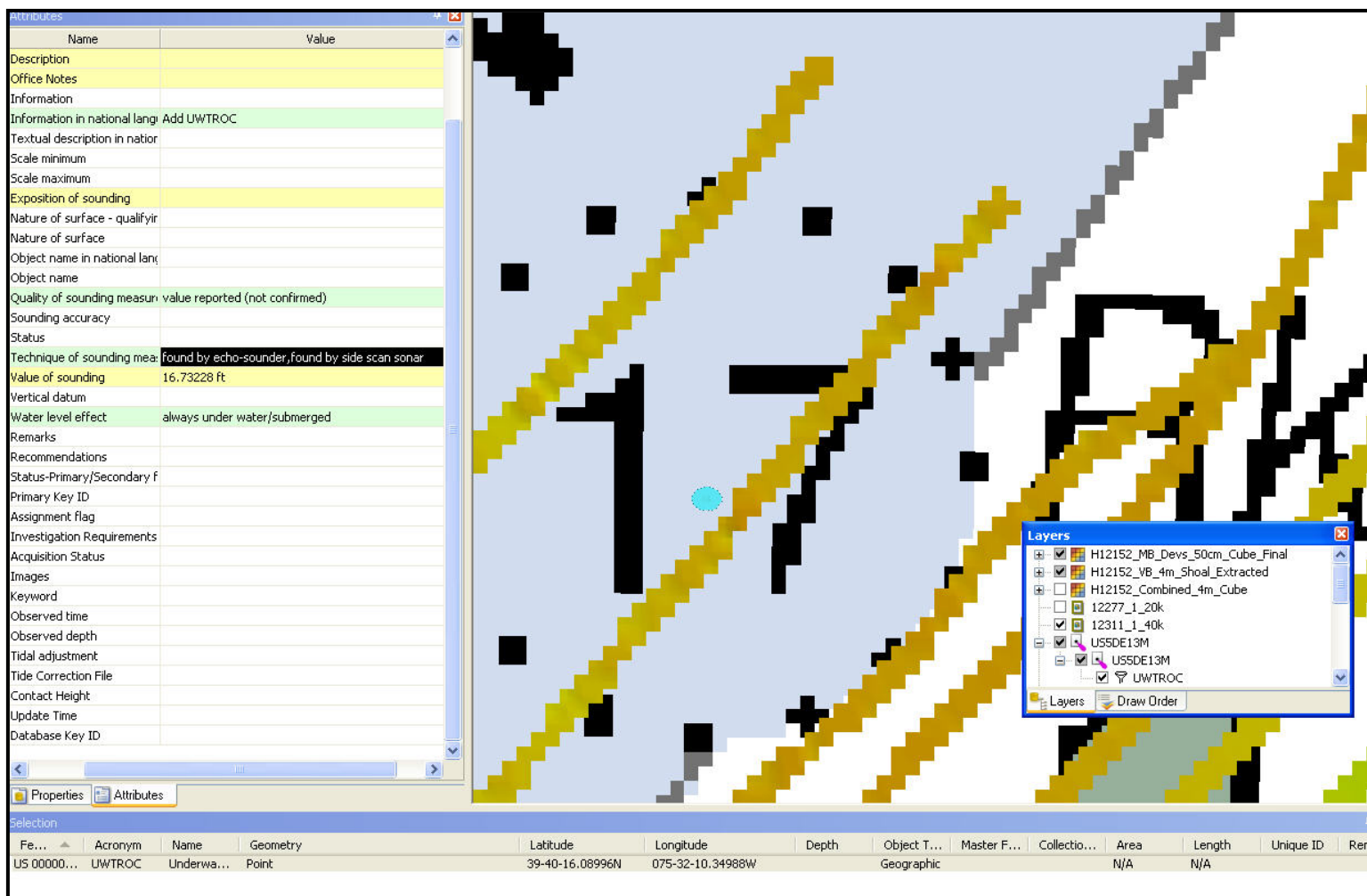


**Raster 12277\_1 (1:20,000)**  
**Lat 39-35-10.74409N , Long. 075-33-18.07424W**



c. An underwater rock (UWTROC) that is currently charted with a depth of 17 feet on raster 12311\_1 (1:40,000) was not developed with MBES or VBES. A measure depth of 5.20 m (17 feet) has been measured utilizing HIPS and SIPS Side Scan Editor. However, this depth measurement is less shoal than the previously charted dangerous UWTROC. The depth of the previously surveyed UWTROC had a value of 16.73228 ft (5.09 m) and should have been charted as a 16 foot dangerous UWTROC.





## D.6 MISCELLANEOUS

Chart compilation was completed by Atlantic Hydrographic Branch personnel in Norfolk, Virginia. Compilation data will be forwarded to the Marine Chart Division in Silver Spring, Maryland. See section D.1 of this report for a list of the Raster Charts and Electronic Navigation Charts (ENC) used for compiling the present survey.

## D.7 ADEQUACY OF SURVEY

The present survey is adequate to supersede the charted bathymetry within the common area. Any features not specifically addressed either in the H-Cell files or the Blue Notes should be retained as charted. Refer to section D and Appendix I and II of the DR for further recommendations by the hydrographer.

**APPROVAL SHEET  
H12152**

**Initial Approvals:**

The completed survey has been inspected with regard to survey coverage, delineation of depth contours, disposition of critical depths, cartographic symbolization, and verification or disproof of charted data. All revisions and additions made to the H-Cell files during survey processing have been entered in the digital data for this survey. The survey records and digital data comply with National Ocean Service and Office of Coast Survey requirements except where noted in the Descriptive Report and the H-Cell Report.

All final products have undergone a comprehensive review per the Hydrographic Surveys Division Office Processing Manual and are verified to be accurate and complete except where noted.

---

**Dinah O. Morris**  
Hydrographic Survey Intern  
Atlantic Hydrographic Branch

I have reviewed the H-Cell files, accompanying data, and reports. This survey and accompanying Marine Chart Division deliverables meet National Ocean Service requirements and standards for products in support of nautical charting except where noted.

Approved: \_\_\_\_\_  
**CDR Richard T. Brennan, NOAA**  
Chief, Atlantic Hydrographic Branch