H11545

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey **Hydrographic / SSS & SWMB**

Registry No. **H11545**

LOCALITY

State Mississippi-Alabama

General Locality **Gulf of Mexico**

Sub-locality 7 NM South of Horn Island

2006

CHIEF OF PARTY
Scott Cholmondeley

TerraSond Ltd.

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DATE

NOAA FORM 77-28 (11-72)

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

REGISTRY NO.

H11545

HYDROGRAPHIC TITLE SHEET

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

FIELD NO.
A

State Mississippi-Alabama

General locality Gulf of Mexica

Sub-Locality 7 NM South of Horn Island

Scale 1:20,000 Date of survey May 24, 2006 – Nov. 11,2006

Instructions Dated February 6, 2006 Project No. OPR-J364-KR-06

Vessel *R/V Davidson* and *Bella Marie*

Chief of Party *Scott Cholmondeley*

Surveyed by:

Soundings taken by **echo sounder**, hand lead, pole Multibeam Reson 8101, Reson 8124

Graphic record scaled by

Graphic record checked by

Protracted by Automated Plot

Verification by ***Atlantic Hydrographic Branch***

Soundings in fathoms, ~~**meters,**~~ feet at MLW, **MLLW** ***(H-Cell units in feet at MLLW)***

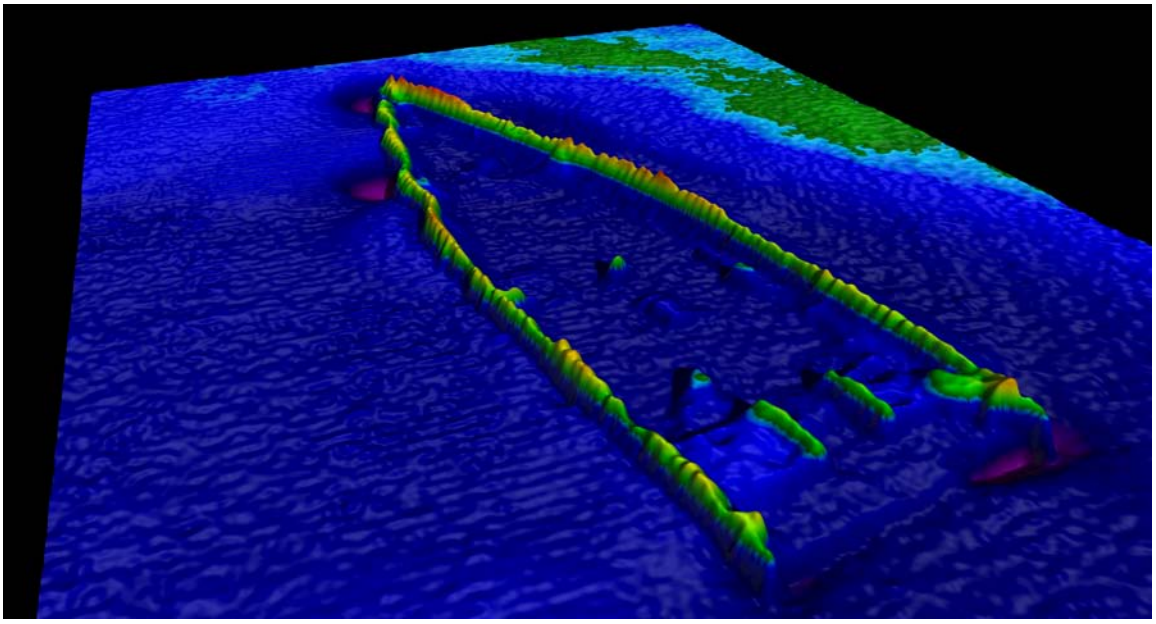
Bold italic red notes in Descriptive Report were made during office processing.

REMARKS: **Contract:**
Contractor: Terrasonde, Ltd.
Subcontractors:

Times: All times are recorded in UTC
UTM Zone: Zone 16
Purpose: To provide NOAA with modern, accurate hydrographic survey data with which to update the nautical charts of the assigned area: Sheet A (H11545) in Gulf of Mexico, Coast of Mississippi-Alabama.

DESCRIPTIVE REPORT

OPR-J364-KR-06



H-11545

FIELD SHEET A

STATE: MISSISSIPPI-ALABAMA

LOCALITY: GULF OF MEXICO

SUBLOCALITY: 7 NM SOUTH OF HORN ISLAND

YEAR: 2006 – 2007

TERRASOND

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Data filed with original field records.

Bold, italic, red notes in the Descriptive Report were made during office processing

Descriptive Report to Accompany Hydrographic Survey H-11545

Sheet A

May 24, 2006 – November 11, 2006

TerraSond Ltd.

Lead Hydrographer: Scott Cholmondeley

A. AREA SURVEYED

This survey was conducted in accordance with Statement of Work, Shallow Water Multibeam Sonar and Side Scan Sonar Survey Services, OPR-J364-KR-06, 7 nautical miles (NM) south of Horn Island, Gulf of Mexico, Mississippi-Alabama, dated February 6, 2006.

The purpose of this survey was to provide NOAA with modern, accurate hydrographic survey data to update the nautical charts of this area. The project area covers approximately 30 square nautical miles and is oriented roughly parallel to and 6 nautical miles south of Horn Island, a barrier island in the Gulf of Mexico.

The project area is approximately 18 nautical miles south of the Port of Biloxi, MS. The Port of Biloxi is an important sport fishing center and resort with a large commercial seafood industry. The port has a small craft harbor used by sport fisherman and pleasure craft.

The Port of Pascagoula, MS is approximately 17 nautical miles to the northeast of the project area. Pascagoula is ranked as one of the top 20 ports in the United States for short tonnage imports and exports. The Port of Pascagoula has access to U.S. Highway 90 and Interstate 10. The port is also served by the CSXT and Mississippi Export Railroad. The port's main imports are oil and machinery. Pascagoula has several large facilities for ship building and repair, oil refining, and seafood packing and processing. The port exports fertilizers, meat, oil and paper. Pascagoula is also one of the gateway ports to the Mississippi River.

The ports Biloxi and Pascagoula, and the ships that use them, rely heavily on the accuracy of the nautical charts for this area

Full bottom coverage, consisting of 200% side scan sonar coverage supplemented with shallow-water multibeam echosounder coverage, was achieved within the limits of hydrography for this survey. The side scan and multibeam imagery was used to locate and determine the least depth over obstructions, wrecks and shoals as well as to determine the least depths over the entire project area. This survey area has a maximum depth of 58 feet and a minimum depth of 40 feet below the Mean Lower Low Water (MLLW) tidal datum. ***Concur.***

For complete survey limits, see Figure 1 on the following page.

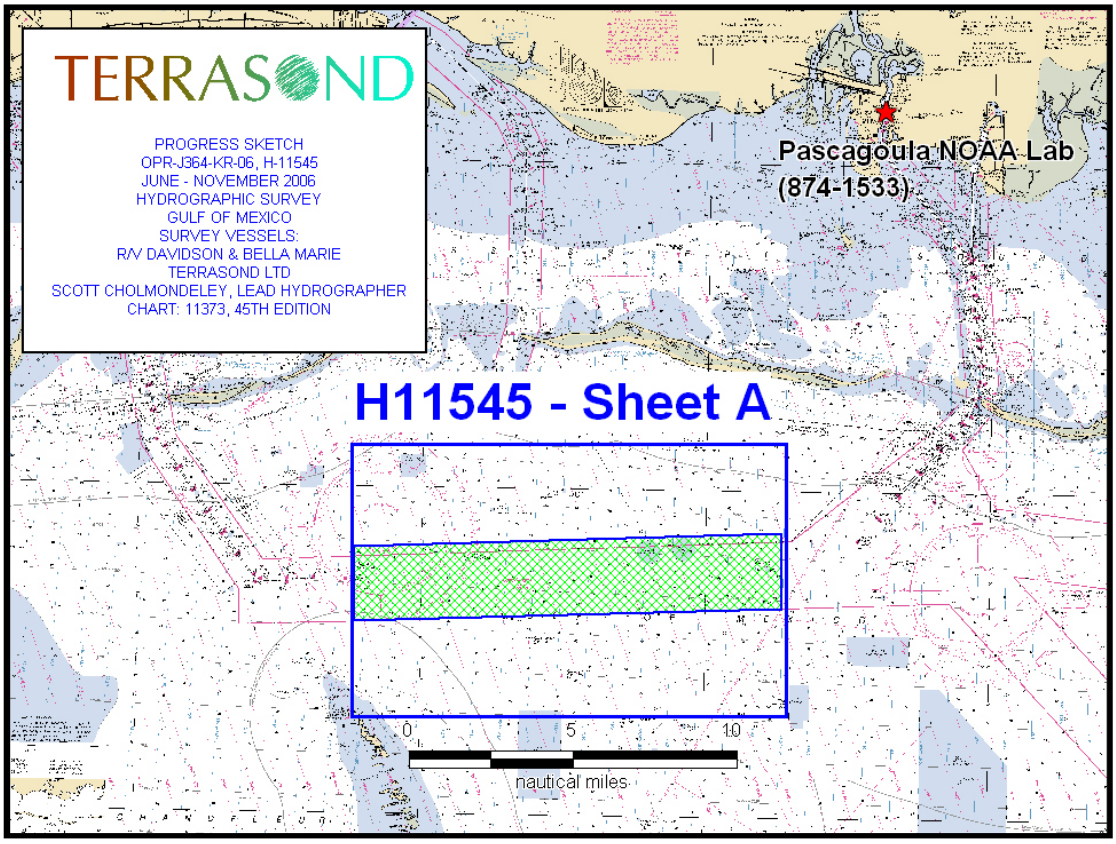


Figure 1 - Overview of H-11545 with Chart 11373, 45th Edition, Jan. 2007.

B. DATA ACQUISITION AND PROCESSING *SEE ALSO THE EVALUATION REPORT.*

B.1 Equipment

Bathymetry and side scan imagery for this survey was acquired using the hydrographic survey vessels *R/V Davidson* and *Bella Marie.*

R/V Davidson

The *R/V Davidson* is a steel hull vessel, 53.3 meters in length overall with an 11.6 meter beam and a 5.4 meter draft. Major systems used on the *R/V Davidson* are listed in the following table.

VESSEL *R/V Davidson* LOA: 53.3m, BEAM 11.6m, DRAFT: 5.4m	
Equipment	**Manufacturer & Model**
Multibeam sonar	Reson 8101
Side Scan Sonar	EdgeTech 4200-FS
Positioning	Primary -- Seatex Seapath 200 RTK
Sound speed	Sea Sciences LTV50 Acrobat Towed Vehicle and Applied Microsystems SV&P Smart Sensor
Vessel attitude	Seatex MRU-5

Equipment performance details are provided in the Data Acquisition and Processing Report (DAPR)*, Sections A. Equipment and B. Quality Control.

***DAPR**
filed with original field reports, and also submitted to Hydrographic Survey Division (HSD) with survey deliverables.

Bella Marie

The *Bella Marie* is an aluminum hulled catamaran hydrographic survey vessel 11.9 m in length with a 4.3 m beam and a 0.75 m draft. Major systems used on the *Bella Marie* are listed in the following table.

VESSEL *Bella Marie* LOA: 11.9m, BEAM 4.3m, DRAFT: 0.75m	
Equipment	**Manufacturer & Model**
Multibeam sonar	Reson 8124
Side Scan Sonar	EdgeTech 4200-FS
Positioning	Seatex Seapath 200 RTK
Sound speed	Applied Microsystems SV&P Smart Sensor and Odom Digibar Pro
Vessel attitude	Seatex MRU-5

Equipment performance details are provided in the Data Acquisition and Processing Report (DAPR)*, Sections A. Equipment and B. Quality Control.

***DAPR**
filed with original field reports, and also submitted to Hydrographic Survey Division (HSD) with survey deliverables.

B2. Quality Control

Side Scan Sonar

Daily confidence checks of the side scan sonar operation were conducted by recording a screen shot of the side scan record which included the side scan image and all operational settings. The confidence checks were performed when distinctive bottom features (e.g. trawl scars, submerged vessels, etc.) were continuously visible in the record from the maximum range of one channel to the maximum range of the other channel. A rub test was performed on both channels of the side scan transducer prior to deployment to ensure adequate signal return.

Data for this sheet were collected at various range scales depending on environmental conditions. Strong thermoclines were common throughout the survey area due to localized heating of the surface waters and freshwater runoff. While surveying with the *R/V Davidson*, the towfish was positioned below the layer when significant thermoclines were encountered whenever practical. This periodically resulted in a towfish height that was less than that required in the specifications for the100m range scale. When this occurred, adjacent swath records were carefully examined to ensure the side scan coverage specified in the statement of work was achieved. Refer to "Separate I: ACQUISITION AND PROCESSING LOGS"***** for range scales for individual lines. While surveying with the *Bella Marie*, which used a fixed-mount side scan array, line spacing and side scan range scale were reduced when thermoclines were encountered to ensure adequate coverage was achieved. ****DAPR filed with original field reports, and also submitted to Hydrographic Survey Division (HSD) with survey deliverables.***

Shallow Water Multibeam

No conditions with the potential for adversely affecting data integrity were encountered with the multibeam suites used during this survey.

Multibeam confidence checks were conducted on the *R/V Davidson* and the *Bella Marie* to verify proper operation of the multibeam suite on a weekly basis, weather permitting. The *R/V Davidson* performed the checks by comparing nadir beam depths with lead line depths. The *Bella Marie* performed the confidence checks using standardized bar check procedures. The results of these comparisons and the line acquisition logs detailing aspects of quality control for each survey line are contained in "Separate I: ACQUISITION AND PROCESSING LOGS"***** of this report.
A detailed discussion of multibeam system calibrations, patch tests, data acquisition, and processing is provided in the Data Acquisition and Processing Report (DAPR)***** for this project. ****DAPR filed with original field reports, and also submitted to Hydrographic Survey Division (HSD) with survey deliverables.***

Crosslines

Seventy-one (71) lines totaling 763.8 lineal nautical miles of mainscheme lines and eighteen (18) lines totaling 42.4 lineal nautical miles of crosslines were run during the 2006 survey of H-11545. The ratio of the linear nautical miles of crosslines to the linear nautical miles of mainscheme lines, at 5.5%, exceeds the 5% required by "NOAA Hydrographic Surveys Specifications and Deliverables", Section 5.5.3. A total of 25 crossings were analyzed using CARIS HIPS, in conjunction with Microsoft Excel., and

comparisons were good. The crossings varied spatially and temporally. A location plot of all mainscheme and crossline intersections is included in "Separate V: CROSSLINE COMPARISONS."

A comprehensive explanation of the crossline analysis process is in the Data Acquisition and Processing Report (DAPR)*. The reports generated from the crossline analysis are in "Separate V: CROSSLINE COMPARISONS." ***DAPR filed with original field reports, and also submitted to Hydrographic Survey Division (HSD) with survey deliverables.***

Contemporary Survey Junctions ***See also the Evaluation Report.***

The easterly limits of this survey junctions with the westerly limits of H-11546 (2006). CARIS BASE Editor was used to compute the difference between sounding values from each sheet in areas of overlap. The sounding differences were gridded to a 1 meter resolution DTM and analyzed for each survey junction. The soundings are in general agreement between the two surveys. No adjustments or recommendations were made based on the junction analysis. ***Concur.***

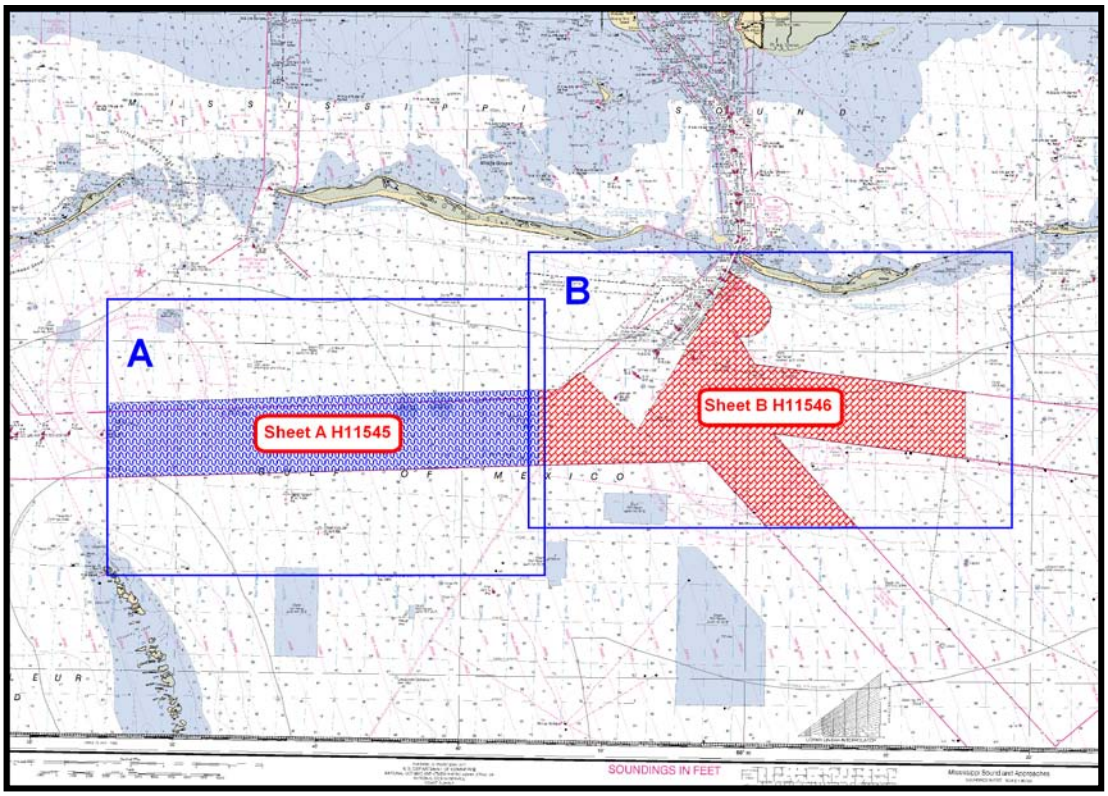


Figure 2 – Overview of survey area showing the junction locations of H-11545 and H-11546

B3. Corrections to Echo Soundings

Hydrographic Survey H-11545 was performed in conjunction with nine other surveys in Projects OPR-J364-KR-06 and S-J977-KR-TE. Any change to the corrections to echo soundings affects all surveys in the area and is described in detail in the Data Acquisition and Processing Report (DAPR) ***accompanying this report.

Sounding data was reduced using zoning provided by NOAA/CO-OPS under the project instructions and verified tides from the National Water Level Observation Network (NWLON) station at Dauphin Island, AL (873-8151) and the Pascagoula NOAA Lab, MS water level station (874-1533). Refer to the Horizontal and Vertical Control Report (HVCR) for tidal zoning methods and operations. ***See Separate II for sound speed corrections.***

B4. Data Processing

The final depth information for this survey was submitted as a collection of CARIS BASE surfaces which best represented the seafloor at the time of the 2006 survey. All possible measures were taken to ensure the data was correctly processed and the appropriate designated soundings, representing the least depth of significant contacts, were selected and retained in the finalized surfaces.

The submittal of several grids of varying resolution was unnecessary for H-11545 due to the shallow depths and relatively flat bottom throughout the survey area. A grid spacing of 2 meters was used for all BASE surfaces and Digital Terrain Models (DTM).

In accordance with the statement of work, line spacing was set to achieve the desired side scan sonar coverage. This was not optimal for shallow water multibeam (SWMB) coverage and resulted in SWMB coverage gaps as the outer beams of adjacent lines did not meet and the use of a grid resolution smaller than two meters resulted in data holidays which could preclude features from inclusion on the surface. ***Concur.***

Two digital products were submitted for the 2006 survey. A CARIS BASE uncertainty surface covering the entire survey area in which the finalized uncertainty is the greater of the standard deviation and *a priori* uncertainty. One sun-illuminated DTM created from the final elevation surface was submitted in addition to the BASE surface. The naming conventions for each grid are:

CARIS BASE Uncertainty Surface: H11545_1_OF_1.hns

Sun-Illuminated Elevation DTM: H11545 _1_OF_1.tif

The Data Acquisition and Processing Report* Sections A: EQUIPMENT – DATA COLLECTION; and B: QUALITY CONTROL contain a detailed discussion of the steps followed when acquiring and processing the 2006 survey data.

DAPR filed with original field reports, and also submitted to Hydrographic Survey Division (HSD) with survey deliverables.

VERTICAL AND HORIZONTAL CONTROL *SEE ALSO THE EVALUATION REPORT.*

Sounding data was tide adjusted using verified tide levels for the National Water Level Observation Network (NWLON) station at Dauphin Island, AL (873-8151 / 873-8150) and the Pascagoula NOAA Lab, MS water level station (874-1533) tide stations through November 11, 2006. Verified data from the Dauphin Island and Pascagoula gauges were downloaded from the NOAA internet Hydro Hot list (http://co-ops.nos.noaa.gov/hydro.shtml). The final zoning methodology is described in detail in the project wide Vertical and Horizontal Control Report.***

Approved tides were applied during field processing.

The horizontal control datum used for this survey is the North American Datum of 1983 (NAD 83). The projection used was UTM, Zone 16 North.

Sounding position control was determined using the Global Positioning System (GPS). The United States Coast Guard differential GPS (DGPS) stations *Mobile Point, AL, StaID 26* and *English Turn, LA, StaID 28,* were used to provide navigation correctors. A summary of weekly DGPS confidence checks is provided in Separate I: ACQUISITION AND PROCESSING LOGS included with this report. ***Concur.***

Data filed with field records.

RESULTS AND RECOMMENDATIONS *SEE ALSO THE EVALUATION REPORT.*

D1. Chart Comparison

In the absence of a paper smooth sheet, sounding data from the 2006 survey used for chart comparison were produced using CARIS HIPS & SIPS Field Sheet Editor. The final edited data was decimated to a $10m^2$ binned surface and populated with the shoalest sounding value within the limits of each bin. In order to replicate traditional smooth sheet sounding selection criteria, a shoal-biased sounding selection using a 60m radius was applied to each binned surface. The soundings were then compared the largest scale chart (or charts) covering the surveyed area. The results of this comparison are discussed in the following pages sorted by chart affected.

No Local Notice to Mariners (LNM) affected the survey area. LNM number 06 (Weekly Edition-February 2007) was the last notice reviewed for this project. There was one feature and one sounding submitted as Dangers to Navigation (DTON) for the 2006 survey. The DTON report is included in Appendix I. to this report.

This survey was compared to the following chart(s):

Chart	Scale	Edition Number	Edition Date	Issue Date
11373	1:80,000	45	2/1/2006	1/27/2007

This survey was compared to the following ENC(s):

Cell Name	Chart	Scale	Edition Number	Issue Date
US4MS12M	11373	1:80,000	8	1/27/2007

Raster Chart Comparison – Survey Area H-11545

All charted features were investigated using side scan and multibeam sonar. The survey agrees, in general, with Chart 11373, 45~~4~~***7th*** Edition. The following pages detail discrepancies found between charted features and the 2006 survey data. The hydrographer recommends that seven charted features be removed from Chart 11373, 45~~4~~***7***th Edition. The hydrographer also recommends that the charted information on one feature and one sounding be modified. ***Concur.***

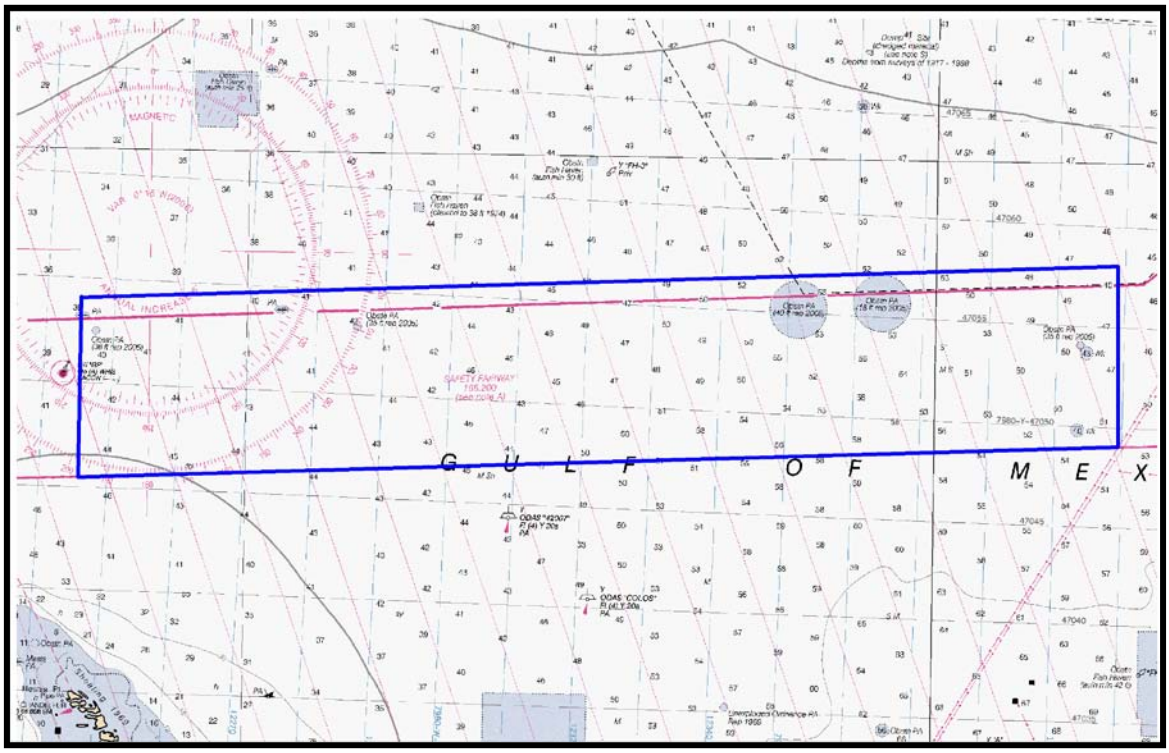


Figure 3 – Survey limits of H-11545 shown with Chart 11373, 45th Edition.

New Features: Survey Area H-11545

There are no new features recommended for inclusion on the largest scale chart in survey area H-11545. ***Concur.***

Changed Features: Survey Area H-11545

Figure 4 delineates an area in survey area H-11545 (circled in red) in which features found by the 2006 survey were significantly shoaler and / or horizontally offset from the corresponding charted features.

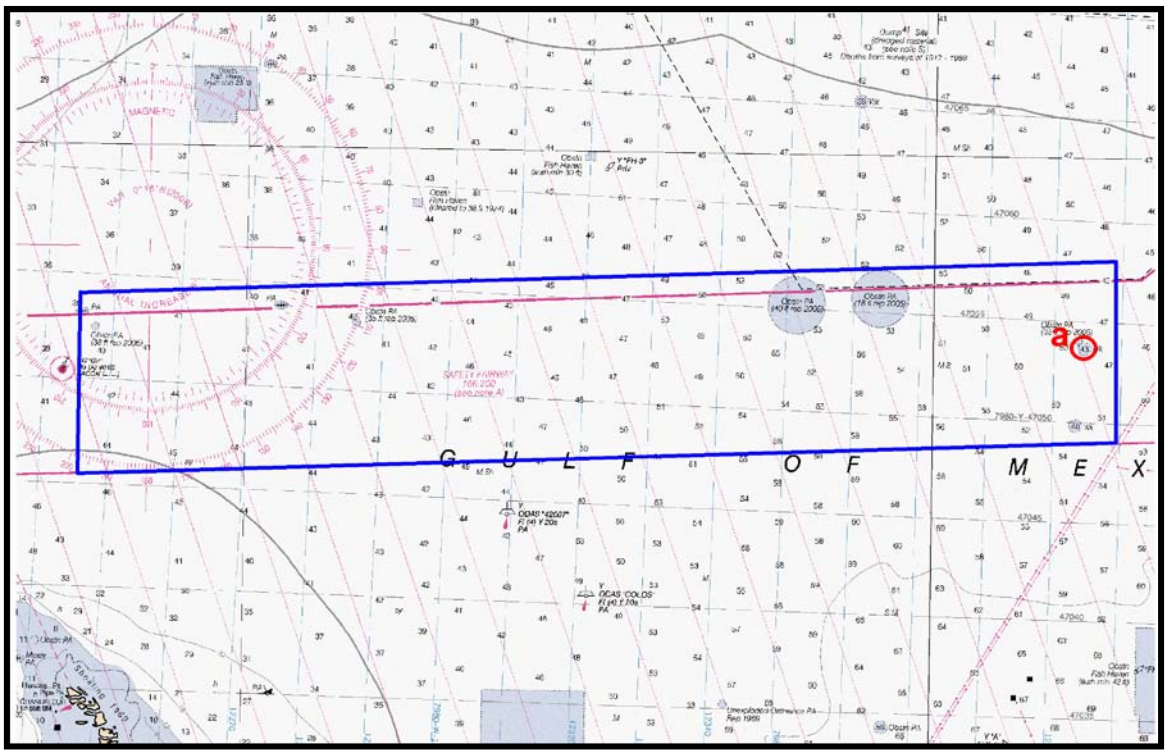


Figure 4 – Area within H-11545 where the 2006 survey produced a least depth that was shoaler than the charted depth. Chart 11373, 45th Edition.

Table 1 - Comparison between the charted feature "a" and the 2006 survey results. Chart 11373, 45th Edition.

Feature Letter	Charted Latitude N	Charted Longitude W	Charted Depth (feet)	Survey Sounding Latitude N	Survey Sounding Longitude W	Survey Sounding (feet)	Vertical Difference (feet)	Horizontal Offset (feet)
a	30° 07' 36.1090377"	88° 37' 48.0076291"	43	30° 07' 40.2286"	88° 37' 58.488"	35.7	7.3	1017 NW

***See charting recommendation on next page.**

The area where feature “a” is located contains one wreck (Figure 5). The wreck is located to the West of the currently charted “Obstn PA” and to the Northwest of the currently charted wreck “Wk (43 ft.).” The Hydrographer recommends marking the 2006 survey sounding of 10.~~9~~***884*** meters (35.~~8~~***708*** ft) as the wreck location and removing the other two symbols from Chart 11373, 4~~5~~***47***th Edition. ***Concur with clarification. Delete the charted notation “Obstn PA (35 ft rep 2005)”and dangerous submerged obstruction symbol. Delete charted 43 Wk and danger curve AWOIS #7452. Chart 35 Wk and danger curve in latitude 30° 07’ 40.23”N, longitude 88° 37’ 58.49”W.***

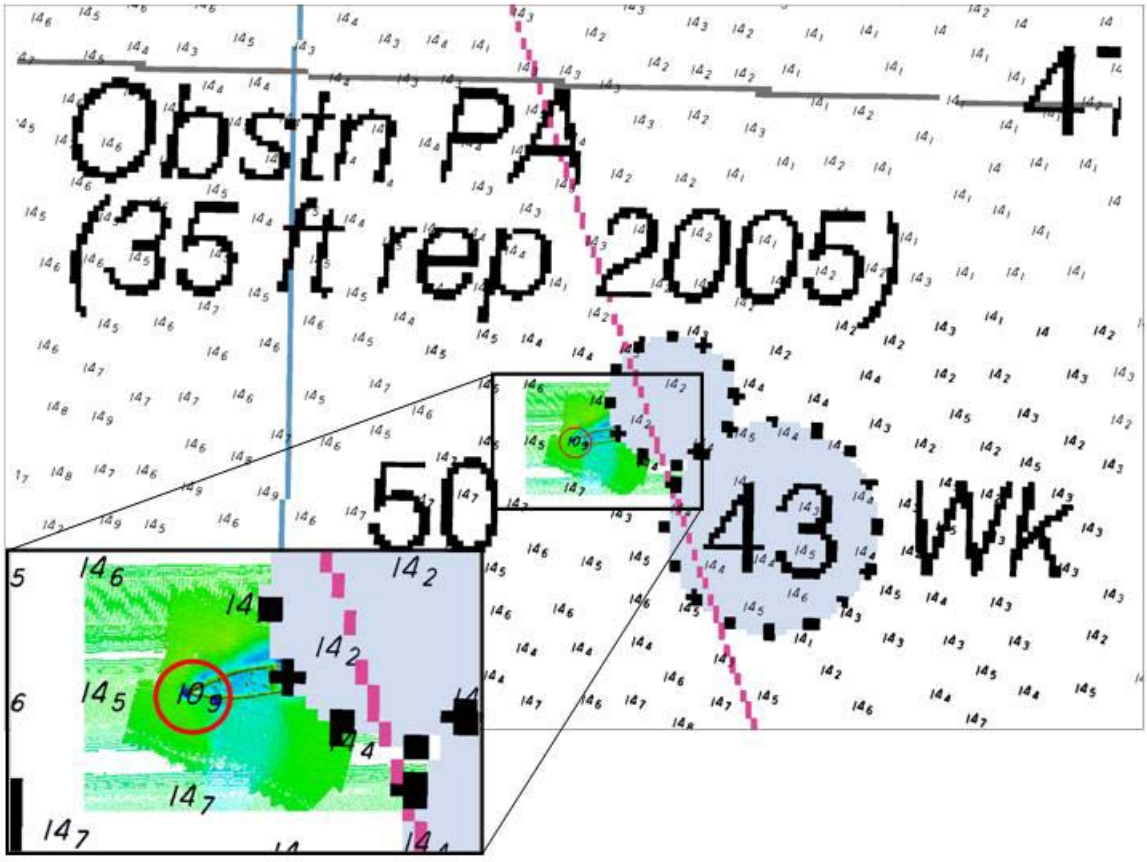


Figure 5 – Close-up of the area in H-11545 where feature “a” is located. The chart shows the location of the wreck and the shoalest sounding. The inset shows a CARIS HIPS BASE surface outlining the wreck. Chart 11373, 45th Edition.

Disproved Features: Survey Area H-11545

There are seven charted features recommended for removal from survey area H-11545. This recommendation is based on side-scan sonar and multibeam data analysis. The position and depth information for these features are shown in Figure 6 and Table 2 below. Five of the seven features were included in the Automated Wreck and Obstruction Information System (AWOIS) listing for this survey.

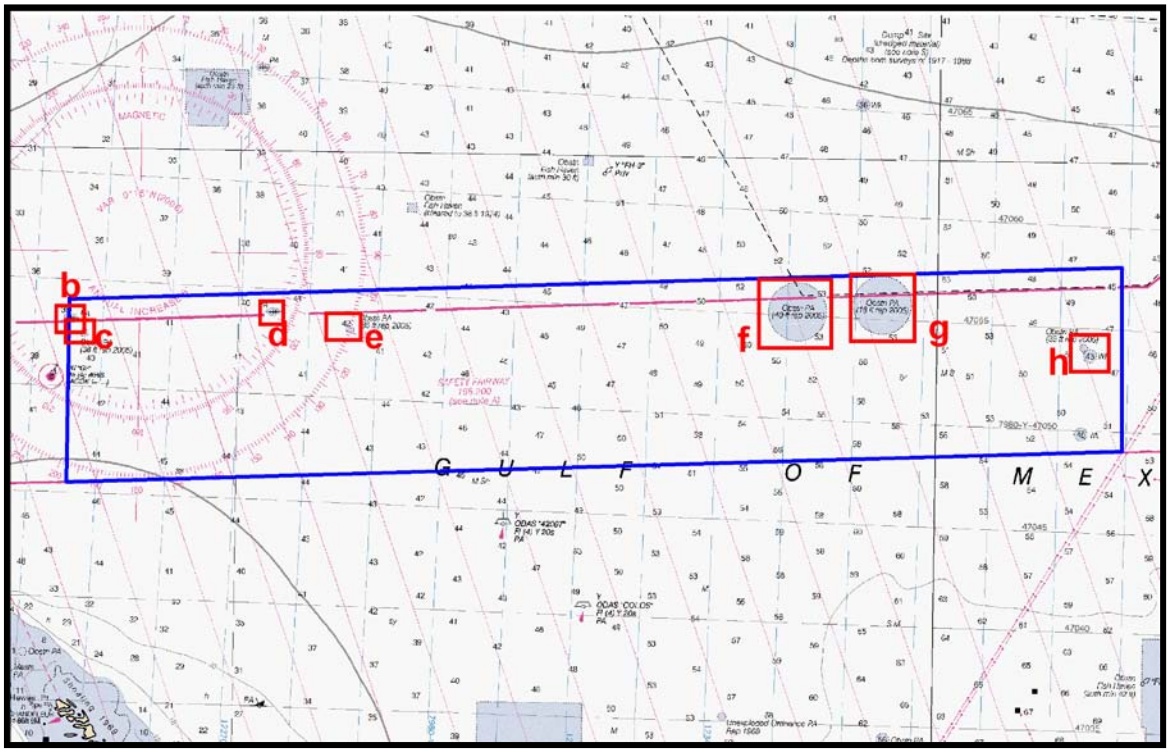


Figure 6 – Overview of H-11545 showing charted features found on Chart 11373, 45th edition, that are unsupported by the 2006 survey data. The features marked by the red squares are recommended for removal.

Table 2 - Features found on Chart 11373, 45th edition recommended for removal. Feature letters are keyed to areas indicated in Figure 6.

Feature Letter	Latitude N	Longitude W	Sounding Value (feet) on Chart	AWOIS Record Number
b	30° 07’ 53.7615878”	88° 52’ 23.2419322”	38	13336
b	***Concur***	***Item not shown on chart 11373 Ed #47, Oct 2008. No change in charting.***		
c	30° 07’ 42.2404762”	88° 52’ 11.5883563”	38	13363
c	***Concur***	***Delete dangerous submerged obstruction and notation Obstn PA (38 ft rep 2005).***		
d	30° 08’ 00.2916497”	88° 49’ 29.3775519”	N/A	N/A
d	***Concur.***	***Delete PA wreck symbol.***		
e	30° 07’ 48.3204097”	88° 48’ 23.2735418”	42	13364
e	***Concur.***	***Delete dangerous submerged obstruction and notation Obstn PA (35 ft rep 2005).***		

f	30° 08’ 05.7175321”	88° 41’ 59.5570856”	40	7314, 13365, 13366
f	***Concur.***	***Delete dangerous submerged obstruction and notation Obstn PA (40 ft rep 2005).***		
g	30° 08’ 12.3792942”	88° 40’ 46.9565131”	18	N/A
g	***Concur.***	***Delete dangerous submerged obstruction and notation Obstn PA (18 ft rep 2005).***		
h	30° 07’ 41.8933543”	88° 37’ 54.2390516”	43	4752, 13367
h	***Concur.***	***Delete dangerous submerged obstruction, notation Obstn PA (35 ft rep 2005) and notation Wk.***		

Figures 7 through 13 include images from CARIS HIPS & SIPS Subset Editor 3D View of the features recommended for removal from Chart 11373, 45th edition. Each image is keyed to Table 2, above. The area covered in the 3D view is represented by the red box with the appropriate letter in Figure 6. The color scale represents depth. The consistency of color and lack of anomalous data in the figures indicate the charted feature is no longer present.

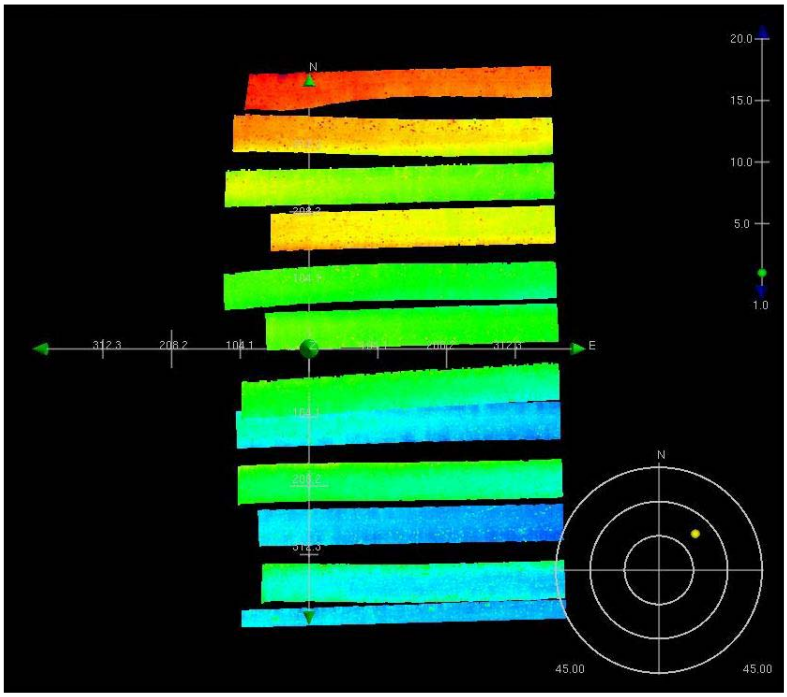


Figure 7 – CARIS HIPS & SIPS Subset Editor 3D view of feature “b” from Figure 6. The color scale represents depth. The consistency of color and lack of anomalous data in the figure indicate the charted feature is no longer present.

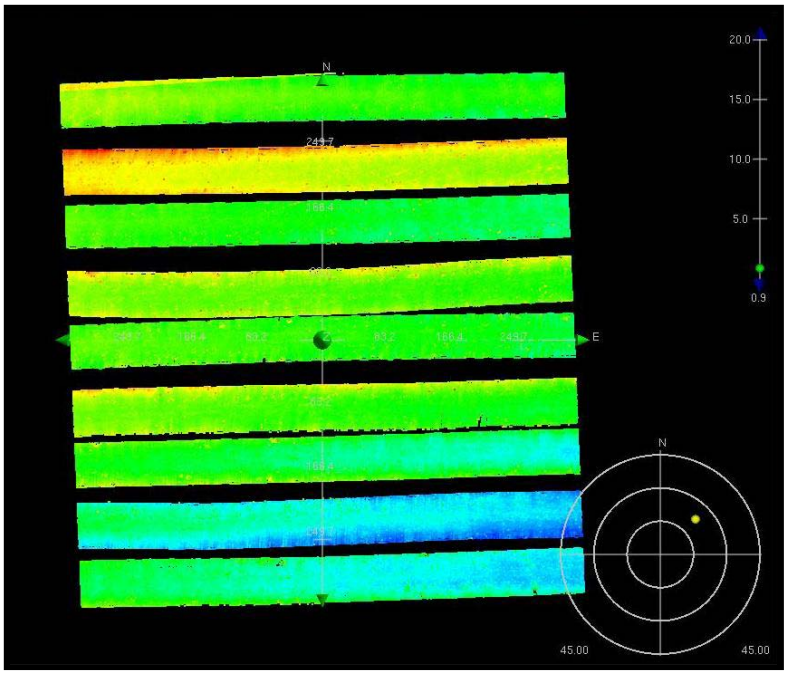


Figure 8 – CARIS HIPS & SIPS Subset Editor 3D view of feature "c" from Figure 6. The color scale represents depth. The consistency of color and lack of anomalous data in the figure indicate the charted feature is no longer present.

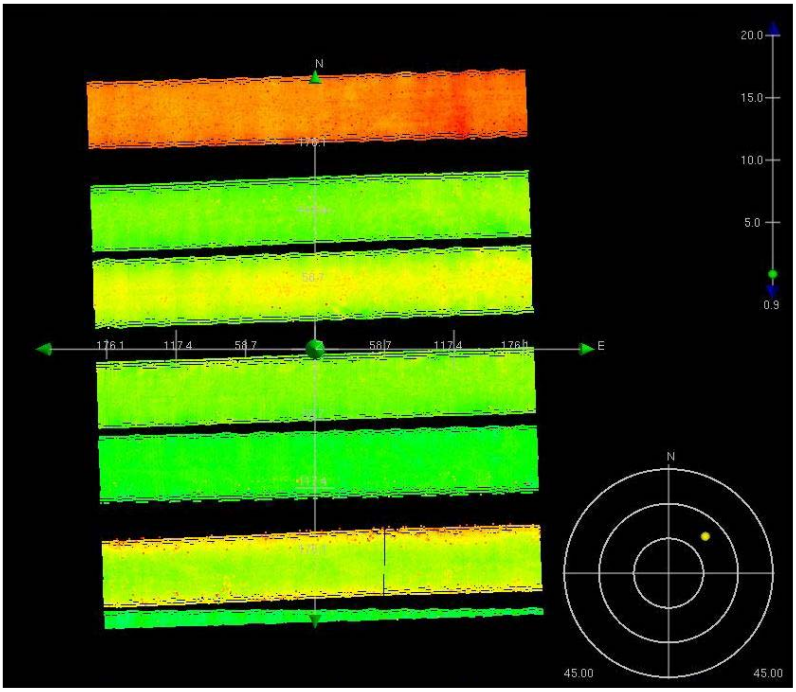


Figure 9 – CARIS HIPS & SIPS Subset Editor 3D view of feature "d" from Figure 6. The color scale represents depth. The consistency of color and lack of anomalous data in the figure indicate the charted feature is no longer present.

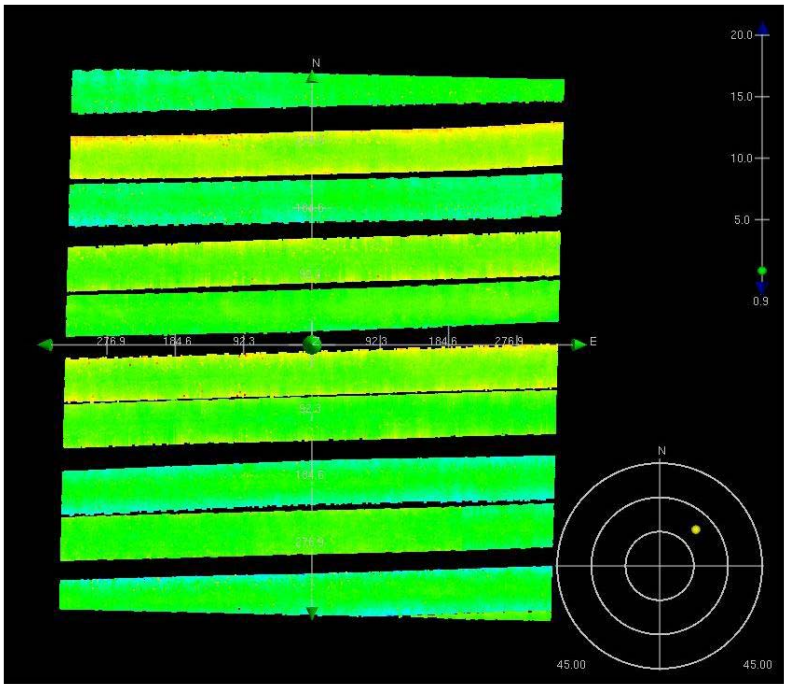


Figure 10 – CARIS HIPS & SIPS Subset Editor 3D view of feature "e" from Figure 6. The color scale represents depth. The consistency of color and lack of anomalous data in the figure indicate the charted feature is no longer present.

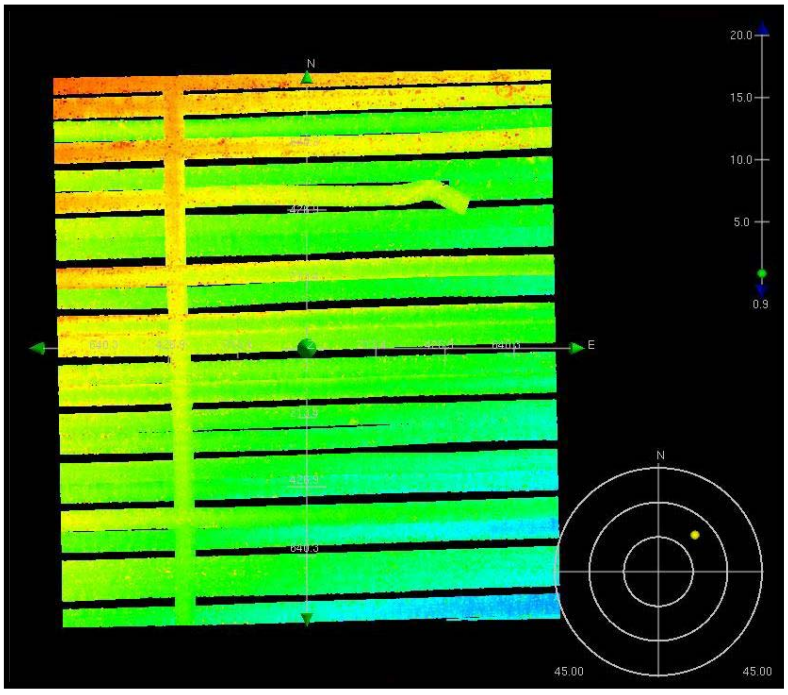


Figure 11 – CARIS HIPS & SIPS Subset Editor 3D view of feature "f" from Figure 6. The color scale represents depth. The consistency of color and lack of anomalous data in the figure indicate the charted feature is no longer present.

Figure 11 shows apparent tidal errors. Their submitted grids are free from these tidal errors.

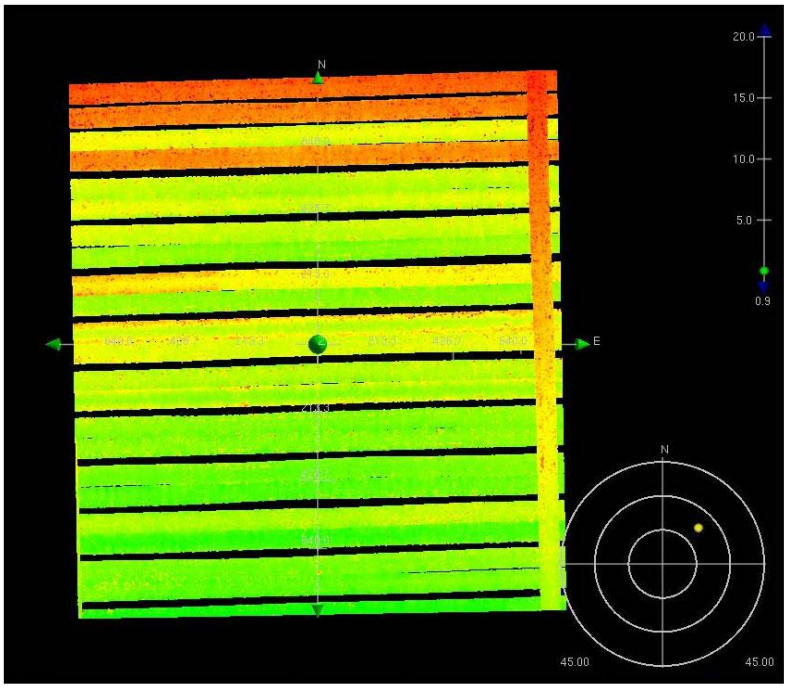


Figure 12 – CARIS HIPS & SIPS Subset Editor 3D view of feature "g" from Figure 6. The color scale represents depth. The consistency of color and lack of anomalous data in the figure indicate the charted feature is no longer present.

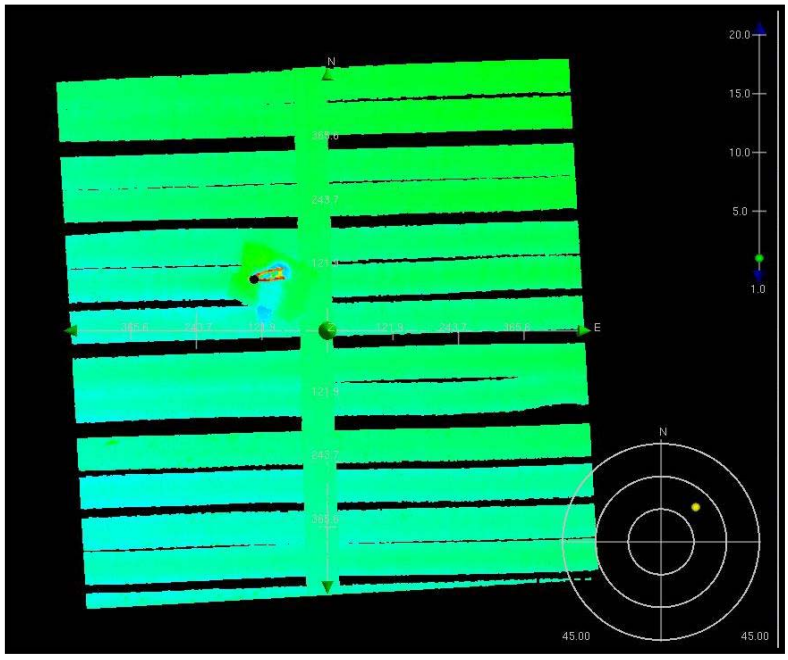


Figure 13 – CARIS HIPS & SIPS Subset Editor 3D view of feature "h" from Figure 6. The color scale represents depth. The anomalous data in the figure reveal only one feature, whereas Chart 11373, 45th Edition, presents two charted features in the same location.

Soundings: Survey Area H-11545

Figure 14 delineates an area (circled in red and designated “i”) where the 2006 survey depths were significantly shoaler than the depths found on the chart. One sounding representing this area was submitted as a DTON (Appendix I.).

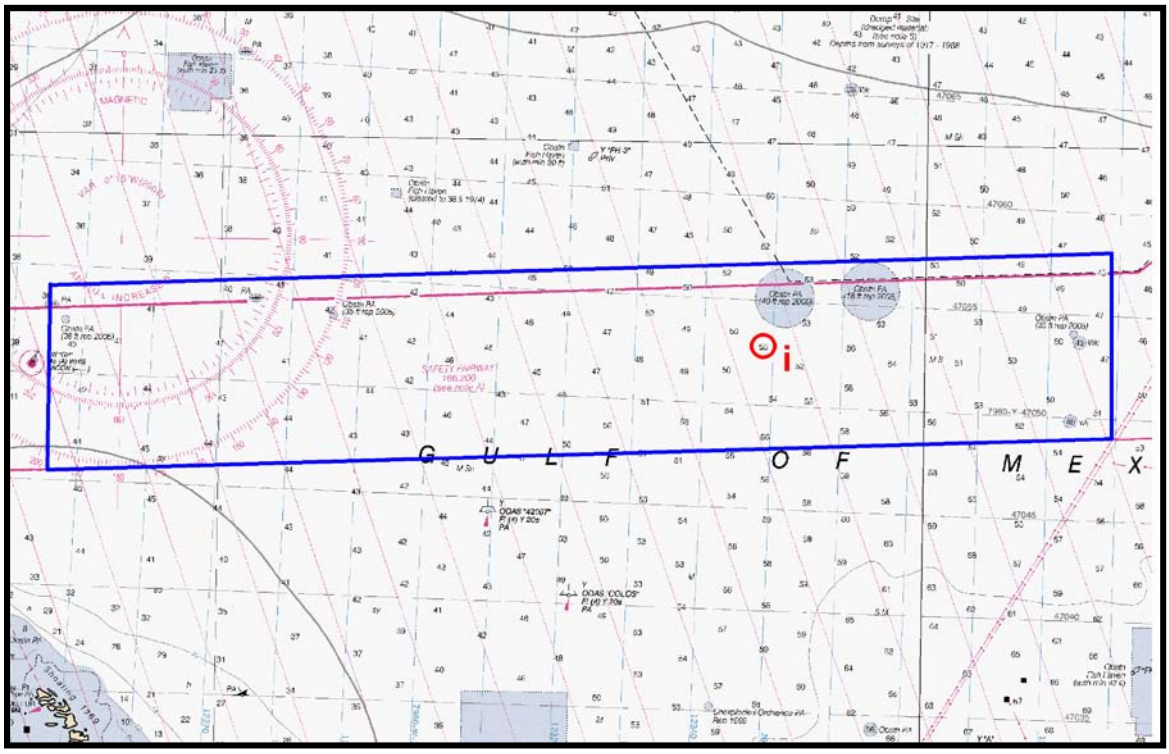


Figure 14 – Area within H-11545 where the 2006 survey produced a least depth that was significantly shoaler than the charted depth. Chart 11373, 45th Edition.

Table 3– Comparison between charted and survey depths on Chart 11373, 45th edition.

Feature Letter	Latitude N	Longitude S	Sounding on Chart (feet)	Survey Sounding (feet)	Difference (feet)
i	30° 07’ 30.6303352”	88° 42’ 20.9346857”	55	49	6
i	***Concur.***				

Trends and Changeable Areas: Survey Area H-11545

Depth contours from Chart 11373, 45th Edition, do not fall within the survey limits of H-11545 therefore, no trends or changeable areas could be determined from the information available. ***Concur.***

Electronic Navigation Chart (ENC)Comparison – H-11545

The 2006 survey agrees, in general, with the largest scale ENCs available for H-11545 survey area. The following pages detail discrepancies found between charted features and the 2006 survey data.

All charted features were investigated using side scan and multibeam sonar. The 2006 survey data supports the recommendation to remove six charted features from ENC US4MS12M, 8th Edition. The survey data also supports the recommendation to modify the charted information on one feature and one sounding. ***Concur.***

Table 4 - Electronic Navigation Charts (ENC) used for chart comparison with survey H-11547

ENC Cell Name	Chart	Edition	Date
US4MS12M	11373	8th	January 5, 2007

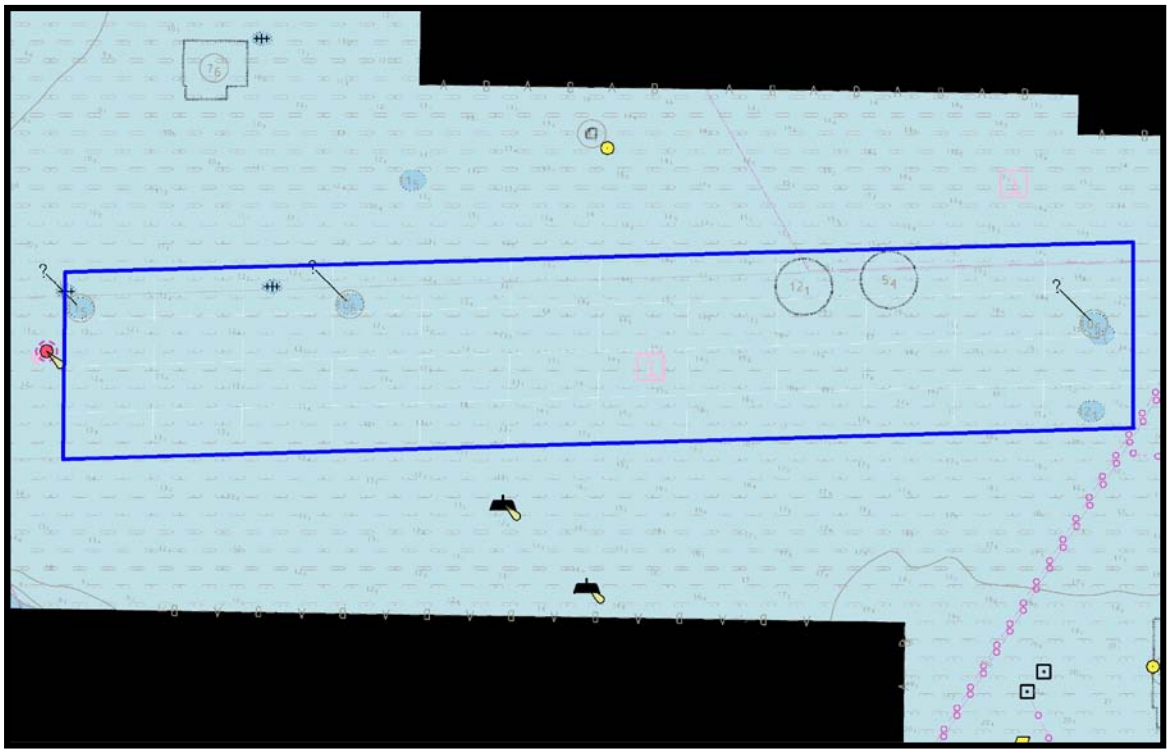


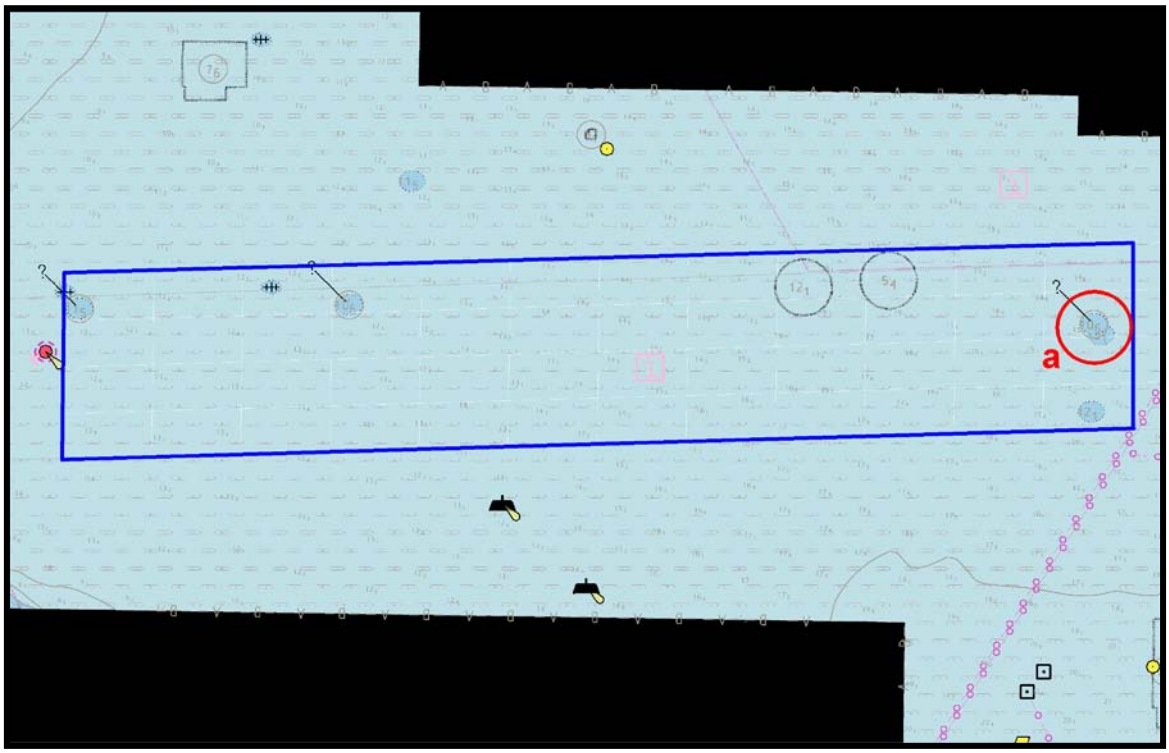
Figure 15 – Survey limits of H-11545 shown with ENC US4MS12M, 8th Edition

New Features: Survey Area H-11545

There are no new features recommended for inclusion in future editions of the largest scale ENC in the H-11545 survey area. ***Concur.***

Changed Features: Survey Area H-11545

Figure 16 delineates an area (circled in red, designated "a") in which the 2006 survey soundings were significantly shoaler than the charted soundings. During the office review of *H-11545*, one DTON



11373 report was submitted relating to this change (Appendix I).

Figure 16 – Area within H-11545 where the 2006 survey produced a least depth that was shoaler than the charted depth. ENC US4MS12M, 8th Edition.

Table 5 – Comparison between the charted feature "a" and the 2006 survey results. ENC US4MS12M, 8th Edition.

Feature Letter	Charted Latitude N	Charted Longitude W	Charted Sounding (meters)	Survey Sounding Latitude N	Survey Sounding Longitude W	Survey Sounding (meters)	Vertical Difference (meters)	Horizontal Offset (meters)	ENC Cell Name
a	30° 07' 34.3117507"	88° 37' 48.0259143"	13.1	30° 07' 40.2286"	88° 37' 58.488"	10.9	2.2	335 NW	US4MS12M

Feature "a" in Figure 16 is in the vicinity of two features that appear on ENC US4MS12M, 8th Edition. The 2006 survey depth is the shoalest sounding over a wreck. The position of the wreck, as determined by the 2006 survey data, is in close proximity to Position Approximate feature that appears on the chart with a depth of 10.6 meters. The hydrographer recommends the removal of the wreck and the 13.1 meter depth feature and that the position of the "Position Approximate" feature be changed to a wreck with the least depth and position that were determined by the survey. ***Concur with clarification.***

Chart 10.6 m wreck at surveyed location and remove charted 13.1 m reported obstruction PA and 13.1 m wreck from the chart.

Disproved Features: Survey Area H-11545

There are six features recommended for removal from the H-11545 survey area. This recommendation is based on side-scan sonar and multibeam data analysis. The position and depth information for these features are shown in Figure 17 and Table 6.

Figure 17 - Features found on ENC US4MS12M, 8th edition recommended for removal.

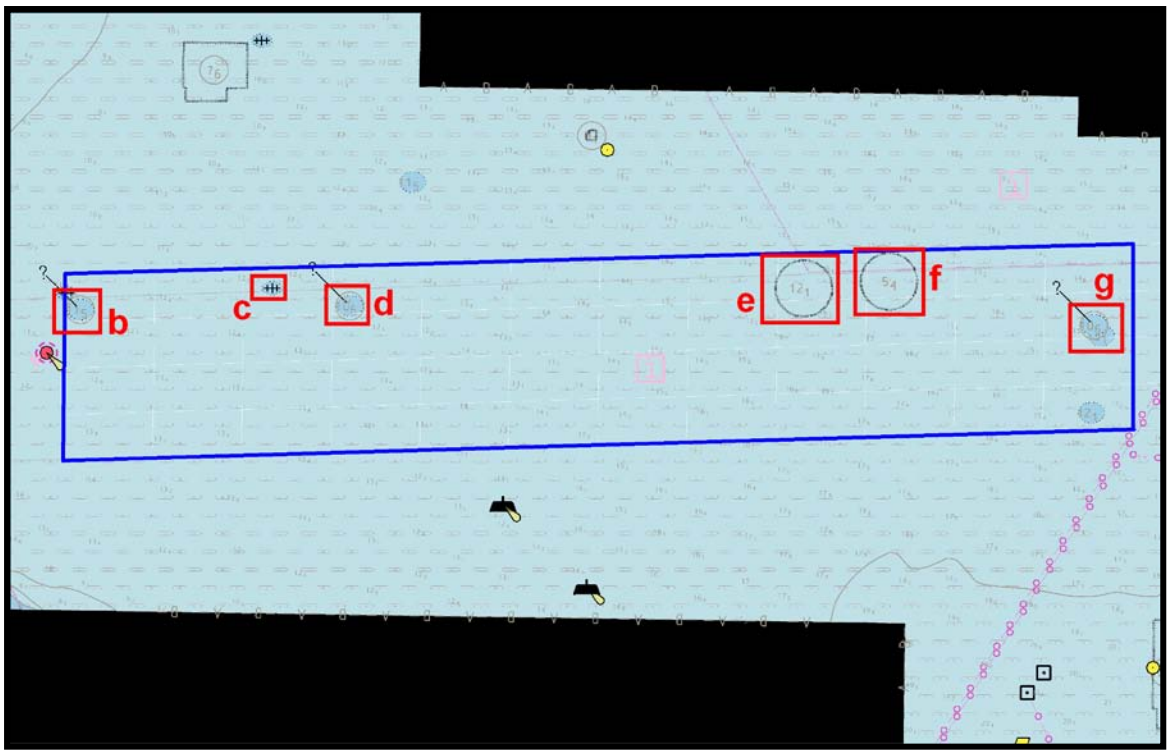


Table 6 – Features found on ENC US4MS12M, 8th edition recommended for removal. Feature letter keyed to areas indicated in Figure 17.

Feature Letter	Latitude N	Longitude W	Sounding Value (meters) on Chart	ENC
b	30° 07’ 42.2404762”	88° 52’ 11.5883563”	11_5	US4MS12M
	Concur.	***Delete dangerous submerged obstruction and notation Obstn PA (38 ft rep 2005).***		
c	30° 08’ 00.2916497”	88° 49’ 29.3775519”	N/A	US4MS12M
c	***Concur.***	***Delete PA wreck symbol.***		
d	30° 07’ 48.3204097”	88° 48’ 23.2735418”	10_6	US4MS12M
d	***Concur.***	***Delete dangerous submerged obstruction and notation Obstn PA (35 ft rep 2005).***		
E	30° 08’ 05.7175321”	88° 41’ 59.5570856”	12_1	US4MS12M

e	***Concur.***	***Delete dangerous submerged obstruction and notation Obstn PA (40 ft rep 2005).***		
F	30° 08’ 12.3792942”	88° 40’ 46.9565131”	5_4	US4MS12M
f	***Concur.***	***Delete dangerous submerged obstruction and notation Obstn PA (35 ft rep 2005).***		
G	30° 07’ 41.8933543”	88° 37’ 54.2390516”	10_6	US4MS12M
g	***Concur.***	***Delete dangerous submerged obstruction, notation Obstn PA (35 ft rep 2005) and notation Wk.***		

Figures 18 through 23 on the following pages include images from CARIS HIPS & SIPS Subset Editor 3D View of the features recommended for removal from ENC US4MS12M, 8th edition. Each image is keyed to Table 5. The area covered in the 3D view is represented by the red box with the appropriate letter in Figure 17. The color scale represents depth. The consistency of color and lack of anomalous data in the figures indicate the charted feature is no longer present.

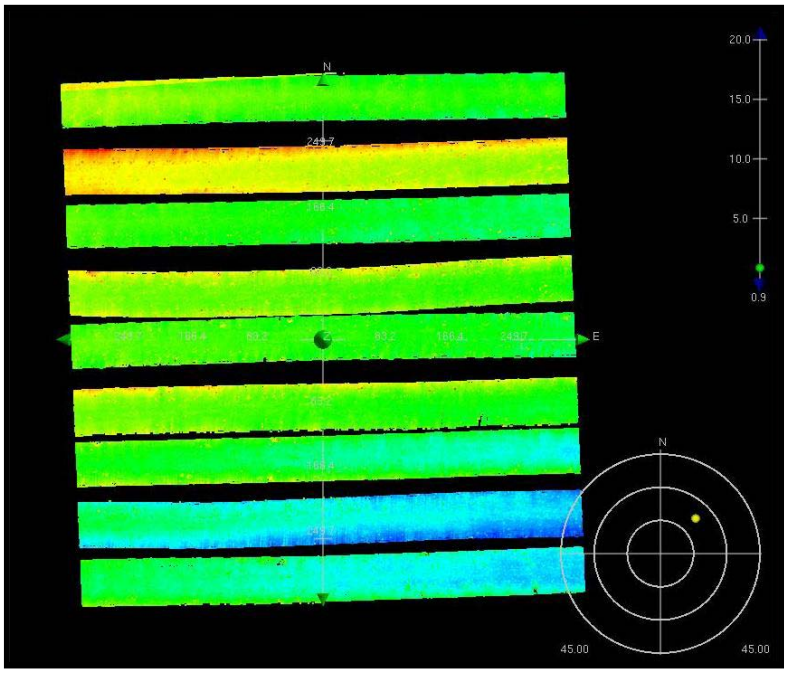


Figure 18 – CARIS HIPS & SIPS Subset Editor 3D view of feature "b" from Figure 17. The color scale represents depth. The consistency of color and lack of anomalous data in the figure indicate the charted feature is no longer present.

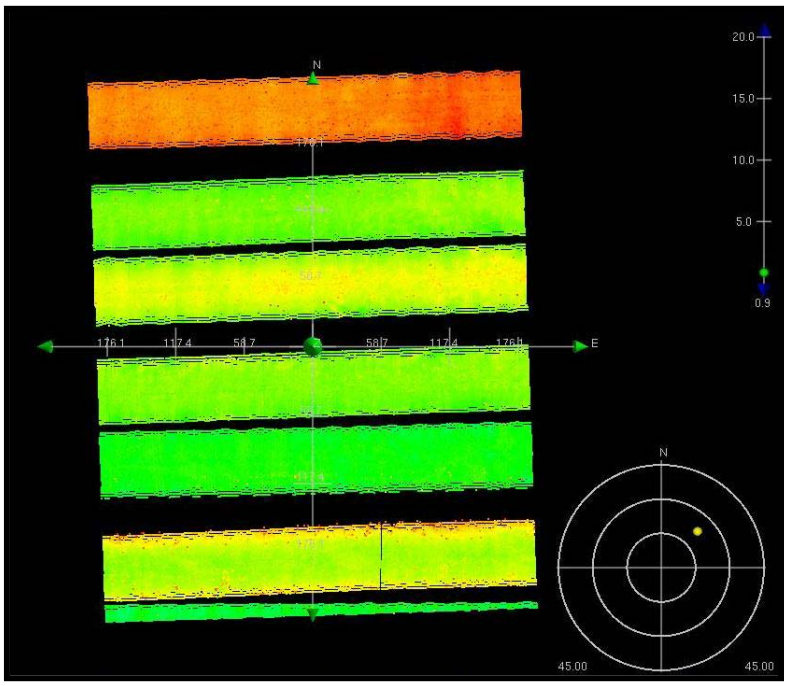


Figure 19– CARIS HIPS & SIPS Subset Editor 3D view of feature "c" from Figure 17. The color scale represents depth. The consistency of color and lack of anomalous data in the figure indicate the charted feature is no longer present.

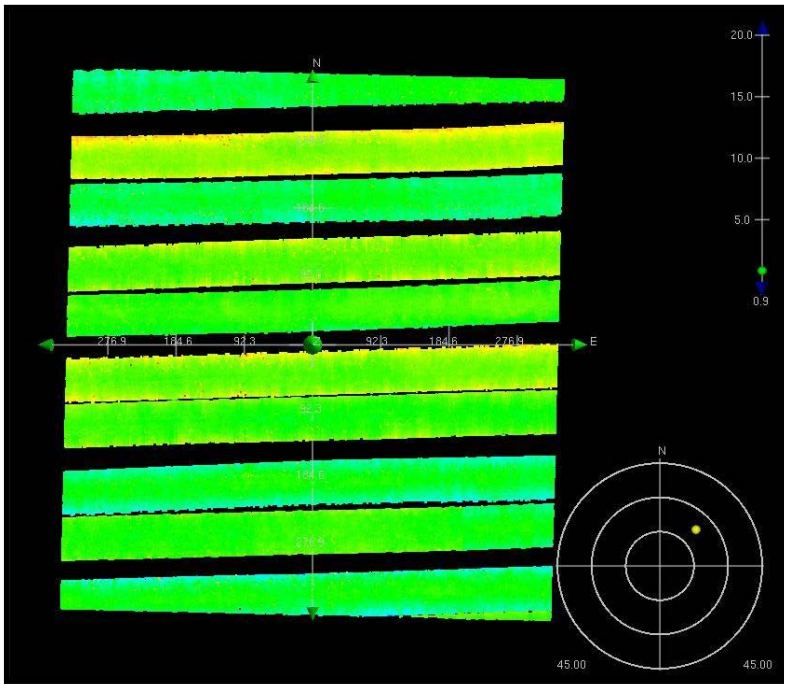


Figure 20 – CARIS HIPS & SIPS Subset Editor 3D view of feature "d" from Figure 17. The color scale represents depth. The consistency of color and lack of anomalous data in the figure indicate the charted feature is no longer present.

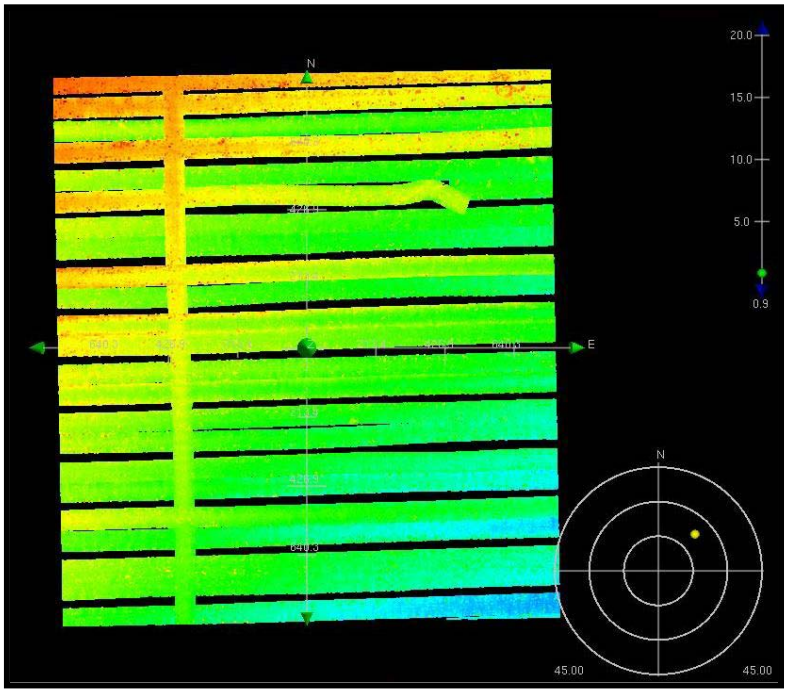


Figure 21 – CARIS HIPS & SIPS Subset Editor 3D view of feature "e" from Figure 17. The color scale represents depth. The consistency of color and lack of anomalous data in the figure indicate the charted feature is no longer present.

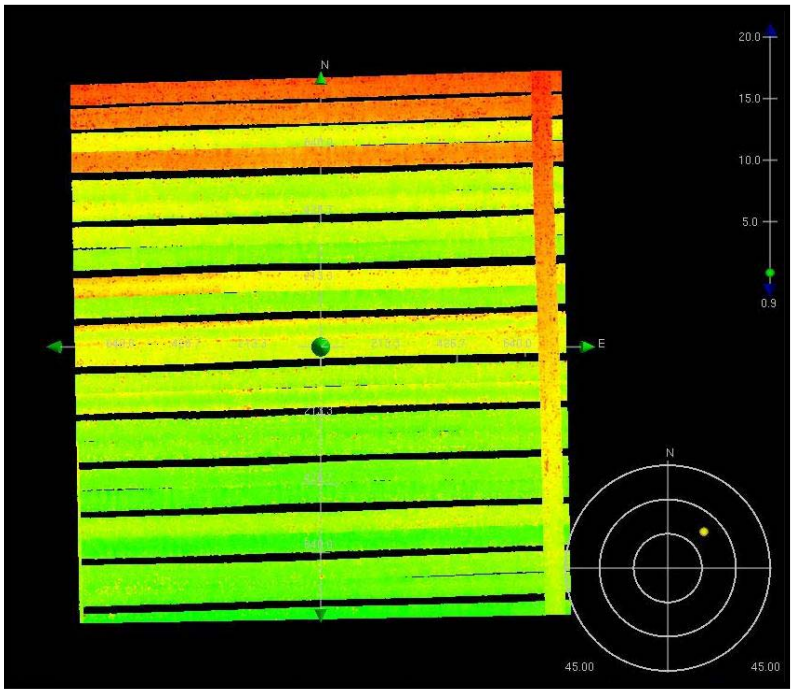


Figure 22 – CARIS HIPS & SIPS Subset Editor 3D view of feature "f" from Figure 17. The color scale represents depth. The consistency of color and lack of anomalous data in the figure indicate the charted feature is no longer present.

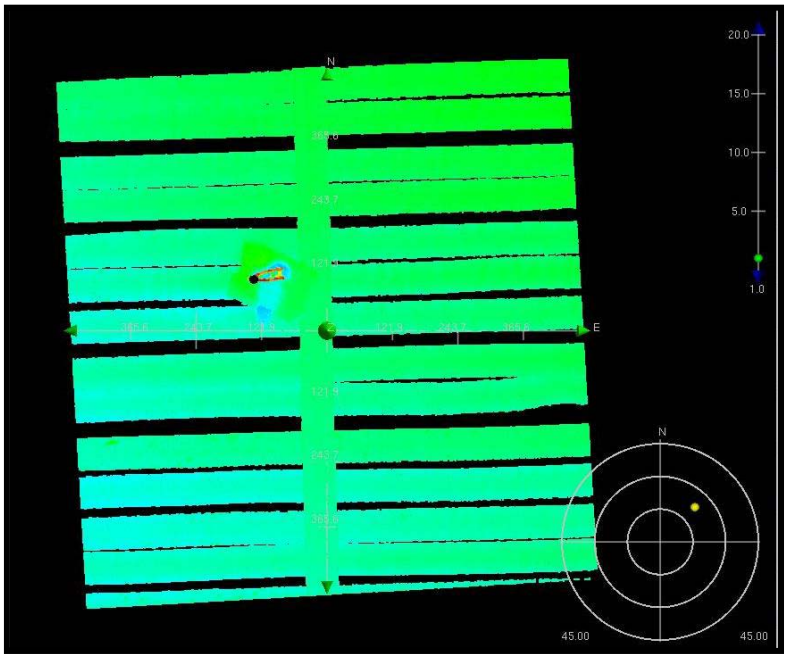


Figure 23 – CARIS HIPS & SIPS Subset Editor 3D view of feature "g" from Figure 17. The color scale represents depth. The anomalous data in the figure reveal only one feature, whereas ENC US4MS12M, 8th Edition, presents two charted features in the same location.

Soundings: Survey Area H-11545

Survey depths are in general agreement with the charted depths for the largest scale ENC covering H-11545. One area, marked with a circle and designated “h” in Figure 24, was noted where depths found during the survey that were significantly shoaler than the charted depths.

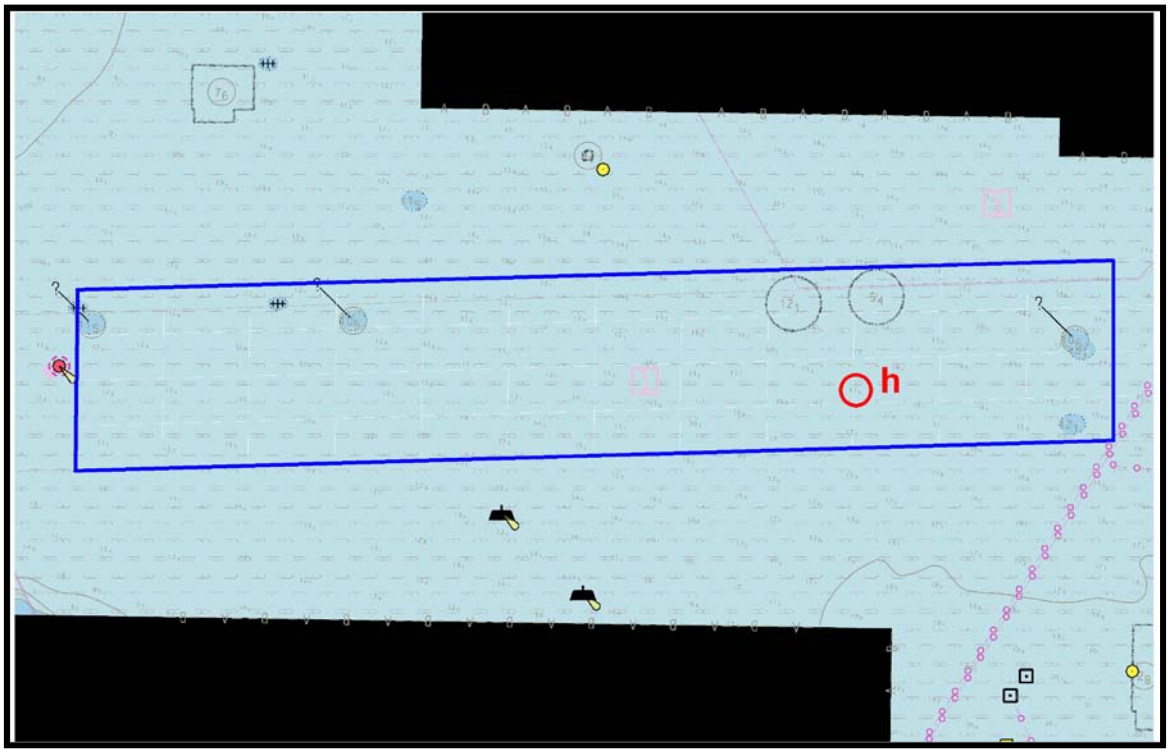


Figure 24 – Area “h” within H-11545 where the 2006 survey depths are significantly shoaler than charted depths overlain on ENC US4MS12M, 8th Edition.

Table 7 – Comparison between the charted depths on ENC US4MS12M, 8th Edition, and depths found during the 2006 survey.

Feature Letter	Sounding on Chart (meters)	Survey Sounding (meters)	Difference (meters)	Latitude N	Longitude W	ENC
h	17.6	15.9	1.7	30° 08’ 00.7059234”	88° 41’ 04.6607137”	US4MS12M
h		***Concur.***				

Trends and Changeable Areas: Survey Area H-11545

There are no charted sounding contours in the H-11545 survey area. No trends or changeable areas could be determined from the information available. ***Concur.***

AWOIS Items Summary

This survey involved a full investigation of eleven Automated Wreck and Obstruction Information System (AWOIS) items. The table below is a summary of the items and the investigation results. Refer to Appendix II: SURVEY FEATURE REPORT for AWOIS item investigation reports and associated graphics files.

AWOIS Record	Description	Comment
4752	Obstn PA (35 ft rep 2005) ***30-07-34.30 N*** ***088-37-48.02 W***	Submerged wreck found near obstruction and wreck symbols for AWOIS 4752 and 13367. Recommend removing Obstn PA and moving Wk 43 to new surveyed position. ***Concur with clarification. . Delete the charted notation "Obstn PA (35 ft rep 2005)"and dangerous submerged obstruction symbol. Delete charted 43 Wk and danger curve AWOIS #7452. Chart 35 Wk and danger curve in latitude 30° 07' 40.23"N, longitude 88° 37' 58.49"W.*** Wreck appears to be entangled in at least two fishing nets. Ribs are visible in the hull of the wreck. Possibly AWOIS 4752 F/V Lucky.
4753	Removed from chart per N/CG241 2/19/88. Not assigned	Item not found. ***Concur.***
7212	Not Charted ***30-07-42.32N*** ***088-43-23.97W***	Item not found. ***Concur.***
7269	51 Charted, 48 ft clearance in previous charted 55-56 ft depths ***30-07-40.72N*** ***088-39-50.06W***	Shoal depths not found. Least depth determined to be 15.5 m (50.85 ft) ***Concur.***
7314	47 ft shoal sounding in prior depths of 52-53 ft. Not previously verified ***30-08-26.82N*** ***088-42-04.07W***	Multibeam corrected depth 14.9 m (48.9 ft). Recommend removing the 47 ft depth and charting a 49 ft depth at the surveyed position. ***Concur.***
13336	PA (no radius) ***30-07-54N*** ***88-52-24W***	Item not found ***Concur. Item not shown on chart 11373 Ed #47, Oct 2008. No change in charting.***
13363	Obstn PA (38 ft rep 2005) ***30-07-42.0N*** ***088-52-12.0W***	Item not found ***Concur. Delete dangerous submerged obstruction and notation Obstn PA (38 ft rep 2005)***.
13364	Obstn PA (35 ft rep 2005) ***30-07-48.0N***	Item not found ***Concur.***

	088-48-24.0W	
13365	Obstns PA (40 ft rep 2005) ***30-08-06.0N*** ***088-42-00.0W***	Items not found ***Concur.***
13366	Obstns PA (40 ft rep 2005) ***30-08-06.0N*** ***088-42-00.0W***	Items not found ***Concur.***
13367	Obstn PA (35 ft rep 2005) ***30-07-42.0N*** ***088-37-54.0W***	Submerged wreck found near obstruction and wreck symbols for AWOIS 4752 and 13367. Recommend removing Obstn PA and moving Wk 43 to new surveyed position ***Concur.***

D2. Additional Results

Aids to Navigation

All the floating aids to navigation in this survey appear as charted, match the Light List and chart characteristics and serve their intended purpose.

Drilling Structures

There were no drilling structures, production platforms or well heads within the survey limits of H-11545.

Comparison with Prior Surveys

A comparison with prior surveys was not required under this task order. See Section D1 for a comparison to the nautical charts.

Bottom Samples

Twenty-three (23) bottom samples were collected in support of the 2006 survey. The samples were distributed geographically to obtain a full representation of the bottom characteristics as specified in NOAA Hydrographic Surveys Specifications and Deliverables, Section 7.1. A table listing the position and description of the bottom samples obtained is included in Appendix V to this report.

Bridges and Overhead Cables

There were no bridges or overhead cables in the survey area.

Submarine Cables and Pipelines

There were no charted submarine cables or pipelines located in the survey area and the side scan sonar and multibeam echosounder surveys did not produce any images that indicated the potential presence of any uncharted pipelines or cables.

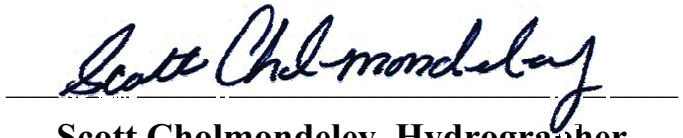
LETTER OF APPROVAL

REGISTRY NO. H-11545

This report and the accompanying digital data are respectfully submitted.

Field operations contributing to the accomplishment of survey H-11545 were conducted under my direct supervision with frequent personal checks of progress and adequacy. This report, digital data, and accompanying records have been closely reviewed and are considered complete and adequate as per the Statement of Work. Other reports submitted with this survey include the Data Acquisition and Processing Report and the Horizontal and Vertical Control Report.

I believe this survey is complete and adequate for its intended purpose.



Scott Cholmondeley, Hydrographer
TerraSond Ltd.

Date 06/06/2007

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APPENDIX I

Danger to Navigation Reports

Danger to Navigation Report

Report of Danger to Navigation

Sheet: A

Registry No.: H-11545

State: Mississippi – Alabama

General Locality: Gulf of Mexico

Sub locality: 7 NM South of Horn Island

Project Number: OPR-J364-KR-06

Survey Dates: May 24th, 2006 – November 11th, 2006

Depths are reduced to Mean Lower Low Water (MLLW) using verified tides. Positions are based on the NAD83 horizontal datum.

The DTON's in this report result from comparison of 2006 survey data to the largest scale chart(s) covering the survey area.

Affected nautical Charts:

Chart Number	Scale	Edition Number	Edition Date	Charted Horizontal Datum	Issued Date
11373	1:80,000	45th	2/1/2006	NAD83	1/27/2007

ENC	Chart	Scale	Edition Number	Charted Horizontal Datum	Issue Date
US4M12M	11373	1:80,000	8	NAD83	1/5/2007

Comments

During office review of H-11545, the following 2006 soundings proved significantly shoaler than charted soundings, and are recommended for update.

Feature Letter	Latitude (N)	Longitude (W)	Charted Depth (ft)	Sounding Depth (ft)	Difference (ft)
B	30º07'31"N	88º42'21"W	55	49	6
C	30º07'00"N	88º41'10"W	58	52	6

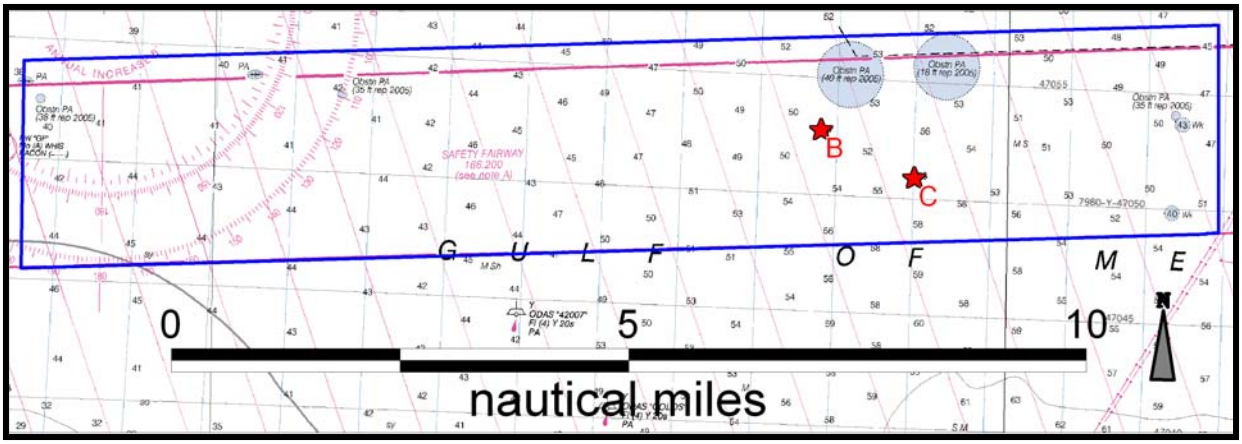
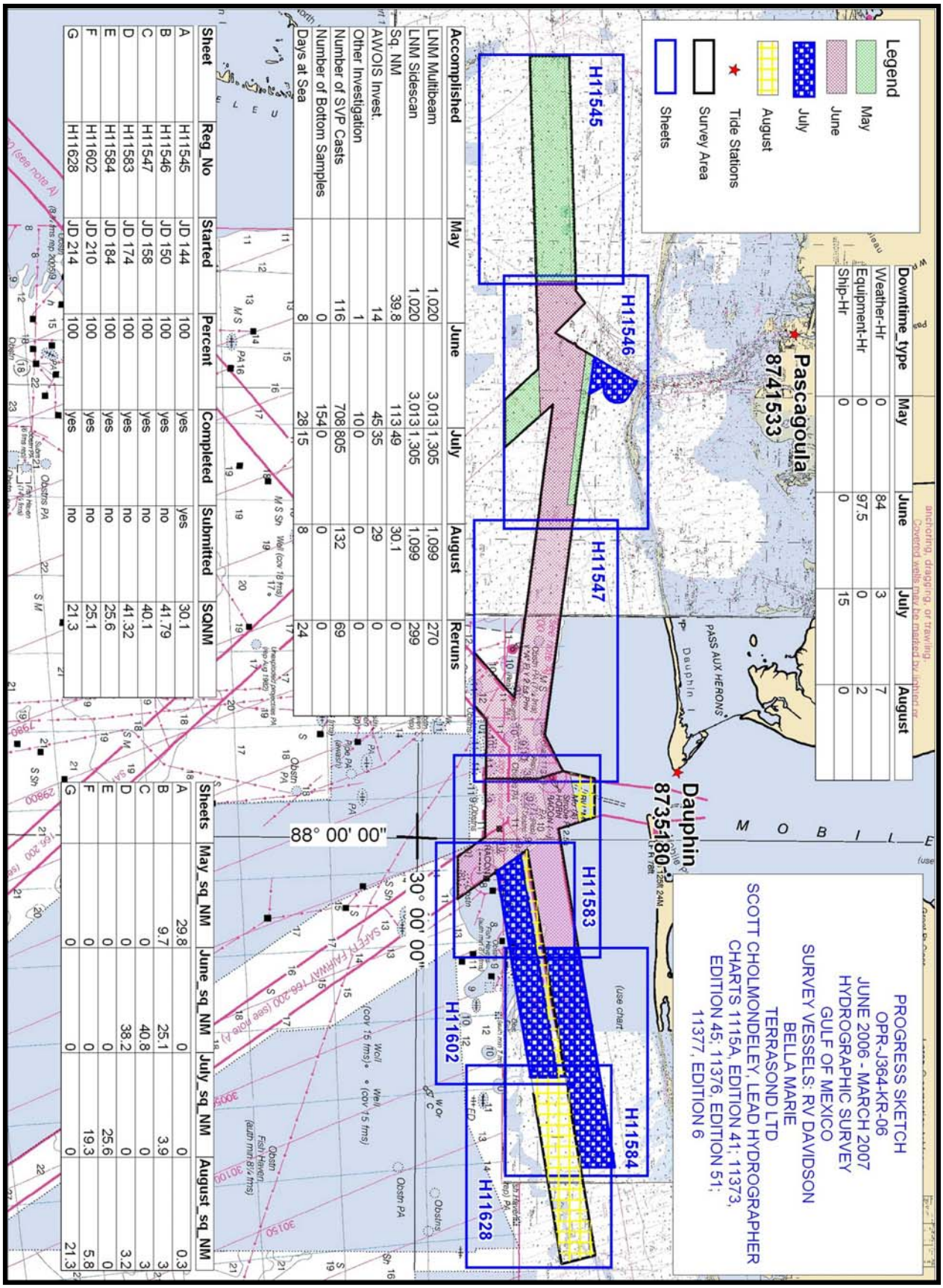


Figure 1 - Overview of H-11545 showing DTON locations, Chart 11373, 45th Edition (1:80,000 scale).

APPENDIX III

Progress Sketch



Downtime_type	May	June	July	August
Weather-Hr	0	84	3	7
Equipment-Hr	0	97.5	0	2
Ship-Hr	0	0	15	0

Accomplished	May	June	July	August	Reruns
LNM Multibeam	1,020	3,013	1,305	1,099	270
LNM Sidescan	1,020	3,013	1,305	1,099	299
Sq. NM	39.8	113.49		30.1	0
AWOIS Invest.	14	45	35	29	0
Other Investigation	1	10	0	0	0
Number of SVP Casts	116	708	805	132	69
Number of Bottom Samples	0	154	0	0	0
Days at Sea	8	28	15	8	24

Sheet	Reg_No	Started	Percent	Completed	Submitted	SQNM
A	H11545	JD 144	100	yes	yes	30.1
B	H11546	JD 150	100	yes	no	41.79
C	H11547	JD 158	100	yes	no	40.1
D	H11583	JD 174	100	yes	no	41.32
E	H11584	JD 184	100	yes	no	25.6
F	H11602	JD 210	100	yes	no	25.1
G	H11628	JD 214	100	yes	no	21.3

Sheets	May_sq_NM	June_sq_NM	July_sq_NM	August_sq_NM
A	29.8	0	0	0.3
B	9.7	25.1	3.9	3.2
C	0	40.8	0	3
D	0	38.2	0	3.2
E	0	0	25.6	0
F	0	0	19.3	5.8
G	0	0	0	21.3

Figure 1: Final Progress Sketch for OPR-J364-KR-06

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APPENDIX V

Supplemental Survey Records and Correspondence

Bottom Samples

Twenty-three bottom samples were collected in support of the 2006 survey. The samples were distributed geographically to obtain a full representation of the bottom characteristics as specified in NOAA Hydrographic Surveys Specifications and Deliverables, Section 7.1.

Table 1 – Bottom samples obtained in conjunction with survey H-11545 (2006).

Point Number	Date	Time (UTC)	Depth (m)	Latitude	Longitude	Color	Surface Description	Nature of Surface
A01	6/25/2006	18:00	12.5	30;07;34.7 N	88;51;06.1 W	grey	medium	mud
A02	6/25/2006	18:10	12.6	30;06;29.3 N	88;51;08.4 W	grey	medium	clay
A03	6/25/2006	18:20	13.1	30;06;32.3 N	88;49;53.3 W	grey	medium	mud
A04	6/25/2006	17:55	12.5	30;07;37.4 N	88;49;57.7 W	grey	fine	mud
A05	6/25/2006	17:40	12.5	30;07;40.4 N	88;48;42.6 W	grey	medium	mud
A06	6/25/2006	18:30	13.4	30;06;35.9 N	88;48;38.9 W	grey	medium	clay
A07	6/25/2006	18:40	13.1	30;06;38.9 N	88;47;24.2 W	grey	medium	clay
A08	6/25/2006	17:30	12.8	30;07;44.7 N	88;47;27.7 W	grey	stiff	mud
A09	6/25/2006	17:15	13.7	30;07;47.2 N	88;46;13.7 W	grey	fine	silt
A10	6/25/2006	18:45	13.1	30;06;42.1 N	88;46;09.1 W	grey	stiff	mud
A11	6/25/2006	18:55	14.3	30;06;44.2 N	88;44;54.9 W	grey	sticky	mud
A12	6/25/2006	16:50	14.9	30;07;48.9 N	88;44;57.4 W	grey	medium	silt
A13	6/25/2006	16:20	15.2	30;07;51.8 N	88;43;44.6 W	grey	soft	clay

Point Number	Date	Time (UTC)	Depth (m)	Latitude	Longitude	Color	Surface Description	Nature of Surface
A14	6/25/2006	19:20	15.8	30;06;47.9 N	88;43;40.4 W	grey	soft	mud
A15	6/25/2006	19:30	16.4	30;06;50.2 N	88;42;25.3 W	grey	soft	mud
A16	6/25/2006	16:10	16.1	30;07;55.2 N	88;42;30.0 W	grey	medium	silt
A17	6/25/2006	16:00	16.8	30;07;57.6 N	88;41;15.6 W	green	medium	silt
A18	6/25/2006	19:45	17.7	30;06;52.9 N	88;41;10.9 W	grey	soft	mud
A19	6/25/2006	19:55	16.1	30;06;56.8 N	88;39;55.8 W	grey	fine	silt
A20	6/25/2006	15:50	15.8	30;08;00.0 N	88;40;01.3 W	green	soft	clay
A21	6/25/2006	15:40	14.9	30;08;02.9 N	88;38;45.1 W	green	soft	clay
A22	6/25/2006	20:05	15.5	30;06;59.0 N	88;38;41.5 W	grey	soft	mud
A23	6/25/2006	20:10	15.2	30;07;01.5 N	88;37;27.0 W	grey	soft	mud

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APPENDIX II

Survey Feature Report

Item Investigation Report

Description (as charted): Wk 43

Source: AWOIS record number 4752

Charted Position: Lat. 30º07’34.30”N Long. 088º37’48.02”W

Charts Affected: 11373 1:80,000, 44th ed. January 2005

11366 1:250,000, 9th ed. March 2005

Investigation

Date(s)/Day Number(s): May 27, Aug. 10-11, 2006/JD 147, 222, 223

Survey Vessel Name: R/V Davidson/Bella-Marie

Position Numbers/Time: Survey lines:

0031A	(JD147 16:52-16:55 UTC)	0046A	(JD147 18:28-18:29 UTC)
0033A_2	(JD147 21:24-21:27 UTC)	1410A	(JD222 18:58-19:00 UTC)
0035A	(JD147 02:08-02:10 UTC)	1411A	(JD222 19:14-19:15 UTC)
0036A	(JD147 02:31-02:33 UTC)	1413A	(JD222 19:35-19:39 UTC)
0037A	(JD147 06:40-06:42 UTC)	1442A	(JD223 08:53-08:55 UTC)
0038A	(JD147 06:54-06:56 UTC)	1443A	(JD223 13:07-13:09 UTC)
0044A	(JD147 14:03-14:05 UTC)		

Investigation Method: 200% side scan sonar; supported by MBES

If Found: Surveyed Position: 30º07’40.23”N 088º37’58.49”W

(NAD83)

Position Determined By: DGPS

Investigation Summary: Submerged wreck found near AWOIS 4752 and 13367. Recommend removing Obstn PA (35 ft rep 2005) and Wk 43 and replacing with Wk 35 at surveyed position. Wreck measures 65m long by 22m wide with a least depth of 10.856m. ***Reference Section D, page 12 of 36.***

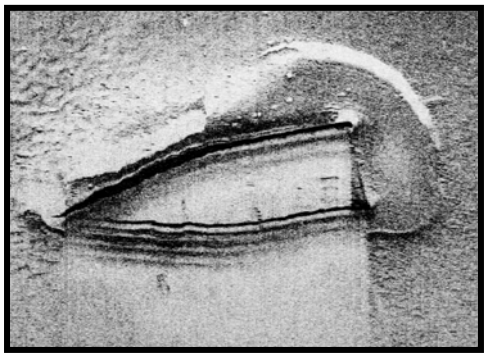


Figure 1 – Side scan sonar image of AWOIS 4752, a wreck in 35 feet of water.

Item Investigation Report

Description (as charted): Removed from chart per N/CG241 Memo to N/CG22 (2/19/88). Not assigned

Source: AWOIS record number 4753

Charted Position: Lat. 30º07'42.72"N Long. 088º44'30.07"W

Charts Affected: 11373 1:80,000, 44th ed. January 2005

11366 1:250,000, 9th ed. March 2005

Investigation

Date(s)/Day Number(s): May 28, Aug. 10, 2006/JD148, 222

Survey Vessel Name: R/V Davidson

Position Numbers/Time: Survey lines:

0045A	(JD148 17:16-17:19 UTC)	0053A	(JD148 08:50-08:53 UTC)
0047A	(JD148 21:37-21:39 UTC)	0055A	(JD148 13:05-13:08 UTC)
0049A	(JD148 01:58-02:00 UTC)	1416A	(JD222 23:17-23:20 UTC)
0050A	(JD148 04:06-04:08 UTC)		

Investigation Method: 200% side scan sonar; supported by MBES

If Found: Surveyed Position: Item not found

(NAD83)

Position Determined By: DGPS

Investigation Summary: Item not found

Item Investigation Report

Description	(as charted): Not Charted (Obstn from 1974 survey removed from chart based on OPR-J433-RU-89 survey)
Source:	AWOIS record number 7212
Charted Position:	Lat. 30º07'42.32"N Long. 088º43'23.97"W
Charts Affected:	11373 1:80,000, 44th ed. January 2005
	11366 1:250,000, 9th ed. March 2005

Investigation

Date(s)/Day Number(s):	May 27-28, 2006/JD147, 148
Survey Vessel Name:	R/V Davidson
Position Numbers/Time:	Survey lines:

0037A	(JD147 05:57-05:59 UTC)	0047A	(JD147 21:45-21:48 UTC)
0039A	(JD147 10:09-10:11 UTC)	0048A	(JD147 23:30-23:33 UTC)
0044A	(JD147 14:49-14:51 UTC)	0049A	(JD148 02:07-02:09 UTC)
0045A	(JD147 17:26-17:28 UTC)	0050A	(JD148 03:57-03:59 UTC)
0046A	(JD147 19:14-19:16 UTC)	0053A	(JD148 08:41-08:44 UTC)

Investigation Method:	200% side scan sonar; supported by MBES
If Found: Surveyed Position:	Item not found
(NAD83)	
Position Determined By:	DGPS
Investigation Summary:	Item not found

Item Investigation Report

Description	(as charted): 51 charted, 48 ft clearance in previous charted 55-56 ft depths
Source:	AWOIS record number 7269
Charted Position:	Lat. 30º07’40.72”N Long. 088º39’50.06”W
Charts Affected:	11373 1:80,000, 44th ed. January 2005
	11366 1:250,000, 9th ed. March 2005

Investigation

Date(s)/Day Number(s):	May 27, Aug. 10, 2006/JD147, 222
Survey Vessel Name:	R/V Davidson
Position Numbers/Time:	Survey lines:

0037A	(JD147 06:24-06:27 UTC)	0045A	(JD147 17:55-17:58 UTC)
0039A	(JD147 07:10-07:13 UTC)	0046A	(JD147 18:44-18:47 UTC)
0043A	(JD147 13:30-13:32 UTC)	0048A	(JD147 22:59-23:02 UTC)
0044A	(JD147 14:20-14:22 UTC)	1410A	(JD222 18:42-18:43 UTC)

Investigation Method:	200% side scan sonar; supported by MBES
If Found: Surveyed Position:	30º07’42.50”N 088º39’43.75”W
(NAD83)	
Position Determined By:	DGPS
Investigation Summary:	Shoalest depth determined for specified survey area is 15.4m. Recommend leaving charted sounding, 51.

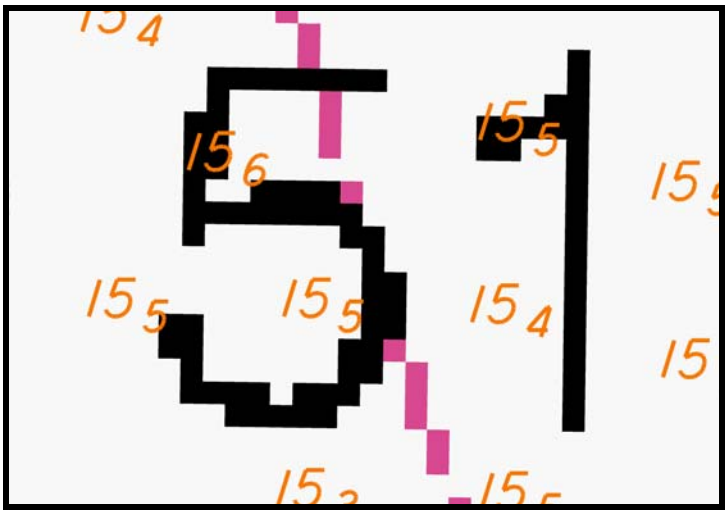


Figure 2 - Screen Capture of 2006 Soundings (orange in meters) overlain on Chart 11373 sounding at position of AWOIS 7269.

Item Investigation Report

Description	(as charted): Not assigned
Source:	AWOIS record number 7314
Charted Position:	Lat. 30º08’26.82”N Long. 088º42’04.07”W
Charts Affected:	11373 1:80,000, 44th ed. January 2005
	11366 1:250,000, 9th ed. March 2005

Investigation

Date(s)/Day Number(s):	May 29, 2006/JD149
Survey Vessel Name:	R/V Davidson
Position Numbers/Time:	Survey lines:

0064A	(JD149 10:52-10:55 UTC)	0069A	(JD149 19:58-20:01 UTC)
0067A	(JD149 15:41-15:44 UTC)	0068A	(JD149 16:59-17:02 UTC)

Investigation Method:	200% side scan sonar; supported by MBES
If Found: Surveyed Position:	Lat. 30º08’28.04”N Long. 088º42’04.28”W
(NAD83)	
Position Determined By:	DGPS
Investigation Summary:	Multibeam corrected least depth 14.9m. Recommend removing the 47 ft sounding and charting 49 ft at the surveyed position.

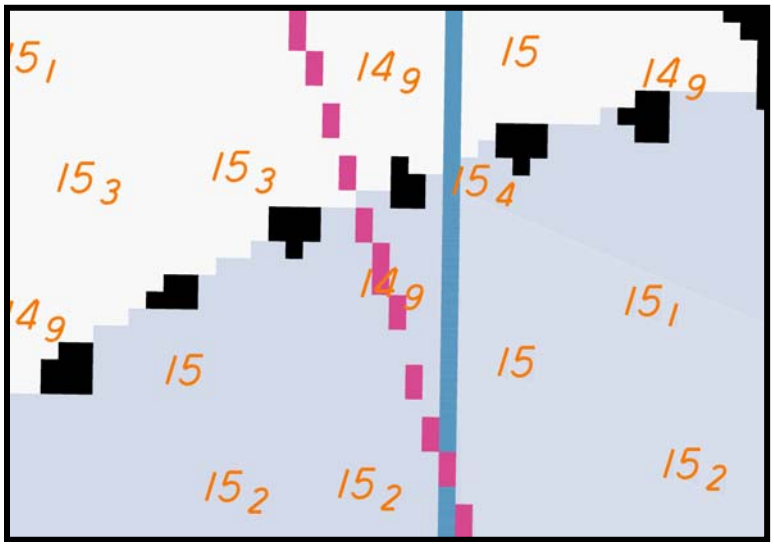


Figure 3 - Screen Capture of 2006 Soundings (orange in meters) overlain on Chart 11373 sounding at position of AWOIS 7314.

Item Investigation Report

Description	(as charted): PA (no radius)
Source:	AWOIS record number 13336
Charted Position:	Lat. 30º07’54”N Long. 088º52’24”W
Charts Affected:	11373 1:80,000, 44th ed. January 2005
	11366 1:250,000, 9th ed. March 2005

Investigation

Date(s)/Day Number(s):	May 29& Aug. 11, 2006/JD149, 233
Survey Vessel Name:	R/V Davidson
Position Numbers/Time:	Survey lines:

0058A	(JD149 19:52-19:54 UTC)	1429A	(JD223 04:03-04:05 UTC)
0060A	(JD149 00:22-00:23 UTC)	1430A	(JD223 04:08-04:10 UTC)
0062A	(JD149 04:51-04:53 UTC)	1432A	(JD223 04:58-04:57 UTC)
0063A	(JD149 09:15-09:16 UTC)	1433A	(JD223 05:05-05:06 UTC)
0066A	(JD149 14:02-04:03 UTC)		

Investigation Method:	200% side scan sonar; supported by MBES
If Found: Surveyed Position:	Item not found
(NAD83)	
Position Determined By:	DGPS
Investigation Summary:	Item not found. Recommend removing the PA from chart.

Item Investigation Report

Description (as charted): Obstn PA (38 ft rep 2005)

Source: AWOIS record number 13363

Charted Position: Lat. 30º07’42”N Long. 088º52’12”W

Charts Affected: 11373 1:80,000, 44th ed. January 2005

11366 1:250,000, 9th ed. March 2005

Investigation

Date(s)/Day Number(s): May 28-29, Aug.11, 2006/JD148, 149, 223

Survey Vessel Name: R/V Davidson

Position Numbers/Time: Survey lines:

0054A	(JD148 10:03-10:05 UTC)	0061A	(JD148 04:32-04:34 UTC)
0056A	(JD148 15:15-15:17 UTC)	1433A	(JD223 05:06-05:07 UTC)
0057A	(JD148 19:14-19:15 UTC)	1434A	(JD223 05:19-15:21 UTC)
0058A	(JD148 19:53-19:55 UTC)	1435A	(JD223 05:31-05:32 UTC)
0059A	(JD148 00:14-00:16 UTC)		

Investigation Method: 200% side scan sonar; supported by MBES

If Found: Surveyed Position: Item not found.

(NAD83)

Position Determined By: DGPS

Investigation Summary: Item not found. Recommend removing the PA (38 ft rep 2005) from chart.

Item Investigation Report

Description (as charted): Obstn PA (35 ft rep 2005)

Source: AWOIS record number 13364

Charted Position: Lat. 30º07'48"N Long. 088º48'24"W

Charts Affected: 11373 1:80,000, 44th ed. January 2005

11366 1:250,000, 9th ed. March 2005

Investigation

Date(s)/Day Number(s): May 28-29, Aug. 11, 2006/JD148, 149, 223

Survey Vessel Name: R/V Davidson

Position Numbers/Time: Survey lines:

0051A	(JD148 05:52-05:54 UTC)	0057A	(JD148 18:45-18:47 UTC)
0054A	(JD148 10:34-10:35 UTC)	0059A	(JD148 23:39-23:41 UTC)
0055A	(JD148 13:37-13:38 UTC)	0061A	(JD149 04:00-04:01 UTC)
0056A	(JD148 15:47-15:49 UTC)	1435A	(JD223 06:01-06:02 UTC)

Investigation Method: 200% side scan sonar; supported by MBES

If Found: Surveyed Position: Item not found.

(NAD83)

Position Determined By: DGPS

Investigation Summary: Item not found. Recommend removing the Obstn PA (35 ft rep 2005) from the chart.

Item Investigation Report

Description (as charted): Obstns PA (40 ft rep 2005)

Source: AWOIS record numbers 13365

Charted Position: Lat. 30º08’06”N Long. 088º42’00”W

Charts Affected: 11373 1:80,000, 44th ed. January 2005

11366 1:250,000, 9th ed. March 2005

Investigation

Date(s)/Day Number(s): May 28-29, Aug. 11 2006/JD148, 149, 223

Survey Vessel Name: R/V Davidson

Position Numbers/Time: Survey lines:

0051A	(JD148 05:52-05:54 UTC)	0057A	(JD148 18:45-18:47 UTC)
0054A	(JD148 10:34-10:36 UTC)	0059A	(JD148 23:39-23:41 UTC)
0055A	(JD148 13:37-13:38 UTC)	0061A	(JD149 04:00-04:01 UTC)
0056A	(JD148 15:47-15:49 UTC)	1435A	(JD223 06:01-06:02 UTC)

Investigation Method: 200% side scan sonar; supported by MBES

If Found: Surveyed Position: Items not found

(NAD83)

Position Determined By: DGPS

Investigation Summary: Items not found. Recommend remove Obstns PA (40ft rep 2005) from the chart.

Item Investigation Report

Description (as charted): Obstns PA (40 ft rep 2005)

Source: AWOIS record number 13366

Charted Position: Lat. 30º08’06”N Long. 088º42’00”W

Charts Affected: 11373 1:80,000, 44th ed. January 2005

11366 1:250,000, 9th ed. March 2005

Investigation

Date(s)/Day Number(s): May 28-29, Aug. 11, 2006/JD148, 149, 223

Survey Vessel Name: R/V Davidson

Position Numbers/Time: Survey lines:

0051A	(JD148 06:49-06:51 UTC)	0059A	(JD148 22:43-22:45 UTC)
0054A	(JD148 11:25-11:27 UTC)	0061A	(JD149 03:03-03:05 UTC)
0056A	(JD148 16:40-16:41 UTC)	0063A	(JD149 07:52-07:54 UTC)
0057A	(JD148 17:57-17:59 UTC)	1437A	(JD223 06:50-06:52 UTC)
0058A	(JD148 21:20-20:22 UTC)	1441A	(JD223 07:59-08:01 UTC)

Investigation Method: 200% side scan sonar; supported by MBES

If Found: Surveyed Position: Item not found

(NAD83)

Position Determined By: DGPS

Investigation Summary: Items not found. Recommend removing Obstns PA (40 ft rep 2005) from the chart.

Item Investigation Report

Description (as charted): Obstn PA (35 ft rep 2005)

Source: AWOIS record number 13367

Charted Position: Lat. 30º07’42”N Long. 088º37’54”W

Charts Affected: 11373 1:80,000, 44th ed. January 2005

11366 1:250,000, 9th ed. March 2005

Investigation

Date(s)/Day Number(s): May 27, Aug. 10-11, Nov. 10, 2006/JD 147, 222, 223, 314

Survey Vessel Name: R/V Davidson/Bella-Marie

Position Numbers/Time: Survey lines:

0033A_2	(JD147 21:24-21:26 UTC)	1410A	(JD222 18:57-18:59 UTC)
0037A	(JD147 06:39-06:41 UTC)	1411A	(JD222 19:14-19:15 UTC)
0038A	(JD147 06:55-06:56 UTC)	1413A	(JD222 19:37-19:39 UTC)
0042A	(JD147 12:56-12:57 UTC)	1442A	(JD223 08:55-08:56 UTC)
0043A	(JD147 13:46-13:47 UTC)	8000A	(JD314 19:03-19:04 UTC)
0044A	(JD147 14:04-14:06 UTC)	8001A	(JD314 19:05-19:06 UTC)
0046A	(JD147 18:28-18:30 UTC)	8002A	(JD314 19:07-19:08 UTC)
0048A	(JD147 22:42-22:44 UTC)	8003A	(JD314 19:09-19:10 UTC)

Investigation Method: 200% Side scan Sonar; supported by MBES

If Found: Surveyed Position: 30º07’40.23”N 088º37’58.49”W

(NAD83)

Position Determined By: DGPS

Investigation Summary: Submerged wreck found near AWOIS 4752 and 13367. Recommend removing Obstn PA (35 ft rep 2005) and Wk 43 and replacing with Wk 35 at surveyed position. Wreck measures 65m long by 22m wide with a least depth of 10.856m.

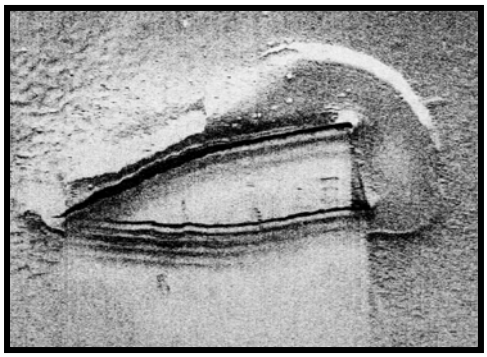


Figure 4 – Side scan image of AWOIS 13367, a wreck in 35 feet of water.

TERRASOND

APPENDIX IV

Tides and Water Levels

Abstract of Times of Hydrography

Project: OPR-J364-KR-06

Registry No.: H-11545

Table 1 – Sheet A Times of Hydrography: Inclusive Dates: May 24, 2006 – November 11th, 2006

START		END	
Day (Julian)	Time (UTC)	Day (Julian)	Time (UTC)
144	8:34:48	144	23:59:59
145	0:00:00	145	23:59:59
146	0:00:00	146	23:55:11
147	0:01:59	147	22:33:29
148	1:00:00	148	23:59:59
149	0:00:00	149	20:37:43
150	0:18:22	150	6:32:20
222	16:14:48	222	23:59:59
223	0:00:00	223	22:50:03
314	0:23:18	314	22:50:03
315	1:52:51	315	21:39:44

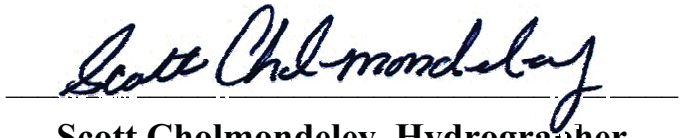
LETTER OF APPROVAL

REGISTRY NO. H-11545

This report and the accompanying digital data are respectfully submitted.

Field operations contributing to the accomplishment of survey H-11545 were conducted under my direct supervision with frequent personal checks of progress and adequacy. This report, digital data, and accompanying records have been closely reviewed and are considered complete and adequate as per the Statement of Work. Other reports submitted with this survey include the Data Acquisition and Processing Report and the Horizontal and Vertical Control Report.

I believe this survey is complete and adequate for its intended purpose.



Scott Cholmondeley, Hydrographer
TerraSond Ltd.

Date 06/06/2007

ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT to Accompany
Surveys H11545 (2006)

This Evaluation Report has been written to supplement and/or clarify the original Descriptive Report. Sections in this report refer to the corresponding sections of the Descriptive Report.

B. DATA ACQUISITION AND PROCESSING

B.1 DATA PROCESSING

The following software was used to process and review data at the Atlantic Hydrographic Branch (AHB):

CARIS HIPS/SIPS version 6.1 HF 1 through 7
CARIS BASE Manager 2.1 HF 1 through 10
CARIS S-57 Composer 2.0 HF 1 through 2

B.2 QUALITY CONTROL

H-Cells

The AHB source depth grid for the survey's nautical chart update product entailed the field's original 2m grid, broken into two 2m grids, combined at 6 meter resolution to create a product surface grid. The survey scale selected soundings were extracted from this 6m product surface. The chart scale selected soundings are a subset of the survey scale selected soundings

Soundings were then checked for conflicts, corrected to remove conflicts, and edited to allow for proper sounding compilation placement with respect to existing charted depths outside the survey area

No depth contours are in the vicinity of the present survey. The chart scale soundings were selected from the sounding selection using AHB best practices.

The compilation products and Stand Alone HOB Files (SAHOB) are detailed in the Compilation Process Log of this document. All individual SAHOB files were assembled in BASE Editor during H-Cell compilation.

The completed H-Cell was exported as a Base Cell File (ENC.000) in S-57 format with all values in metric units. The metric equivalent ENC.000 file was then converted to NOAA chart units (ENC_CS.000) with all values measured in feet following NOAA

sounding rounding rules.

The H11545 CARIS H-Cell final deliverables include the following products:

H11545_CS.000	1:80,000 Scale	H11545 Selected Soundings (Chart Scale)
H11545_SS.000	1:20,000 Scale	H11545 Selected Soundings (Survey Scale)

JUNCTIONS

H11514 (2006) to the west

C. VERTICAL AND HORIZONTAL CONTROL

Final vertical correction processing was completed by the field unit with no additional corrections required by Atlantic Hydrographic Branch personnel. The field unit applied verified water levels in conjunction with the preliminary tidal zoning which was accepted and approved by N/OPSI CO-OPS as the final zoning for H11545. Sounding datum is Mean Lower Low Water (MLLW). 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 16. Office ENC processing of this survey required translating the datum to meet S-57 ENC requirements.

D. RESULTS AND RECOMMENDATIONS

Chart Comparison **11373 (37th Edition, Oct. /08__**
Corrected through NM, Oct. 11/08
Corrected through LNM, Sep. 30/08
Scale 1:80,000

ENC Comparison **US4MS12M**
Mississippi Sound and Approaches
Edition 13
Update Application Date 2009-01-30
Issue Date 2009-03-13
References: Charts 11373

Hydrography

The charted Hydrography originates with prior surveys and requires no further consideration. The hydrographer makes adequate chart comparisons in Section D. of the Descriptive Report.

Miscellaneous

Chart compilation was done by Atlantic Hydrographic Branch personnel, in Norfolk, Virginia. Compilation data will be forwarded to Marine Chart Division, Silver Spring, Maryland. 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.

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 File or the Blue Notes should be retained as charted. Refer to the Descriptive Report for further survey requirements recommended by the hydrographer.

Version 1.0

This Document is for Office Process use only and is intended to supplement, not supersede or replace, information/recommendations in the Descriptive or Evaluation Reports

AHB PRE-COMPILATION PROCESS

REGISTRY No.	***H11545***
PROJECT No.	***OPR-J364-KR-06***
FIELD UNIT	***TERRASOND***
PRE-COMPILER	***LARRY K LEPLEY***
LARGEST SCALE CHART	***11373, edition 47, 200810***
CHART SCALE	***1:80,000***
SURVEY SCALE	***1:10,000***
DATE OF SURVEY	***May 24, 2006 – November 11, 2006***
CONTENT REVIEW DATE	

Components	File Names
Product Surface	***PS_H11545_Combined_6m.hns***
Shifted Surface	***N/A***
Contour Layer	***No charted contours within survey limits***
Survey Scale Soundings	***H11545_SS_Soundings.hob***
Chart Scale Soundings	***H11545_CS_SOUNDG.hob***
ENC Retain Soundings	***H11545_ENC_CS_Soundings.hob***
Feature Layer	***H11545_Features.hob***
Meta-Objects Layer	***H11545_MetaObjects.hob***
Blue Notes	***H11545_BlueNotes.hob***

SPECIFICATIONS:

I. COMBINED SURFACE:
   a. File name: ***PS_H11545_Combined_6m***
   b. Resolution: ***6*** m
   c. Final Grid Location:_____

II. PRODUCT SURFACE (SOUNDINGS):
   a. Scale: 1:
   b. Radius: m
   c. Resolution: m
   .
   d. Depth
      i. Minimum: ***13.8*** m
      ii. Maximum: ***15.4*** m

   PRODUCT SURFACE (CONTOURS): ***N/A. No charted contours within the survey limits.*** Scale: 1:____
   a. Radius:_____m
   b. Resolution: ____m

III. SHIFTED SURFACE:
   Single Shift Value: ***-0.229*** *[-0.229m (feet), (≤ 10 fathoms)]*
   [-1.372m (fathoms), (> 10 fathoms)]

IV. CONTOUR LAYER: ***No charted contours within the survey limits.***
   a. Use a Depth List: XXXXXX_NOAA_depth_curves_list.txt
      Depth List:

b. Output Options: ***No charted contours within the survey limits.***
   i. Create contour lines:
      1. Line Object: DEPCNT
      2. Value Attribute: VALDCO

V. SOUNDING SELECTION:
   i. Selection Criteria: ***SS soundings were extracted from the***
   ii. Radius = Shoal biased
   iii. ~~Use Single-Defined Radius~~:= distance on ground (m)
   iv. Filter: ~~Generalized !=1~~ ***Filtered Interpolated != 1***

VI. FEATURES:

a. Brought in from Survey
   Total No. ***12***

b. Brought in from ENC
   ENC: #***US4MS12M.000***
   Total No. ***0***

VII. META-OBJECTS: ***Area limits generated during contour creation. The contour process was performed in order to create area object for survey limits. Although no contours were created, the output area object remains valid and serves as area meta object.***

a. M_COVR attributes

Acronym	Value
SORDAT	***11112006***
CATCOV	***Coverage available***
SORIND	***US,US,survy,H11545***

b. M_QUAL attributes

Acronym	Value
CATZOC	
INFORM	***H11545, OPR-J364-KR-06, Terrasond, Ltd***
POSACC	
SORDAT	***11112006***
SORIND	***US,US,survy,H11545***
SUREND	***20061111***
SURSTA	***20060524***
TECSOU	***depth known***

c. DEPARE attributes

Acronym	Value
DRVALV 1	
DRVALV2	
SORDAT	***11112006***
SORIND	***US,US,nsurf,H11545***

d. M_CSCL attributes, ***N/A***

Acronym	Value
CSCALE	
SORDAT	
SORIND	

VIII. NOTES: ***AHB confirms that the two reported DToNs are now charted depths on raster chart 11373, 37th Edition, Oct. 2008 and ENC US4MS12M.***

APPROVAL SHEET
H11545

Initial Approvals:

The completed survey has been inspected with regard to survey coverage, delineation of depth curves, representation of critical depths, cartographic symbolization, and verification or disproval 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 Evaluation Report.

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

Digitally signed by Larry Lepley
DN: cn=Larry Lepley, o=NOAA, ou=Atlantic Hydrographic Branch, email=larry.lepley@noaa.gov, c=US
Date: 2009.03.31 13:05:18 -04'00'

Larry Lepley
Physical Scientist
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: _

Digitally signed by Shepard Smith
DN: cn=Shepard Smith, o=NOAA, ou=AHB, email=shep.smith@noaa.gov, c=US
Date: 2009.03.31 13:21:07 -04'00'

Shepard Smith
Commander, NOAA
Chief, Atlantic Hydrographic Branch

Mark Lathrop
AWOIS/Surf Check
2009.05.04
13:38:34 -04'00'