NOAA FORM 76-35A

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

# DESCRIPTIVE REPORT

*Type of Survey* *Multibeam and Sidescan Sonar*

*Field No.* *4*

*Registry No* *H12397*

LOCALITY

*State* *Virginia*

*General Locality* *Atlantic Ocean*

*Sublocality* *14 NM East of Hog Island*

**2012**

**CHIEF OF PARTY**

*Jason M. Infantino*

*Science Applications International Corporation*

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**DATE**

| NOAA FORM 77-28 (11-72) U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION | REGISTRY No |
|---|---|
| **HYDROGRAPHIC TITLE SHEET** | **H12397** |

| | |
|---|---|
| **State** | Virginia |
| **General Locality** | Atlantic Ocean |
| **Sub Locality** | 14 NM East of Hog Island |
| **Scale** | 1:40,000 |
| **Date of Survey** | 02 September 2012 – 29 September 2012 |
| **Instructions Dated** | 13 March 2012 |
| **Project No.** | OPR-D302-KR-12 |
| **Vessel** | *M/V Atlantic Surveyor* D582365 |
| **Chief of Party** | Jason M. Infantino |
| **Surveyed by** | Alex Bernier, Gary Davis, Paul Donaldson, Chuck Holloway, Jason Infantino, Colette LeBeau, Webster McDonald, Evan Robertson, Andrew Seaman, Deborah Smith, Bridget Williams |
| **Soundings by echosounder** | Multibeam RESON SeaBat 7125 SV |
| **Verification by** | |
| **Soundings in** | Meters |
| **Soundings at** | MLLW |

| | | |
|---|---|---|
| **REMARKS:** | **Contract:** | DG133C-08-CQ-0003 |
| | **Contractor:** | Science Applications International Corporation 221 Third Street, Newport, RI 02840 USA |
| | **Subcontractor:** | N/A |
| | **Times:** | All times are recorded in UTC |
| | **UTM Zone:** | Zone 18 North |
| | **Purpose:** | To provide NOAA with modern, accurate hydrographic survey data with which to update the nautical charts of the assigned area: Sheet 4 (H12397) in the Atlantic Ocean, Coast of Virginia. |

Science Applications International Corporation (SAIC) warrants only that the survey data acquired by SAIC and delivered to NOAA under Contract DG133C-08-CQ-0003 reflects the state of the sea floor in existence on the day and at the time the survey was conducted.

The purpose of this survey is to provide contemporary surveys to update National Ocean Service (NOS) nautical charts. All separates are filed with the hydrographic data. Any revisions to the Descriptive Report (DR) generated during office processing are shown in bold red italic text. The processing branch maintains the DR as a field unit product, therefore, all information and recommendations within the body of the DR are considered preliminary unless otherwise noted. The final disposition of surveyed features is represented in the OCS nautical chart update products. All pertinent records for this survey, including the DR, are archived at the National Geophysical Data Center (NGDC) and can be retrieved via http://www.ngdc.noaa.gov/.

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**Descriptive Report to Accompany**
**Hydrographic Survey H12397**
**Scale 1:40,000, Surveyed 2012**
***M/V Atlantic Surveyor***
**Science Applications International Corporation (SAIC)**
**Jason M. Infantino, Lead Hydrographer**

**PROJECT**
**Project Name:** Virginia Coast
**Project Number:** OPR-D302-KR-12
**Assigned Processing Branch:** Atlantic Hydrographic Branch
**Dates of Instructions:** 13 March 2012 **Task Order#:** 07
**Dates of Supplemental Instructions:** 02 April 2012, 01 May 2012, 27 August 2012, 11 October 2012, and 23 October 2012
**Sheet Designation:** 4
**Registry Number:** H12397

## A. AREA SURVEYED

The area surveyed was a section of the Atlantic Ocean off the coast of Virginia, 14 nautical miles (NM) East of Hog Island (Figure 1).

### A.1 SURVEY LIMITS

Data were acquired within the following survey limits:

| Northeast Limit | Southwest Limit |
|---|---|
| 37° 25’ 15.34”N | 37° 20’ 44.62”N |
| 075° 23’ 51.69”W | 075° 30’ 49.95”W |

*Table 1: Survey Limits*

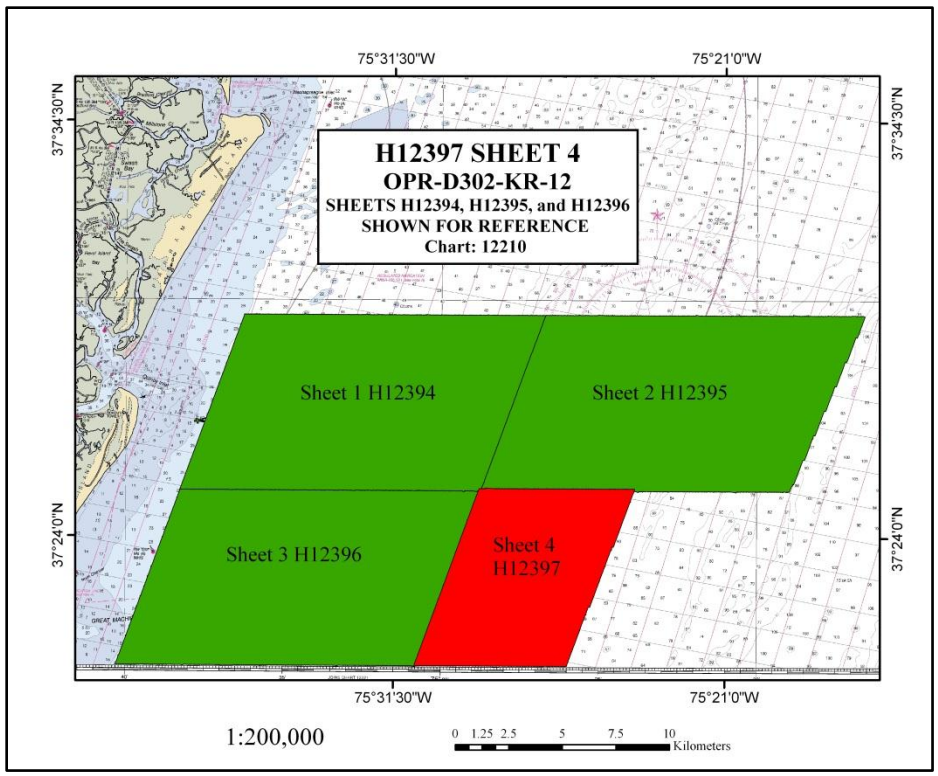


*Figure 1: H12397 Survey Bounds*

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

## A.2 SURVEY PURPOSE

To provide NOAA with modern and accurate hydrographic survey data with which to update the nautical charts of the assigned area: Sheet 4 (H12397) in the Atlantic Ocean, Coast of Virginia.

## A.3 SURVEY QUALITY

The entire survey is adequate to supersede previous data.

H12397 was surveyed in accordance with the following documents:

1. Project Instructions, OPR-D302-KR-12, dated 13 March 2012
2. Statement of Work, Hydrographic Survey Services, SAIC, DG133C-08-CQ-0003, dated 04 May 2012
3. Tides and Water Levels Statement of Work OPR-D302-KR-2012 Virginia Coast, dated 03 February 2012
4. *NOS Hydrographic Surveys Specifications and Deliverables,* April 2012, Released 23 April 2012 (HSSD)

## A.4 SURVEY COVERAGE

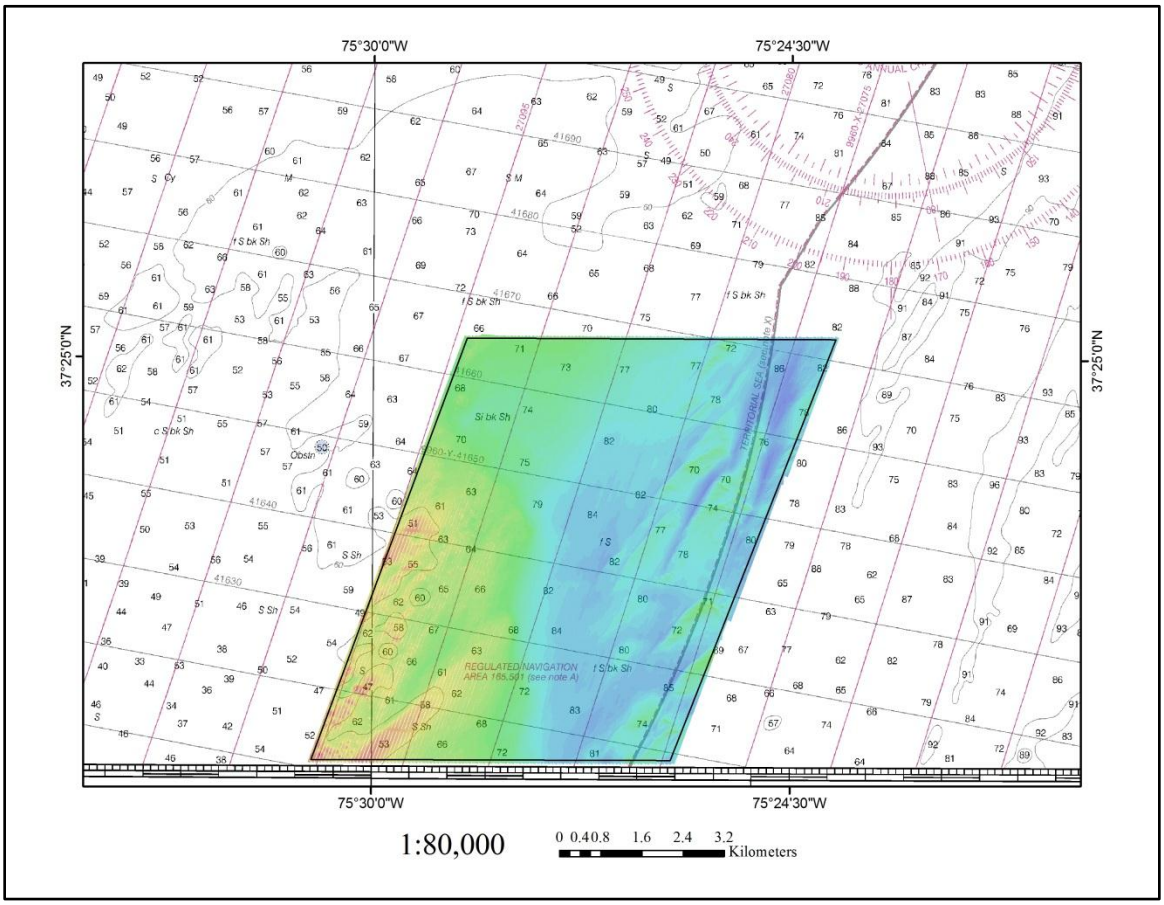


*Figure 2: Final Multibeam Coverage for H12397*

Survey coverage was in accordance with the requirements in the Project Instructions and the HSSD.

## A.5 SURVEY STATISTICS

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

| | HULL ID | M/V Atlantic Surveyor | Total |
|---|---|---|---|
| LNM | SBES Mainscheme | 0 | 0 |
| | MBES Mainscheme | 0 | 0 |
| | Lidar Mainscheme | 0 | 0 |
| | SSS Mainscheme | 0 | 0 |
| | SBES/MBES Combo Mainscheme | 0 | 0 |
| | SBES/SSS Combo Mainscheme | 0 | 0 |
| | MBES/SSS Combo Mainscheme | 503.13 | 503.13 |
| | SBES/MBES Combo Crosslines | 41.72 | 41.72 |
| | Lidar Crosslines | 0 | 0 |
| Number of Bottom Samples | | | 3 |
| Number of DPs | | | 0 |
| Number of Items Investigated by Dive Ops | | | 0 |
| Total Number of SNM | | | 17.43 |

*Table 2: Hydrographic Survey Statistics*

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

| *Survey Dates* |
|---|
| 09/02/2012 |
| 09/03/2012 |
| 09/04/2012 |
| 09/07/2012 |
| 09/08/2012 |
| 09/11/2012 |
| 09/12/2012 |
| 09/29/2012 |

*Table 3: Dates of Hydrography*

### A.6 SHORELINE

Shoreline was investigated in accordance with the Project Instructions and the HSSD.

### A.7 BOTTOM SAMPLES

Bottom samples were acquired in accordance with the Project Instructions and the HSSD.

## B. DATA ACQUISITION AND PROCESSING

### B.1 EQUIPMENT AND VESSELS

SAIC used their **ISS-2000** software on a Windows XP platform to acquire these survey data. Survey planning and data analysis were conducted using SAIC's **SABER** software on Red Hat Enterprise 5 Linux platforms. L-3 Klein 3000 sidescan data were collected on a Windows XP platform using L-3 Klein's **SonarPro** software. Subsequent processing and review of the sidescan data, including the generation of coverage mosaics, were accomplished using **SABER.**

A detailed description of the systems used to acquire and process these data has been included in Section A of the Data Acquisition and Processing Report, Revision 1 (DAPR, rev1) for OPR-D302-KR-12, previously delivered with the H12395 Descriptive Report (DR) on 01 February 2013). There were no variations from the equipment configuration described in the DAPR, rev1.

#### B.1.1 Vessels

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

| **Hull ID** | ***M/V Atlantic Surveyor*** |
|---|---|
| **LOA** | 110 feet |
| **Draft** | 9 feet |

*Table 4: Vessels Used*

The platform for multibeam sonar, sidescan sonar, and sound speed data collection was the *M/V Atlantic Surveyor* (D582365). Three 20-foot ISO containers were secured on the aft deck. One was used as the real-time data acquisition office, another as the data processing office, and the third for spares storage, maintenance, and repairs. A 10-foot ISO container housed an 80 kW generator that provided dedicated power to the sidescan winch, ISO containers, and all survey equipment.

### B.1.2 Equipment

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

| Manufacturer | Model | Type |
|---|---|---|
| RESON | SeaBat 7125 SV | MBES |
| L3-Klein | 3000 | SSS |
| Applanix | POS/MV 320 | Positioning and Attitude System |
| Trimble | Probeacon | Positioning System |
| Brooke Ocean Technology, LTD | MVP-30 | Sound Speed System |
| Seabird | SBE-19 | Sound Speed System |

*Table 5: Major Systems Used*

The Position Orientation System/Marine Vessels (POS/MV 320) Inertial Measurement Unit (IMU) was mounted below the main deck of the vessel, port of the keel. The RESON 7125 transducer was hull-mounted port of the vessel's keel in close proximity to the IMU. The Brooke Ocean Technology Moving Vessel Profiler 30 (MVP-30) was mounted to the starboard stern quarter. The L-3 Klein 3000 sidescan sonar was towed along the centerline axis from an A-frame mounted on the stern of the vessel. A J-frame mounted on the starboard rail of the ship served as the location for bottom sampling and CTD data collection.

## B.2 QUALITY CONTROL

### B.2.1 Crosslines

There were 41.72 linear nautical miles of crosslines and 503.13 linear nautical miles of mainscheme lines surveyed on H12397. This resulted in crossline mileage that represented approximately 8.3 percent of the mainscheme mileage which meets the requirement in Section 5.2.4.3 of the HSSD, to achieve at least eight percent for a multibeam survey using set line spacing. Crosslines were oriented at 95°/275° and were spaced 775 meters apart, while the mainscheme lines were oriented at 20.3°/200.3° and were spaced 65 meters apart. During mainscheme operations, the sidescan sonar range scale was set to 75 meters which provided a consistent 150-meter imagery swath and up to 20 meters of overlap between adjacent lines in each 100% coverage mosaic. Refer to the "Multibeam Processing Log" section within Separates I for information on the delineation of mainscheme and crossline data files.

In the field, hydrographers conducted daily comparisons of mainscheme to near nadir crossline data to ensure that no systematic errors were introduced and to identify potential problems with the survey system. After the application of all correctors and completion of final processing in the office, separate two-meter CUBE PFM grids were built. One grid contained the full valid swath (±60° from nadir) of all mainscheme multibeam data and the other included only the near nadir swath (±5° from nadir) crossline data.

The **SABER Frequency Distribution** tool was used to analyze the difference grid created from mainscheme and crossing PFM grids. Comparisons of all final crossing data in H12397 showed that all comparisons were less than 32 centimeters (Figure 3). All comparisons fell within the requirement defined in Section 5.2.4.3 of the HSSD which states that at least 95% of the depth difference values are to be within the maximum allowable total vertical uncertainty (calculated to be between 0.537 meters and 0.616 meters for the CUBE depths observed in H12397).

The difference grid used was created by subtracting the H12397 crossline CUBE depths from the H12397 mainscheme CUBE depths. Therefore, positive differences indicate that H12397 mainscheme data are deeper than H12397 crossline data. The mainscheme data were deeper than the crossline data in 39.20% of junctions and shoaler than crossline data in 60.26% of the junctions across the entire survey area (Figure 3). The distribution is well spread about zero with a slight skew in the negative direction, as visualized in Figure 4.

Twenty-five crossings of mainscheme and crossline data were selected from areas of relatively flat bottom and varied spatially and temporally for beam-by-beam comparisons (Figure 5). The results of the comparisons are presented in the "Crossline Comparisons" section of Separates II of this report. The crossings show a general trend of uniform differences in beam depths across the swaths of the files with the majority of the differences less than 20 centimeters. Slight sound speed artifacts were observed in a few of the crossings; however none of these artifacts were outside of the data quality specifications or had a significant effect on the final gridded surface. A number of the crossings showed a depth bias ranging from 10 centimeters to 30 centimeters consistent across all beams within the multibeam swath. This is not uncommon when using discrete tide zoning and is typically due to the variability and uncertainties in the water level correctors.

| Depth Difference Range (m) | All | | Positive | | Negative | | Zero | |
|---|---|---|---|---|---|---|---|---|
| | Count | Cumulative Percent | Count | Cumulative Percent | Count | Cumulative Percent | Count | Cumulative Percent |
| 0.00-0.05 | 55848 | 45.89 | 24524 | 20.15 | 30660 | 25.19 | 664 | 0.55 |
| >0.05-0.10 | 38649 | 77.64 | 13937 | 31.60 | 24712 | 45.50 | | |
| >0.10-0.15 | 19226 | 93.44 | 5834 | 36.39 | 13392 | 56.50 | | |
| >0.15-0.20 | 6785 | 99.01 | 2737 | 38.64 | 4048 | 59.83 | | |
| >0.20-0.25 | 938 | 99.78 | 431 | 39.00 | 507 | 60.24 | | |
| >0.25-0.30 | 248 | 99.99 | 231 | 39.19 | 17 | 60.26 | | |
| >0.30-0.32 | 14 | 100.00 | 14 | 39.20 | 0 | 60.26 | | |
| **Totals** | 121708 | 100.00% | 47708 | 39.20% | 73336 | 60.26% | 664 | 0.55% |
| Reference Grid: h12397_2m_main_12nov2012_pfm_h12397_2m_cross_pfm_12nov2012.dif | | | | | | | | |

*Figure 3: Junction Analysis of CUBE Depths, Mainscheme Lines vs. Crosslines, H12397*

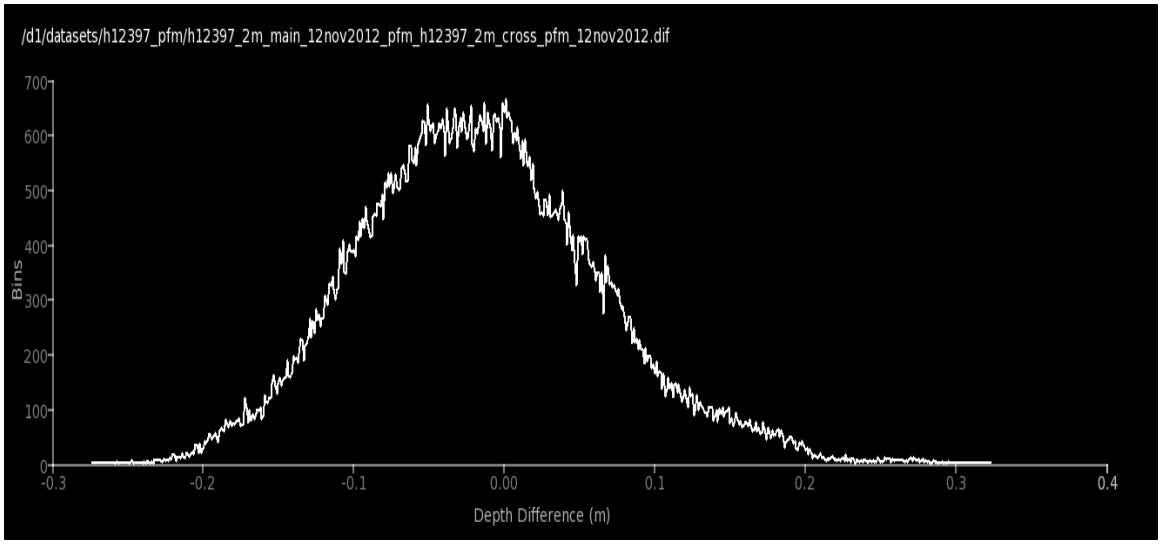


*Figure 4: Frequency Distribution Plot of Depth Differences for H12397 Mainscheme Lines vs. H12397 Crosslines*

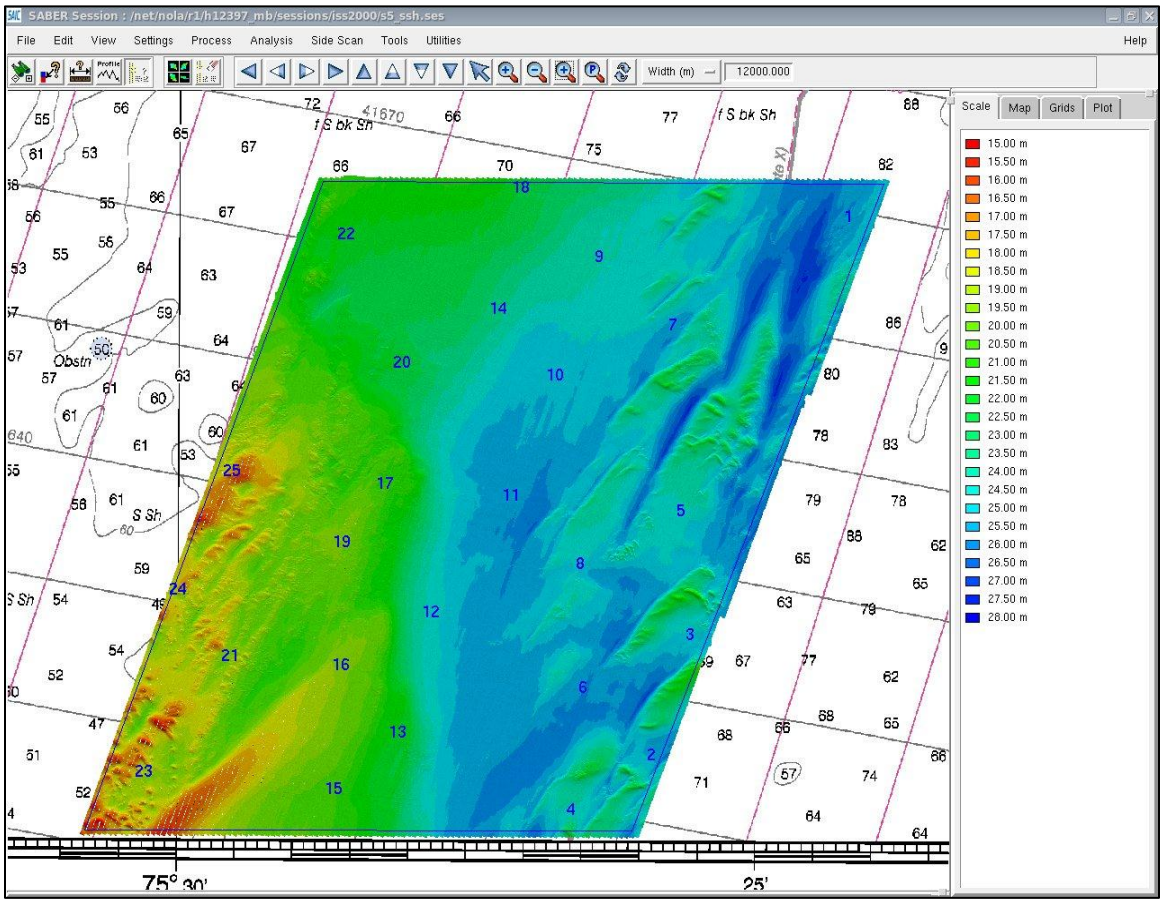


*Figure 5: Location of 25 Crossings (Blue Numbers) Used in the Crossing Analysis for H12397*

### B.2.2 Uncertainty

The Total Propagated Uncertainty (TPU) model that SAIC has adopted had its genesis at the Naval Oceanographic Office (NAVOCEANO), and is based on the work by Rob Hare and others ("Error Budget Analysis for NAVOCEANO Hydrographic Survey Systems, Task 2 FY 01", 2001, *HSRC FY01 Task 2 Final Report*). Once the TPU model is applied to the GSF bathymetry data, each beam is attributed with the horizontal uncertainty and the vertical uncertainty at the 95% confidence level. For specific details on SAIC's use and application of the **SABER** Total Propagated Uncertainty model, see Section B.1 in the DAPR, rev1.

The vertical and horizontal uncertainty values that were estimated by the TPU model for individual multibeam soundings varied little across the dataset, tending to be most affected by beam angle. During application of horizontal and vertical uncertainties to the GSF files, individual beams where either the horizontal or vertical uncertainty exceeded the maximum allowable IHO S-44 5$^{th}$ edition Order 1a specifications were flagged as invalid. As a result, all individual soundings used in development of the final CUBE depth surface had modeled vertical and horizontal uncertainty values at or below the allowable IHO S-44 5$^{th}$ edition, Order 1a uncertainty.

During the creation of the CUBE surface, two separate vertical uncertainty surfaces are calculated by the **SABER** software. One surface contains the standard deviation of all soundings that are contributing to the CUBE hypothesis (Hyp. StdDev) and the other surface contains the average of the vertical uncertainty of all soundings contributing to the CUBE hypothesis (Hyp. AvgTPE). A third vertical uncertainty surface is generated from the larger value of these two uncertainties in each node and is referred to as the Hypothesis Final Uncertainty. For specific details on this process see Section B.2 of the DAPR, rev1.

The final two-meter PFM CUBE surface contained final vertical uncertainties that ranged from 0.270 to 0.486 meters. The IHO Order 1a maximum allowable vertical uncertainty was calculated to range between 0.537 to 0.616 meters, based on the minimum CUBE depth (15.090 meters) and maximum CUBE depth (27.668 meters). The **SABER Check PFM Uncertainty** function was used to highlight all instances in the Hypothesis Final Uncertainty surface where a given node exceeded IHO Order 1a allowable vertical uncertainty for the CUBE depth at that node. The final two-meter PFM CUBE surface contained no individual CUBE nodes with final vertical uncertainties that exceeded IHO Order 1a allowable vertical uncertainty.

The **SABER Frequency Distribution** tool was also used to review the Hypothesis Final Uncertainty surface within the two-meter resolution PFM grid. The results show that all grid nodes in the two-meter PFM contained vertical uncertainties of 0.486 meters or less.

### B.2.3 Junctions

Analysis of the sheet-to-sheet junctions between H12397 and H12394, H12395, and H12396 was performed. Details for H12394, H12395, and H12396 are listed in Table 6. Figure 12 (at the end of this section) shows the general locality of H12397 as it relates to the sheets for which junctions were performed.

The following junctions were made with this survey:

| Registry No. | Scale | Year of Acquisition | Field Party | Location of Junction |
|---|---|---|---|---|
| H12394 | 1:40,000 | 2012 | SAIC | Northwest |
| H12395 | 1:40,000 | 2012 | SAIC | North |
| H12396 | 1:40,000 | 2012 | SAIC | West |

*Table 6: Junctioning Surveys*

<u>H12394</u>
Figure 6 depicts the junction analysis between H12397 and H12394, surveyed between 06 July and 29 September 2012, which borders H12397 to the northwest. Junction analysis was conducted on the differences between the CUBE depths from the final two-meter PFM grids from H12397 and H12394 in the common area of these two sheets. The H12397 CUBE depths in the common area varied from 20.706 meters to 21.696 meters resulting in allowable vertical uncertainties between 0.568 and 0.574 meters. The results showed that all comparisons were within 16 centimeters, well within the allowable vertical uncertainty for the respective sheets.

The difference grid was generated by subtracting the H12394 data from the H12397 data. Therefore positive values indicate that H12397 depth data were deeper than H12394 depth data. Throughout the common area, H12397 CUBE depths were deeper than H12394 78.54% of the time and were shoaler than H12394 20.45% of the time (Figure 6). The distribution is skewed slightly in the positive direction, but the differences are fairly close to zero, as visualized in Figure 7.

| Depth Difference Range (m) | All | | Positive | | Negative | | Zero | |
|---|---|---|---|---|---|---|---|---|
| | Count | Cumulative Percent | Count | Cumulative Percent | Count | Cumulative Percent | Count | Cumulative Percent |
| 0.00-0.05 | 1360 | 52.98 | 810 | 31.55 | 524 | 20.41 | 26 | 1.01 |
| >0.05-0.10 | 584 | 75.73 | 583 | 54.27 | 1 | 20.45 | | |
| >0.10-0.15 | 617 | 99.77 | 617 | 78.30 | 0 | 20.45 | | |
| >0.15-0.16 | 6 | 100.00 | 6 | 78.54 | 0 | 20.45 | | |
| **Totals** | 2567 | 100% | 2016 | 78.54% | 525 | 20.45% | 26 | 1.01% |
| Reference Grid: H12397_mb_all_2m_02Jan2013_pfm_H12394_2m_MLLW_pfm.dif | | | | | | | | |

*Figure 6: Junction Analysis of CUBE Depths, H12397 vs. H12394*

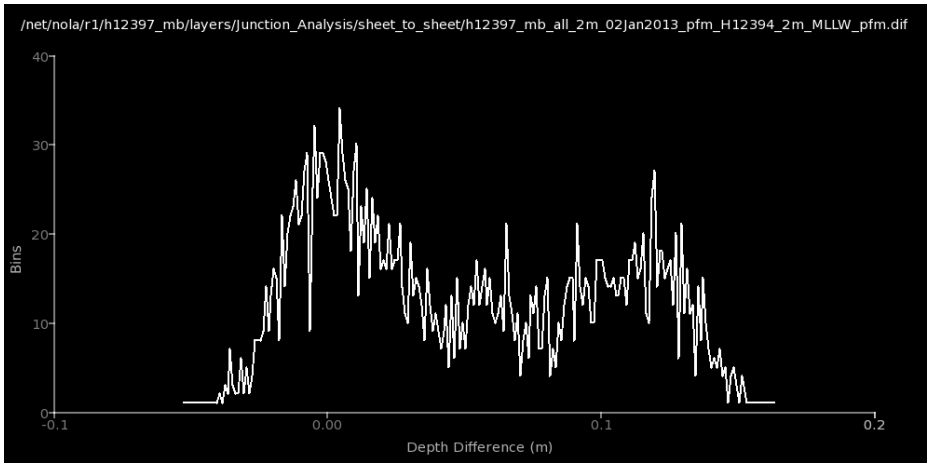


*Figure 7: Frequency Distribution Plot of Depth Differences for H12397 vs. H12394*

<u>H12395</u>

Figure 8 depicts the junction analysis between H12397 and H12395, surveyed between 29 July and 29 September 2012, which borders H12397 to the north. Junction analysis was conducted on the differences between the CUBE depths from the final two-meter PFM grids from H12397 and H12395 in the common area of these two sheets. The H12397 CUBE depths in the common area varied from 20.541 meters to 26.488 meters resulting in allowable vertical uncertainties between 0.567 and 0.607 meters. The results showed that all comparisons were within 36 centimeters, well within the allowable vertical uncertainty for the respective sheets.

The difference grid was generated by subtracting the H12395 data from the H12397 data. Therefore positive values indicate that H12397 depth data were deeper than H12395 depth data. Throughout the common area, H12397 CUBE depths were deeper than H12395 46.64% of the time and were shoaler than H12395 52.96% of the time (Figure 8). Though the distribution is skewed slightly in the negative direction, the differences are fairly well spread about zero, as visualized in Figure 9.

| Depth Difference Range (m) | All | | Positive | | Negative | | Zero | |
|---|---|---|---|---|---|---|---|---|
| | **Count** | **Cumulative Percent** | **Count** | **Cumulative Percent** | **Count** | **Cumulative Percent** | **Count** | **Cumulative Percent** |
| 0.00-0.05 | 73113 | 41.04 | 36394 | 20.43 | 36008 | 20.21 | 711 | 0.40 |
| >0.05-0.10 | 52026 | 70.24 | 25106 | 34.52 | 26920 | 35.32 | | |
| >0.10-0.15 | 28950 | 86.49 | 12384 | 41.47 | 16566 | 44.62 | | |
| >0.15-0.20 | 14477 | 94.62 | 4870 | 44.20 | 9607 | 50.01 | | |
| >0.20-0.25 | 6465 | 98.24 | 2391 | 45.55 | 4074 | 52.30 | | |
| >0.25-0.30 | 2507 | 99.65 | 1359 | 46.31 | 1148 | 52.94 | | |
| >0.30-0.35 | 601 | 99.99 | 568 | 46.63 | 33 | 52.96 | | |
| >0.35-0.36 | 19 | 100.00 | 19 | 46.64 | 0 | 52.96 | | |
| **Totals** | 178158 | 100.00% | 83091 | 46.64% | 94356 | 52.96% | 711 | 0.40% |
| Reference Grid: H12397_mb_all_2m_02Jan2013_pfm_H12395_2m_MLLW_pfm.dif | | | | | | | | |

*Figure 8: Junction Analysis of CUBE Depths, H12397 vs. H12395*

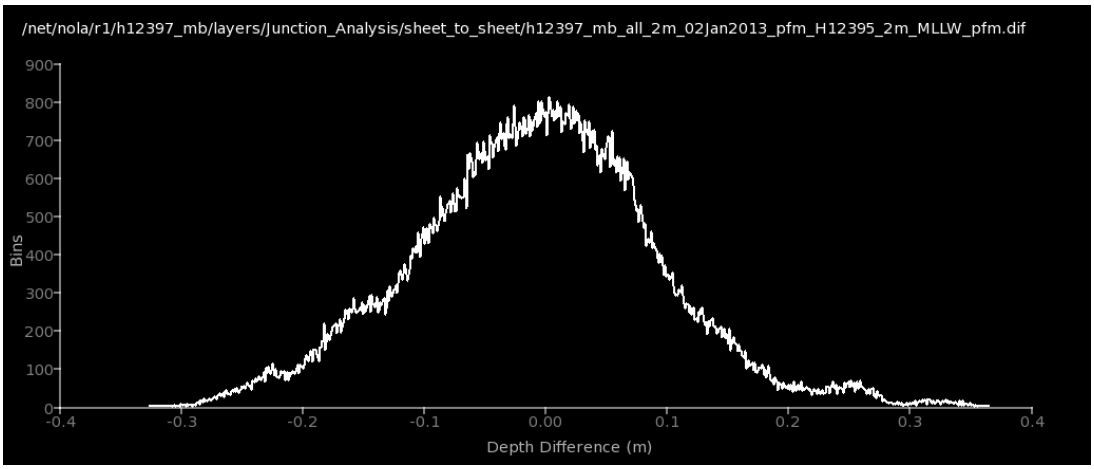


*Figure 9: Frequency Distribution Plot of Depth Differences for H12397 vs. H12395*

H12396

Figure 10 depicts the junction analysis between H12397 and H12396, surveyed between 14 August and 29 September 2012, which borders H12397 to the west. Junction analysis was conducted on the differences between the CUBE depths from the final two-meter PFM grids from H12397 and H12396 in the common area of these two sheets. The H12397 CUBE depths in the common area varied from 15.329 meters to 22.360 meters resulting in allowable vertical uncertainties between 0.538 and 0.578 meters. The results showed all of the comparisons were within 29 centimeters, well within the allowable vertical uncertainty for the respective sheets.

The difference grid was generated by subtracting the H12396 data from the H12397 data. Therefore positive values indicate that H12397 depth data were deeper than H12396 depth data. Throughout the common area, H12397 CUBE depths were deeper than H12396 9.09% of the time and were shoaler than H12396 90.59% of the time (Figure 10). While the distribution is skewed in the negative direction, the differences are fairly close to zero, as visualized in Figure 11.

| Depth Difference Range (m) | All | | Positive | | Negative | | Zero | |
|---|---|---|---|---|---|---|---|---|
| | Count | Cumulative Percent | Count | Cumulative Percent | Count | Cumulative Percent | Count | Cumulative Percent |
| 0.00-0.05 | 65954 | 29.92 | 17312 | 7.85 | 47926 | 21.74 | 716 | 0.32 |
| >0.05-0.10 | 65715 | 59.74 | 2389 | 8.94 | 63326 | 50.48 | | |
| >0.10-0.15 | 76545 | 94.47 | 296 | 9.07 | 76249 | 85.07 | | |
| >0.15-0.20 | 11397 | 99.64 | 29 | 9.09 | 11368 | 90.23 | | |
| >0.20-0.25 | 779 | 99.99 | 0 | 9.09 | 779 | 90.58 | | |
| >0.25-0.29 | 19 | 100.00 | 0 | 9.09 | 19 | 90.59 | | |
| **Totals** | 220409 | 100.00% | 20026 | 9.09% | 199667 | 90.59% | 716 | 0.32% |
| Reference Grid: H12397_mb_all_2m_02Jan2013_pfm_H12396_2m_MLLW_pfm.dif | | | | | | | | |

*Figure 10: Junction Analysis of CUBE Depths, H12397 vs. H12396*

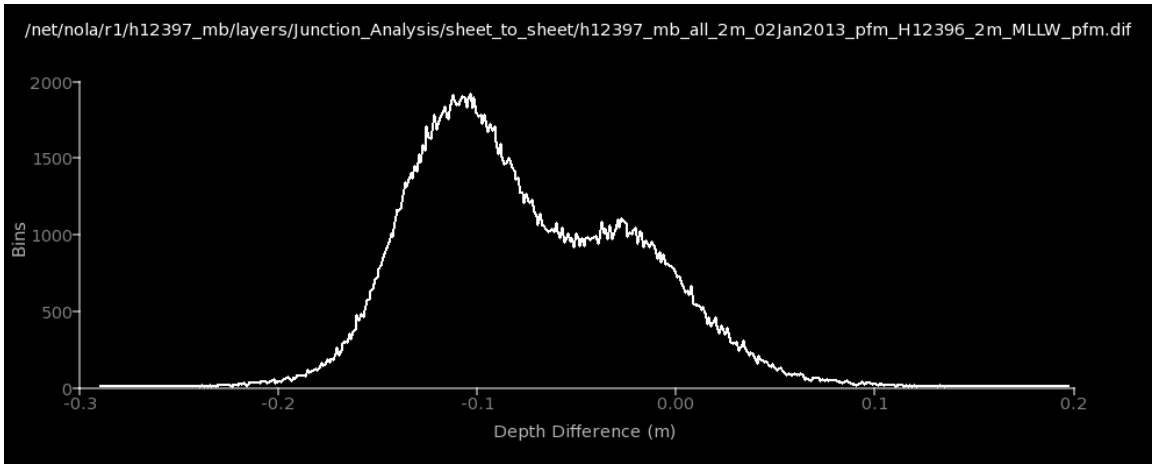


*Figure 11: Frequency Distribution Plot of Depth Differences for H12397 vs. H12396*

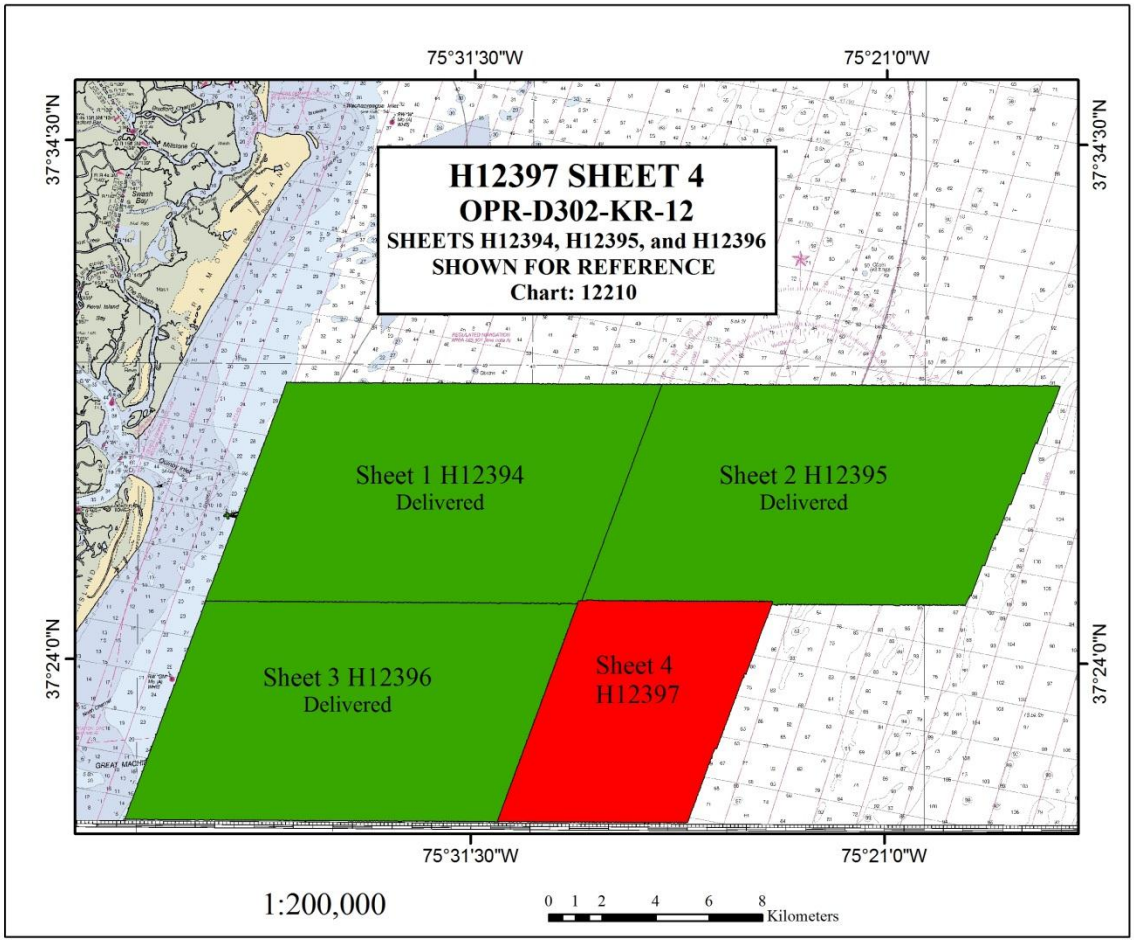


*Figure 12: General Locality and Status of Sheets in Reference to H12397*

### B.2.4 Sonar QC Checks

Sonar system quality control checks were conducted as detailed in the quality control section of the DAPR, rev1.

### B.2.5 Equipment Effectiveness

There were no conditions or deficiencies that affected equipment operational effectiveness.

### B.2.6 Factors Affecting Soundings

There were no other factors that affected corrections to soundings.

### B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: The MVP-30 was primarily used to collect sound speed profile (SSP) data. The CTD was used to collect one profile during survey operations while the MVP-30 was being repaired. Throughout the H12397 survey operations the SSP data were obtained at frequent enough intervals to ensure depth accuracy requirements as defined in Section 5.2.3.3 of the HSSD.

A total of 172 profiles were applied to online data for H12397. All profiles that were applied for online multibeam collection were acquired within the bounds of the survey area. Please refer to the DAPR, rev1 for specific details regarding acquisition (Section A.8) and application (Section C.1.3) of sound speed profiles. For information regarding the start and end of online data, please reference the "Sidescan Review Log" and "Watchstander Logs" sections within Separates I.

Confidence checks of the sound speed profile casts were conducted periodically (at least once per survey leg) by comparing at least two consecutive casts taken with different SV and P Smart Sensors or a CTD. Four sound speed confidence checks were conducted during H12397 and the results can be found in Separates II within the "Atlantic Surveyor Comparison Cast Log" section.

Sound speed profiles were obtained for four different survey purposes. The "Atlantic Surveyor Sound Speed Profile Log" section of Separates II, is a cumulative report detailing each cast associated with H12397. This log is separated by the purpose of the applied cast; with individual tables for "Used for MB" (online Multibeam), "Used for Comparison", "Used for Lead Line", and "Used for Closing". Additionally in a separate folder on the delivery drive (H12397/Data/Processed/SVP/CARIS_SSP) there are four sound speed profile files (.svp). These four files contain concatenated SSP data that has been formatted for use in CARIS. The CARIS SSP files are designated based on the purpose of the cast and their filenames match the tables within the sound speed profile log. All sound speed profile files are delivered with the H12397 delivery data and are broken out into sub-folders which correspond to the purpose of each cast.

### B.2.8 Coverage Equipment and Methods

All equipment and survey methods were used as detailed in the DAPR, rev1.

### B.2.9 Coverage Analysis

The **SABER Gapchecker** routine was used to flag multibeam data gaps exceeding the allowable limit of three contiguous nodes. Additionally, the entire surface was visually scanned for holidays at various points during the data processing effort. Additional survey lines were run to fill any holidays that were detected. A final review of the CUBE surface showed that valid depths exist in 99.99% of the nodes and there were no areas where four or more contiguous nodes lacked data.

All grids were examined for the number of soundings contributing to the chosen CUBE hypotheses for each node by running **SABER**'**s Frequency Distribution** tool on the Hypothesis Number of Soundings (Hyp. # Soundings) surface of the PFM grid. The Hyp. # Soundings surface reports the number of soundings that were used to compute the chosen hypothesis. Analysis of the H12397 final two-meter PFM grid revealed that 99.96% of all nodes contained three or more soundings; satisfying the requirements set line spacing surveys, as specified in Section 5.2.2.2 of the HSSD.

## B.3 ECHO SOUNDINGS CORRECTIONS

### B.3.1 Corrections to Echo Soundings

All data reduction procedures conform to those detailed in the DAPR, rev1.

### B.3.2 Calibrations

All sounding systems were calibrated as detailed in the DAPR, rev1.

## B.4 BACKSCATTER

Backscatter was not collected for this survey.

## B.5 DATA PROCESSING

### B.5.1 Software Updates

There were no software configuration changes after the DAPR, rev1 was submitted.

The following Feature Object Catalog was used: NOAA Extended Attribute Files V5_2.

### B.5.2 Surfaces

The following surfaces were submitted to the Processing Branch:

| Surface Name | Surface Type | Resolution | Depth Range | Surface Parameter | Purpose |
|---|---|---|---|---|---|
| H12397_2m_MLLW | BAG | 2-meter | 15.090 meters – 27.668 meters | N/A | MBES Trackline SBES Set Line Spacing |
| H12397_ss_1_100_mosaic | SSS Mosaic | 1-meter | N/A | N/A | 100% SSS |
| H12397_ss_2_100_mosaic | SSS Mosaic | 1-meter | N/A | N/A | 200% SSS |

*Table 7: Summary of H12397 Surface Files*

A PFM CUBE Depth surface was used to assess and document multibeam survey coverage. The CUBE depth is populated as either the node's chosen hypothesis or the

depth of a feature or designated sounding set by the hydrographer, which overrides the chosen hypothesis. The range of CUBE depths in H12397 was from 15.090 meters (49 feet, 0.280-meter uncertainty) to 27.668 meters (91 feet, 0.280-meter uncertainty). Section 5.2.2.3 of the HSSD requires a two-meter grid resolution for depths ranging from zero meters to 20 meters and a four-meter grid resolution for depths ranging from 16 meters to 40 meters. Due to the range of depths encountered on this project, SAIC requested and was granted permission to deliver all final grids at the higher two-meter node resolution (see 01 May 2012 correspondence in Appendix II). Therefore, the final CUBE surface for H12397 was generated at two-meter grid node resolution. There were no significant features within H12397. As a result no additional resolution grids, as defined in Section 5.2.2.1 of the HSSD, were generated.

The final gridded multibeam data are delivered as a Bathymetric Attributed Grid (BAG). The BAG file was exported from the CUBE PFM grid as detailed in Section B.2.4 of the DAPR, rev1.

In addition to the standard Depth and Uncertainty surfaces, all final BAG files delivered for H12397 contain the additional Elevation Solution Group and Node Group surfaces. The Elevation Solution Group consists of three surfaces; Standard Deviation, Number of Soundings, and Shoal Depth. The Node Group is comprised of surfaces containing values for Hypothesis Strength and Number of Hypotheses. A detailed description for each of these group surfaces can be found in Section B.2.5 of the DAPR, rev1.

The BAG files delivered for OPR-D302-KR-12 are in BAG version 1.5.1. This version of BAG allows for the compression of the grid files. For H12397, the final two-meter BAG is delivered in both compressed and uncompressed formats. The file size for the compressed BAGs is typically 25-30 percent the size of the uncompressed versions.

As of the date of delivery for H12397, the hotfix for CARIS that will allow users to view version 1.5.1 BAGs is not available. Therefore BAG version 1.1.0 files are being delivered as well. The BAG version 1.1.0 files only contain two surfaces, so the additional surfaces are delivered as supplemental non-standard BAG files. These additional BAG files were generated through the same process as the standard BAG files. The version 1.1.0 BAG format only allows for a Depth surface and an Uncertainty surface. Therefore, each of the non-standard BAG files were created with the CUBE Depth surface, populating the Depth values of the BAG and each of the additional Elevation Solution and Node Group surfaces populating the Uncertainty surface of the BAG.

Please note when reviewing these additional, non-standard BAGs the file name designates the surface which populates the Uncertainty layer of the BAG (Figure 13). Please also note that when displayed the two surfaces of the BAG remain named Depth and Uncertainty. These non-standard BAGs are provided for review purposes only and are not intended to be used as archival products.

| BAG File Name | Comments |
|---|---|
| H12397_2m_MLLW_CUBE_Depth_Node_Std_Dev | Standard Deviation (Elevation Solution) of 2.0-meter BAG |
| H12397_2m_MLLW_CUBE_Depth_Hyp_Nmbr_of_Sndgs | Number of Soundings (Elevation Solution) of 2.0-meter BAG |
| H12397_2m_MLLW_CUBE_Depth_Node_Shoal_Depth | Shoal Depth (Elevation Solution) of 2.0-meter BAG |
| H12397_2m_MLLW_CUBE_Depth_Node_Hyp_Str | Hypothesis Strength (Node) of 2.0-meter BAG |
| H12397_2m_MLLW_CUBE_Depth_Node_Nmbr_of_Hyp | Number of Hypotheses (Node) of 2.0-meter BAG |

*Figure 13: Summary of Non-standard H12397 BAG Files*

### B.5.3 Sidescan Coverage Analysis

For all details regarding sidescan data processing, see Section B.3 of the DAPR, rev1. The Project Instructions required 200% sidescan coverage with concurrent set line spacing multibeam data for all depths. The 200% sidescan coverage was verified by generating two separate 100% coverage mosaics at one-meter cell size resolution as specified in Section 8.3.1 of the HSSD. The first and second 100% coverage mosaics were independently reviewed using tools in **SABER** to verify data quality and swath coverage. Both coverage mosaics are determined to be complete and sufficient to meet the requirements contained within the Project Instructions. The mosaics are delivered as TIFF (.tif) images with accompanying world files (.tfw).

- H12397_ss_1_100_mosaic
- H12397_ss_2_100_mosaic

Sidescan sonar contacts were investigated and confirmed using **SABER Contact Review**. Sidescan contact information is delivered in several ways. The "Sidescan Contacts List" spreadsheet, located in Separates III, notes all sidescan contacts that were identified within H12397. All sidescan sonar contacts and accompanying images are also delivered in a Sidescan Sonar Contacts S-57 file.

## C. VERTICAL AND HORIZONTAL CONTROL

No vertical or horizontal controls were established, recovered, or occupied during data acquisition for OPR-D302-KR-12, which includes H12397. Therefore a Horizontal and Vertical Control Report is not required.

### C.1 VERTICAL CONTROL

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

Standard Vertical Control Methods Used:
Discrete Zoning

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

| Station Name | Station ID |
|---|---|
| Duck, NC | 8651370 |

*Table 8: NWLON Tide Station*

| File Name | Status |
|---|---|
| 8651370_verified_09012012_09302012.tid | Verified Observed |

*Table 9: Water Level Files (.tid)*

| File Name | Status |
|---|---|
| D302KR2012CORP.zdf | Final |

*Table 10: Tide Correctors (.zdf or .tc)*

No final tide note was provided by the NOAA Center for Operational Oceanographic Products and Services (CO-OPS). SAIC is not required to have a final tide note from CO-OPS for H12397 however a final tide note has been provided by SAIC in Appendix I.

The Project Instructions specified NOAA tide station 8651370 Duck, NC as the source for water level correctors. A full explanation of the tide zone assessment is detailed in Section C.4 of the DAPR, rev1. For H12397, 8651370 Duck, NC was the source of all final verified water level heights for determining correctors to soundings. All data for H12397 were contained within two tide zones (SA46 and SA55) which were provided from NOAA.

SAIC did not revise the delivered tide zones for tide station 8651370 Duck, NC as the water level zoning parameters in the file D302KR2012CORP.zdf, provided by National Ocean Service (NOS), were deemed adequate for the application of observed verified water levels. As a result, they were accepted as final and applied to all H12397 multibeam data.

## C.2 HORIZONTAL CONTROL

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

The survey data for sheet H12397 were collected in horizontal datum North American Datum of 1983 (NAD-83), using geodetic coordinates, while data display and products used the UTM Zone 18, North projection.

Please refer to the DAPR, rev1 for details regarding all antenna and transducer offsets.

Horizontal positioning of the multibeam transducer by the POS/MV was verified by frequent comparison checks against an independent Trimble DGPS system. During

survey data acquisition, the **ISS-2000** real-time system provided a continuous view of the positioning comparison between the POS/MV and the Trimble DGPS. An alarm was triggered within **ISS-2000** if the comparisons were not within an acceptable range. Any soundings with total horizontal uncertainties exceeding the maximum allowable IHO S-44 5th edition Order 1a specifications were flagged as invalid and therefore not used in the CUBE depth calculations. Daily positioning confidence checks for H12397 were conducted several times throughout the day and a daily value is presented as a standalone table within Separates I, "Daily Positioning Confidence Checks". All daily positioning confidence checks for H12397 were within 0.41 meters.

The following DGPS Stations were used for horizontal control:

| DGPS Stations |
|---|
| Driver, VA (289 kHz) |
| Annapolis, MD (301 kHz) |
| New Bern, NC (294 kHz) |

*Table 11: USCG DGPS Stations*

## D. RESULTS AND RECOMMENDATIONS

### D.1 CHART COMPARISON

#### D.1.1 Raster Charts

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

| Chart | Scale | Edition | Edition Date | LNM Date | NM Date |
|---|---|---|---|---|---|
| 12210 | 1:80000 | 38 | 05/01/2008 | 12/25/2012 | 01/05/2013 |

*Table 12: Largest Scale Raster Charts*

<u>12210</u>
The chart comparisons were conducted using SAIC's **SABER** software to view the BSB raster charts with overlain data for H12397 such as the CUBE gridded surface, selected soundings, contacts, and features. Charting recommendations for depths follow Section 5.1.2 of the HSSD where depths and uncertainties are to be rounded to the nearest millimeter using standard arithmetic rounding (round half up) and accompanying chart depth units are rounded using NOAA cartographic rounding (0.75 round up).

United States Coast Guard (USCG) District 5 Notice to Mariners publications were reviewed for changes subsequent to the date of the Hydrographic Survey Project Instructions and before the end of survey (as specified in Section 8.1.4 of the HSSD). The Notice to Mariners reviewed were from week 11 (13 March 2012) until week 39 (25 September 2012). There were no changes that affected the area within H12397 over that time period.

H12397 data meets data accuracy standards and bottom coverage requirements. Recommend updating the common areas of all charts using data from this survey. Charting recommendations for all features are provided in the S-57 Feature File.

Chart 12210 encompasses all of H12397.

CUBE depths within sheet H12397 generally agreed within ±4 feet of the charted depths.

The charted 60-foot depth curves throughout H12397 were generally found to be in agreement with the survey data. Most were found to be located within 250 meters of their charted locations.

### D.1.2 Electronic Navigational Charts

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

| ENC | Scale | Edition | Update Application Date | Issue Date | Preliminary? |
|---|---|---|---|---|---|
| US4VA70M | 1:80000 | 12 | 07/12/2012 | 01/05/2013 | NO |
| US4VA12M | 1:80000 | 22 | 04/06/2012 | 01/02/2013 | NO |

*Table 13: Largest Scale ENCs*

<u>USVA70M</u>
For ENC comparisons, a combination of Jeppesen's **dKart Inspector**, SevenCs' **SeeMyDENC**, and CARIS' **EasyView** were used in conjunction with **SABER**.

US4VA70M encompasses most of H12397 except for a small portion west of 78° 29' 00.00"W and south of 37° 24' 00.00"N.

CUBE depths within sheet H12397 generally agreed within ±1.5 meters of the charted depths.

<u>US4VA12M</u>
US4VA12M encompasses a portion of H12397 west of 78° 29' 00.00"W and south of 37° 24' 00.00"N.

CUBE depths within sheet H12397 generally agreed within ±1.5 meters of the charted depths.

The charted 18.2-meter depth curves throughout H12397 were generally found to be in agreement with the survey data. Most were found to be located within 300 meters of their charted locations.

### D.1.3 AWOIS Items

As documented in the Project Instructions, the one uncharted AWOIS item (2784) assigned for project OPRD302-KR-12 fell outside the survey bounds of H12397.

### D.1.4 Charted Features

No charted features exist for this survey.

### D.1.5 Uncharted Features

There were no uncharted multibeam features within the survey bounds of H12397. However there were two exposed cables identified within the H12397 survey bounds. See the S-57 feature file and Sidescan Sonar Contacts S-57 File; also refer to Section D.2.5 for details and recommendations regarding these objects.

### D.1.6 Danger to Navigation

No Danger to Navigation Reports were submitted for this survey.

### D.1.7 Shoal and Hazardous Features

No shoals or potentially hazardous features exist for this survey.

### D.1.8 Channels

No channels exist for this survey. There are no designated anchorages, precautionary areas, safety fairways, traffic separation schemes, pilot boarding areas, or channel and range lines within the survey limits.

## D.2 ADDITIONAL RESULTS

### D.2.1 Shoreline

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

### D.2.2 Prior Surveys

The junction analyses with the 2012 survey sheets H12394, H12395, and H12396 were conducted and the results are presented in Section B.2.3 of this report.

### D.2.3 Aids to Navigation

Aids to navigation (ATONs) do not exist for this survey.

### D.2.4 Overhead Features

Overhead features do not exist for this survey.

### D.2.5 Submarine Features

Two uncharted exposed cables were found by sidescan within the survey area. One cable was exposed for approximately 1800 meters from approximately 37° 24’ 35.10”N 075° 26’ 02.70”W southwest to approximately 37° 23’ 41.16”N 075° 26’ 30.39”W. Small sections of exposed cable were observed branching away from this cable segment, as described in Figure 14. To the south of the first cable, a second approximately 70-meter long section of exposed cable was found from approximately 37° 21’ 22.13”N 075° 28’ 18.68”W extending southwest to approximately 37° 21’ 20.09”N 075° 28’ 19.52”W. These cable segments were visible only in the sidescan data and could not be identified in the multibeam bathymetry data or either of the one-meter mosaic files. The cables are identified by sidescan contacts as noted in Figure 14, below.

Recommendations:

- Chart submarine cable where supported by this data.

| Contact Name | Sequential ID | Cable Association | Comments |
|---|---|---|---|
| 20122471455103600 | 6 | 1 | Northern extent of exposed cable 1 in sidescan data. |
| 20122471453004600 | 5 | 1 | Section of exposed cable 1 in sidescan data. There are two cables branching off to the north for approximately 30 meters at this location. |
| 20122471451061500 | 4 | 1 | Section of exposed cable 1 in sidescan data. There is one cable branching off to the north for approximately 40 meters at this location. |
| 20122471449065500 | 3 | 1 | Section of exposed cable 1 in sidescan data. There is one cable branching off to the north for approximately 70 meters at this location. |
| 20122471447117500 | 2 | 1 | Section of exposed cable 1 in sidescan data. |
| 20122471445295500 | 1 | 1 | Southern extent of exposed cable 1 in sidescan data. |
| 20122481052017100 | 7 | 2 | Northern extent of exposed cable 2 in sidescan data. |
| 20122481052234100 | 8 | 2 | Southern extent of exposed cable 2 in sidescan data. |

*Figure 14: Listing of Contacts used to Identify Two Exposed Cables seen within H12397*

### D.2.6 Ferry Routes and Terminals

No ferry routes or terminals exist for this survey.

### D.2.7 Platforms

No platforms exist for this survey.

### D.2.8 Significant Features

No significant features exist for this survey.

### D.2.9 Construction and Dredging

There is no present or planned construction or dredging within the survey limits.

### D.2.10 Other Results

#### *D.2.10.1 Designated Soundings*

There were no designated soundings set in H12397.

#### *D.2.10.2 S-57 Feature File*

Included with H12397 delivery is the S-57 feature file, H12397.000. Details on how this file is generated and quality controlled can be found in Section B.2.6 of the DAPR, rev1. The S-57 feature file delivered for H12397 contains millimeter precision for the value of sounding (VALSOU) attribute. As specified in Section 8.2 of the HSSD, the S-57 feature file is in the WGS84 datum and is unprojected with all units in meters.

#### *D.2.10.3 Sidescan Sonar Contacts S-57 File*

As requested by AHB, SAIC also generated a supplemental S-57 file to present the sidescan contacts, H12397_SSCon.000. Details on how this file was generated, attributed, and quality controlled can be found in Section B.3.5 of the DAPR, rev1. The supplemental sidescan S-57 feature file is delivered in a sub-directory of the S-57_Features directory named, “Sidescan_Sonar_S-57_File_as_Cartographic_Symbol”.

The “Sidescan Contacts List”, located in Separates III of this report, provides a table containing the same information as the sidescan S-57 file.

#### *D.2.10.4 Bottom Characteristics*

In accordance with both the Project Instructions and Section 7.1 of the HSSD, bottom characteristics were obtained for H12397. Bottom characteristics were acquired at the locations proposed in the Project Reference File (PRF) by NOAA. Three samples were collected. Bottom characteristics are included in the H12397 S-57 feature file, H12397.000, within the Seabed Area (SBDARE) object and are classified according to the requirements set forth in Appendix 10 of the HSSD. In addition to being maintained within the S-57 feature file, bottom characteristic results are represented in Appendix II of this document. Bottom characteristics obtained for H12397 are sufficient to be used to update the respective charts.

## E. APPROVAL SHEET

15 March 2013

### LETTER OF APPROVAL

REGISTRY NUMBER: H12397

Field operations and data processing contributing to the accomplishment of this survey, H12397, were conducted under my direct supervision or that of other SAIC lead hydrographers with frequent personal checks of progress and adequacy. This report and accompanying deliverable data items have been closely reviewed by me and are considered complete and adequate as per the Statement of Work.

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

The survey data meets or exceeds requirements as set forth in the NOS Hydrographic Surveys and Specifications Deliverables Manual, Project Instructions, and all HSD Technical Directives. These data are adequate to supersede charted data in their common areas.

Reports previously submitted to NOAA for this project include:

| Report Name | Report Date Sent |
|---|---|
| Data Acquisition and Processing Report | 11 January 2013 |
| Descriptive Report, H12394 | 11 January 2013 |
| Descriptive Report, H12395 | 01 February 2013 |
| Data Acquisition and Processing Report (Revision 1) | 01 February 2013 |
| Descriptive Report, H12396 | 22 February 2013 |

Jason M. Infantino

Digitally signed by Jason M. Infantino
DN: cn=Jason M. Infantino, o=Marine Survey and Engineering Solutions, ou=SAIC, email=infantinoj@saic.com, c=US
Date: 2013.03.11 10:22:41 -04'00'

Jason M. Infantino
Lead Hydrographer
Science Applications International Corporation
15 March 2013

# Appendix I:
# Tides & Water Levels

**Field Tide Note**
A field tide note was not required for H12397.

**Final Tide Note**
Observed verified water levels for the station in Duck, NC (8651370) were downloaded from the NOAA Tides and Currents web site. Water Level correctors were prepared for each zone using the **SABER Create Water Level Files** software. The **SABER Apply Correctors** software applied the water level data to the multibeam data according to the zone containing the nadir beam of each ping.

Please refer to the H12397 Descriptive Report Section C.1 for details regarding final tides for H12397. The water level zoning correctors, based entirely on Duck, NC (8651370), were applied to all multibeam data for H12397.

No final tide note was provided by NOAA Center for Operational Oceanographic Products and Services (CO-OPS), SAIC is not required to have a final tide note from CO-OPS.

The on-line times for acquisition of valid hydrographic data are presented in the Abstract Times of Hydrography, H12397 (Table A-1).

**Abstract Times of Hydrography**

**Project**: OPR-D302-KR-12
**Registry No.**: H12397
**Contractor Name**: Science Applications International Corporation
**Date:** 15 March 2013
**Sheet Designation**: 4
**Inclusive Dates**: 02 September 2012 - 29 September 2012
Field work is complete.

| Begin Date | Begin Julian Day | Begin Time | End Date | End Julian Day | End Time |
|---|---|---|---|---|---|
| 09/02/2012 | 246 | 00:22:44 | 09/05/2012 | 249 | 00:38:17 |
| 09/07/2012 | 251 | 15:38:31 | 09/08/2012 | 252 | 14:07:48 |
| 09/11/2012 | 255 | 18:44:29 | 09/12/2012 | 256 | 12:19:52 |
| 09/29/2012 | 273 | 04:21:56 | 09/29/2012 | 273 | 06:52:46 |

*Table A-1: Abstract Times of Hydrography, H12397*

**Transmittal Letter to CO-OPS**
A transmittal letter to CO-OPS was not required for H12397.

**Other Correspondence Relating to Tides**
There is no other correspondence relating to tides and/or water levels.

# Appendix II:
# Supplemental Survey Records and Correspondence

## APPENDIX II. SUPPLEMENTAL SURVEY RECORDS AND CORRESPONDENCE

This appendix is comprised of two sections. The first section contains copies of email exchanges between SAIC and NOAA concerning various aspects of the survey, data processing, and submittal topics. The second section contains the tabular summary of the bottom characteristic results for this sheet.

**CORRESPONDENCE**

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From: Marc Moser [mailto:marc.s.moser@noaa.gov]
Sent: Monday, April 02, 2012 11:55 AM
To: Evans, Rhodri E.
Cc: Jeffrey Ferguson; Mark Lathrop; Megan Greenaway
Subject: 2012 NOAA Extended Attribute Files

Good afternoon,
I am sending the attached files to all contractors as a courtesy to provide you with information on how HSD and NOAA field units are implementing the feature reporting requirements, as documented in the 2012 HSSD, within CARIS software. This is by no means an endorsement for CARIS products nor is it meant to imply any requirement to use CARIS products to process and or deliver hydrographic feature data. For those who utilize CARIS software, the attached files contain the guidance and necessary files that HSD provides to the NOAA field units to implement NOAA Extended Attributes in CARIS. You are welcome to use NOAA's approach for implementing the NOAA Extended Attributes or establish a different approach that better suits your processes and procedures.

All charted features within the bounds of the assigned project area shall be addressed, documented and submitted using the NOAA Extended Attributes as defined in 2012 HSSD. To aid with this requirement I have directed the COTR's to provide a Composite Source Feature File (CSF) in a .000 format. This file has been generated from the largest scale ENC covering the project area. The CSF shall be updated with your survey results. The updated CSF will become the final feature deliverable, the Final Feature File in .000 format, as described in the 2012 HSSD.

Please contact your COR if you have any questions.

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From: Mark Lathrop [mailto:mark.t.lathrop@noaa.gov]
Sent: Wednesday, April 25, 2012 1:57 PM
To: Davis, Gary R.
Cc: Evans, Rhodri E.; Donaldson, Paul L.; Quintal, Rebecca T.
Subject: Re: Tide Zones for TO7

Gary,

Our scale criteria has changed in the last few years away from the printed smooth sheet and more towards reflecting the nautical chart. Surveys are now generally twice the scale of the largest scale chart of the survey area with a minimum scale of 1:40,000.

We should be receiving updated zoning from CO-OPS soon. Please stand by.

Mark

On Tue, Apr 24, 2012 at 5:07 PM, Davis, Gary R. <GARY.R.DAVIS@saic.com> wrote:
Mark,

There is a section of Sheet 3 (H12396), Task Order 7, that is not covered by a tide zone (see attached file). Please provide additional zoning to cover this area. Also please clarify if Water Level Station Duck, NC (865-1370) or Wachapreague, VA (863-1044) is to be used, both are listed in the project instructions.

We would also like to verify that the scale of the surveys for Task order 7 is 40,000. Previous surveys along the coast have been 20,000.

Thanks,
Gary

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From: Mark Lathrop [mailto:mark.t.lathrop@noaa.gov]
Sent: Thursday, April 26, 2012 2:19 PM
To: Evans, Rhodri E.
Subject: Re: 2012 RFP

Rod,

I will send you the updated Project Instructions and SOW next week. We will be surveying to the 2012 Specs. If there is anything there that you are concerned about with regard to this year's survey please let me know. I've attached the Awois detail, CSF and PRF files for your survey.

Mark

On Thu, Apr 26, 2012 at 1:52 PM, Evans, Rhodri E. <RHODRI.E.EVANS@saic.com> wrote:

Mark,

In addition to the revised tide zoning and Tides SOW that we know will be coming from CO-Ops soon, we have the following questions and requests:

1. We note that today the NOS Hydrographic Surveys Specifications and Deliverables Manual (HSSDM), April 2012 in now posted to the NOAA website. We are currently reviewing it for changes from the October 2011 version. Please confirm if we are to deliver to the April 2012 version (the task was proposed to the 2011 specifications per your email below of 12 January 2012)?

2. We note that the Project Instructions (dated 2/27/2012) that we received with the faxed task award lists the Statement of Work (SOW), Hydrographic Survey Services, 2011 as a supporting document. Is there a new 2012 version of the SOW, or is the 2011 version still in effect (per your email below)? Further, can we please have the project instructions as a PDF file (we have only the faxed hard copy and a scruffy scan that we made of the fax) and we will use it as the PIs for our internal use and for delivery in the Separates.

3. In your email below (dated January 12, 2012), you indicated that the Project Instructions list 2 Full Investigation AWOIS Items, but that there is only one and it is Information Only. Can you please provide the information for the one AWOIS?

4. The new HSSDM states that a Composite Source File (CSF) and Project Reference File (PRF) will be provided. It also states that a Prior Survey Feature File (PRI) may be provided with the Project Instructions. Can you please send these files?

Thanks & Regards,
Rod

---

From: Mark Lathrop [mailto:mark.t.lathrop@noaa.gov]
Sent: Tuesday, May 01, 2012 3:07 PM
To: Evans, Rhodri E. [UNK]
Subject: Re: 2012 RFP

Rod,

Only two? That's a first, I believe!
1) No problem with submitting 2-meter node resolution for the entire survey.

2) AHB has several ACORs and I believe they are not necessarily dedicated to any particular contractor. You may substitute the DTON email address provided for ACOR. In fact I suggested this change to the 2012 HSSD during the review process but it somehow didn't get modified.

Mark

On Mon, Apr 30, 2012 at 4:54 PM, Evans, Rhodri E. <RHODRI.E.EVANS@saic.com> wrote:

Mark,

We have completed our review of the new April 2012 HSSD document and we have only 2 questions:

1. We note that in section 5.2.2.3 Set Line Spacing, of the April 2012 HSSD, it calls for 2-meter node resolution for water depths from 0-20 meters and 4-meter node resolution for water depths 16-40 meters. Is it acceptable to deliver the entire sheet at 2-meter node spacing if the data can support it?
2. We note that in section 8.1.3 Danger to Navigation, of the April 2012 HSSD, that it states "Contractors shall submit all Dangers to Navigation via e-mail to the COR and ACOR at processing branch stated in the Hydrographic Survey Project Instructions." We do not see the ACOR identified in the Project instructions. Can you please provide that contact information?

Thanks and Regards, Rod.

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From: Castle Parker [mailto:castle.e.parker@noaa.gov]
Sent: Monday, August 27, 2012 7:54 AM
To: Quintal, Rebecca T.
Cc: Mark T Lathrop
Subject: RE: OPR-D302-KR-12 Danger To Nav Reports - H12394 DTN#1; H12395 DTN#1; H12396 DTN#1

Good Morning Rebecca,
AHB is going to submit H12396 DtoN #1 50ft OBSTRN; standby on the official submission. AHB will not submit H12394 DtoN#1 as the wreck is charted even though the feature and position is charted as doubtful; it is nonetheless charted. H12395 DtoN#1 will not be submitted either as the wreck is deeper than the danger zone of 66ft (11fm). Both features will be updated with the associated Hcell.
I will be submitting H12396 DtoN#1 within the next half hour.
Thanks for your continued support. Have a great day!
Gene

From: Quintal, Rebecca T.
Sent: Friday, August 24, 2012 3:30 PM
To: Mark.T.Lathrop@noaa.gov; ahb.dton@noaa.gov
Cc: Evans, Rhodri E.; Davis, Gary R.; Donaldson, Paul L.; Robertson, Evan J.; Smith, Deborah M.; Holloway, Charles F.; Castle Parker
Subject: OPR-D302-KR-12 Danger To Nav Reports - H12394 DTN#1; H12395 DTN#1; H12396 DTN#1

Mark,

Please find attached three (3) Danger to Navigation Reports.

- H12394 DTON #1
- H12395 DTON #1
- H12396 DTON #1

The files for each DTON submission are contained in a separate zip file. Each Zip file contains the following files:

- One (1) S-57 file (*.000)
- One (1) Word document report (*.docx)
- One (1) Text file (*.txt)
- Four (4) image files that are referenced in the S-57 file (*.jpg)

We note that the May 4, 2012 SOW states in Section 2.2.7.2 Dangers to Navigation, that Contractors shall deliver the DTON as a report (with sample report provided). However in the 2012 edition of the Hydrographic Surveys Specifications and Deliverables it states in Section 8.1.3 Danger to Navigation, that Contractors shall deliver the DTON as an S-57 .000 feature file and does not state that a report or ascii text file should be delivered in addition.

For these deliveries we provided the S-57 file, and a report and ascii text file. Please let us know if the S-57 file is all that is required on future DTON deliveries. Thanks!

Please contact me if there are any questions or problems with the attached files.

Thank you,
-Rebecca

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From: Castle Parker [mailto:castle.e.parker@noaa.gov]
Sent: Monday, August 27, 2012 8:36 AM
To: Quintal, Rebecca T.
Cc: Mark Lathrop
Subject: RE: OPR-D302-KR-12 Danger To Nav Reports - H12394 DTN#1; H12395 DTN#1; H12396 DTN#1

Rebecca,
You can submit the S57 file without the Word document. The remarks should include the information regarding the water level correction and horizontal datum. Also, submit the images. The ASCII file is not necessary either. One thing I did notice is that the acquisition time in the S57 file had the correct date , but the time was missing. HSSD doesn't specify the acquisition time and the associated S57 field to populate; use the "obstim" to populate the date and time stamp.
HSD has started using S57 file for all DtoN submissions…. Or should I say, we're moving that way. The documents and ASCII files are more work and all the information should be populated in the S57 file.
Thanks again and respond as necessary.
Gene

From: Quintal, Rebecca T. [mailto:REBECCA.T.QUINTAL@saic.com]
Sent: Monday, August 27, 2012 8:29 AM
To: Castle Parker

Cc: Mark T Lathrop
Subject: RE: OPR-D302-KR-12 Danger To Nav Reports - H12394 DTN#1; H12395 DTN#1; H12396 DTN#1

Thank for the information Gene!

Any comments on if we need to submit both the written report and associated ascii files, and the S-57 file?
Thanks!
-Rebecca

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From: Megan Greenaway <megan.greenaway@noaa.gov>
Date: Thu, Oct 11, 2012 at 9:48 AM
Subject: Documenting Extended Attribute Files in DR

Good morning,
I want to clarify and emphasize the importance of the naming convention for the NOAA Extended Attribute files in the DR section B.5 Data Processing "Feature Object Catalog". From here forward please use the following naming convention.

NOAA Extended Attribute Files VX_X

The version number is the important item because the processing branches need to use the same version when SAR'ing and compiling your surveys. For now, the processing branches can use a 2012 NOAA Extended Attribute set of files to process 2010 and 2011 surveys because we have made "additions" to the extended attribute files and have not removed any attributes. However, in the future we may remove items or change enumeration values and therefore would not see an attribute or enumeration that was populated by the field.

HSD OPS will update the 2013 HSSD with these requirements. I realize the xmlDR prompt is very vague right now. Grant has suggested a drop down which I think is a good idea.

Vitad or Chris can you please forward to the NRT's?

Thanks,
Megan

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From: Castle Parker
Sent: Tuesday, October 23, 2012 2:31 PM
To: Quintal, Rebecca T.
Cc: Mark Lathrop
Subject: RE: OPR-D302-KR-12 Danger To Nav Reports - H12394 DTN#1; H12395 DTN#1; H12396 DTN#1

Good Day Rebecca,
I would leave special feature type blank, since they weren't officially submitted to MCD's Nautical Data Branch as a DtoN. Therefore, they are a regular survey feature. The "descrp" attribute can be flagged as "update" since we want to remove the charted position doubtful (PD).
$0.02 worth!
gp

From: Quintal, Rebecca T.
Sent: Tuesday, October 23, 2012 2:17 PM
To: Castle Parker
Cc: Mark T Lathrop
Subject: RE: OPR-D302-KR-12 Danger To Nav Reports - H12394 DTN#1; H12395 DTN#1; H12396 DTN#1

Gene,

Hello. For objects where DToNs were submitted by a field unit, but were not submitted by the branches to MCD, should the field unit fill out the sftype (Special Feature Type) as DTON or leave it blank? We had this case twice this year (see below).

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# Appendix III: Feature Report

AWOIS: 0

DtoN: 0

Maritime Boundary: 0

Wrecks: 0

APPROVAL PAGE

H12397

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

The following products will be sent to NGDC for archive

- H12397_DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- H12397_GeoImage.pdf

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

Approved:_____ For: _____

**LT Abigail Higgins, NOAA**
Chief, Atlantic Hydrographic Branch