

**H12930**

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

**DESCRIPTIVE REPORT**

Type of Survey: Navigable Area

Registry Number: H12930

**LOCALITY**

State(s): North Carolina

General Locality: Approaches to Wilmington

Sub-locality: South Frying Pan Shoal

**2016**

CHIEF OF PARTY  
LCDR Matthew Jaskoski, NOAA

LIBRARY & ARCHIVES

Date:

**HYDROGRAPHIC TITLE SHEET**

**H12930**

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

State(s): **North Carolina**

General Locality: **Approaches to Wilmington**

Sub-Locality: **South Frying Pan Shoal**

Scale: **40000**

Dates of Survey: **08/18/2016 to 11/08/2016**

Instructions Dated: **06/29/2016**

Project Number: **OPR-G309-FH-16**

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

Chief of Party: **LCDR Matthew Jaskoski, NOAA**

Soundings by: **Multibeam Echo Sounder**

Imagery by: **Multibeam Echo Sounder Backscatter**

Verification by: **Atlantic Hydrographic Branch**

Soundings Acquired in: **meters at Mean Lower Low Water**

Remarks:

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

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## Descriptive Report to Accompany Survey H12930

Project: OPR-G309-FH-16

Locality: Approaches to Wilmington

Sublocality: South Frying Pan Shoal

Scale: 1:40000

August 2016 - November 2016

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

Chief of Party: LCDR Matthew Jaskoski, NOAA

### A. Area Surveyed

Survey H12930 was conducted 29 NM south east of Cape Fear NC, with a sublocality of South Frying Pan Shoal as shown in Figure 1.

#### A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
33° 30' 1.32" N 77° 41' 58.86" W	33° 14' 3.78" N 77° 29' 40.68" W

*Table 1: Survey Limits*

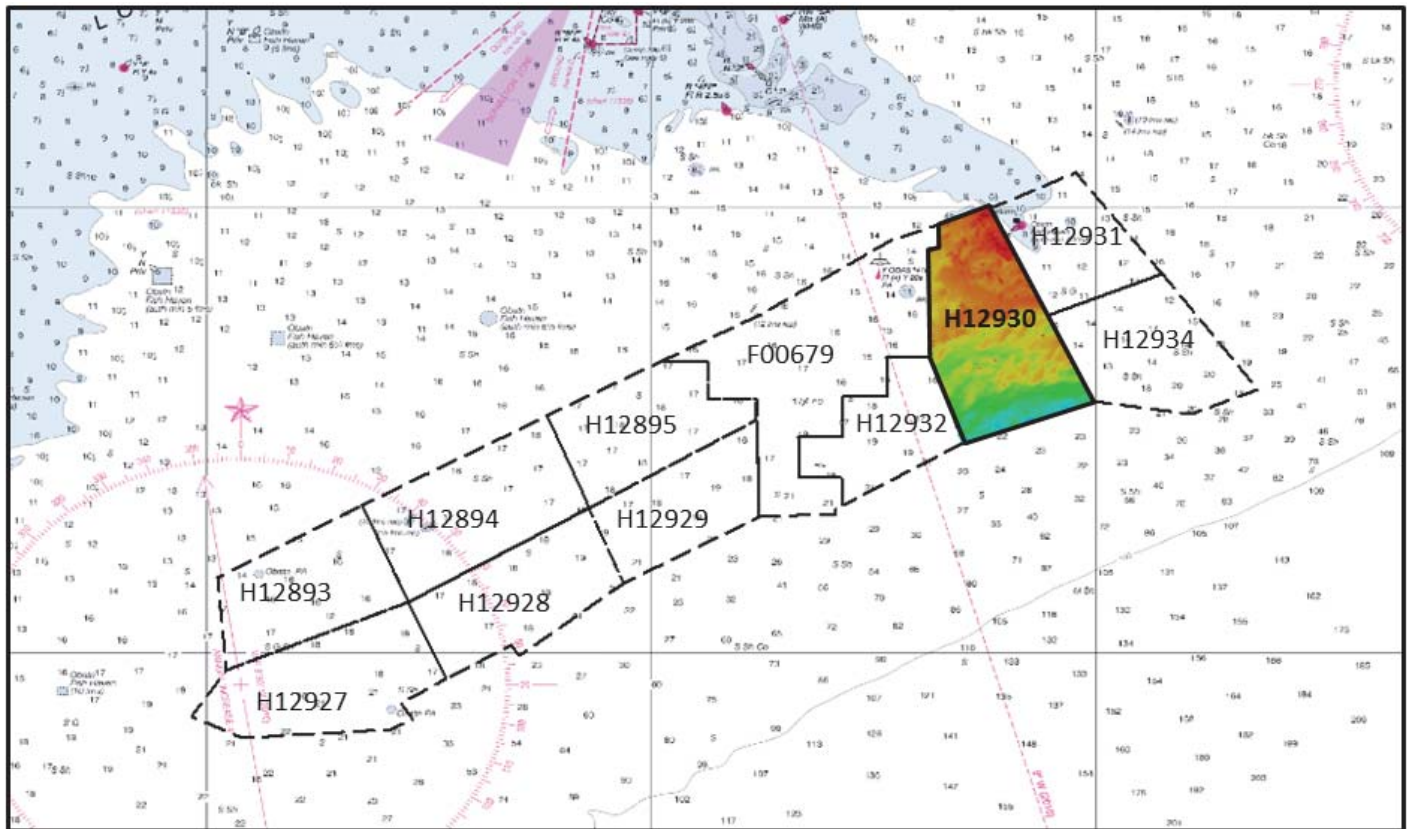


Figure 1: H12930 Survey Limits

Survey H12930 was combined with survey H12933.

## A.2 Survey Purpose

The purpose of this project is to provide contemporary surveys to update National Ocean Service (NOS) nautical charting products. Survey areas will address 793 SNM, of which 660 SNM are Priority 1 in accordance with the National Hydrographic Survey Priorities Edition 2012. The project is based on a request from an Atlantic Coast Port Access Route Study conducted by Pacific Northwest National Laboratory at the request of the U.S. Coast Guard to delineate traffic corridors using AIS. This project will improve the chart for traffic navigating from Port to Port along the Atlantic Ocean Channel.

## A.3 Survey Quality

The entire survey is adequate to supersede previous data.



### A.4 Survey Coverage

The following table lists the coverage requirements for this survey as assigned in the project instructions:

Water Depth	Coverage Required
All waters in survey area	Complete Coverage Multibeam Coverage with Backscatter. Refer to HSSD Section 5.2.2.3.

Survey coverage was in accordance with the requirements listed above and in the HSSD.

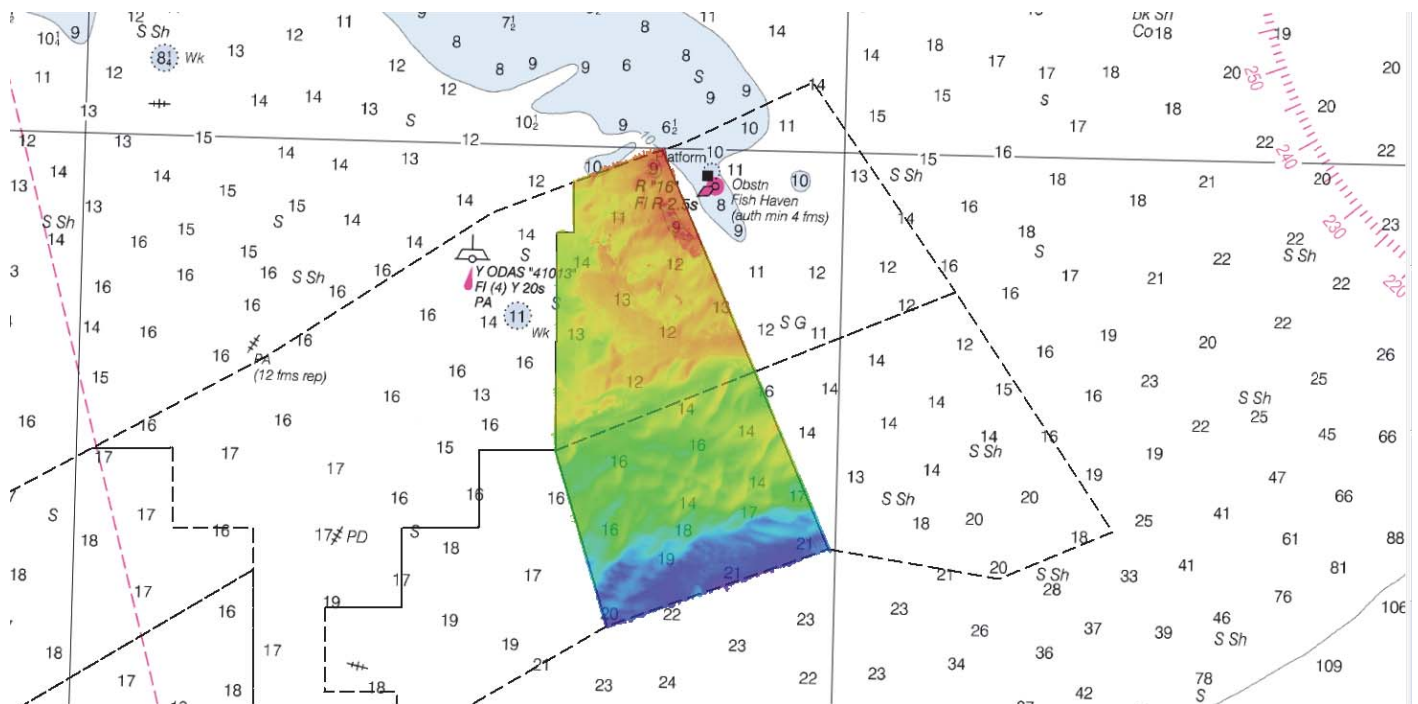


Figure 2: H12930 Coverage Area Overlaid on RNC 11520

### A.5 Survey Statistics

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

	<b>HULL ID</b>	<i>S250</i>	<i>Total</i>
<b>LNM</b>	<b>SBES Mainscheme</b>	0	0
	<b>MBES Mainscheme</b>	1336.03	1336.03
	<b>Lidar Mainscheme</b>	0	0
	<b>SSS Mainscheme</b>	0	0
	<b>SBES/SSS Mainscheme</b>	0	0
	<b>MBES/SSS Mainscheme</b>	0	0
	<b>SBES/MBES Crosslines</b>	64.68	64.68
	<b>Lidar Crosslines</b>	0	0
<b>Number of Bottom Samples</b>			13
<b>Number Maritime Boundary Points Investigated</b>			0
<b>Number of DPs</b>			0
<b>Number of Items Investigated by Dive Ops</b>			0
<b>Total SNM</b>			90.65

*Table 2: Hydrographic Survey Statistics*

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

<b>Survey Dates</b>	<b>Day of the Year</b>
08/18/2016	231
08/25/2016	238

<b>Survey Dates</b>	<b>Day of the Year</b>
08/26/2016	239
08/27/2016	240
08/28/2016	241
08/29/2016	242
08/30/2016	243
08/31/2016	244
09/01/2016	245
09/10/2016	254
09/26/2016	270
10/20/2016	294
10/21/2016	295
11/08/2016	313

*Table 3: Dates of Hydrography*

## **B. Data Acquisition and Processing**

### **B.1 Equipment and Vessels**

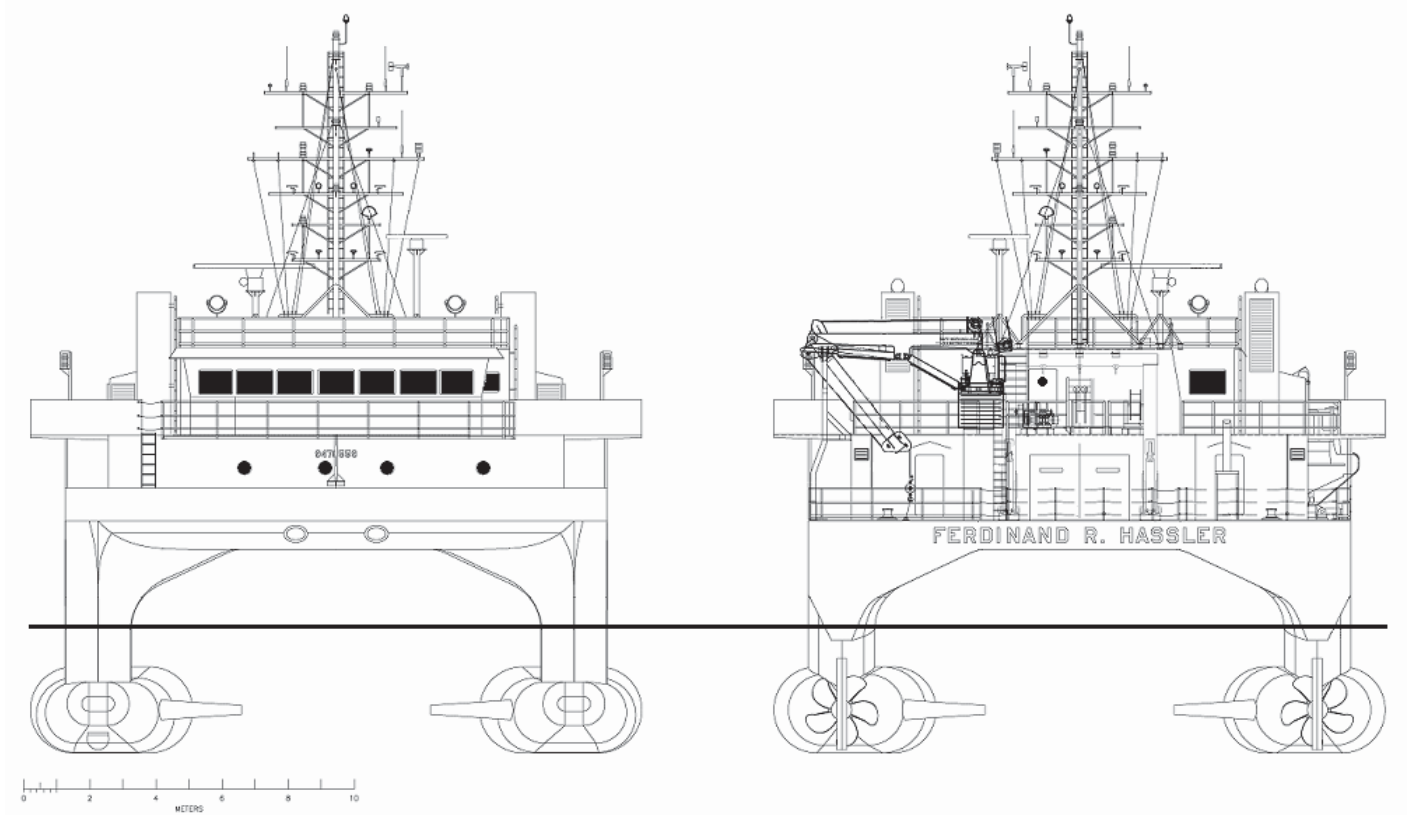
Refer to the Data Acquisition and Processing Report (DAPR) for a complete description of data acquisition and processing systems, survey vessels, quality control procedures and data processing methods. Additional information to supplement sounding and survey data, and any deviations from the DAPR are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

#### **B.1.1 Vessels**

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

<b>Hull ID</b>	<i>S250</i>
<b>LOA</b>	37.7 meters
<b>Draft</b>	3.77 meters

*Table 4: Vessels Used*



*Figure 3: NOAA Ship FERDINAND R. HASSLER*

NOAA Ship FERDINAND R. HASSLER (S250), shown in Figure 3, acquired all surveyed soundings during operation for H12930

## B.1.2 Equipment

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

<b>Manufacturer</b>	<b>Model</b>	<b>Type</b>
Sea-Bird Electronics	SBE 19plus SeaCAT	Conductivity, Temperature, and Depth Sensor
RESON	SVP-70	Surface Sound Speed System
ODIM Brooke Ocean	MVP-200	Sound Speed System
AML Oceanographic	MicroCTD	Sound Speed System
Hemisphere	MBX-4	Positioning System
Applanix	POS M/V 320 V5	Positioning and Attitude System
RESON	SeaBat 7125	MBES

*Table 5: Major Systems Used*

## B.2 Quality Control

### B.2.1 Crosslines

Crosslines acquired for this survey totaled 4.84% of mainscheme acquisition.

The ratio of crossline to main scheme mileage was calculated to be 4.84% which is within specifications set forth in Section 5.2.4.3 of the 2016 HSSD.

A geographic plot of crosslines is shown in Figure 4. To evaluate crossline agreement, two 2-meter surfaces were created: one from crossline depths, the other from mainscheme depths. These two surfaces were differenced using CARIS BASE Editor. The two surfaces are in excellent agreement. See Figure 4. Nodes totaling greater than 2.06 million have a difference value range from -1.95 meters and 1.8 meters. The statistical analysis of the differences between the mainscheme and crossline surfaces is shown in Figure 5. The average difference between the surfaces is 0.06 meters with a standard deviation of 0.10 meters; Ninety-five percent of nodes agree within +/- 0.20 meters of the mean. To minimize the effect sound speed anomalies in the outer beams, all cross lines were filtered by rejecting all data greater than 45 degrees from nadir.

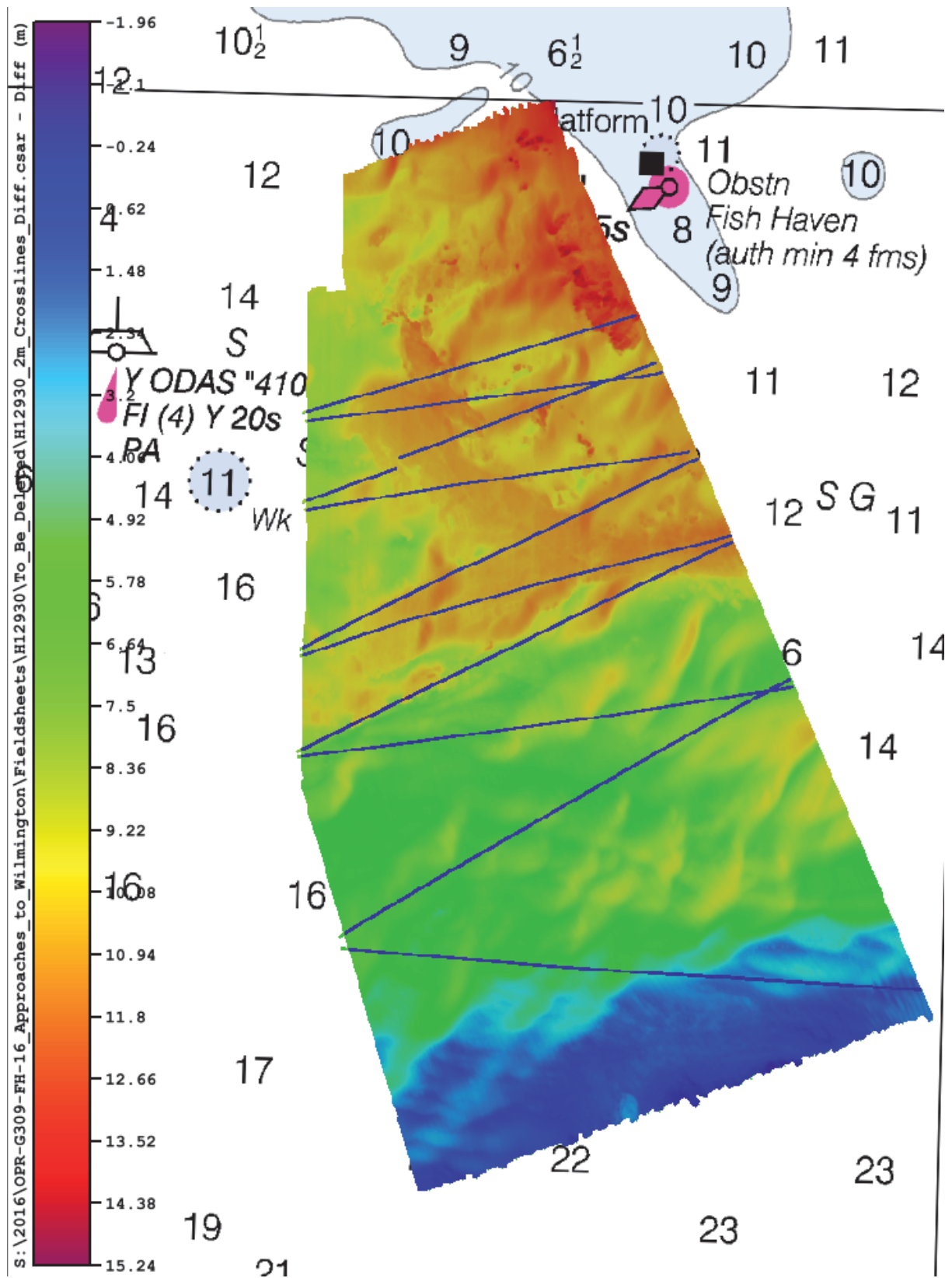


Figure 4: H12930 MBES crossline data overlaid on mainscheme data.

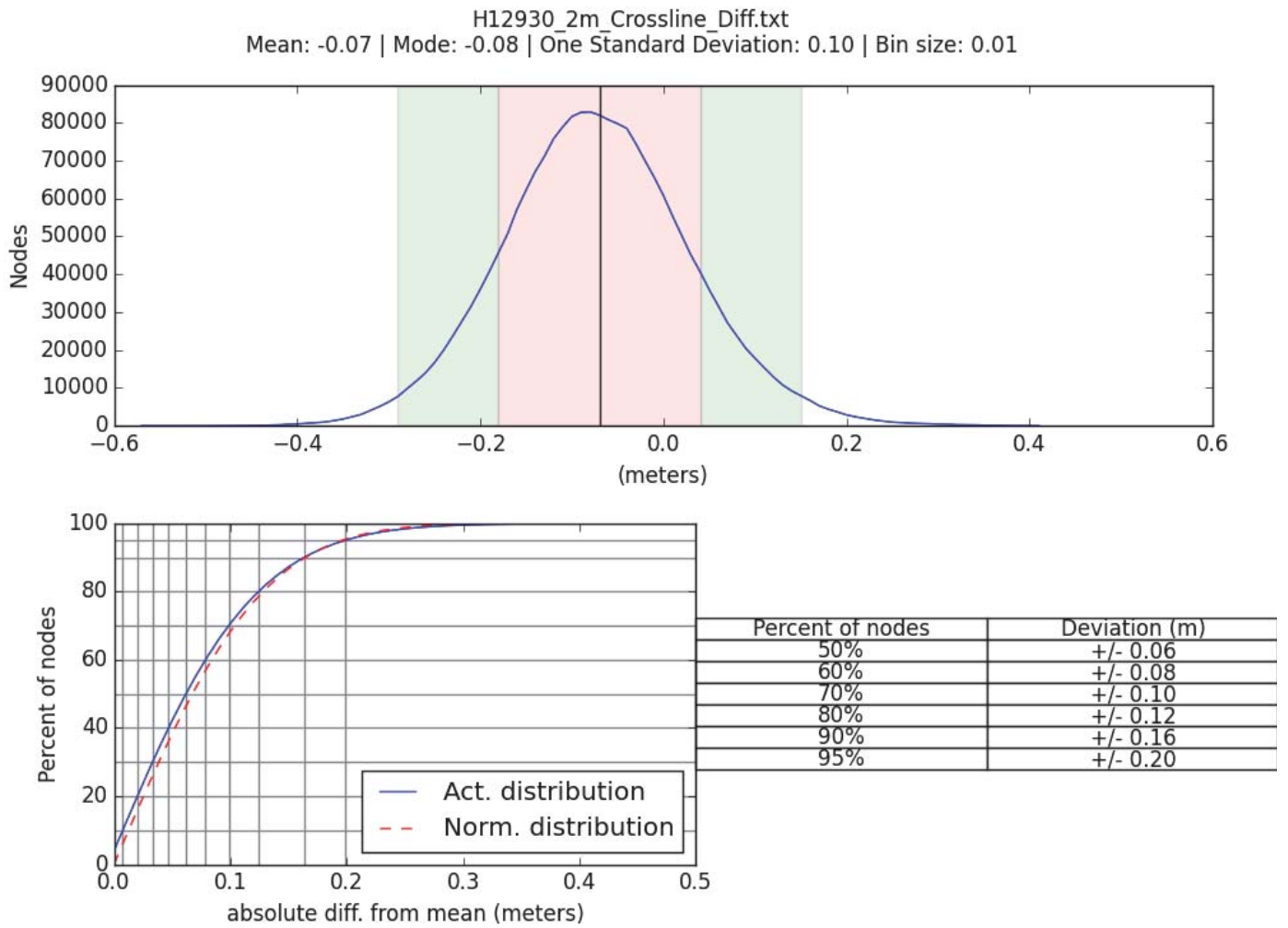


Figure 5: H12930 Crossline difference statistics: mainscheme minus crosslines

### B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Measured	Zoning	Method
0.01 meters	0.148 meters	ERS via VDATUM

Table 6: Survey Specific Tide TPU Values.

Hull ID	Measured - CTD	Measured - MVP	Surface
S250	1.0 meters/second	1.0 meters/second	0.5 meters/second

*Table 7: Survey Specific Sound Speed TPU Values.*

Two (2) tidal models were available for water level corrections associated with survey H12930. A discrete tide zone file, produced by CO-OPS for project OPR-G309-FH-16, was provided to the field unit. Additionally, a vertical datum transformation (VDatum) model was delivered to the field unit in the project instructions. All final gridded data for survey H12930 were reduced to MLLW via VDatum. This model functioned as a gridded separation model for GPS tide computations with a 0.148 meter uncertainty. Final TPU calculations are derived from the following sources: VDatum separation model, sound velocity (MVP, CTD and surface sound velocimeter), HVF uncertainties, and SBET post processed uncertainty. Error data sources applied through CARIS processing software are listed in Figure 6.

The ODIM Brooke Ocean Moving Vessel Profiler (MVP) experienced intermittent mechanical issues during the course of H12930 data acquisition. When not operational, a Sea-Bird CTD was used to conduct static casts to model the water column sound speed profile approximately every two to four hours. Frequency was dependent on changes observed in refraction errors within processed data and comparison of previous profile data. MVP cast data were used on DN 238 through DN 245. CTD cast data were used in data processing for DN 254, DN270, DN294, DN295, and DN313.

### B.2.3 Junctions

H12930 junctions with four contemporary surveys, three of the survey were conducted by the NOAA Ship Ferdinand R. Hassler, the fourth is a NOAA Ship NANCY FOSTER survey W00310. See Table 8 for further information.

The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
W00310	1:0	2014	NOAA Ship NANCY FOSTER	W
H12931	1:40000	2016	NOAA Ship FERDINAND R. HASSLER	NE
H12932	1:40000	2016	NOAA Ship FERDINAND R. HASSLER	SW
H12934	1:40000	2016	NOAA Ship FERDINAND R. HASSLER	E

*Table 8: Junctioning Surveys*



## W00310

Survey H12930 junctions with its contemporary survey W00310 to the west and their respective nodes overlap by approximately 400 meters to 600 meters. The large variation in overlap is due to W00310 being conducted as a set line spacing survey. Coverage for H12930 extended beyond the extents of the sheet limits. The minimum and maximum depth difference between the two surveys is -10.08 meters and 0.95 meters, respectively. Of the greater than 1,000,000 overlapping nodes, the average difference is 0.37 meters with a standard deviation of 0.12 meters; Ninety-five percent of the differenced surface nodes are within +/- 0.24 meters of the mean, as shown in Figure 7. The H12930 data was inspected and no aberrant accepted soundings were found to be included in the final grid. The large range (-10.08 to 0.95) is likely caused by fliers in the W00310 junction surface. The large variation in overlap is due to W00310 being conducted as a set line spacing survey. Coverage for H12930 extended beyond the extents of the sheet limits.

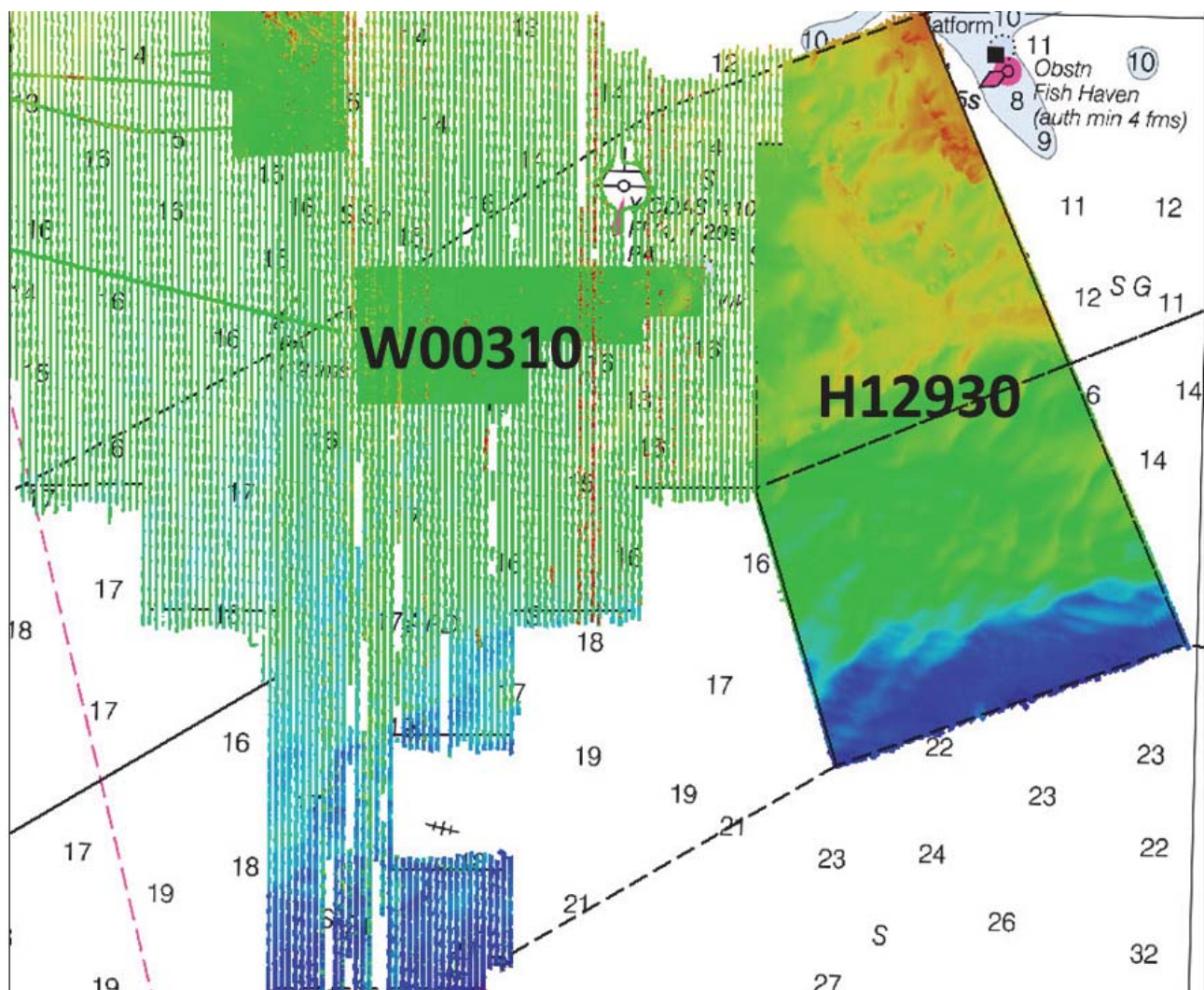
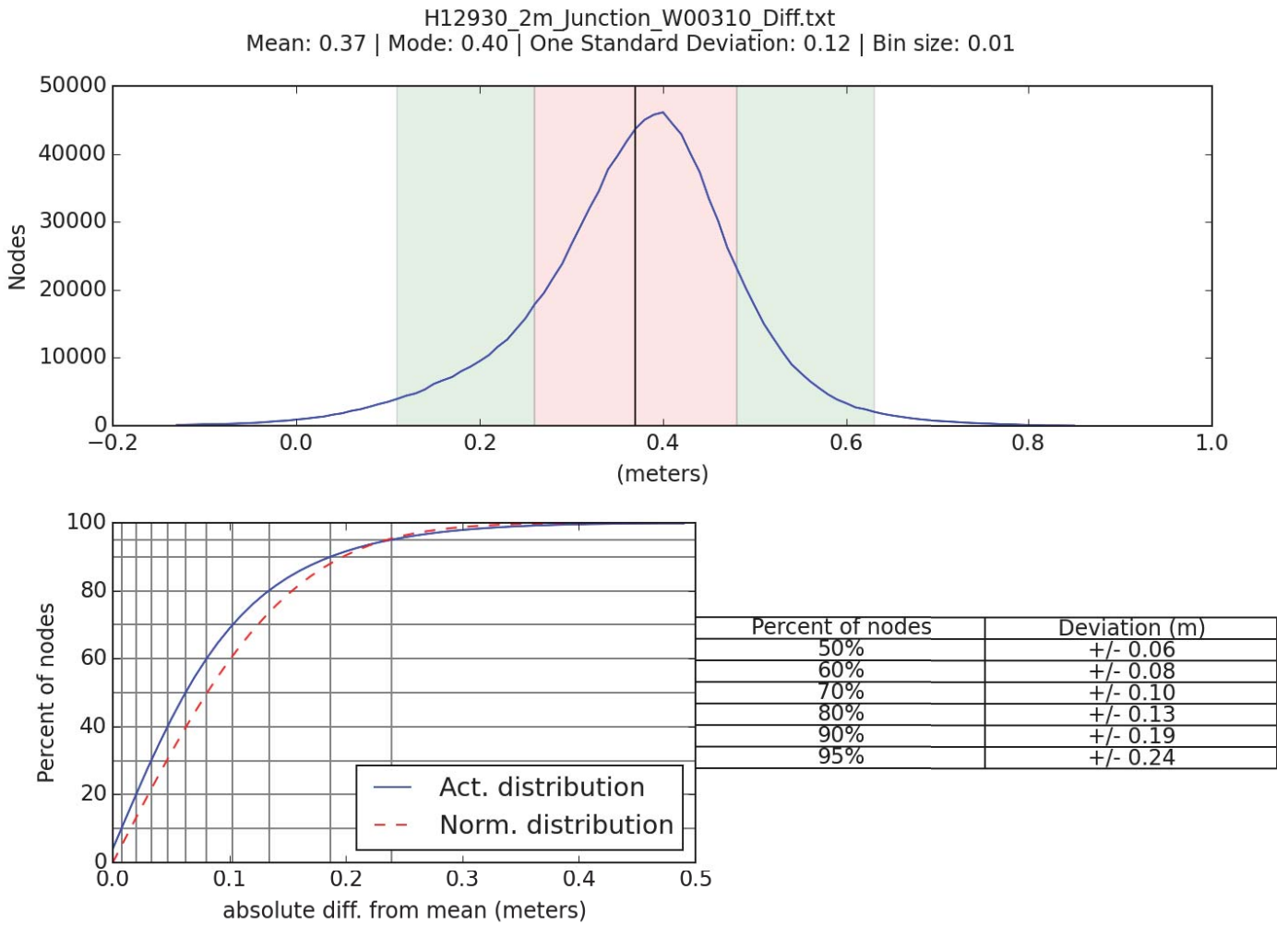


Figure 6: The Junction Between H12930 and W00310



*Figure 7: Difference Surface Statistics for H12930 and W00310*

H12931

Survey H12930 junctions with its contemporary survey H12931 to the east and their respective nodes overlap by approximately 100 meters to 300 meters. The minimum and maximum depth difference between the two surveys is -1.32 meters and 0.97 meters, respectively. Of the greater than 500,000 overlapping nodes, the average difference is -0.09 meters with a standard deviation of 0.10 meters; Ninety-five percent of the differenced surface nodes are within +/- 0.19 meters of the mean, as shown in Figure 9.

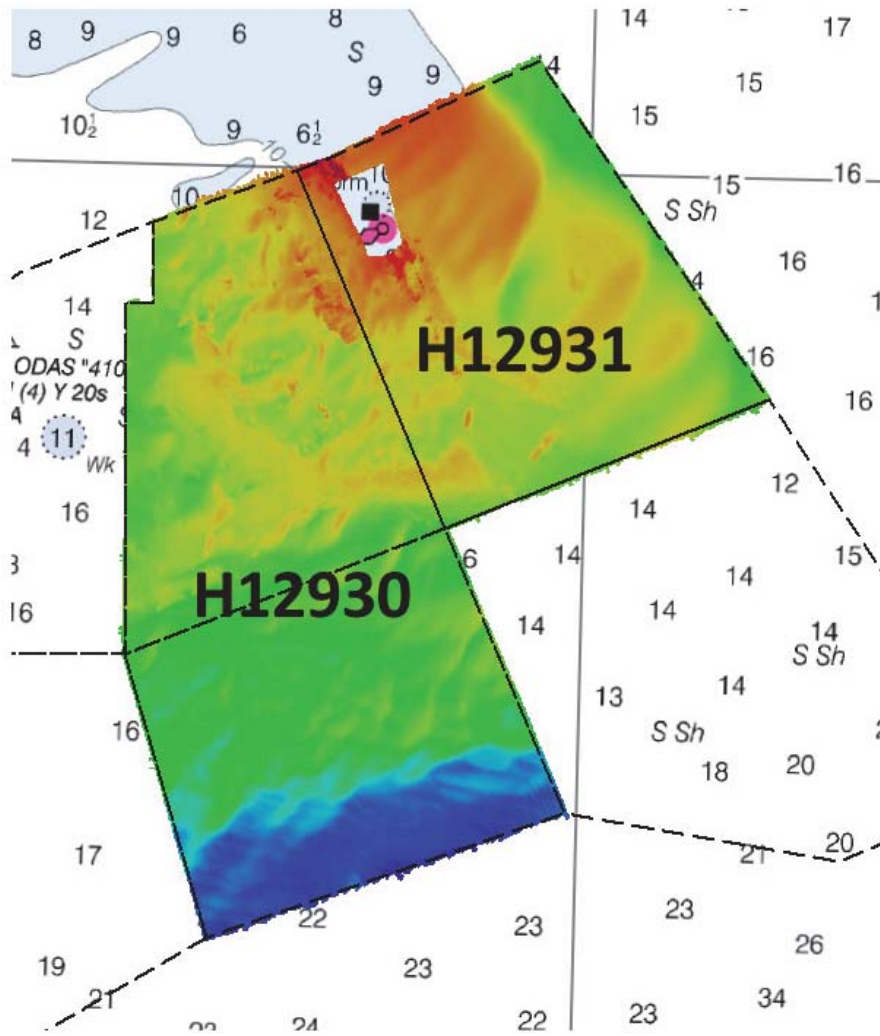
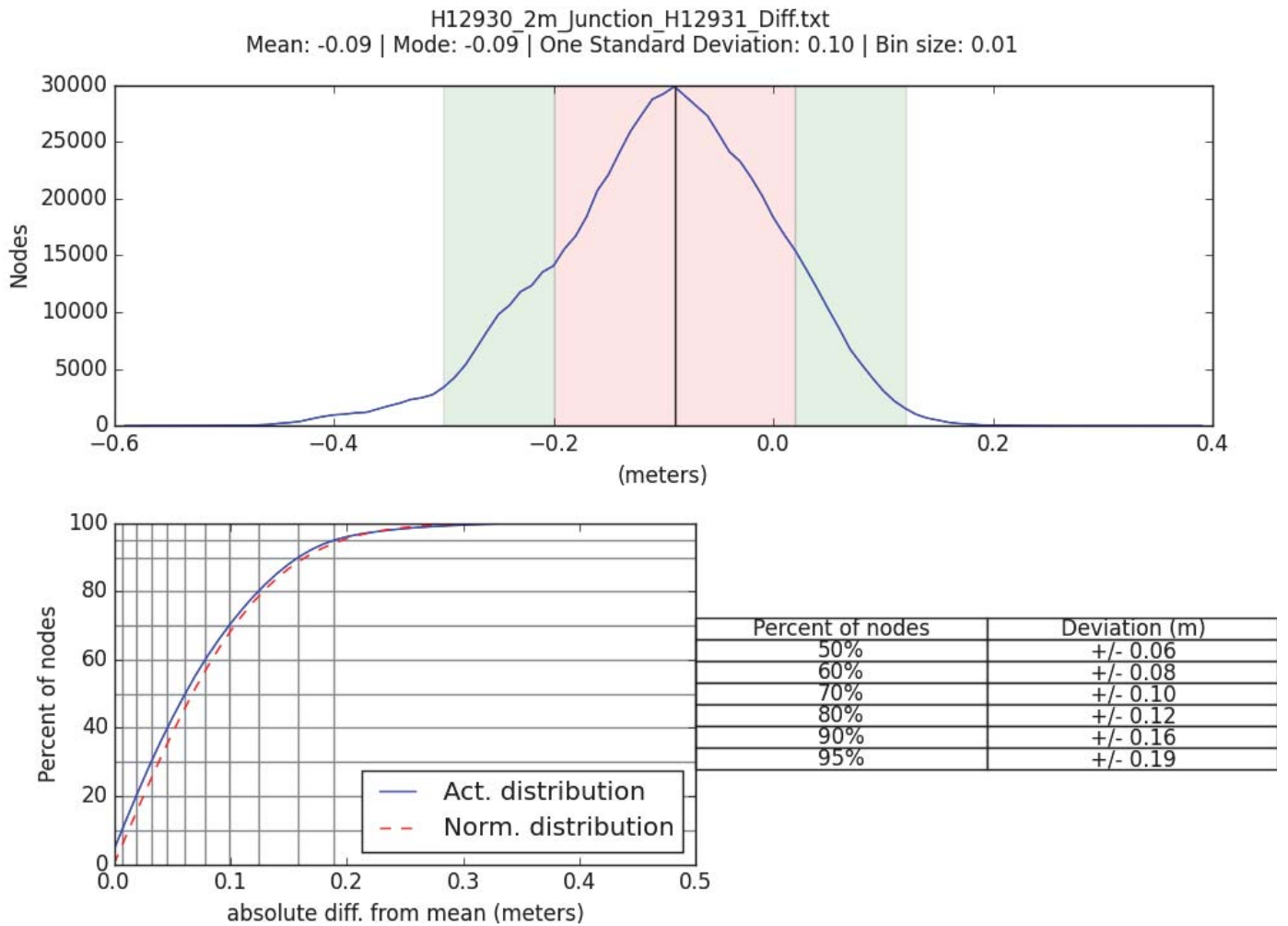


Figure 8: The junction between H12930 and H12931



*Figure 9: Difference Surface Statistics for H12930 and H12931*

H12932

Survey H12930 junctions with its contemporary survey H12932 to the west and their respective nodes overlap by approximately 150 meters to 300 meters. The minimum and maximum depth difference between the two surveys is -0.75 meters and 1.01 meters, respectively. Of the greater than 500,000 overlapping nodes, the average difference is -0.064 meters with a standard deviation of 0.122 meters; Ninety-five percent of the differenced surface nodes are within +/- 0.24 meters of the mean, as shown in Figure 11.

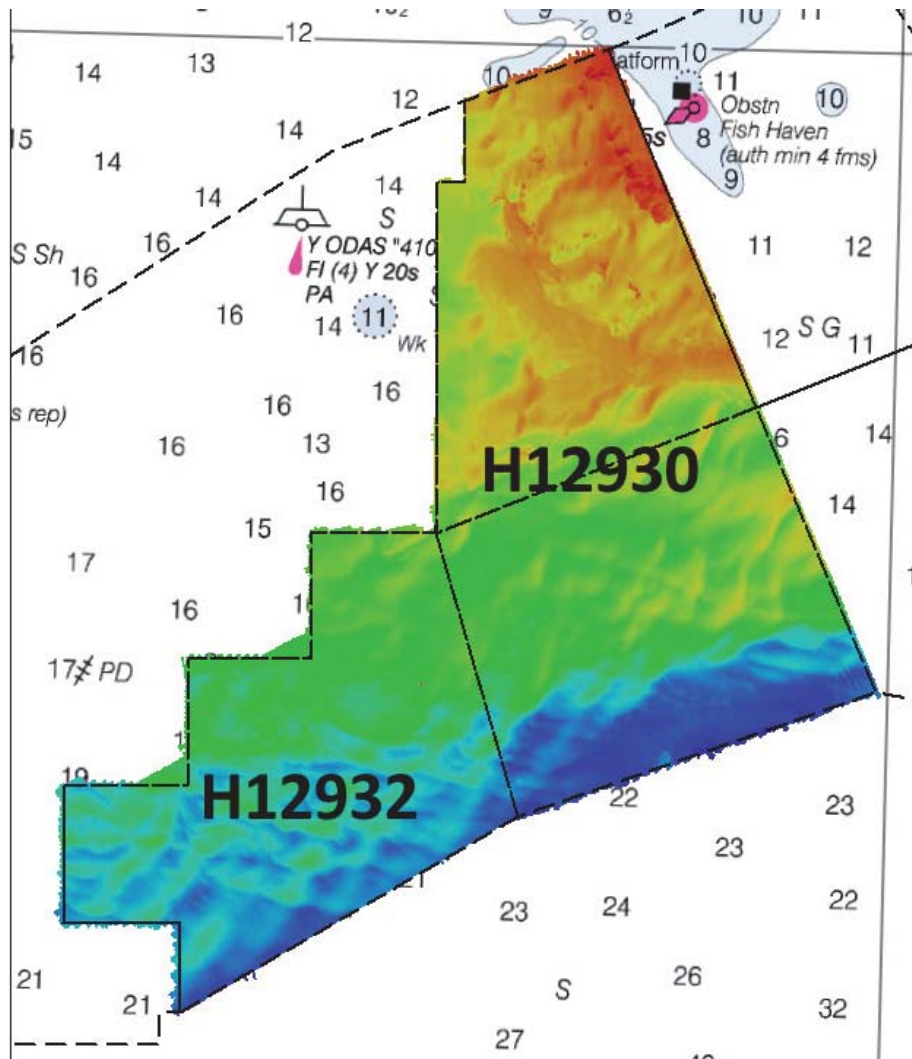
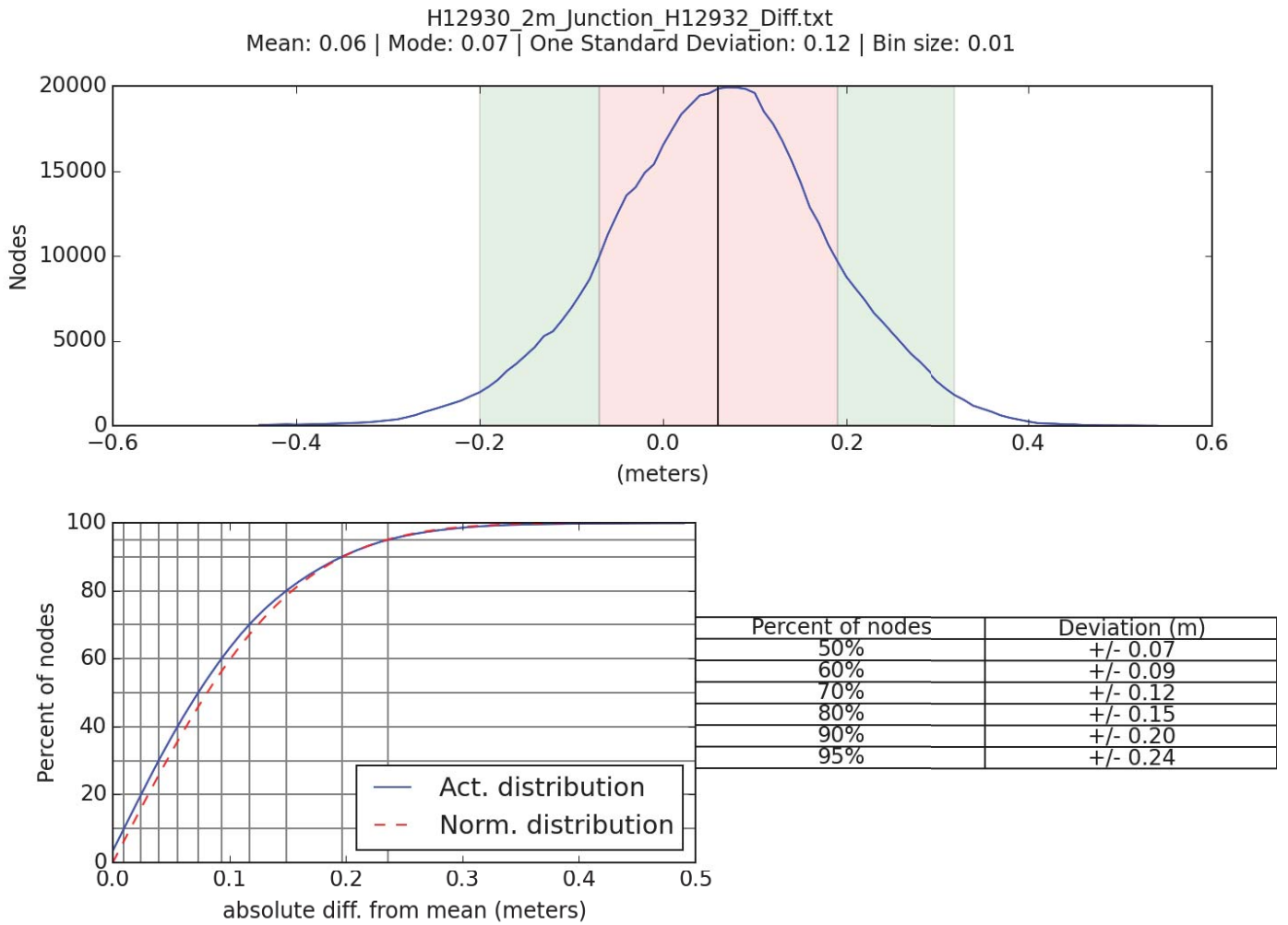


Figure 10: The junction between H12930 and H12932



*Figure 11: Difference Surface Statistics for H12930 and H12932*

H12934

Survey H12930 junctions with its contemporary survey H12934 to the east and their respective nodes overlap by approximately 550 meters to 150 meters. The minimum and maximum depth difference between the two surveys is -1.10 meters and 0.61 meters, respectively. Of the greater than 500,000 overlapping nodes, the average difference is -0.02 meters with a standard deviation of 0.12 meters; Ninety-five percent of the differenced surface nodes are within +/- 0.22 meters of the mean, as shown in Figure 13.

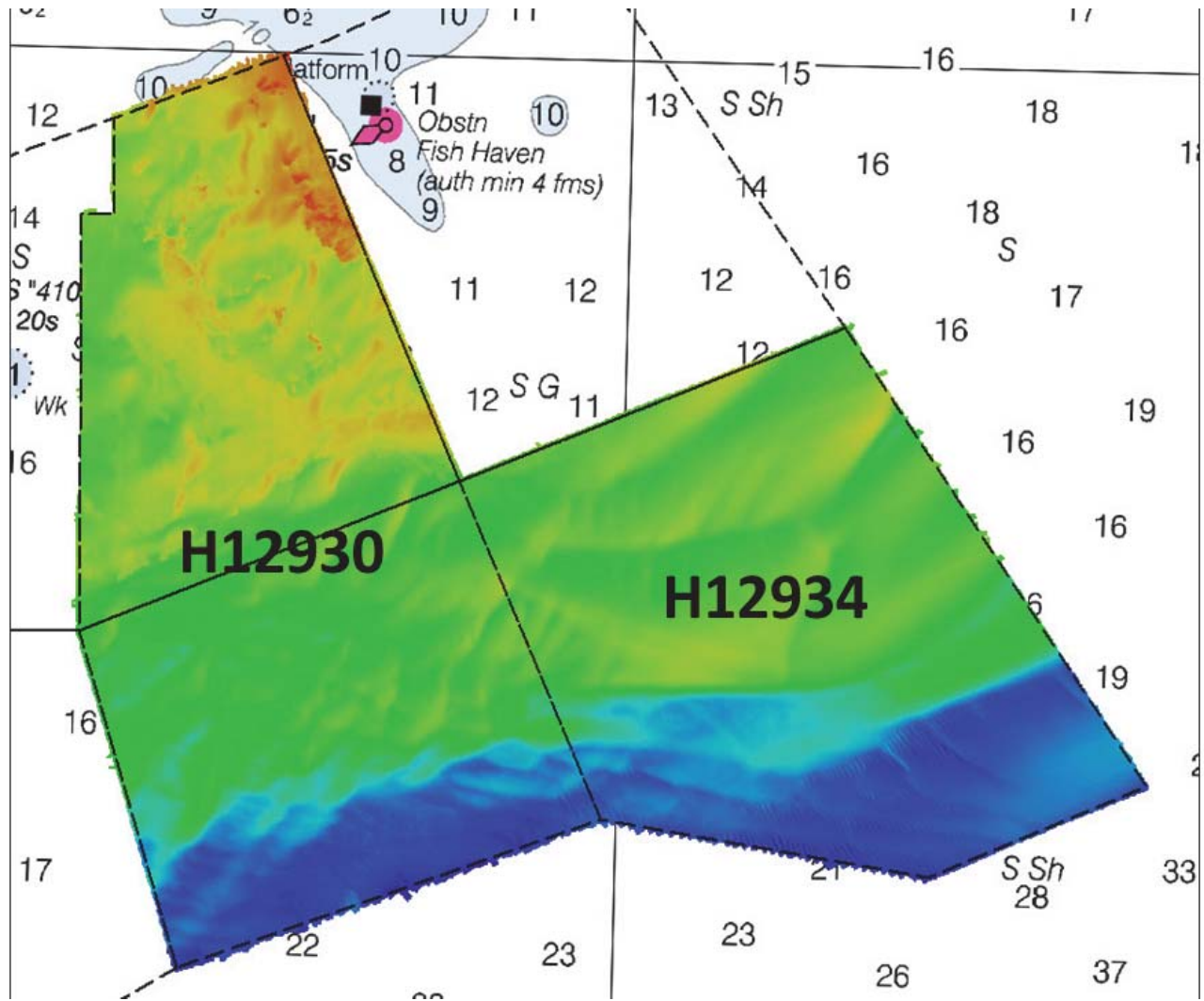


Figure 12: The junction between H12930 and H12934

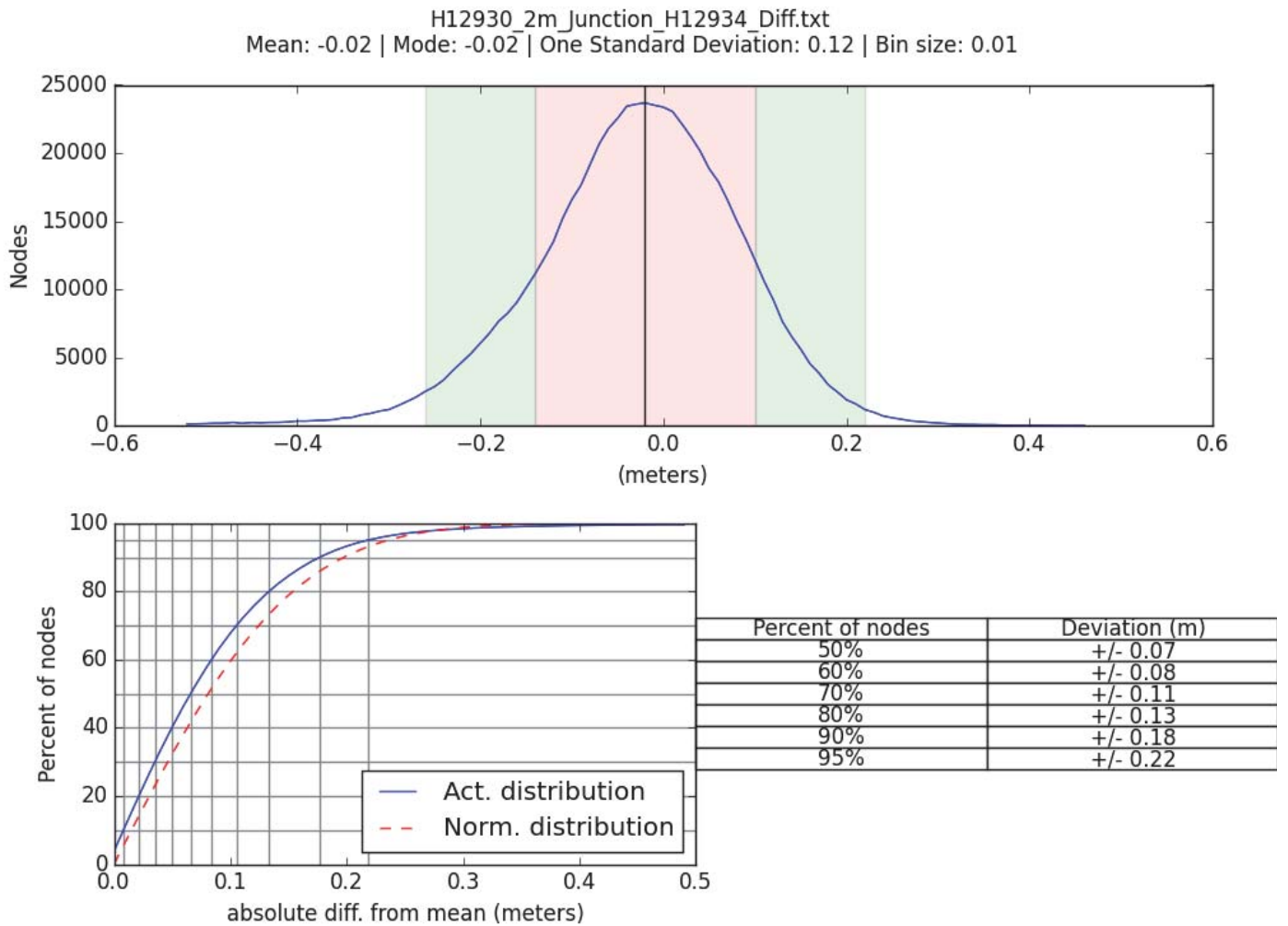


Figure 13: Difference Surface Statistics for H12930 and H12934

### B.2.4 Sonar QC Checks

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

### B.2.5 Equipment Effectiveness

#### Static Two-Way Travel Time Offset

For reasons unknown, the port Reson 7125 developed a static two-way travel time offset equating to a depth error of approximately 0.50 to 1.00 meters. The problem disappeared after rebooting the system but data collected on the port system on DN241 lines 2016\_2411834 through 2016\_2411257 totaling 8 lines were affected with this offset. The Ferdinand Hassler chose to delete the lines re-acquire the data instead of

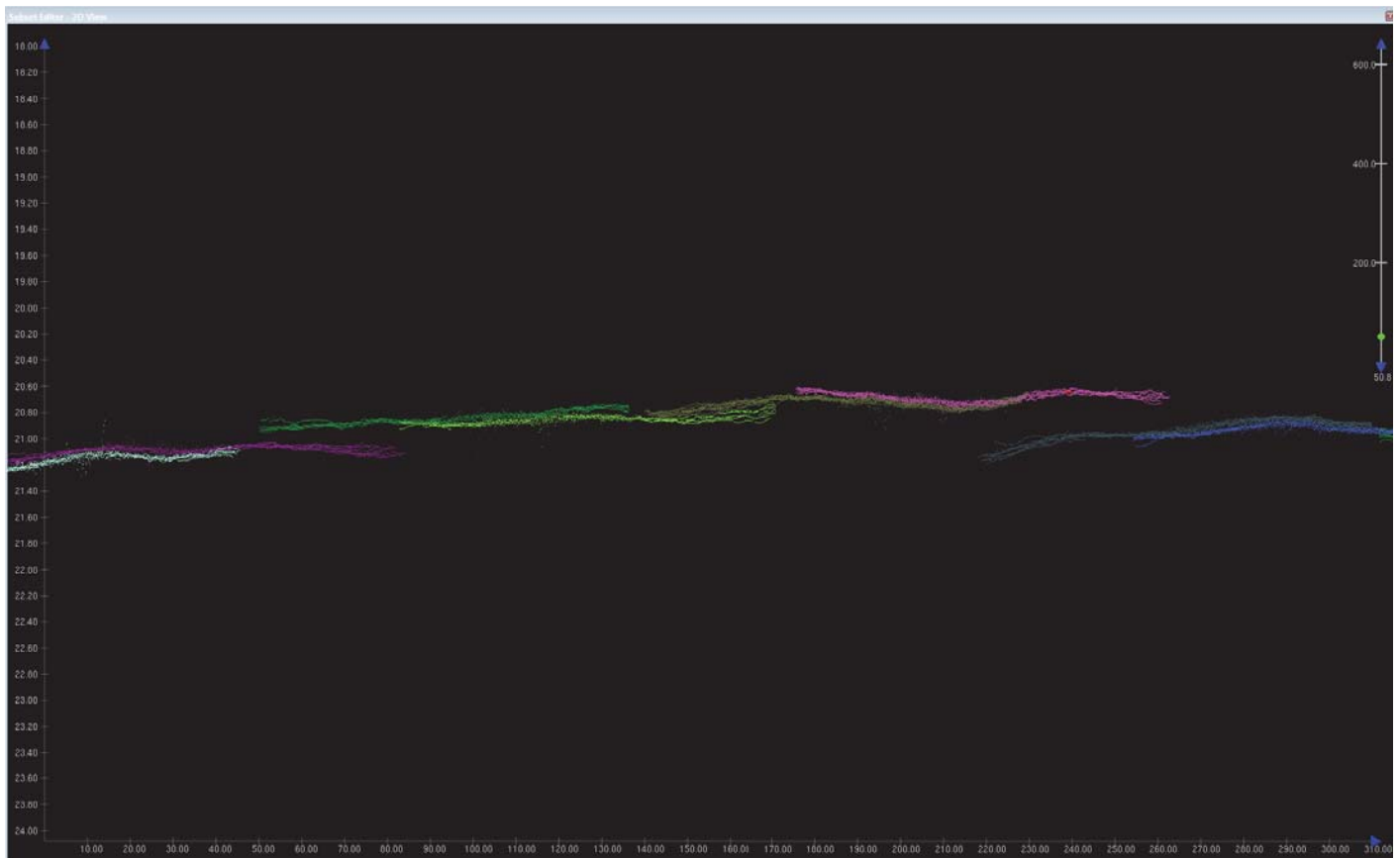


applying a static offset to correct for two-way travel time error. The new data was collected on DN294, and DN295.

## B.2.6 Factors Affecting Soundings

### SBET Anomaly

A vertical offset ranging from 0.26-0.30 meters can be seen in the data for DN243, lines 2016\_2431442(2) port and Stbd, 2016\_2431632 due to an SBET that has periods of poor quality vertical solutions. The oscillations in the vertical solution are within the TVU specifications for the depth of the area.



*Figure 14: Example of SBET anomaly.*

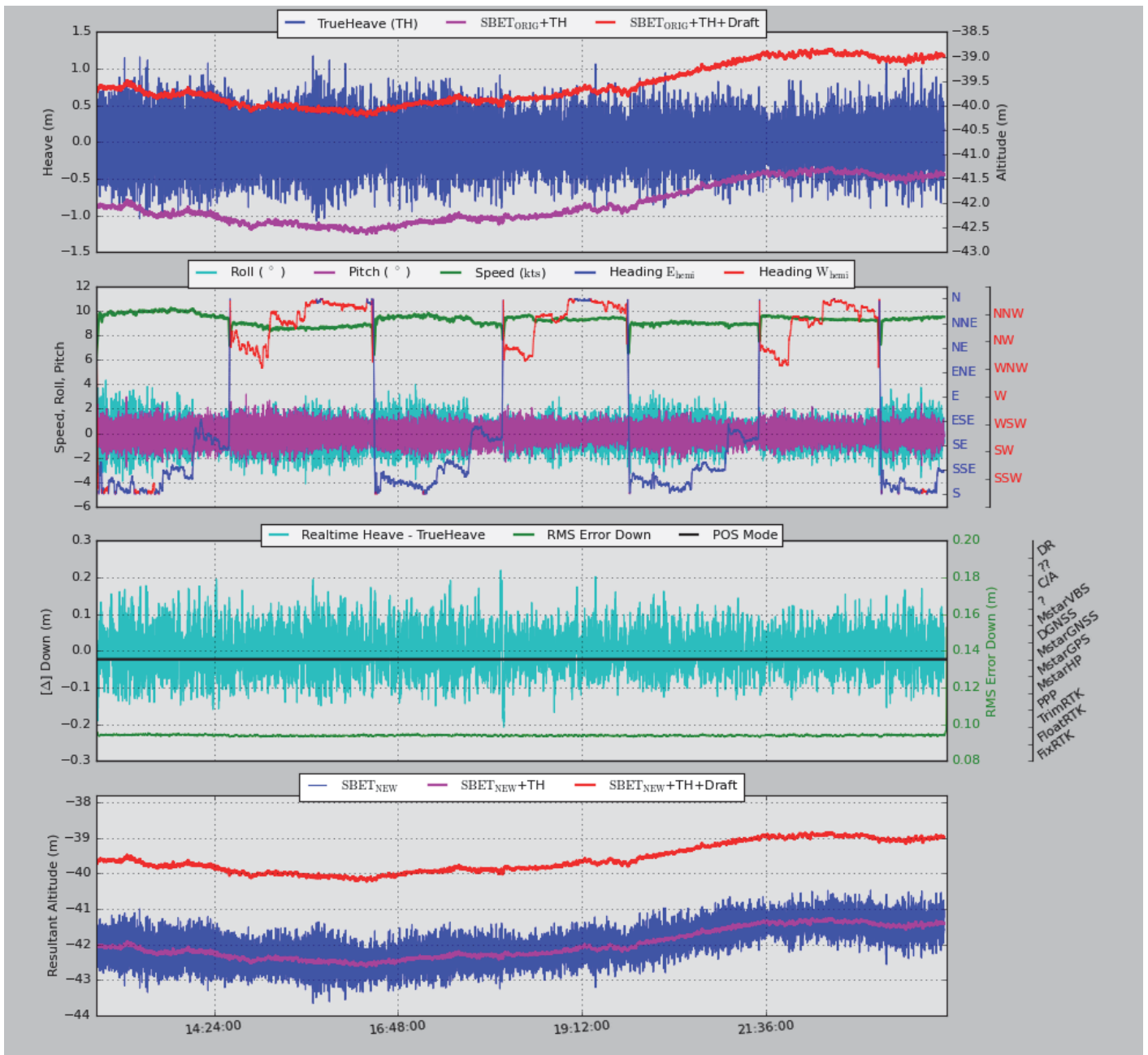


Figure 15: SBET corresponding to survey lines in figure 14.

### B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: As noted in prior sections, the ODIM Brooke Ocean MVP experienced intermittent mechanical issues during the course of data acquisition and both moving and static casts (via Sea-Bird CTD) were collected. These sound speed measurements were collected using the MVP-200 and Sea-Bird CTD approximately every one to four hours.

A total of 123 sound speed measurements were taken within the boundaries of H12893. Three (3) casts were taken more than 200 meters outside of the survey area due to operational and efficiency constraints of the

ship. Given the ship was required to halt operations to collect static CTD due to mechanical failure of the MVP, and the water column profile was suitably consistent over the spatial and temporal extents, it was deemed acceptable to include the outside casts for processing in H12930.

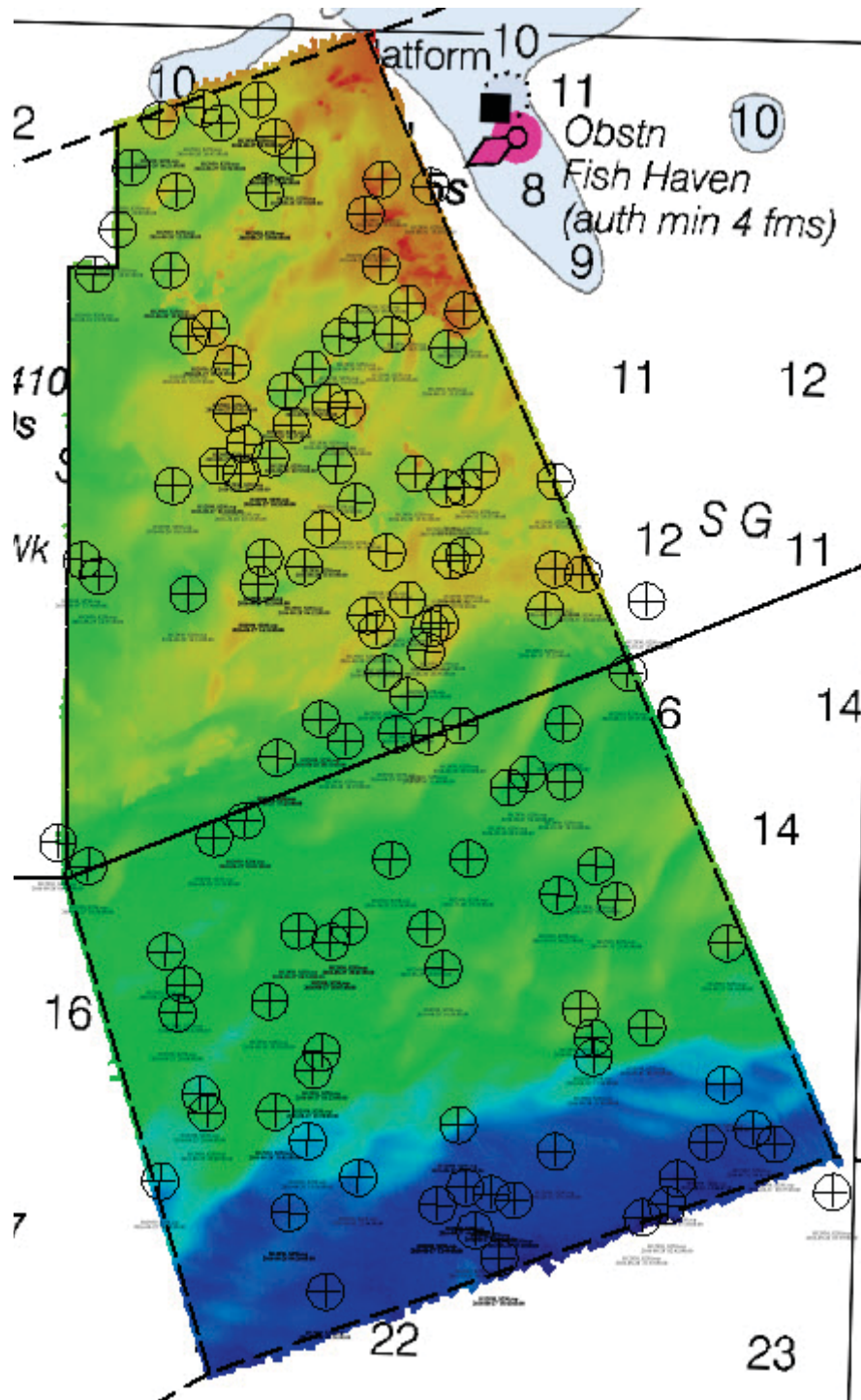
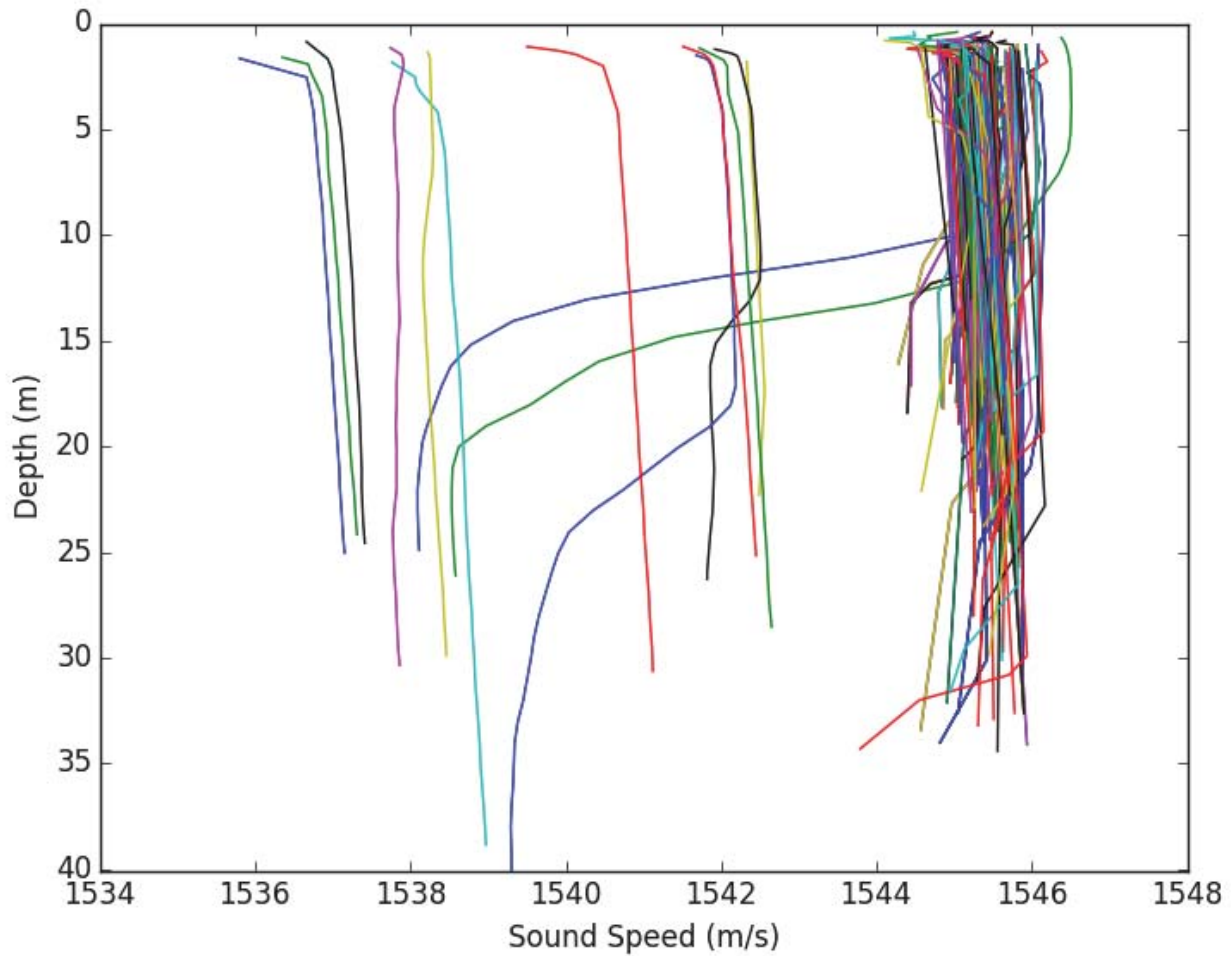


Figure 16: H12930 sound speed profile locations



*Figure 17: Sound Speed Profiles for survey H12930.*

### **B.2.8 Coverage Equipment and Methods**

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

## **B.3 Echo Sounding Corrections**

### **B.3.1 Corrections to Echo Soundings**

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

### B.3.2 Calibrations

All sounding systems were calibrated as detailed in the DAPR.

### B.4 Backscatter

Backscatter was logged in RESON datagram 7008 snippets record in the raw .s7k files. The .s7k file also holds the navigation record and bottom detections for all lines of survey H12930. The files were paired with the CARIS HDCS data, imported, and processed using Fledermaus Geocoder Toolbox (FMGT). The FMGT projects and backscatter mosaic imagery are included in the field submission. The processed mosaic is formatted as a geo-referenced tiff image per specifications. The following information is provided as metadata for the processing branch:

Backscatter data processing and mosaicking performed in Fledermaus FMGT version 7.6.3 using Reson DeTVG plugins where appropriate. Backscatter data has a histogram range of 10 to -70dB. Backscatter data is provided in separate layers broken down by survey vessel hull number and sonar operating frequency.

### B.5 Data Processing

#### B.5.1 Primary Data Processing Software

The following software program was the primary program used for bathymetric data processing:

Manufacturer	Name	Version
Caris	Caris HIPS and SIPS	9.0.24

*Table 9: Primary bathymetric data processing software*

The following Feature Object Catalog was used: V\_5\_4

#### B.5.2 Surfaces

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

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
H12930_MB_1m_MLLW	CUBE	1 meters	15.53 meters - 44.00 meters	NOAA_1m	Complete MBES

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
H12930_MB_1m_MLLW_Final	CUBE	1 meters	15.53 meters - 20.00 meters	NOAA_1m	Complete MBES
H12930_MB_2m_MLLW	CUBE	2 meters	15.61 meters - 44.37 meters	NOAA_2m	Complete MBES
H12930_MB_2m_MLLW_Final	CUBE	2 meters	18.00 meters - 40.00 meters	NOAA_2m	Complete MBES
H12930_MB_4m_MLLW	CUBE	4 meters	15.65 meters - 43.55 meters	NOAA_4m	Complete MBES
H12930_MB_4m_MLLW_Final	CUBE	4 meters	36.00 meters - 43.55 meters	NOAA_4m	Complete MBES

*Table 10: Submitted Surfaces*

### **B.5.3 No Sound Speed Correction (Caris SVC processing) After SBET Application**

Based on feedback from the Atlantic Hydrographic Branch (AHB), the Ferdinand R. Hassler discovered that one element of the recommended Caris processing workflow was not followed throughout project OPR-G309-FH-16. The Caris Sound Velocity Correction (SVC) process was conducted before but not after loading Smoothed Best Estimates of Trajectory (SBETs). It is recommended to perform the SVC process after loading SBETs in order for the ray tracing to account for the updated motion and attitude information. A copy of survey H12932 was re-processed to assess the effect of not applying SVC after loading SBETs. As viewed in Caris Subset Editor, the vertical difference between processing methods ranged from 0.005 - 0.010 meters in all sampled areas, including two wrecks. The SVC processing methods were also compared using 2 meter and 4 meter difference surfaces. In the 2 meter difference surface, the depths differ by -8.17 to 3.07 meters, with a mean difference of 0.00 meters and a standard deviation of 0.00 meters, and 95% of nodes exhibit a depth difference of  $\pm 0.01$  meters. In the 4 meter difference surface, the depths differ by -0.74 to 0.62 meters, with a mean difference of 0.00 meters and a standard deviation of 0.00 meters, and 95% of nodes exhibit a depth difference of  $\pm 0.01$  meters. The high values in the difference surfaces are isolated and limited to features and steep slopes. A detailed review confirmed that the high values in the difference surfaces are entirely the result of CUBE gridding inconsistencies and small horizontal shifts in the grid node structure rather than actual vertical differences in the sounding data. The results of this testing were discussed with HSD Operations and AHB. Based on the limited magnitude of the error, it was concluded that re-processing the data was unnecessary. The ship's Caris processing SOP has been updated to reflect the

recommended SVC workflow. Please refer to the DAPR and the correspondence in Appendix II for more information.

### B.5.4 Data Density

A density analysis was run to calculate the number of soundings per surface node for all finalized surfaces. The results determined that greater than 99.5% of all nodes contained five or more soundings which meets the data density specifications.

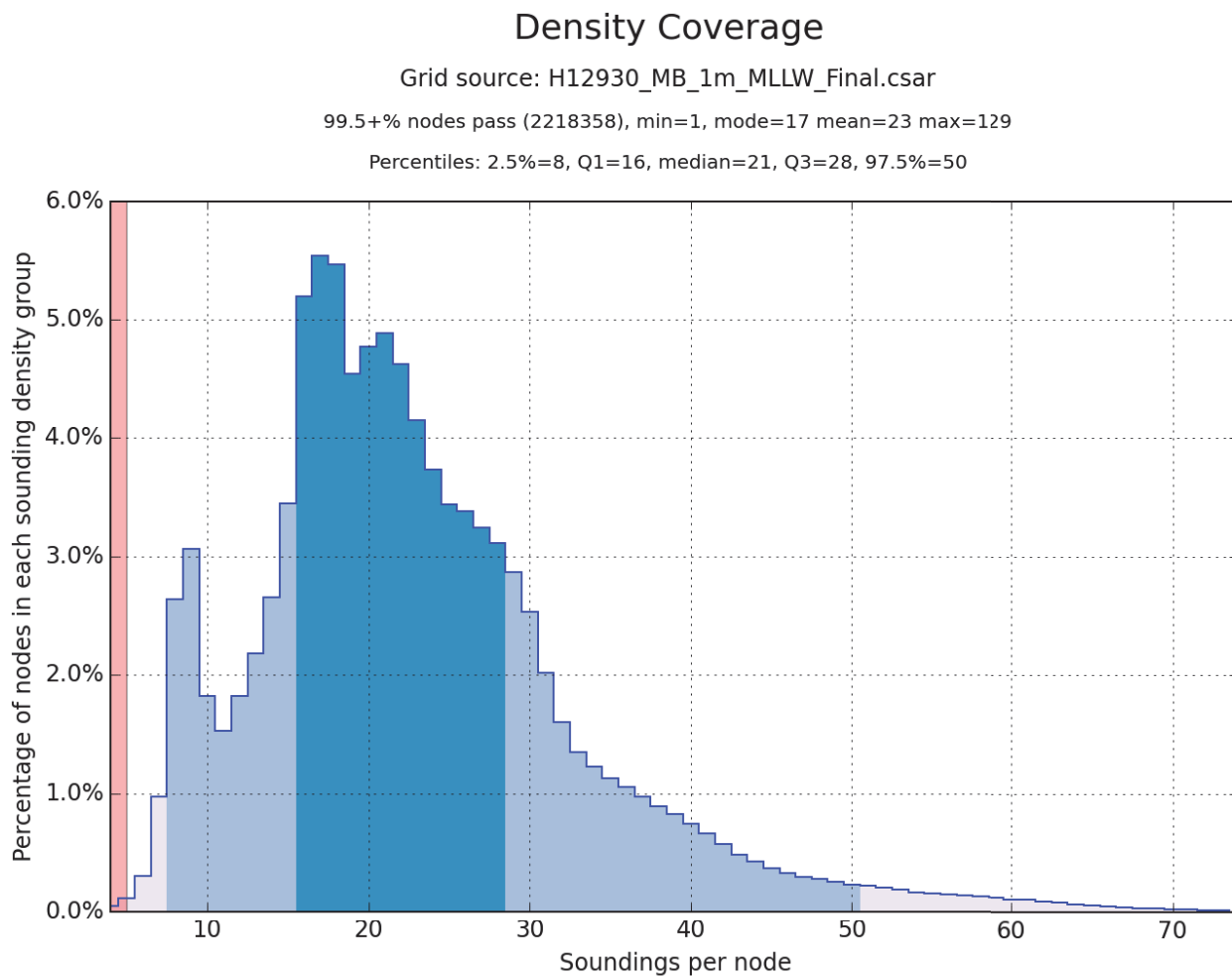


Figure 18: Data density of the 1-meter finalized surface.

### Density Coverage

Grid source: H12930\_MB\_2m\_MLLW\_Final.csar

99.5+% nodes pass (75049695), min=1, mode=24 mean=43 max=422

Percentiles: 2.5%=13, Q1=27, median=40, Q3=53, 97.5%=102

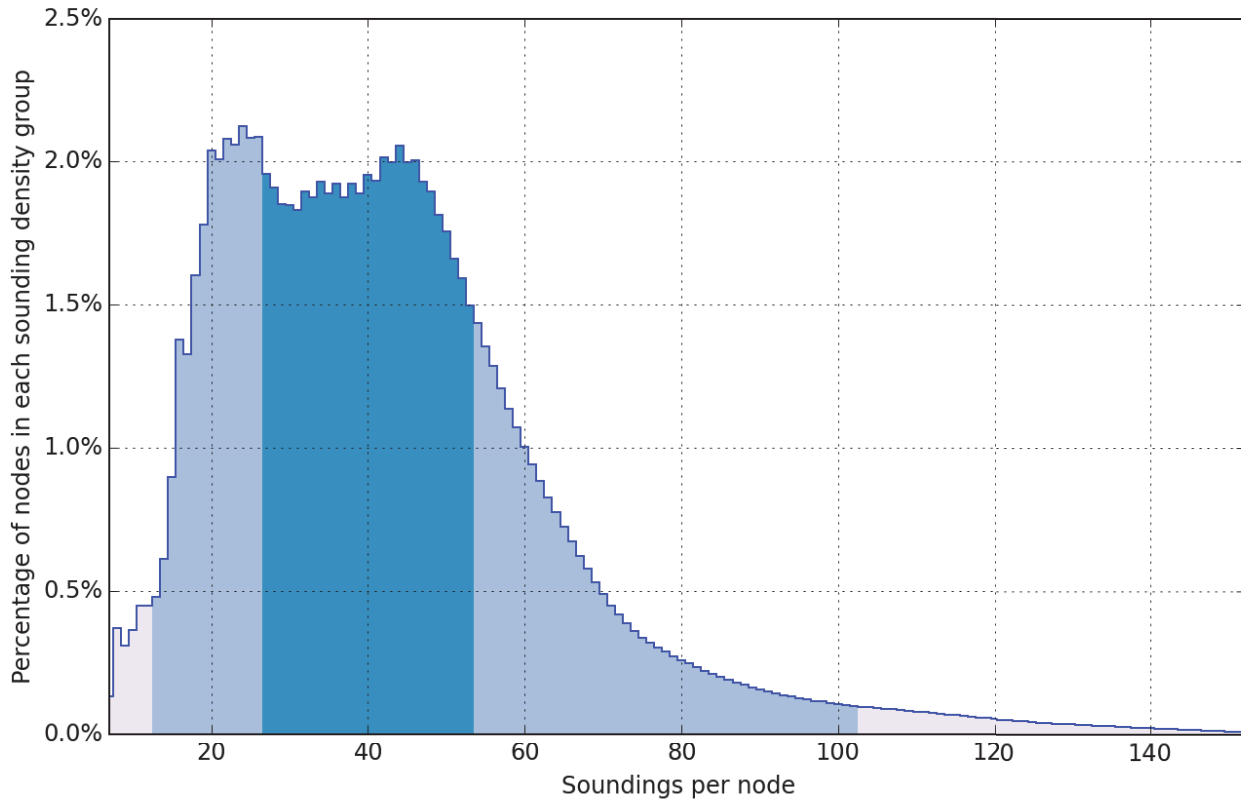
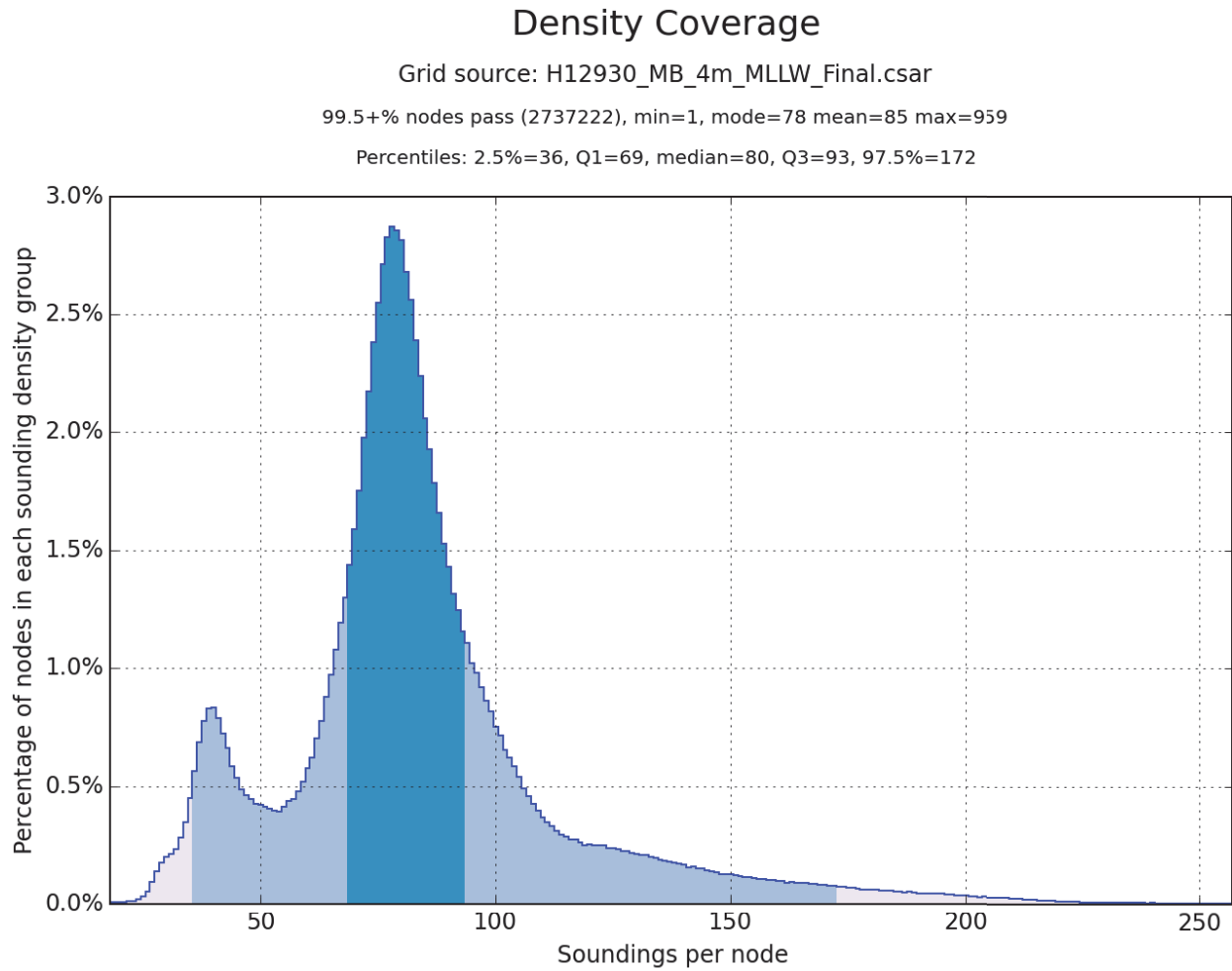


Figure 19: Data density of the 2-meter finalized surface.





*Figure 20: Data density of the 4-meter finalized surface.*

### **B.5.5 Total Vertical Uncertainty Analysis**

Pydro's Finalized CSAR QA tool was used to calculate the percentage of nodes which meet total vertical uncertainty (TVU) specifications for all finalized surfaces. The resulting statistical analysis yielded greater than 99.9% of all nodes meet TVU specifications.

## Uncertainty Standards

Grid source: H12930\_MB\_1m\_MLLW\_Final.csar

99.5+% nodes pass (2217779), min=0.60, mode=0.62 mean=0.63 max=2.10

Percentiles: 2.5%=0.61, Q1=0.61, median=0.62, Q3=0.63, 97.5%=0.66

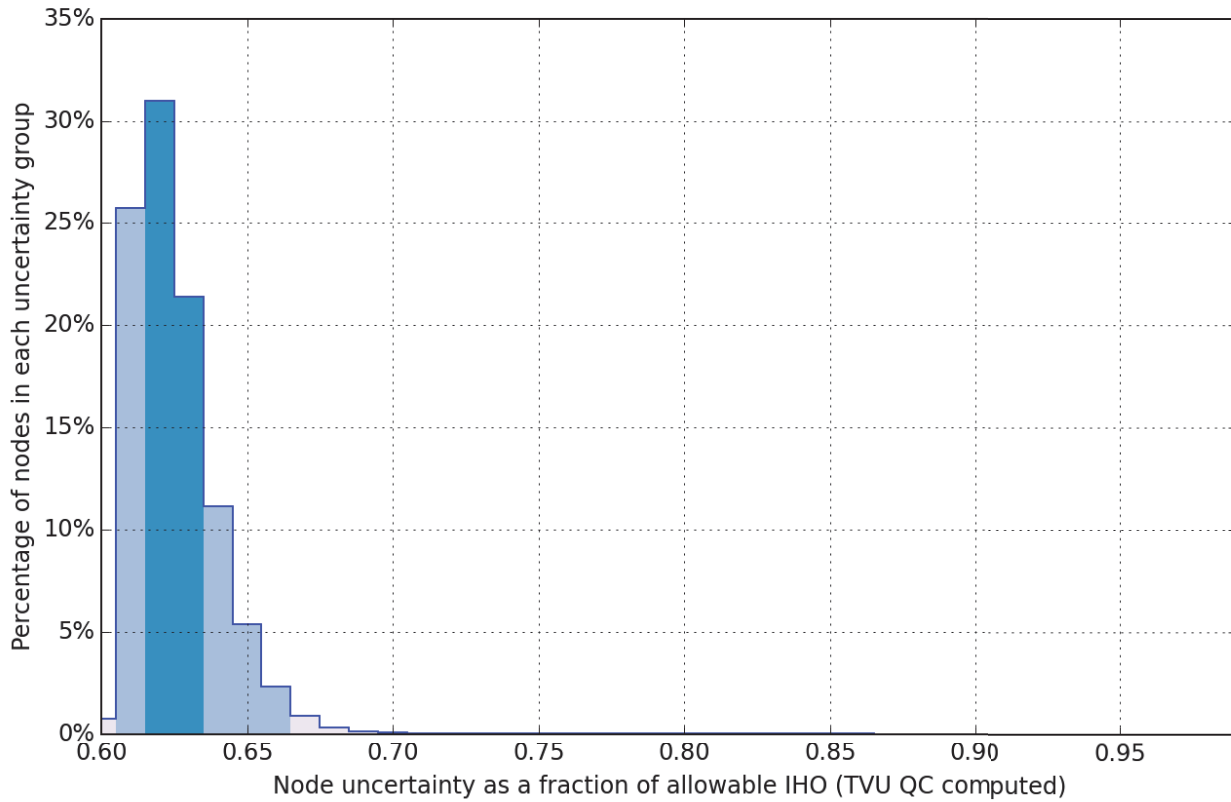


Figure 21: Total Vertical Uncertainty Analysis for 1-meter finalized surface

### Uncertainty Standards

Grid source: H12930\_MB\_2m\_MLLW\_Final.csar

99.5+% nodes pass (75062218), min=0.47, mode=0.59 mean=0.58 max=1.74

Percentiles: 2.5%=0.49, Q1=0.56, median=0.58, Q3=0.61, 97.5%=0.65

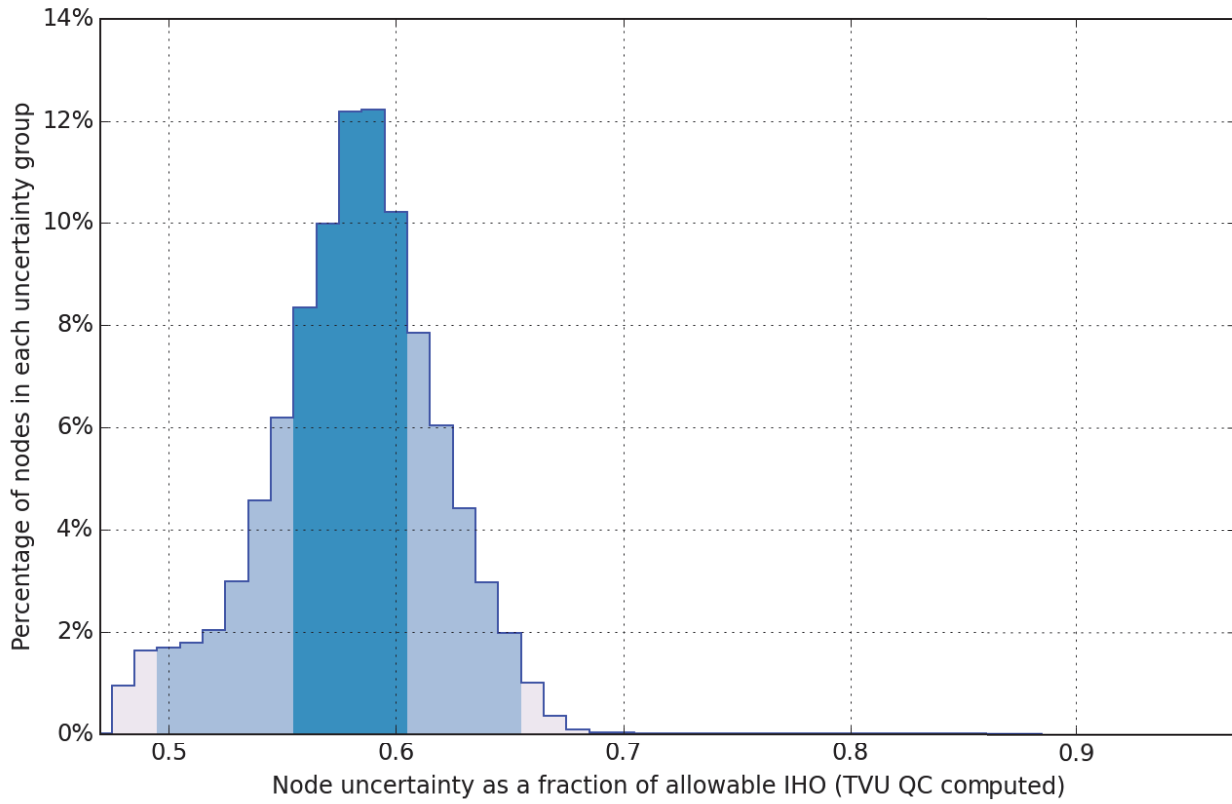


Figure 22: Total Vertical Uncertainty Analysis for 2-meter finalized surface

## Uncertainty Standards

Grid source: H12930\_MB\_4m\_MLLW\_Final.csar

99.5+% nodes pass (2738415), min=0.46, mode=0.49 mean=0.53 max=1.34

Percentiles: 2.5%=0.48, Q1=0.49, median=0.52, Q3=0.55, 97.5%=0.63

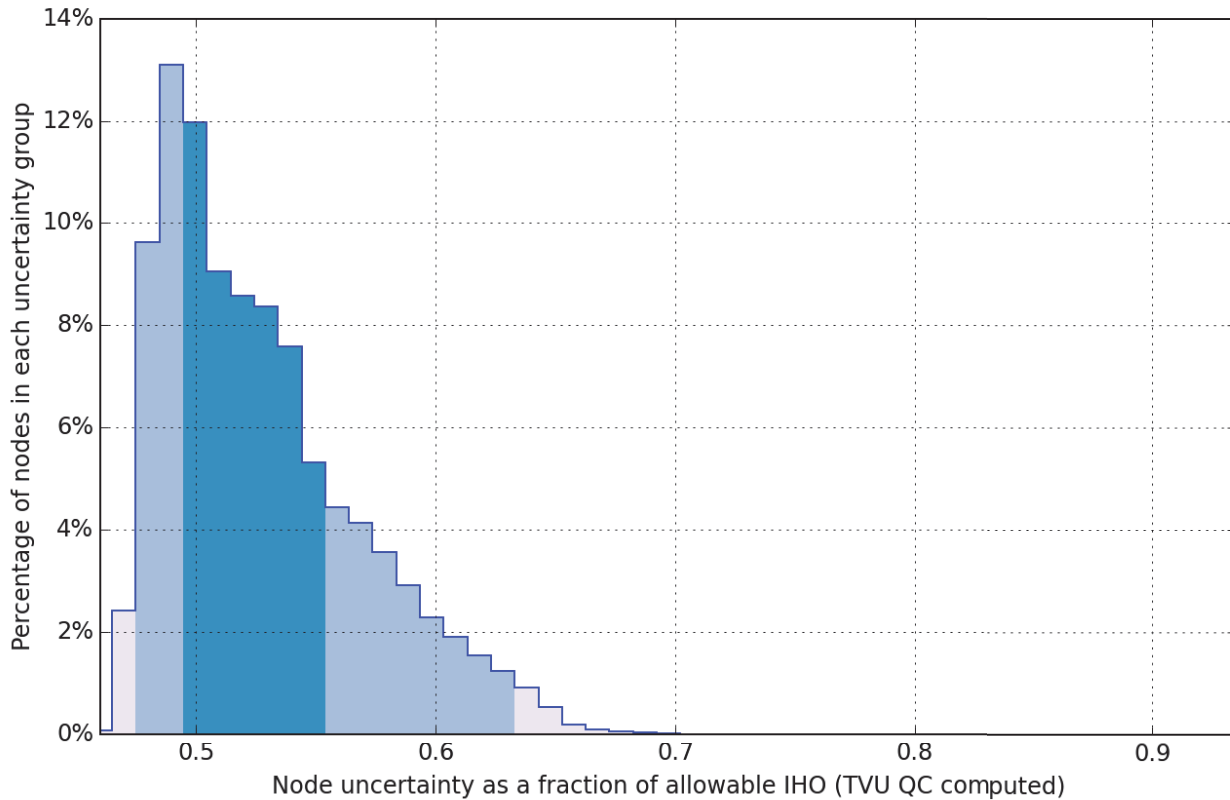


Figure 23: Total Vertical Uncertainty Analysis for 4-meter finalized surface

## C. Vertical and Horizontal Control

Additional information discussing the vertical or horizontal control for this survey can be found in the accompanying ERS Checkline and ERS Capability Memo(s).

### C.1 Vertical Control

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

#### ERS Methods Used:

ERS via VDATUM

#### Ellipsoid to Chart Datum Separation File:

G309FH16ExpandedProjectArea\_xyWGS84-MLLW\_geoid12b

All soundings submitted for H12930 have been reduced to MLLW using documented VDatum techniques.

## C.2 Horizontal Control

The horizontal datum for this project is World Geodetic System of 1984: WGS84 (G1674).

The projection used for this project is UTM Zone 18 North.

An SBAS (satellite base augmentation solution) subscription was utilized through Fugro Marinestar to achieve a post-processed precise point position (5P) solution. See the associated DAPR and ERS Capability Memo for technical details.

The following DGPS Stations were used for horizontal control:

DGPS Stations
Kensington, SC (292 kHz)

*Table 11: USCG DGPS Stations*

## C.3 Additional Horizontal or Vertical Control Issues

### 3.3.1 Marinestar Subscription License

All data for survey H12930 has been reduced to Mean Lower Low Water (MLLW) using documented VDatum techniques. The Ferdinand R. Hassler is equipped with Applanix POS/MV position and orientation systems on the port and starboard hulls. Both POS/MV systems have been integrated with Fugro's Marinestar service, which provides real-time GPS correctors via satellite. The correctors are derived using a Precise Point Positioning (PPP) approach. The POS/MV data was post-processed in Applanix POSpac MMS to produce Smoothed Best Estimates of Trajectory (SBETs) and RMS uncertainty files using the method of Post Processed Precise Point Positioning (5P). The resulting SBETs and RMS files were applied in CARIS HIPS and SIPS to all data for survey H12930.

Main-scheme coverage for H12930 was collected using only the starboard POS/MV for both the port and starboard Reson 7125. During the period main-scheme data was collected the ship had one MarineStar subscription. Cross lines and holiday were collected with using both port and starboard POS/MVs.

### 3.3.2 WGS84 Horizontal Datum

The horizontal datum requirement stated in the 2016 HSSD Section 2.1 was given as World Geodetic System of 1984 (WGS84 (G1674)). The field unit followed this requirement, however after data acquisition had already begun, Hydrographic Technical Directive #2016-03 was published rescinding this requirement and re-established the horizontal datum requirement to be the North American Datum of 1983 (NAD83). Subsequent email correspondence from the Chief of HSD Operations stated that any survey initiated in the WGS84 horizontal datum may be continued for the duration of the project and or sheet. All correspondence are contained in the appendix.

### 3.3.3 Traditional Tides

All soundings for H12930 are reduced to MLLW using documented VDatum techniques. However, if it is deemed necessary to change the water level reduction method to discrete zoned tides, the following information may be useful.

- 1) The National Water Level Observation Network (NWLON) station serving as datum control for this survey is Wrightsville Beach, NC (8658163).
- 2) The verified water level file (8658163.tid) has been loaded for all data in H12930. GPS tides were applied during the final merge process for all data in H12930, as required for ellipsoid-referenced surveys.
- 3) The final discrete zoning file (G309FH2016\_Rev3\_CORP.zdf), as provided in the Tide Note in Appendix I, has been loaded for all data in H12930.
- 4) A request for final approved tides was sent to CO-OPS on December 7, 2016. The final Tide Note was received on December 20, 2016, providing a revised discrete zoning file (G309FH2016\_Rev3\_CORP.zdf) for project OPR-G309-FH-16 due to the destruction of the original datum control station (8661070 - Springmaid Pier, SC) during Hurricane Matthew (October 8 - 9, 2016).

## D. Results and Recommendations

### D.1 Chart Comparison

The hydrographer has compared a sounding plot from the surveyed area to the charted soundings. Additionally, the Chart Review Tool contained in the QC Tools under PydroExplorer was run to compare both ENC (US3SC10M) and (US4NC11M ) to processed sounding data. There are no charted contours to compare.

#### D.1.1 Raster Charts

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

Chart	Scale	Edition	Edition Date	LNМ Date	NM Date
11536	1:80000	20	01/2015	10/04/2016	10/15/2016
11520	1:432720	45	09/2013	08/16/2016	08/24/2016

*Table 12: Largest Scale Raster Charts*

#### 11536

A comparison was performed with Chart 11520 (1:80000) using soundings derived from the 2 meter finalized surface, shown in Figure 24. Charted depths generally agree within 1 to 10 feet of H12930 surveyed soundings.

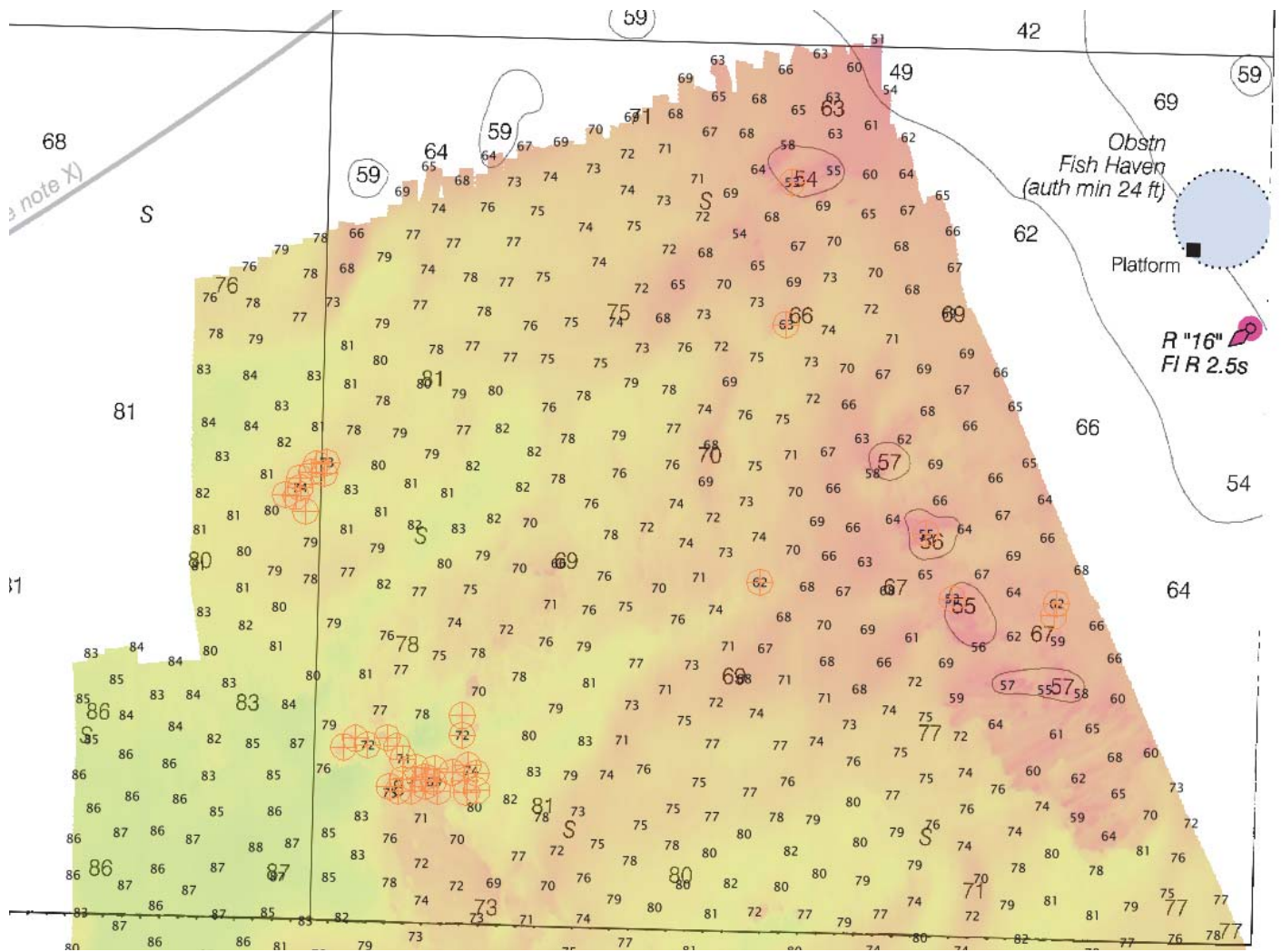


Figure 24: Chart 11536 comparison. Soundings flagged in red are generally 1 - 10 feet shallower than the closest charted sounding.

## 11520

A comparison was performed with Chart 11520 (1:432,720) using soundings derived from the 2 meter finalized surface, shown in Figure 25. Charted depths generally agree within 1 to 2 fathoms of H12930 surveyed soundings.



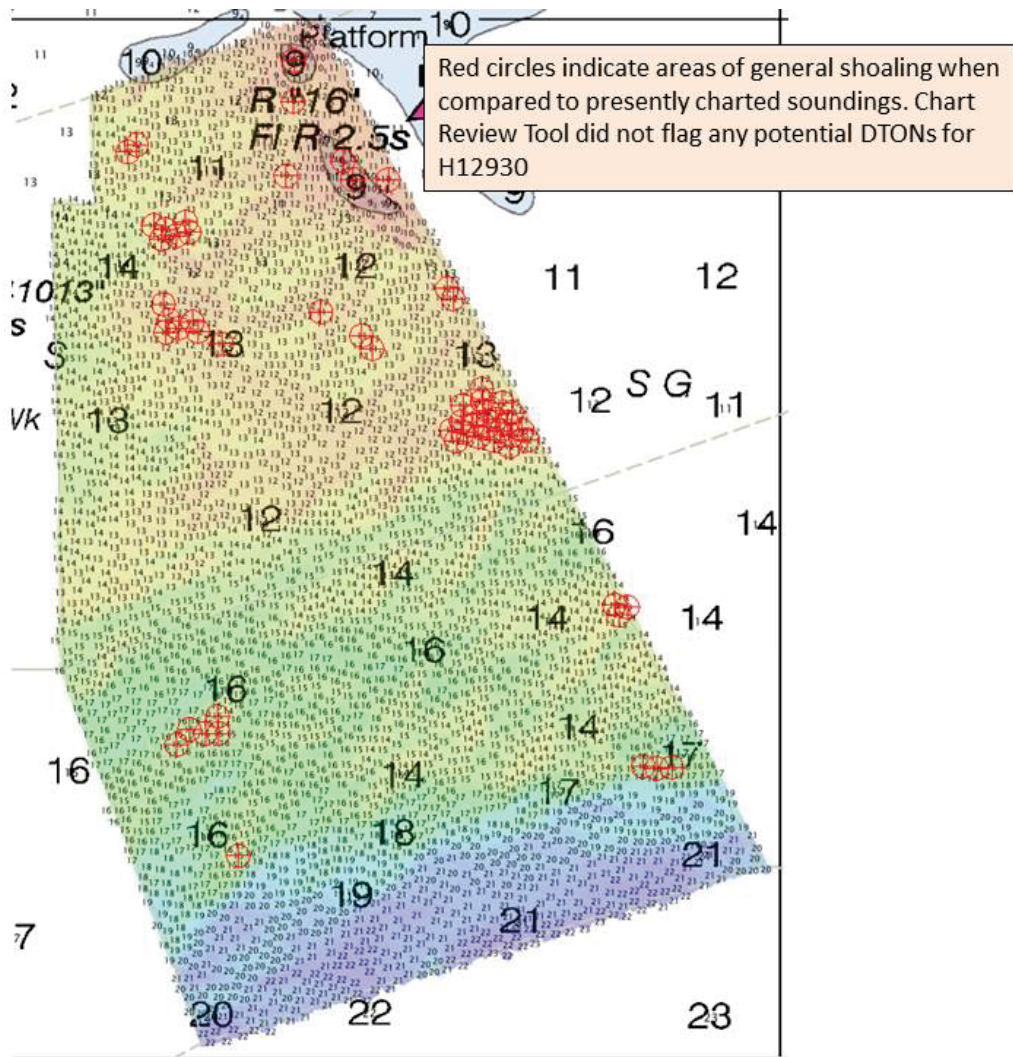


Figure 25: Chart 11520 comparison. Soundings flagged in red are generally 1 -2 fathoms shoaler than the closest charted sounding.

### D.1.2 Electronic Navigational Charts

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

ENC	Scale	Edition	Update Application Date	Issue Date	Preliminary?
US4NC11M	1:80000	21	09/15/2014	06/06/2016	YES
US3SC10M	1:432720	21	09/15/2014	06/06/2016	NO

Table 13: Largest Scale ENC's

### US4NC11M

ENC US4NC11M objects and soundings from within the survey bounds of H12930 were ungrouped in CARIS BASE Editor. Using the QC Tools Chart Comparison function these were then compared to a survey scale sounding set extracted from H12930 with a radius value of 1mm at a 1:300,000 scale. Similar to the visual comparison made for RNC 11520, results showed that minor shoaling of no more than 1-2 fathoms exists.

### US3SC10M

ENC US3SC10M objects and soundings from within the survey bounds of H12930 were ungrouped in CARIS BASE Editor. Using the QC Tools Chart Comparison function these were then compared to a survey scale sounding set extracted from H12930 with a radius value of 1mm at a 1:300,000 scale. Similar to the visual comparison made for RNC 11520, results showed that minor shoaling of no more than 1-2 fathoms exists.

#### **D.1.3 Maritime Boundary Points**

No Maritime Boundary Points were assigned for this survey.

#### **D.1.4 Charted Features**

No charted features exist for this survey.

#### **D.1.5 Uncharted Features**

No uncharted features exist for this survey.

#### **D.1.6 Dangers 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.1.9 Bottom Samples**

Thirteen (13) bottom samples were acquired for this survey. All bottom samples were entered in the H12932 Final Feature File.

**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**

No prior survey comparisons exist for this survey.

**D.2.3 Aids to Navigation**

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

**D.2.4 Overhead Features**

No overhead features exist for this survey.

**D.2.5 Submarine Features**

No submarine features exist for this survey.

**D.2.6 Ferry Routes and Terminals**

No ferry routes or terminals exist for this survey.

**D.2.7 Platforms**

No platforms exist for this survey.

**D.2.8 Significant Features**

No Significant Features exist for this survey.

**D.2.9 Construction and Dredging**

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

**D.2.10 New Survey Recommendation**

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

**D.2.11 Inset Recommendation**


No new insets are recommended for this area.

## E. Approval Sheet

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

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

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

Approver Name	Approver Title	Approval Date	Signature
LCDR Matthew Jaskoski, NOAA	Chief of Party	02/26/2017	
LT Nicholas Morgan, NOAA	Field Operations Officer	02/26/2017	 MORGAN.NICHOLAS.CH ARLES.1292288138 2017.03.01 16:57:04 -05'00'
LCDR Jonathan French, NOAA	Sheet Manager	02/26/2017	FRENCH.JONATHAN.R.1275634880 AN.R.1275634880 <small>Digitally signed by FRENCH.JONATHAN.R.1275634880 DN: cn=U.S. Government, ou=DoD, ou=PKI, ou=NOAA, cn=FRENCH.JONATHAN.R.1275634880 Date: 2017.03.01 10:55:47 -05'00'</small>

## F. Table of Acronyms

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

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

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



APPENDIX I  
TIDES AND WATER LEVELS



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

**PROVISIONAL TIDE NOTE FOR HYDROGRAPHIC SURVEY**

**DATE :** December 16, 2016

**HYDROGRAPHIC BRANCH:** Atlantic

**HYDROGRAPHIC PROJECT:** OPR-G309-FH-2016\_ Revised3

**HYDROGRAPHIC SHEET:** H12930

**LOCALITY:** South Frying Pan Shoal, Approaches to Wilmington, NC

**TIME PERIOD:** August 18 - November 8, 2016

**TIDE STATION USED:** 8658163 Wrightsville Beach, NC

Lat. 34° 12.8'N Long. 77° 47.2' W

**PLANE OF REFERENCE (MEAN LOWER LOW WATER):** 0.000 meters

**HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE:** 1.206 meters

**ESTIMATED ZONING ERROR:** 0.37 meters

**REMARKS: RECOMMENDED ZONING**

**Use zone(s) identified as:** SA108, SA109A

**Refer to attachments for zoning information.**

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

**Note 2:** Annual leveling for Wrightsville Beach, NC (8658163) was not completed in the past year. A review of the verified leveling records from October 2006 to October 2015 shows the tide station benchmark network to be stable within an allowable 0.009 m tolerance. This Tide Note may be used as final stability verification for survey OPR-G309-FH-2016\_Rev3, H12930. CO-OPS will immediately provide a revised Tide Note should subsequent leveling records indicate any benchmark network stability movement beyond the allowable 0.009 m tolerance.

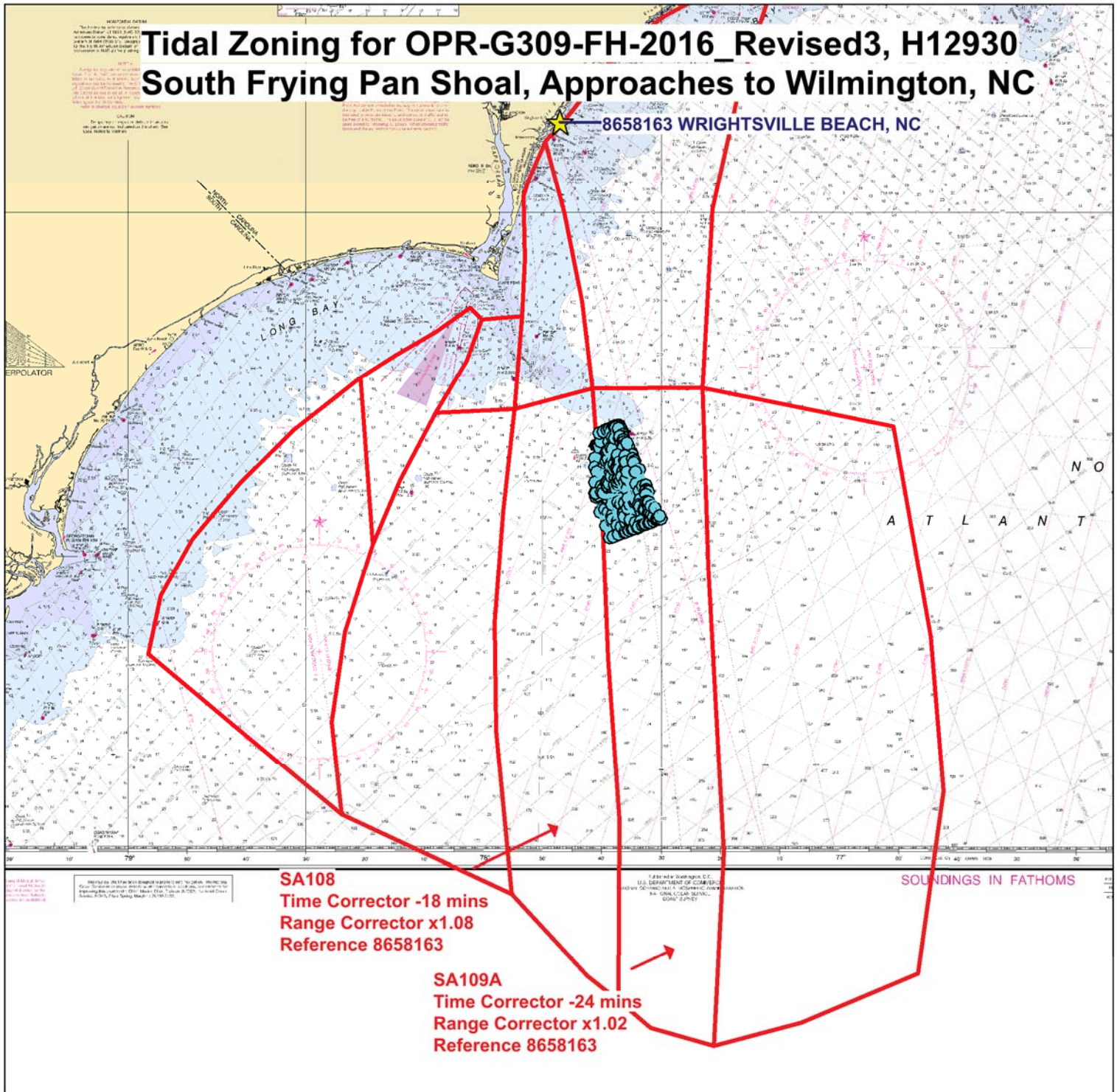
**HOVIS.GERALD.THOMAS.JR.1365860250**

Digitally signed by  
HOVIS.GERALD.THOMAS.JR.1365860250  
DN: c=US, o=U. S. Government, ou=DoD,  
ou=PKI, ou=OTHER,  
cn=HOVIS.GERALD.THOMAS.JR.1365860250  
Date: 2016.12.20 11:16:12 -05'00'

CHIEF, PRODUCTS AND SERVICES BRANCH



# Tidal Zoning for OPR-G309-FH-2016\_ Revised3, H12930 South Frying Pan Shoal, Approaches to Wilmington, NC



## APPENDIX II

# SUPPLEMENTAL SURVEY RECORDS AND CORRESPONDENCE



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

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## combining sheets 7 and 10

4 messages

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**CO.Ferdinand Hassler - NOAA Service Account** <co.ferdinand.hassler@noaa.gov> Sat, Aug 20, 2016 at 7:08 PM  
To: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>, Starla Robinson - NOAA Federal <Starla.Robinson@noaa.gov>

hey, I know we've already started a few lines on sheet 7 but what do you think about combining sheets 7 and 10 into one sheet? It would be about 88 SNM which is pretty big, but we could run North-South lines pretty efficiently

CO

Lieutenant Commander Matthew Jaskoski, NOAA  
Commanding Officer, NOAA Ship *Ferdinand R. Hassler* (S-250)  
CO cell: (240) 687-4602  
Ship's cell: (603) 812-8748  
Sat Phone: (808) 851-3826  
Personal cell: (757) 647-3356

---

**OPS.Ferdinand Hassler - NOAA Service Account** <ops.ferdinand.hassler@noaa.gov> Sun, Aug 21, 2016 at 9:40 AM  
To: "CO.Ferdinand Hassler - NOAA Service Account" <co.ferdinand.hassler@noaa.gov>  
Cc: Starla Robinson - NOAA Federal <Starla.Robinson@noaa.gov>

I think it makes sense to me. We had a sheet in the Chesapeake last year that was about that size. I would have to see if the depths were similar to know if it would be in the ballpark of the same amount of data.

Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*  
29 Wentworth Road  
New Castle, NH, 03854  
[Quoted text hidden]

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**Starla Robinson - NOAA Federal** <starla.robinson@noaa.gov> Mon, Aug 22, 2016 at 3:23 PM  
To: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>  
Cc: "CO.Ferdinand Hassler - NOAA Service Account" <co.ferdinand.hassler@noaa.gov>

HSD is fine with combining sheets 7 and 10 as long as it doesn't cause processing problems. I do believe 7 is shoaler than Chesapeake.

I ask that we continue to make mosaics using a 4 meter grid.

Thank you,  
Starla  
[Quoted text hidden]

Starla D. Robinson, Physical Scientist  
NOS - OCS - Hydrographic Survey Division - Operations Branch  
National Oceanic Atmospheric Administration  
Office: 301-713-2702 x125  
Cell: 360-689-1431  
Website: [In-House Planned Hydrographic Surveys -2016](#)

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**OPS.Ferdinand Hassler - NOAA Service Account** <ops.ferdinand.hassler@noaa.gov> Tue, Aug 23, 2016 at 3:56 PM  
To: Starla Robinson - NOAA Federal <starla.robinson@noaa.gov>  
Cc: "CO.Ferdinand Hassler - NOAA Service Account" <co.ferdinand.hassler@noaa.gov>

Thanks Starla. We'll plan on combining 7-10 then when we get out there.

-Nick

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

[Quoted text hidden]



OPS.Ferdinand Hassler - NOAA Service Account &lt;ops.ferdinand.hassler@noaa.gov&gt;

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**CORMS Morning Report - Wednesday, August 24, 2016**

1 message

**CORMS Operations** <corms@noaa.gov>

Wed, Aug 24, 2016 at 7:52 AM

To: Morning Report &lt;nos.co-ops.cormsmorningreport@noaa.gov&gt;

Cc: corms@noaa.gov

**CORMS Morning Report****Wednesday, August 24, 2016****ALL WATER LEVEL STATION OUTAGES** (missing all data for more than 3 days)

None.

**NWLON STATION ISSUES****8658120** Wilmington (all data) was stopped from 1155 to 1409 UTC 08/23, for maintenance.**8661070** Springmaid Pier (all data) was stopped at 1607 UTC 08/23, for maintenance. A1-DCP1 water level, wind & air press were restarted at 1745 UTC 08/23, after maintenance and review. Water & air temps remain stopped for suspect data.**Great Lakes Water Level 7-Day Summary**

Pass.

**MAPPING/CHARTING STATION ISSUES****8418150** Portland (all DCP's) appears suspect at 1248 UTC 08/22. All data was stopped from 1714 to 1918 UTC 08/23, for maintenance.**8661070** Springmaid Pier L2 is above 60 V until 0630 UTC 08/23 and then returned to normal. L1 appears normal. All DCP's appear missing from 0606 to 1642 UTC 08/23 and suspect (spiking) at 1648 08/23.**8741533** Pascagoula NOAA Lab L2 is below 12.5 V until 1242 UTC 08/23 and after 2354 UTC 08/23. L1 appears normal.**9463502** Port Moller (all DCP's) has several periods of intermittent data.**9464212** Village Cove water levels (all DCP's) are suspect.**PARTNER STATION ISSUES****9414575** Coyote Creek Y1-DCP1 water level is suspect (spiking) from 2100 to 2200 UTC 08/23.**9752619** Isabel Segunda, Vieques Island (PRSN) L2 is missing. L1 appears normal.**9753216** Fajardo (PRSN) L2 is missing. L1 appears normal. All DCP's appear missing from 0854 to 1130 UTC 08/23.**9754228** Yabucoa Harbor (PRSN) L2 is missing. L1 appears normal.

**9757112** Caja de Muertos (PRSN) L2 is missing. L1 appears normal.

**9757809** Arecibo (PRSN) L2 is missing. L1 appears normal.

**9759412** Aguadilla (PRSN) (all) did not update.

**9761115** Barbuda water levels (except T1-DCP1) are suspect (not following predictions).

### **TCOON STATION ISSUES**

**8775237** Port Aransas (TCOON) (all sensors) was stopped at 1704 UTC 08/23, for maintenance.

### **STATIONS IN HIGH WATER CONDITION**

None.

### **PORTS ISSUES**

#### **Chesapeake Bay**

**8573364** Tolchester Beach C1-DCP1 wind was switched to primary at 1448 UTC 08/23, after suspect data ended and review.

#### **Lower Columbia River**

**9440569** Skamokawa N1-DCP1 water level was stopped from 1720 to 2303UTC 08/23, for maintenance.

#### **Voice/Text**

**St. Charles Parish Project** VOICE remains out of service.

For an updated list of current PORTS outages or maintenance, click on the CORMS Instrument Status Page link:  
[https://corms.nos.noaa.gov/instrument\\_status.html](https://corms.nos.noaa.gov/instrument_status.html)

### **TSUNAMI REPORTS**

None.

### **OPERATIONAL FORECAST SYSTEMS**

No problems.

### **IT OPERATIONS**

The PORTS Stations Monitor page for cb0201 York Spit LBB 22 current meter is showing no data, and it appears to be stuck at 1747 UTC 05/09/16.

### **SIGNIFICANT COASTAL WEATHER EVENTS**



Gale Warnings are posted along southwest Alaska. High Surf Advisories are in effect for American Samoa.

## **TROPICAL OUTLOOK**

### **Atlantic, Caribbean Sea, and Gulf of Mexico**

At 0900 UTC 08/24, Tropical Storm Gaston was located about 975 miles west of the Cabo Verde Islands and was moving west-northwest at 15 knots. Maximum sustained winds were 60 knots with gusts to 75 knots. There are no coastal watches or warnings in effect.

A broad area of low pressure located near the southernmost of the Leeward Islands has a medium (50%) chance of becoming a tropical cyclone during the next 48 hours.

Elsewhere, tropical cyclone formation is not expected during the next 48 hours.

### **Eastern Pacific**

An area of low pressure located about 350 miles south-southwest of Manzanillo, Mexico has a high (80%) chance of becoming a tropical cyclone during the next 48 hours.

Elsewhere, tropical cyclone formation is not expected during the next 48 hours.

### **Central/Western Pacific**

At 0900 UTC 08/24, Tropical Depression 14W was located about 500 miles north of Guam and was moving north at 21 knots. TD 14W is moving away from the Marianas. There are no coastal watches or warnings in effect.

Elsewhere, tropical cyclone formation is not expected during the next 48 hours.

## **OPERATIONS STAFF**

Camel Banks / Molly Smith

*Continuous Operational Real-time Monitoring Service*

NOAA/NOS/CO-OPS/OD/PMAB/DMAT/CORMS

<http://tidesandcurrents.noaa.gov>

301-713-2540 (desk)

301-758-4080 (cell)

1-800-For-NOAA



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

## Final Tide Notes for project OPR-G309-FH-2016\_ Revised3, Registry Nos. F00679, H12893, H12894, H12895, H12929, H12930, H12931, H12932, and H12934

12 messages

**Cristina Urizar - NOAA Federal** <cristina.urizar@noaa.gov> Tue, Dec 20, 2016 at 1:31 PM  
 To: "CO.Ferdinand Hassler" <co.ferdinand.hassler@noaa.gov>, "OPS.Ferdinand Hassler" <ops.ferdinand.hassler@noaa.gov>  
 Cc: "\_NOS.CO-OPS.HPT" <nos.coops.hpt@noaa.gov>, Jerry Hovis <gerald.hovis@noaa.gov>, Corey Allen <corey.allen@noaa.gov>, Russell Quintero - NOAA Federal <russell.quintero@noaa.gov>, Castle E Parker <Castle.E.Parker@noaa.gov>, AHB Chief - NOAA Service Account <ahb.chief@noaa.gov>

Dear FERDINAND HASSLER Operations Officer,

Attached is a zipped file containing the final tide files for project OPR-G309-FH-2016\_ Revised3, Registry Nos. F00679, H12893, H12894, H12895, H12929, H12930, H12931, H12932, and H12934. Below is a description of those files. If you have any problems retrieving any of the information, please give me a call. The following files are included in the zipped attachment G309FH2016\_Rev3\_Zoning\_and\_Tide\_Notes.zip for project OPR-G309-FH-2016, F00679, H12893, H12894, H12895, H12929, H12930, H12931, H12932, and H12934:

F00679Rev.pdf  
 H12893Rev.pdf  
 H12894Rev.pdf  
 H12895Rev.pdf  
 H12929.pdf  
 H12930.pdf  
 H12931.pdf  
 H12932.pdf  
 H12934.pdf  
 G309FH2016\_Rev3\_CORP.zdf

**Note that the four (4) revised final tide notes for project OPR-G309-FH-2016\_ Revised3, Registry Nos. F00679, H12893, H12894 and H12895 are being issued to provide consistent final tidal zoning across the project. The final tide files included in this email apply to all tide notes also included in this email.**

There are nine (9) final tide notes for OPR-G309-FH-2016\_ Revised3 in this email. Tide station data for Wrightsville Beach, NC (8658163) may be retrieved via the Internet from the CO-OPS website service at <http://opendap.co-ops.nos.noaa.gov/axis/text.html>. The \*.pdf file is the tide note in Adobe Acrobat format with the graphic.

The following files are the MapInfo zoning files:

G309FH2016\_Rev3\_CORP.DAT  
 G309FH2016\_Rev3\_CORP.ID  
 G309FH2016\_Rev3\_CORP.IND  
 G309FH2016\_Rev3\_CORP.MAP  
 G309FH2016\_Rev3\_CORP.TAB  
 G309FH2016\_Rev3\_LABP.DAT  
 G309FH2016\_Rev3\_LABP.ID  
 G309FH2016\_Rev3\_LABP.MAP  
 G309FH2016\_Rev3\_LABP.TAB  
 G309FH2016\_Rev3\_STNP.DAT  
 G309FH2016\_Rev3\_STNP.ID  
 G309FH2016\_Rev3\_STNP.IND

G309FH2016\_Rev3\_STNP.MAP  
G309FH2016\_Rev3\_STNP.TAB

Please e-mail me when you have captured all files successfully. Give me a call at [727-209-5954](tel:727-209-5954), if there are any problems.

--  
Cristina Urizar  
Oceanographer

National Oceanic and Atmospheric Administration  
NOS/CO-OPS/Oceanographic Division  
263 13th Avenue South, Rm. 302  
St Petersburg, Florida 33701  
Office: [727-209-5954](tel:727-209-5954)  
Cell: [301-325-6793](tel:301-325-6793)

<http://tidesandcurrents.noaa.gov>

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 **G309FH2016\_Rev3\_Zoning\_and\_Tide\_Notes.zip**  
6604K

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**OPS.Ferdinand Hassler - NOAA Service Account**

Mon, Jan 9, 2017 at  
1:14 PM

<ops.ferdinand.hassler@noaa.gov>

To: Starla Robinson - NOAA Federal <Starla.Robinson@noaa.gov>

Cc: Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>, CO HASSLER

<co.ferdinand.hassler@noaa.gov>

Hi Starla,

CO-OPS has provided a revised zoning file for all of the surveys that were done pre-hurricane Matthew (H12893, 94, 95, and F00679). I was planning on doing a final shipboard review with the CO and Jeff Marshall when he comes out here over the next couple of weeks. Do we need to re-apply final tides using the new Wrightsville Beach, NC tide station that we switched to Post-Hurricane Matthew? Or should we keep it using the Springmaid Pier, SC station? I guess the question is, do we want to submit all surveys using a single tide station or Springmaid for pre-Hurricane Matthew and Wrightsville for post-Hurricane Matthew?

Personally I don't really want to have to go in and re-apply tides to three surveys that we are close to sending off. But if we think this saves headaches down the line we can.

V/r  
Nick

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

[Quoted text hidden]

---

**Starla Robinson - NOAA Federal** <starla.robinson@noaa.gov>

Mon, Jan 9, 2017 at 3:00 PM

To: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>, Corey Allen -

NOAA Federal <corey.allen@noaa.gov>, "russell.quintero" <russell.quintero@noaa.gov>

Cc: Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>, CO HASSLER

<co.ferdinand.hassler@noaa.gov>

[I will look into it. I am CCing Corey and LT Quintero on this email.](#)

[Quoted text hidden]

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*Starla D. Robinson, Physical Scientist*  
*NOS - OCS - Hydrographic Survey Division - Operations Branch*  
*National Oceanic Atmospheric Administration*  
*Office: 301-713-2702 x125*  
*Cell: 360-689-1431*  
*Website: [HSD Planned Hydrographic Surveys](#)*

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**Starla Robinson - NOAA Federal** <starla.robinson@noaa.gov>

Mon, Jan 9, 2017 at 3:31 PM

To: cristina.urizar@noaa.gov

Cc: Corey Allen - NOAA Federal <corey.allen@noaa.gov>, "russell.quintero" <russell.quintero@noaa.gov>, "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>

Hello Cristina,

I am the HSD project manager for OPR-G309-FH-2016. The first four surveys for the project were completed well before the hurricane. They are processed and nearly complete. Would it be possible to use the original Springmaid Pier, SC final water levels and zones for those four surveys? We would like a final tide note referencing Springmaid Pier, unless there is a compelling reason not to.

Thank you,  
Starla

**Note that the four (4) revised final tide notes for project OPR-G309-FH-2016\_Revised3, Registry Nos. F00679, H12893, H12894 and H12895 are being issued to provide consistent final tidal zoning across the project. The final tide files included in this email apply to all tide notes also included in this email.**

[Quoted text hidden]

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*Starla D. Robinson, Physical Scientist*  
*NOS - OCS - Hydrographic Survey Division - Operations Branch*  
*National Oceanic Atmospheric Administration*  
*Office: 301-713-2702 x125*  
*Cell: 360-689-1431*  
*Website: [HSD Planned Hydrographic Surveys](#)*

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**Cristina Urizar - NOAA Federal** <cristina.urizar@noaa.gov>

Tue, Jan 10, 2017 at 9:05 AM

To: Starla Robinson - NOAA Federal <starla.robinson@noaa.gov>

Cc: Corey Allen - NOAA Federal <corey.allen@noaa.gov>, "russell.quintero" <russell.quintero@noaa.gov>, "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>, "\_NOS.CO-OPS.HPT" <nos.coops.hpt@noaa.gov>, Jerry Hovis <gerald.hovis@noaa.gov>

Good morning,

It was nice chatting with you yesterday afternoon, Starla. Below is a summary of our conversation.

Before I began working on the tide notes, Colleen reached out to Corey to discuss the various products HPT provided OCS (preliminary zoning and revised preliminary zoning) and how the files were labeled. In that conversation, Corey and Colleen agreed that the best way forward was for CO-OPS to deliver zoning based on Wrightsville Beach, NC that would be used to process all the data collected for G309 regardless of when it was collected (pre- or post-hurricane Matthew). This was to be done for three reasons:

1. The estimated error of the zoning based on Wrightsville Beach is less than the estimated error of the zoning based on Springmaid Pier.
2. To provide consistency across the project as a whole in the processing phase. Switching between control stations may introduce error.
3. To reduce any confusion regarding which files to use in the final processing of the data.

The tidal zoning provided in the previously delivered tide notes using Springmaid Pier as control (with Reg Nos. F00679, H12893, H12894 and H12895) was within OCS error tolerances.

Thank you,  
Cristina

[Quoted text hidden]

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**Starla Robinson - NOAA Federal** <starla.robinson@noaa.gov> Thu, Jan 12, 2017 at 8:52 AM  
To: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>  
Cc: Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>, "russell.quintero" <russell.quintero@noaa.gov>

Hello Nick,

Could you send us an estimate on how much time it would take to apply the Wrightsville Beach, NC tide station data to the three pre-hurricane surveys and the difference in uncertainty it will gain us?

Thank you,  
Starla

[Quoted text hidden]

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*Starla D. Robinson, Physical Scientist*  
*NOS - OCS - Hydrographic Survey Division - Operations Branch*  
*National Oceanic Atmospheric Administration*  
*Office: 301-713-2702 x125*  
*Cell: 360-689-1431*  
*Website: [HSD Planned Hydrographic Surveys](#)*

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**OPS.Ferdinand Hassler - NOAA Service Account** Thu, Jan 12, 2017 at 9:28 AM  
<ops.ferdinand.hassler@noaa.gov>  
To: Starla Robinson - NOAA Federal <starla.robinson@noaa.gov>  
Cc: Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>, "russell.quintero" <russell.quintero@noaa.gov>

Starla,

We are reviewing all 3 of Jeff's surveys with the CO tomorrow. Do we want to go down this hole? This would be a big hold-up and we are trying to review these while Jeff is here and he's likely leaving this weekend. It appears that our ship won't be getting U/W for this habitat mapping leg (likely it seems right now at least). This is affording us a really good opportunity to get these surveys off the ship. It's hard to say how long it would take but applying the tides, merging, TPU...etc, recomputed surfaces and then making changes to the DRs. Maybe call it a week? Then we'd be kicking the review down the road. What would we really gain?

-Nick

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

[Quoted text hidden]

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**Russell Quintero - NOAA Federal** <russell.quintero@noaa.gov>

Thu, Jan 12, 2017 at 10:00  
AM

To: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>  
Cc: Starla Robinson - NOAA Federal <starla.robinson@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>

Nick,

There's a lot going on over here, so I'm trying to sort out the exact state of things and haven't gotten far yet. My intention is to try and change things as little as possible once we start down a path; minimize changes to the PI and similarly minimize changes to the requests we send to CO-OPS. Stability breeds efficiency. It seems from a very brief chat with Starla that the agreement with CO-OPS may not have been communicated to her or to you, but using the older gauge causes non-trivial costs on other offices.

If you proceed with preliminary tides, CO-OPS will need to generate a new set of final tides and we all know how long that takes. AHB will need to apply them and do all of the processing that you would do if you just applied the final already given to you, and then AHB would need to check for any problems. This also gets a little odd as any data QC issues in the surfaces they created now may not have been there when you delivered it...they are now QCing their own product instead of yours.

As for the timeline, I think a week is grossly inflated if getting this off is a priority. How many places in the DR does this exist? By memory I can think of one; updating this is a 15 minute job total for all 3 surveys. It's not much different than fixing a typo or some verbiage the CO doesn't like that's identified during the review. In fact, there is no real reason to fix it before the review; just note that it will be changed.

Apply Tides, Merge, and TPU surely take less than 3 hours total. Caris doesn't multithread efficiently unless something has changed a lot in Caris 10 and the network is the primary bottleneck on most ships, so you can run all 3 surveys on one machine or just use more than one computer, set them all to go, and come back at the end of the workday. I'm certain they would be done.

Save a copy of the current surfaces, difference the new one to highlight any major changes. That's a 20 minute process max, plus 30 for scanning the surfaces for changes.

You can also proceed with the survey review simply knowing that this process is pending, and with the expectation that any big changes get brought to the FOO/CO's attention. 99.5% of the content in the DR and the FFF will be unchanged, and the bathy should improve if anything.

If we failed to communicate the change in tide station to you, I can certainly appreciate your frustration and I apologize. However, the right answer here isn't kicking the can down the pipeline for someone else to fix, and the most efficient fix is to fix it now, on the ship.

V/r,  
Russ

Lieutenant Russell Quintero, NOAA  
Chief, Hydrographic Surveys Division Operations Branch  
National Oceanic & Atmospheric Administration  
1315 East-West Hwy, SSMC3 6217  
Silver Spring, MD 20910  
Cell: 970-481-2030

[Quoted text hidden]

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**OPS.Ferdinand Hassler - NOAA Service Account**

<ops.ferdinand.hassler@noaa.gov>

To: Russell Quintero - NOAA Federal <russell.quintero@noaa.gov>

Thu, Jan 12, 2017 at  
10:13 AM

Cc: Starla Robinson - NOAA Federal <starla.robinson@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>

Hi Russ,

Just FYI we had received final tides for Springmaid Pier (the original gauge) long ago. So these three surveys already have final tides applied but from Springmaid Pier.

-V/r  
Nick

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

[Quoted text hidden]

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**Russell Quintero - NOAA Federal** <russell.quintero@noaa.gov> Thu, Jan 12, 2017 at 10:20 AM  
To: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>  
Cc: Starla Robinson - NOAA Federal <starla.robinson@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>

Yeah, I'm on the phone with CO-OPS right now and they just told me that.

I'll get back to you shortly.

Lieutenant Russell Quintero, NOAA  
Chief, Hydrographic Surveys Division Operations Branch  
National Oceanic & Atmospheric Administration  
1315 East-West Hwy, SSMC3 6217  
Silver Spring, MD 20910  
Cell: 970-481-2030

[Quoted text hidden]

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**Russell Quintero - NOAA Federal** <russell.quintero@noaa.gov> Thu, Jan 12, 2017 at 10:28 AM  
To: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>  
Cc: Starla Robinson - NOAA Federal <starla.robinson@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>

Just got off the phone with CO-OPS. I was incorrectly under the assumption that you had only preliminary from the original gauge that was taken out during the hurricane.

These four have final tides for both stations. The uncertainty is slightly lower using Wrightsville, but Springmaid is in spec and can be used if it's more convenient.

F00679  
H12893  
H12894  
H12895

These have survey before and after the hurricane and must use the Wrightsville gauge.

H12929  
H12930  
H12931

H12932  
H12934

Hopefully that helps you get these off the ship.

R/  
Russ

Lieutenant Russell Quintero, NOAA  
Chief, Hydrographic Surveys Division Operations Branch  
National Oceanic & Atmospheric Administration  
1315 East-West Hwy, SSMC3 6217  
Silver Spring, MD 20910  
Cell: 970-481-2030

[Quoted text hidden]

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**OPS.Ferdinand Hassler - NOAA Service Account**

Thu, Jan 12, 2017 at  
10:38 AM

<ops.ferdinand.hassler@noaa.gov>

To: Russell Quintero - NOAA Federal <russell.quintero@noaa.gov>

Cc: Starla Robinson - NOAA Federal <starla.robinson@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>

Great, thanks Russ. It will definitely help. I know a week was probably exaggerating but the way things go on this ship any derailment when making good progress can turn into a lot of time letting a survey sit because nobody is here to work on it. So I was exaggerating because we don't have a designated person to work on it once Jeff leaves.

-Nick

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

[Quoted text hidden]





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

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## Fwd: Wilmington Bottom Sample Guidance

7 messages

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**Nicholas Morgan - NOAA Federal** <nicholas.morgan@noaa.gov>

Sat, Oct 1, 2016 at 10:55 AM

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

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

From: **Starla Robinson - NOAA Federal** <starla.robinson@noaa.gov>

Date: Sat, Oct 1, 2016 at 10:39 AM

Subject: Wilmington Bottom Sample Guidance

To: Nicholas Morgan - NOAA Federal <nicholas.morgan@noaa.gov>, Matthew Jaskoski - NOAA Federal <Matthew.Jaskoski@noaa.gov>, Chris Taylor - NOAA Federal <chris.taylor@noaa.gov>, Adam Reed - NOAA Federal <adam.reed@noaa.gov>, Michael White - NOAA Affiliate <michael.white@noaa.gov>, Juliet Kinney - NOAA Affiliate <juliet.kinney@noaa.gov>

Cc: Ashley Chappell - NOAA Federal <ashley.chappell@noaa.gov>

OPS,

Here is the guidance for the next set of the Wilmington bottom samples, and some other useful documents. Please let me know what you think, and add to this. The main changes are recording the position of the camera, and guidance on what to send to Chris and I. This is a starting place, incorporating what feedback I received from the first round.

We are going to get drop cameras for the fleet. I am was thinking we could send these documents and any resulting SOP with the drop cameras.

In addition to this guidance we would like to hear your feedback on the operation of the drop camera. Please send that review to me and Juliet and I.

It was also recommended we incorporating Coastal and Marine Ecological Classification Standard (CMECS) into our classification methodology. We are still looking into that, but if you are interested more information is at: <https://www.cmeccatalog.org/>.

Thank you,  
Starla

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*Starla D. Robinson, Physical Scientist*

*NOS - OCS - Hydrographic Survey Division - Operations Branch*

*National Oceanic Atmospheric Administration*

*Office: 301-713-2702 x125*

*Cell: 360-689-1431*

*Website: [In-House Planned Hydrographic Surveys -2016](#)*

--

*LT Nick Morgan, NOAA*

*Operations Officer*

*NOAA Ship Ferdinand R. Hassler*

**Physical Address (UPS/FedEx):**

*UNH Judd Gregg Marine Research Complex*

*29 Wentworth Rd.*

*New Castle, NH 03854*

**Mailing Address:**

*PO Box 638*

New Castle, NH 03854

Ship's landline: 603-431-4500

Ship's cell: 603-812-8748

Cell Phone: 907-617-0963

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 **Bottom\_Sample\_Guidance.zip**  
10828K

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**Starla Robinson - NOAA Federal** <starla.robinson@noaa.gov> Wed, Nov 9, 2016 at 5:11 PM  
To: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>, John Doroba - NOAA Federal <john.doroba@noaa.gov>, Chris Taylor - NOAA Federal <chris.taylor@noaa.gov>, Michael White - NOAA Affiliate <michael.white@noaa.gov>, Juliet Kinney - NOAA Affiliate <juliet.kinney@noaa.gov>, Cody Guilday - NOAA Affiliate <cody.guilday@noaa.gov>  
Cc: Matthew Jaskoski - NOAA Federal <Matthew.Jaskoski@noaa.gov>, Nicholas Morgan - NOAA Federal <nicholas.morgan@noaa.gov>, "CO.Ferdinand Hassler - NOAA Service Account" <co.ferdinand.hassler@noaa.gov>, Adam Reed - NOAA Federal <adam.reed@noaa.gov>

Hello FH Folk,

As you make your triumphant return, I want to remind you that we would like the additional bottom characteristic products listed in the attached guidance package.

Please make the mosaics at the same resolution the bathymetry, and record the processing times in the [backscatter metrics](#) log.

Please copy this email and documents into your correspondence folder.

Thank you,  
Starla

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

From: **Starla Robinson - NOAA Federal** <starla.robinson@noaa.gov>

Date: Sat, Oct 1, 2016 at 10:39 AM

Subject: Wilmington Bottom Sample Guidance

To: Nicholas Morgan - NOAA Federal <nicholas.morgan@noaa.gov>, Matthew Jaskoski - NOAA Federal <Matthew.Jaskoski@noaa.gov>, Chris Taylor - NOAA Federal <chris.taylor@noaa.gov>, Adam Reed - NOAA Federal <adam.reed@noaa.gov>, Michael White - NOAA Affiliate <michael.white@noaa.gov>, Juliet Kinney - NOAA Affiliate <juliet.kinney@noaa.gov>

Cc: Ashley Chappell - NOAA Federal <ashley.chappell@noaa.gov>

OPS,

Here is the guidance for the next set of the Wilmington bottom samples, and some other useful documents. Please let me know what you think, and add to this. The main changes are recording the position of the camera, and guidance on what to send to Chris and I. This is a starting place, incorporating what feedback I received from the first round.

We are going to get drop cameras for the fleet. I am was thinking we could send these documents and any resulting SOP with the drop cameras.

In addition to this guidance we would like to hear your feedback on the operation of the drop camera. Please send that review to me and Juliet and I.

..

Thank you,  
Starla

--

*Starla D. Robinson, Physical Scientist*

NOS - OCS - Hydrographic Survey Division - Operations Branch

National Oceanic Atmospheric Administration

Office: 301-713-2702 x125

Cell: 360-689-1431

Website: [HSD Planned Hydrographic Surveys](#)

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 **Bottom\_Sample\_Guidance.zip**  
10828K

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**Michael White - NOAA Affiliate** <michael.white@noaa.gov>

Thu, Nov 10, 2016 at 9:19 AM

To: Starla Robinson - NOAA Federal <starla.robinson@noaa.gov>

Cc: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>, John Doroba - NOAA Federal <john.doroba@noaa.gov>, Chris Taylor - NOAA Federal <chris.taylor@noaa.gov>, Juliet Kinney - NOAA Affiliate <juliet.kinney@noaa.gov>, Cody Guilday - NOAA Affiliate <cody.guilday@noaa.gov>, Matthew Jaskoski - NOAA Federal <Matthew.Jaskoski@noaa.gov>, Nicholas Morgan - NOAA Federal <nicholas.morgan@noaa.gov>, "CO.Ferdinand Hassler - NOAA Service Account" <co.ferdinand.hassler@noaa.gov>, Adam Reed - NOAA Federal <adam.reed@noaa.gov>

Hi All,

The mosaics were currently being gridded at 4 meter cells. Likely the data will support finer resolutions, but it is not what the SOP instructs. The SOP states, "The final exported Mosaic (.tiff) will be approximately 5% of the Mosaic Memory used in FMGT by a single tile...If the export exceeds 20MB, use a coarser resolution." For the attached spreadsheet I would suggest having two more columns labeled "Mosaic Memory" and "Pixel Size."

Additionally:

1) The default range of the FMGT histogram is 10 to -70. Typically mosaics will only populate part of this range. If the processor resets the bounds of the histogram to match the spread of the created mosaic and *then* exports the TIFF, the resulting mosaic will have better contrast and look less "grayed out."

I placed two examples in: R:\Temporary\_Fledermaus\_Projects\H1229\_S250Port\_400kHz.fmproj\Output\SD

2) In FMGT under the Settings tab -> Processing Parameters there is a window to set the acquisition system. By selecting, "Reson 2175" the default setting will fill in for all of the fields. These can be adjusted to match the true values for each head, but having the defaults set will likely result in better mosaics. This is not in the SOP.

For the operation of the bottom camera and sediment samples:

Along with the images from the bottom sampler, Cody and I were taking images on deck of the samples and storing them in the Multimedia folder. These may be useful for additional characterization/verification of the sediment characterization. We might want to consider keeping them with the bottom sample images. I would say the bottom sample images are better at showing the in situ bottom type (ripples, bio cover, large clasts) compared to capturing fine scale sediment size. Chris Taylor may have more to say from a habitat perspective. I will attach examples.

Currently the plan is attaching one image to each sample. Do we have guidelines to choose the image? I.e. what makes one image better than the others. Attached are the images from Samples 4, 5 and 6

 **Examples.zip**

for H12930. Some show the bottom type, some a close up of the sediment and the hand sample. If we attach one image, which image?

The grab sampler also seems to take more reliable samples when the camera is attached. When the camera was not operational, we had several stations without samples but always got a sample with the device attached. Even if the camera is not working, may be worth have the device attached to the grabber.

Hope this input helps,

Mike White

[Quoted text hidden]

--

Michael P. White  
Hydrographic Analyst (E.R.T., Inc.)  
NOAA/CCOM Joint Hydrographic Center  
UNH, Durham

---

**Starla Robinson - NOAA Federal** <starla.robinson@noaa.gov>

Thu, Nov 10, 2016 at 5:35 PM

To: Michael White - NOAA Affiliate <michael.white@noaa.gov>, "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>, John Doroba - NOAA Federal <john.doroba@noaa.gov>, Chris Taylor - NOAA Federal <chris.taylor@noaa.gov>, Juliet Kinney - NOAA Affiliate <juliet.kinney@noaa.gov>, Cody Guilday - NOAA Affiliate <cody.guilday@noaa.gov>, Matthew Jaskoski - NOAA Federal <Matthew.Jaskoski@noaa.gov>, Nicholas Morgan - NOAA Federal <nicholas.morgan@noaa.gov>, Adam Reed - NOAA Federal <adam.reed@noaa.gov>

Cc: "CO.Ferdinand Hassler - NOAA Service Account" <co.ferdinand.hassler@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>, "russell.quintero" <russell.quintero@noaa.gov>

Good point Mike,

Looking back through my files I think we did 4 meter resolution backscatter as well. So please do not do any additional 2 meter mosaic creation until I can check in with Chris.

For the final product I have been asking for a non-stretched mosaic, because that is the easiest way to keep the range consistent between sheets. If we were to expand this requirements to other projects we would want to keep it standardized between platform/sonar units. I was stretching the grayscale contrast to do the bottom sample selection. If you were the customer, what would you find useful? Or would you rebuild mosaics from the raw data?

For the Final Features file you can connect multiple images. My suggestion is choose one that shows the substrate well, and one that shows the surrounding habitat, if it adds useful data. No more than 4 images, less is better. From a habitat point of view what do you think would be useful? This is not a rhetorical question, we could use the input.

The Wilmington project is a collaboration between HSD / NCCOS / and UNH-JHC-CCOM. We have been asking for additional products and ideas along the way so we could meet each group's needs; and explore different ways of doing things. Your input is essential. Any ideas or advice you can give, now is the time, so we can add it to our recommendations.

Thank you for making this project a reality!

- Starla

[Quoted text hidden]

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**Chris Taylor - NOAA Federal** <chris.taylor@noaa.gov>

Fri, Nov 18, 2016 at 8:00 AM

To: Starla Robinson - NOAA Federal <starla.robinson@noaa.gov>

Cc: Michael White - NOAA Affiliate <michael.white@noaa.gov>, "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>, John Doroba - NOAA Federal <john.doroba@noaa.gov>, Juliet Kinney - NOAA Affiliate <juliet.kinney@noaa.gov>, Cody Guilday - NOAA Affiliate <cody.guilday@noaa.gov>, Matthew Jaskoski - NOAA Federal <Matthew.Jaskoski@noaa.gov>, Nicholas Morgan - NOAA Federal <nicholas.morgan@noaa.gov>, Adam Reed - NOAA Federal <adam.reed@noaa.gov>, "CO.Ferdinand Hassler - NOAA Service Account" <co.ferdinand.hassler@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>, "russell.quintero" <russell.quintero@noaa.gov>

All,

Thanks for the update on this project and sorry for the delays in responding. I concur with all that Starla and Mike have presented regarding resolution for mosaics. We (NCCOS) appreciate the extra effort gathering and managing bottom sample/imagery. We look forward to reviewing the imagery and producing some preliminary seafloor characterization surfaces.

We look forward to collaborating with HSD and others on future projects where we are able to improve seafloor habitat mapping in concert with core mission objectives for OCS.

Regards,  
Chris

[Quoted text hidden]

--

J. Christopher Taylor, PhD  
National Centers for Coastal Ocean Science  
@ NOAA's Beaufort Laboratory  
101 Pivers Island Road, Beaufort, North Carolina 28516  
O: +1 252 838 0833 M: +1 252 723 3993  
Website: <http://coastalscience.noaa.gov/>

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**Starla Robinson - NOAA Federal** <starla.robinson@noaa.gov> Fri, Nov 18, 2016 at 6:29 PM  
To: Chris Taylor - NOAA Federal <chris.taylor@noaa.gov>, "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>  
Cc: Matthew Jaskoski - NOAA Federal <Matthew.Jaskoski@noaa.gov>, Nicholas Morgan - NOAA Federal <nicholas.morgan@noaa.gov>, Adam Reed - NOAA Federal <adam.reed@noaa.gov>, "CO.Ferdinand Hassler - NOAA Service Account" <co.ferdinand.hassler@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>, "russell.quintero" <russell.quintero@noaa.gov>, Michael White - NOAA Affiliate <michael.white@noaa.gov>, Cody Guilday - NOAA Affiliate <cody.guilday@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>

OPS,

Four meter backscatter mosaics, or whatever you used, are fine. How do we best get the data from you?

Thank you,  
Starla

[Quoted text hidden]

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**Starla Robinson - NOAA Federal** <starla.robinson@noaa.gov> Wed, Dec 21, 2016 at 3:19 PM  
To: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>  
Cc: Matthew Jaskoski - NOAA Federal <Matthew.Jaskoski@noaa.gov>, Nicholas Morgan - NOAA Federal <nicholas.morgan@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>, "CO.Ferdinand Hassler - NOAA Service Account" <co.ferdinand.hassler@noaa.gov>, Briana Welton - NOAA Federal <briana.welton@noaa.gov>, "russell.quintero" <russell.quintero@noaa.gov>

Hello Hassler,

Congratulations on pulling off another amazing and challenging year. What you have accomplished as a ship -especially a ship with no stable survey department- is impressive. I am singing your successes among the halls. I am currently writing up a project summary and I cannot wait to share it. That said...

I am looking through the preliminary bottom sample data, and I saw some things that need to be corrected before the finals are submitted. For example the S57 files have no reference to the sample site and there are no associated images, and the images in the folder do not follow naming convention. The bottom sample logs are not the version requested, they do not include the measurements from the camera face to the sampler, and they are incomplete. Given that the data was preliminary, a rushed request, and you may have corrected it already.

**Again, attached is the official bottom sample guidance.** Please ensure the sheet managers have this. This data will be testing our bottom image workflow from acquisition to NCEI and other data discovery platforms. It is important that the S57 files have correct attribution.

Thank you again,  
Starla

[Quoted text hidden]

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 **Bottom\_Sample\_Guidance.zip**  
10828K



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

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## NOAA Ship Hassler SV Correct

4 messages

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**Richard Brennan - NOAA Federal** <richard.t.brennan@noaa.gov>

Wed, Feb 15, 2017 at 10:11 AM

To: Briana Welton <Briana.Welton@noaa.gov>, Benjamin K Evans <benjamin.k.evans@noaa.gov>, CO HASSLER <CO.Ferdinand.Hassler@noaa.gov>, "OPS. Ferdinand Hassler" <OPS.Ferdinand.Hassler@noaa.gov>, Russell Quintero - NOAA Federal <Russell.Quintero@noaa.gov>, Samuel Greenaway - NOAA Service Account <Samuel.Greenaway@noaa.gov>, Lorraine Robidoux - NOAA Federal <lorraine.robidoux@noaa.gov>

LCDR Jaskoski,

I have reviewed the technical details associated with the situation surrounding the Hassler surveys that are currently in question. As currently understood, there are approximately 16 surveys between AHB and Hassler. The issue, as I understand it in general terms, is that the data in question was not SVP corrected after SBET computation and application to the data. Based on my technical review I would like the current remediation:

1. Pick one survey to serve as a representative example of this set. Save the current BASE surface with the SVP applied *before* SBET application as `_OLD`. Then, re-apply SVP and recompute a *new* grid. Do a difference surface and compute the min, max, average, and standard deviation for this difference surface.

Based on my review the SBET process does no change the roll, pitch, or yaw nor the location of the transducer in the water column - or at least not in a meaningful way. This representative data set should confirm that.

2. Please report the finding of this analysis. Assuming it is exceedingly small, I think the next steps are:

- Create a revised DAPR that can be used for all surveys that describes the problem and the analysis. I expect that you will work with AHB to arrange this documentation is properly included with all surveys.
- I will provide a waiver in light of this analysis that authorizes the data to proceed using the current process.
- Include both the waiver and this email in the separates for all theses surveys to document the action taken.
- Ensure Hassler SOPs are updated to ensure this process is corrected.

3. If the analysis shows anything more than a 5cm difference, please advise me. We will discuss how to proceed from there.

It is my expectation that we will manage similar problems encountered with other field units or our contractors in a similar and consistent fashion. If there are any questions, concerns, or details I have not addressed I expect you or LCDR Welton will contact me with that information.

Rick

**CAPT Rick Brennan, NOAA**

Chief, Hydrographic Surveys Division

1315 East-West Highway, SSMC3 Room 6823

Silver Spring, MD 20910

Work: [301-713-2700](tel:301-713-2700)

Cell: [443-994-3301](tel:443-994-3301)

---

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

Wed, Feb 15, 2017 at 10:36 AM

To: James J Miller <james.j.miller@noaa.gov>, Patrick Debrousse - NOAA Federal <patrick.j.debrousse@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>

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



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

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## NOAA Ship Hassler SV Correct

9 messages

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**Richard Brennan - NOAA Federal** <richard.t.brennan@noaa.gov>

Wed, Feb 15, 2017 at 10:11 AM

To: Briana Welton <Briana.Welton@noaa.gov>, Benjamin K Evans <benjamin.k.evans@noaa.gov>, CO HASSLER <CO.Ferdinand.Hassler@noaa.gov>, "OPS. Ferdinand Hassler" <OPS.Ferdinand.Hassler@noaa.gov>, Russell Quintero - NOAA Federal <Russell.Quintero@noaa.gov>, Samuel Greenaway - NOAA Service Account <Samuel.Greenaway@noaa.gov>, Lorraine Robidoux - NOAA Federal <lorraine.robidoux@noaa.gov>

LCDR Jaskoski,

I have reviewed the technical details associated with the situation surrounding the Hassler surveys that are currently in question. As currently understood, there are approximately 16 surveys between AHB and Hassler. The issue, as I understand it in general terms, is that the data in question was not SVP corrected after SBET computation and application to the data. Based on my technical review I would like the current remediation:

1. Pick one survey to serve as a representative example of this set. Save the current BASE surface with the SVP applied *before* SBET application as `_OLD`. Then, re-apply SVP and recompute a *new* grid. Do a difference surface and compute the min, max, average, and standard deviation for this difference surface.

Based on my review the SBET process does no change the roll, pitch, or yaw nor the location of the transducer in the water column - or at least not in a meaningful way. This representative data set should confirm that.

2. Please report the finding of this analysis. Assuming it is exceedingly small, I think the next steps are:

- Create a revised DAPR that can be used for all surveys that describes the problem and the analysis. I expect that you will work with AHB to arrange this documentation is properly included with all surveys.
- I will provide a waiver in light of this analysis that authorizes the data to proceed using the current process.
- Include both the waiver and this email in the separates for all theses surveys to document the action taken.
- Ensure Hassler SOPs are updated to ensure this process is corrected.

3. If the analysis shows anything more than a 5cm difference, please advise me. We will discuss how to proceed from there.

It is my expectation that we will manage similar problems encountered with other field units or our contractors in a similar and consistent fashion. If there are any questions, concerns, or details I have not addressed I expect you or LCDR Welton will contact me with that information.

Rick

**CAPT Rick Brennan, NOAA**

Chief, Hydrographic Surveys Division

1315 East-West Highway, SSMC3 Room 6823

Silver Spring, MD 20910

Work: [301-713-2700](tel:301-713-2700)

Cell: [443-994-3301](tel:443-994-3301)

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

Wed, Feb 15, 2017 at 10:36 AM

To: James J Miller <james.j.miller@noaa.gov>, Patrick Debrousse - NOAA Federal <patrick.j.debrousse@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>

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

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**CO.Ferdinand Hassler - NOAA Service Account** <co.ferdinand.hassler@noaa.gov> Wed, Feb 15, 2017 at 10:53 AM  
To: Richard Brennan - NOAA Federal <richard.t.brennan@noaa.gov>  
Cc: Briana Welton <Briana.Welton@noaa.gov>, Benjamin K Evans <benjamin.k.evans@noaa.gov>, "OPS. Ferdinand Hassler" <OPS.Ferdinand.Hassler@noaa.gov>, Russell Quintero - NOAA Federal <Russell.Quintero@noaa.gov>, Samuel Greenaway - NOAA Service Account <Samuel.Greenaway@noaa.gov>, Lorraine Robidoux - NOAA Federal <lorraine.robidoux@noaa.gov>

CAPT,  
Will do.

v/r  
Matt

Lieutenant Commander Matthew Jaskoski, NOAA  
Commanding Officer, NOAA Ship *Ferdinand R. Hassler* (S-250)  
CO cell: (240) 687-4602  
Ship's VIOP: (541) 867-8935  
Sat Phone: (808) 851-3826  
Personal cell: (757) 647-3356

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**OPS.Ferdinand Hassler - NOAA Service Account** <ops.ferdinand.hassler@noaa.gov> Wed, Feb 15, 2017 at 3:26 PM  
To: Jeffery Marshall - NOAA Federal <jeffery.marshall@noaa.gov>

FYI

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

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

From: **Richard Brennan - NOAA Federal** <richard.t.brennan@noaa.gov>  
Date: Wed, Feb 15, 2017 at 10:11 AM  
Subject: NOAA Ship Hassler SV Correct  
To: Briana Welton <Briana.Welton@noaa.gov>, Benjamin K Evans <benjamin.k.evans@noaa.gov>, CO HASSLER <CO.Ferdinand.Hassler@noaa.gov>, "OPS. Ferdinand Hassler" <OPS.Ferdinand.Hassler@noaa.gov>, Russell Quintero - NOAA Federal <Russell.Quintero@noaa.gov>, Samuel Greenaway - NOAA Service Account <Samuel.Greenaway@noaa.gov>, Lorraine Robidoux - NOAA Federal <lorraine.robidoux@noaa.gov>

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**CO.Ferdinand Hassler - NOAA Service Account** <co.ferdinand.hassler@noaa.gov> Tue, Feb 21, 2017 at 12:55 PM  
To: Richard Brennan - NOAA Federal <richard.t.brennan@noaa.gov>  
Cc: Briana Welton <Briana.Welton@noaa.gov>, Benjamin K Evans <benjamin.k.evans@noaa.gov>, "OPS. Ferdinand Hassler" <OPS.Ferdinand.Hassler@noaa.gov>, Russell Quintero - NOAA Federal <Russell.Quintero@noaa.gov>, Samuel Greenaway - NOAA Service Account <Samuel.Greenaway@noaa.gov>, Lorraine Robidoux - NOAA Federal <lorraine.robidoux@noaa.gov>

CAPT,  
attached is our report of analysis of the two grids. The algorithm chose a couple different hypotheses around features and a slope area, but it appears that both grids are nearly identical. No change to VALSOU's etc.

v/r  
Matt

Lieutenant Commander Matthew Jaskoski, NOAA  
Commanding Officer, NOAA Ship *Ferdinand R. Hassler* (S-250)  
CO cell: (240) 687-4602  
Ship's VIOP: (541) 867-8935



Sat Phone: (808) 851-3826  
Personal cell: (757) 647-3356

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**H12932 Re-SVC Process Analysis.pptx**  
1988K

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**Briana Welton - NOAA Federal** <briana.welton@noaa.gov>

Wed, Mar 1, 2017 at 8:28 AM

To: "CO.Ferdinand Hassler - NOAA Service Account" <co.ferdinand.hassler@noaa.gov>

Cc: Richard Brennan - NOAA Federal <richard.t.brennan@noaa.gov>, Benjamin K Evans <benjamin.k.evans@noaa.gov>, "OPS. Ferdinand Hassler" <OPS.Ferdinand.Hassler@noaa.gov>, Russell Quintero - NOAA Federal <Russell.Quintero@noaa.gov>, Samuel Greenaway - NOAA Service Account <Samuel.Greenaway@noaa.gov>, Lorraine Robidoux - NOAA Federal <lorraine.robidoux@noaa.gov>

LCDR Jaskoski and CAPT Brennan,

Based on the ship's analysis, I agree that reprocessing is unnecessary. I suggest that the ship accurately document how the data have been processed either in a revised DAPR or in the DR for each survey as deviation from the DAPR for all surveys still in the ship's control; and that AHB document how the data have been processed for the surveys that are in our control.

V/r,

Bri

[Quoted text hidden]

<H12932 Re-SVC Process Analysis.pptx>

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**Richard Brennan - NOAA Federal** <richard.t.brennan@noaa.gov>

Thu, Mar 2, 2017 at 10:30 AM

To: Briana Welton - NOAA Federal <briana.welton@noaa.gov>

Cc: "CO.Ferdinand Hassler - NOAA Service Account" <co.ferdinand.hassler@noaa.gov>, Benjamin K Evans <benjamin.k.evans@noaa.gov>, "OPS. Ferdinand Hassler" <OPS.Ferdinand.Hassler@noaa.gov>, Russell Quintero - NOAA Federal <Russell.Quintero@noaa.gov>, Samuel Greenaway - NOAA Service Account <Samuel.Greenaway@noaa.gov>, Lorraine Robidoux - NOAA Federal <lorraine.robidoux@noaa.gov>

LCDR Welton,

I concur with your recommendations. Please proceed with this plan as you described.

LCDR Jaskoski,

Please work with AHB with regard to the best path regarding DAPR revision or documentation of this process in the DR.

Rick

**CAPT Rick Brennan, NOAA**

Chief, Hydrographic Surveys Division  
1315 East-West Highway, SSMC3 Room 6823  
Silver Spring, MD 20910  
Work: 301-713-2700  
Cell: 443-994-3301

[Quoted text hidden]

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**CO.Ferdinand Hassler - NOAA Service Account** <co.ferdinand.hassler@noaa.gov>

Thu, Mar 2, 2017 at 10:39 AM

To: Richard Brennan - NOAA Federal <richard.t.brennan@noaa.gov>

3/2/2017

National Oceanic and Atmospheric Administration Mail - NOAA Ship Hassler SV Correct

Cc: Briana Welton - NOAA Federal <briana.welton@noaa.gov>, Benjamin K Evans <benjamin.k.evans@noaa.gov>, "OPS. Ferdinand Hassler" <OPS.Ferdinand.Hassler@noaa.gov>, Russell Quintero - NOAA Federal <Russell.Quintero@noaa.gov>, Samuel Greenaway - NOAA Service Account <Samuel.Greenaway@noaa.gov>, Lorraine Robidoux - NOAA Federal <lorraine.robidoux@noaa.gov>

Will do.

v/r  
Matt

Lieutenant Commander Matthew Jaskoski, NOAA  
Commanding Officer, NOAA Ship *Ferdinand R. Hassler* (S-250)  
CO cell: (240) 687-4602  
Ship's VIOP: (541) 867-8935  
Sat Phone: (808) 851-3826  
Personal cell: (757) 647-3356

[Quoted text hidden]

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**CO.Ferdinand Hassler - NOAA Service Account** <co.ferdinand.hassler@noaa.gov>

Thu, Mar 2, 2017 at 10:42 AM

To: Briana Welton - NOAA Federal <briana.welton@noaa.gov>

Cc: "OPS.Ferdinand Hassler" <ops.ferdinand.hassler@noaa.gov>

Hey Bri,  
we've got these ready to go - might be able to submit them before we depart on Saturday, if not they'll be ready to go at our next inport (3/15-18)

Jasko

Lieutenant Commander Matthew Jaskoski, NOAA  
Commanding Officer, NOAA Ship *Ferdinand R. Hassler* (S-250)  
CO cell: (240) 687-4602  
Ship's VIOP: (541) 867-8935  
Sat Phone: (808) 851-3826  
Personal cell: (757) 647-3356

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

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## OPR-G309-FH-16 ERS Capability Memo

1 message

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**OPS.Ferdinand Hassler - NOAA Service Account** <ops.ferdinand.hassler@noaa.gov> Wed, Feb 15, 2017 at 9:05 AM

To: \_NOS OCS HSD ERS Deliverables <ers.deliverables@noaa.gov>

Cc: Starla Robinson - NOAA Federal <Starla.Robinson@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>, James J Miller <james.j.miller@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>

Please find the attached ERS Capability Memo for project OPR-G309-FH-16 Approaches to Wilmington.

V/r  
LT Morgan

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

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 **OPR-G309-FH-16\_ERS\_Capability\_Memo.pdf**  
1111K



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

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## Hydro Hot List request, OPR-G309-FH-16

6 messages

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**OPS.Ferdinand Hassler - NOAA Service Account** <ops.ferdinand.hassler@noaa.gov> Sat, Jul 9, 2016 at 6:01 AM  
To: "\_NOS CO-OPS OET Team" <nos.coops.oetteam@noaa.gov>, "\_NOS.CO-OPS.HPT" <NOS.COOPS.HPT@noaa.gov>  
Cc: Starla Robinson - NOAA Federal <Starla.Robinson@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>

Good morning,

NOAA Ship *Ferdinand Hassler* is scheduled to begin survey operations on OPR-G309-FH-16 on July 12th, 2016. Please add the following station to the Hydro Hot List for OPR-G309-FH-16:

**8661070 - Springmaid Pier, SC**

V/r  
Nick Morgan

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

---

**Hua Yang - NOAA Affiliate** <hua.yang@noaa.gov> Mon, Jul 11, 2016 at 7:54 AM  
To: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>  
Cc: "\_NOS CO-OPS OET Team" <nos.coops.oetteam@noaa.gov>, "\_NOS.CO-OPS.HPT" <NOS.COOPS.HPT@noaa.gov>, Starla Robinson - NOAA Federal <Starla.Robinson@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>

Good morning Nick,

The station was just added to the [Hydro Hot List](#). Thank you for your timely notice.

Have a good survey,

Hua Yang

Hydrographic Planning Team  
NOAA/National Ocean Service  
Center for Operational Oceanographic Products and Services  
Station 7128  
1305 East West Highway, SSMC4  
Silver Spring, MD 20910  
Office: 240-533-0612  
Email: [Hua.Yang@noaa.gov](mailto:Hua.Yang@noaa.gov)  
Web: <http://tidesandcurrents.noaa.gov/>

Hydro Hot List: <http://tidesandcurrents.noaa.gov/hydro.shtml>

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**OPS.Ferdinand Hassler - NOAA Service Account** <ops.ferdinand.hassler@noaa.gov> Mon, Jul 11, 2016 at 9:59 AM  
To: Hua Yang - NOAA Affiliate <hua.yang@noaa.gov>  
Cc: "\_NOS CO-OPS OET Team" <nos.coops.oetteam@noaa.gov>, "\_NOS.CO-OPS.HPT" <NOS.COOPS.HPT@noaa.gov>, Starla Robinson - NOAA Federal <Starla.Robinson@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>

Thank you very much!

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

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**OPS.Ferdinand Hassler - NOAA Service Account** <ops.ferdinand.hassler@noaa.gov> Tue, Aug 23, 2016 at 1:01 PM  
To: Hua Yang - NOAA Affiliate <hua.yang@noaa.gov>  
Cc: \_NOS CO-OPS OET Team <nos.coops.oetteam@noaa.gov>, "\_NOS.CO-OPS.HPT" <NOS.COOPS.HPT@noaa.gov>, Starla Robinson - NOAA Federal <Starla.Robinson@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>

Good morning,

I've noticed some voltage issues showing up on the Springmaid Pier tide station. I just wanted to check in to make sure that the station is operating correctly.

Thank you,  
-Nick

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

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**Colleen Fanelli - NOAA Federal** <colleen.fanelli@noaa.gov> Tue, Aug 23, 2016 at 1:46 PM  
To: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>  
Cc: Hua Yang - NOAA Affiliate <hua.yang@noaa.gov>, \_NOS CO-OPS OET Team <nos.coops.oetteam@noaa.gov>, "\_NOS.CO-OPS.HPT" <NOS.COOPS.HPT@noaa.gov>, Starla Robinson - NOAA Federal <Starla.Robinson@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>

Nick,

Our field office visited the station today and replaced a blown fuse and a battery. The power system is back to working as expected. Thank you.

~Colleen

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Colleen Fanelli  
Oceanographer, Hydrographic Planning Team Lead  
NOAA/National Ocean Service  
Center for Operational Oceanographic Products and Services  
Station 7127  
1305 East-West Highway N/OPS3  
Silver Spring, MD 20910  
[Colleen.Fanelli@noaa.gov](mailto:Colleen.Fanelli@noaa.gov)  
Phone (NEW): (240) 533 - 0615

*Compare the meteorologist with his or her oceanographer colleague: the oceanographer may spend many years planning a campaign of observations of currents, temperature and salinity in a tiny area of the ocean, many weeks of discomfort on a ship taking the observations and several years analysing them back at the laboratory. All of this work is done for the research meteorologist, several times a day on a global basis, who merely has to read the numbers from an archive and construct whatever diagnostic quantity is required.*

*—Jan N. James, Introduction to Circulating Atmospheres*

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**OPS.Ferdinand Hassler - NOAA Service Account** <ops.ferdinand.hassler@noaa.gov> Tue, Aug 23, 2016 at 1:57 PM  
To: Colleen Fanelli - NOAA Federal <colleen.fanelli@noaa.gov>

Cc: Hua Yang - NOAA Affiliate <hua.yang@noaa.gov>, \_NOS CO-OPS OET Team <nos.coops.oetteam@noaa.gov>, "\_NOS.CO-OPS.HPT" <NOS.COOPS.HPT@noaa.gov>, Starla Robinson - NOAA Federal <Starla.Robinson@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>

Great, thanks!

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

On Tue, Aug 23, 2016 at 1:57 PM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:

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

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APPROVAL PAGE

H12930

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 NCEI for archive

- H12930\_DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- H12930\_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: \_\_\_\_\_

**Commander Briana W. Hillstrom, NOAA**  
Chief, Atlantic Hydrographic Branch