

H13095

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

DESCRIPTIVE REPORT

Type of Survey: Basic Hydrographic Survey

Registry Number: H13095

LOCALITY

State(s): North Carolina
Virginia

General Locality: Virginia/North Carolina

Sub-locality: Westcentral sheet, 19 NM offshore of False Cape, VA

2018

CHIEF OF PARTY
LCDR Mark Blankenship, NOAA

LIBRARY & ARCHIVES

Date:

HYDROGRAPHIC TITLE SHEET

H13095

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 Virginia**

General Locality: **Virginia/North Carolina**

Sub-Locality: **Westcentral sheet, 19 NM offshore of False Cape, VA**

Scale: **40000**

Dates of Survey: **03/01/2018 to 11/01/2018**

Instructions Dated: **01/05/2018**

Project Number: **OPR-D304-FH-18**

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

Chief of Party: **LCDR Mark Blankenship, 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 data to update National Oceanic and Atmospheric Administration (NOAA) nautical charts. Any revisions to the Descriptive Report (DR) applied during office processing are shown in red italic text. The DR is maintained as a field unit product, therefore all information and recommendations within this report are considered preliminary unless otherwise noted. The final disposition of surveyed features is represented in the NOAA nautical chart products. All pertinent records for this survey are archived at the National Centers for Environmental Information (NCEI) and can be retrieved via <https://www.ncei.noaa.gov/>.*

Products created during office processing were generated in NAD83 UTM 18N, MLLW datum. All references to other horizontal or vertical datums in this report are applicable to the processed hydrographic data provided by the field unit.

Table of Contents

A. Area Surveyed.....	1
A.1 Survey Limits.....	1
A.2 Survey Purpose.....	2
A.3 Survey Quality.....	3
A.4 Survey Coverage.....	3
A.5 Survey Statistics.....	5
B. Data Acquisition and Processing.....	7
B.1 Equipment and Vessels.....	7
B.1.1 Vessels.....	7
B.1.2 Equipment.....	10
B.2 Quality Control.....	10
B.2.1 Crosslines.....	10
B.2.2 Uncertainty.....	12
B.2.3 Junctions.....	13
B.2.4 Sonar QC Checks.....	29
B.2.5 Equipment Effectiveness.....	29
B.2.6 Factors Affecting Soundings.....	30
B.2.7 Sound Speed Methods.....	31
B.2.8 Coverage Equipment and Methods.....	32
B.3 Echo Sounding Corrections.....	32
B.3.1 Corrections to Echo Soundings.....	32
B.3.2 Calibrations.....	32
B.4 Backscatter.....	32
B.5 Data Processing.....	33
B.5.1 Primary Data Processing Software.....	33
B.5.2 Surfaces.....	34
B.5.3 Designated Soundings.....	36
C. Vertical and Horizontal Control.....	36
C.1 Vertical Control.....	37
C.2 Horizontal Control.....	37
D. Results and Recommendations.....	37
D.1 Chart Comparison.....	37
D.1.1 Electronic Navigational Charts.....	40
D.1.2 Maritime Boundary Points.....	41
D.1.3 Charted Features.....	41
D.1.4 Uncharted Features.....	41
D.1.5 Shoal and Hazardous Features.....	41
D.1.6 Channels.....	41
D.1.7 Bottom Samples.....	41
D.2 Additional Results.....	41
D.2.1 Shoreline.....	41
D.2.2 Prior Surveys.....	42
D.2.3 Aids to Navigation.....	42

D.2.4 Overhead Features.....	42
D.2.5 Submarine Features.....	42
D.2.6 Platforms.....	42
D.2.7 Ferry Routes and Terminals.....	42
D.2.8 Abnormal Seafloor and/or Environmental Conditions.....	42
D.2.9 Construction and Dredging.....	42
D.2.10 New Survey Recommendation.....	42
D.2.11 Inset Recommendation.....	43
E. Approval Sheet.....	44
F. Table of Acronyms.....	45

List of Tables

Table 1: Survey Limits.....	1
Table 2: Survey Coverage.....	3
Table 3: Hydrographic Survey Statistics.....	6
Table 4: Dates of Hydrography.....	7
Table 5: Vessels Used.....	7
Table 6: Major Systems Used.....	10
Table 7: Survey Specific Tide TPU Values.....	12
Table 8: Survey Specific Sound Speed TPU Values.....	13
Table 9: Junctioning Surveys.....	15
Table 10: Primary bathymetric data processing software.....	34
Table 11: Primary imagery data processing software.....	34
Table 12: Submitted Surfaces.....	34
Table 13: Largest Scale ENC's.....	40

List of Figures

Figure 1: H13095 survey limits with respect to assigned sheet limits.....	2
Figure 3: H13095 coverage relative to OPR-D304-FH-18 project extent.....	5
Figure 2: Representative area within H13095 that contain multiple holidays.....	4
Figure 4: NOAA Ship Ferdinand R. Hassler drawing.....	8
Figure 5: NOAA Ship Ferdinand R. Hassler alongside Marine Operations Center - Atlantic.....	9
Figure 6: H13095 Crossline Coverage.....	11
Figure 7: H13095 Crossline difference statistical analysis.....	12
Figure 8: H13095 Junction Overview.....	14
Figure 9: Difference Surface Statistics for H13095 and H12306.....	15
Figure 10: Fraction of allowable error for the junction of H13095 and H12306.....	16
Figure 11: Junction between H13095 and H12306.....	17
Figure 12: Difference Surface Statistics for H13095 and H12307.....	18
Figure 13: Fraction of allowable error for the junction of H13095 and H12307.....	19
Figure 14: Junction between H13095 and H12307.....	20
Figure 15: Difference Surface Statistics for H13095 and H12841.....	21

Figure 16: Fraction of allowable error for the junction of H13095 and H12841.....	22
Figure 17: Junction between H13095 and H12841.....	23
Figure 18: Difference Surface Statistics for H13095 and H12858.....	24
Figure 19: Fraction of allowable error for the junction of H13095 and H12858.....	25
Figure 20: Junction between H13095 and H12858.....	26
Figure 21: Difference Surface Statistics for H13095 and H13094.....	27
Figure 22: Fraction of allowable error for the junction of H13095 and H13094.....	28
Figure 23: Junction between H13095 and H13094.....	29
Figure 24: Difference surface of data collected before Baltimore repair period vs. data collected after Baltimore repair period. Migrating bedforms are seen in the difference surface. No significant differences observed by hydrographer.	30
Figure 25: H13095 sound speed profile locations.....	31
Figure 26: H13095 Backscatter Overview gridded at 2m resolution.....	33
Figure 27: H13095 Data density of the VR finalized surface.....	35
Figure 28: H13095 Total Vertical Uncertainty in the VR finalized surface.....	36
Figure 29: H13095 Chart Comparison - triangle rule	38
Figure 30: H13095 Chart Comparison - Survey scale soundings and contours in red and chart scale soundings and contours in blue for northern area.....	39
Figure 31: H13095 Chart Comparison - Survey scale soundings and contours in red and chart scale soundings and contours in blue for southern area.....	40

Descriptive Report to Accompany Survey H13095

Project: OPR-D304-FH-18

Locality: Virginia/North Carolina

Sublocality: Westcentral sheet, 19 NM offshore of False Cape, VA

Scale: 1:40000

March 2018 - November 2018

NOAA Ship Ferdinand R. Hassler

Chief of Party: LCDR Mark Blankenship, NOAA

A. Area Surveyed

This survey was conducted southeast of the Chesapeake Bay entrance, approximately 23 nautical miles offshore of False Cape, Virginia

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
36° 42' 21.54" N 75° 31' 10.4" W	36° 29' 23.36" N 75° 25' 36.74" W

Table 1: Survey Limits

Data were not acquired to the survey limits in accordance with the requirements in the Project Instructions and the 2018 Hydrographic Surveys Specifications and Deliverables (HSSD) due to experiencing mechanical deficiencies with the ship at the end of the field season. H13095 was approximately halfway completed. Additionally, the orientation of survey limits between survey H13095 and H13096 were modified at the request of the hydrographer to accommodate for the direction of prevailing wave patterns. See supplemental correspondence section for more information.

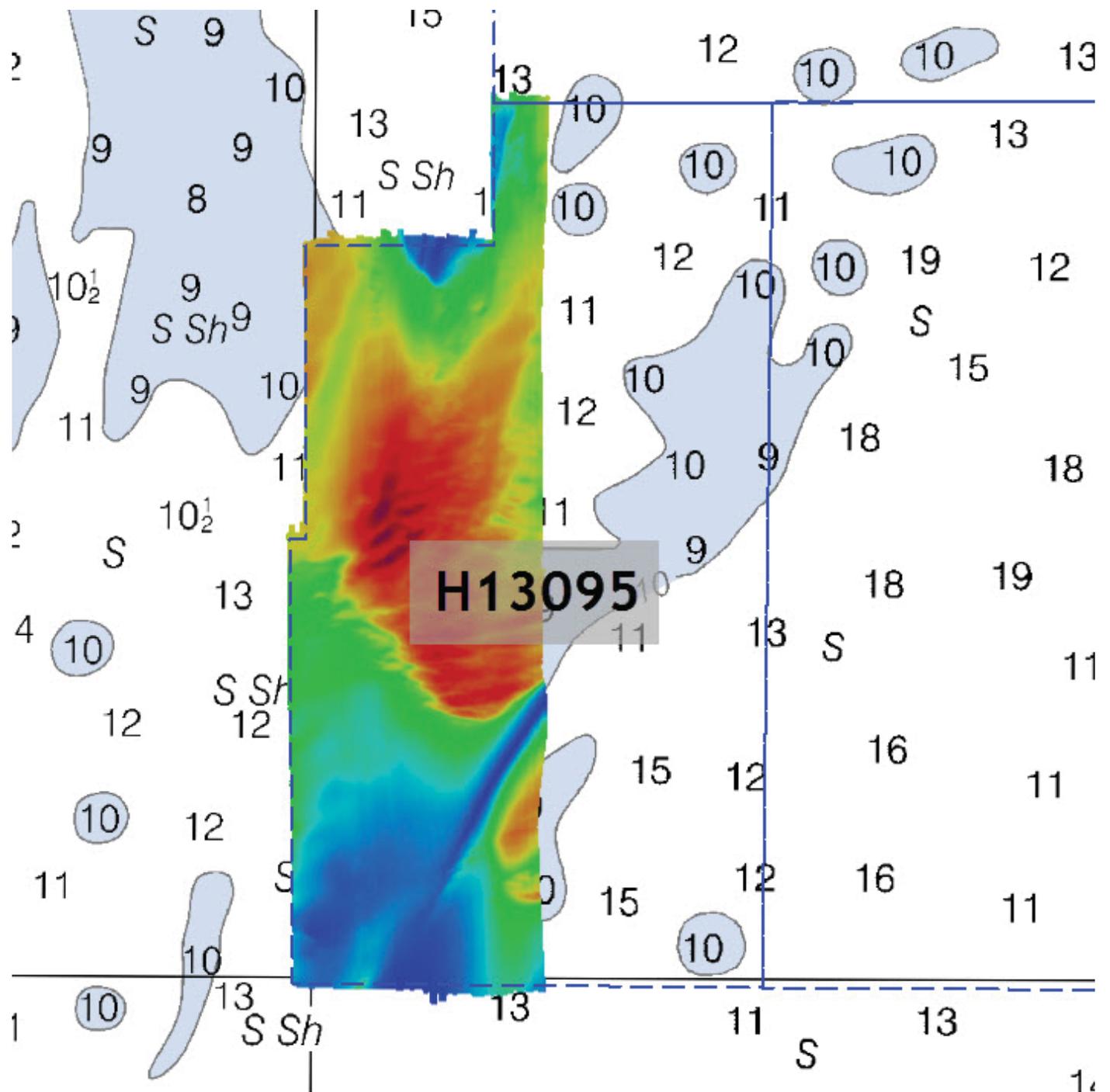


Figure 1: H13095 survey limits with respect to assigned sheet limits

A.2 Survey Purpose

The purpose of this project is to provide contemporary surveys to update National Ocean Service (NOS) nautical charting products. This survey covers approximately 74 SNM of the project area in the approach to Hampton Roads, home to the world's largest naval base and a port that annually receives over 5,000 arrivals / departures of deep-draft vessels which continually increase in size over time. Within the survey area, there

are currently reported depths that are comparable to those of the dredged Thimble Shoal Channel. A vessel ballasted for little-under keel clearance in the channel could risk grounding in the working area if uncharted shoaling has occurred. There are likely substantial changes to the seabed since the most recent partial-bottom coverage survey, which took place in the 1930s. This survey is a critical part of an ongoing, multi-year hydrographic survey covering the approaches to Chesapeake Bay to support the safety of commerce and monitor the habitat and the environmental health of the region.

A.3 Survey Quality

The entire survey is adequate to supersede previous data.

All MBES data was acquired to Complete Coverage requirements as specified in the 2018 HSSD.

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 (Refer to HSSD Section 5.2.2.2)
All waters in survey area	Acquire backscatter data during all multibeam data acquisition (Refer to HSSD Section 6.2)

Table 2: Survey Coverage

Twenty two (22) holidays occur within sheet H13095.

All holidays were due to a lack of line overlap while driving coverage with the ship. The twenty two (22) holidays occur in five (5) discrete location, are on average about 10m wide, and have been deemed hydrographically insignificant.

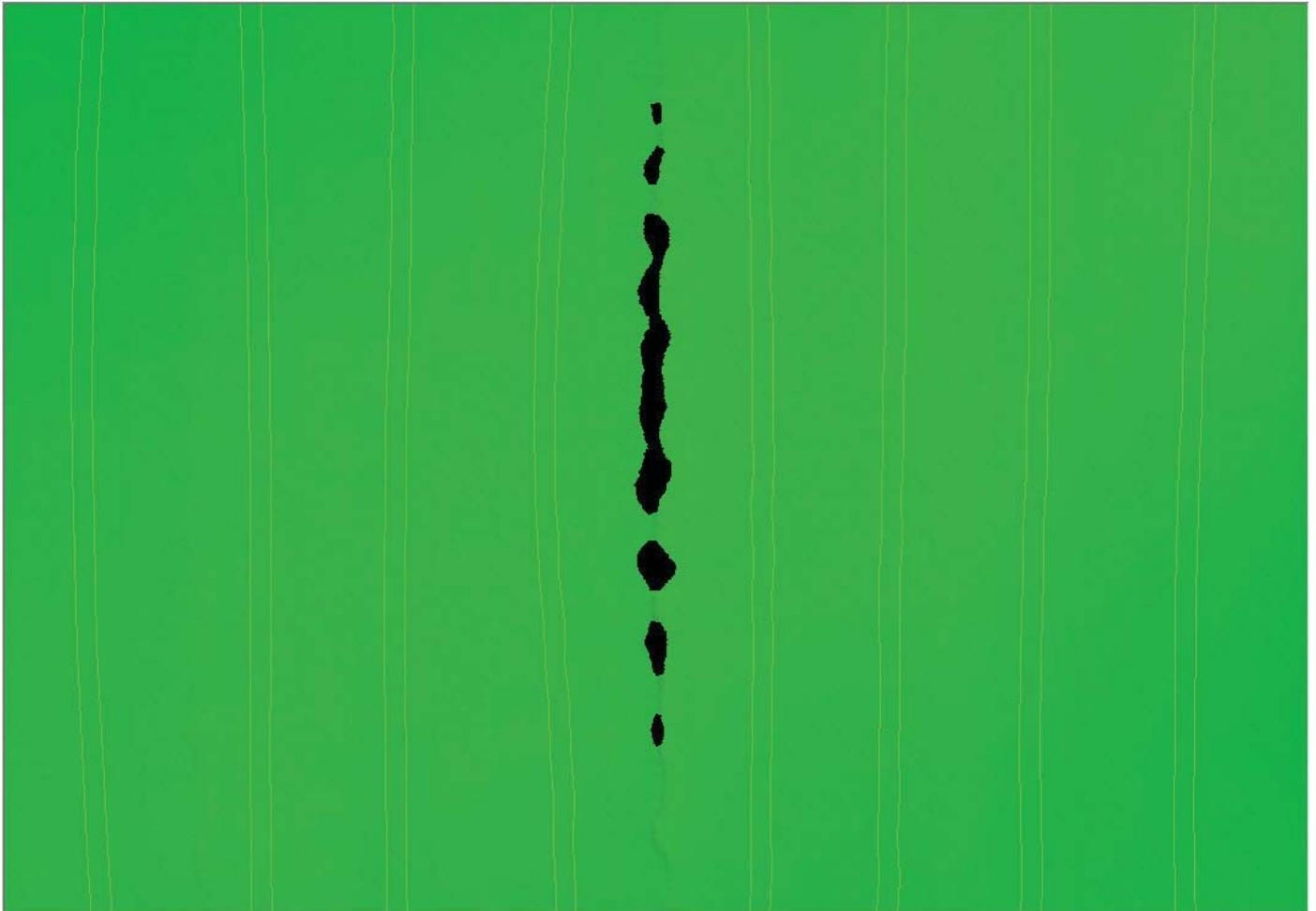


Figure 2: Representative area within H13095 that contain multiple holidays

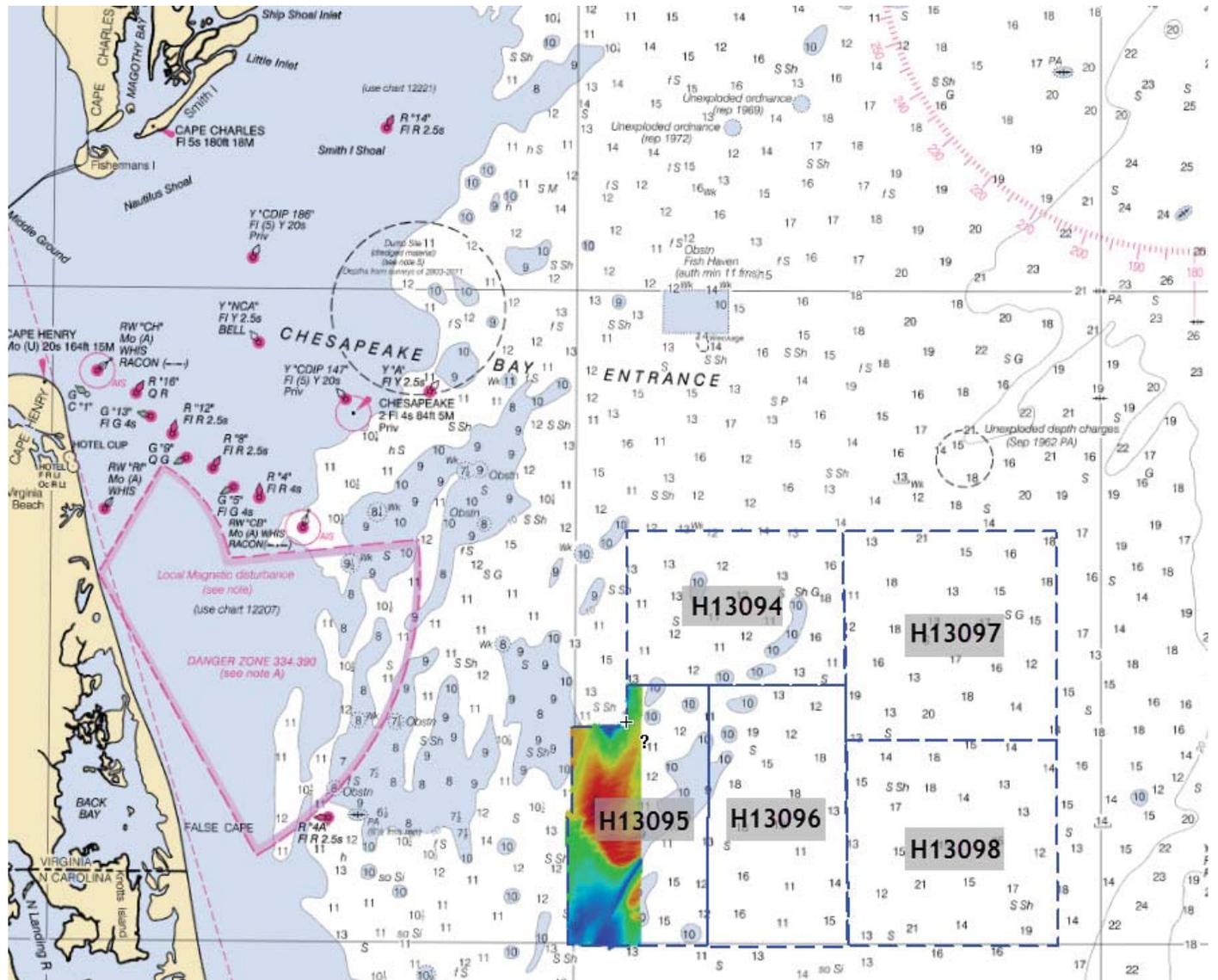


Figure 3: H13095 coverage relative to OPR-D304-FH-18 project extent

A.5 Survey Statistics

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

	HULL ID	<i>S250</i>	<i>Total</i>
LNM	SBES Mainscheme	0	0
	MBES Mainscheme	692.6	692.6
	Lidar Mainscheme	0	0
	SSS Mainscheme	0	0
	SBES/SSS Mainscheme	0	0
	MBES/SSS Mainscheme	0	0
	SBES/MBES Crosslines	13.3	13.3
	Lidar Crosslines	0	0
Number of Bottom Samples			1
Number Maritime Boundary Points Investigated			0
Number of DPs			0
Number of Items Investigated by Dive Ops			0
Total SNM			35.5 37

Table 3: Hydrographic Survey Statistics

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

Survey Dates	Day of the Year
03/01/2018	60
03/11/2018	70

Survey Dates	Day of the Year
03/12/2018	71
03/14/2018	73
03/15/2018	74
10/31/2018	304
11/01/2018	305

Table 4: Dates of Hydrography

The ship experienced mechanical difficulties on 03/15/2018. The deficiency was not corrected in time to finish the survey before the multi-month alongside repair period began in Baltimore, MD. In anticipation of a difficult sound speed environment that is known to exist off the Virginia coast during the summer months, the decision was made to postpone data collection for this project until later in the field season. Starting on 10/31/2018, two days of acquisition were completed before the ship, yet again, experienced mechanical difficulties leading to the conclusion of the 2019 field season.

To evaluate agreement of data collected before and after the alongside repair period, two surfaces were differenced and statistics generated using the Pydro Compare Surfaces tool and results reviewed in CARIS HIPS & SIPS. The statistical analysis of the differences between the two surfaces were less than 10cm.

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:

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

Table 5: Vessels Used

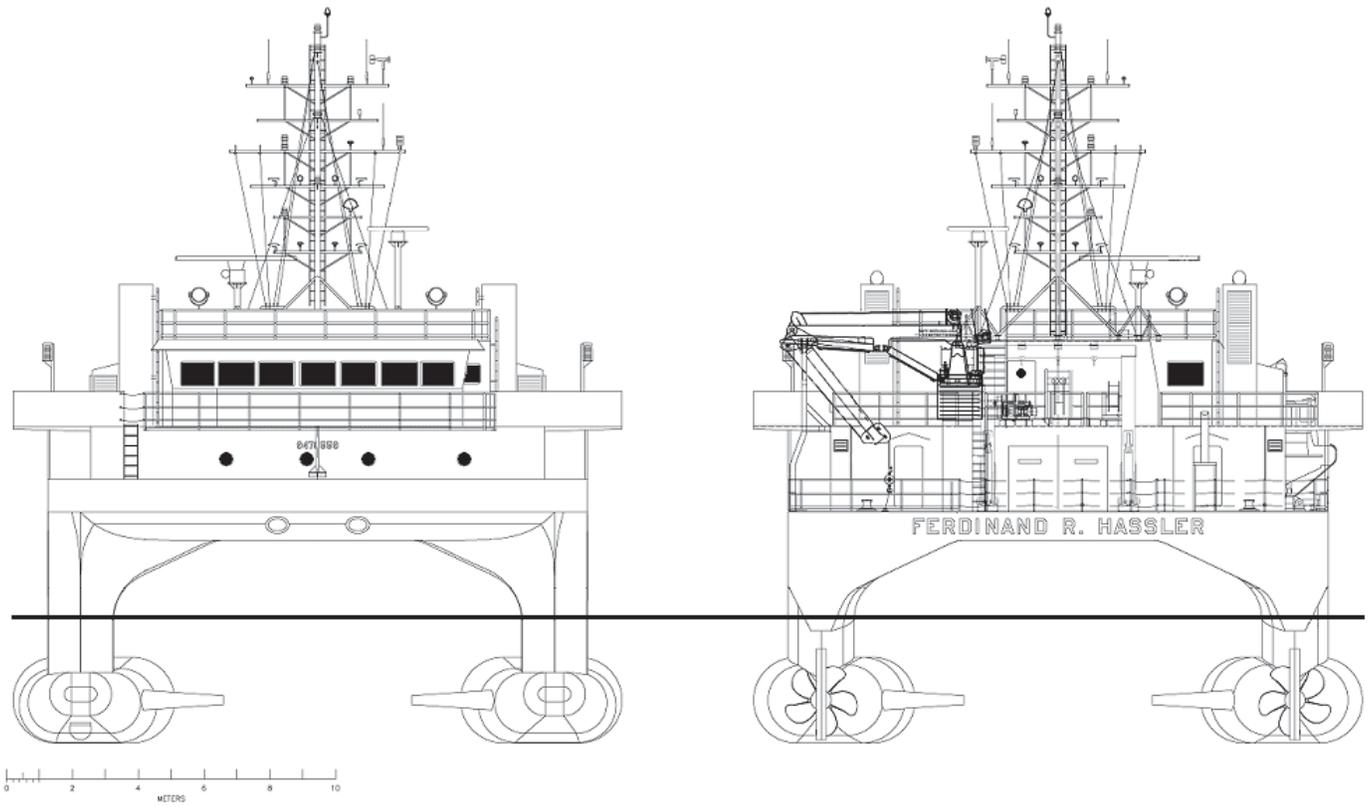


Figure 4: NOAA Ship Ferdinand R. Hassler drawing



Figure 5: NOAA Ship Ferdinand R. Hassler alongside Marine Operations Center - Atlantic

NOAA Ship FERDINAND R. HASSLER (S250) acquired all soundings during operations for H13095

B.1.2 Equipment

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

Manufacturer	Model	Type
ODIM Brooke Ocean	Micro-CTD	Conductivity, Temperature, and Depth Sensor
ODIM Brooke Ocean	MVP200	Sound Speed System
Applanix	POS MV 320 v5	Positioning and Attitude System
Teledyne RESON	SeaBat 7125 SV	MBES
Teledyne RESON	SVP 70	Sound Speed System
Sea-Bird Scientific	SBE 19plus V2	Conductivity, Temperature, and Depth Sensor

Table 6: Major Systems Used

B.2 Quality Control

B.2.1 Crosslines

Multibeam/single beam echo sounder/side scan sonar crosslines acquired for this survey totaled 1.92% of mainscheme acquisition.

Crossline percentage did not meet the requirement per HSSD Section 5.2.4.2 due to experiencing mechanical deficiencies with the ship at the end of the field season.

To evaluate crossline agreement, two surfaces of 2-meter grid resolution were created; one from the crossline depths, the other from the mainscheme depths. These two surfaces were differenced using CARIS HIPS & SIPS. The statistical analysis of the differences between the mainscheme and crossline surfaces is shown below. The average difference between the surfaces is 0.01 meters with a standard deviation of 0.09 meters; 95% of nodes agree within +/- 0.17 meters of the mean.

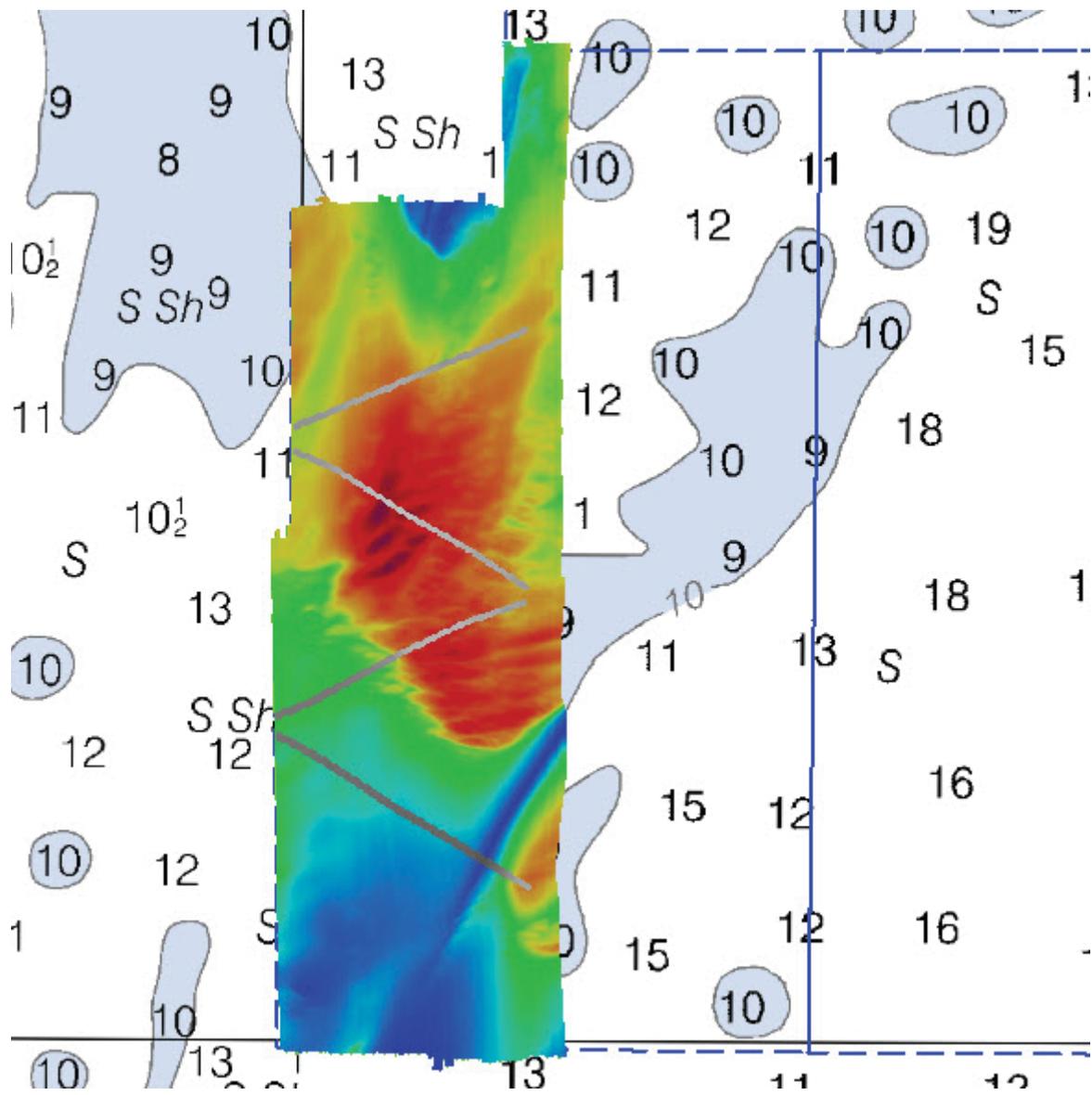


Figure 6: H13095 Crossline Coverage

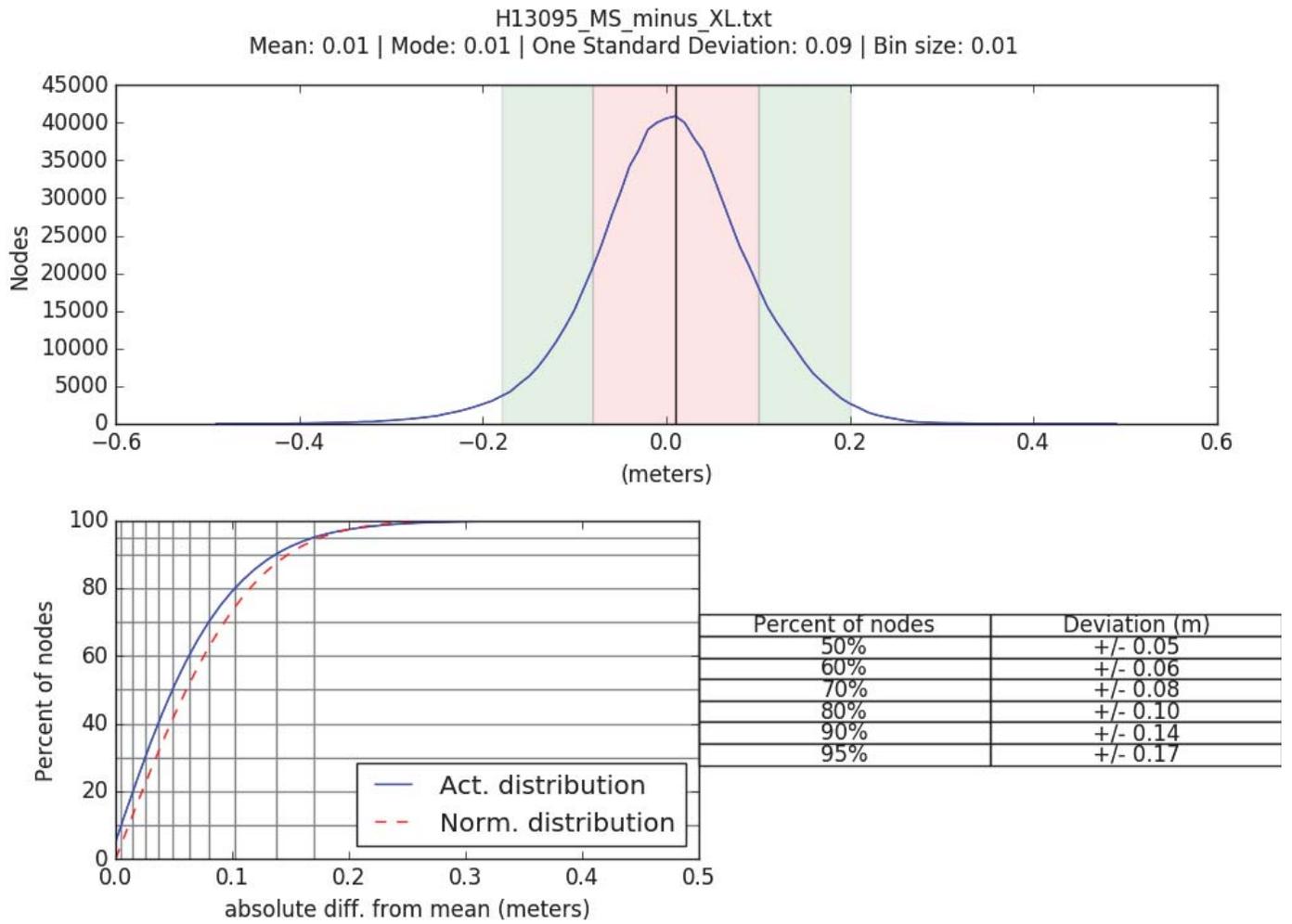


Figure 7: H13095 Crossline difference statistical analysis

B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Method	Measured	Zoning
ERS via VDATUM	0 meters	0.09 meters

Table 7: 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 8: Survey Specific Sound Speed TPU Values.

B.2.3 Junctions

H13095 junctions with H12306 and H12307 acquired by the NOAA Ship THOMAS JEFFERSON in 2011, H12841 acquired by the NOAA Ship FERDINAND R. HASSLER in 2015, H12858 acquired by the NOAA Ship FERDINAND R. HASSLER in 2016, and H13094 acquired by the NOAA Ship FERDINAND R. HASSLER in 2018.

To evaluate junction agreement, the two surfaces were differenced and statistics generated using the Pydro Compare Surfaces tool and results reviewed in CARIS HIPS & SIPS. The statistical analysis of the differences between the mainscheme and crossline surfaces are reported below.

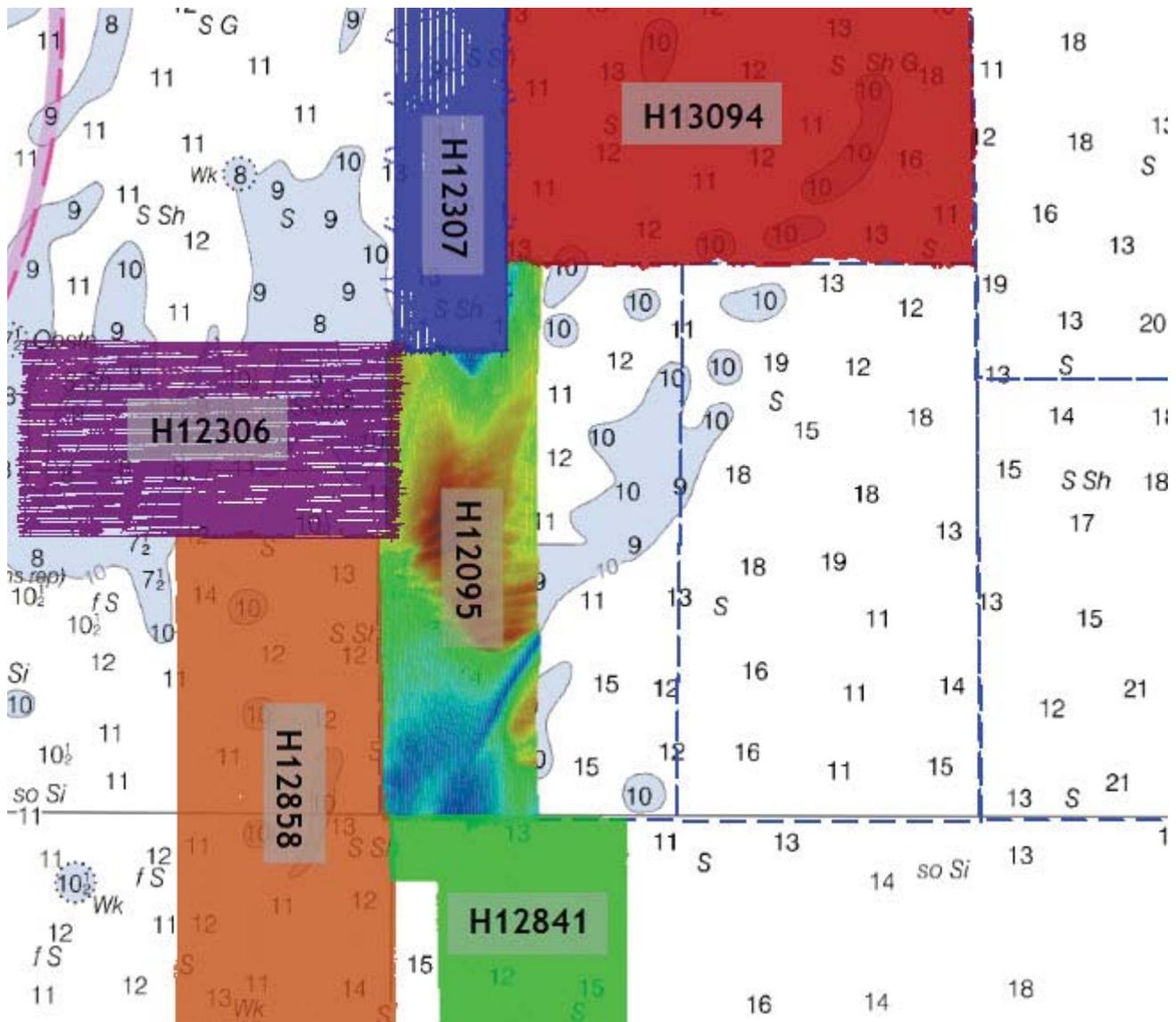


Figure 8: H13095 Junction Overview

The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
H12306	1:40000	2011	NOAA Ship THOMAS JEFFERSON	NW
H12307	1:40000	2011	NOAA Ship THOMAS JEFFERSON	N
H12841	1:40000	2015	NOAA Ship FERDINAND R. HASSLER	S
H12858	1:40000	2016	NOAA Ship FERDINAND R. HASSLER	SW
H13094	1:40000	2018	NOAA Ship FERDINAND R. HASSLER	NE

Table 9: Junctioning Surveys

H12306

The minimum and maximum depth difference between H13095 and H12306 is -0.56 and 0.51 meters respectively. The average difference is 0.01 meters with a standard deviation of 0.11 meters; 95% of the differenced nodes are within +/- 0.20 meters of the mean; 100% of the differenced nodes are within the fraction of allowable error. Junction overlap ranges from ~600m to ~800m.

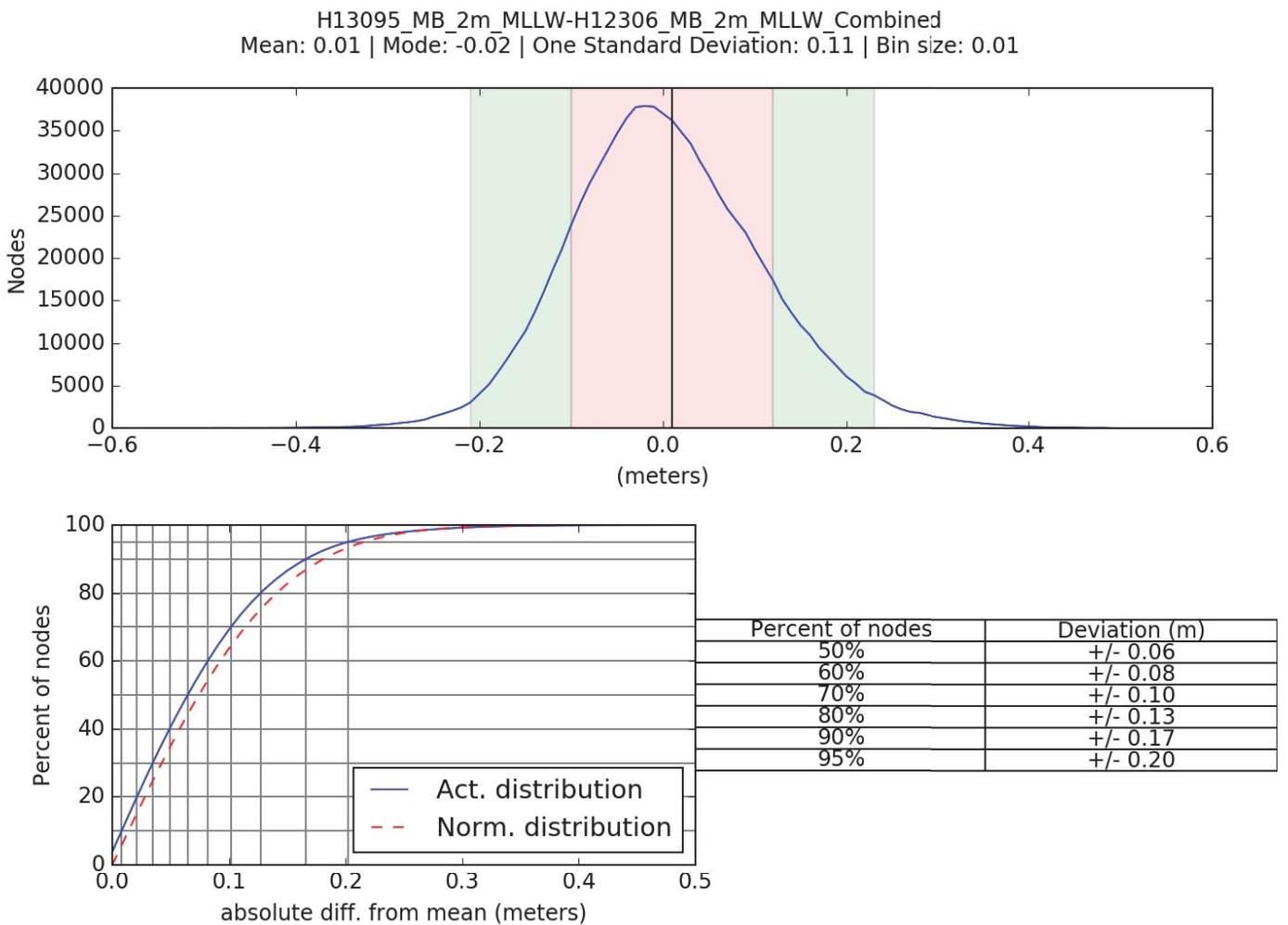


Figure 9: Difference Surface Statistics for H13095 and H12306

Comparison Distribution

Per Grid: H13095_MB_2m_MLLW-H12306_MB_2m_MLLW_Combined_fracAllowErr.csar

100% nodes pass (934243), min=0.0, mode=0.1 mean=0.1 max=0.7

Percentiles: 2.5%=0.0, Q1=0.0, median=0.1, Q3=0.1, 97.5%=0.3

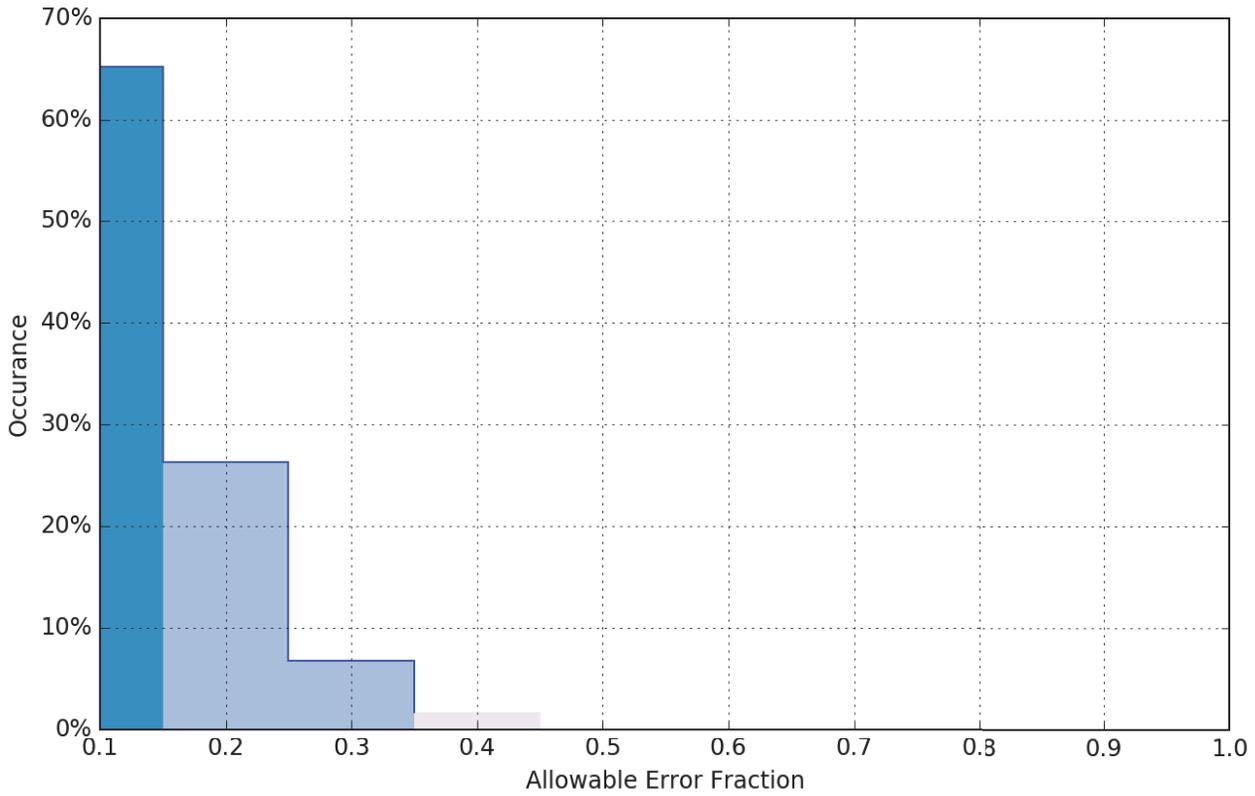


Figure 10: Fraction of allowable error for the junction of H13095 and H12306

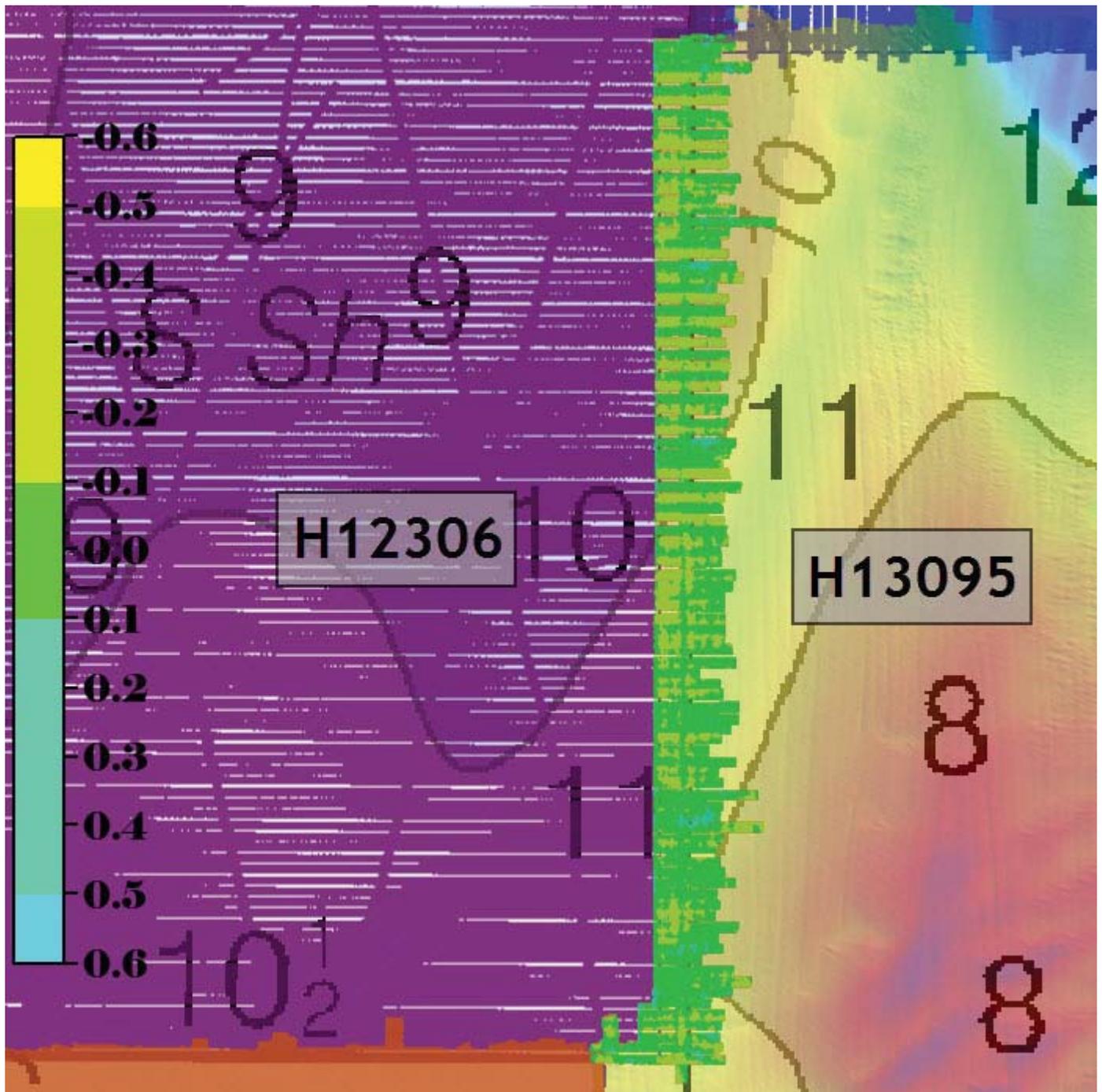


Figure 11: Junction between H13095 and H12306

H12307

The minimum and maximum depth difference between H13095 and H12307 is -1.44 and 1.00 meters respectively. The average difference is 0.06 meters with a standard deviation of 0.15 meters; 95% of the

differenced nodes are within +/- .29 meters of the mean; 99.5+% of the differenced nodes are within the fraction of allowable error. Junction overlap ranges from ~80m to ~400m.

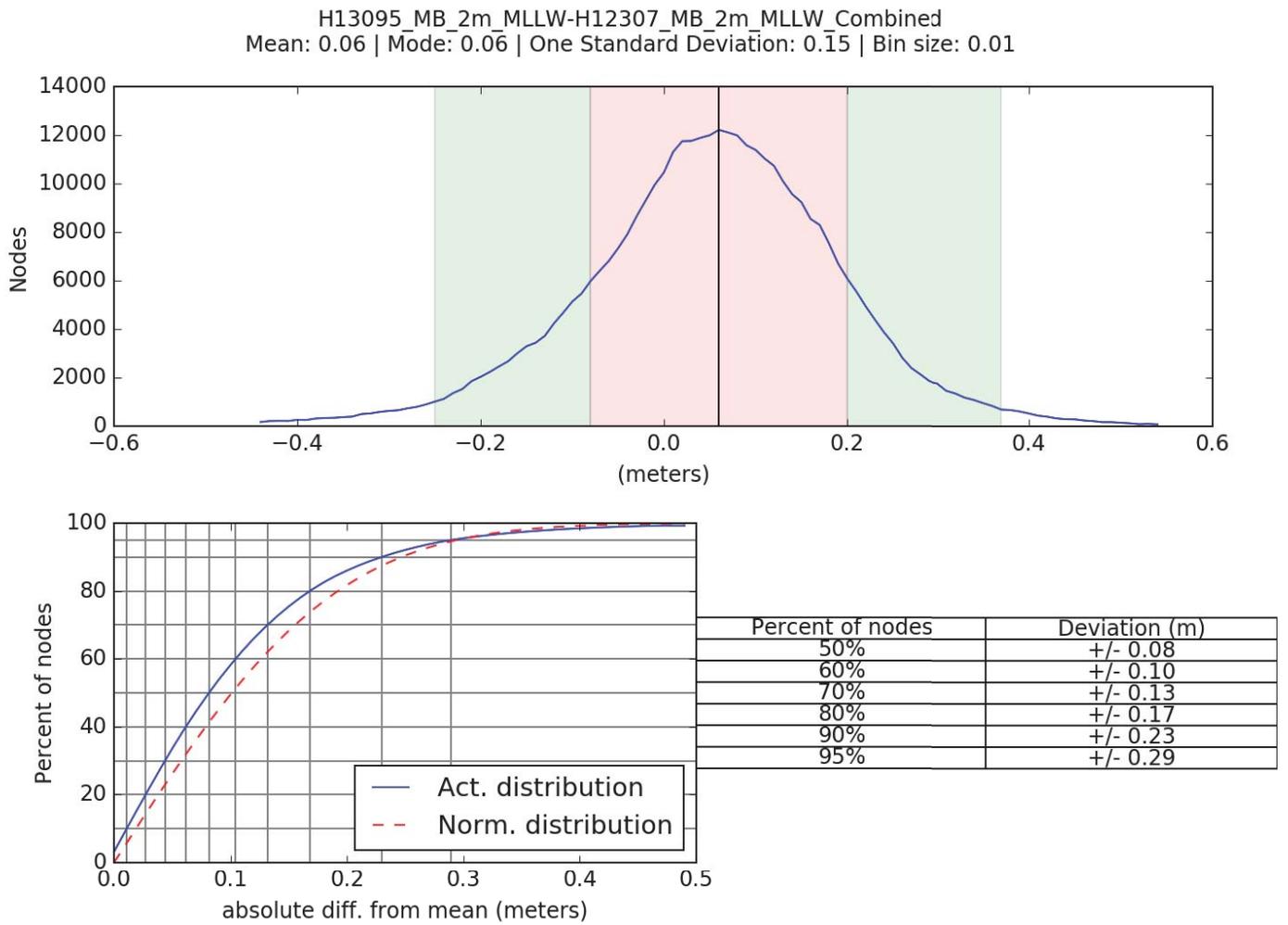


Figure 12: Difference Surface Statistics for H13095 and H12307

Comparison Distribution

Per Grid: H13095_MB_2m_MLLW-H12307_MB_2m_MLLW_Combined_fracAllowErr.csar

99.5+% nodes pass (383865), min=0.0, mode=0.1 mean=0.1 max=1.7

Percentiles: 2.5%=0.0, Q1=0.1, median=0.1, Q3=0.2, 97.5%=0.4

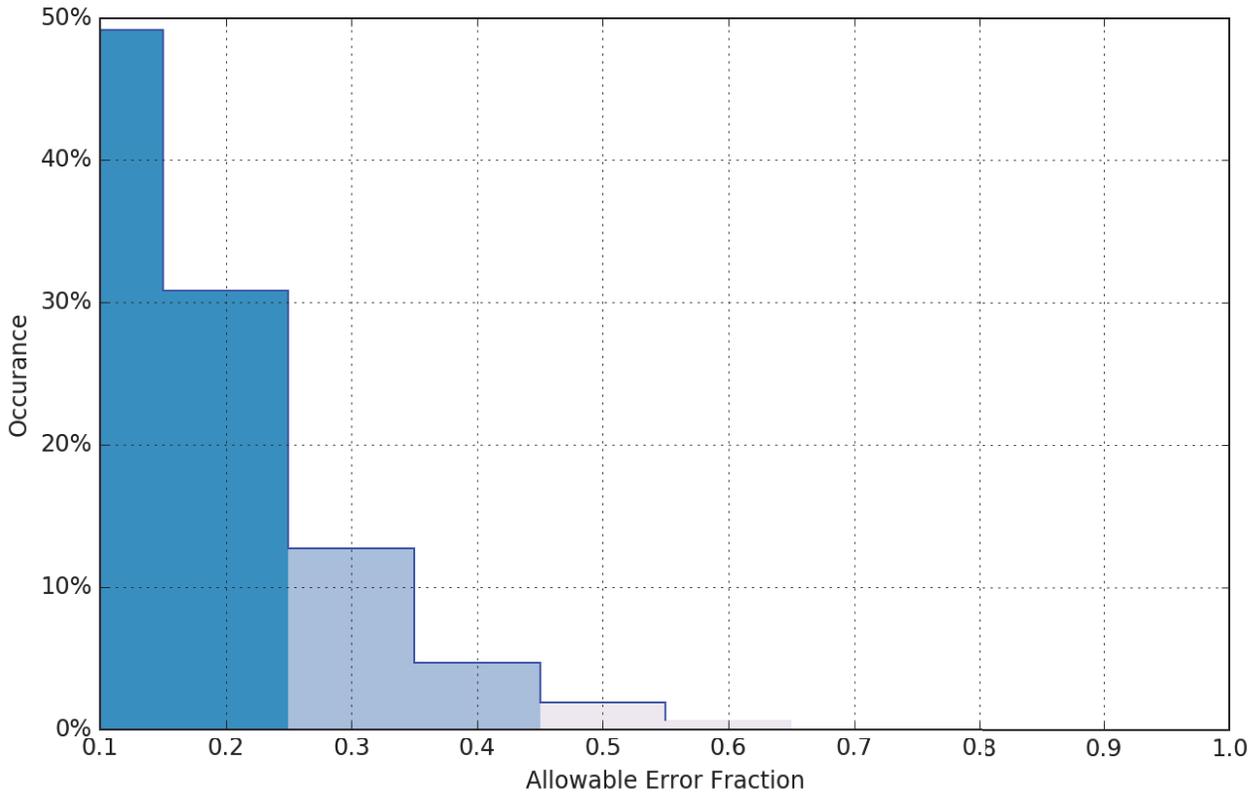


Figure 13: Fraction of allowable error for the junction of H13095 and H12307

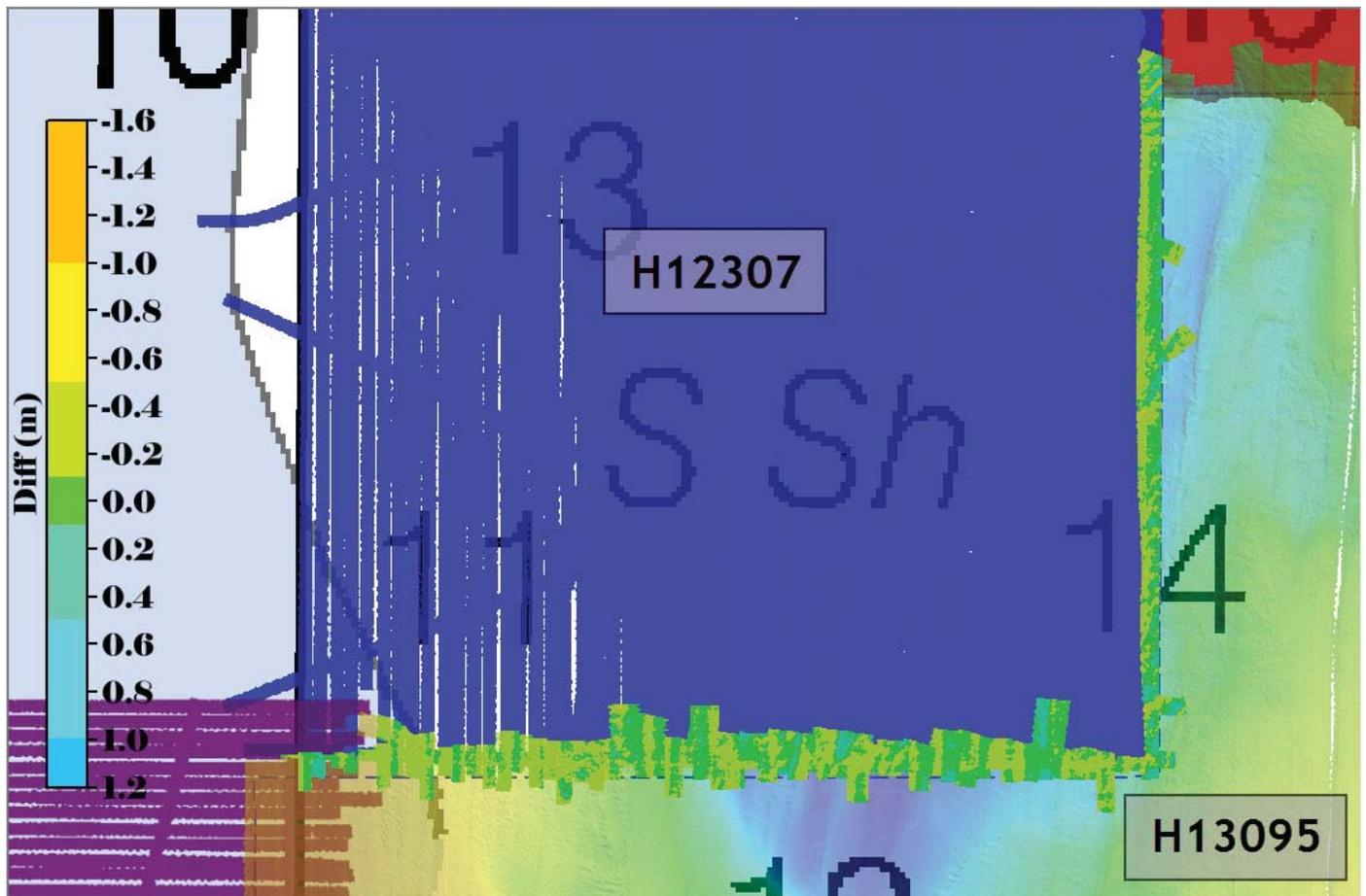


Figure 14: Junction between H13095 and H12307

H12841

The minimum and maximum depth difference between H13095 and H12841 is -12.31 and 2.96 meters respectively. The large differences are due to fliers being present in the source grid of H12841. The average difference is -0.07 meters with a standard deviation of 0.10 meters; 95% of the differenced nodes are within +/- 0.18 meters of the mean; 99.5+% of the differenced nodes are within the fraction of allowable error. Junction overlap ranges from ~200m to ~500m.

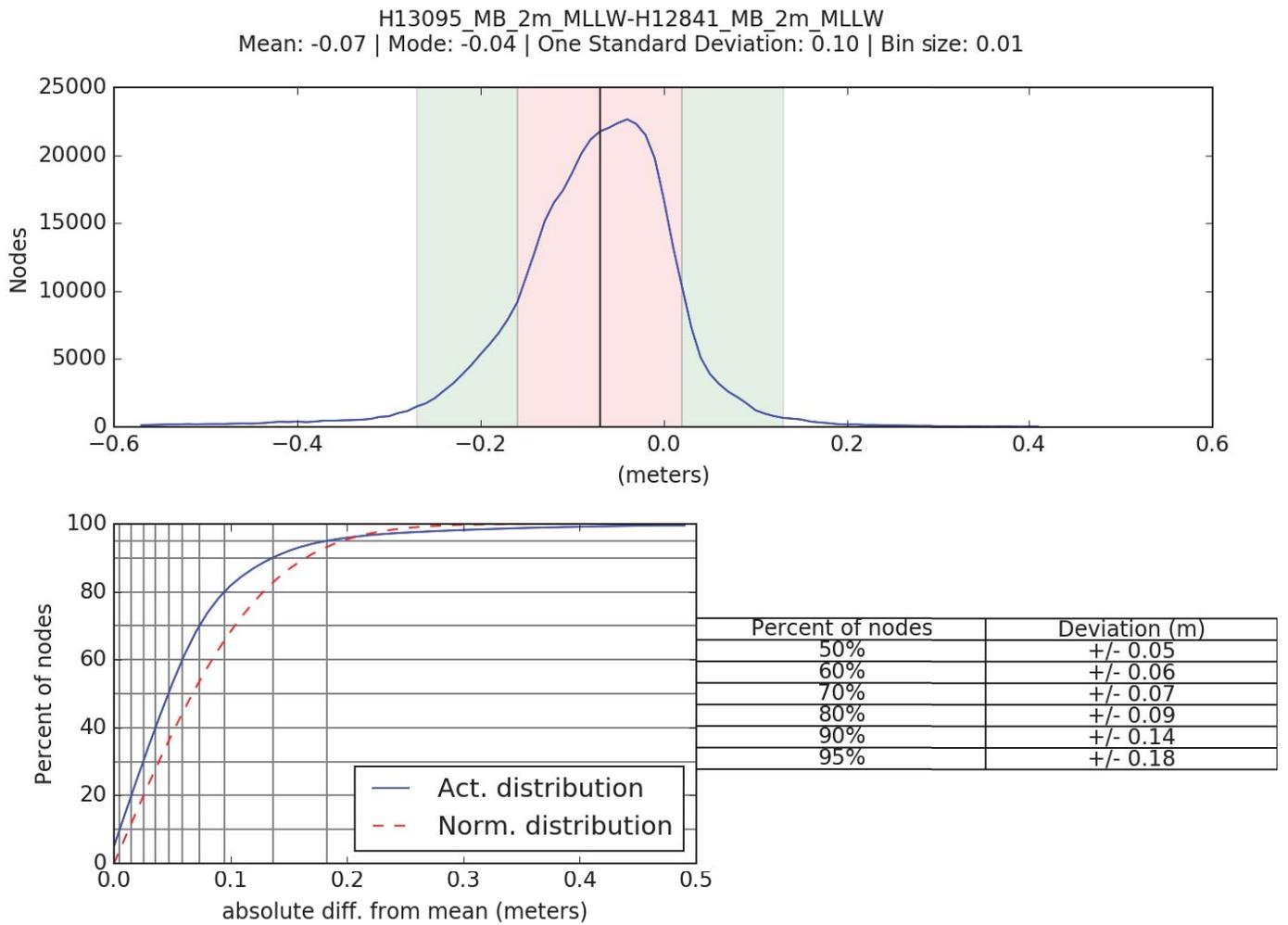


Figure 15: Difference Surface Statistics for H13095 and H12841

Comparison Distribution

Per Grid: H13095_MB_2m_MLLW-H12841_MB_2m_MLLW_fracAllowErr.csar

99.5+% nodes pass (428247), min=0.0, mode=0.1 mean=0.1 max=13.3

Percentiles: 2.5%=0.0, Q1=0.0, median=0.1, Q3=0.1, 97.5%=0.3

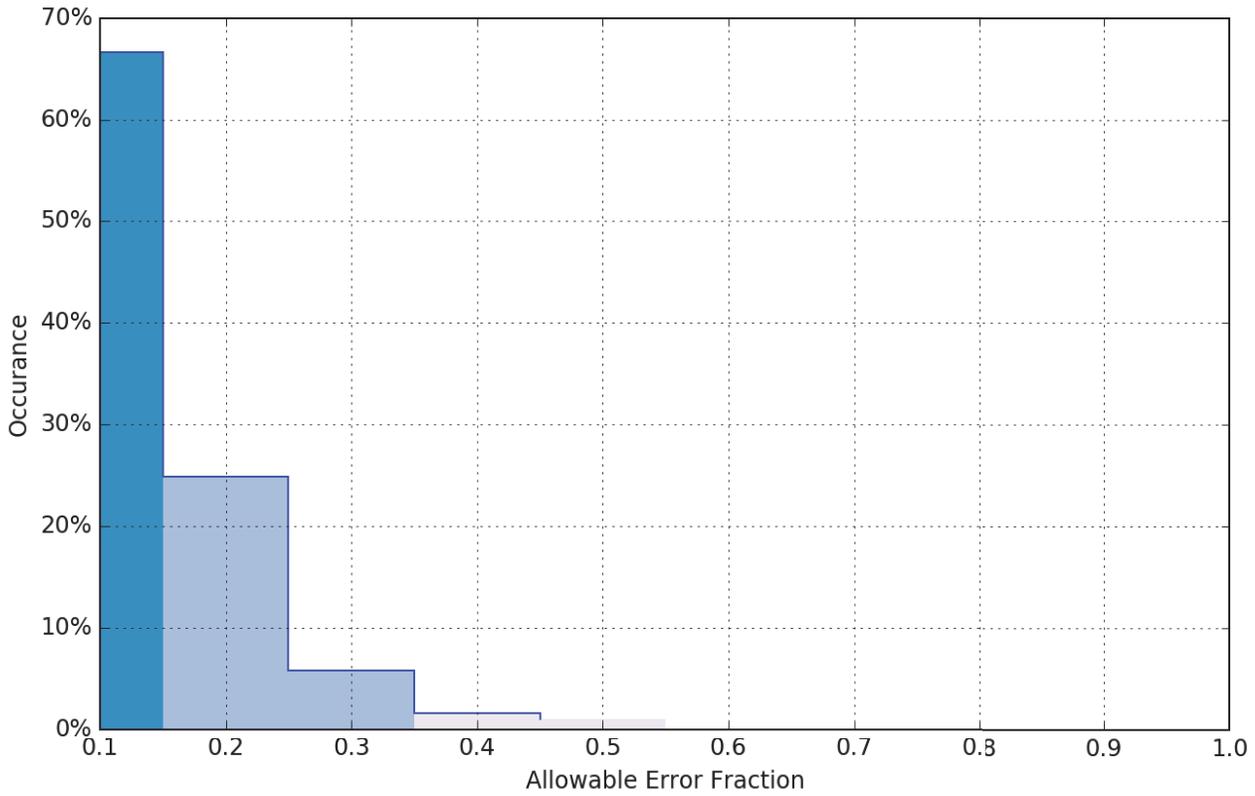


Figure 16: Fraction of allowable error for the junction of H13095 and H12841

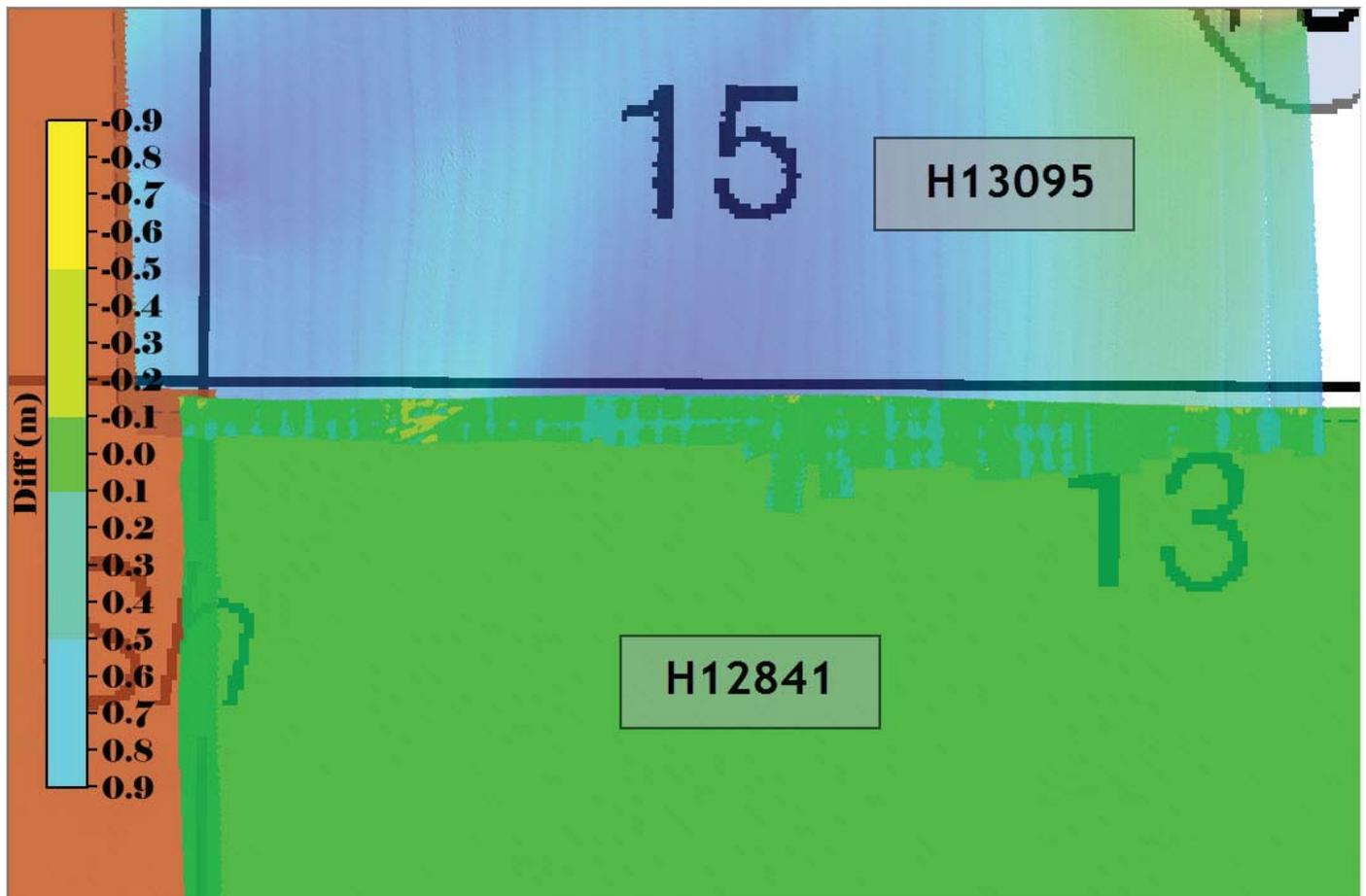


Figure 17: Junction between H13095 and H12841

H12858

The minimum and maximum depth difference between H13095 and H12858 is -0.60 and 0.45 meters respectively. The average difference is 0.02 meters with a standard deviation of 0.09 meters; 95% of the differenced nodes are within +/- 0.16 meters of the mean; 100% of the differenced nodes are within the fraction of allowable error. Junction overlap ranges from ~90m to ~110m.

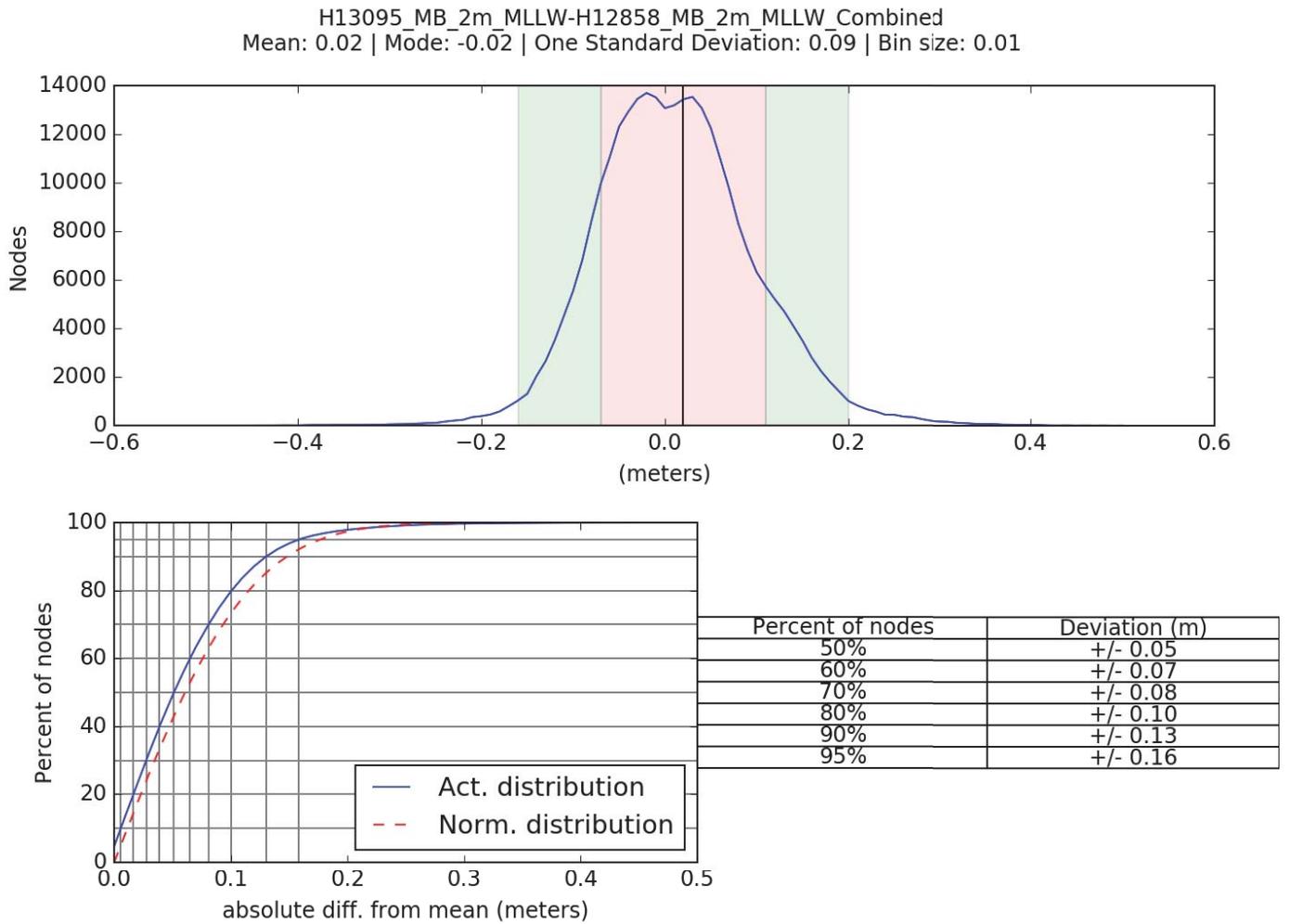


Figure 18: Difference Surface Statistics for H13095 and H12858

Comparison Distribution

Per Grid: H13095_MB_2m_MLLW-H12858_MB_2m_MLLW_Combined_fracAllowErr.csar

100% nodes pass (285209), min=0.0, mode=0.1 mean=0.1 max=0.7

Percentiles: 2.5%=0.0, Q1=0.0, median=0.1, Q3=0.1, 97.5%=0.2

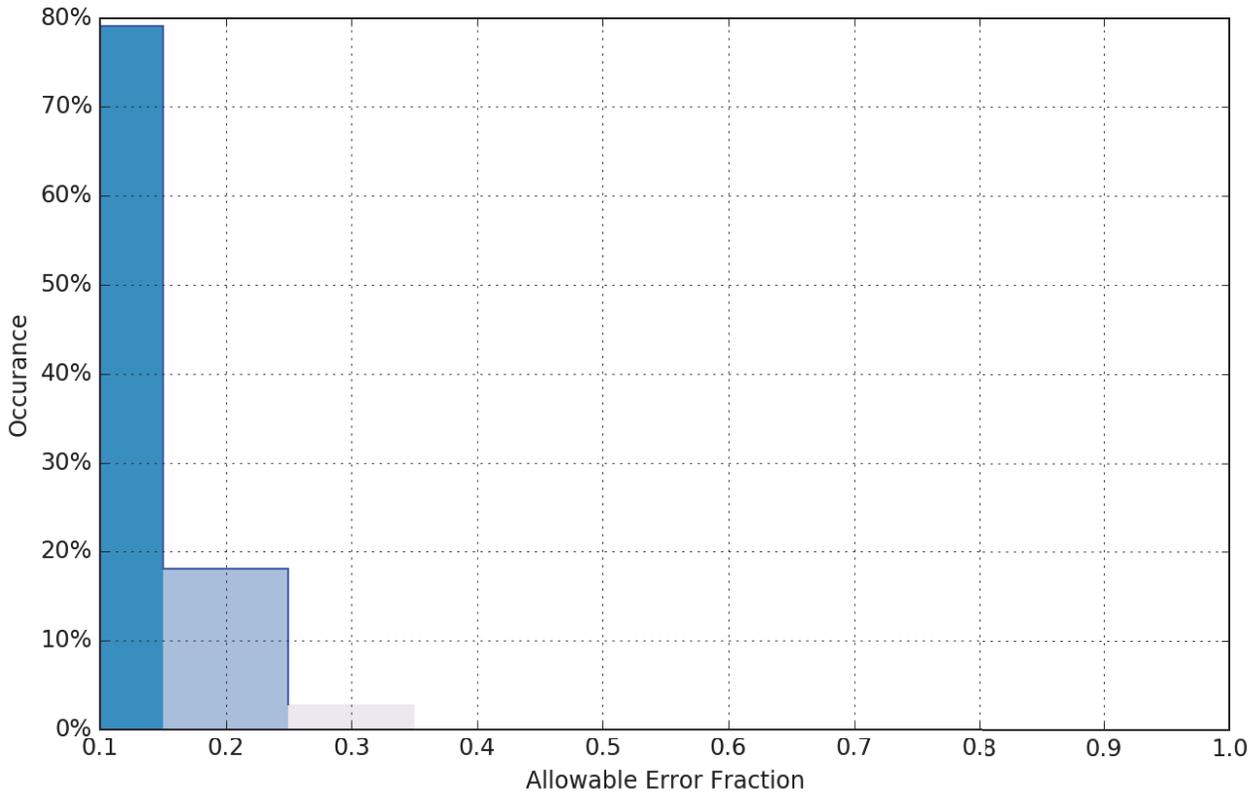


Figure 19: Fraction of allowable error for the junction of H13095 and H12858

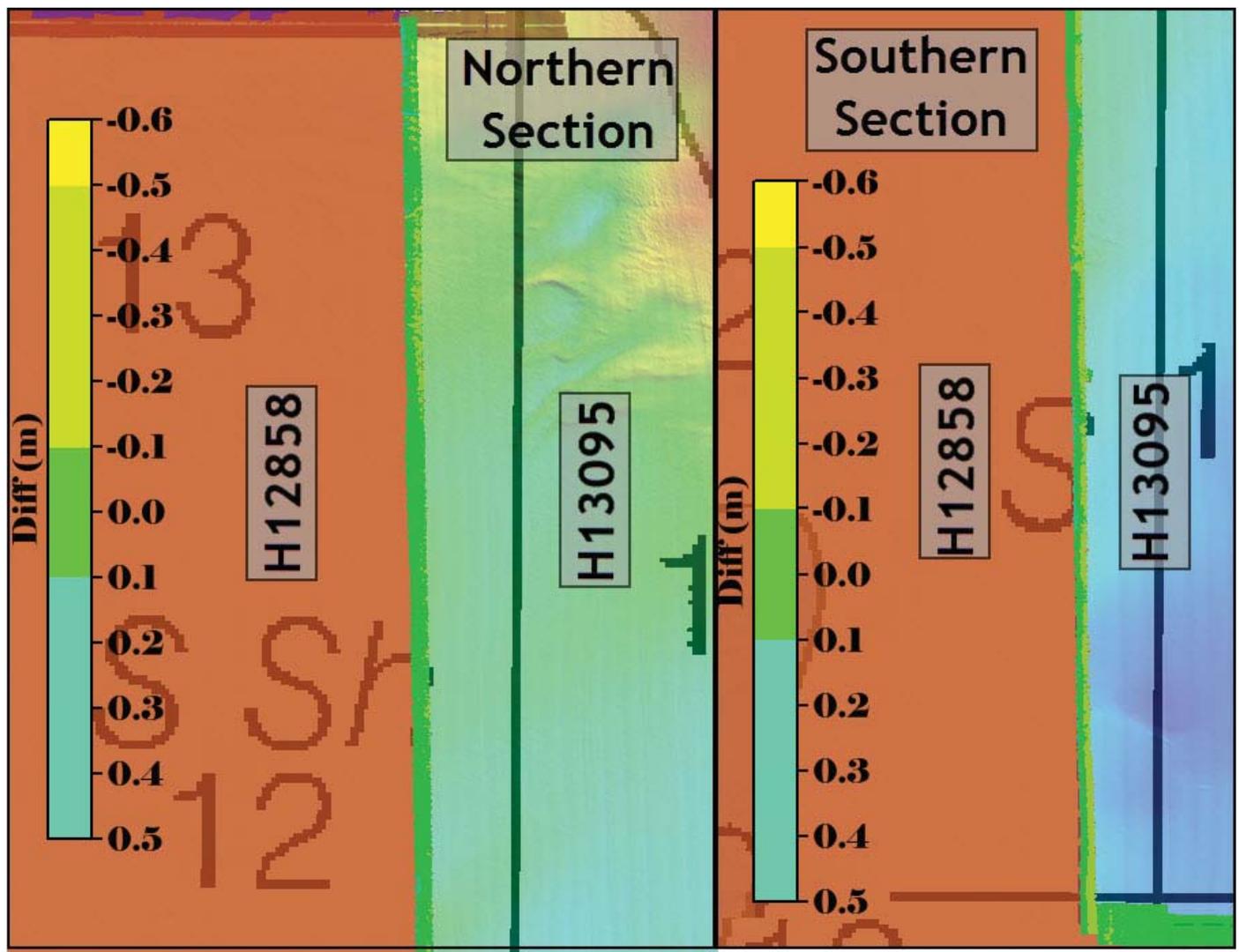


Figure 20: Junction between H13095 and H12858

H13094

The minimum and maximum depth difference between H13095 and H13094 is -0.48 and 0.74 meters respectively. The average difference is -0.02 meters with a standard deviation of 0.15 meters; 95% of the differenced nodes are within +/- 0.32 meters of the mean; 100% of the differenced nodes are within the fraction of allowable error. Junction overlap ranges from ~80m to ~300m.

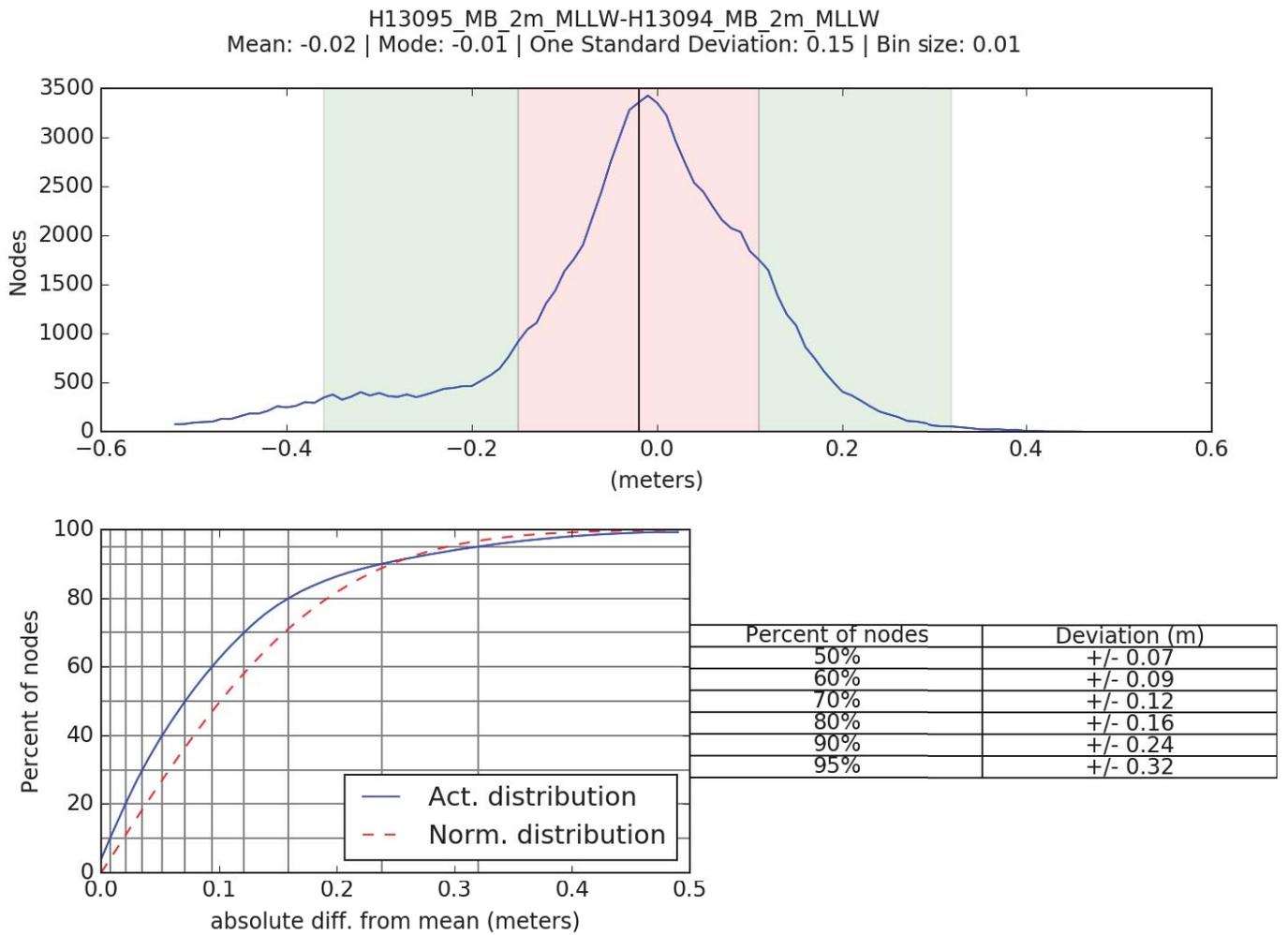


Figure 21: Difference Surface Statistics for H13095 and H13094

Comparison Distribution

Per Grid: H13095_MB_2m_MLLW-H13094_MB_2m_MLLW_fracAllowErr.csar

100% nodes pass (83809), min=0.0, mode=0.1 mean=0.1 max=0.9

Percentiles: 2.5%=0.0, Q1=0.0, median=0.1, Q3=0.2, 97.5%=0.5

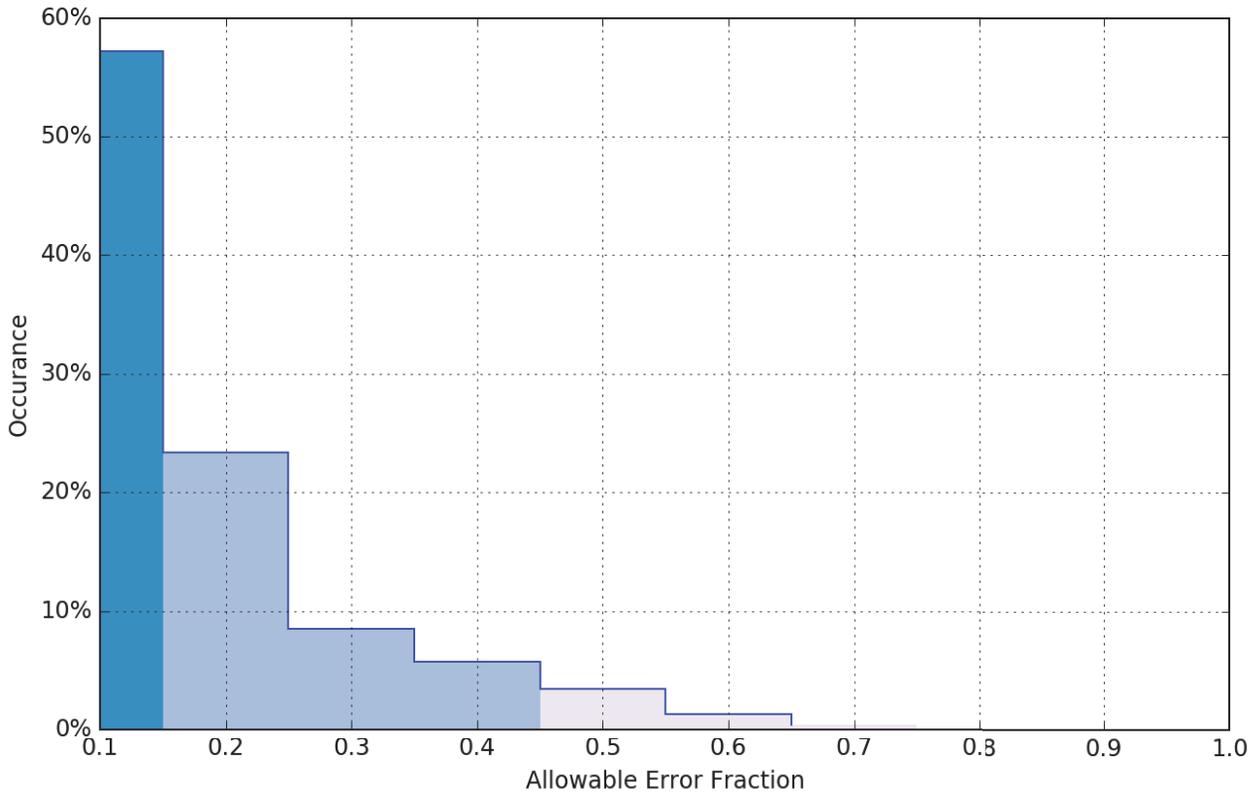


Figure 22: Fraction of allowable error for the junction of H13095 and H13094

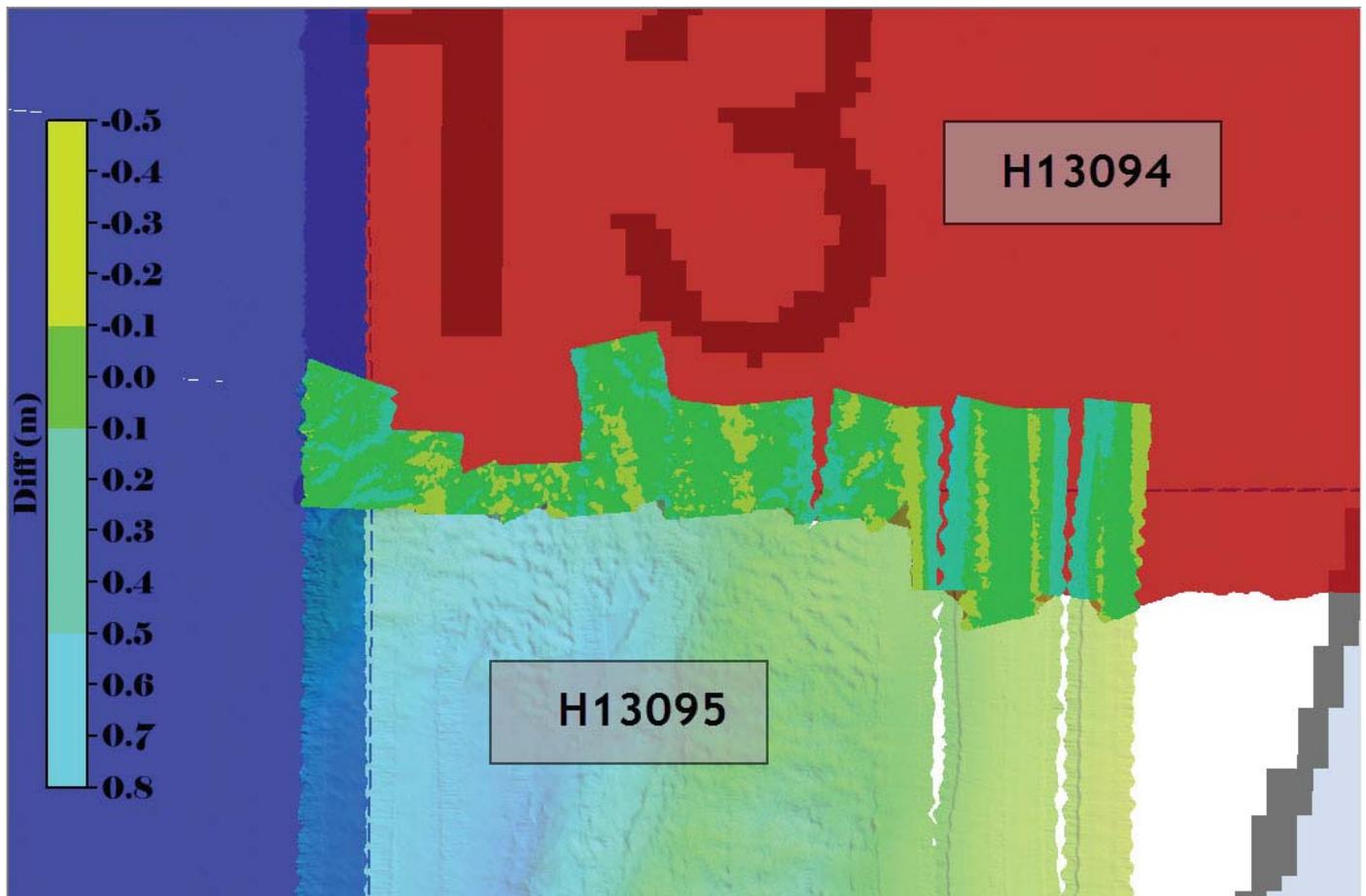


Figure 23: Junction between H13095 and H13094

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

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

B.2.6 Factors Affecting Soundings

Temporal Gap in Data Acquisition

A large gap in time for data acquisition exists for H13095. Data acquisition was cut short on March 15th, 2018 due to mechanical deficiencies with the ship's SOLAS equipment. After repairs were completed, the ship was required to sail directly to a multi-month repair period in Baltimore, MD. This repair period was completed in the summer of 2018. Due to the widely-known difficult sound speed environment that exists in the near coastal area off the Chesapeake Bay during the summer months, a decision was made to postpone the completion of H13095 until the Fall as the ship began transiting north for winter inport. See supplemental correspondence for additional detail.

Data acquisition was resumed on October 31st, 2018 but was again cut short due to mechanical deficiencies.

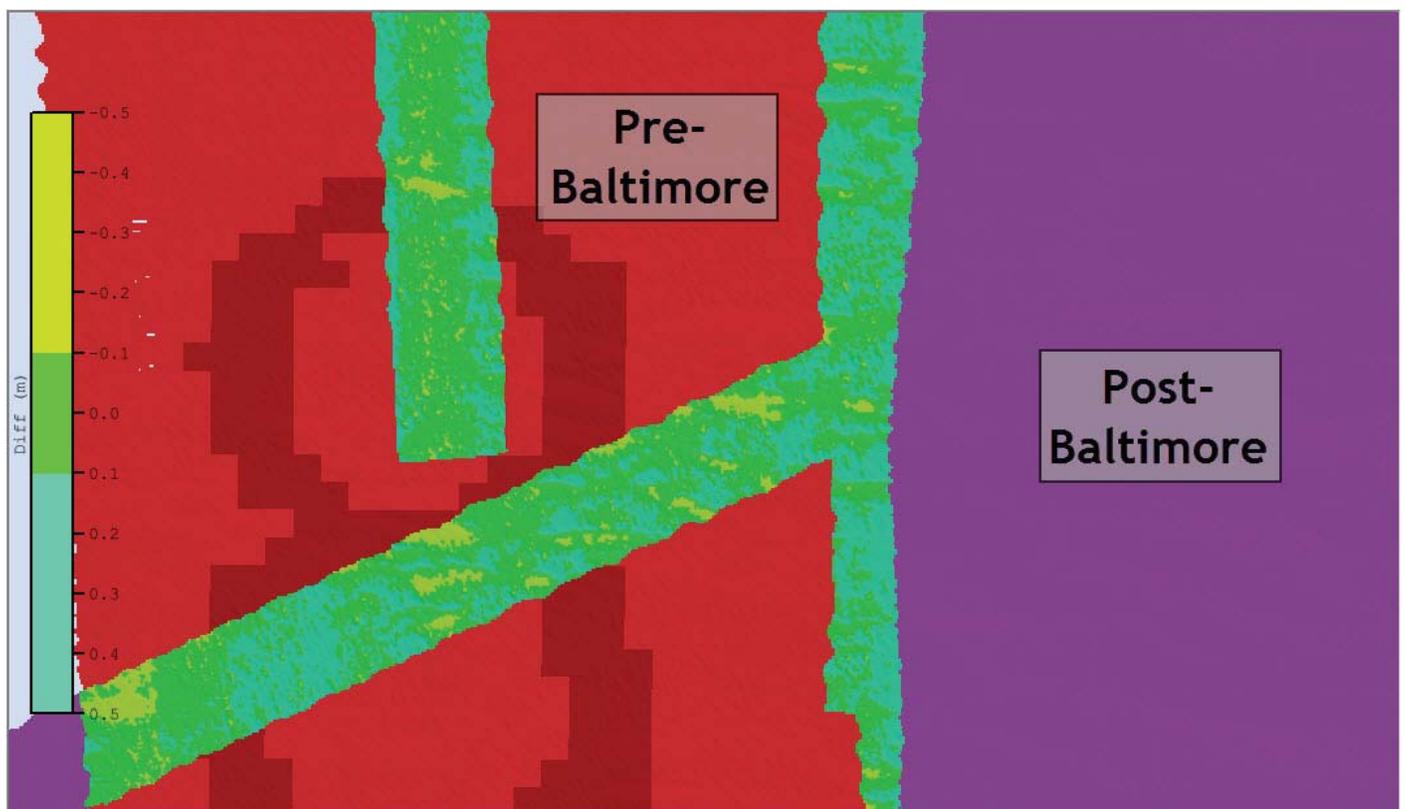


Figure 24: Difference surface of data collected before Baltimore repair period vs. data collected after Baltimore repair period. Migrating bedforms are seen in the difference surface. No significant differences observed by hydrographer.

B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: Casts were taken as deemed necessary by the field hydrographer, but not at an interval to exceed once every four hours via Moving Vessel Profiler.

During the course of acquisition a total of 105 sound speed measurements were collected via Moving Vessel Profiler and 6 casts were collected via Seabird SBE 19+ CTD. Sound speed corrections were applied in CARIS HIPS/SIPS using the Nearest in Distance Within Time (NIDWT) selection with time frequency of four hours.

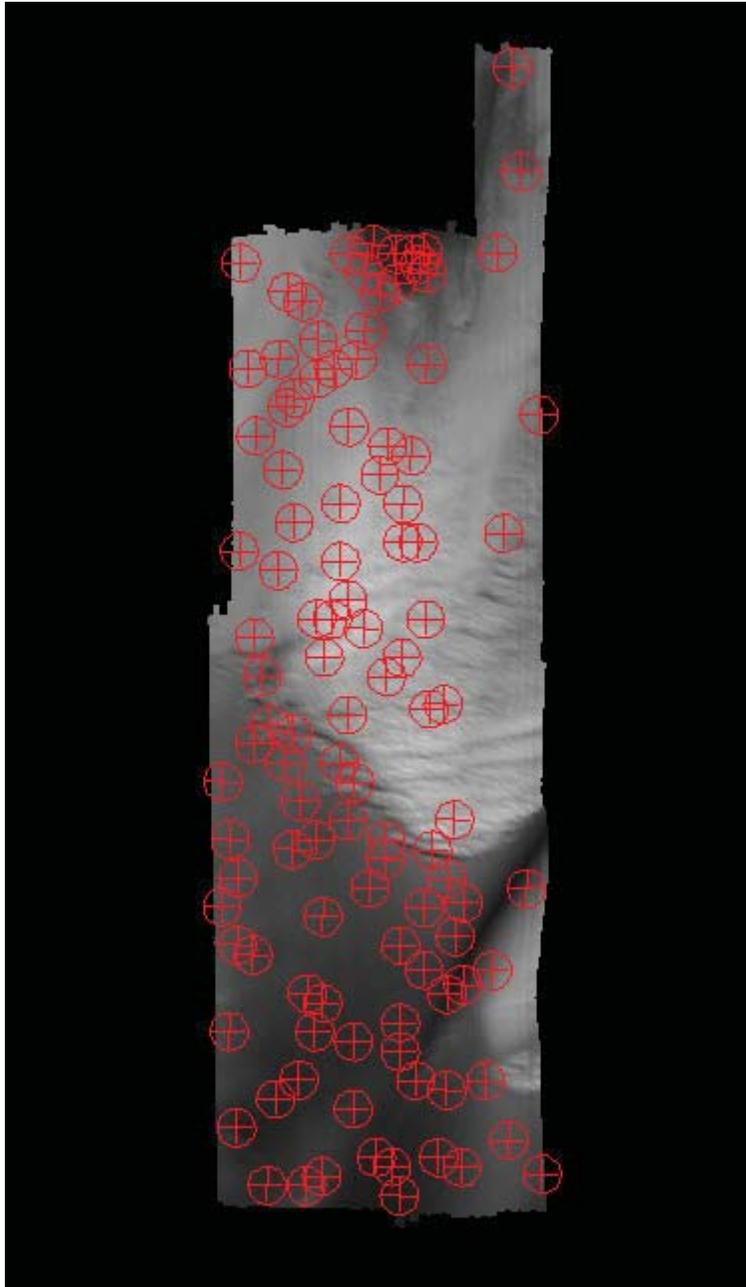


Figure 25: H13095 sound speed profile locations

B.2.8 Coverage Equipment and Methods

Complete coverage was achieved per PIs and HSSD 5.2.2.2 via dual head MBES coverage. No areas failed to meet coverage requirements with the exception of the holidays described above.

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 processed in accordance with Hydrographic Technical Directive (HTD) 2018-3.

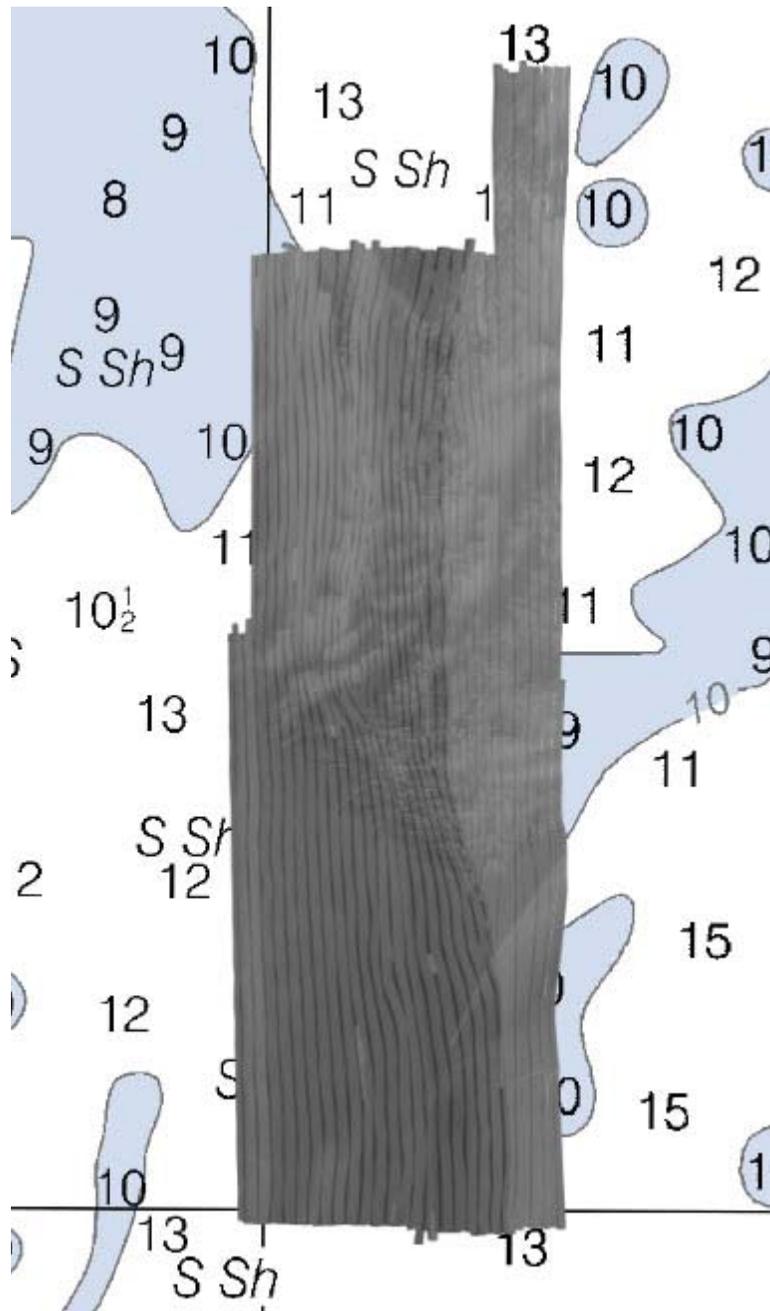


Figure 26: H13095 Backscatter Overview gridded at 2m resolution

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	HIPS/SIPS	10.3.1

Table 10: Primary bathymetric data processing software

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

Manufacturer	Name	Version
Fledermaus	FMGT	7.8.6

Table 11: Primary imagery data processing software

The following Feature Object Catalog was used: NOAA Profile Version 5.8.

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
H13095_MB_VR_MLLW	CARIS VR Surface (CUBE)	Variable Resolution	13.98 meters - 29.75 meters	NOAA_VR	Complete MBES
H13095_MB_VR_MLLW_Final	CARIS VR Surface (CUBE)	Variable Resolution	13.98 meters - 29.75 meters	NOAA_VR	Complete MBES

Table 12: Submitted Surfaces

A density analysis was run using the VR finalized surface to calculate the number of soundings per surface node. The results determined that greater than 99.5% of all nodes contained five or more soundings which meets the data density specifications. A TVU analysis was run using the VR finalized surface. The results determined that greater than 99.5% of nodes were within IHO allowable Total Vertical Uncertainty for Order 1a surveys.

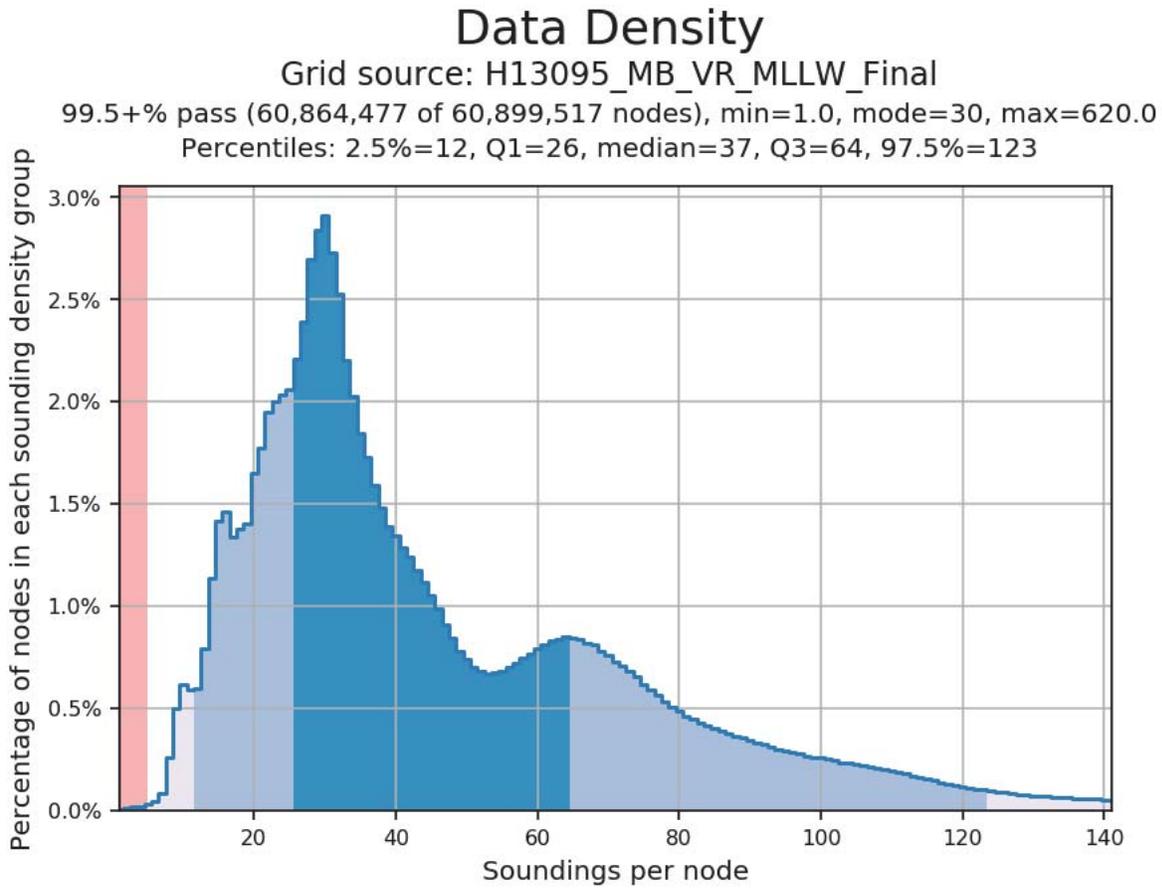


Figure 27: H13095 Data density of the VR finalized surface

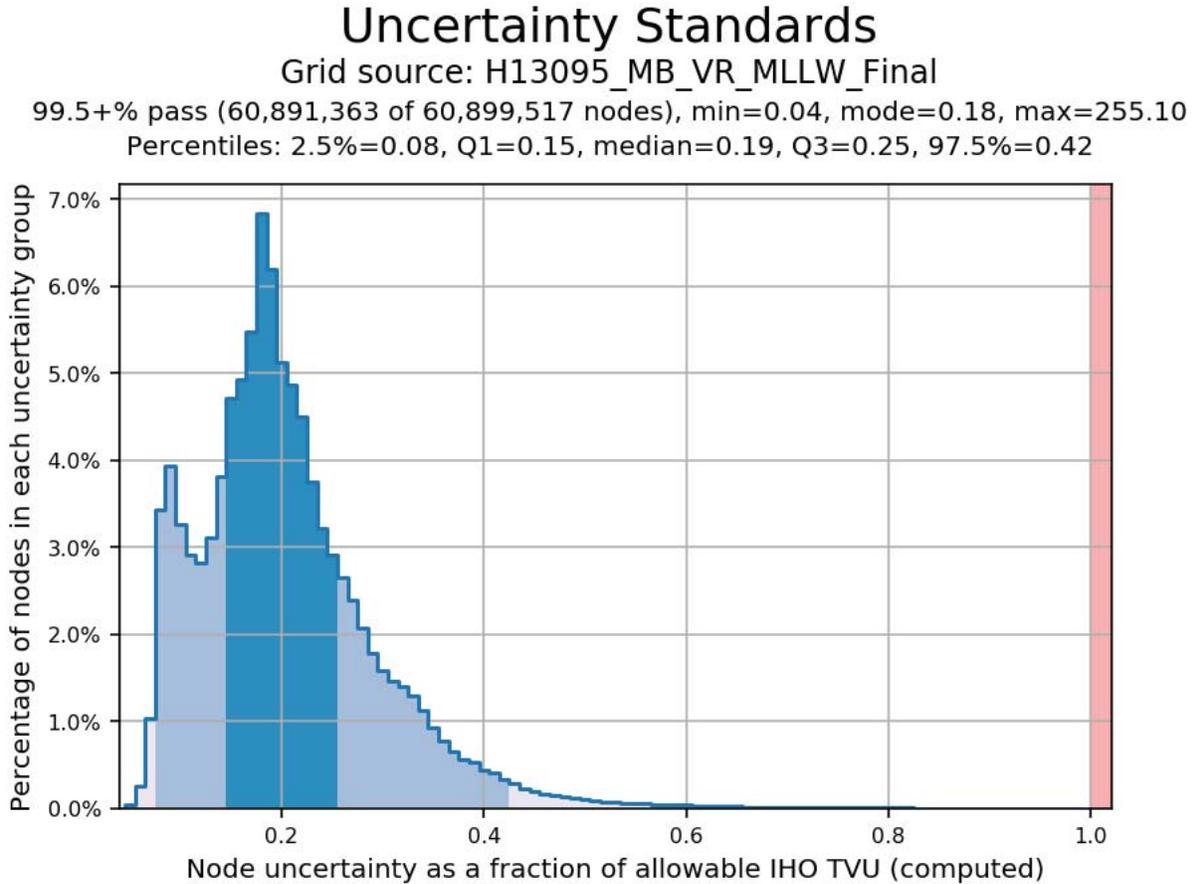


Figure 28: H13095 Total Vertical Uncertainty in the VR finalized surface

B.5.3 Designated Soundings

H13095 does not contain any designated soundings in accordance with HSSD Section 5.2.1.2.3.

C. Vertical and Horizontal Control

All data for survey ~~H13131~~ **H13095** have been reduced to Mean Lower Low Water (MLLW) using documented VDatum techniques documented in the DAPR. The 'Ferdinand R. Hassler' is equipped with Applanix POS/ MV position and orientation systems on the port and starboard hulls. Correctors are derived using a Precise Point Positioning (PPP) approach. For data acquired before April 1, 2018, the POS/MV data was 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 and post-processed in Applanix POSpac MMS service to produce Smoothed Best Estimates of Trajectory (SBETs) and RMS uncertainty files using the method of Post Processed Precise Point Positioning (5P). Data acquired after April 1, 2018

was post-processed in Applanix POSPac MMS using the Applanix RTX service to produce Smoothed Best Estimates of Trajectory (SBETs) and RMS uncertainty files using the method of Post Processed Precise Point Positioning (5P). Additional information discussing the vertical or horizontal control for this survey can be found in the accompanying DAPR.

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:

OPR_D304_FH_18_VDatum_xyNAD83-MLLW_geoid12b.csar

C.2 Horizontal Control

The horizontal datum for this project is North American Datum 1983.

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

D. Results and Recommendations

D.1 Chart Comparison

Survey soundings from H13095 were generated from a variable resolution CUBE surface in CARIS HIPS and SIPS and compared with the soundings from the largest scale Electronic Navigational Charts using the QC Tools 2 triangle rule tool. Contours from H13095 were also generated and visually compared with the charted contours from the largest scale Electronic Navigational Charts. No soundings were flagged by the triangle rule.

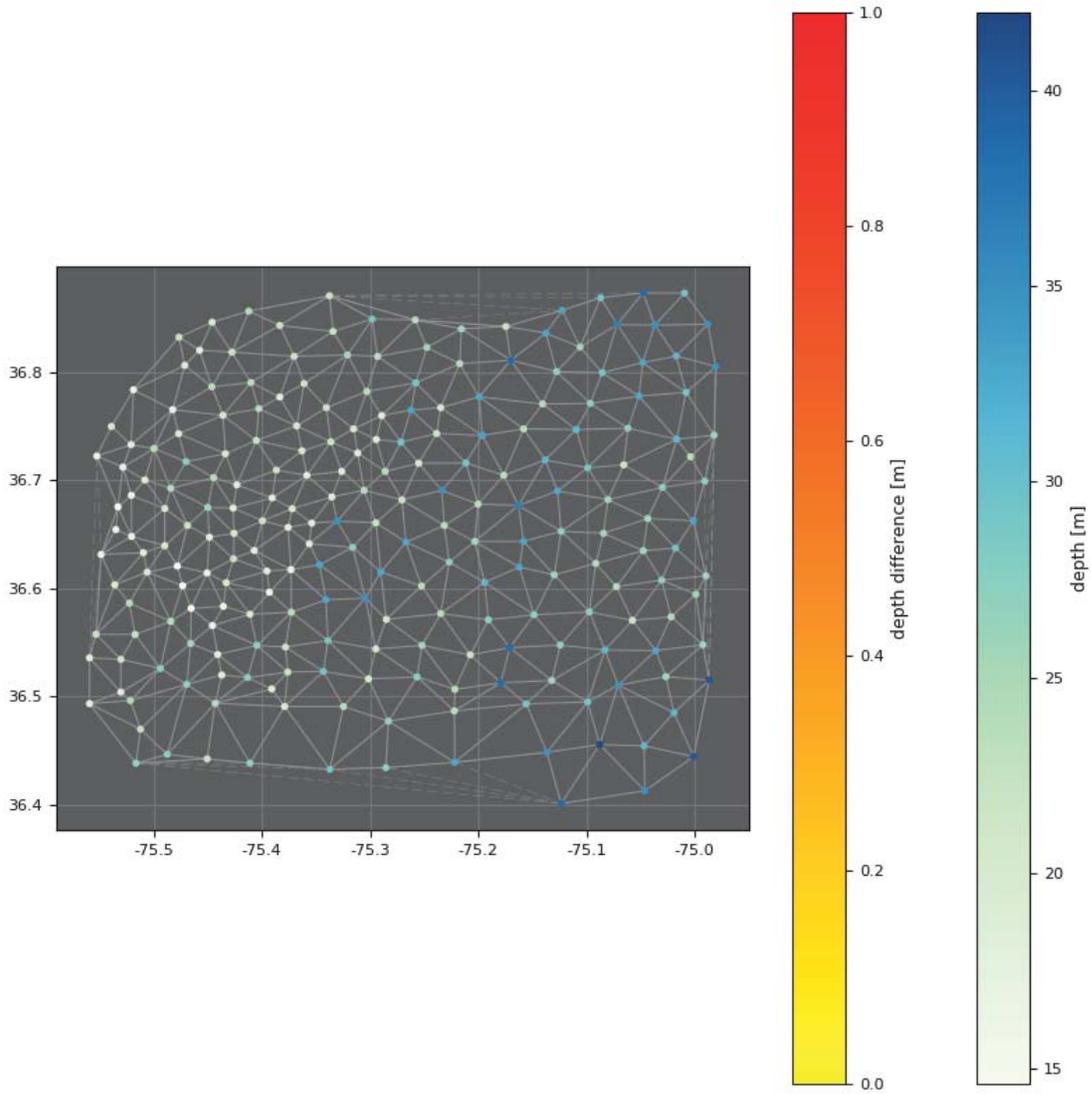


Figure 29: H13095 Chart Comparison - triangle rule

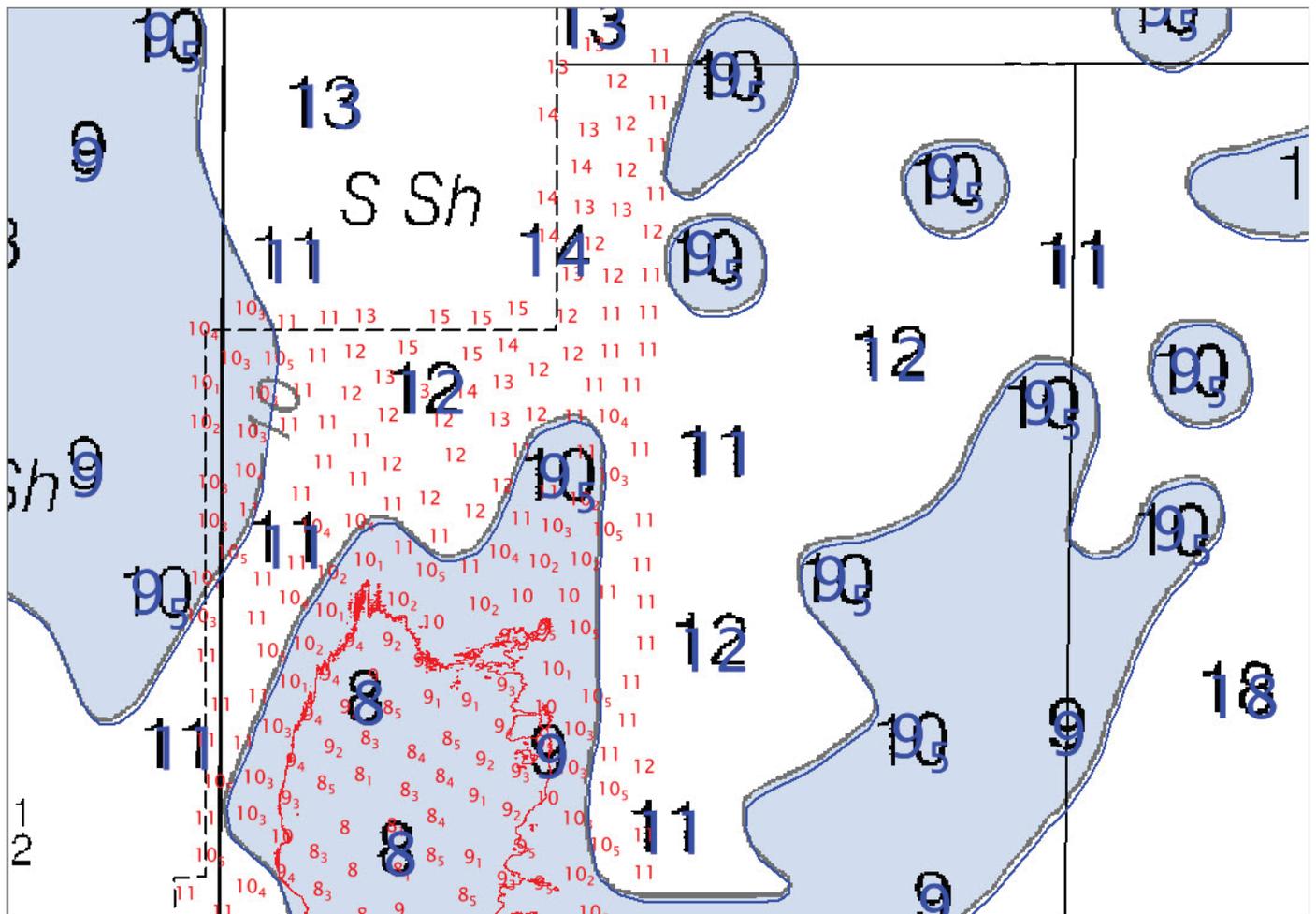


Figure 30: H13095 Chart Comparison - Survey scale soundings and contours in red and chart scale soundings and contours in blue for northern area

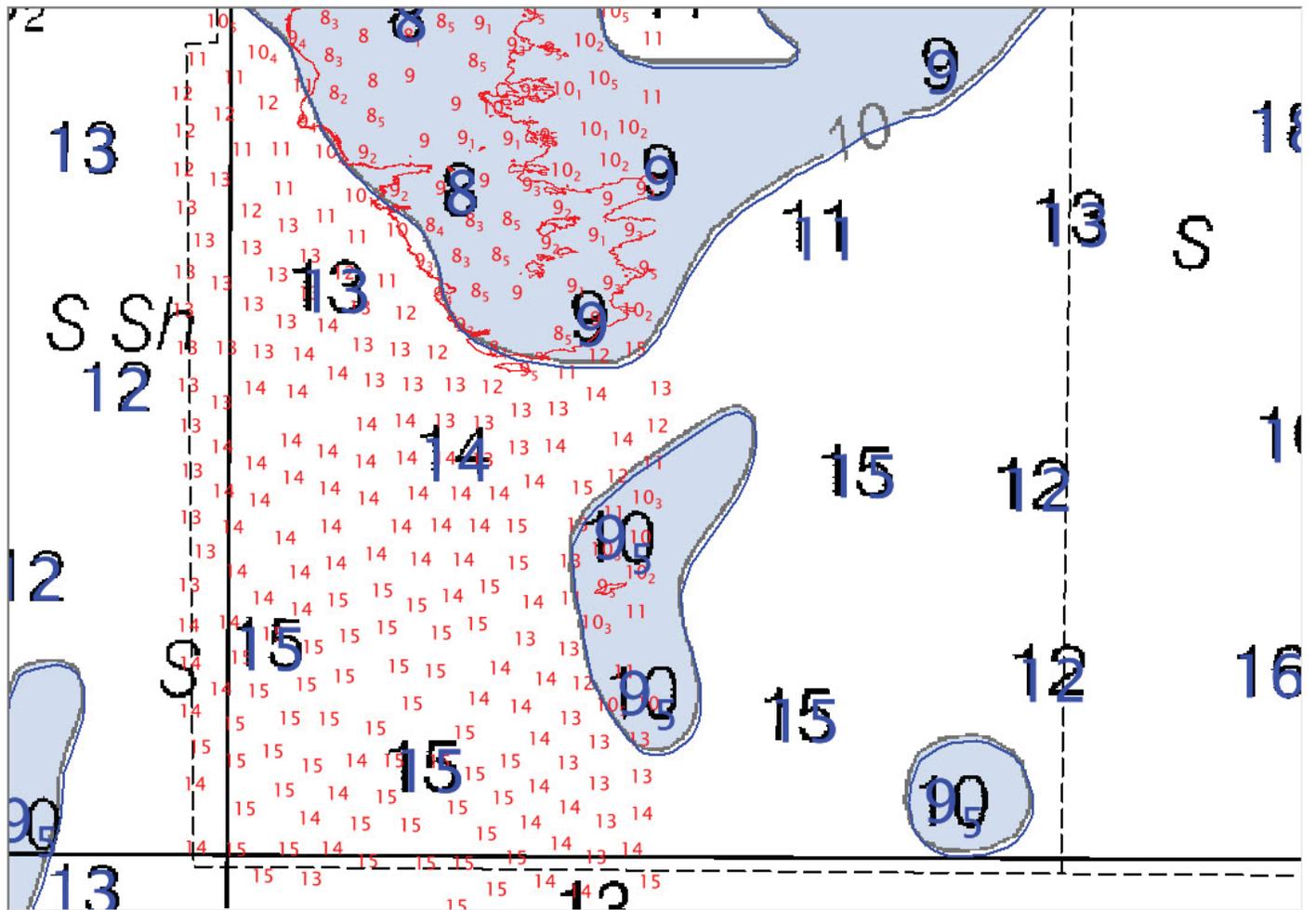


Figure 31: H13095 Chart Comparison - Survey scale soundings and contours in red and chart scale soundings and contours in blue for southern area

D.1.1 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?
US3DE01M	1:419707	20	11/13/2017	09/25/2017	NO

Table 13: Largest Scale ENC's

US3DE01M

ENC US3DE01M generally compares well with survey H13095. Due to the deepening trend observed throughout H13095, the surveyed 10-fathom contour has slightly decreased in size. Soundings as surveyed agree to within +/- 1 fathom as compared with currently charted depths.

D.1.2 Maritime Boundary Points

No Maritime Boundary Points were assigned for this survey.

D.1.3 Charted Features

No charted features exist for this survey.

D.1.4 Uncharted Features

No uncharted features exist for this survey.

D.1.5 Shoal and Hazardous Features

No shoals or potentially hazardous features exist for this survey.

D.1.6 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.1.7 Bottom Samples

Due to the field season ending abruptly for mechanical deficiencies with the ship, no bottom samples were collected for this survey.

D.2 Additional Results

D.2.1 Shoreline

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

D.2.2 Prior Surveys

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 Platforms

No platforms exist for this survey.

D.2.7 Ferry Routes and Terminals

No ferry routes or terminals exist for this survey.

D.2.8 Abnormal Seafloor and/or Environmental Conditions

No abnormal seafloor and/or environmental conditions 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.

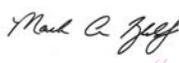
E. Approval Sheet

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, Field Procedures Manual, Letter Instructions, and all HSD Technical Directives. These data are adequate to supersede charted data in their common areas. This survey is complete and no additional work is required with the exception of deficiencies noted in the Descriptive Report.

Report Name	Report Date Sent
Data Acquisition and Processing Report	2019-04-19

Approver Name	Approver Title	Approval Date	Signature
Mark Blankenship, LCDR/NOAA	Chief of Party	04/15/2019	 Digitally signed by BLANKENSHIP.MARK.ANTHONY.1 052425537 Date: 2019.05.09 14:20:41 -04'00'
John R Kidd, LT/NOAA	Field Operations Officer	04/15/2019	 KIDD.JOHN.RYAN.1401688524 2019.05.09 13:37:47 -04'00'

F. Table of Acronyms

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

Acronym	Definition
HSTP	Hydrographic Systems Technology Programs
HSX	Hypack Hysweep File Format
HTD	Hydrographic Surveys Technical Directive
HVCR	Horizontal and Vertical Control Report
HVF	HIPS Vessel File
IHO	International Hydrographic Organization
IMU	Inertial Motion Unit
ITRF	International Terrestrial Reference Frame
LNM	Linear Nautical Miles
MBAB	Multibeam Echosounder Acoustic Backscatter
MCD	Marine Chart Division
MHW	Mean High Water
MLLW	Mean Lower Low Water
NAD 83	North American Datum of 1983
NAIP	National Agriculture and Imagery Program
NALL	Navigable Area Limit Line
NM	Notice to Mariners
NMEA	National Marine Electronics Association
NOAA	National Oceanic and Atmospheric Administration
NOS	National Ocean Service
NRT	Navigation Response Team
NSD	Navigation Services Division
OCS	Office of Coast Survey
OMAO	Office of Marine and Aviation Operations (NOAA)
OPS	Operations Branch
MBES	Multibeam Echosounder
NWLON	National Water Level Observation Network
PDBS	Phase Differencing Bathymetric Sonar
PHB	Pacific Hydrographic Branch
POS/MV	Position and Orientation System for Marine Vessels
PPK	Post Processed Kinematic
PPP	Precise Point Positioning
5P	Post Processed Precise Point Positioning

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



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

H13095

2 messages

OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> Mon, Nov 12, 2018 at 6:02 PM
To: AHB Chief - NOAA Service Account <ahb.chief@noaa.gov>, Castle Parker - NOAA Federal <castle.e.parker@noaa.gov>
Cc: Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>

Greetings,

OPR-D304-FH-18 H13095 and F00716 were started before the 2018 HSSD was released and therefore the folder structure was established using the 2017 HSSD specs. I am requesting a waiver to continue using the 2017 folder structure. This email will be archived in the correspondence folder once the conversation is complete.

LT John Kidd

Field Operations Officer, NOAA Ship FERDINAND R. HASSLER

*ship's cell: 603-812-8748 * VOIP: 541-867-8935 * iridium: 808-851-3826*

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

Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>

Tue, Nov 13, 2018 at 11:28 AM

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

Hi LT Kidd,

yes, you may keep the 2017 survey file structure for sheets OPR-D304-FH-18; H13095 and F00716 as they were opened prior to the directive.

Doug

[Quoted text hidden]

--

Douglas Wood

Physical Scientist

Hydrographic Surveys Division

Office of Coast Survey

National Oceanic and Atmospheric Administration

[1315 East West Highway](#)

[Silver Spring, MD 20910](#)

240-533-0042



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

H13095

8 messages

OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov>
To: Brendan Guthrie - NOAA Federal <brendan.guthrie@noaa.gov>

Thu, Mar 28, 2019 at 1:03 PM

Hey Brendan,

Am I missing something? I don't see the DR on the hard drive you submitted. Was this sheet fully processed when you returned it?

LT John Kidd
Field Operations Officer, NOAA Ship FERDINAND R. HASSLER
ship's cell: [603-812-8748](tel:603-812-8748) * VOIP: [541-867-8935](tel:541-867-8935) * irridium: [808-851-3826](tel:808-851-3826)

Shipyards Address (UPS/FedEx):
GMD Shipyards Corp. (Atten: NOAA Ship Hassler)
Brooklyn Navy Yard
63 Flushing Ave BLDG # 595 UNIT # 276
Brooklyn, NY 11205-1005

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

Brendan Guthrie - NOAA Affiliate <brendan.guthrie@noaa.gov>
To: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>

Thu, Mar 28, 2019 at 2:34 PM

Hey John,

Yeah I went through processing the Sheet like we discussed. The surfaces should all be there and I went through the DR and added the figure images to correspond with important info. I did not finalize the DR to a pdf and left it as the xml file. Is that what you mean in regard to not seeing the DR?

Brendan Guthrie

Marine GIS Analyst - [CSS Inc.](#)
brendan.guthrie@noaa.gov
bguthrie@css-inc.com
240-533-0373 | Office
704-241-3209 | Cell
Biogeography Branch
[NOAA](#) | [NOS](#) | [NCCOS](#) | [MSE](#)
[1305 East-West Hwy, SSMC-4, #9319](#)
Silver Spring, MD 20910-3278
coastalscience.noaa.gov

Disclaimer: Any views or opinions expressed in this message are those of the sender, and do not represent official views of NOAA nor the United States Government or its agents, or CSS Inc.

[Quoted text hidden]

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

Thu, Mar 28, 2019 at 3:02 PM

To: Brendan Guthrie - NOAA Affiliate <brendan.guthrie@noaa.gov>

No, I just opened the DR and ran a quick validation on it. There were a lot of red 'x' on most of the tabs. When I look through the tabs there is still a lot of stock verbiage and no images populated. Can you please take a look at the attached DR and tell me if this is what you intended to submit?

Additionally, there is only one image in the DR Images folder.

LT John Kidd
Field Operations Officer, NOAA Ship FERDINAND R. HASSLER
ship's cell: [603-812-8748](tel:603-812-8748) * VOIP: [541-867-8935](tel:541-867-8935) * irridium: [808-851-3826](tel:808-851-3826)

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[New Castle, NH 03854](#)

Mailing Address:
PO Box 638, New Castle, NH 03854

[Quoted text hidden]

 **H13095_DR.xml**
31K

Brendan Guthrie - NOAA Affiliate <brendan.guthrie@noaa.gov>

Thu, Mar 28, 2019 at 3:41 PM

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

Okay so this xml file is missing some of the work I did, mainly in the quality control/junction survey and chart comparison section. I am not sure why it isn't there. Let me look to see if I have another xml version saved on my google drive unless it was saved in another folder on the hard drive. All of the work I did on this survey I made sure to save it to the hard drive vs my computer at AHB. There also are a lot of image folder directories missing that had images or they say image failed to display even though I added images in for reference so that information is also missing even though I added it to the DR.

[Quoted text hidden]

[Quoted text hidden]

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

Thu, Mar 28, 2019 at 4:56 PM

To: Brendan Guthrie - NOAA Affiliate <brendan.guthrie@noaa.gov>

So sounds like there is a major data management issue at work here. Please do your best at figuring out what is going on. If you need me to send this hard drive back to AHB for large data transfers please let me know.

LT John Kidd
Field Operations Officer, NOAA Ship FERDINAND R. HASSLER
ship's cell: [603-812-8748](tel:603-812-8748) * VOIP: [541-867-8935](tel:541-867-8935) * irridium: [808-851-3826](tel:808-851-3826)

Shipyard Address (UPS/FedEx):

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Brooklyn, NY 11205-1005

Physical Address (UPS/FedEx):

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[New Castle, NH 03854](#)

Mailing Address:

PO Box 638, New Castle, NH 03854

[Quoted text hidden]

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

Tue, Apr 2, 2019 at 12:25 PM

To: Brendan Guthrie - NOAA Affiliate <brendan.guthrie@noaa.gov>

Brendan,

Please send me an update. Our field season will be starting soon and I need to know if this survey is going to require a lot of work.

LT John Kidd

Field Operations Officer, NOAA Ship FERDINAND R. HASSLER
ship's cell: [603-812-8748](tel:603-812-8748) * VOIP: [541-867-8935](tel:541-867-8935) * irridium: [808-851-3826](tel:808-851-3826)

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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

[Quoted text hidden]

Brendan Guthrie - NOAA Affiliate <brendan.guthrie@noaa.gov>

Wed, Apr 3, 2019 at 11:22 AM

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

John,

I wasn't able to find any other files related to this survey on my personal google drive or noaa google drive. I can start reworking through the xml and fill in as much as I can for the DR if you'd like. I shouldn't need the full harddrive sent back but maybe uploading some surface zip files or screenshots via google drive might help and I'll put some hours on it this week.

Thanks,

[Quoted text hidden]

--

[Quoted text hidden]

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

Wed, Apr 3, 2019 at 12:06 PM

To: CO HASSLER <co.ferdinand.hassler@noaa.gov>

CO,

Brendan can't seem to find his work... I think we would have better success if I just pushed through this survey here on the ship. Not sure what kind of feedback or corrective action we want to take.

LT John Kidd
Field Operations Officer, NOAA Ship FERDINAND R. HASSLER
ship's cell: [603-812-8748](tel:603-812-8748) * VOIP: [541-867-8935](tel:541-867-8935) * irridium: [808-851-3826](tel:808-851-3826)

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Physical Address (UPS/FedEx):
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[29 Wentworth Rd](#)
[New Castle, NH 03854](#)

Mailing Address:
PO Box 638, New Castle, NH 03854

[Quoted text hidden]



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

H12979, H13095, and H13131 Survey Outline

1 message

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

Thu, Jun 13, 2019 at 6:29 PM

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

Cc: Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>

Greetings

Please see attached survey outlines for OPR-D304-FH-18 H13095 and OPR-G343-FH-18 H13131 and H12979. My apologizes for not sending earlier.

LT John Kidd

Operations Officer, NOAA Ship FERDINAND R. HASSLER

ship's cell: [603-812-8748](tel:603-812-8748) * VOIP: [541-867-8935](tel:541-867-8935) * irridium: [808-851-3826](tel:808-851-3826)

Shipyards Address (UPS/FedEx):

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Brooklyn, NY 11205-1005

Physical Address (UPS/FedEx):

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[29 Wentworth Rd](#)

[New Castle, NH 03854](#)

Mailing Address:

PO Box 638, New Castle, NH 03854

3 attachments

 **H12979_Survey_Outline.000**
867K

 **H13131_Survey_Outline.000**
2427K

 **H13095_Survey_Outline.000**
2427K



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

Marine Mammal Observations

2 messages

OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> Thu, Jun 13, 2019 at 3:24 PM
To: _NMFS AFSC NMML POP INFORMATION <pop.information@noaa.gov>
Cc: Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>, _NOS OCS ECC <ocs.ecc@noaa.gov>

Greetings,

Please see attached document for marine mammal sightings during the 2018 field season.

LT Steven Wall
Operations Officer in Training, NOAA Ship FERDINAND R. HASSLER
ship's cell: [603-812-8748](tel:603-812-8748) * VOIP: [541-867-8935](tel:541-867-8935) * irridium: [808-851-3826](tel:808-851-3826)

Shipyard Address (UPS/FedEx):
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[29 Wentworth Rd](#)
[New Castle, NH 03854](#)

Mailing Address:
PO Box 638, New Castle, NH 03854

 **FH_Marine Mammal Sightings_20190613.pdf**
3639K

Blair Delean - NOAA Federal <blair.j.delean@noaa.gov> Thu, Jun 13, 2019 at 5:04 PM
To: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>
Cc: _NMFS AFSC NMML POP INFORMATION <pop.information@noaa.gov>, Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>, _NOS OCS ECC <ocs.ecc@noaa.gov>

Excellent, thank you for your POP submission.

Very Respectfully,

LTJG Blair Delean, NOAA
Marine Mammal Laboratory
206.526.4048



[Quoted text hidden]



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

NCEI Sound Speed Data

1 message

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

Thu, Jun 13, 2019 at 1:44 PM

To: "NODC.Submissions" <NODC.Submissions@noaa.gov>

Cc: Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>

Greetings,

Please see attached .zip files containing sound speed data collected during last years projects, OPR-G343-FH-18 and OPR-D304-FH-18.

LT Steven Wall

Operations Officer in Training, NOAA Ship FERDINAND R. HASSLER
ship's cell: [603-812-8748](tel:603-812-8748) * VOIP: [541-867-8935](tel:541-867-8935) * irridium: [808-851-3826](tel:808-851-3826)

Shipyards Address (UPS/FedEx):

GMD Shipyards Corp. (Atten: NOAA Ship Hassler)
Brooklyn Navy Yard
63 Flushing Ave BLDG # 595 UNIT # 276
Brooklyn, NY 11205-1005

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

2 attachments

 **OPR-G343-FH-18_20190613.zip**
717K

 **OPR-D304-FH-18_20190613.zip**
1900K



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

Sea Turtle Sightings

3 messages

OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> Thu, Jun 13, 2019 at 3:24 PM
To: larisa.avens@noaa.gov, jeffrey.seminoff@noaa.gov, george.balazs@noaa.gov
Cc: Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>, _NOS OCS ECC <ocs.ecc@noaa.gov>

Greetings,

Please see attached document for sea turtle sightings during the 2018 field season.

LT Steven Wall
Operations Officer in Training, NOAA Ship FERDINAND R. HASSLER
ship's cell: 603-812-8748 * VOIP: 541-867-8935 * irridium: 808-851-3826

Shipyard Address (UPS/FedEx):
GMD Shipyard Corp. (Atten: NOAA Ship Hassler)
Brooklyn Navy Yard
63 Flushing Ave BLDG # 595 UNIT # 276
Brooklyn, NY 11205-1005

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

 **FH_Sea Turtle Sightings_20190613.pdf**
947K

Mail Delivery Subsystem <mailer-daemon@googlemail.com>
To: ops.ferdinand.hassler@noaa.gov

Thu, Jun 13, 2019 at 3:24 PM



Message not delivered

There was a problem delivering your message to **george.balazs@noaa.gov**. See the technical details below.

Final-Recipient: rfc822; george.balazs@noaa.gov
Action: failed

Status: 5.0.0

Last-Attempt-Date: Thu, 13 Jun 2019 08:24:16 -0700 (PDT)

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

From: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>
To: larisa.avens@noaa.gov, jeffrey.seminoff@noaa.gov, george.balazs@noaa.gov
Cc: Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>, _NOS OCS ECC <ocs.ecc@noaa.gov>
Bcc:
Date: Thu, 13 Jun 2019 15:24:01 +0000
Subject: Sea Turtle Sightings
Greetings,

Please see attached document for sea turtle sightings during the 2018 field season.

LT Steven Wall
Operations Officer in Training, NOAA Ship FERDINAND R. HASSLER
ship's cell: [603-812-8748](tel:603-812-8748) * VOIP: [541-867-8935](tel:541-867-8935) * iridium: [808-851-3826](tel:808-851-3826)

Shipyards Address (UPS/FedEx):
GMD Shipyards Corp. (Atten: NOAA Ship Hassler)
Brooklyn Navy Yard
63 Flushing Ave BLDG # 595 UNIT # 276
Brooklyn, NY 11205-1005

Physical Address (UPS/FedEx):
UNH Judd Gregg Marine Research Complex
[29 Wentworth Rd](#)
[New Castle, NH](#) ----- Message truncated -----

Larisa Avens - NOAA Federal <larisa.avens@noaa.gov>

Thu, Jun 13, 2019 at 6:23 PM

To: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>
Cc: Jeffrey Seminoff <jeffrey.seminoff@noaa.gov>, George Balazs - NOAA Federal <george.balazs@noaa.gov>, Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>, _NOS OCS ECC <ocs.ecc@noaa.gov>

Good afternoon,
Thank you for passing along this information!

Best,
Larisa

[Quoted text hidden]

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Larisa Avens, Ph.D., Research Fishery Biologist  
National Marine Fisheries Service, NOAA Beaufort Laboratory  
[101 Pivers Island Rd. Beaufort, NC 28516](#)  
Ph: [252-728-8747](tel:252-728-8747)  
<http://www.sefsc.noaa.gov/labs/beaufort/>

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APPROVAL PAGE

H13095

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

- Descriptive Report
- Bathymetric Attributed Grid (BAG) MLLW and Ellipsoid Datums
- Processed survey data and records
- GeoPDF of survey products

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 Meghan McGovern, NOAA**  
Chief, Atlantic Hydrographic Branch