H12854

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

DESCRIPTIVE REPORT

Type of Survey:	Navigable Area
Registry Number:	H12854

LOCALITY

State(s):	Virginia
General Locality:	Coastal Virginia
Sub-locality:	Offshore of Assawoman Island

2015

CHIEF OF PARTY
Shepard M. Smith, CAPT / NOAA

LIBRARY & ARCHIVES

Date:

U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	REGISTRY NUMBER:
HYDROGRAPHIC TITLE SHEET	**H12854**

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):	**Virginia**
General Locality:	**Coastal Virginia**
Sub-Locality:	**Offshore of Assawoman Island**
Scale:	**10000**
Dates of Survey:	**12/08/2015 to 12/17/2015**
Instructions Dated:	**01/05/2016**
Project Number:	**OPR-D302-TJ-15**
Field Unit:	**NOAA Ship *Thomas Jefferson***
Chief of Party:	**Shepard M. Smith, CAPT / NOAA**
Soundings by:	**Multibeam Echo Sounder**
Imagery by:	**Side Scan Sonar**
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 H12854

Project: OPR-D302-TJ-15

Locality: Coastal Virginia

Sublocality: Offshore of Assawoman Island

Scale: 1:10000

December 2015 - December 2015

NOAA Ship *Thomas Jefferson*

Chief of Party: Shepard M. Smith, CAPT / NOAA

A. Area Surveyed

The Area surveyed is located 3 nm east of Assawoman Island, VA

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
37° 49' 36" N 75° 30' 58" W	37° 35' 37" N 75° 22' 31" W

Table 1: Survey Limits

The survey limits of H12854 were extended into the eastern portion of H12853.

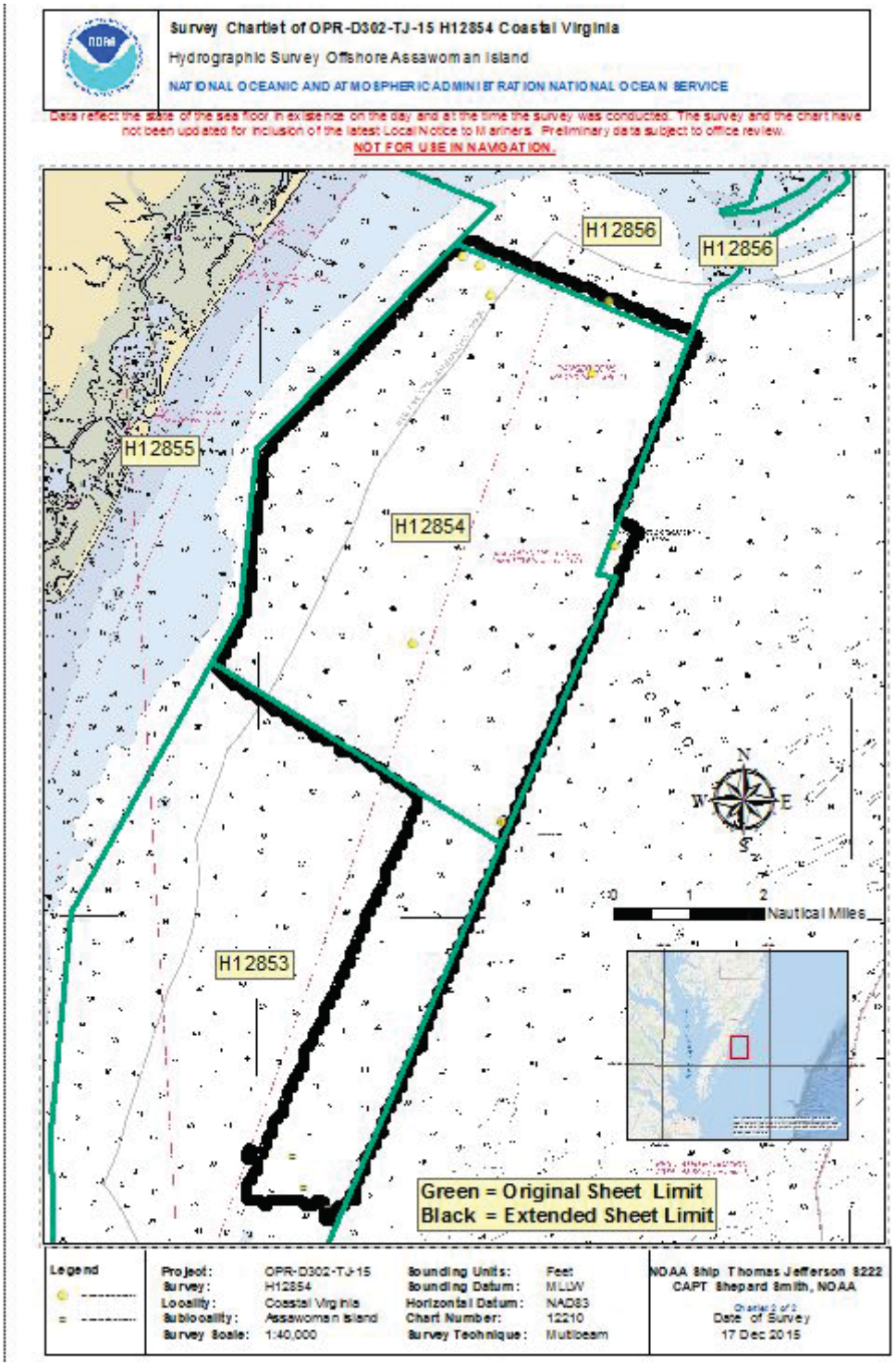


Figure 1: H12854_Extended Limit

A.2 Survey Purpose

Survey data from this project is intended to supersede all prior survey data in the common area. Hydrographic holdings in this area date back to 1930 and prior. Local constituents have raised concern over

the accuracy of this data and the ability to safely navigate. In addition, lidar analysis has shown significant shoal movement in shallow areas which raises concern over the bathymetry in the adjacent waters. . This survey is part of of a project coverining approximately 86 square nautical miles of navigationally significant areas as identified in the 2012 NOAA Hydrographic Survey Priorities (NHSP).

A.3 Survey Quality

The entire survey is adequate to supersede previous data.

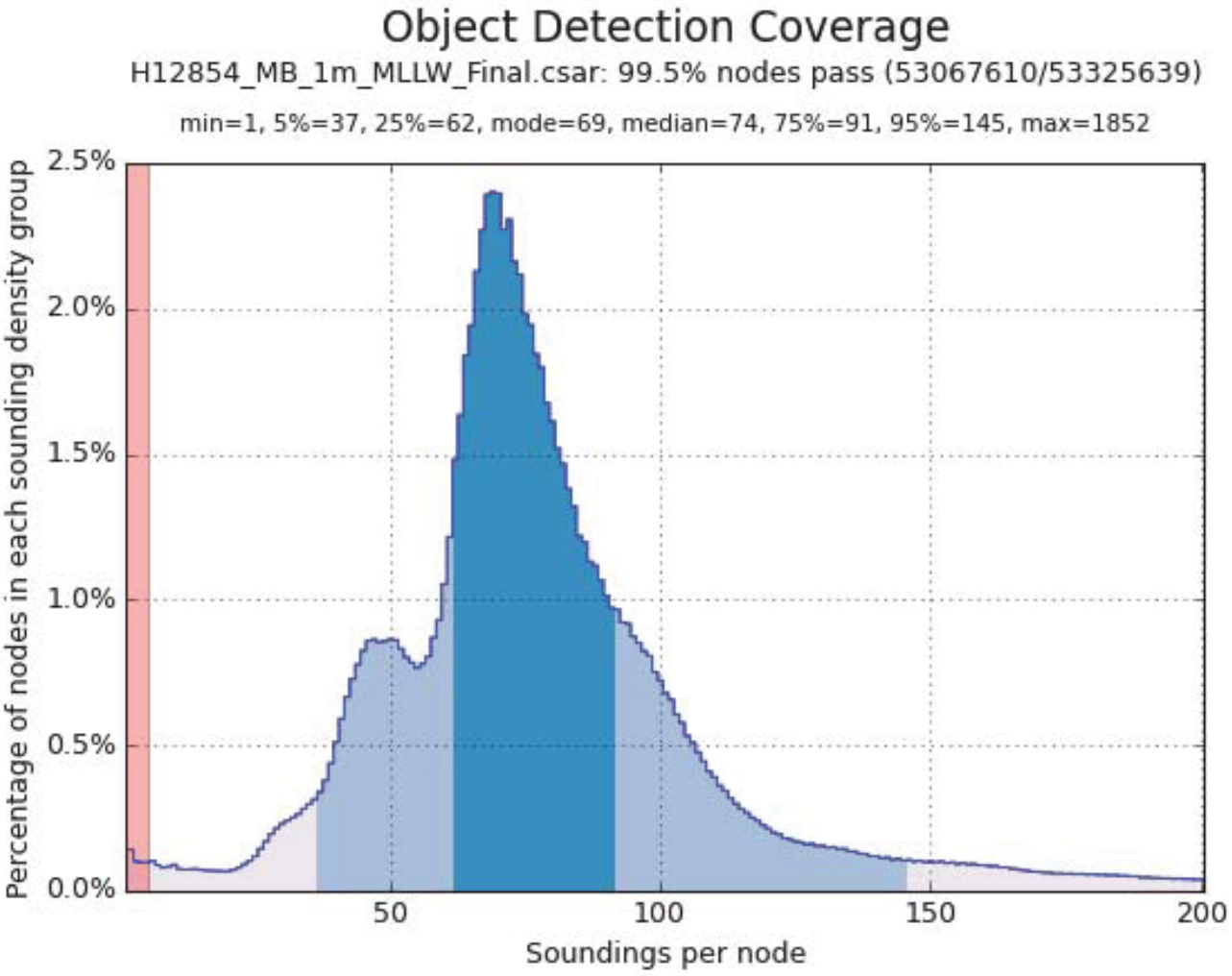


Figure 2: Mainscheme 1m Density and Object Detection Statistic

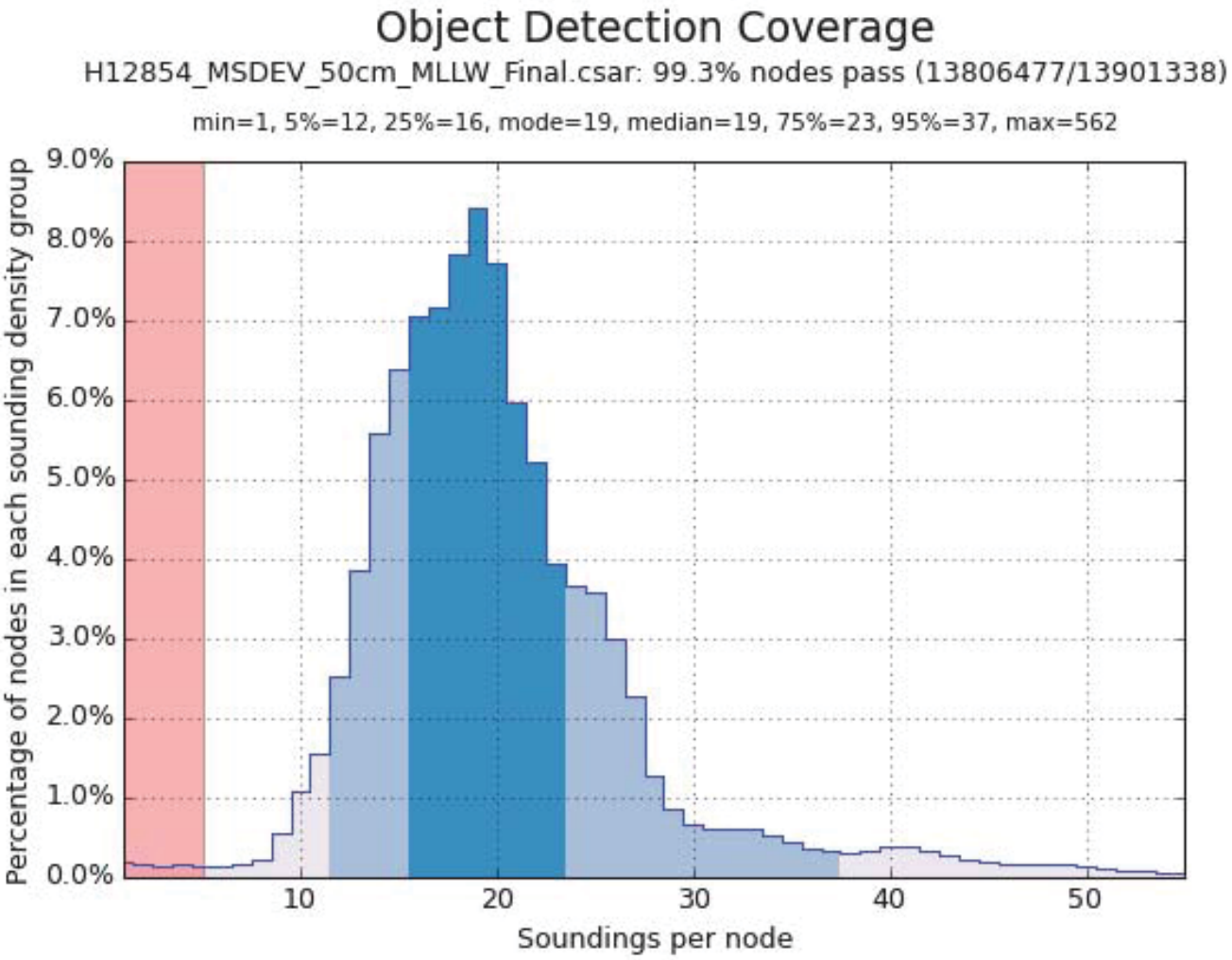


Figure 3: Developments at 50cm Density and Object Detection Statistic

A.4 Survey Coverage

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

Water Depth	Coverage Required
Greater than 4 meters water depth	Complete Coverage accomplished using either: A) Complete coverage MBES depth and backscatter data, or B) 100% SSS coverage with concurrent set line spacing MBES depth and backscatter data. Refer to HSSD Section 5.2.2.2

Thomas Jefferson acquired 100% SSS coverage according to the project instructions. Splits were also run at the 200% interval in one area, but are considered to be a part of the 100% coverage. See B.2.8 for details.

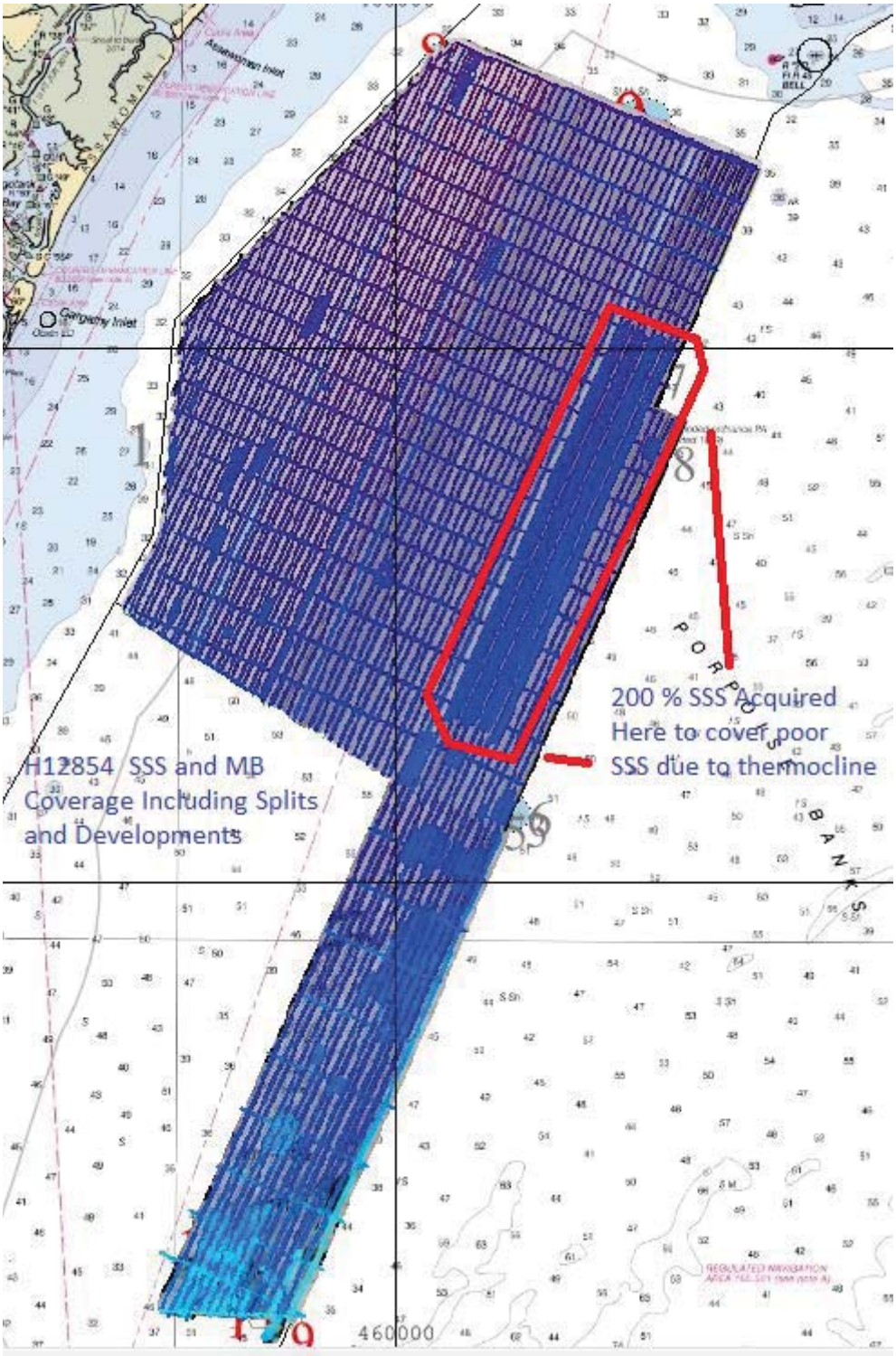


Figure 4: H12854 MB and SSS Coverage

A.5 Survey Statistics

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

	HULL ID	*S222*	*Total*
LNM	**SBES Mainscheme**	0	0
	MBES Mainscheme	601.5	601.5
	Lidar Mainscheme	0	0
	SSS Mainscheme	551.7	551.7
	SBES/SSS Mainscheme	0	0
	MBES/SSS Mainscheme	0	0
	SBES/MBES Crosslines	93.6	93.6
	Lidar Crosslines	0	0
Number of Bottom Samples			9
Number Maritime Boundary Points Investigated			19
Number of DPs			0
Number of Items Investigated by Dive Ops			0
Total SNM			37.52

Table 2: Hydrographic Survey Statistics

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

Survey Dates	Day of the Year
12/08/2015	342
12/09/2015	343
12/10/2015	344
12/11/2015	345
12/13/2015	347
12/14/2015	348
12/15/2015	349
12/16/2015	350
12/17/2015	351

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:

Hull ID	*S222*
LOA	208 feet
Draft	15 feet

Table 4: Vessels Used

B.1.2 Equipment

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

Manufacturer	Model	Type
Reson	7125 SV2	MBES
Klein	5000	SSS
Applanix	POS/MV v5	Positioning and Attitude System
Simrad	SSVS SV-71	Sound Speed System
Rolls Royce	Brooke Ocean Moving Vessel Profiler	Sound Speed System
Seabird	Seacat 19plus	Conductivity, Temperature, and Depth Sensor

Table 5: Major Systems Used

B.2 Quality Control

B.2.1 Crosslines

Crosslines acquired for this survey totaled 15.56% of mainscheme acquisition.

Crosslines exceeded the requirements in anticipation more extensive acquisition. Crosslines were compared to mainscheme using a difference surface, created in CARIS HIPS 9.0.20. A 50cm CUBE surface was created using strictly mainsheme lines, while a second 50cm CUBE surface was created using only crosslines. The two surfaces were then differenced. 95.9% of nodes agree within +/- 0.25m. The mean was -0.04 m and the standard deviation was 0.118m (See figure Mainschem to XLine defference). Survey H12854 crossline analysis complies with section 5.2.4.3 of the HSSD (2015).A separate analysis was conducted by comparing only ERS crosslines to TCARI crosslines. The results confirm the decision to use ERS as the method of data reduction to MLLW: the mean difference was 0.001m, with a standard deviation of 0.08m, with a minimum and maximum difference of +/- 0.03m and +/- 0.18m, respectively (Figure ERZT Datum Difference).

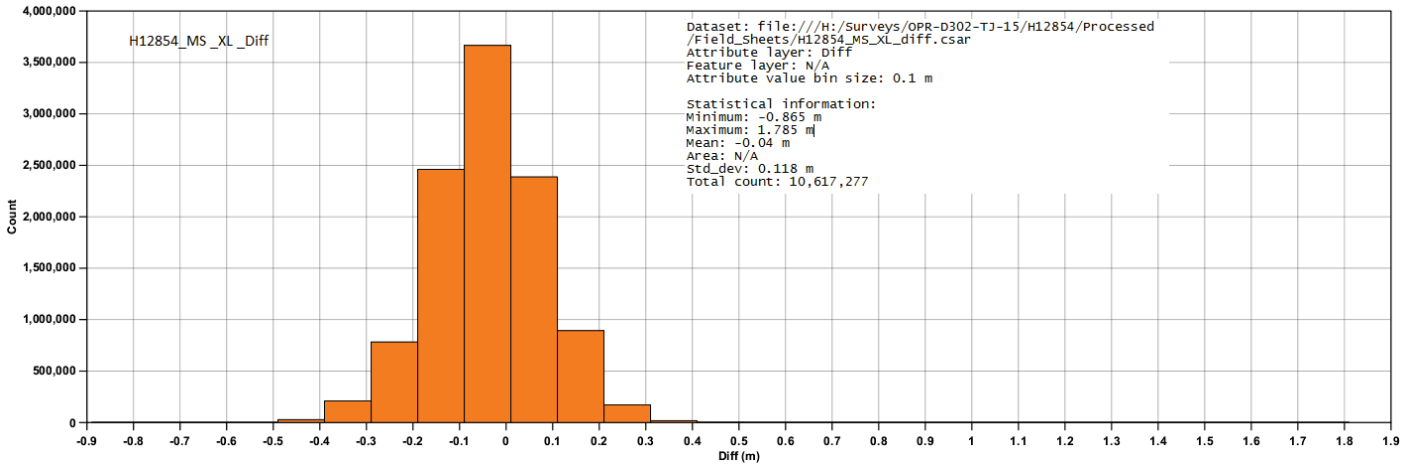


Figure 5: Mainscheme to XLine Difference

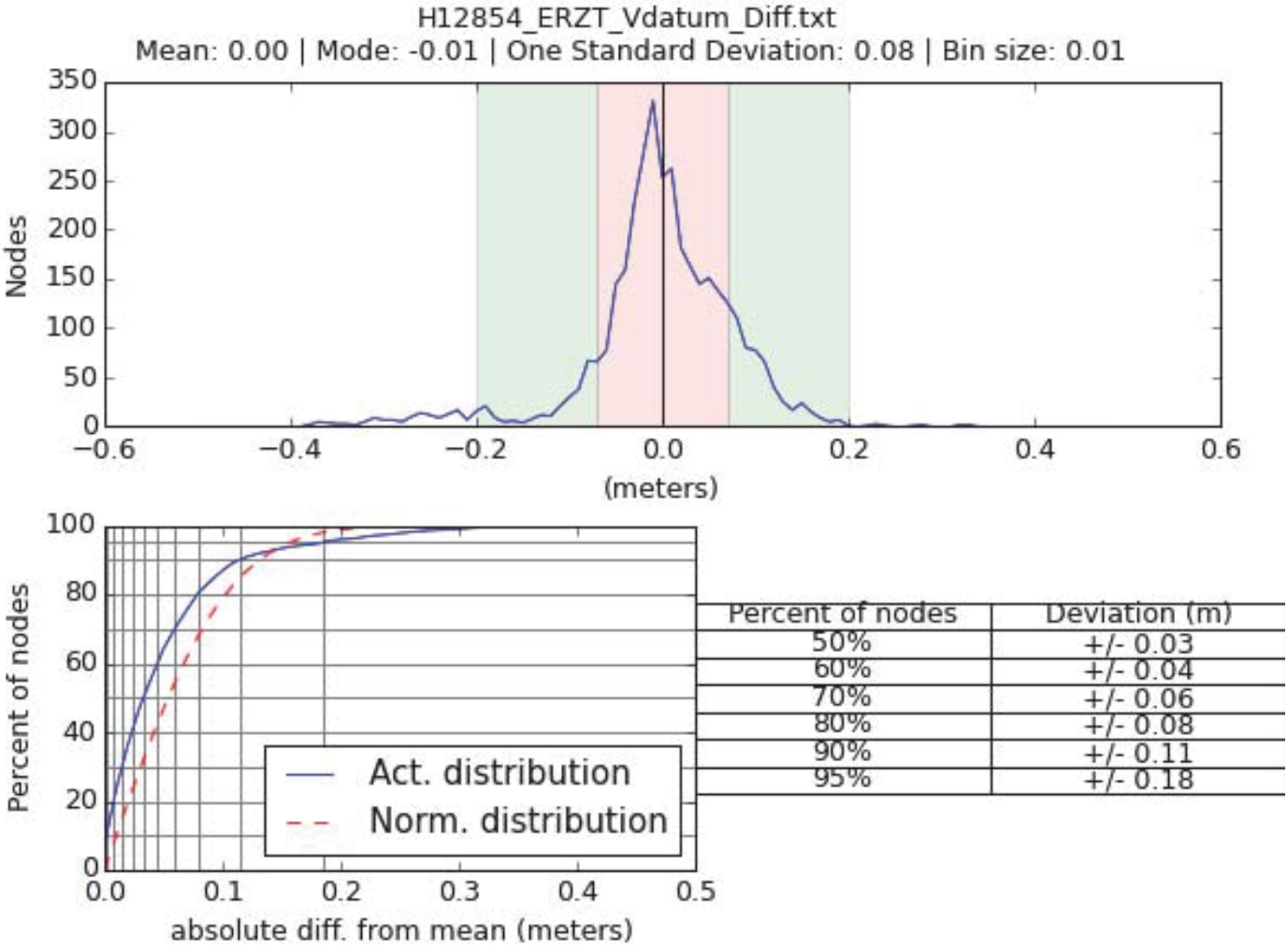


Figure 6: Fig 5. ERZT VDATUM Difference

B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Measured	Zoning	Method
0 meters	0 meters	TCARI
0.0 meters	0.090 meters	ERS

Table 6: Survey Specific Tide TPU Values

Hull ID	Measured - CTD	Measured - MVP	Surface
S222	4.0 meters/second	1.0 meters/second	0.2 meters/second

Table 7: Survey Specific Sound Speed TPU Values

Total Propagated Uncertainty values for survey H12854 were derived using a combination of: real time uncertainties for vessel motion; a priori values for equipment and vessel characteristics; an a priori value for the separation model used to reduce soundings to chart datum; and field assigned values for sound speed uncertainties. The real time uncertainties for vessel motion include roll, pitch, gyro, navigation, and elevation. The uncertainties in these measurements were recorded as part of the POSPac IAPPK 3D positional solution and the Marine Star 5P solution and were applied to the soundings via an SBET RMS file generated by Applanix POSPac. Uncertainties for sonar mounting and vessel speed were based on Appendix 4, table 4.9 of the NOAA Field Procedures Manual (FPM) (ed 2015). These were applied to the data via the CARIS HIPS Hydrographic Vessel File. The uncertainty associated with the VDatum separation model was supplied by the Hydrographic Services Division's Operations Branch, and is listed under the Zoning (See table 6). Finally, the uncertainty associated with sound speed measurements were based on the frequency and location of CTD casts, in accordance with the guidance set by Appendix 4 of the FPM (ed 2014) (see Table 7).

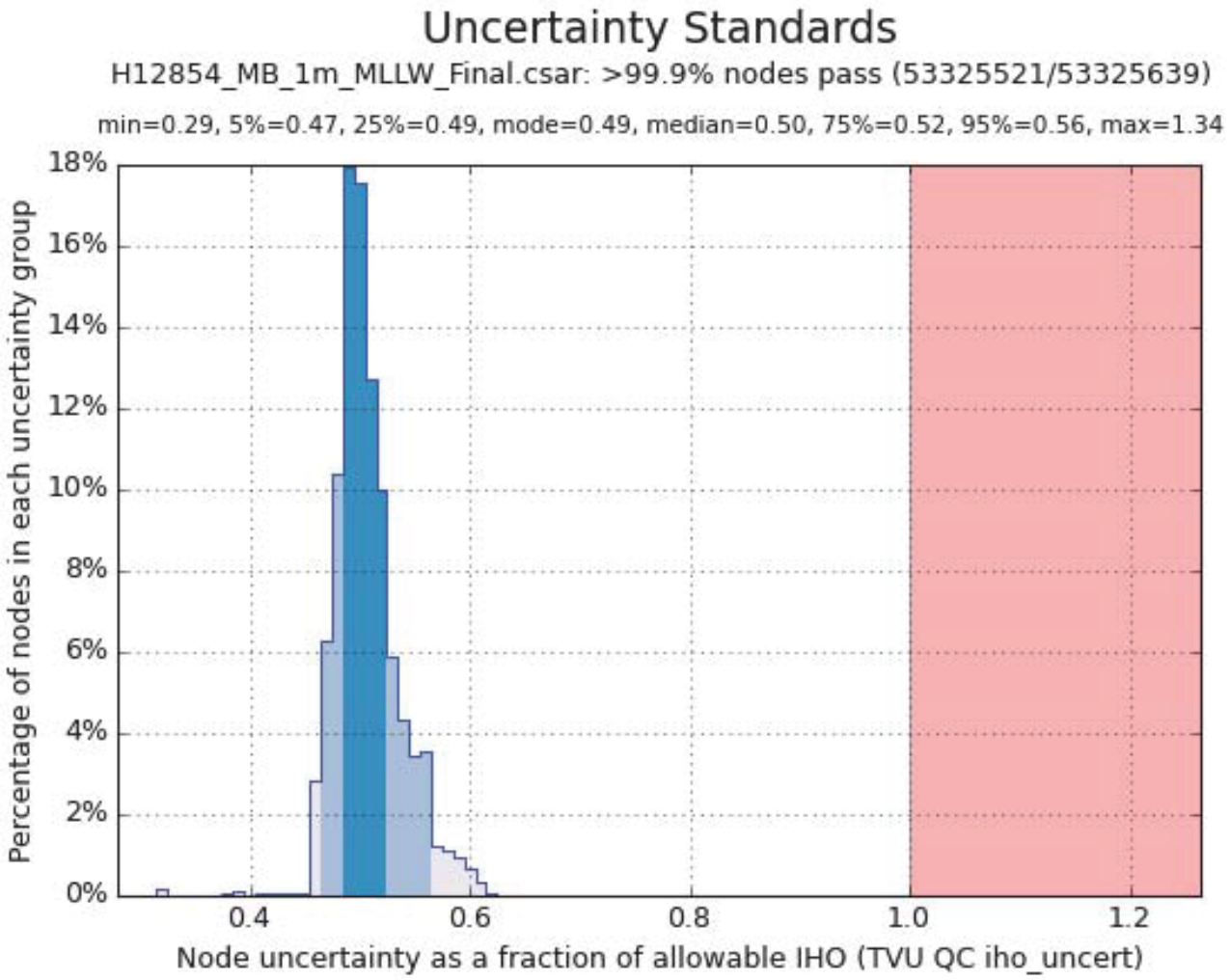


Figure 7: Uncertainty Standard Mainscheme 1m

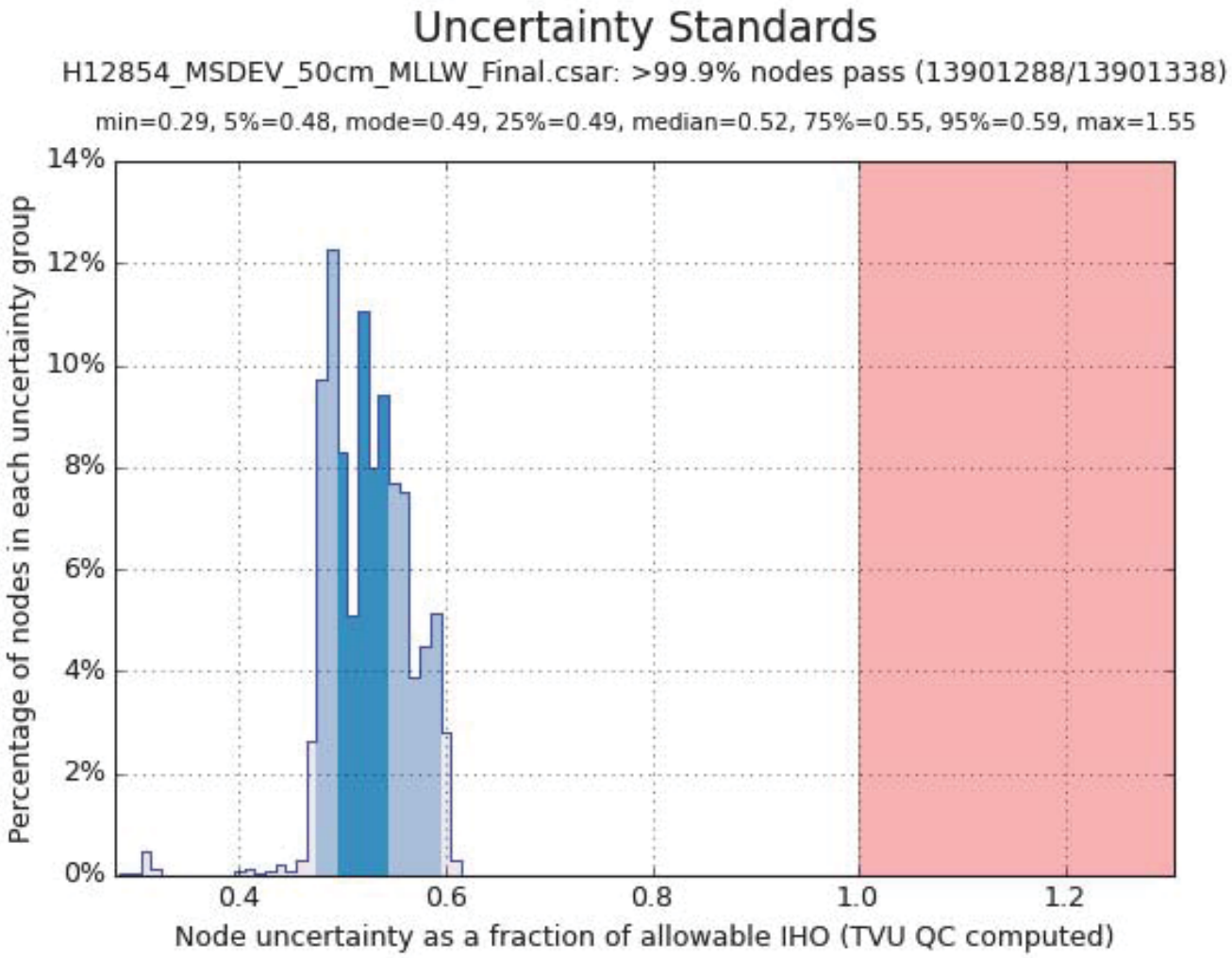


Figure 8: Uncertainty Standard Object Detection 50cm

Uncertainty Source	Discrete	TCARI	ERS
Source	Realtime	Realtime	Custom
Position	Realtime	Realtime	Realtime
Sonar	Realtime	Realtime	Realtime
Heading	Realtime	Realtime	Realtime
Pitch	Realtime	Realtime	Realtime
Roll	Realtime	Realtime	Realtime
Vertical	Delayed Heave	Delayed Heave	Realtime Heave
Tide	Realtime	Realtime	Realtime

Figure 9: Uncertainty Source Processing Type

B.2.3 Junctions

Comparisons to junctions H12336, H12160, and H12094 were performed. H12092 and H12338 did not junction with this survey.

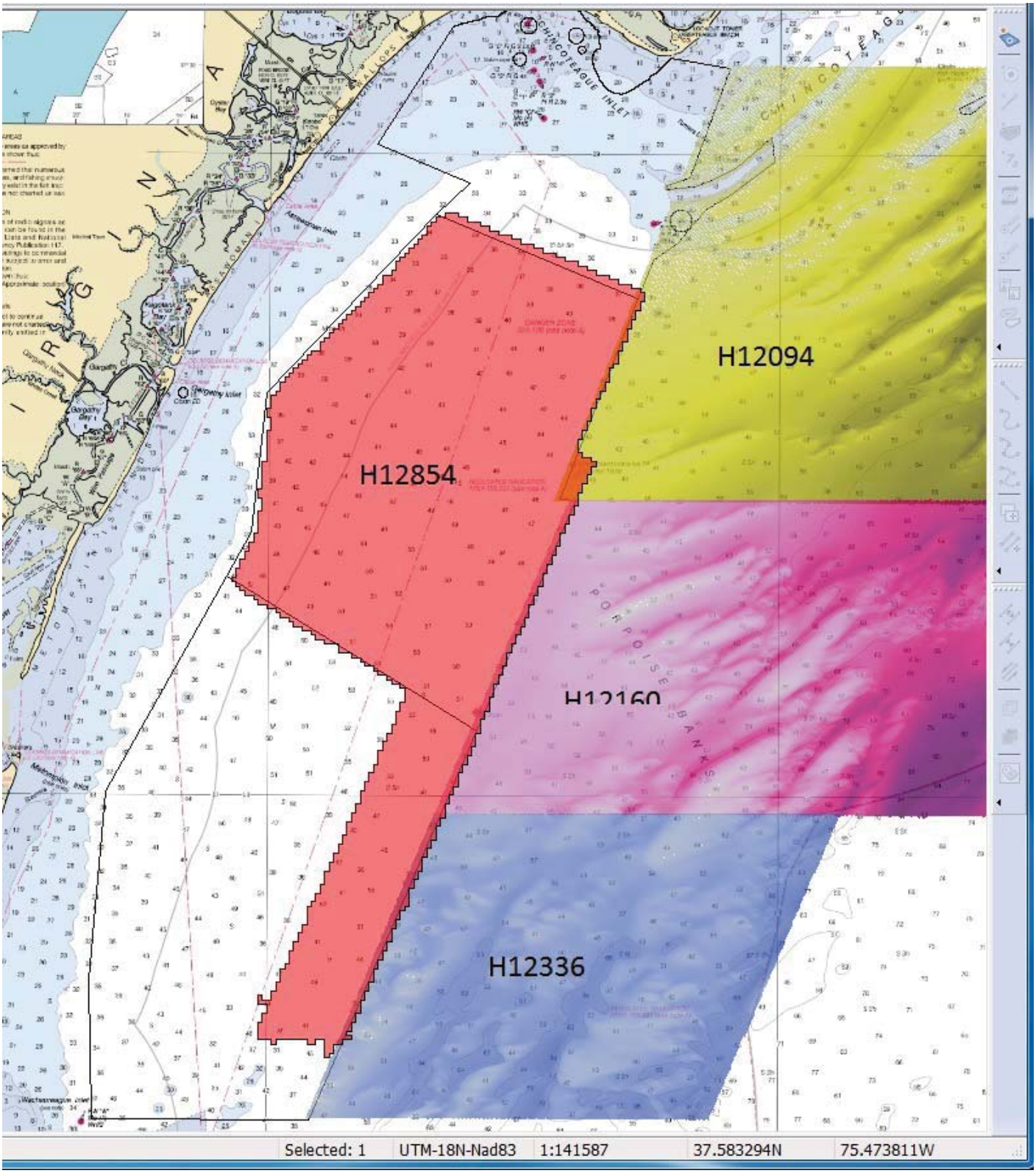


Figure 10: Applicable Priors

The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
H12336	1:40000	2011	SAIC	E
H12160	1:10000	2010	SAIC	E
H12094	1:20000	2009	SAIC	E

Table 8: Junctioning Surveys

H12336

Mean Difference from Survey H12336 was 0.018 meters.

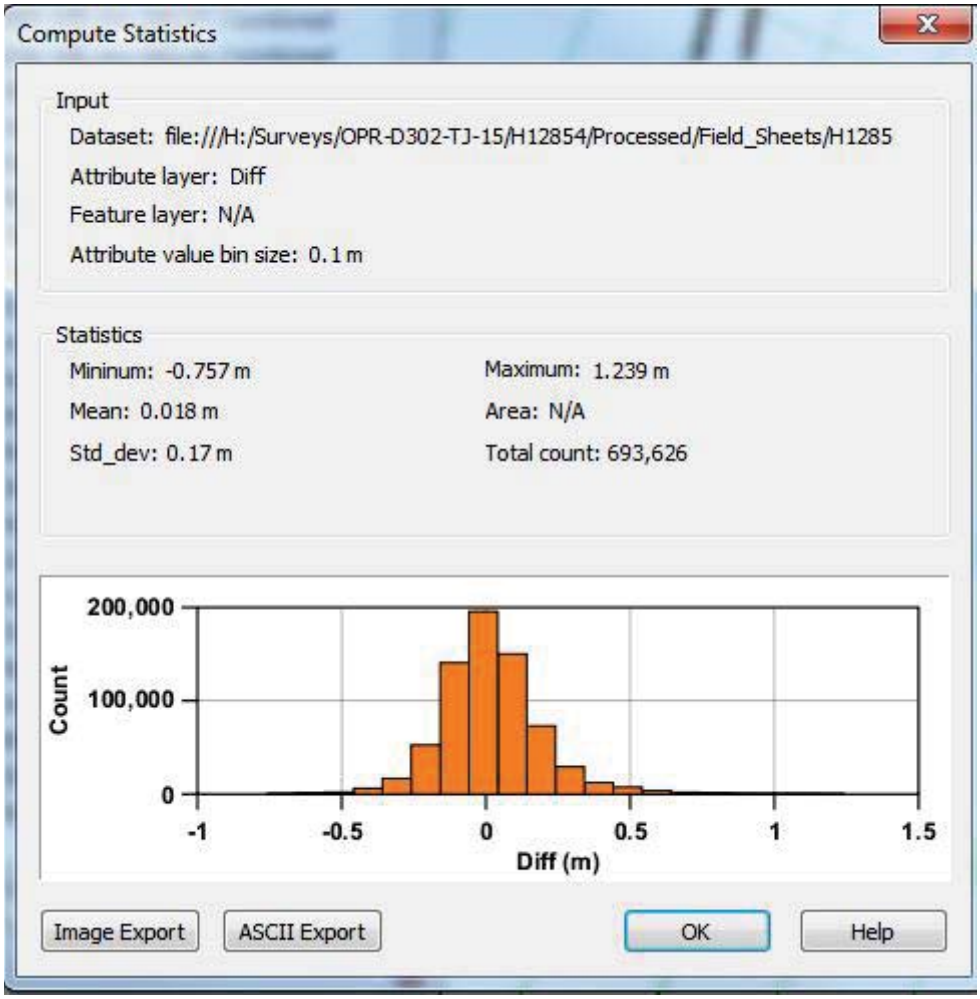


Figure 11: H12336 Comparison

H12160

Mean Difference from Survey H12160 was 0.015 meters.

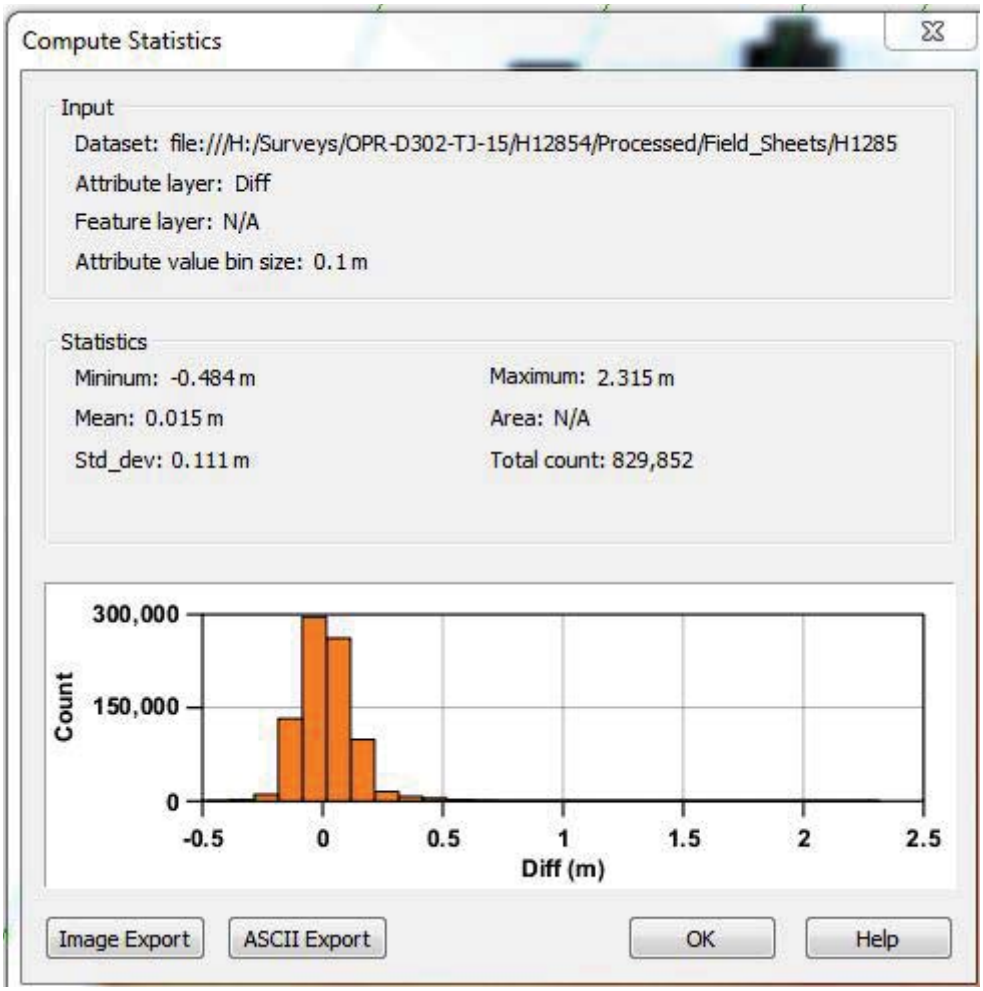


Figure 12: H12160 Comparison

H12094

Mean Difference from Survey H12336 was 0.134 meters.

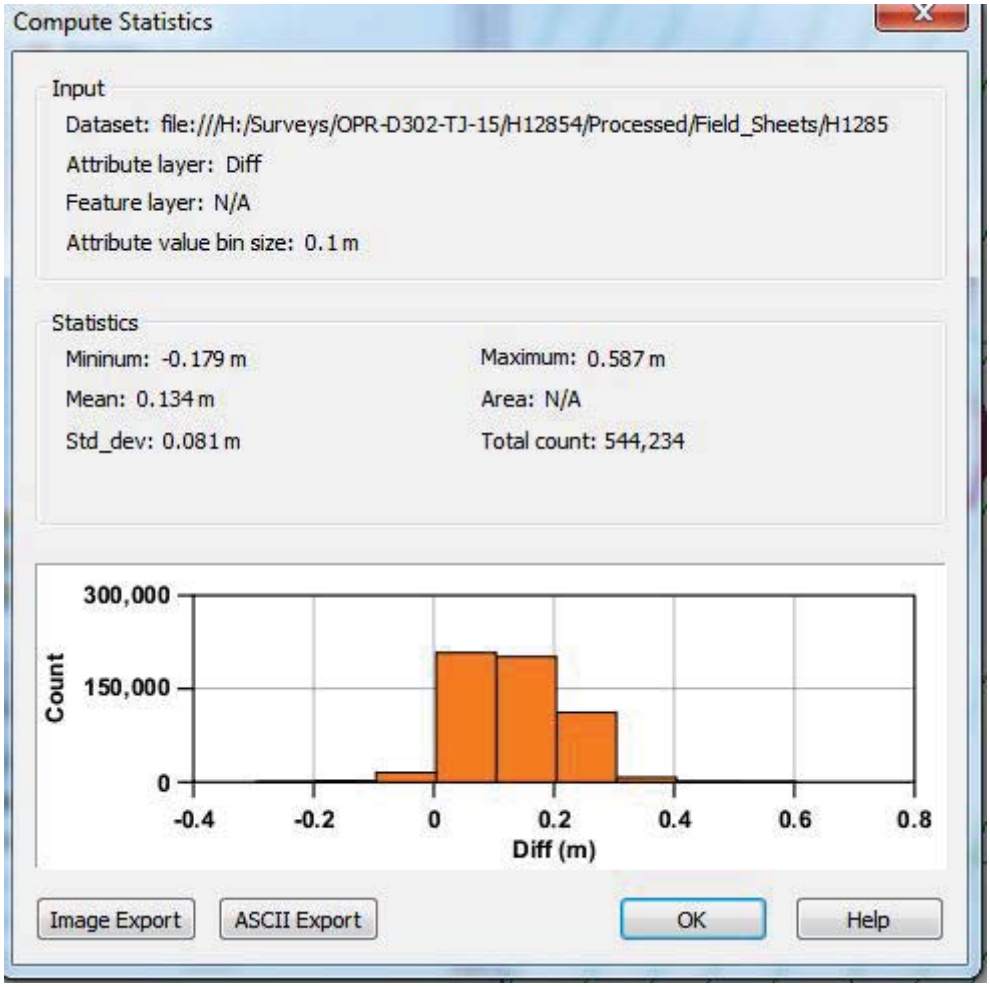


Figure 13: H12094 Comparison

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

There were no other factors that affected corrections to soundings.

B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: Sound Speed Cast Frequency: The Moving Vessel Profiler (MVP) was the primary source of sound velocity profiling in addition to support from the Conductivity, Temperature, and Depth (CTD).

Casts were conducted and by use of the Cast Time program. Cast Time is an adaptive feedback controller that will monitor water column variability based on successively acquired sound speed profiles from a Moving Vessel Profiler (MVP) and provide sampling interval recommendations based on the following logic:
1. If the oceanography is not showing a significant change, the sampling interval will be relaxed by 15%, to allow for a gradual interval relaxation over time. This is “RELAX” mode—enacted when the outer beam refraction error is less than 1/3 of the maximum allowable error.
2. If the oceanography is changing slightly, but the sampling interval sufficiently captures that change, then the sampling interval will be retained. This is “STEADY” mode—enacted when the outer beam refraction error is greater than 1/3, but less than 2/3, of the maximum allowable error.
3. If the oceanography is changing more rapidly than the sampling interval can capture, then the sampling interval will be reduced to one half of the interval that should have been used to maintain sufficient capture. This is “PANIC” mode—enacted when the outer beam refraction error is greater than 2/3 of the maximum allowable error.

Casts were taken at intervals between 10 and 56 minutes. Times lapses greater than 56 minutes were due to breaks in acquisition for events such as launch deployment and recovery. The process does not account for the spatial variability so casts are also taken at evenly spaced locations throughout the survey and comparisons performed. The casts were processed aboard Thomas Jefferson using the Velocipy program. Casts taken outside of the survey area were in conjunction with running the excess crosslines, and do not affect the data.

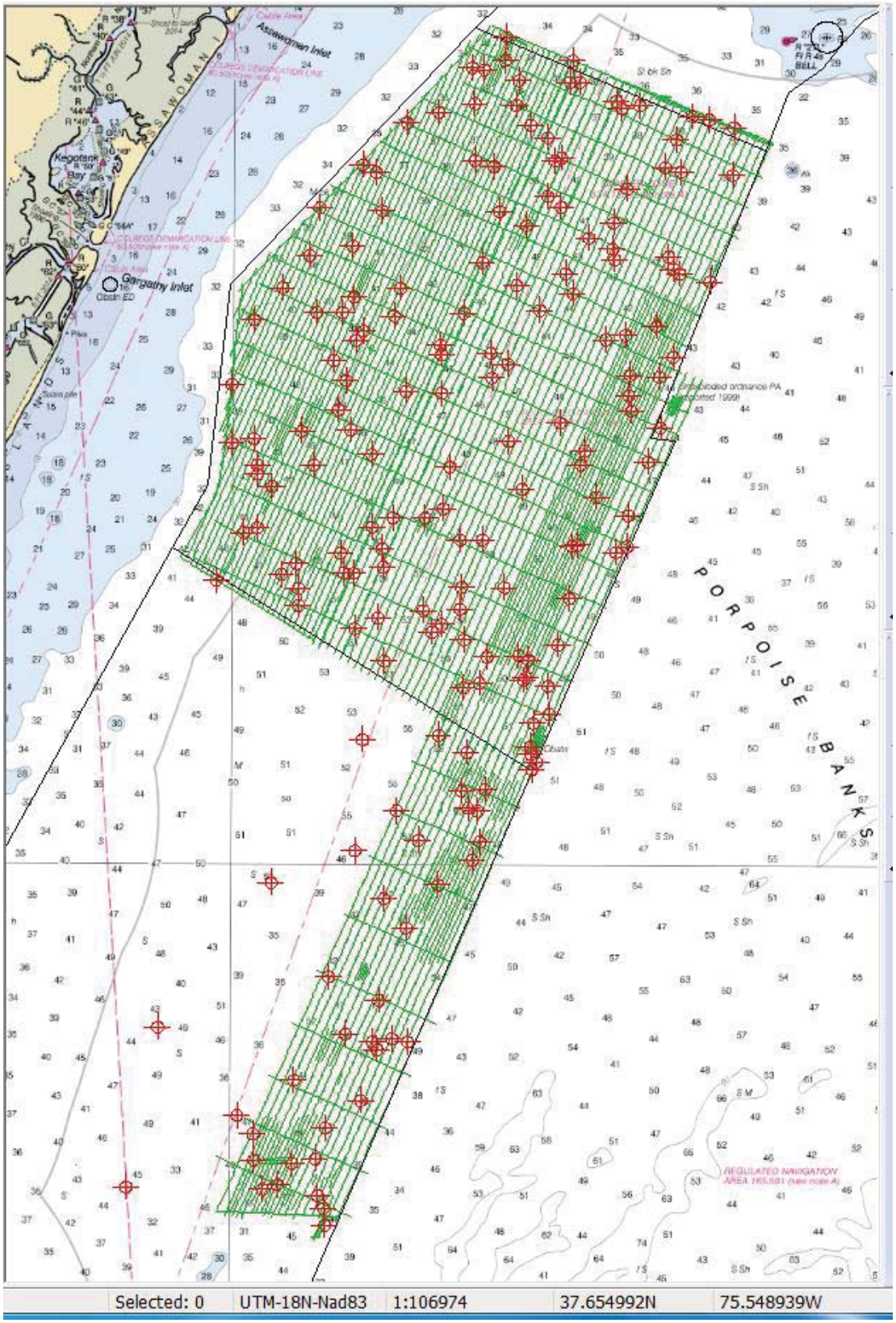


Figure 14: Sound Speed Area

B.2.8 Coverage Equipment and Methods

During the course of survey Thomas Jefferson observed significant thermocline-related imagery loss was in the SSS trace from approximately 50-60 meters off nadir to the outer edge of the trace. At these areas a second 100% (200% interval) split was acquired in that area to eleviate any ambiguity of the side scan data. There was no filtering. The entirety of the mainscheme and splits are considered to be at 100% and in the same mosaic.

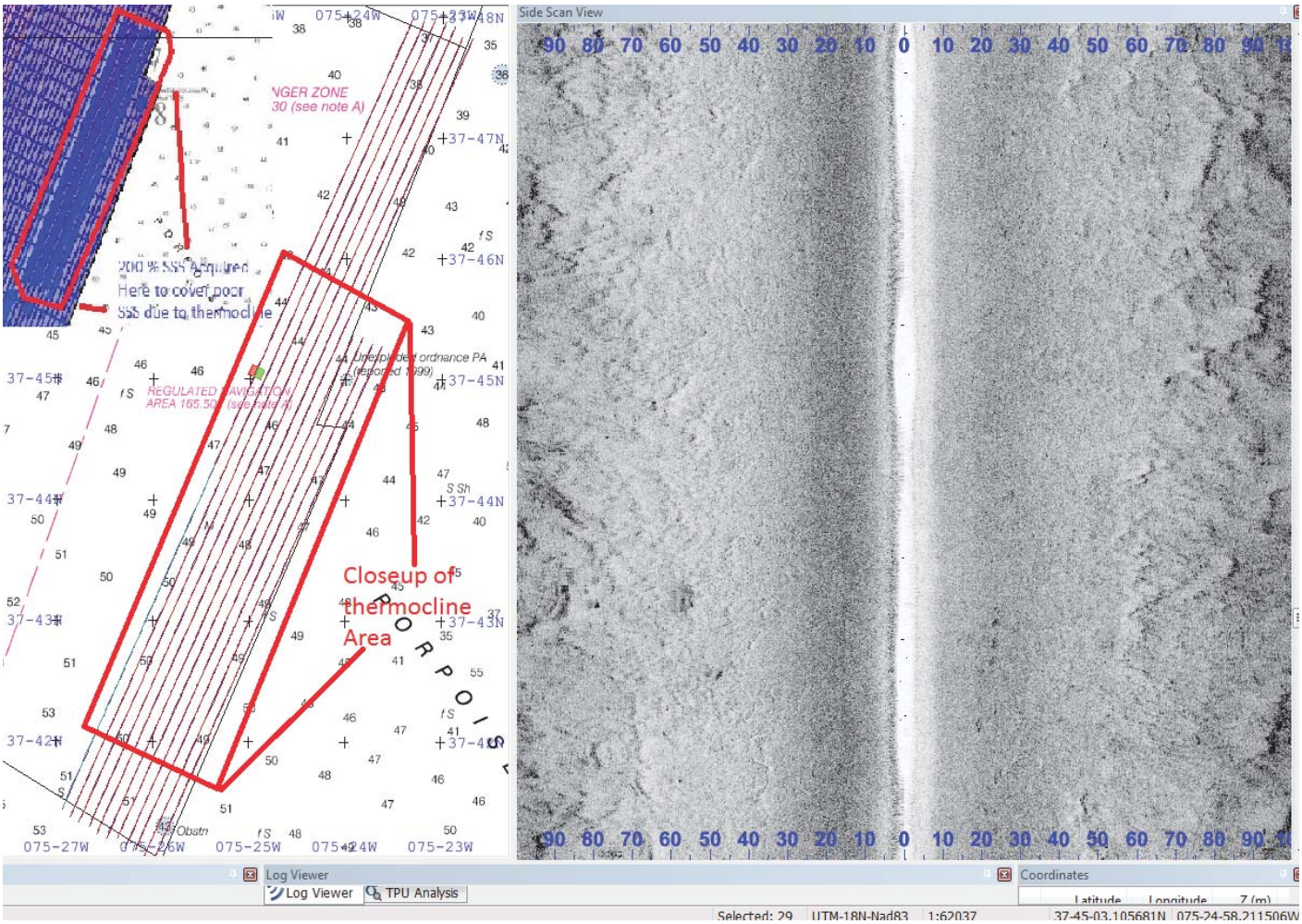


Figure 15: Thermocline

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

Raw Backscatter was logged as a 7k file and is to be submitted to the Atlantic Hydrographic Branch. One line of backscatter per vessel per day was processed and examined onboard the NOAA Ship Thomas Jefferson to ensure quality control.

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	9.0 v17-20

Table 9: Primary bathymetric data processing software

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

Manufacturer	Name	Version
CARIS	HIPS/SIPS	9.0 v17-20

Table 10: Primary imagery data processing software

The following Feature Object Catalog was used: NOAA Profile V_5_3_3

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
H12854_MB_1m_MLLW_Final	CUBE	1.0 meters	7.3 meters - 21.7 meters	NOAA_1m	Complete MBES

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
H12854_MB_1m_MLLW	CUBE	1.0 meters	9.9 meters - 21.7 meters	NOAA_1m	Complete MBES
H12854_MB_50cm_MLLW_Final	CUBE	0.5 meters	7.3 meters - 17.5 meters	NOAA_0.5m	Object Detection
H12854_MB_50cm_MLLW	CUBE	0.5 meters	8.5 meters - 17.6 meters	NOAA_0.5m	Object Detection
H12854_SSS_50cm	SSS Mosaic	0.5 meters	7 meters - 21 meters	NOAA_0.5m	Object Detection

Table 11: Submitted Surfaces

Only 100% SSS was required for this survey, therefore the blind spot in the sidescan had to be covered with object detection sounding data. A 50cm sounding grid was created for the the entire survey and was QC'd post acquistion prior to the 1m grid creation as required for submission. Results indicated indicated that the 99.1% of the surface exceeded HSSD specifications of five or more soundings per node.

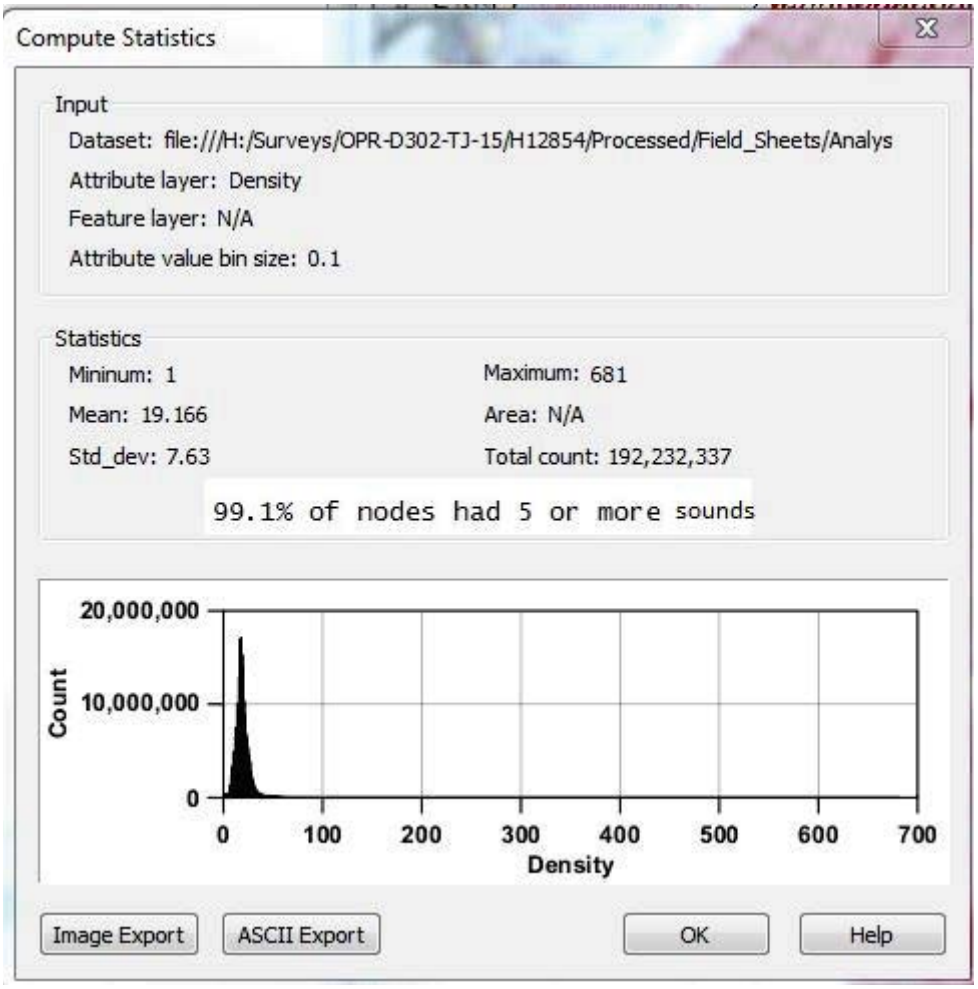


Figure 16: Nadir QC at 50cm

C. Vertical and Horizontal Control

Additional information discussing the vertical or horizontal control for this survey can be found in the accompanying HVCR.

C.1 Vertical Control

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

Standard Vertical Control Methods Used:

TCARI

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

Station Name	Station ID
Wachapreague	8631044

Table 12: NWLON Tide Stations

File Name	Status
8631044.tid	Final Approved

Table 13: Water Level Files (.tid)

File Name	Status
D302TJ2015_12212015.tc	Preliminary

Table 14: Tide Correctors (.zdf or .tc)

A request for final approved tides was sent to N/OPS1 on 01/07/2016. The final tide note was received on 01/22/2016.

TCARI tides were loaded for QC process in 5P and IAPPK. They remain loaded in the HDCS line data.

Non-Standard Vertical Control Methods Used:

VDatum
Constant Separation

Ellipsoid to Chart Datum Separation File:

OPR-D302-TJ-15_ChincoteagueInlet_VDatum_SEP.csar

C.2 Horizontal Control

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

The projection used for this project is UTM 18.

The following PPK methods were used for horizontal control:

Smart Base

The following CORS Stations were used for horizontal control:

HVCR Site ID	Base Station ID
DEMI	DEMI
NCBI	NCBI
COVX	COVX
LOYW	LOYW
VAWI	VAWI
NJCM	NJCM

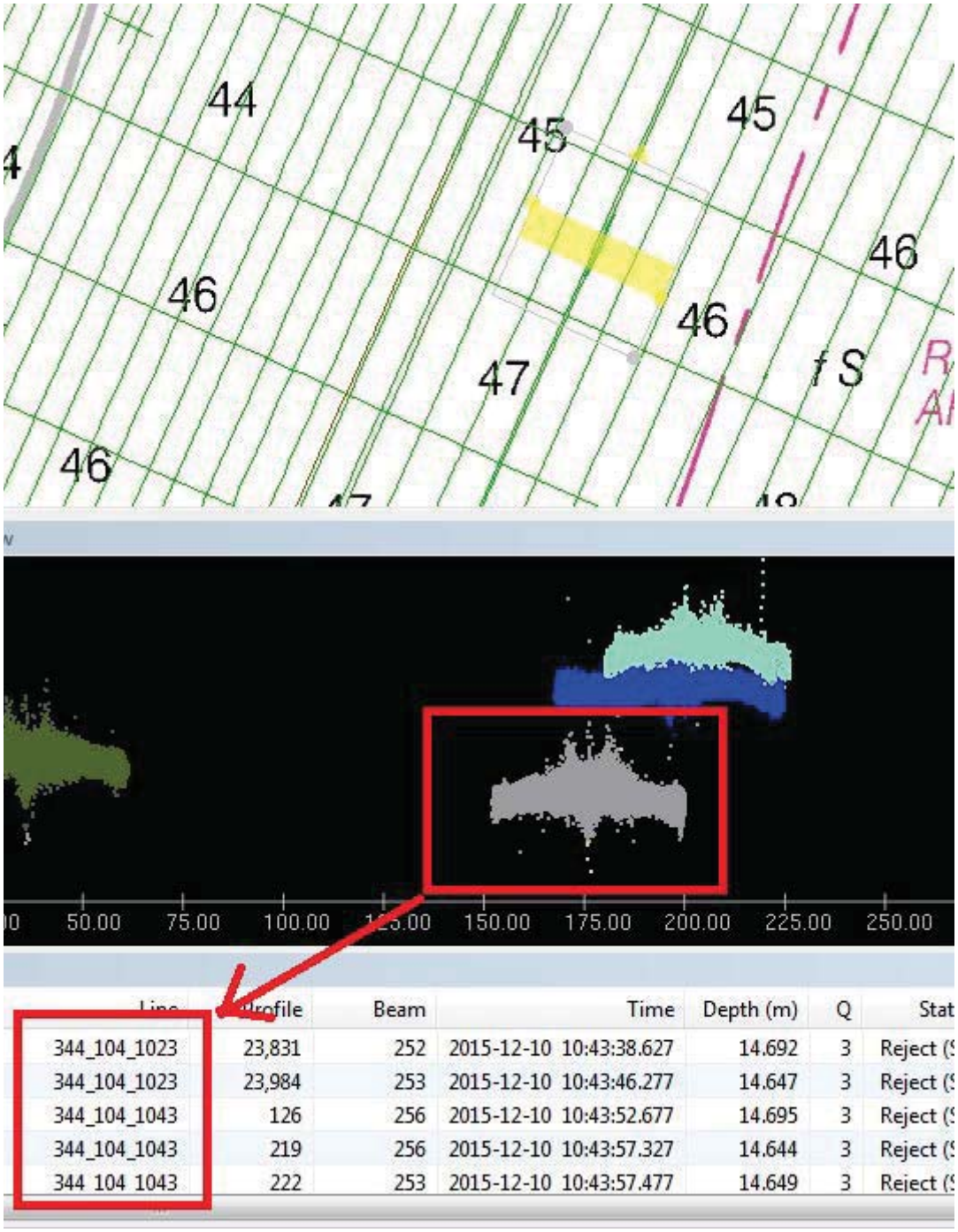
Table 15: CORS Base Stations

Post Processed Precise Point Positioning

C.3 Additional Horizontal or Vertical Control Issues

3.3.1 GPS Tide Failure

On Day number 344, lines 101_2226,2306 104_1023 and 104 1043 failed to produce acceptable GPS tide solutions for 5P and IAPPK . The data was Deleted/Rejected and the lines re-run.
Lines 348-933-1113 and 348_800_1909 were outside the survey area and were deleted /rejected.
On Day 348 the following lines had unacceptable 5P results. IAPPK was applied to lines: 348_836_0545 , 348_837_0555 , 348_822_0501 , 348_822_0511 , 348_935_1015 , 348_938_0854.
These were the most egregious areas.



Line	Profile	Beam	Time	Depth (m)	Q	Stat
344_104_1023	23,831	252	2015-12-10 10:43:38.627	14.692	3	Reject (S
344_104_1023	23,984	253	2015-12-10 10:43:46.277	14.647	3	Reject (S
344_104_1043	126	256	2015-12-10 10:43:52.677	14.695	3	Reject (S
344_104_1043	219	256	2015-12-10 10:43:57.327	14.644	3	Reject (S
344_104_1043	222	253	2015-12-10 10:43:57.477	14.649	3	Reject (S

Figure 17: Bad GPS Tide

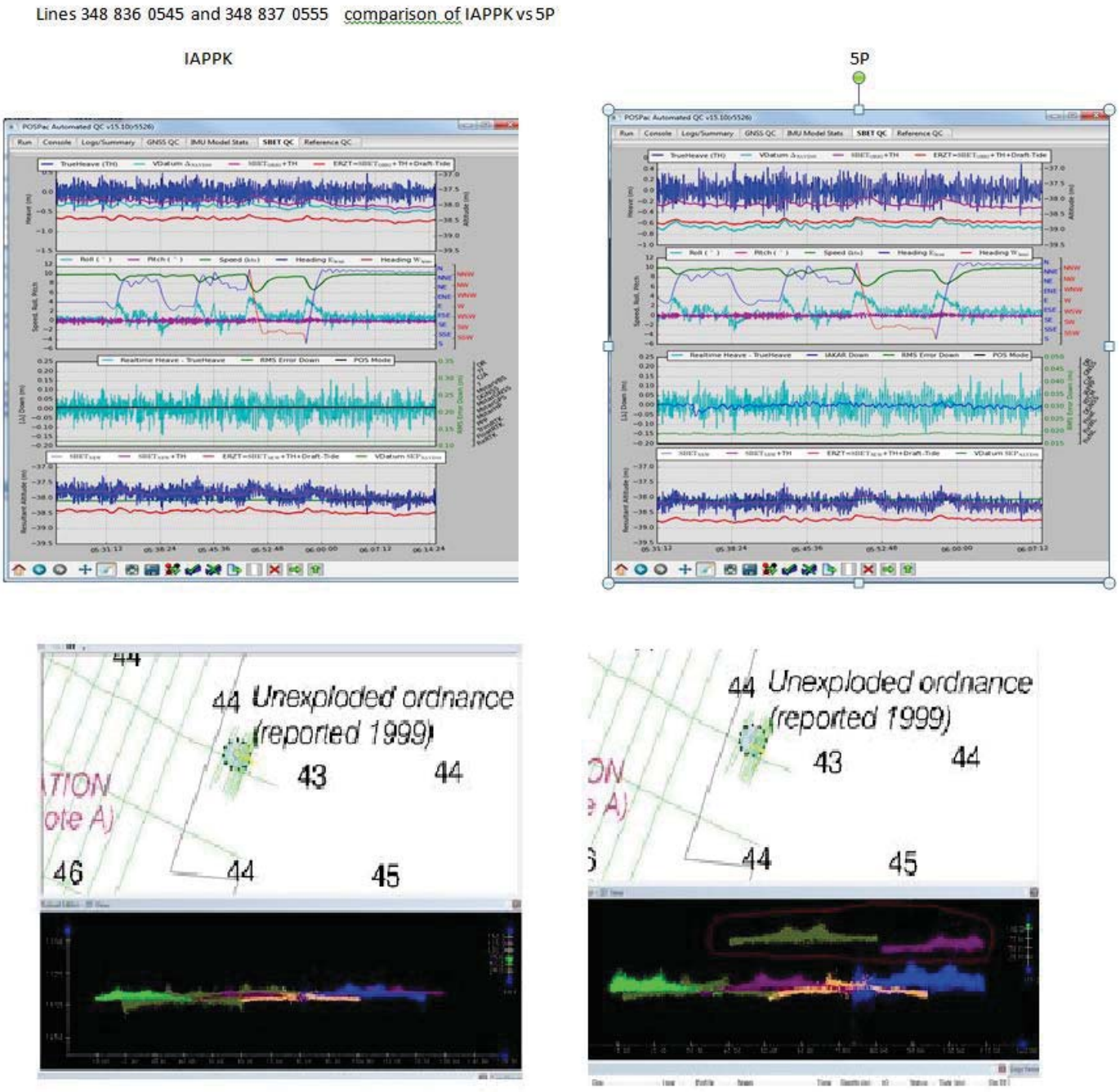


Figure 18: . IAPPK vs 5P

D. Results and Recommendations

D.1 Chart Comparison

A TIN model was created from the ENC chart and compared to a 1m surface made from data acquired during this survey. Details on differences can be found on D.1.1. in addition to the differences in features.

D.1.1 Raster Charts

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

Chart	Scale	Edition	Edition Date	LNM Date	NM Date
12200	1:419706	1	05/2014	08/29/2015	08/29/2015
12210	1:80000	1	01/2015	08/29/2015	08/29/2015
12210	1:20000	1	01/2015	11/28/2015	11/28/2015
12211	1:80000	1	01/2011	02/01/2016	02/01/2016

Table 16: Largest Scale Raster Charts

12200

No Significant Changes to Chart were Observed at this scale.

12210

A chart comparison to 12210 revealed that 75% of the Charted depths were within +/- 0.5m with a mean difference of 0.4m. The majority of changes occured in the southern panhandle and the eastern most portion of the survey. This is based on a linear difference between charted depths which range 100 -1200m apart. For the charted depths a Linear method for tin and grid creation was used. The Linear method uses a weighted sum of its natural neighbour's elevations to calculate the slopes of a surface. Depth is then computed based on the elevation on the slope at the location of each node. Two points are natural neighbours if their areas border one another. Linear interpolation has shorter processing times, but produces slightly coarser surfaces. Each cell in the surface is checked to determine if one or more original sounding values are present within the area of the cell. In each cell, if an original value: Is not present, an interpolated value is used; or, is present, the shoalest value with true position is used. Put plainly the empty cells are filled with interpolated data until it reaches the next charted depth. Additional Obstructions and shoaling oberved and can be seen in the final feature file.

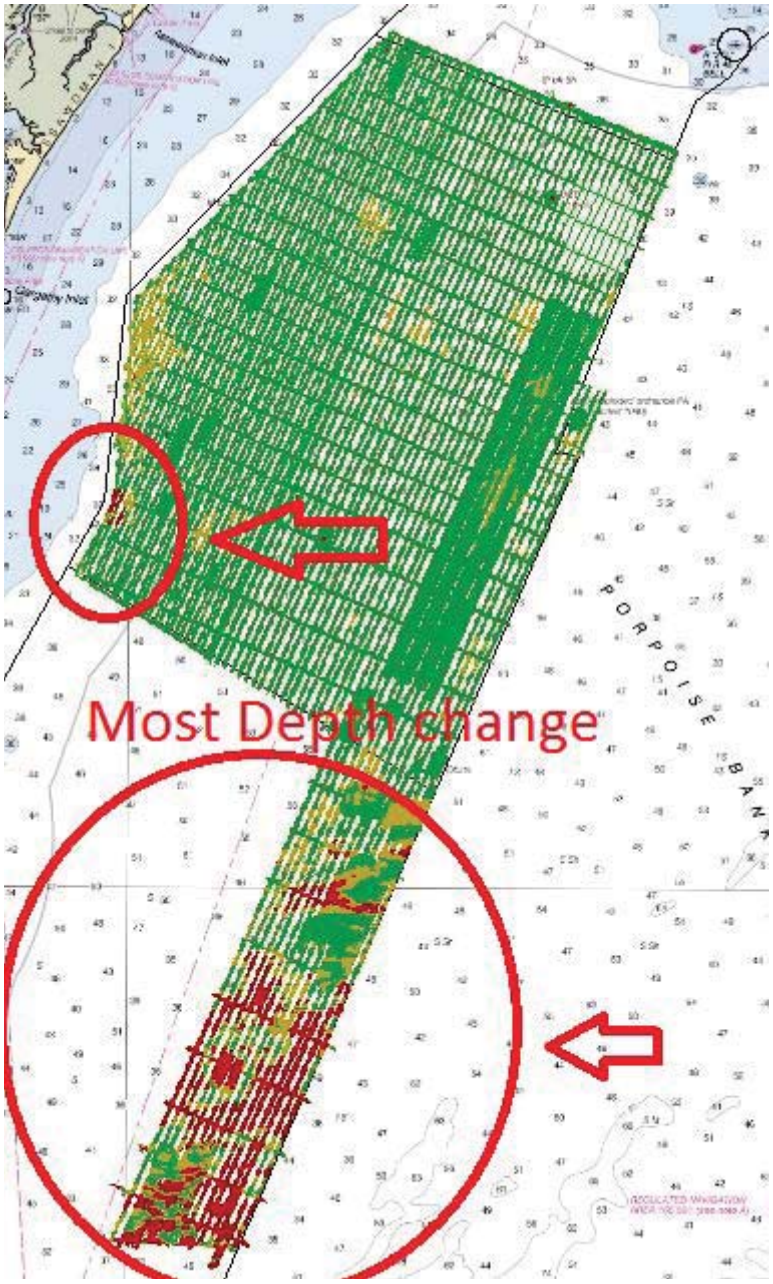


Figure 19: Areas of Change

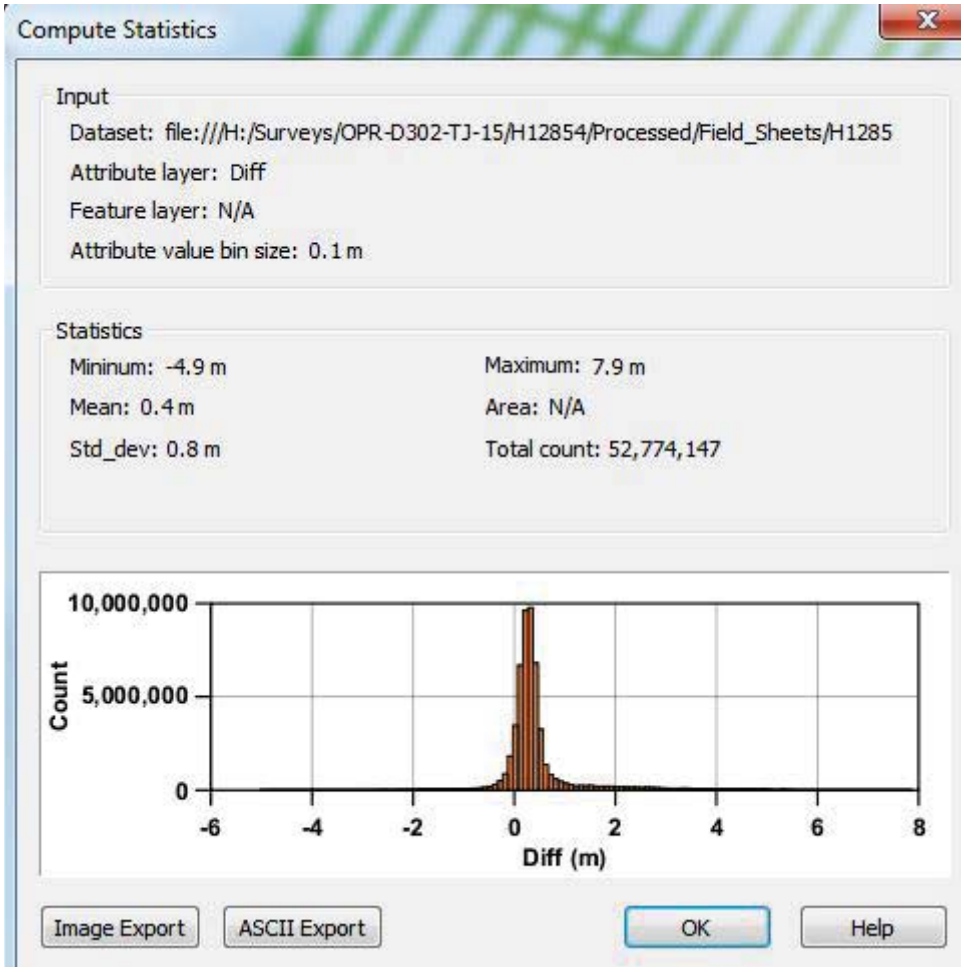


Figure 20: 12210 Diffence Statistic

12210

12210 (Inset) This inset does not interesect the survey

12211

There were only six depths from the this chart that intersected the survey. Differences were +/- 0.25 m

Chart 12211	H12854	
34	33	1
35	34	1
34	34	0
36	35	1
35	35	0
35	35	0
37	38	-1
36	36	0
	mean	0.25

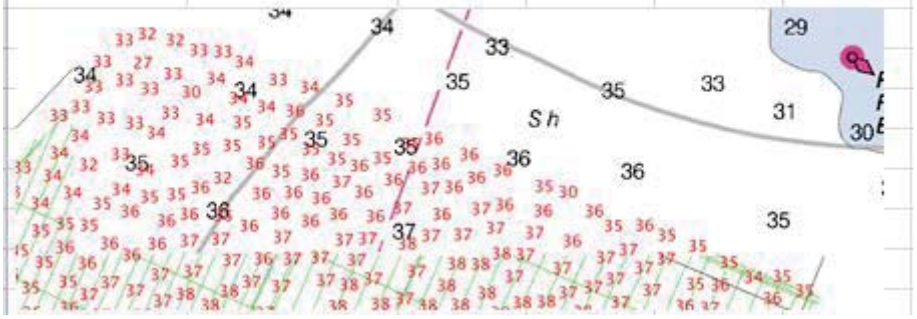


Figure 21: Chart Comparison 12211

D.1.2 Electronic Navigational Charts

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

ENC	Scale	Edition	Update Application Date	Issue Date	Preliminary?
US4VA70M	1:80000	14	06/27/2015	06/27/2015	NO

Table 17: Largest Scale ENCs

US4VA70M

The analysis for 12210 also applies to this ENC.

D.1.3 Maritime Boundary Points

Boundary points for the three mile limit are within this survey but are exempt from discussion as per Chief Scientists Instruction. The reasoning behind this is that no rocks or land masses were prescribed for investigation in the CSF, nor does the survey encompass a vicinity, in which it could be discerned, that any new rocks or land masses would change the current maritime boundry points.

D.1.4 Charted Features

Two charted Items exist for this Survey.

One is an unexploded ordinance PA (UXO). The item was covered by 100% SSS and Object detection MB. No visible evidence of it was observed. This item should be retained until a DOD authority can clear it for removal from the chart.

The second Item is a 43 ft Obstn located in the eastern portion of the survey and west of Porpoise Banks. Prior survey H12160 was overlayed to check location for its original position and depth of 13.1m. The charted Obstruction at 43ft was investigated with object detection multibeam and proved non-existent. The item should be deleted from the chart. See Final Feature File for Details on these items.

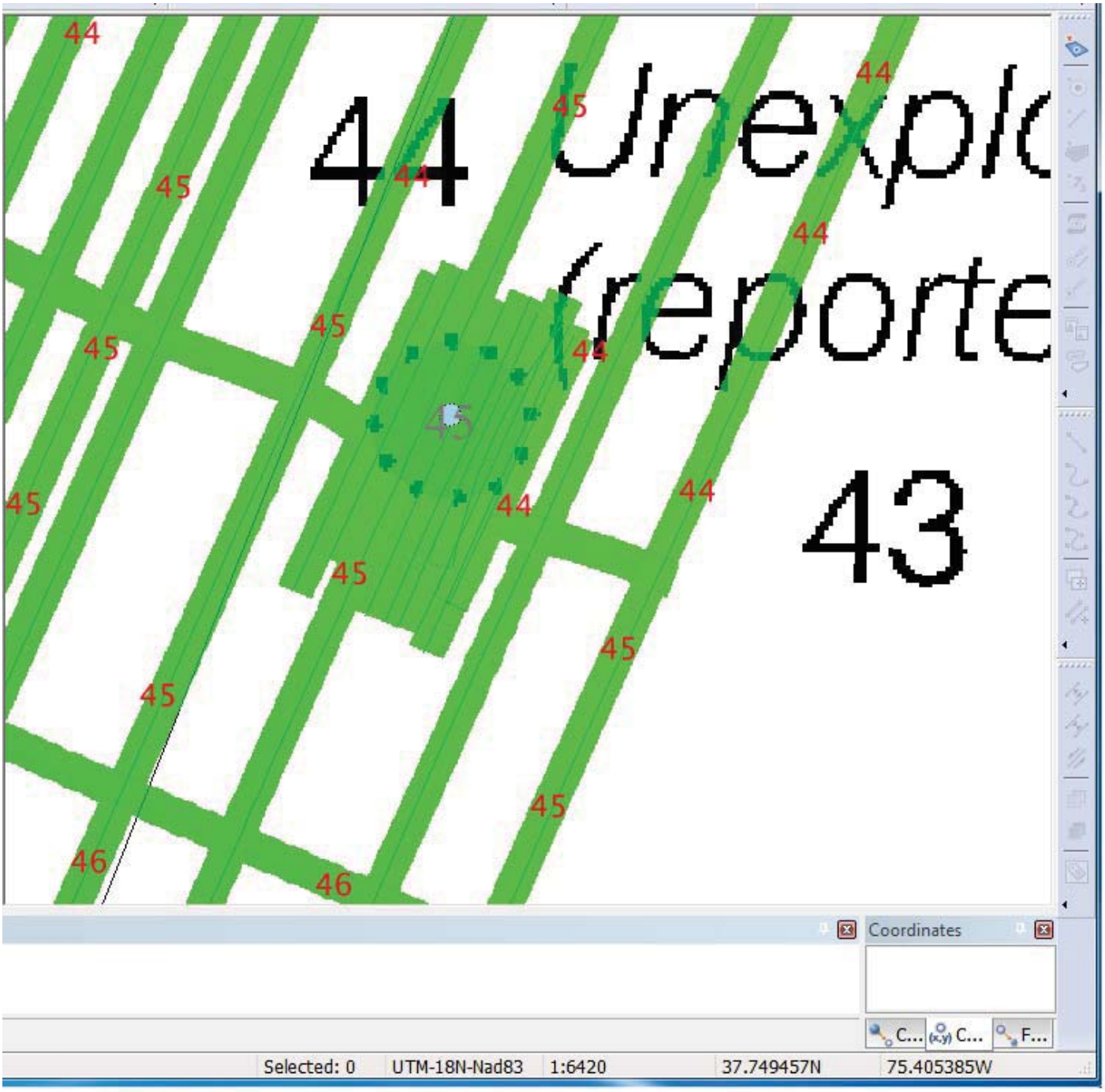


Figure 22: UXO

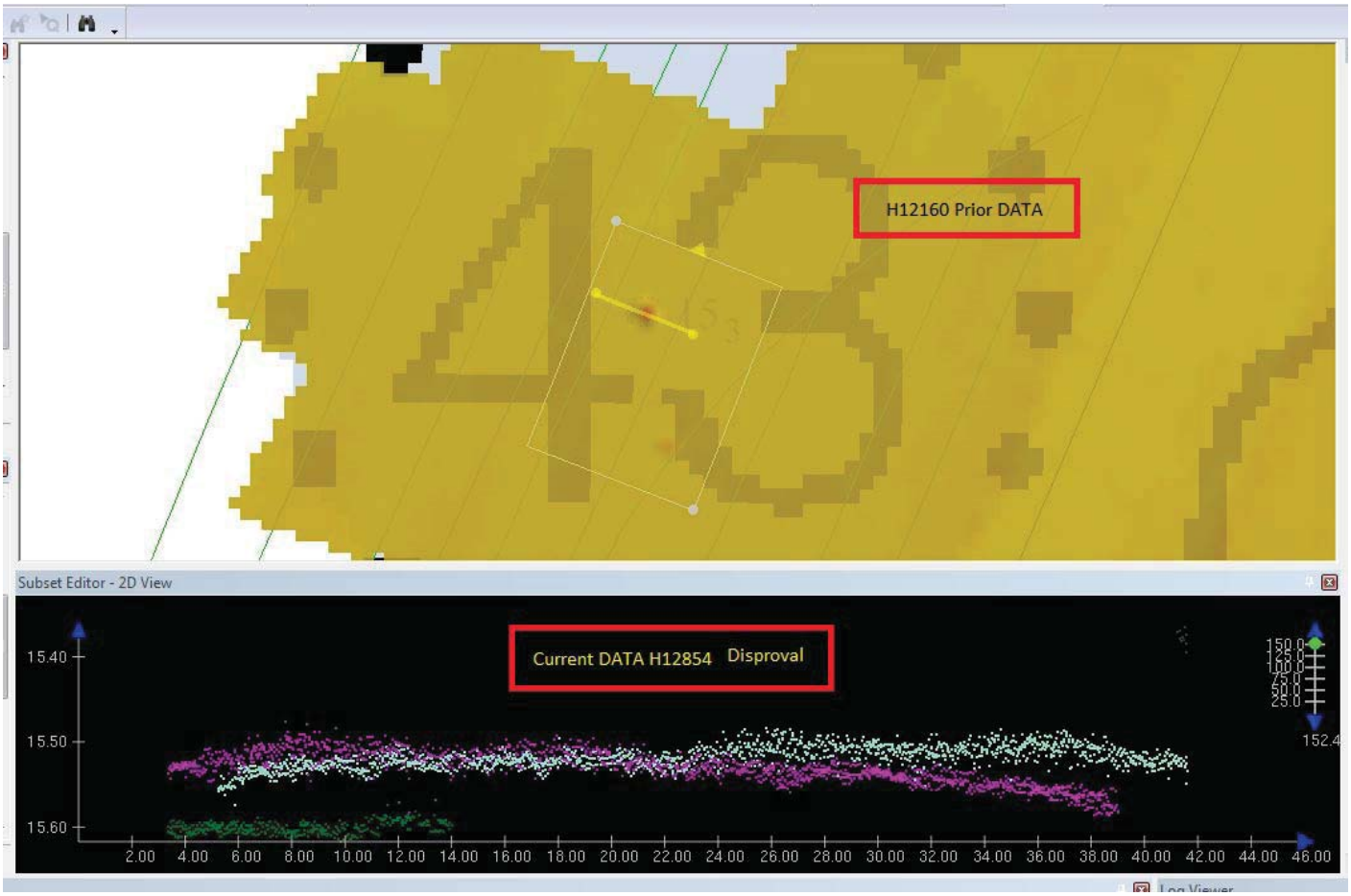


Figure 23: Disapproval 43ft Obstruction

D.1.5 Uncharted Features

Nine uncharted items exist for this survey. Six of the items are obstructions, and the other three are shoals of particular interest. Refer to Final Feature File for additional information.

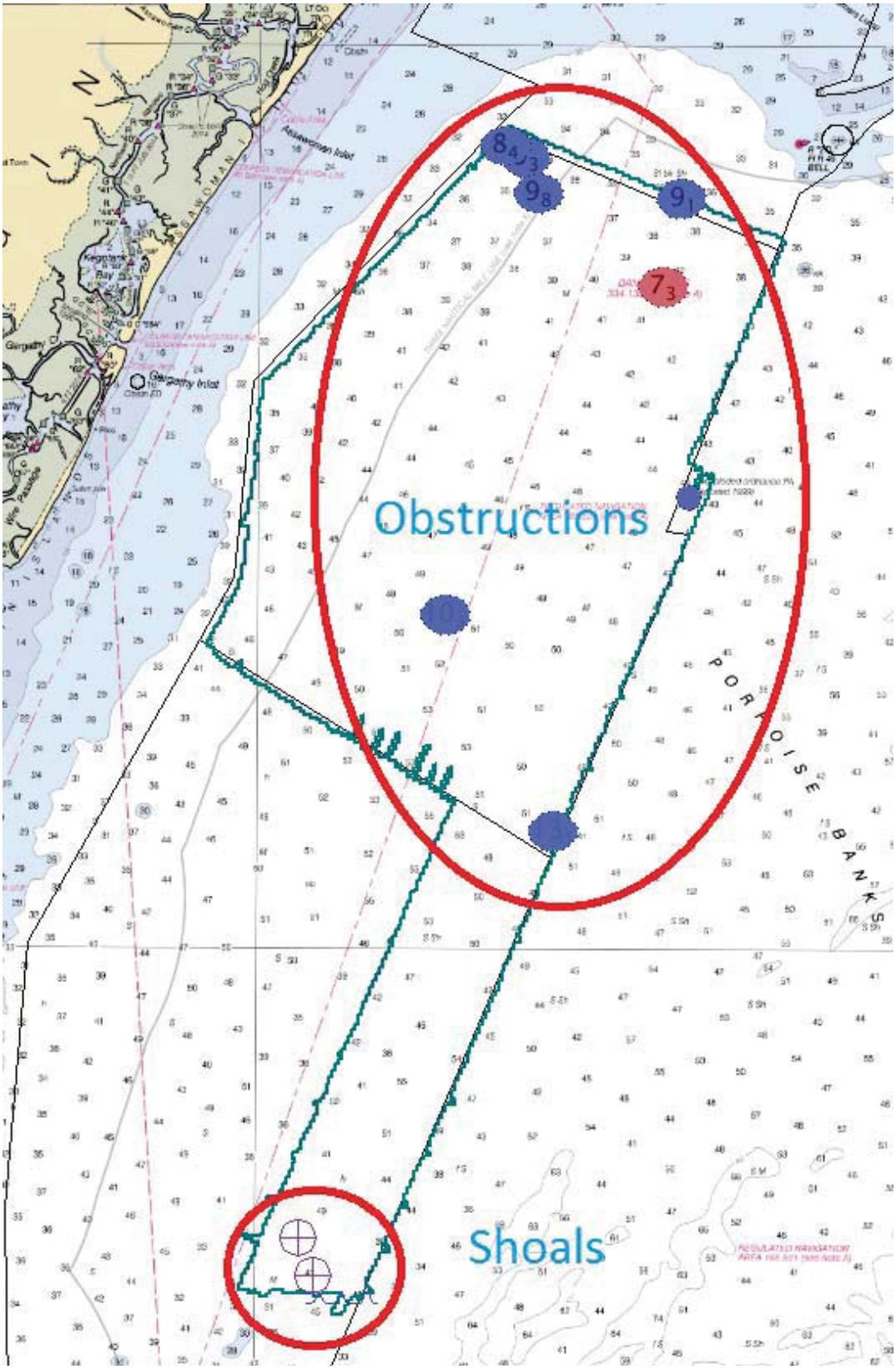


Figure 24: Feature Locale

D.1.6 Dangers to Navigation

Danger to Navigation Reports are included in Appendix II of this report, and were submitted to OCS NDB HSD 12/24/2015

D.1.7 Shoal and Hazardous Features

There are three shoals. seven obstructions , and a UXO (Unexploded Ordnance) on this survey . The southern most salient area of the survey contained the third shoal. It was observed at the close of survey and was not fully developed.

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

Nine Bottom Samples were Acquired. See final feature file for details.

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, surveys are over 10 years old.

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

There are 11 significant features for this survey. See the Final Feature File for details.

D.2.9 Construction and Dredging

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

D.2.10 New Survey Recommendation

The proposed survey of H12853 in spring of 2016 should resolve any un-addressed items in this survey. See D.1.7. for future shoal investigations.

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
Shepard M. Smith, CAPT / NOAA	Chief of Party	04/06/2016	SMITH.SHEPARD.M.1006778930 Digitally signed by SMITH.SHEPARD.M.1006778930 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=NOAA, cn=SMITH.SHEPARD.M.1006778930 Date: 2016.04.19 15:29:29 Z
Joseph K. Carrier, LT / NOAA	Field Operations Officer	04/06/2016	CARRIER.JOSEPH.KELSO.III.1155373152 Digitally signed by CARRIER.JOSEPH.KELSO.III.1155373152 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=NOAA, cn=CARRIER.JOSEPH.KELSO.III.1155373152 Date: 2016.04.19 16:41:55 Z
Peter G. Lewit	Chief Hydrographic Survey Technician	04/06/2016	LEWIT.PETER.G.1250929265 Digitally signed by LEWIT.PETER.G.1250929265 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=OTHER, cn=LEWIT.PETER.G.1250929265 Date: 2016.04.19 18:50:16 Z

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 Staiton
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	Local Notice to Mariners
LNM	Linear Nautical Miles
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
PPS	Pulse per second

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
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 Positiong System timing message
ZDF	Zone Definition File

APPENDIX I

TIDES AND WATER LEVELS

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NOAA Ship THOMAS JEFFERSON (MOA-TJ)
439 West York St
Norfolk, VA 23510-1145

January 07, 2016

MEMORANDUM FOR: Gerald Hovis, Chief, Products and Services Branch, N/OPS3

FROM: CAPT Shepard Smith, NOAA, NOAA Ship THOMAS JEFFERSON (MOA-TJ)

SUBJECT: Request for Approved Tides/Water Levels

Please provide the following data:

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

Transmit data to the following:

NOAA Ship THOMAS JEFFERSON (MOA-TJ)
439 West York St
Norfolk, VA 23510-1145

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

Project No.:	OPR-D302-TJ-15
Registry No.:	H12854
State:	Virginia
Locality:	Coastal Virginia
Sublocality:	Assawoman Island

Attachments containing:

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

cc: MOA-TJ

Year_DOY	Min Time	Max Time
2015_342	04:21:36	23:56:49
2015_343	00:19:39	23:47:10
2015_344	00:13:31	23:50:07
2015_345	00:08:48	23:50:18
2015_346	00:07:50	23:50:08
2015_347	00:08:14	12:12:54
2015_348	02:09:38	23:25:22
2015_349	00:09:39	23:50:47
2015_350	00:13:18	23:23:45
2015_351	00:13:01	02:46:28

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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : April 18, 2016

HYDROGRAPHIC BRANCH: Atlantic
HYDROGRAPHIC PROJECT: OPR-D302-TJ-2015
HYDROGRAPHIC SHEET: H12854

LOCALITY: Assawoman Island,Coastal Virginia,VA
TIME PERIOD: December 08 - December 17, 2015

TIDE STATION USED: 8631044 Wachapreague, VA
Lat. 37° 36.5'N Long. 75° 41.2' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.276 meters

REMARKS: RECOMMENDED GRID

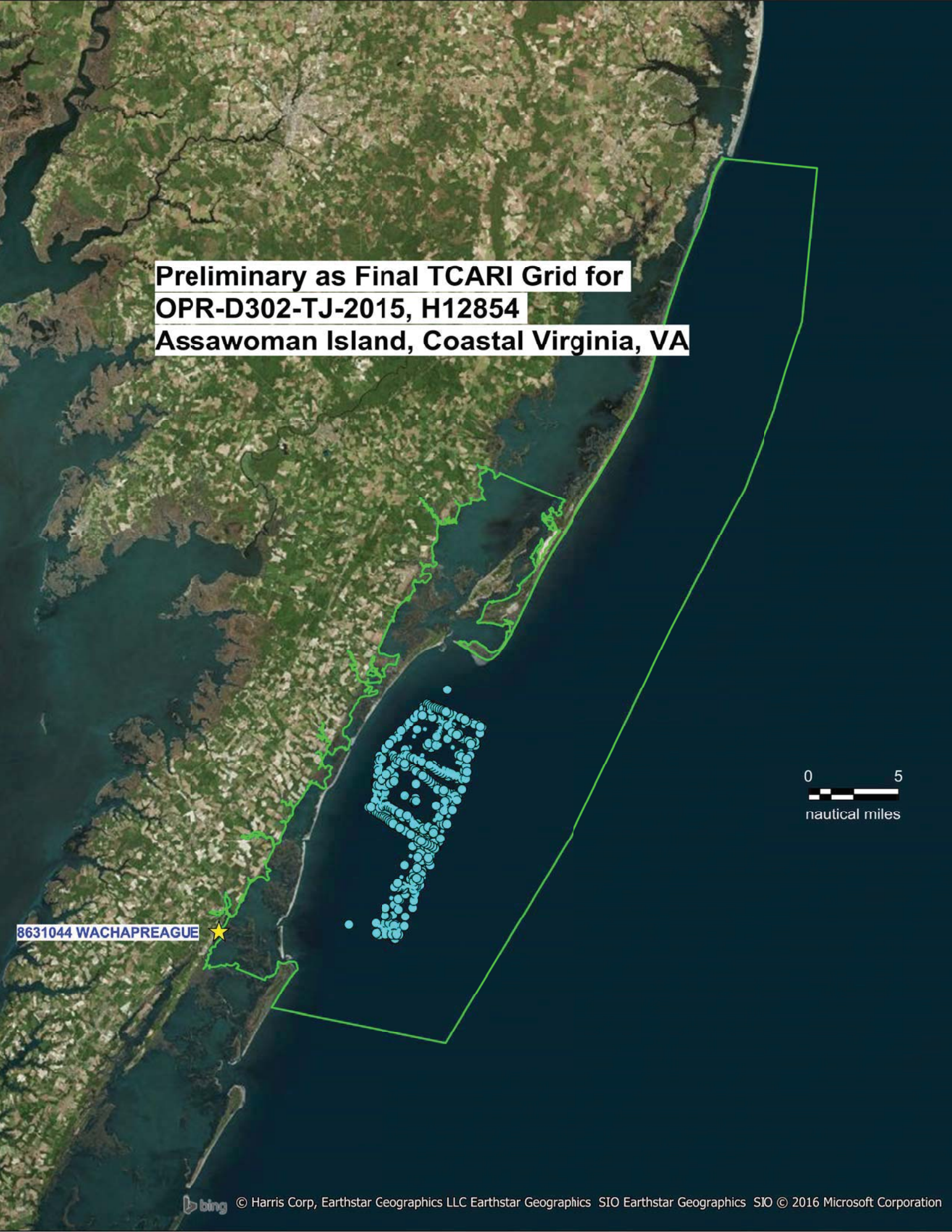
The TCARI grid "D302TJ2015_H12856.tc provided for the project instructions has been accepted as the final grid for project OPR-D302-TJ-2015, H12854, during the time period between December 08 and December 17, 2015.

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).

MICHALSKI.MICHAEL.PAUL.1280465174
Digitally signed by MICHALSKI.MICHAEL.PAUL.1280465174
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=OTHER, cn=MICHALSKI.MICHAEL.PAUL.1280465174
Date: 2016.04.18 12:09:05 -04'00'

ACTING CHIEF, PRODUCTS AND SERVICES BRANCH


Preliminary as Final TCARI Grid for
OPR-D302-TJ-2015, H12854
Assawoman Island, Coastal Virginia, VA
0
5
nautical miles
8631044 WACHAPREAGUE
bing
© Harris Corp, Earthstar Geographics LLC Earthstar Geographics SIO Earthstar Geographics SIO © 2016 Microsoft Corporation

APPENDIX II

SUPPLEMENTAL SURVEY RECORDS AND CORRESPONDENCE

Joseph Carrier - NOAA Federal <joseph.carrier@noaa.gov>

DToN Report for H12854

5 messages

OPS.Thomas Jefferson - NOAA Service Account <ops.thomas.jefferson@noaa.gov> Thu, Dec 24, 2015 at 4:37 PM
To: OCS NDB - NOAA Service Account <OCS.NDB@noaa.gov>, "CO.Thomas Jefferson - NOAA Service Account" <CO.thomas.jefferson@noaa.gov>, Matthew Jaskoski - NOAA Federal <matthew.jaskoski@noaa.gov>, Patrick Keown - NOAA Federal <patrick.keown@noaa.gov>, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>, Peter Lewit - NOAA Federal <peter.lewit@noaa.gov>, Michael Gonsalves - NOAA Federal <michael.gonsalves@noaa.gov>

All,

Please find attached a Danger to Navigation report for survey H12854, part of project OPR-D302-TJ-15, Chincoteague Inlet, VA. Please contact me with any questions. Thank you!

V/r,

LT Matthew Forrest

Field Operations Officer, NOAA Ship *Thomas Jefferson*
439 West York Street
Norfolk, VA 23510
cell: (757) 647-0187
voip: (541) 867-8927
fax: (757) 512-8295
http://www.moc.noaa.gov/tj/

H12854_DToN.pdf
281K

Michael Gonsalves - NOAA Federal <michael.gonsalves@noaa.gov> Thu, Dec 24, 2015 at 5:15 PM
To: "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>

Pretty cool! Did you get any imagery on it? What do you think it is?
~~ mog
[Quoted text hidden]

OCS NDB - NOAA Service Account <ocs.ndb@noaa.gov> Thu, Dec 24, 2015 at 5:18 PM
To: "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>

LT Forrest,

Would you please send along the .xml file that accompanies the report?

Many thanks!
Diane

Nautical Data Branch/Marine Chart Division/
Office of Coast Survey/National Ocean Service/
Contact: ocs.ndb@noaa.gov

NOAA NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

On Thu, Dec 24, 2015 at 11:37 AM, OPS.Thomas Jefferson - NOAA Service Account <ops.thomas.jefferson@noaa.gov> wrote:
[Quoted text hidden]

Matthew Forrest - NOAA Federal <matthew.r.forrest@noaa.gov> Fri, Dec 25, 2015 at 7:01 AM
To: OCS NDB - NOAA Service Account <ocs.ndb@noaa.gov>
Cc: "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>

My apologies for forgetting the complete file. Please find it attached. Thank you!

V/r,

Forrest
[Quoted text hidden]
--
LT Matthew Forrest, NOAA
Operations Officer in Training
NOAA Ship Thomas Jefferson
439 W York St
Norfolk, VA 23510
Tel: (757) 647-0187
Iridium: (808) 434-2706

H12854_DToN_V2.zip
496K

OCS NDB - NOAA Service Account <ocs.ndb@noaa.gov> Mon, Dec 28, 2015 at 6:17 PM
To: "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>
Cc: "CO.Thomas Jefferson - NOAA Service Account" <CO.thomas.jefferson@noaa.gov>, Matthew Jaskoski - NOAA Federal <matthew.jaskoski@noaa.gov>, Patrick Keown - NOAA Federal <patrick.keown@noaa.gov>, Peter Lewit - NOAA Federal <peter.lewit@noaa.gov>, Michael Gonsalves - NOAA Federal <michael.gonsalves@noaa.gov>, _NOS OCS PBA Branch <ocs.pba@noaa.gov>, _NOS OCS PBB Branch <ocs.pbb@noaa.gov>, _NOS OCS PBC Branch <ocs.pbc@noaa.gov>, _NOS OCS PBD Branch <ocs.pbd@noaa.gov>, _NOS OCS PBE Branch <ocs.pbe@noaa.gov>, _NOS OCS PBG Branch <ocs.pbg@noaa.gov>, Benjamin K Evans <Benjamin.K.Evans@noaa.gov>, Castle E Parker <Castle.E.Parker@noaa.gov>, James M Crocker <James.M.Crocker@noaa.gov>, Matt Kroll <Matt.Kroll@noaa.gov>, Nautical Data Branch <OCS.NDB@noaa.gov>, NSD Coast Pilot <coast.pilot@noaa.gov>, Pearce Hunt <Pearce.Hunt@noaa.gov>, Tara Wallace <Tara.Wallace@noaa.gov>

L-1897/15 and DD-27067 have been registered by the Nautical Data Branch and directed to Products Branch E for processing.

The DtoN reported is an obstruction located east of Assawoman Island, VA.

The following chart is affected:
12210 kapp 550

The following ENC is affected:
US4VA70M

References:

H12854
OPR-D302-TJ-15

This information was discovered and submitted by the NOAA ship Thomas Jefferson.

Nautical Data Branch/Marine Chart Division/
Office of Coast Survey/National Ocean Service/
Contact: ocs.ndb@noaa.gov

On Thu, Dec 24, 2015 at 11:37 AM, OPS.Thomas Jefferson - NOAA Service Account <ops.thomas.jefferson@noaa.gov> wrote:
[Quoted text hidden]

From:	OCS NDB - NOAA Service Account
To:	Castle E Parker
Cc:	Briana Welton; Patrick Keown - NOAA Federal; Ryan Wartick - NOAA Federal; Russell Quintero; _NOS OCS PBA Branch; _NOS OCS PBB Branch; _NOS OCS PBC Branch; _NOS OCS PBD Branch; _NOS OCS PBE Branch; _NOS OCS PBG Branch; Benjamin K Evans; James M Crocker; Matt Kroll; NSD Coast Pilot; Pearce Hunt; Tara Wallace
Subject:	Fwd: H12854 DtoN Submission to NDB
Date:	Thursday, October 27, 2016 3:36:25 PM
Attachments:	H12854_DtoNs.zip

DD-27848 has been registered by the Nautical Data Branch and directed to Products Branch E for processing.

The DtoNs reported are several shoals and obstructions in the Atlantic Ocean, VA offshore of Assawoman Island.

The following charts are affected:
12210 kapp 550

12211 kapp 552

The following ENC is affected:
US4VA70M

References:
H12854
OPR-D302-TJ-15

This information was discovered by the crew of the NOAA Ship *Thomas Jefferson* and was submitted by AHB.

Nautical Data Branch/Marine Chart Division/
Office of Coast Survey/National Ocean Service/
Contact: ocs.ndb@noaa.gov

---------- Forwarded message ----------
From: **Castle Parker - NOAA Federal** <castle.e.parker@noaa.gov>
Date: Thu, Oct 27, 2016 at 12:15 PM
Subject: H12854 DtoN Submission to NDB
To: OCS NDB - NOAA Service Account <ocs.ndb@noaa.gov>
Cc: Briana Welton - NOAA Federal <briana.welton@noaa.gov>, Patrick Keown - NOAA Federal <patrick.keown@noaa.gov>, Ryan Wartick - NOAA Federal <ryan.wartick@noaa.gov>, Russell Quintero - NOAA Federal <russell.quintero@noaa.gov>

Good day,

Please find attached compressed file associated with H12854 DtoN submission to Nautical Data Branch (NDB) and Marine Chart Division (MCD). This danger submission contains

three shoal soundings and three obstructions for chart application.

The information originates from field unit NOAA Ship *Thomas Jefferson* and was observed and evaluated by Atlantic Hydrographic Branch (AHB) during the final survey verification and review process. The contents of the attached WinZip file were generated at AHB. The attached zip file contains a DtoN Letter (PDF), associated image files, and a Pydro XML file.

If you have any questions, please direct them back to me via email or phone 757-441-6746 x115.

Thank you for your assistance with this matter.

Regards,

Gene Parker

Castle Eugene Parker

NOAA Office of Coast Survey

Atlantic Hydrographic Branch

Hydrographic Team Lead / Physical Scientist

castle.e.parker@noaa.gov

office (757) 441-6746 x115

From: Matthew Forrest - NOAA Federal
To: Castle Parker - NOAA Federal
Subject: Fwd: NODC file 2015
Date: Monday, November 07, 2016 9:51:02 AM

---------- Forwarded message ----------
From: **ChiefST.Thomas Jefferson - NOAA Service Account**
<chiefst.thomas.jefferson@noaa.gov>
Date: Tue, Apr 5, 2016 at 5:20 PM
Subject: NODC file 2015
To: "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>

NODC files for 2015 have been zipped and sent to NODC.submissions@noaa.gov
and cc to Sam Greenaway as per FPM on 04/05/2016

--
LT Matthew Forrest, NOAA
Operations Officer
NOAA Ship Thomas Jefferson
439 W York St
Norfolk, VA 23510
Tel: (757) 647-0187
Iridium: (808) 434-2706

APPROVAL PAGE

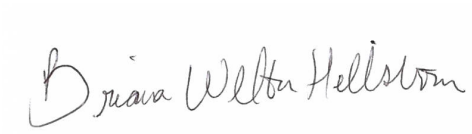
H12854

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

- H12854_DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- H12854_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.



Digitally signed by HILLSTROM.BRIANA.WELTON.1267667531
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=NOAA, cn=HILLSTROM.BRIANA.WELTON.1267667531
Date: 2017.06.30 09:20:41 -04'00'

Approved: _____

Lieutenant Commander Briana Welton Hillstrom, NOAA
Chief, Atlantic Hydrographic Branch