

H12792

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

DESCRIPTIVE REPORT

Type of Survey: Navigable Area

Registry Number: H12792

LOCALITY

State(s): South Carolina

General Locality: Southeast Atlantic Coast

Sub-locality: 6 NM Northeast of Charleston Harbor Channel Buoy

2015

CHIEF OF PARTY
CAPT Shepard M. Smith

LIBRARY & ARCHIVES

Date:

HYDROGRAPHIC TITLE SHEET

H12792

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): **South Carolina**

General Locality: **Southeast Atlantic Coast**

Sub-Locality: **6 NM Northeast of Charleston Harbor Channel Buoy**

Scale: **20000**

Dates of Survey: **05/31/2015 to 06/16/2015**

Instructions Dated: **04/09/2015**

Project Number: **OPR-G380-TJ-15**

Field Unit: **NOAA Ship *Thomas Jefferson***

Chief of Party: **CAPT Shepard M. Smith**

Soundings by: **Multibeam Echo Sounder**

Imagery by: **Side Scan Sonar Multibeam Echo Sounder Backscatter**

Verification by: **Atlantic Hydrographic Branch**

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

Remarks:

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

Table of Contents

A. Area Surveyed.....	1
A.1 Survey Limits.....	1
A.2 Survey Purpose.....	2
A.3 Survey Quality.....	2
A.4 Survey Coverage.....	3
A.5 Survey Statistics.....	3
B. Data Acquisition and Processing.....	5
B.1 Equipment and Vessels.....	5
B.1.1 Vessels.....	5
B.1.2 Equipment.....	6
B.2 Quality Control.....	6
B.2.1 Crosslines.....	6
B.2.2 Uncertainty.....	7
B.2.3 Junctions.....	9
B.2.4 Sonar QC Checks.....	12
B.2.5 Equipment Effectiveness.....	12
B.2.6 Factors Affecting Soundings.....	12
B.2.7 Sound Speed Methods.....	13
B.2.8 Coverage Equipment and Methods.....	20
B.2.9 H12792 Density Compliance.....	20
B.3 Echo Sounding Corrections.....	21
B.3.1 Corrections to Echo Soundings.....	21
B.3.2 Calibrations.....	22
B.4 Backscatter.....	22
B.5 Data Processing.....	22
B.5.1 Software Updates.....	22
B.5.2 Surfaces.....	23
B.5.3 Multibeam Data Filters.....	23
B.5.4 Areas of High Node Standard Deviation.....	23
C. Vertical and Horizontal Control.....	24
C.1 Vertical Control.....	24
C.2 Horizontal Control.....	25
D. Results and Recommendations.....	25
D.1 Chart Comparison.....	25
D.1.1 Raster Charts.....	26
D.1.2 Electronic Navigational Charts.....	27
D.1.3 AWOIS Items.....	29
D.1.4 Maritime Boundary Points.....	29
D.1.5 Charted Features.....	29
D.1.6 Uncharted Features.....	30
D.1.7 Dangers to Navigation.....	30
D.1.8 Shoal and Hazardous Features.....	30
D.1.9 Channels.....	30

D.1.10 Bottom Samples	30
D.2 Additional Results.....	30
D.2.1 Shoreline.....	30
D.2.2 Prior Surveys.....	30
D.2.3 Aids to Navigation.....	30
D.2.4 Overhead Features.....	30
D.2.5 Submarine Features.....	31
D.2.6 Ferry Routes and Terminals.....	31
D.2.7 Platforms.....	31
D.2.8 Significant Features.....	31
D.2.9 Construction and Dredging.....	31
D.2.10 New Survey Recommendation.....	31
D.2.11 Inset Recommendation.....	31
E. Approval Sheet.....	32
F. Table of Acronyms.....	33

List of Tables

Table 1: Survey Limits.....	1
Table 2: Hydrographic Survey Statistics.....	4
Table 3: Dates of Hydrography.....	5
Table 4: Vessels Used.....	5
Table 5: Major Systems Used.....	6
Table 6: Survey Specific Tide TPU Values.....	7
Table 7: Survey Specific Sound Speed TPU Values.....	8
Table 8: Junctioning Surveys.....	10
Table 9: Calibrations not discussed in the DAPR.....	22
Table 10: Software Updates.....	22
Table 11: Submitted Surfaces.....	23
Table 12: Largest Scale Raster Charts.....	26
Table 13: Largest Scale ENCs.....	27

List of Figures

Figure 1: H12792 in Relation to the Project Area Overlaid on RNC 11528.....	2
Figure 2: H12792 100% mosaic holidays	3
Figure 3: H12792 XL to MS depth difference surface statistics	7
Figure 4: H12792 Uncertainty standards.....	9
Figure 5: H12792 Junctions.....	10
Figure 6: H12792 and Junction H12804 Statistics.....	11
Figure 7: H12792 and Junction H12771 Statistics.....	12
Figure 8: H12792 acquisition lines colored by the corresponding sound speed casts applied.....	14
Figure 9: H12792 Distant MVP cast.....	15
Figure 10: H12792 refraction area.....	16

Figure 11: H12792 line 154 132 0046 refraction area..... 17
Figure 12: H12792 line 154 132 0046 refraction area reduced..... 18
Figure 13: H12792 SSV blowout holiday..... 19
Figure 14: H12792 rejected SSV blowout subset..... 20
Figure 15: H12792 1 meter finalized surface density results..... 21
Figure 16: H12792 High node standard deviation..... 24
Figure 17: H12972 Soundings vs charted soundings..... 26
Figure 18: H12792 Contours..... 27
Figure 19: Shoal sounding differences observed between the ENC and H12792 are shown in blue. Depth ranges are in meters..... 28
Figure 20: Deep sounding differences observed between the ENC and H12792 are shown in blue. Depth ranges are in meters..... 28
Figure 21: H12792 AWOIS..... 29

Descriptive Report to Accompany Survey H12792

Project: OPR-G380-TJ-15

Locality: Southeast Atlantic Coast

Sublocality: 6 NM Northeast of Charleston Harbor Channel Buoy

Scale: 1:20000

May 2015 - June 2015

NOAA Ship *Thomas Jefferson*

Chief of Party: CAPT Shepard M. Smith

A. Area Surveyed

This hydrographic survey was completed as specified by hydrographic survey project instructions OPR-G380-TJ-15, signed 4 April 2015. This survey is located due east of the harbor channel entrance.

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
32° 41' 35.2" N 79° 31' 31.18" W	32° 37' 38.62" N 79° 29' 35.09" W

Table 1: Survey Limits

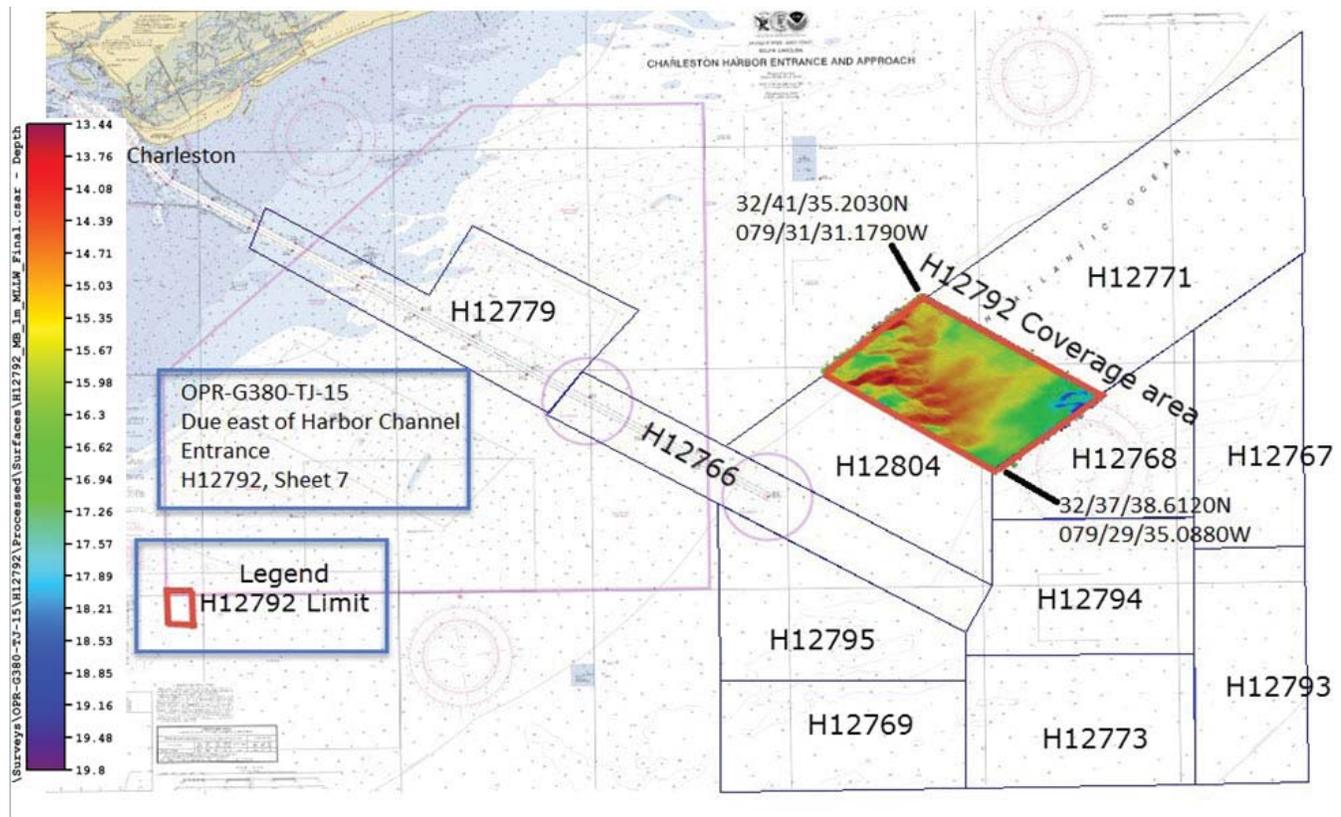


Figure 1: H12792 in Relation to the Project Area Overlayed on RNC 11528

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

A.2 Survey Purpose

This project is being conducted in support of NOAA's Office of Coast Survey to provide contemporary hydrographic data in support of a new nautical chart in this area and in response to a harbor deepening project in the Port of Charleston which will better serve deeper draft ships transiting the area.

A.3 Survey Quality

The entire survey is adequate to supersede previous data.

A.4 Survey Coverage

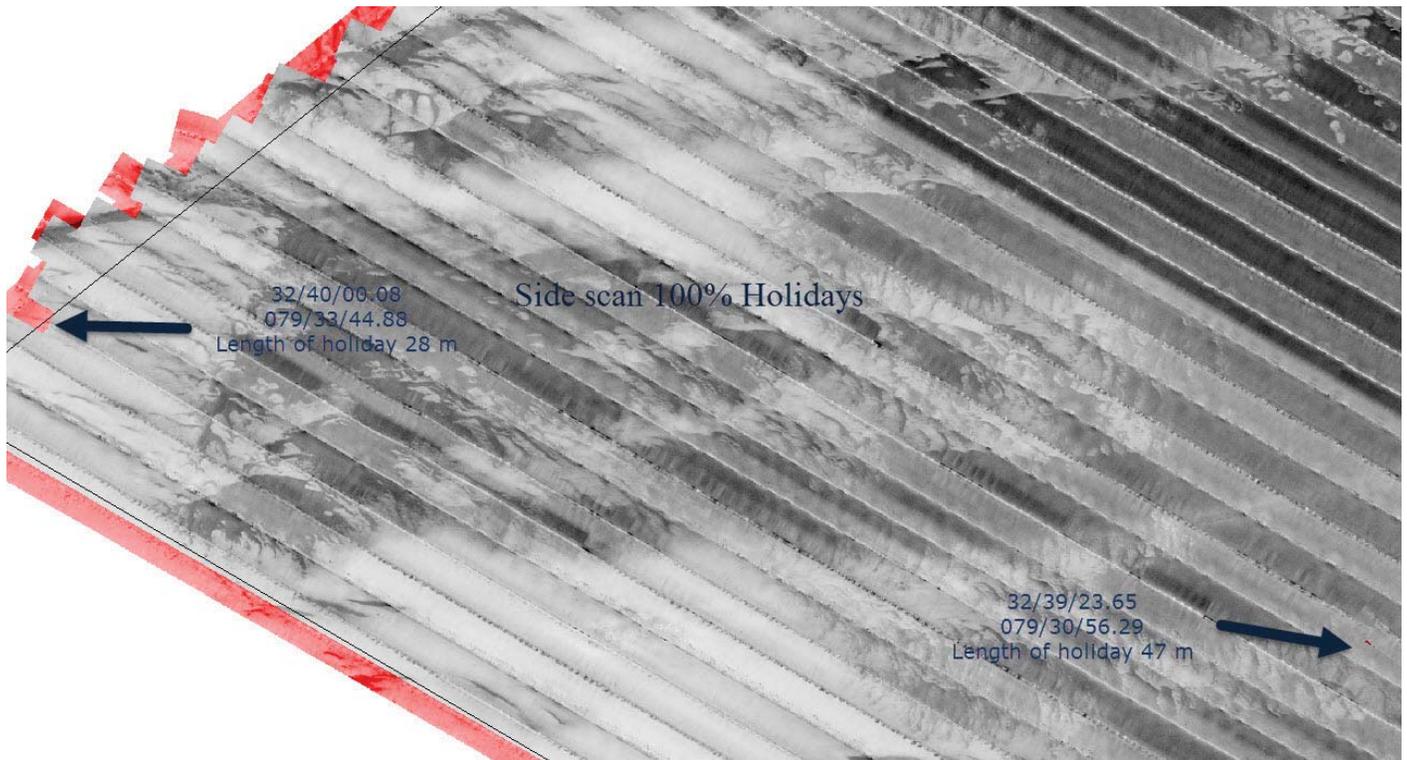


Figure 2: H12792 100% mosaic holidays

Two small holidays are present in the 100% side scan mosaic (Colored gray). These are covered with the 200% mosaic (colored red). This is shown in figure 2.

A.5 Survey Statistics

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

	HULL ID	<i>S222</i>	<i>3102</i>	<i>Total</i>
LNM	SBES Mainscheme	0	0	0
	MBES Mainscheme	0	0	0
	Lidar Mainscheme	0	0	0
	SSS Mainscheme	0	0	0
	SBES/SSS Mainscheme	0	0	0
	MBES/SSS Mainscheme	366.03	0.50	366.53
	SBES/MBES Crosslines	36.09	0	36.09
	Lidar Crosslines	0	0	0
Number of Bottom Samples				0
Number of AWOIS Items Investigated				0
Number Maritime Boundary Points Investigated				0
Number of DPs				0
Number of Items Investigated by Dive Ops				0
Total SNM				14

Table 2: Hydrographic Survey Statistics

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

Survey Dates	Day of the Year
05/31/2015	151
06/01/2015	152
06/02/2015	153
06/03/2015	154
06/04/2015	155
06/06/2015	157
06/16/2015	167

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	<i>S222</i>	<i>3102</i>
LOA	208 feet	31 feet
Draft	15 feet	5.2 feet

Table 4: Vessels Used

Data were acquired by NOAA Ship Thomas Jefferson and Hydrographic Survey Launch 3102. NOAA Ship Thomas Jefferson acquired Reson 7125 SV2 multibeam echosounder soundings, Reson 7125 ROV multibeam echosounder soundings, multibeam backscatter data, Klein 5000 V2 side scan sonar data, Rolls Royce MVP100 sound velocity profiles, and Applanix POS/MV version 5 position and attitude data. NOAA Launch 3102 acquired Reson 7125 SV1 multibeam echosounder soundings, multibeam backscatter data,

Klein 5000 side scan sonar data, Seabird Seacat 19+ sound velocity profiles and Applanix POS/MV version 4 position and attitude data.

B.1.2 Equipment

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

Manufacturer	Model	Type
Applanix	POS/MV version 4	Positioning and Attitude System
Applanix	POS/MV version 5	Positioning and Attitude System
Seabird	Seacat 19+	Conductivity, Temperature, and Depth Sensor
Rolls Royce	MVP 100	Conductivity, Temperature, and Depth Sensor
Reson	7125 SV1	MBES
Reson	7125 SV2	MBES
Reson	7125 ROV	MBES
Reson	SV-71	Sound Speed System
Klein	5000	SSS
Klein	5000 V2	SSS

Table 5: Major Systems Used

B.2 Quality Control

B.2.1 Crosslines

Crosslines acquired for this survey totaled 10% of mainscheme acquisition.

The Thomas Jefferson acquired 36.09 linear nautical miles of MBES crosslines, equating to 10% of mainscheme MBES data. Crosslines were compared to mainscheme by creating a difference surface in Caris Bathymetry Data Base. A 1m CUBE surface was created using strictly mainscheme lines, while a second 1m CUBE surface was created using only crosslines. The depth layers of the two surfaces were then differenced. The minimum difference value was -0.366m and maximum difference value was 0.332m. The mean was 0.01 m and the standard deviation was 0.084 m. Survey H12792 complies with section 5.2.4.3 of the HSSD (2015 ed). The Chief Hydrographer chose to exceed the specifications of 4% crossline coverage

for validation at closer intervals when given the option of interpolating ERS holidays versus re-acquiring bathymetry.

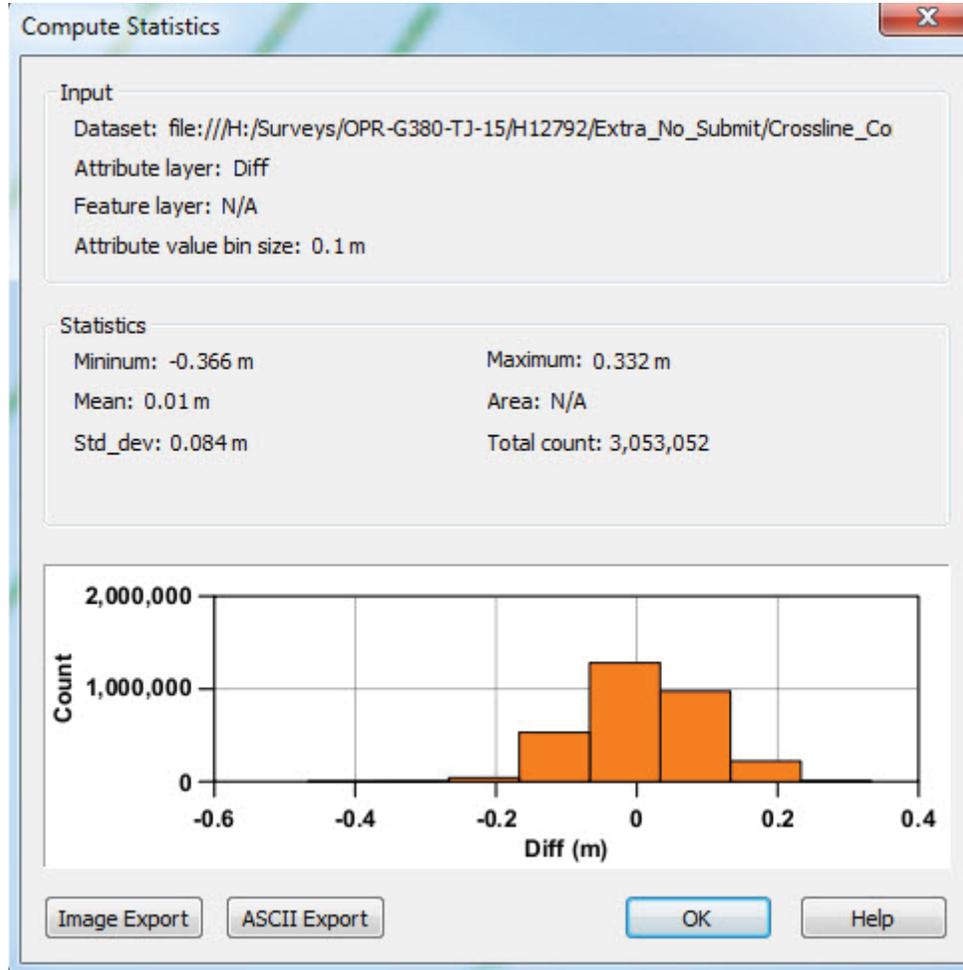


Figure 3: H12792 XL to MS depth difference surface statistics

B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Measured	Zoning
0 meters	0.125 meters

Table 6: Survey Specific Tide TPU Values

Hull ID	Measured - CTD	Measured - MVP	Surface
S222	4 meters/second	1 meters/second	0.2 meters/second
3102	4 meters/second	N/A meters/second	0.2 meters/second

Table 7: Survey Specific Sound Speed TPU Values

Total Propagated Uncertainty values for survey H12792 were derived using a combination of: real time uncertainties for vessel motion; a priori values for equipment and vessel characteristics; assigned values for water level uncertainties; 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 post-processed Precise Point Position (5P) positional solution and were applied to the soundings via an SBET RMS file generated by Applanix POSPac. Uncertainties for sonar mounting and vessel speed were assigned using the a priori values found in Appendix 4, table 4.9 of the NOAA Field Procedures Manual (FPM) (ed 2014), and applied to the data via the CARIS HIPS Hydrographic Vessel File. Uncertainties associated with water level measurements and interpolation were automatically calculated as part of the TCARI water levels, and applied to the data during the Merge process. 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).

Total Propagated Uncertainties for the entire survey were evaluated to ensure compliance with section 5.1.3 of NOAA's HSSD (ed 2015). First, the maximum allowable uncertainty for each node was calculated using the equation:

$-\text{Uncertainty}/((0.5^2 + ((\text{Depth} * 0.013)^2))^0.5)$. Second, the ratio between the actual uncertainty and maximum allowed uncertainty was found for each node. Out of 33,996,286 nodes, 0 did not meet IHO order 1 standards (or 100% meet IHO order 1 uncertainty requirements).

A custom layer was created for the finalized surface submitted in correlation with survey H12792. The layer was derived from the difference between the calculated uncertainties of individual nodes and the allowable uncertainty at the coupled node. This layer was examined using the CARIS QC report tool. The resulting statistical analysis identified 100% of nodes within H12792 met the vertical uncertainty standards of Section 5.1.3 of the 2015 Hydrographic Survey Specifications and Deliverables.

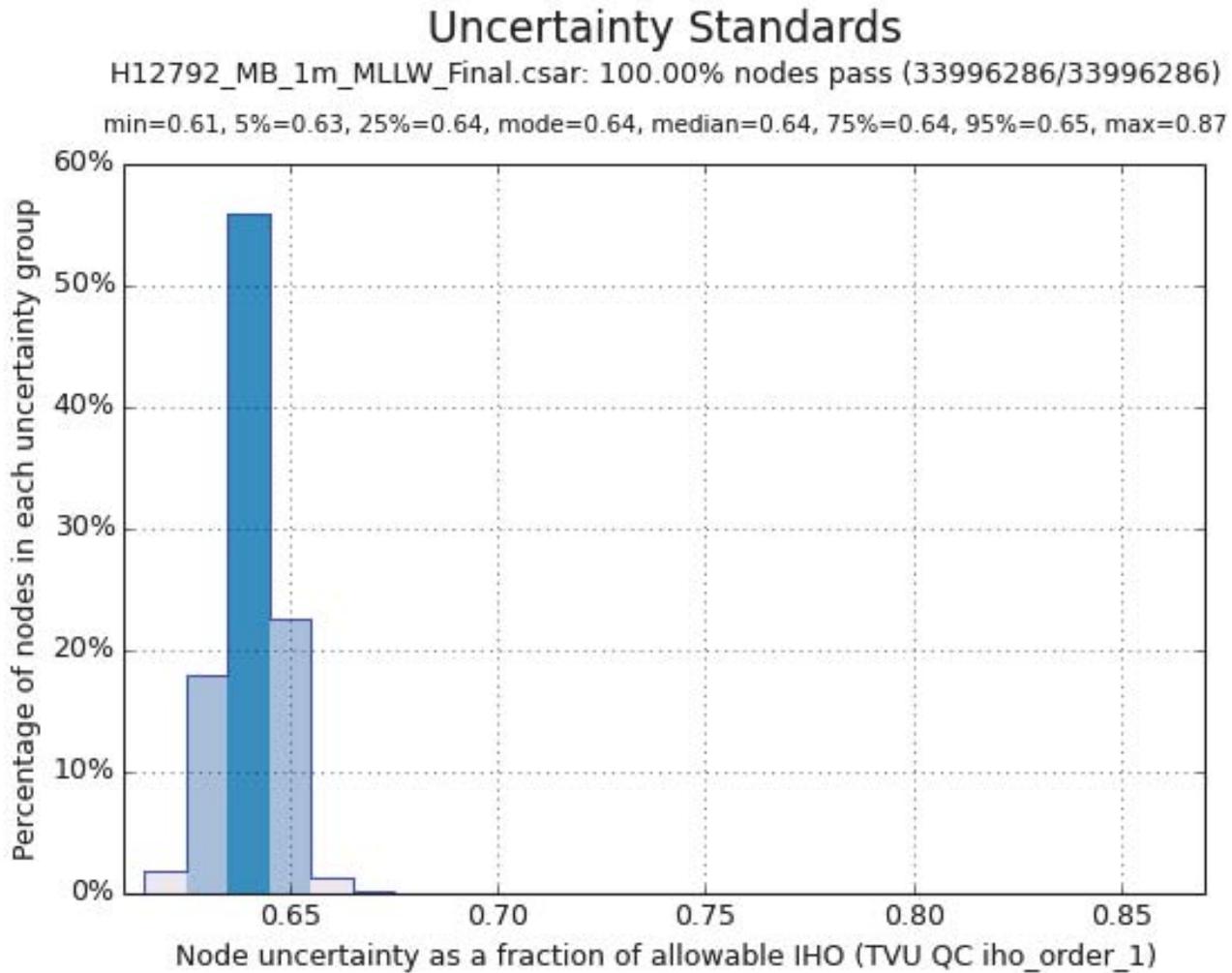


Figure 4: H12792 Uncertainty standards

B.2.3 Junctions

Two concurrent surveys were acquired during the same relative time frame of acquisition of H12792: H12804 and H12771. Depth comparisons were made using a CARIS HIPS generated difference surface as a check that the sonar systems and application of correctors were in agreement within 0.3m.

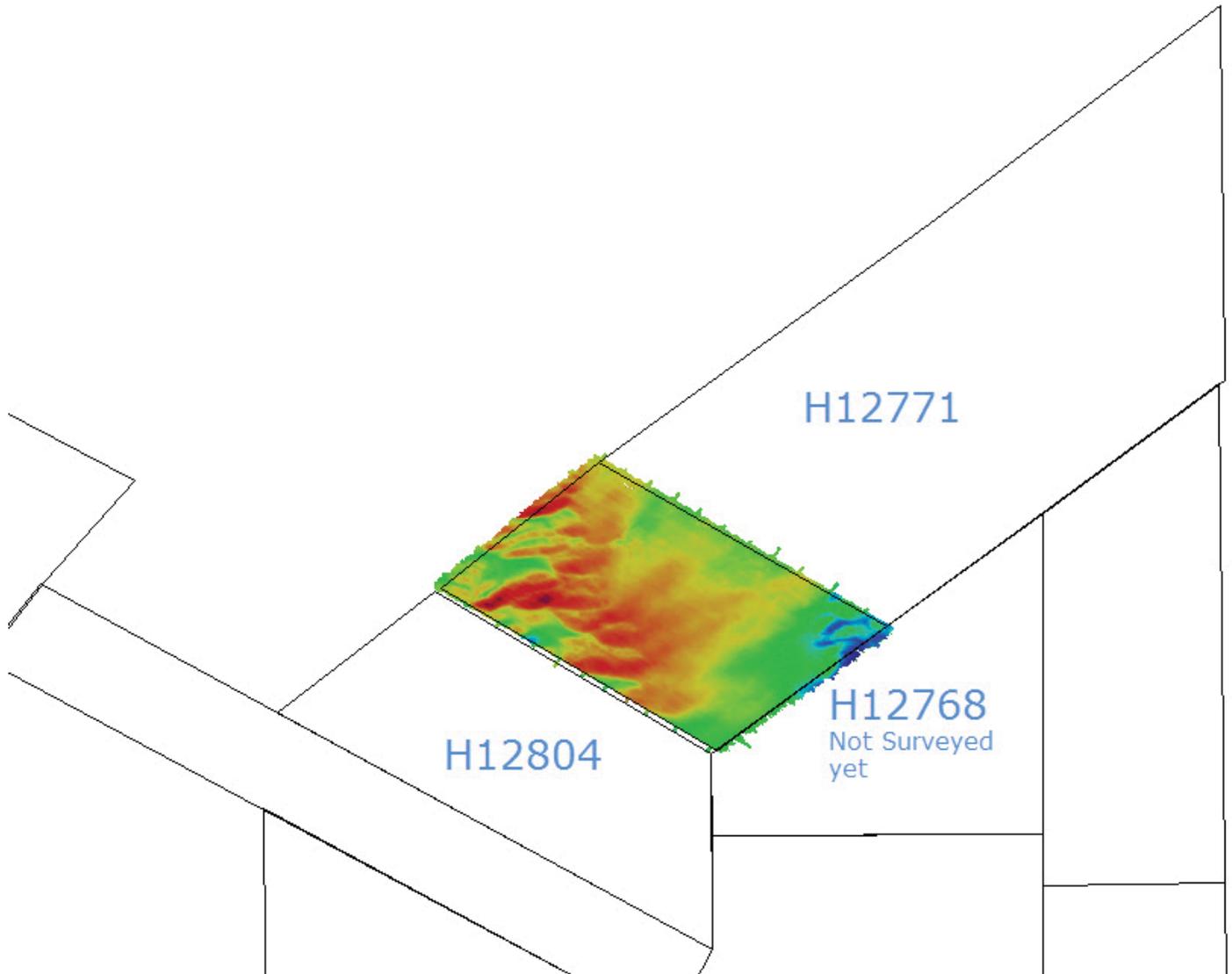


Figure 5: H12792 Junctions

The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
H12804	1:20000	2015	NOAA Ship THOMAS JEFFERSON	S
H12771	1:20000	2015	NOAA Ship THOMAS JEFFERSON	N

Table 8: Junctioning Surveys

H12804

The difference between survey H12792 and the junction survey H12804 ranged from -0.352m to 0.433m. The mean was 0.053m and the standard deviation was 0.084m. When differenced, 99.68% of sounding nodes agree within 0.3m.

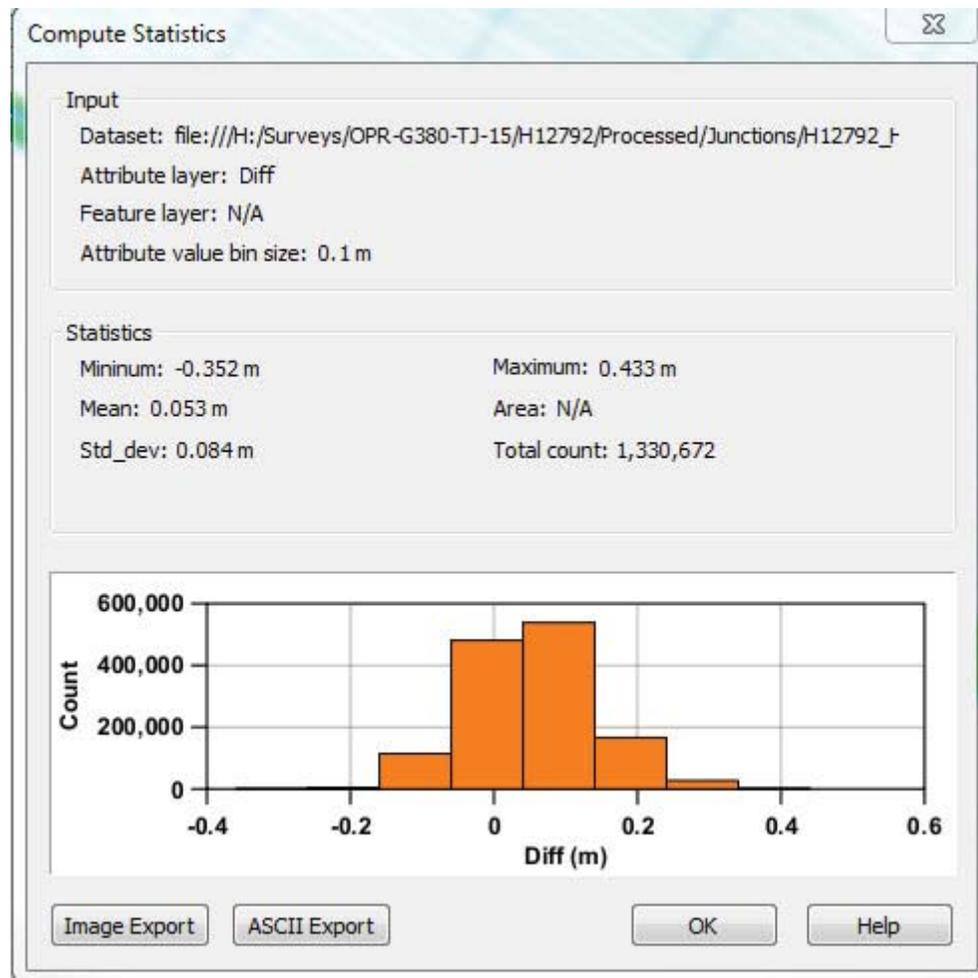


Figure 6: H12792 and Junction H12804 Statistics

H12771

The difference between survey H12792 and the junction survey H12771 ranged from -0.493m to 0.231m. The mean was -0.019m and the standard deviation was 0.058m. When differenced, 99.99% of sounding nodes agree within 0.3m.

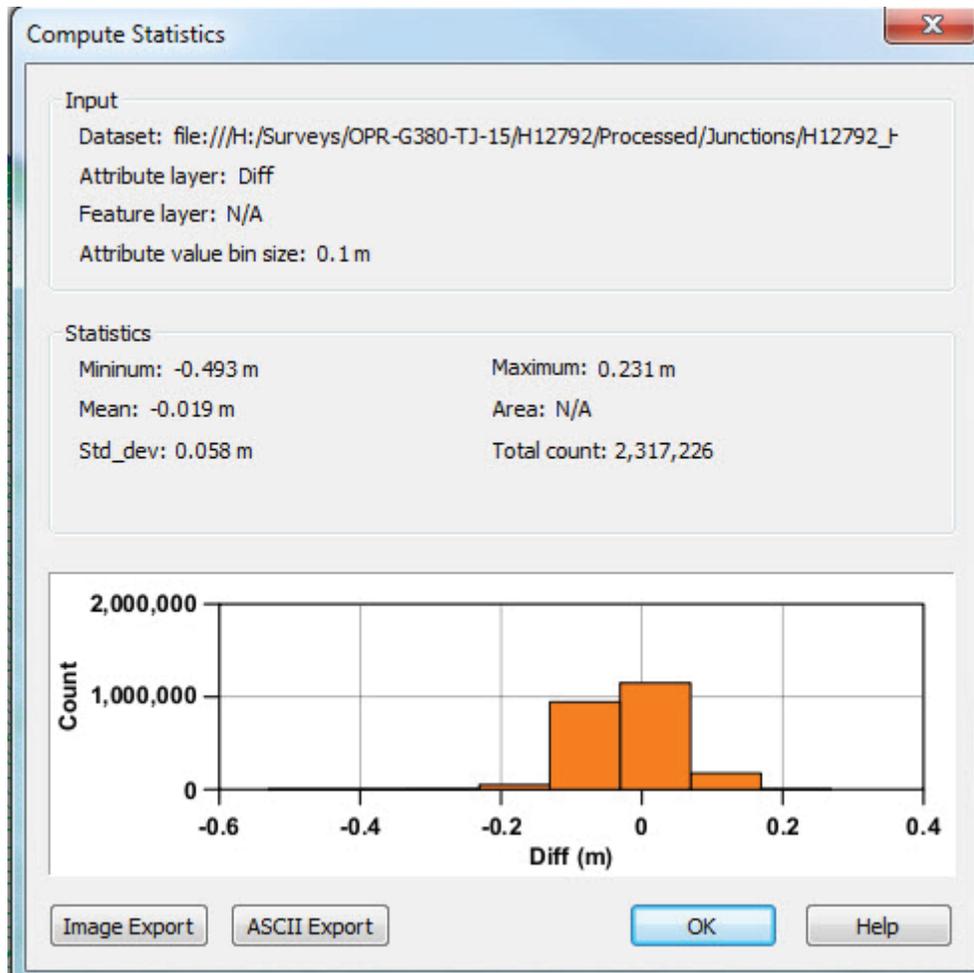


Figure 7: H12792 and Junction H12771 Statistics

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 profiles were acquired from S222 in accordance with HSSD 2015 standards using a Rolls Royce Brooke Ocean MVP 100 approximately every hour with efforts made to evenly distribute the casts spatially and temporally across the survey area. All MVP casts were concatenated into a vessel master file and applied to multibeam data in CARIS using the parameter of nearest in distance within time 1 hour. A sound speed profile was acquired from platform 3102 in accordance with HSSD 2015 standards. The one CTD cast was concatenated into a vessel master file and applied to multibeam data in CARIS using the parameter of nearest in distance within time 4 hours.

One MVP cast was taken about 900 meters from the survey area. No problems were identified as the area is well mixed.

SVP casts were loaded using nearest in distance within time 1 hour with the exception of lines 154_132_0046 and 154_133_0123. Line 154_133_0123 is using nearest in time. By applying nearest in time to the selected line, the sound velocity profile applied to the data removed the refraction artifact present in the data. Applying nearest in distance to line 154_132_0046 reduced the refraction artifact the most. The outer beams were removed in the area that still had refraction.

There is a small holiday where an SSV blowout was rejected.

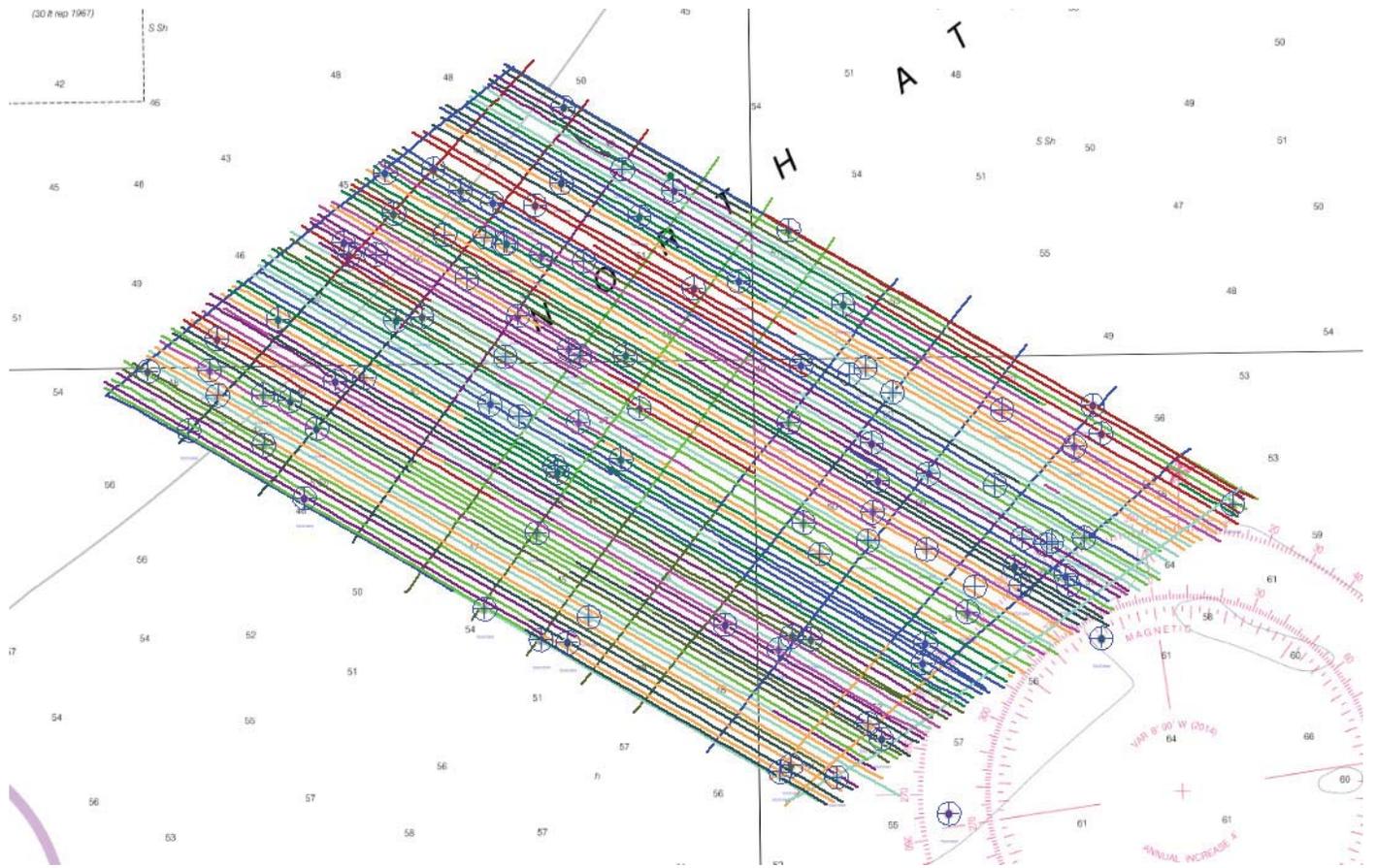


Figure 8: H12792 acquisition lines colored by the corresponding sound speed casts applied

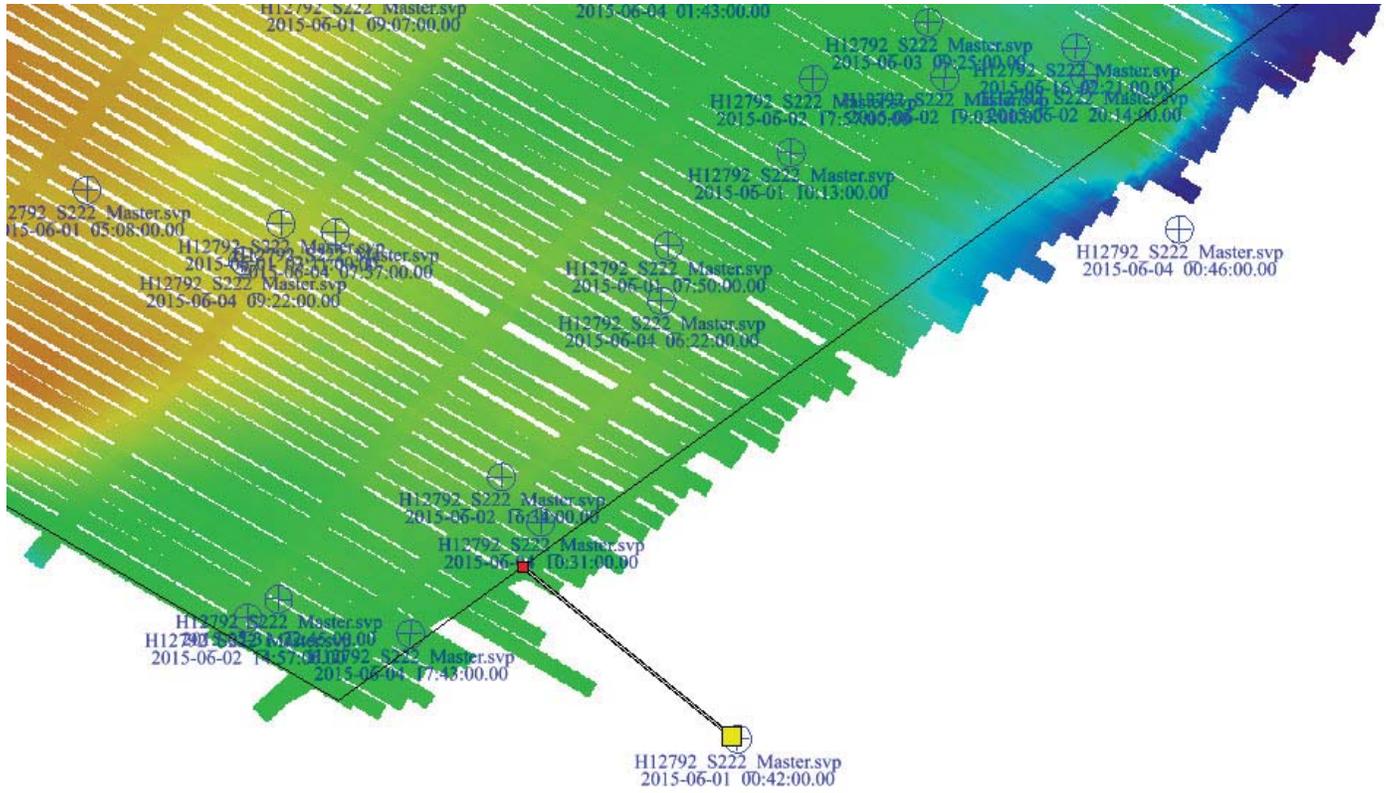


Figure 9: H12792 Distant MVP cast

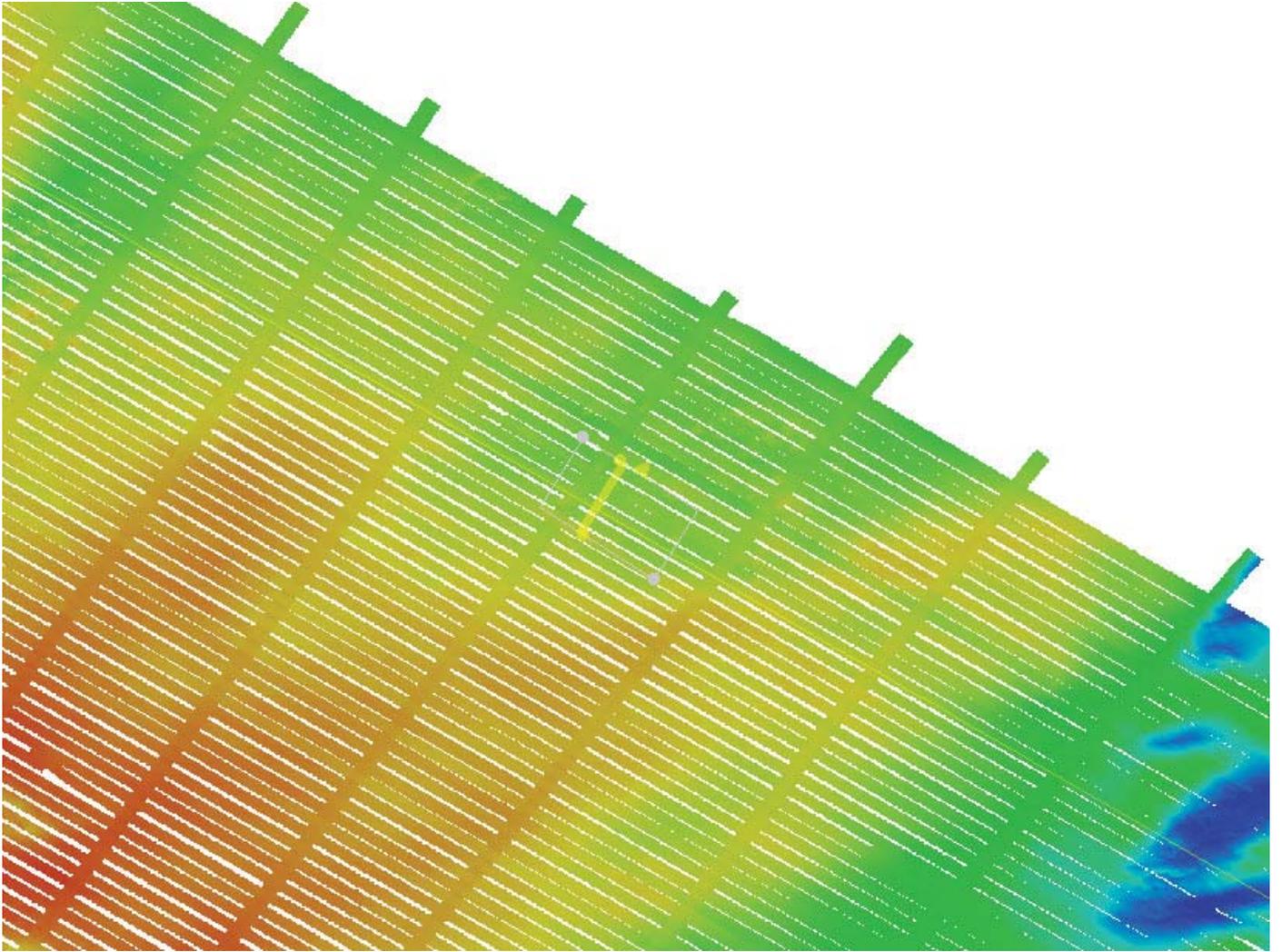


Figure 10: H12792 refraction area

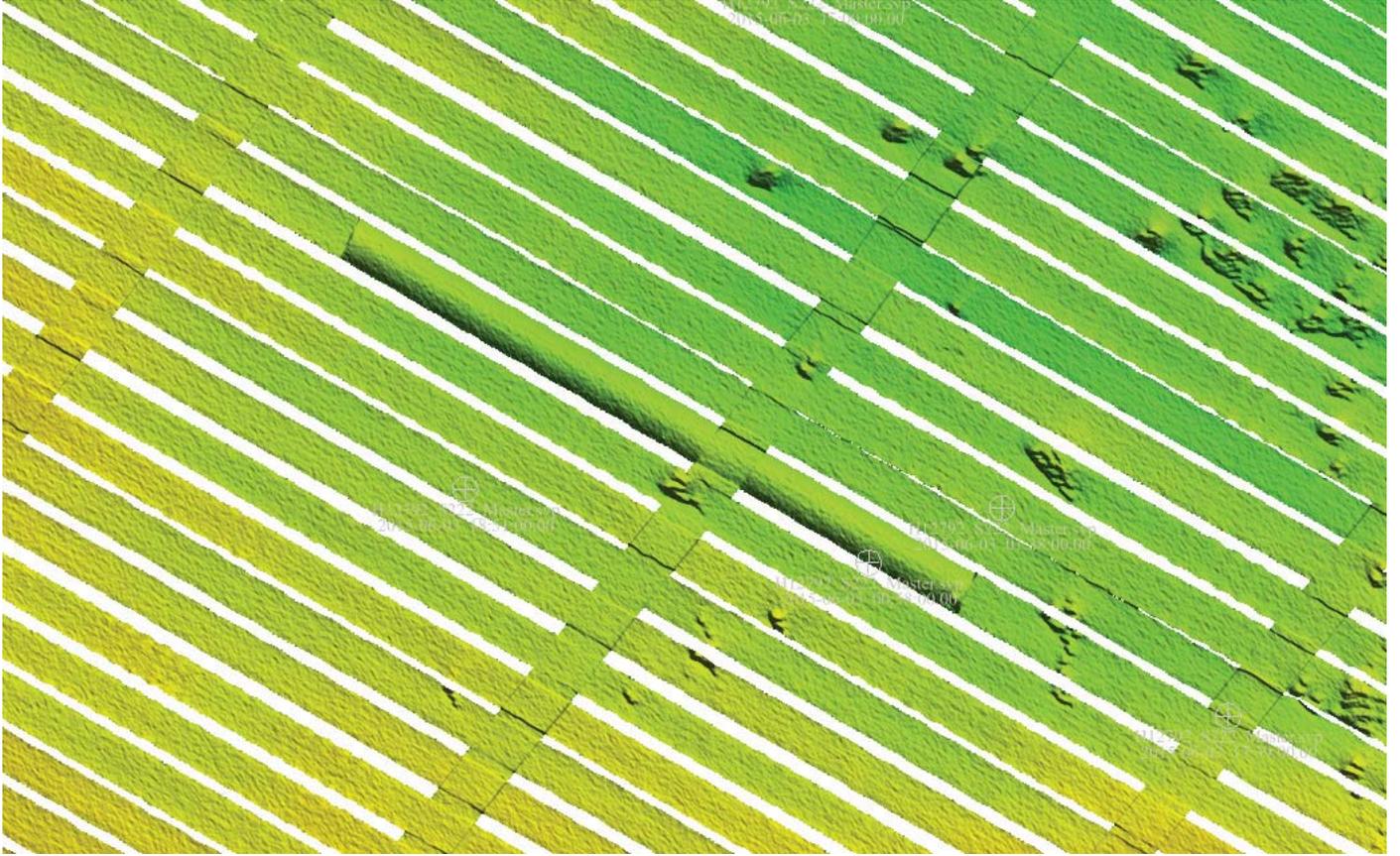


Figure 11: H12792 line 154_132_0046 refraction area

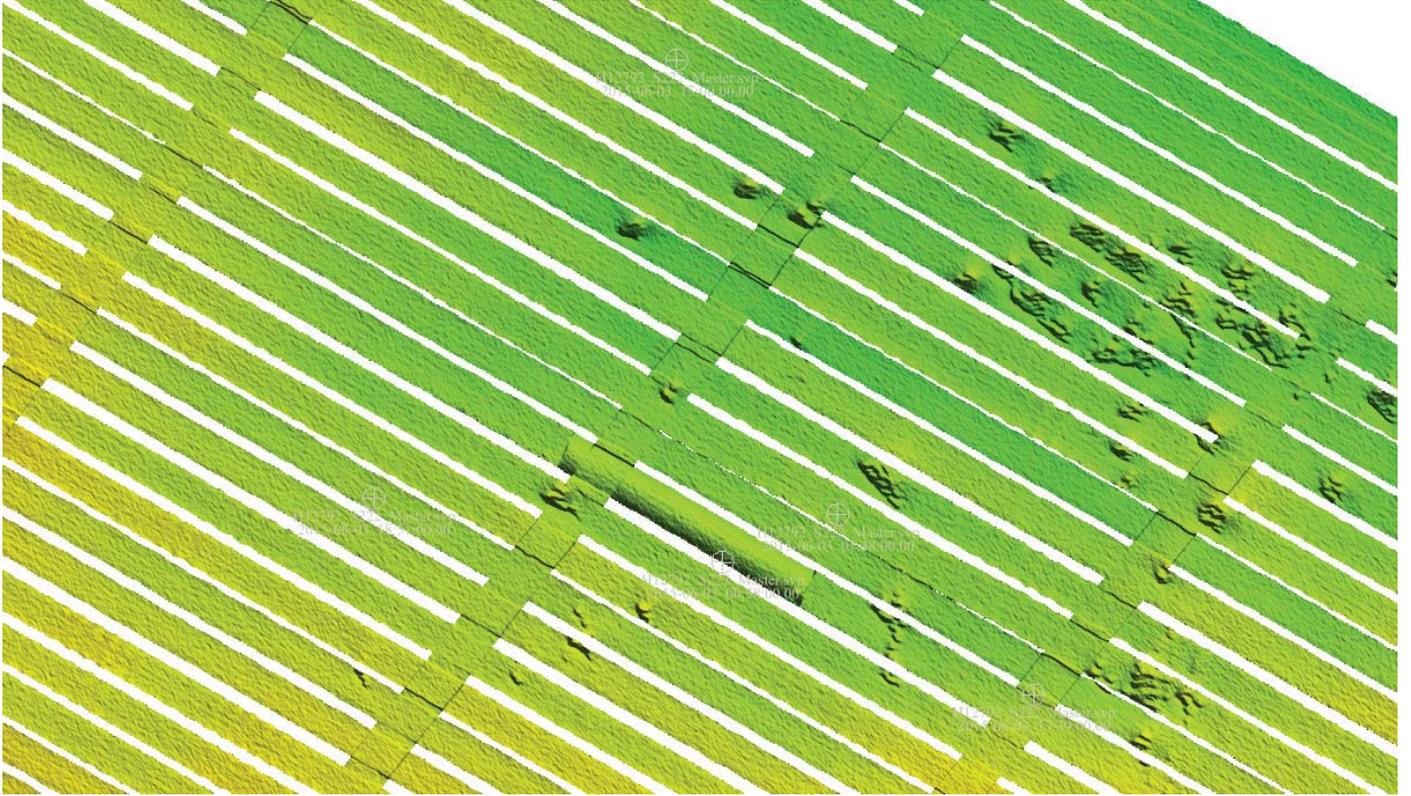


Figure 12: H12792 line 154_132_0046 refraction area reduced

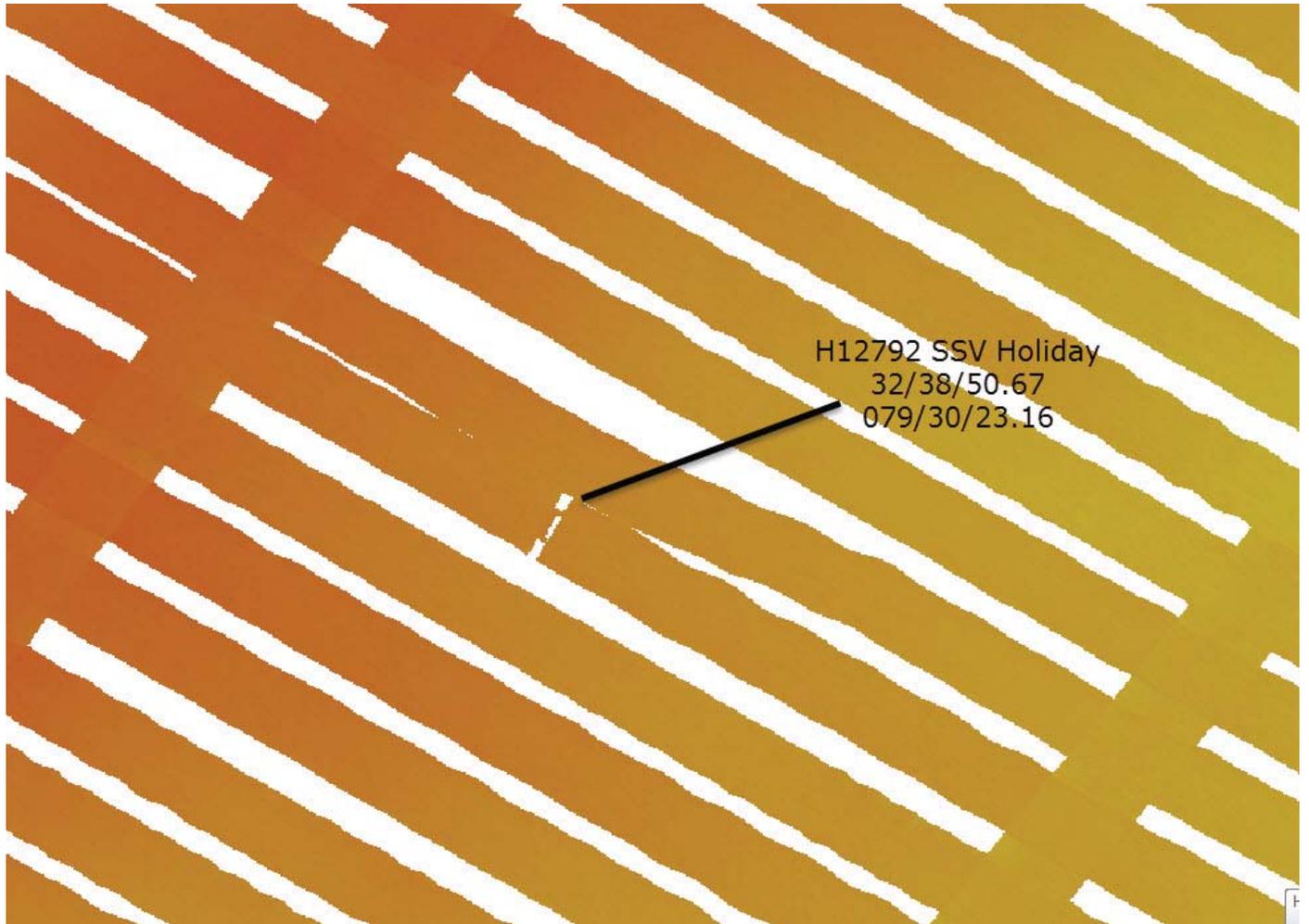


Figure 13: H12792 SSV blowout holiday

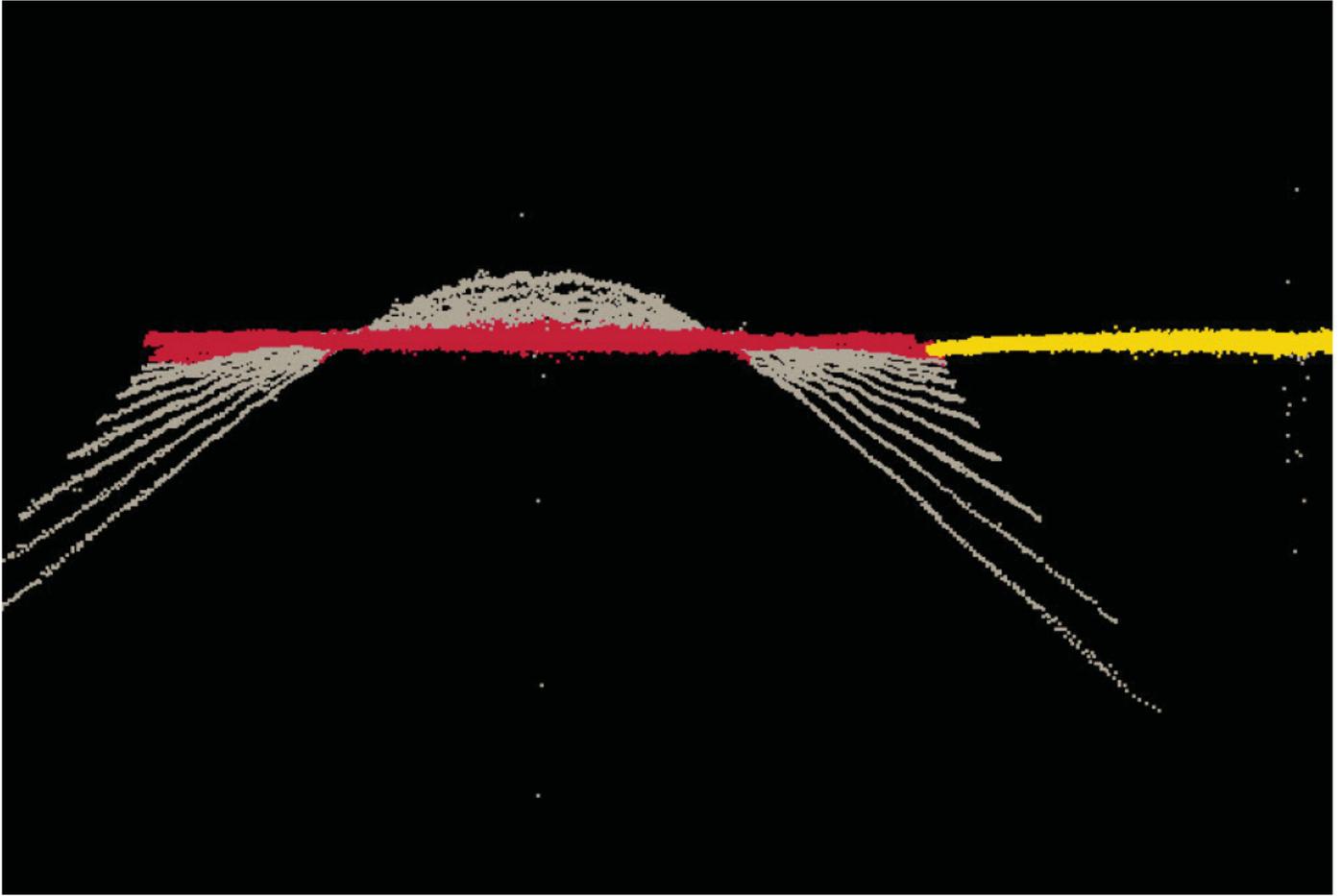


Figure 14: H12792 rejected SSV blowout subset

B.2.8 Coverage Equipment and Methods

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

B.2.9 H12792 Density Compliance

Density requirements for H12792 were analyzed using the finalized CSAR QA tool in the Pydro Contributions program. The Chief Hydrographer chose to exceed the specifications for object detection with set line spacing because density requirements were met and bathymetry was better represented using a 1m resolution. The 1 meter surface meets density 99.40% of the time.

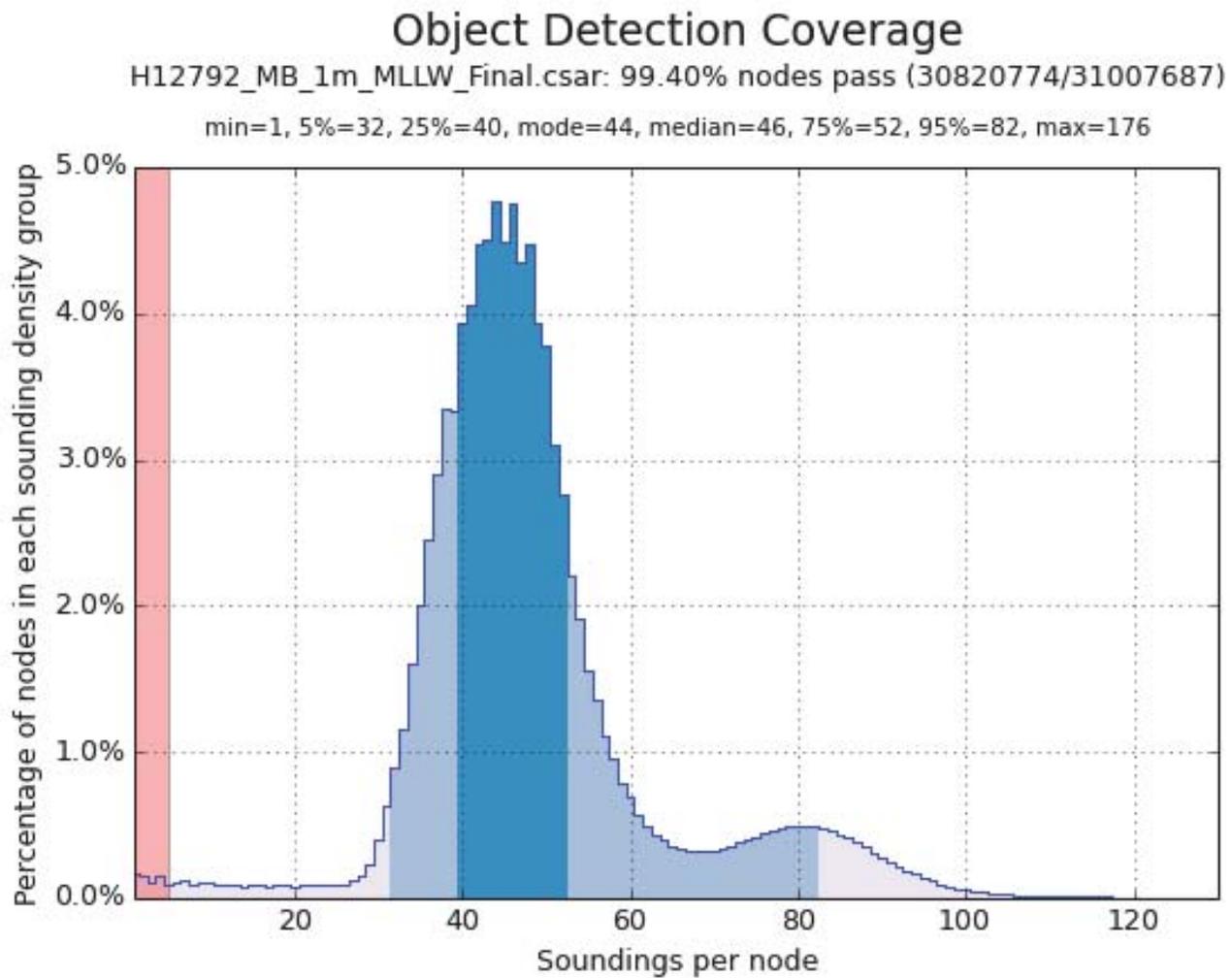


Figure 15: H12792 1 meter finalized surface density results

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

The following calibrations were conducted after the initial system calibration discussed in the DAPR:

Calibration Type	Date	Reason
GAMS calibration	2015-06-15	New GPS antennas were installed after it was discovered the use of the Iridium phone was causing cycle slips in the processed POSPAC data.

Table 9: Calibrations not discussed in the DAPR.

A GAMS calibration was conducted.

B.4 Backscatter

Backscatter was logged as a 7k file and submitted to the Atlantic Hydrographic Branch for processing. One line per vessel, per day was processed aboard the Thomas Jefferson in order to assess and ensure quality. No deficiencies were noted.

B.5 Data Processing

B.5.1 Software Updates

The following software updates occurred after the submission of the DAPR:

Manufacturer	Name	Version	Service Pack	Hotfix	Installation Date	Use
Caris	HIPS/SIPS	9.0.13	N/A	N/A	04/14/2015	Processing
Caris	HIPS/SIPS	9.0.14	N/A	N/A	06/01/2015	Processing

Table 10: Software Updates

The following Feature Object Catalog was used: 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
H12792_MB_1m_MLLW_Final	CUBE	1 meters	13.44 meters - 19.80 meters	NOAA_1m	MBES TracklineSBES Set Line Spacing
H12792_SSS_100_1m	SSS Mosaic	1 meters	0 meters - 0 meters	N/A	100% SSS
H12792_SSS_200_1m	SSS Mosaic	1 meters	0 meters - 0 meters	N/A	200% SSS

Table 11: Submitted Surfaces

B.5.3 Multibeam Data Filters

A swath filter was applied to the data to remove sonar side lobe anomalies in the RESON SV2 system. The filter used logic that rejected bathymetric data points beyond 60 degrees on either side of nadir. The filter was only applied to cross lines. All other erroneous data was manually rejected by the hydrographer during normal data processing and editing.

B.5.4 Areas of High Node Standard Deviation

There are areas of high node standard deviation present in the data. Most of these occur where the crosslines and mainscheme overlap. In areas where the observed nsd was 0.1m, differences of up to 28cm of vertical difference between cross lines and mainscheme lines was observed.

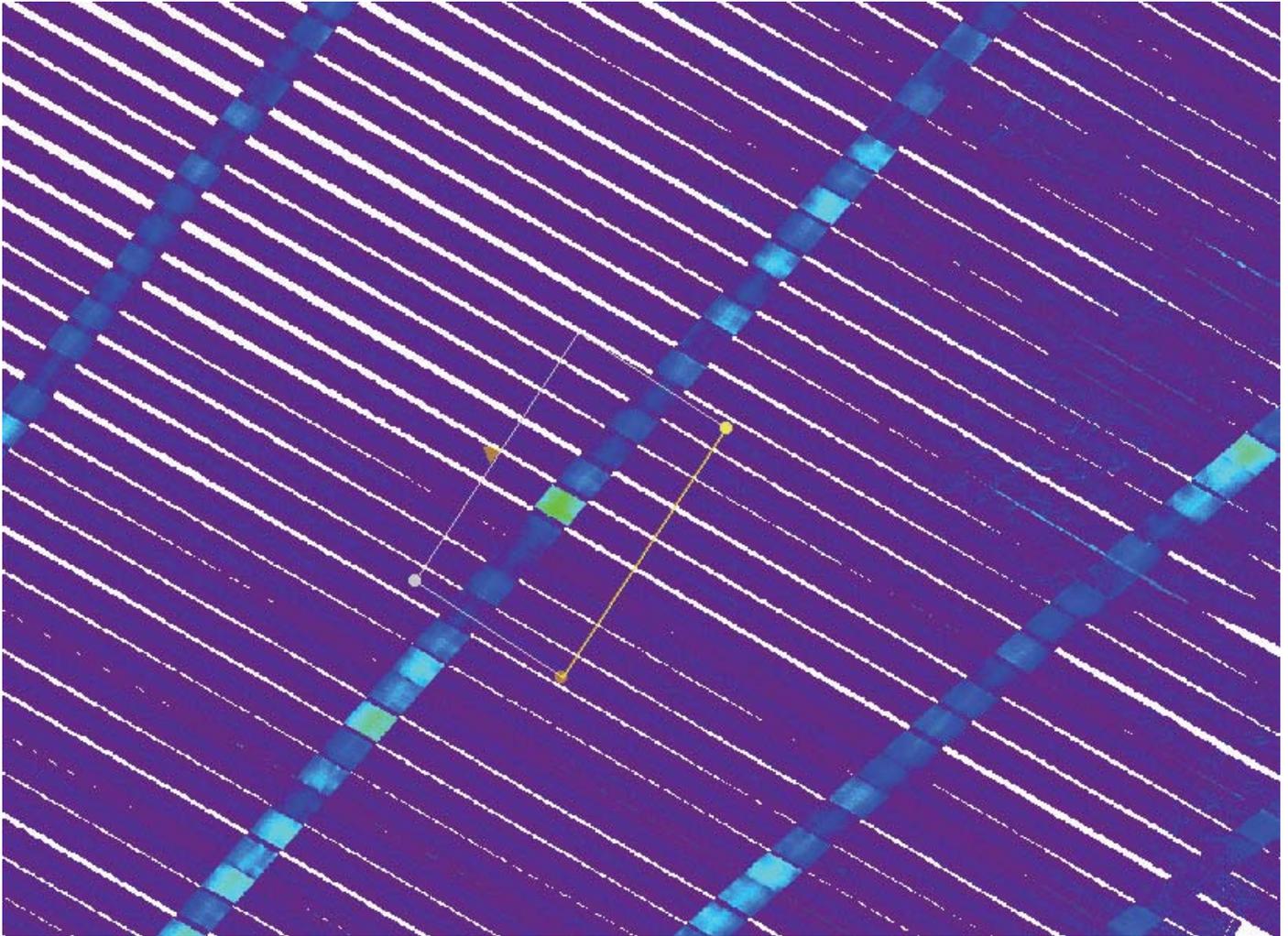


Figure 16: H12792 High node standard deviation

C. Vertical and Horizontal Control

All vertical and horizontal control activities conducted during the course of this survey are fully addressed in the following sections. Per section 5.1.2.3 of the FPM (2014 ed), no Horizontal and Vertical Control Report has been generated for survey H12792.

C.1 Vertical Control

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

Non-Standard Vertical Control Methods Used:

VDatum

Ellipsoid to Chart Datum Separation File:

2015_G380_VDatum_NAD83_MLLW_rev2.csar

All soundings submitted as H12792 are reduced to MLLW using documented VDatum techniques. If it is deemed necessary to change the water level reduction method to discrete zoning the following additional information will be useful:

- 1) The National Water Level Observation Network (NWLON) stations serving as datum control for this survey is Charleston, SC (8665530).
- 2) The submitted water level files (8665530_Verified.tid) are the final approved water levels for the period of hydrography. These files have been loaded to all CARIS lines submitted as H12792.
- 3) The submitted tide corrector (G380TJ2015CORP.zdf) is the preliminary zoning file that was accepted as final per final tide note, submitted in Appendix I. This file has been loaded to all CARIS lines submitted as H12792.
- 4) A request for final approved tides was sent to COOPS on 10 June, 2015. The final tide note was received on 17 June 2015, stating that preliminary zoning is accepted as the final zoning for project OPR-G380-TJ-15, H12792, during the time period between 31 May 2015 and 6 June 2015. Note that data collected on 16 June 2015 DN 167 is not dependent on water level correctors, please refer to project correspondence in Appendix II.

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 zone 17 north. Additional information discussing the use of 5P for this survey can be found in the accompaning DAPR..

D. Results and Recommendations

D.1 Chart Comparison

Chart comparison procedures were followed as outlined in section 4.5 of the FPM (2014 ed) and section 8.1.4 sub section D.1 of the HSSD (2015 ed). The ENC and RNC versions of the relevant charts were reviewed to ensure that the latest USCG Local Notice to Mariners (LNM) has been applied.

Chart comparisons for survey H12792 were conducted using a selected sounding set over plot removed to a map scale of 1:30000. In CARIS BDB, the soundings were then converted into a point cloud, from which a 1m interpolated surface was generated. Contouring was run on the interpolated surface and the results are listed below.

D.1.1 Raster Charts

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

Chart	Scale	Edition	Edition Date	LNМ Date	NM Date
11528	1:40000	1	07/2014	02/17/2015	02/21/2015

Table 12: Largest Scale Raster Charts

11528

Most of the soundings agree within two feet. The largest area of change occurs in the south west area. There are depths up to three feet deeper than charted. There is some shifting of the contours. Some charted soundings were not surveyed due to the set line spacing of the survey. The Hydrographer recommends updating all contours and soundings with the digital data from survey H12792.

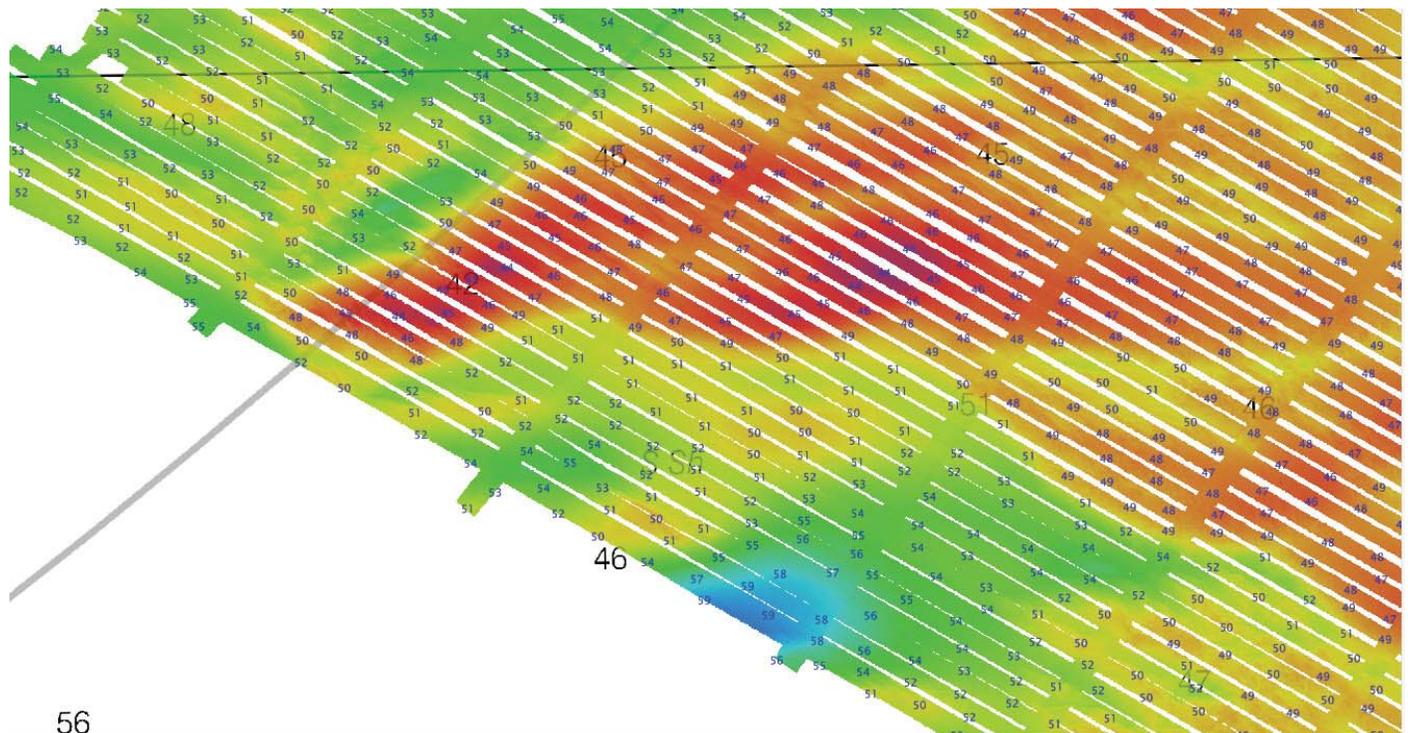


Figure 17: H12792 Soundings vs charted soundings

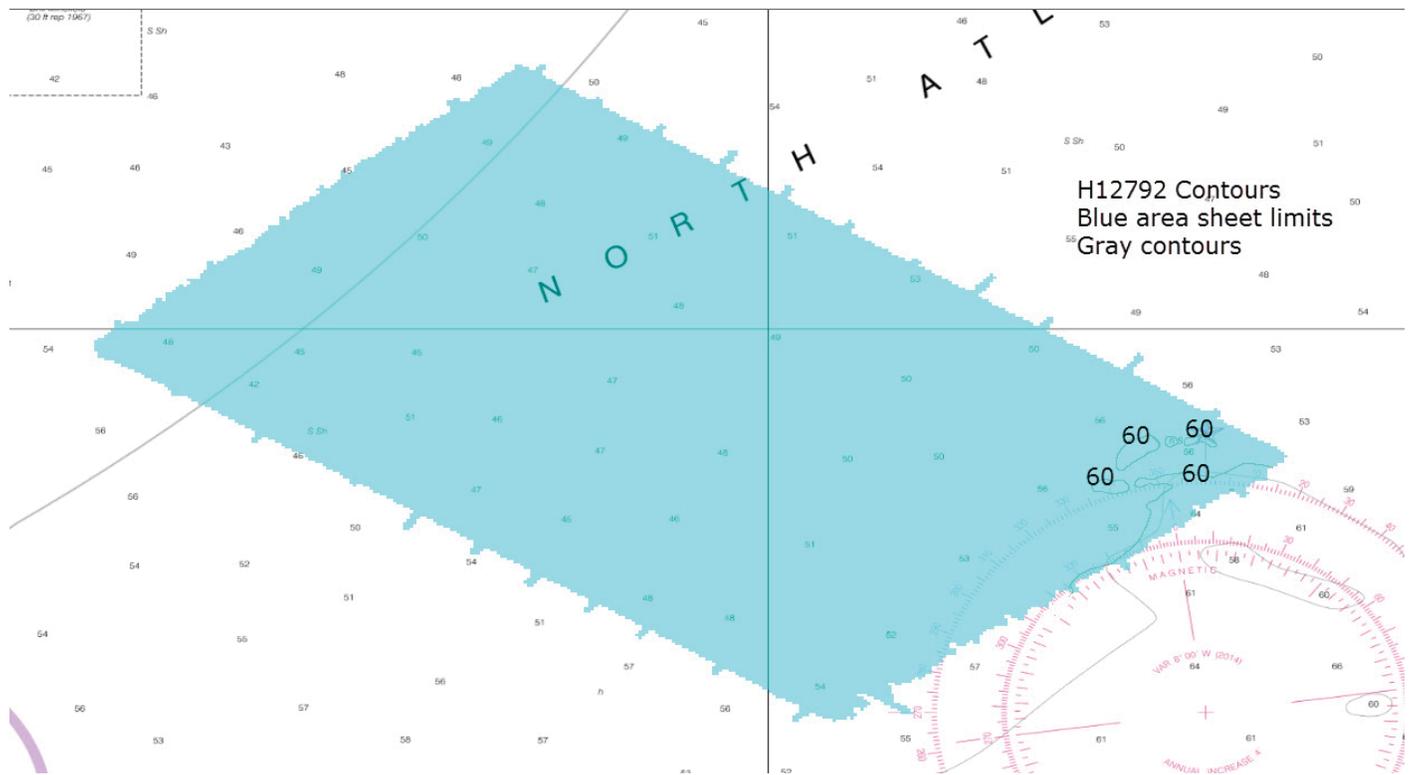


Figure 18: H12792 Contours

D.1.2 Electronic Navigational Charts

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

ENC	Scale	Edition	Update Application Date	Issue Date	Preliminary?
US5SC25M	1:40000	1	10/06/2014	10/06/2014	NO

Table 13: Largest Scale ENC's

US5SC25M

In general, survey H12792 is in agreement with ENC US5SC25M. Most of the soundings agree within 0.6 meters. The largest area of change occurs in the south west area. There are depths up to 0.9 meters deeper than charted.

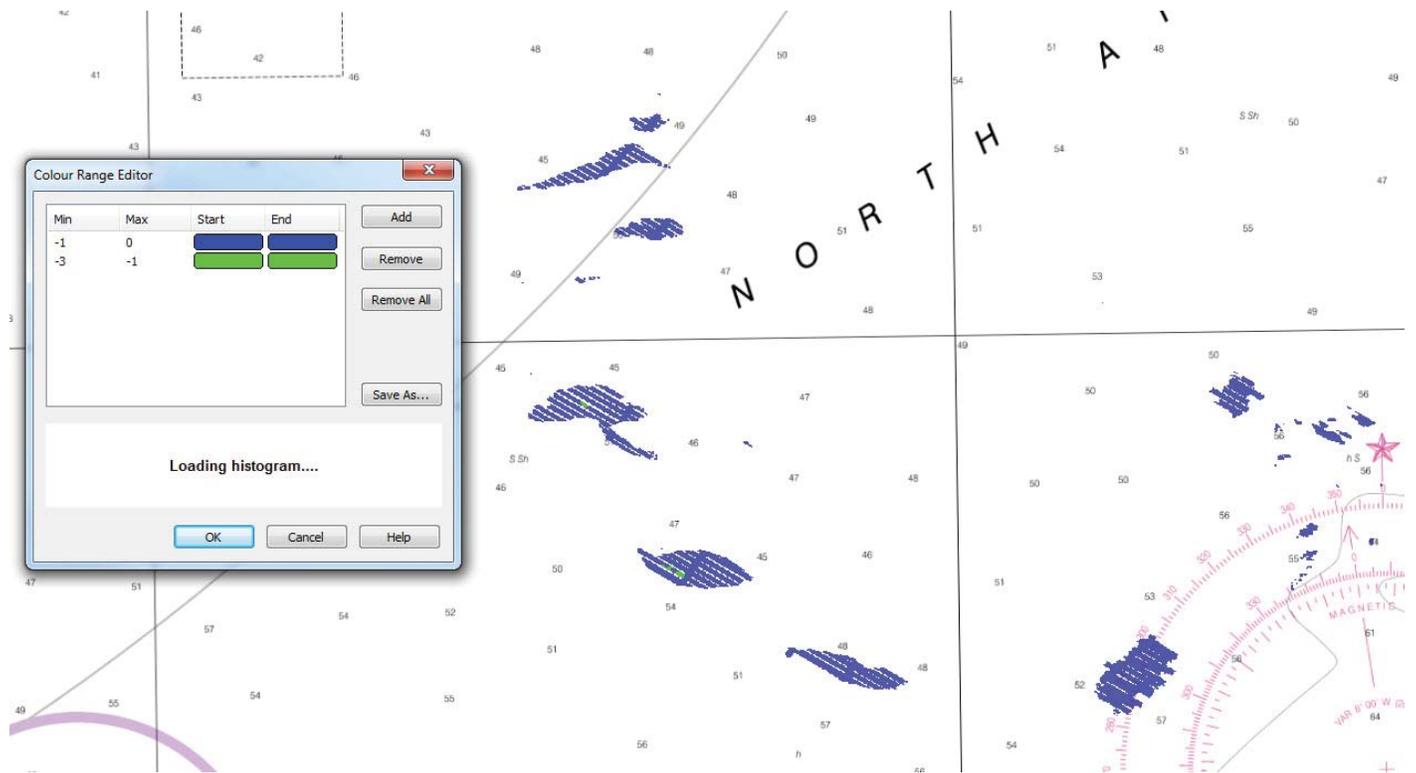


Figure 19: Shoal sounding differences observed between the ENC and H12792 are shown in blue. Depth ranges are in meters.

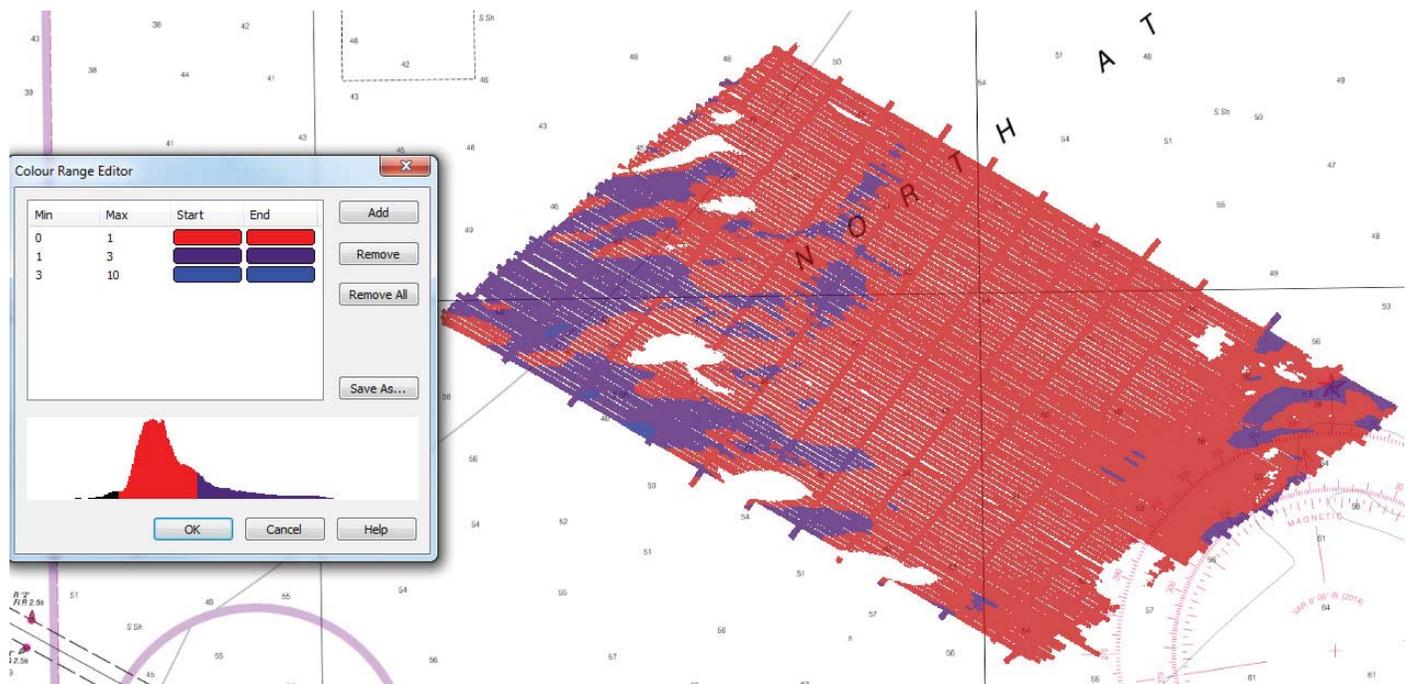


Figure 20: Deep sounding differences observed between the ENC and H12792 are shown in blue. Depth ranges are in meters.

D.1.3 AWOIS Items

No AWOIS items were assigned and there were no existing AWOIS items within the survey limits.



Figure 21: H12792 AWOIS

D.1.4 Maritime Boundary Points

No Maritime Boundary Points were assigned for this survey.

D.1.5 Charted Features

No charted features exist for this survey.

D.1.6 Uncharted Features

No uncharted features exist for this survey.

D.1.7 Dangers to Navigation

No Danger to Navigation Reports were submitted for this survey.

D.1.8 Shoal and Hazardous Features

No shoals or potentially hazardous features exist for this survey.

D.1.9 Channels

No channels exist for this survey.

D.1.10 Bottom Samples

Bottom samples are not required for this project.

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

Comparisons were made only to the chart.

D.2.3 Aids to Navigation

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

D.2.4 Overhead Features

No overhead features exist for this survey.

D.2.5 Submarine Features

No submarine features exist for this survey.

D.2.6 Ferry Routes and Terminals

No ferry routes or terminals exist for this survey.

D.2.7 Platforms

No platforms exist for this survey.

D.2.8 Significant Features

No significant features exist for this survey.

D.2.9 Construction and Dredging

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

D.2.10 New Survey Recommendation

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

D.2.11 Inset Recommendation

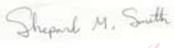
No new insets are recommended for this area.

E. Approval Sheet

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

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

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

Approver Name	Approver Title	Approval Date	Signature
CAPT Shepard M. Smith, NOAA	Commanding Officer	06/17/2015	 <small>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: 2015.07.24 15:35:33 -0400</small>
LT Joseph K. Carrier III, NOAA	Field Operations Officer	06/17/2015	 <small>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: 2015.07.24 20:13:38 Z</small>
HST Kimberly Glomb	Sheet Manager	06/17/2015	

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	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 States Coast Guard
UTM	Universal Transverse Mercator
XO	Executive Officer
ZDA	Global Positioning 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

June 09, 2015

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

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

SUBJECT: Request for Approved Tides/Water Levels

Please provide the following data:

1. Tide Note
2. Final zoning in MapInfo and .MIX format
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-G380-TJ-15
Registry No.: H12792
State: South Carolina
Locality: Southeast Atlantic Ocean
Sublocality: Due east of Harbor Channel Entrance

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_151	23:18:04	23:46:12
2015_152	00:45:29	10:39:22
2015_153	10:11:37	21:50:48
2015_154	00:46:39	23:53:30
2015_155	00:21:16	18:01:03
2015_157	16:23:41	16:49:22



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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : June 17, 2015

HYDROGRAPHIC BRANCH: Atlantic
HYDROGRAPHIC PROJECT: OPR-G380-TJ-2015
HYDROGRAPHIC SHEET: H12792

LOCALITY: Due east of Harbor Channel Entrance, SC
TIME PERIOD: May 31 - June 06, 2015

TIDE STATION USED: 8665530 Charleston, SC
Lat. 32° 46.9' N Long. 79° 55.4' W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.648 meters

REMARKS: RECOMMENDED ZONING

Preliminary zoning is accepted as the final zoning for project OPR-G380-TJ-2015, H12792, during the time period between May 31 - June 06, 2015.

Please use the zoning file G380TJ2015CORP submitted with the project instructions for OPR-G380-TJ-2015. Zones SA138 and SA139 are the applicable zones for H12792.

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).

HOVIS.GERALD.THOMAS.JR.1365860250

Digitally signed by
HOVIS.GERALD.THOMAS.JR.1365860250
DN: c=US, o=U.S. Government, ou=DoD,
ou=PKI, ou=OTHER,
cn=HOVIS.GERALD.THOMAS.JR.1365860250
Date: 2015.06.17 14:41:26 -04'00'

CHIEF, PRODUCTS AND SERVICES BRANCH



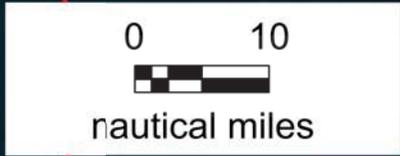
**Preliminary as Final Tidal Zoning for
OPR-G380-TJ-2015, H12792
Due east of Harbor Channel Entrance, SC**

8665530 CHARLESTON, SC



SA139
Reference 8665530

SA138
Reference 8665530



APPENDIX II

SUPPLEMENTAL SURVEY RECORDS AND CORRESPONDENCE



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

OPR-G380-TJ-15Combined sheets

6 messages

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

Sun, Jun 7, 2015 at 10:34 PM

To: Kathryn Pridgen - NOAA Federal <kathryn.pridgen@noaa.gov>

Cc: "CO.Thomas Jefferson - NOAA Service Account" <co.thomas.jefferson@noaa.gov>, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>

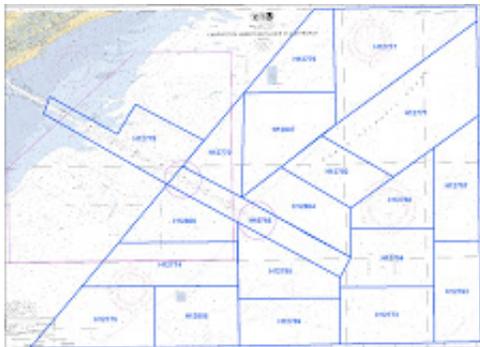
Katy,

TJ would like to modify the sheet layout to match available resources and keep the momentum we have with the early sheets. Essentially, we need to combine H12771 and H12803 because we don't have an available sheet manager. It's been great to give everyone the experience with at least one sheet but TJ feels these two sheets can be combined and managed with much less overhead; one package from TJ, one DR, one SAR, one H-cell, etc... If the weather holds and equipment stays operational, we should be able to close it out by the time we leave Charleston.

Please let us know if you have any concerns. Attached is a screen grab of the proposed sheet limits.

Very respectfully,
Joe Carrier, LT/NOAA

Field Operation's Officer, NOAA Ship *Thomas Jefferson*
439 West York Street
Norfolk, VA 23510
cell: (757) 647-0187
voip: (301) 713-7782
fax: (757) 512-8295
<http://www.moc.noaa.gov/tj/>



Combined sheets.jpg
373K

Kathryn Pridgen - NOAA Federal <kathryn.pridgen@noaa.gov>

Mon, Jun 8, 2015 at 1:47 PM

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

Cc: "CO.Thomas Jefferson - NOAA Service Account" <co.thomas.jefferson@noaa.gov>, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>

Joe,

I dont think that will be a problem, especially if you are confident that the combined sheet will be completely surveyed by the end of the survey. I dont want to leave a sheet partially surveyed. I will work on combining those two sheets into one sheet H12771, I will cancel the other sheet H12803. Will that work?

Katy

[Quoted text hidden]

–

Kathryn Pridgen
Physical Scientist
NOAA-HSD OPS
301-713-2722 ext 145
kathryn.pridgen@noaa.gov

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

Mon, Jun 8, 2015 at 1:50 PM

To: Kathryn Pridgen - NOAA Federal <kathryn.pridgen@noaa.gov>

Cc: "CO.Thomas Jefferson - NOAA Service Account" <co.thomas.jefferson@noaa.gov>, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>

Katy,

Thank you for working with us on this one and for the quick reply. Please cancel H12803 and add the coverage area to H12771.

Joe

Very respectfully,
Joe Carrier, LT/NOAA

Field Operation's Officer, NOAA Ship *Thomas Jefferson*
439 West York Street
Norfolk, VA 23510
cell: (757) 647-0187
voip: (301) 713-7782
fax: (757) 512-8295
<http://www.moc.noaa.gov/tj/>

[Quoted text hidden]

Kathryn Pridgen - NOAA Federal <kathryn.pridgen@noaa.gov>

Mon, Jun 8, 2015 at 1:57 PM

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

Cc: "CO.Thomas Jefferson - NOAA Service Account" <co.thomas.jefferson@noaa.gov>, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>

Alright, its all fixed, my sheet are now identical to your graphic.

Katy

[Quoted text hidden]

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

Mon, Jun 8, 2015 at 3:16 PM

To: Kathryn Pridgen - NOAA Federal <kathryn.pridgen@noaa.gov>

Cc: "CO.Thomas Jefferson - NOAA Service Account" <co.thomas.jefferson@noaa.gov>, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>

Thanks Katy

Very respectfully,
Joe Carrier, LT/NOAA

Field Operation's Officer, NOAA Ship *Thomas Jefferson*
439 West York Street
Norfolk, VA 23510
cell: (757) 647-0187
voip: (301) 713-7782
fax: (757) 512-8295

<http://www.moc.noaa.gov/tj/>

[Quoted text hidden]

Kathryn Pridgen - NOAA Federal <kathryn.pridgen@noaa.gov>

Mon, Jun 8, 2015 at 3:42 PM

To: Joseph Carrier - NOAA Federal <joseph.carrier@noaa.gov>, Jacklyn James - NOAA Federal <jacklyn.c.james@noaa.gov>

Cc: "CO.Thomas Jefferson - NOAA Service Account" <co.thomas.jefferson@noaa.gov>, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>

Joe and the rest of the TJ,

I am getting ready to go to sea on the Rainier (I leave on Wednesday) for the remainder of the Charleston project. While I am at sea, Jacklyn James, will be the HSD contact for the rest of the Charleston Survey. For any further questions, comments, or issues please contact Jackie at HSD, jacklyn.c.james@noaa.gov.

Thanks!

Katy

[Quoted text hidden]



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

Re: TJ DAPR Questions

2 messages

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

Tue, Jun 2, 2015 at 2:37 AM

To: matthew.jaskoski@noaa.gov

Cc: _OMAO MOA OPS Thomas Jefferson <OPS.Thomas.Jefferson@noaa.gov>, "LTJG Matthew Forrest, NOAA" <Matthew.R.Forrest@noaa.gov>

Pulling Joe and Matt into the conversation.

On 5/30/15, Russell Quintero - NOAA Federal <russell.quintero@noaa.gov> wrote:

> Jasko,

>

> I'm helping TJ with their DAPR for this year while I'm out here
> augmenting. We wanted to get AHB's feedback on a few things we are
> doing a little differently.

>

> The xmlDAPR is certainly helpful, but there are parts of the
> implementation that create far more work than is necessary, and even
> deviate from the HSSD.

>

> The TJ DAPR is undergoing final review, but is essentially done
> already. To facilitate the speed of composition, we have deviated from
> the xmlDAPR while continuing to adhere to the HSSD. The specific
> changes are:

>

> 1) We are not tracking interchangeable hardware. We obviously track
> the serial numbers of all components of the sensor (Tpu and fish for a
> SSS for instance), but anything that can be swapped out at will is not
> tracked. Processing computers that are freely interchangeable with no
> effect on the data are not tracked in the DAPR. Already hardware like
> monitors and external hard drives that are deemed to have no effect
> are not tracked, we are just shifting that line slightly further.

>

> 2) The xmlDAPR requires that you transcribe out of the HVF all of the
> values used in the survey, for every sensor and vessel. It also
> requires transcribing the output of things like the dynamic draft and
> patch test. In contrast, the HSSD actually specify that these should
> be in a separate appendix.

>

> Doing these as a separate appendix is actually far, far faster on the
> ship, far easier, and less prone to error. The Vessel Editor in Caris
> can generate a report that contains all of the relevant info with only
> a few button clicks instead of manually transferring every single
> value.

>

> As such, we complied with the HSSD instead of the xmlDAPR schema. To
> make that work, we occasionally had to mark "Not Applied" to some
> correctors, and then add an "Additional Discussion" block immediately
> following that explained how we did those correctors and referenced
> the appropriate appendix.

>

>

> While we are confident that we are in compliance with the HSSD, we
> wanted to make sure the Branch wouldn't have any opposition to this

> approach.
>
> V/r,
> Russ
>
> --
> Lieutenant Russell Quintero, NOAA
> DoD Liaison, Office of Coast Survey
> 1315 East-West Highway
> SSMC3 - 6110
> Silver Spring, MD 20910
>
> 301-713-2780x152 Office
> 970-481-2030 Mobile
>

--
Lieutenant Russell Quintero, NOAA
DoD Liaison, Office of Coast Survey
1315 East-West Highway
SSMC3 - 6110
Silver Spring, MD 20910

301-713-2780x152 Office
970-481-2030 Mobile

Matthew Jaskoski - NOAA Federal <matthew.jaskoski@noaa.gov>

Tue, Jun 2, 2015 at 11:53 AM

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

Cc: _OMAO MOA OPS Thomas Jefferson <OPS.Thomas.Jefferson@noaa.gov>, "LTJG Matthew Forrest, NOAA" <Matthew.R.Forrest@noaa.gov>

Hey Russ,

I don't have a problem if you all want to generate a *.pdf DAPR in the traditional manner as opposed to using the xml (as long as it meets the requirements of HSSD, of course).

I believe the xmlDAPR is in a phase of substantial re-write and I would highly recommend you email the current deficiencies to the xmlDR/DAPR folks for inclusion in the re-scheming discussion. My understanding is that in the new version the vessel offsets and inventory items will be automatically populate from the HVF and Hybase respectively, so that may be part of the different schema/stylesheets architecture.

thanks for the heads-up,
Jasko

Lieutenant Commander Matthew Jaskoski, NOAA
Chief, Atlantic Hydrographic Branch
439 W. York St.
Norfolk, VA 23510
Office: 757-441-6746 x200
Cell: 757-647-3356

[Quoted text hidden]



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

OPR-G380-TJ-15: Horcon Report

5 messages

Joseph Carrier - NOAA Federal <joseph.carrier@noaa.gov> Sun, Jun 7, 2015 at 8:55 PM
To: Matthew Jaskoski - NOAA Federal <matthew.jaskoski@noaa.gov>
Cc: Castle Parker - NOAA Federal <castle.e.parker@noaa.gov>, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>, "CO.Thomas Jefferson - NOAA Service Account" <co.thomas.jefferson@noaa.gov>

LCDR Jaskoski,

Historically, TJ hasn't managed tide or base stations during survey operations and therefore didn't submit a Horcon report with surveys. Using Fugro's MarineStar we have been able to stay out of the tide gauge and base station installation business. Do you foresee a need for TJ to submit a Horcon report with these Charleston surveys using MarineStar?

Very respectfully,
Joe Carrier, LT/NOAA

Field Operation's Officer, NOAA Ship *Thomas Jefferson*
439 West York Street
Norfolk, VA 23510
cell: (757) 647-0187
voip: (301) 713-7782
fax: (757) 512-8295
<http://www.moc.noaa.gov/tj/>

Matthew Jaskoski - NOAA Federal <matthew.jaskoski@noaa.gov> Mon, Jun 8, 2015 at 1:09 PM
To: Joseph Carrier - NOAA Federal <joseph.carrier@noaa.gov>
Cc: Castle Parker - NOAA Federal <castle.e.parker@noaa.gov>, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>, "CO.Thomas Jefferson - NOAA Service Account" <co.thomas.jefferson@noaa.gov>

Hey Joe,
Assuming the ship isn't generating another report about the MarineStar integration and ERS on the project (that will accompany the data to NGDC) - I think it would be a good idea to submit an HVCR since it is a project-wide element that represents a significant departure from our past-practices. I think you could use Tyanne's report on MarineStar as the bulk of your text for your HVCR. All you really need is some background information on how the MarineStar Systems works, and a brief description of the methods, adequacy of positioning, and any confidence checks that were done - to meet the intent of the HVCR. The intent is to document the positioning activities that took place as part of the project.

hope this helps,
regards,
Jasko

Lieutenant Commander Matthew Jaskoski, NOAA
Chief, Atlantic Hydrographic Branch
439 W. York St.
Norfolk, VA 23510
Office: 757-441-6746 x200
Cell: 757-647-3356

[Quoted text hidden]

Joseph Carrier - NOAA Federal <joseph.carrier@noaa.gov> Mon, Jun 8, 2015 at 1:48 PM
To: Matthew Jaskoski - NOAA Federal <matthew.jaskoski@noaa.gov>
Cc: Castle Parker - NOAA Federal <castle.e.parker@noaa.gov>, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>, "CO.Thomas Jefferson - NOAA Service Account" <co.thomas.jefferson@noaa.gov>

Jasko,

Thanks for the quick reply. Since TJ has never installed tide gauges or base stations for projects in the past and I don't have any examples on our network to work from. If you have one you can share like the ERS survey from the Hassler I'd really like to take a look and see how they did their report.

Since I'm going to be using Tyanne's report as a reference, do you mind if I ask for her help on revising the HVCR to make sure it's accurate?

Regards,
Joe

Very respectfully,
Joe Carrier, LT/NOAA

Field Operation's Officer, NOAA Ship *Thomas Jefferson*
439 West York Street
Norfolk, VA 23510
cell: (757) 647-0187
voip: (301) 713-7782
fax: (757) 512-8295
<http://www.moc.noaa.gov/tj/>

[Quoted text hidden]

Matthew Jaskoski - NOAA Federal <matthew.jaskoski@noaa.gov> Mon, Jun 8, 2015 at 3:40 PM
To: Joseph Carrier - NOAA Federal <joseph.carrier@noaa.gov>
Cc: Castle Parker - NOAA Federal <castle.e.parker@noaa.gov>, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>, "CO.Thomas Jefferson - NOAA Service Account" <co.thomas.jefferson@noaa.gov>

hey Joe,

I think this got kicked back to me because of the attached DAPR pdf file sizes. did you get the earlier email? note there is a change in my recommendation regarding the HVCR

Jasko

Lieutenant Commander Matthew Jaskoski, NOAA
Chief, Atlantic Hydrographic Branch
439 W. York St.
Norfolk, VA 23510
Office: 757-441-6746 x200
Cell: 757-647-3356

On Mon, Jun 8, 2015 at 11:35 AM, Matthew Jaskoski - NOAA Federal <matthew.jaskoski@noaa.gov> wrote:

Hey Joe,

I'm going to reverse course on my earlier recommendation that you include an HVCR. It looks like FH did not do an HVCR for the survey that they completed to the elipse, I believe they detailed everything in the DR/DAPR. This seems like a legitimate way to proceed, and considering you all did not establish any actual HorVerCon equipment the generation of a HVCR might be an unnecessary encumbrance on the ship. You could/should detail the MarineStar info in the DAPR - particularly sections A.4, B.1.4, and probably C.4-5.

from AHB's view we are content if you want to skip the HVCR and add the information about MarineStar in the DAPR (with any project specific deviations from the DAPR outlined in the appropriate DR).

Jasko

Lieutenant Commander Matthew Jaskoski, NOAA
Chief, Atlantic Hydrographic Branch
439 W. York St.
Norfolk, VA 23510
Office: 757-441-6746 x200
Cell: 757-647-3356

[Quoted text hidden]

Joseph Carrier - NOAA Federal <joseph.carrier@noaa.gov> Mon, Jun 8, 2015 at 4:49 PM
To: Matthew Jaskoski - NOAA Federal <matthew.jaskoski@noaa.gov>
Cc: Castle Parker - NOAA Federal <castle.e.parker@noaa.gov>, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>, "CO.Thomas Jefferson - NOAA Service Account" <co.thomas.jefferson@noaa.gov>

Jasko,

Thanks for the update and thanks for reconsidering the HVCR!

Very respectfully,
Joe Carrier, LT/NOAA

Field Operation's Officer, NOAA Ship *Thomas Jefferson*
439 West York Street
Norfolk, VA 23510
cell: (757) 647-0187
voip: (301) 713-7782
fax: (757) 512-8295
<http://www.moc.noaa.gov/tj/>

[Quoted text hidden]



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

OPR-G380: Soundings and Set line spacing

5 messages

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

Sat, May 30, 2015 at 11:43 PM

To: Matthew Jaskoski - NOAA Federal <matthew.jaskoski@noaa.gov>

Cc: "CO.Thomas Jefferson - NOAA Service Account" <co.thomas.jefferson@noaa.gov>

Jasko,

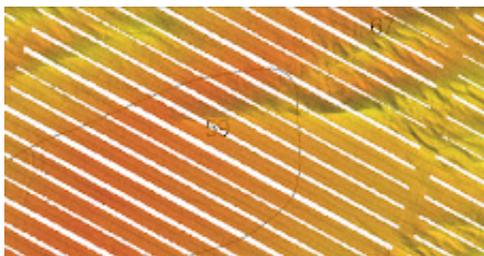
When sorting through some of the Charleston surveys where TJ is using set line spacing with concurrent 200% MB to achieve object detection. We noticed that there were a few soundings per sheet that land between the MB lines.

Section 5.2.2.3 of the 2014 HSSD says "All charted depths falling between sounding lines and shallower than adjacent surveyed soundings shall be verified or disproved."

In TJ's case, most of these soundings fall within very flat bottom areas and are 1-2 ft different on either side of the soundings (see attached). At such slight differences, it would be hard to say if it were within our estimated uncertainty or just a shoal sounding. Interested to hear what AHB's thoughts are and please don't hesitate to ask if you would like to discuss further.

Very respectfully,
Joe Carrier, LT/NOAA

Field Operation's Officer, NOAA Ship *Thomas Jefferson*
439 West York Street
Norfolk, VA 23510
cell: (757) 647-0187
voip: (301) 713-7782
fax: (757) 512-8295
<http://www.moc.noaa.gov/tj/>



59foot_32_33_48n_79_32_00W_sounding.jpg
470K

Matthew Jaskoski - NOAA Federal <matthew.jaskoski@noaa.gov>

Mon, Jun 1, 2015 at 6:30 PM

To: Joseph Carrier - NOAA Federal <joseph.carrier@noaa.gov>, Edward Owens - NOAA Federal <edward.owens@noaa.gov>

Cc: "CO.Thomas Jefferson - NOAA Service Account" <co.thomas.jefferson@noaa.gov>

Hey Joe (I'm looping in Ed here for carto-perspective),

I think by the letter of the law the centroid should be ensonified to remove the charted shoal sounding with a deeper one. However, as you point out 1-2 ft is right about the TVU as well as right around the charted depth vertical uncertainty for a CATZOC A1 area as depicted on the final product.

Considering there has been little change to the seafloor, and the new depths are w/in 1-2ft of the charted depths it does seem like a waste of resources to slit these lines simply to "paint the number" I don't think we will have a

problem superseding soundings in the type of situation you described - Ed what do you think?

Jasko

Lieutenant Commander Matthew Jaskoski, NOAA
Chief, Atlantic Hydrographic Branch
439 W. York St.
Norfolk, VA 23510
Office: 757-441-6746 x200
Cell: 757-647-3356

[Quoted text hidden]

CAPT Shepard Smith <shep.smith@noaa.gov> Mon, Jun 1, 2015 at 7:04 PM
To: Matthew Jaskoski - NOAA Federal <matthew.jaskoski@noaa.gov>
Cc: Joseph Carrier - NOAA Federal <joseph.carrier@noaa.gov>, Edward Owens - NOAA Federal <edward.owens@noaa.gov>, "CO.Thomas Jefferson - NOAA Service Account" <co.thomas.jefferson@noaa.gov>

Also, there is no indication of anything unusual in the sidescan, and no indication of unresolved shoaling (gradient of seafloor is level on both sides of the gap).

CAPT Shepard M. Smith, NOAA

[Quoted text hidden]

Edward Owens - NOAA Federal <edward.owens@noaa.gov> Tue, Jun 2, 2015 at 3:46 PM
To: CAPT Shepard Smith <shep.smith@noaa.gov>
Cc: Matthew Jaskoski - NOAA Federal <matthew.jaskoski@noaa.gov>, Joseph Carrier - NOAA Federal <joseph.carrier@noaa.gov>, "CO.Thomas Jefferson - NOAA Service Account" <co.thomas.jefferson@noaa.gov>

CAPT, et al,

Didn't seem to get any of the graphics described in the thread...? No matter, think I get the gist. Based on Shep's last statement, that recount is the best practice we apply for shoal disprovals in set line spacing datasets. If there is an indication of shoaling or indication thereof in the SS we would question the ability to disprove that shoal sounding and apply logic of the magnitude of depth variance and nav. signif. between the surveyed and charted depths to decide the charting action. If no shoaling is indicated by those same means the shoaler charted sounding is superseded by the survey data. If this occurs on the edge of the survey (outermost line) we would typically resort to retaining the shoaler charted value. Does that hit all the notes?

Regards, Edward

[Quoted text hidden]

Shep Smith - NOAA Federal <shep.smith@noaa.gov> Tue, Jun 2, 2015 at 4:29 PM
To: Edward Owens - NOAA Federal <edward.owens@noaa.gov>
Cc: Matthew Jaskoski - NOAA Federal <matthew.jaskoski@noaa.gov>, Joseph Carrier - NOAA Federal <joseph.carrier@noaa.gov>, "CO.Thomas Jefferson - NOAA Service Account" <co.thomas.jefferson@noaa.gov>

Ed,

Thanks, I think that answers the question, and I think is a reasonable approach. We will use this guidance in choosing when to split.

Best Regards,

Shep

CAPT Shepard M. Smith, NOAA
Commanding Officer, NOAA Ship Thomas Jefferson
National Oceanic and Atmospheric Administration

[Quoted text hidden]



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

OPR-G380-TJ-15

2 messages

Joseph Carrier - NOAA Federal <joseph.carrier@noaa.gov> Sun, Jun 7, 2015 at 11:06 PM
To: Michael Gonsalves - NOAA Federal <michael.gonsalves@noaa.gov>
Cc: Kathryn Pridgen - NOAA Federal <kathryn.pridgen@noaa.gov>, "CO.Thomas Jefferson - NOAA Service Account" <co.thomas.jefferson@noaa.gov>, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>

LCDR Gonsalves,

The project instructions require TJ to use HSSD 2014. TJ is requesting to use the 2015 HSSD for OPR-G380-TJ-15.

Please advise if HSD has any concerns.

Very respectfully,
Joe Carrier, LT/NOAA

Field Operation's Officer, NOAA Ship *Thomas Jefferson*
439 West York Street
Norfolk, VA 23510
cell: (757) 647-0187
voip: (301) 713-7782
fax: (757) 512-8295
<http://www.moc.noaa.gov/tj/>

Kathryn Pridgen - NOAA Federal <kathryn.pridgen@noaa.gov> Mon, Jun 8, 2015 at 2:00 PM
To: Joseph Carrier - NOAA Federal <joseph.carrier@noaa.gov>

Joe,
HSD has no issues with using HSSD 2015 instead of HSSD 2014.

Katy Pridgen
[Quoted text hidden]
—
Kathryn Pridgen
Physical Scientist
NOAA-HSD OPS
301-713-2722 ext 145
kathryn.pridgen@noaa.gov



Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov>

Fwd: TJ ERS Capability Memo G380

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

Fri, Aug 14, 2015 at 10:39 AM

To: Castle Parker - NOAA Federal <castle.e.parker@noaa.gov>, Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov>, Kayla Johnson - NOAA Affiliate <kayla.johnson@noaa.gov>, Matthew Jaskoski - NOAA Federal <matthew.jaskoski@noaa.gov>

All,

Attached is the TJ's ERS Capability Memo for OPR-G380-TJ-15. Please add this to the project correspondence for the survey's TJ has already submitted. I tried to capture all of the SAR managers however if I missed someone, please feel free to forward.

Very respectfully,
Joe Carrier, LT/NOAA

Field Operation's 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/>

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

From: **Shep Smith - NOAA Federal** <shep.smith@noaa.gov>

Date: Tue, Aug 11, 2015 at 9:26 PM

Subject: TJ ERS Capability Memo G380

To: Eric Berkowitz - NOAA Federal <eric.w.berkowitz@noaa.gov>, Michael Gonsalves - NOAA Federal <michael.gonsalves@noaa.gov>

Cc: "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>, Peter Lewit - NOAA Federal <peter.lewit@noaa.gov>, Matthew Jaskoski - NOAA Federal <matthew.jaskoski@noaa.gov>

Captain Berkowitz,

Please find attached the requested ERS Capability memo for OPR-G380-TJ

Best Regards,

Shep

CAPT Shepard M. Smith, NOAA
Commanding Officer, NOAA Ship Thomas Jefferson
National Oceanic and Atmospheric Administration

TJ_2015_OPR-G380_ERS_Capability_Memo.pdf
209K



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Office of Marine and Aviation Operations,
Marine Operation Center-Atlantic, NOAA Ship Thomas Jefferson
Norfolk, Virginia 23510

August 11, 2015

MEMORANDUM FOR: Captain Eric W. Berkowitz
Chief, Hydrographic Surveys Division

FROM: Captain Shepard M. Smith, NOAA
Commanding Officer, NOAA Ship Thomas Jefferson

SUBJECT: NOAA Ship *Thomas Jefferson* ERS Capability

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: 2015.08.11 17:23:55 -0400

Under the project instructions OPR-G380-TJ-15, the NOAA Ship *Thomas Jefferson* (TJ) was tasked with surveying the approaches to Charleston, SC by referencing the vertical datum to the ellipse.

The crew of the *Thomas Jefferson* with support from the Atlantic Hydrographic Branch, Hydrographic Systems Technical Programs and Hydrographic Surveys Division collaborated to evaluate different methods of surveying to the ellipse. The ship and launches were integrated with Fugro's Marinestar-XP service, which provides a 1 sigma accuracy of approximately +/-10cm in the horizontal and +/-15cm in the vertical planes using a combination of GPS satellites and geostationary communications satellites.

The majority of the project area was beyond 30km from the nearest CORS base station, SCHA. When TJ arrived at the project area, station SCHA was offline for multiple days making initial comparisons impossible. Both the proximity and availability of the CORS station data made further attempts to test and compare the single base IAPPK and Real-time PPP challenging. Once the CORS station was available and ephemeris could be downloaded, multiple days were processed using IAPPK on the inshore sheet H12779. The availability of IAPPK to validate and or resolve vertical issues with 5P proved valuable in determining whether the the hydrographer chose to interpolate or to plan and execute ERS holidays.

Testing and subsequent integration of the Post Processed Precise Point Positioning (5P) method has proven efficient, accurate and reliable. Compared to traditional methods using discrete zoned/TCARI based tides, the *Thomas Jefferson* found Fugro's commercial service, MarineStar during data acquisition and post processing to consistently provide results within acceptable tolerances outlined in the Hydrographic Survey Specifications and Deliverables HSSD. Further, the system generally provided output within the stated 15cm of vertical uncertainty documented in it's technical capabilities.

A comparison between crosslines and mainscheme at 1m resolution demonstrated the internal consistency of the VDatum method was more accurate than traditional zoned tides (internal document: Faulkes, et al., 2015). Using an Ellipsoid Referenced Zone Tide comparison with Survey H12766, the observed vertical solution demonstrated parity with the regional separation model provided by HSD Operations, giving confidence that the SBET solutions created from 5P were satisfactory. Further, the reduced processing times associated with 5P allowed TJ survey personnel to more quickly identify problematic lines within the survey, thereby reducing bottlenecks and increasing efficiency. Throughout the project, the TJ worked with HSTP to develop new tools and procedures necessary to analyze and identify issues with the Smoothed Best Estimate of Trajectory (SBET). These tools provided the hydrographer with the ability to identify



suspected problem areas between ERS and the resultant grids through interpolation using the Pydro Pospac auto QC tool (v5092). In areas of extensive communication loss of MarineStar data(>8min), the ship found it more efficient to resurvey lines or utilize IAPPK. Since there currently are no specifications in regards to interpolating ERS data, the TJ incorporated a higher percentage of crosslines than required by the Hydrographic Specifications and Deliverables (2015 ed.) to better constrain areas of data dropouts, and ensure any systematic errors were promptly discovered and resolved in a timely manner.

The *Thomas Jefferson* expects to submit all of the surveys under Project OPR-G380-TJ-15 as full Ellipsoidally Referenced Surveys.

APPROVAL PAGE

H12792

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

The following products will be sent to NGDC for archive

- H12792_DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- H12792_GeoImage.pdf

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

Approved: _____

Lieutenant Commander Matthew Jaskoski, NOAA
Chief, Atlantic Hydrographic Branch