H12782

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

DESCRIPTIVE REPORT

Type of Survey:	Navigable Area
Registry Number:	H12782

LOCALITY

State(s):	Alaska
General Locality:	Shumagin Islands
Sub-locality:	12 NM South of Simeonof Island

2015

CHIEF OF PARTY
CDR David J. Zezula, NOAA

LIBRARY & ARCHIVES

Date:

U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	REGISTRY NUMBER:
HYDROGRAPHIC TITLE SHEET	**H12782**

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):	**Alaska**
General Locality:	**Shumagin Islands**
Sub-Locality:	**12 NM South of Simeonof Island**
Scale:	**40000**
Dates of Survey:	**05/29/2015 to 06/14/2015**
Instructions Dated:	**04/06/2015**
Project Number:	**OPR-P183-FA-15**
Field Unit:	**NOAA Ship *Fairweather***
Chief of Party:	**CDR David J. Zezula, NOAA**
Soundings by:	**Multibeam Echo Sounder**
Imagery by:	**Multibeam Echo Sounder Backscatter**
Verification by:	**Pacific 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

List of Tables

List of Figures

Descriptive Report to Accompany Survey H12782

Project: OPR-P183-FA-15

Locality: Shumagin Islands

Sublocality: 12 NM South of Simeonof Island

Scale: 1:40000

May 2015 - June 2015

NOAA Ship *Fairweather*

Chief of Party: CDR David J. Zezula, NOAA

A. Area Surveyed

The survey area is located in the Shumagin Islands, with in the sub-locality of 12 NM South of Simeonof Island.

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
54° 44' 12.74" N 159° 24' 28.25" W	54° 36' 22.91" N 159° 5' 53.68" W

Table 1: Survey Limits

Survey limits were acquired in accordance with the requirements in the Project Instructions and the National Ocean Service Hydrographic Surveys Specifications and Deliverables (HSSD) dated approved April 2014.

A.2 Survey Purpose

The purpose of this project is to provide contemporary surveys to update National Ocean Service (NOS) nautical charting products. This area is considered navigationally significant and of critical survey priority. In addition, soundings will support a new, larger scale navigation chart.

A.3 Survey Quality

The entire survey is adequate to supersede previous data.

A.4 Survey Coverage

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

Water Depth	Coverage Required
All waters	Complete MBES with backscatter OR 100% SSS with concurrent set line spacing MBES with backscatter.

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

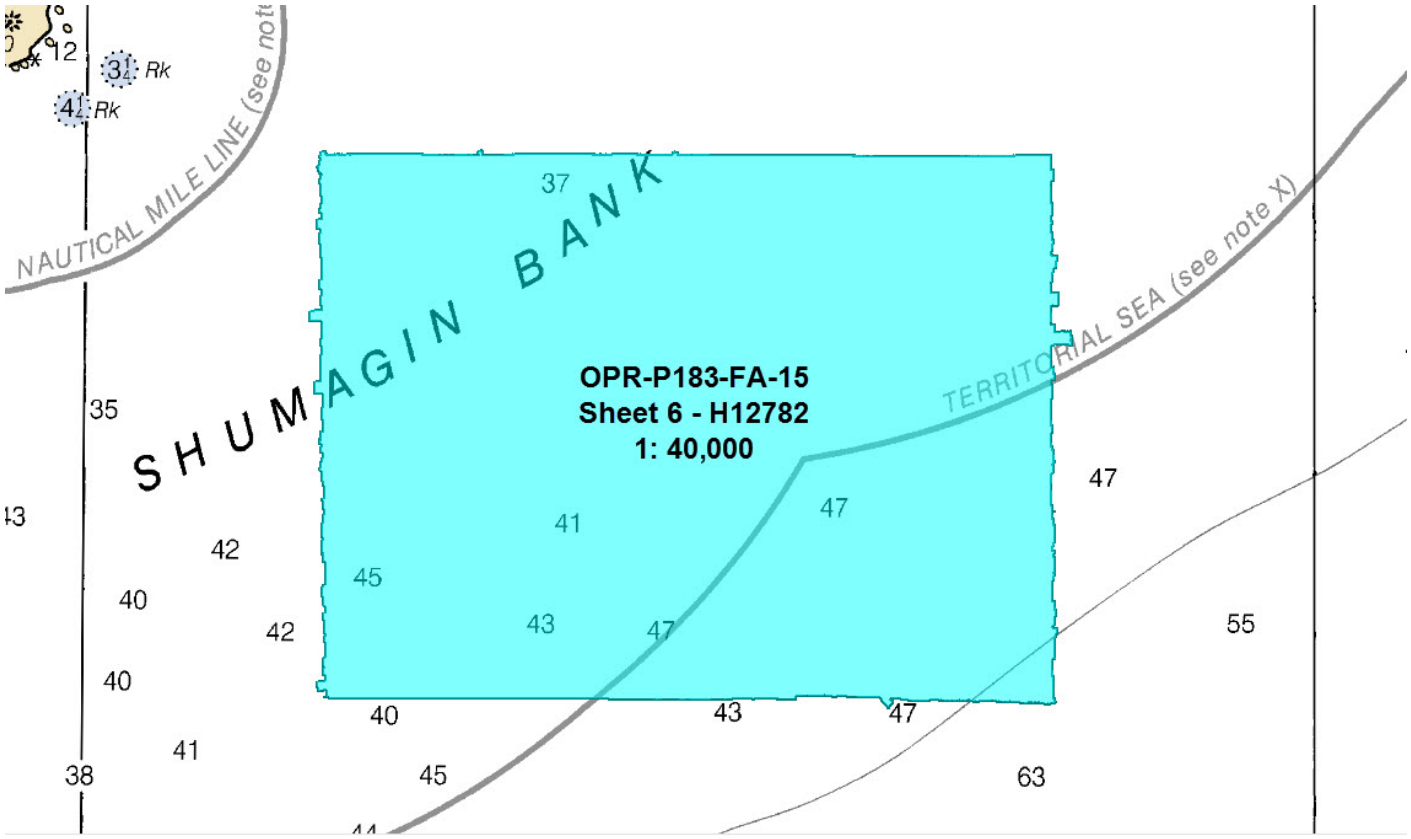


Figure 1: H12782 Survey Outline

A.5 Survey Statistics

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

	HULL ID	*S220*	*2805*	*2806*	*Total*
LNM	**SBES Mainscheme**	0	0	0	0
	MBES Mainscheme	660.558	29.823	4.652	695.033
	Lidar Mainscheme	0	0	0	0
	SSS Mainscheme	0	0	0	0
	SBES/SSS Mainscheme	0	0	0	0
	MBES/SSS Mainscheme	0	0	0	0
	SBES/MBES Crosslines	39.229	0	0	39.229
	Lidar Crosslines	0	0	0	0
Number of Bottom Samples					1
Number Maritime Boundary Points Investigated					0
Number of DPs					0
Number of Items Investigated by Dive Ops					0
Total SNM					79.57

Table 2: Hydrographic Survey Statistics

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

Survey Dates	Day of the Year
05/29/2015	149
05/30/2015	150
06/11/2015	162
06/12/2015	163
06/13/2015	164
06/14/2015	165

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	*S220*	*2805*	*2806*
LOA	70.4 meters	8.64 meters	8.64 meters
Draft	4.7 meters	1.12 meters	1.12 meters

Table 4: Vessels Used

B.1.2 Equipment

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

Manufacturer	Model	Type
Kongsberg	EM710	MBES
Reson	7125	MBES
RESON	SVP70	Sound Speed System
RESON	SVP71	Sound Speed System
Rolls-Royce/Brooke Ocean Technology, Canada Ltd.	MVP 200	Conductivity, Temperature, and Depth Sensor
Sea-Bird	SBE 19plus	Conductivity, Temperature, and Depth Sensor
Applanix	POS/MV V4	Positioning and Attitude System

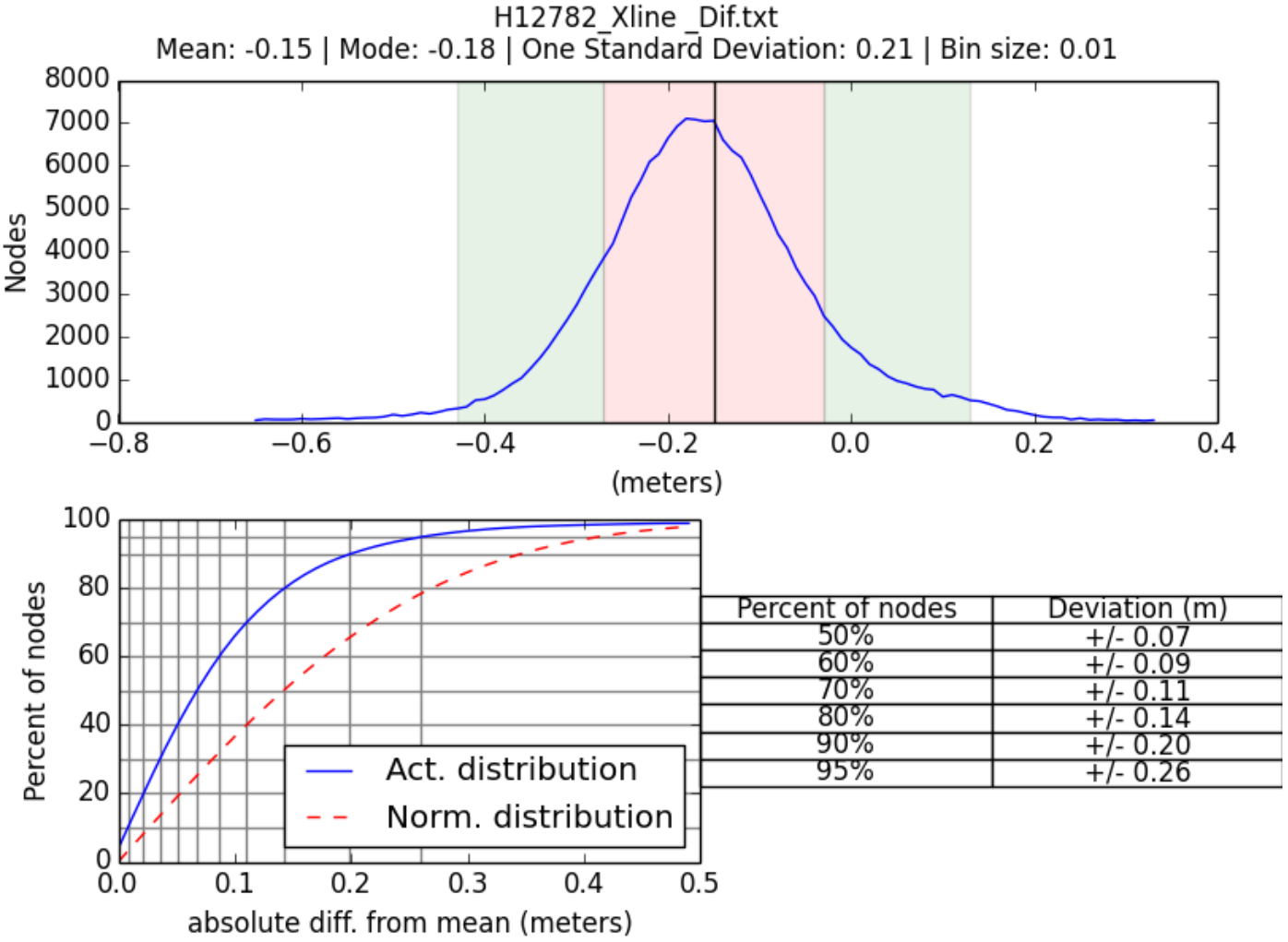
Table 5: Major Systems Used

B.2 Quality Control

B.2.1 Crosslines

Crosslines acquired for this survey totaled 5.64% of mainscheme acquisition.

Crosslines were collected, processed and compared in accordance with section 5.2.4.3 of the HSSD. Surface differencing in CARIS HIPS and SIPS was used to assess crossline agreement with main scheme lines. Differences in crosslines to mainscheme lines are believed to be caused by abrupt changes in slopes in rocky areas. See figure 2, for statistical representation of crossline difference, which shows 95% of all nodes to have a maximum deviation of +/- 0.26 meters. The difference surface is submitted digitally in the Separates II folder.



Percent of nodes	Deviation (m)
50%	+/- 0.07
60%	+/- 0.09
70%	+/- 0.11
80%	+/- 0.14
90%	+/- 0.20
95%	+/- 0.26

Figure 2: Statistical information for difference between crossline to mainscheme

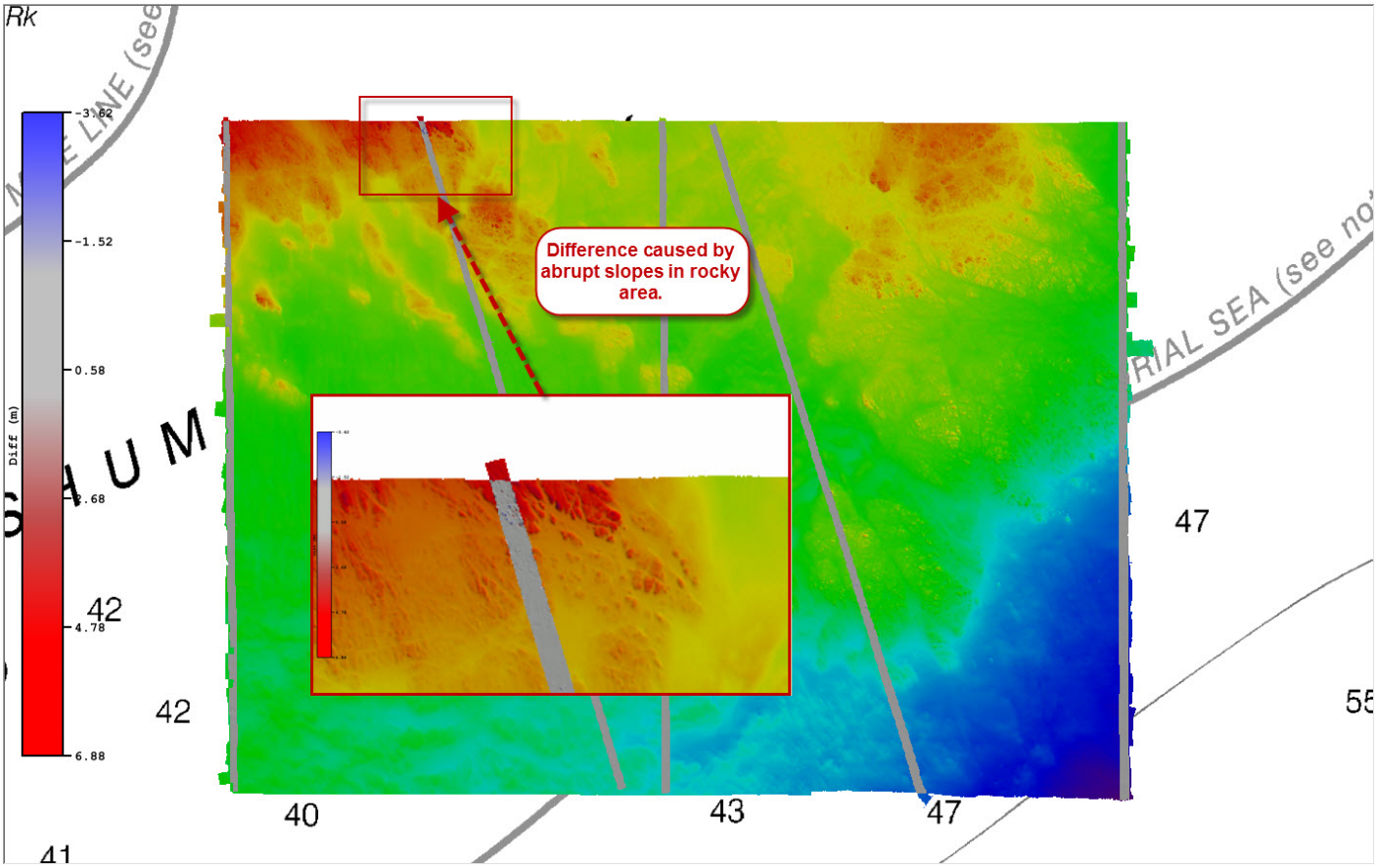


Figure 3: Graphical representation of difference between crossline and mainscheme surfaces

B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Measured	Zoning	Method
0.01 meters	0.08 meters	ERZT

Table 6: Survey Specific Tide TPU Values

Hull ID	Measured - CTD	Measured - MVP	Surface
S220	2 meters/second	1 meters/second	0.5 meters/second
2805	2 meters/second		0.5 meters/second
2806	2 meters/second		0.5 meters/second

Table 7: Survey Specific Sound Speed TPU Values

The following tidal ERZT uncertainty values were applied to the submitted data: Measured: 0.0, Zoning 0.03464.

B.2.3 Junctions

The areas of overlap between surveys were reviewed in CARIS HIPS and SIPS by surfacing differencing eight meter and four meter combined surfaces to asses surface agreement. The junction agreement is generally within the total allowable vertical uncertainty in their common areas and depths for all surfaces. Data overlap between all surveys was achieved. See figure 4 for planned areas of overlap.

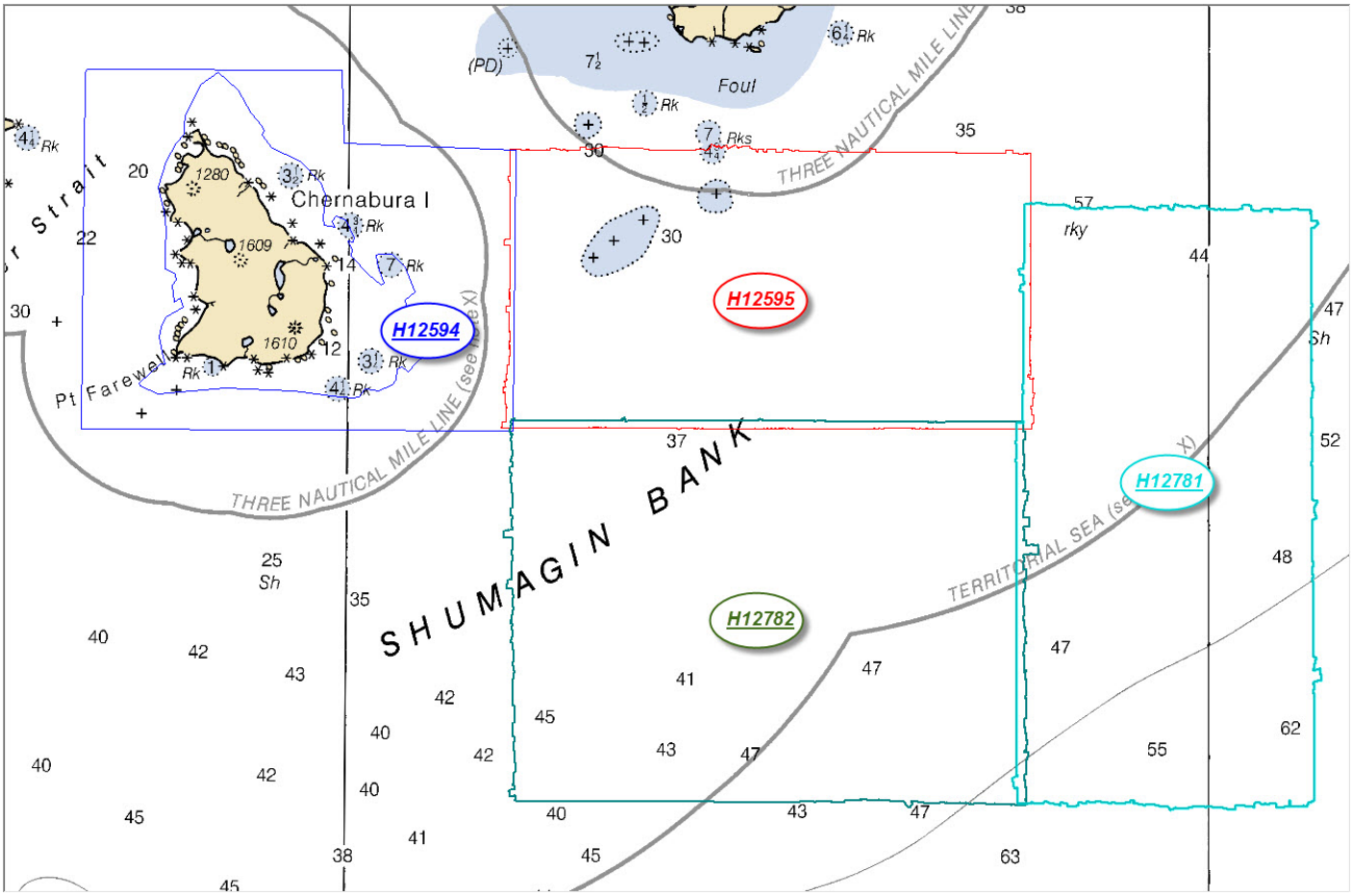


Figure 4: Junctions between H12594, H12595, H12781, and H12782

The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
H12595	1:40000	2013	NOAA Ship RAINIER	NW
H12594	1:40000	2013	NOAA Ship RAINIER	N
H12781	1:40000	2015	NOAA Ship RAINIER	E

Table 8: Junctioning Surveys

H12595

Surface differencing in CARIS HIPS and SIPS was used to assess junction agreement between H12782_MB_8m_MLLW_Combined surface and H12595_MB_4m_MLLW_Combined surface. The difference between surfaces was generally -0.5m and 0.5m and the few areas of larger differences are believed to be caused by the rocky seafloor. See figure 5 for a graphical representation and figure 6 for statistical information of the surface differencing.

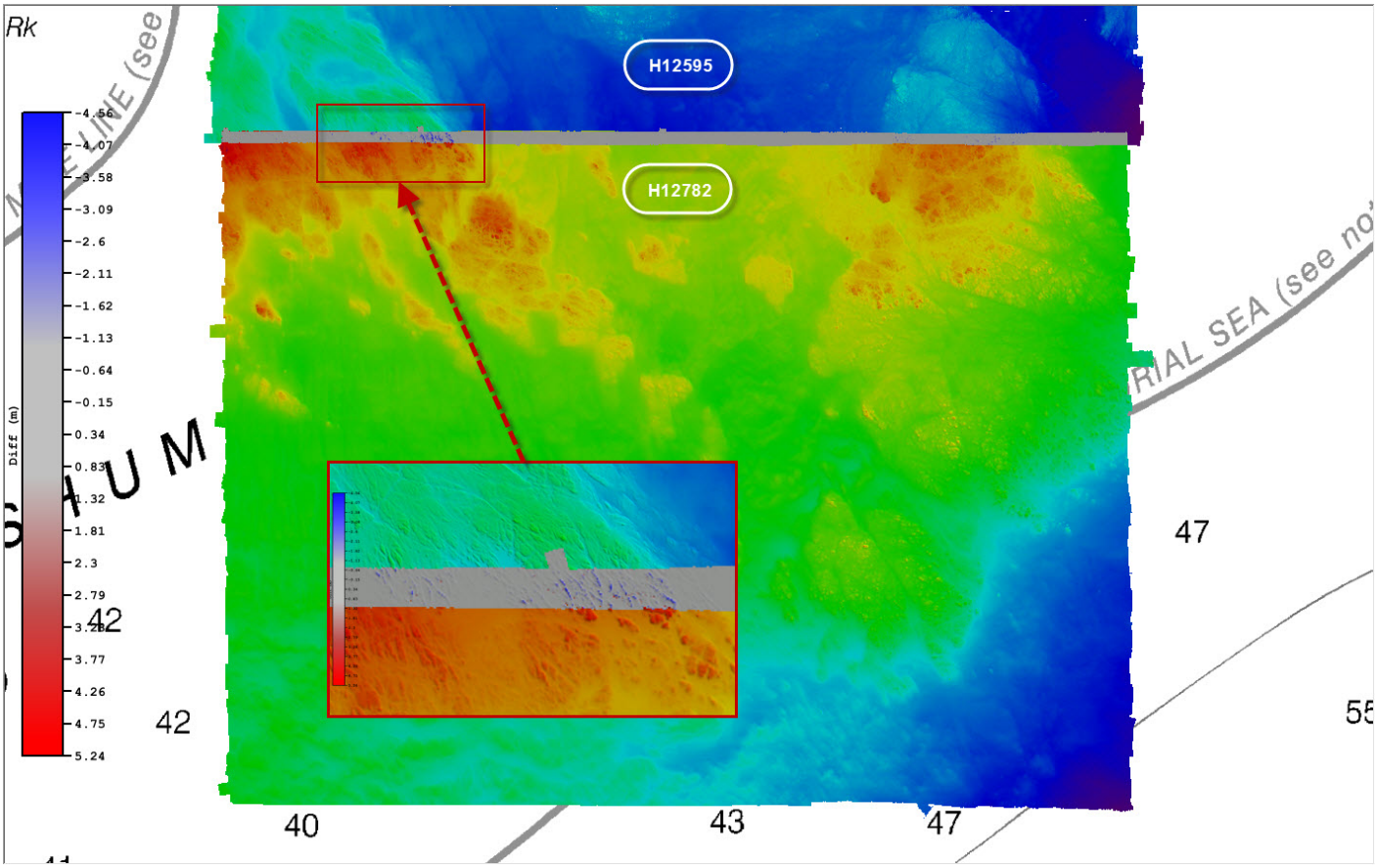
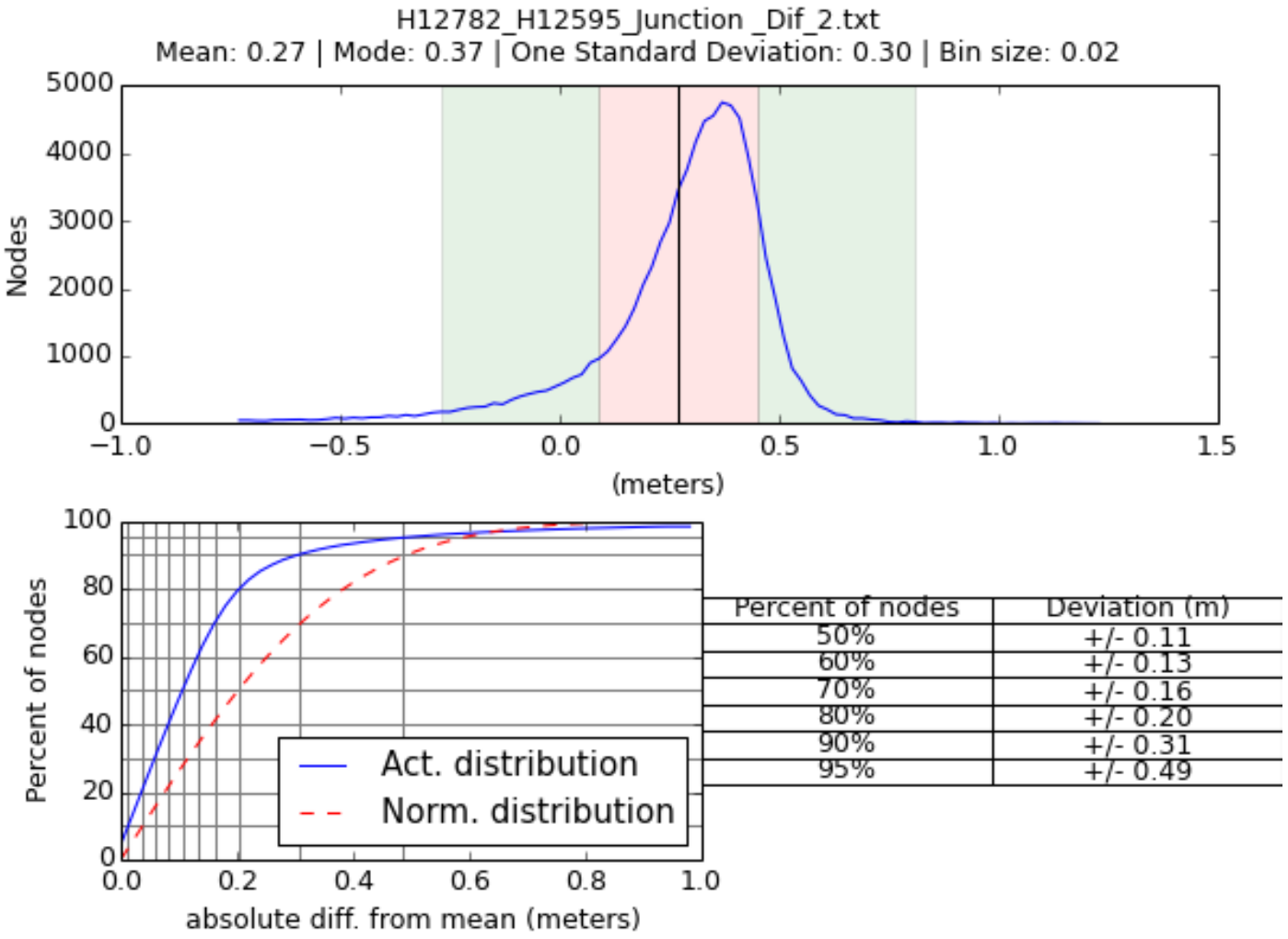


Figure 5: Graphical representation of difference between junction H12782 and H12595



Percent of nodes	Deviation (m)
50%	+/- 0.11
60%	+/- 0.13
70%	+/- 0.16
80%	+/- 0.20
90%	+/- 0.31
95%	+/- 0.49

Figure 6: Statistical information for junction comparison between sheet H12782 and H12595

H12594

Due to insufficient overlap in the data, a proper junction comparison could not be performed. See figure 7 for a graphical representation and figure 8 for statistical information of the surface differencing.

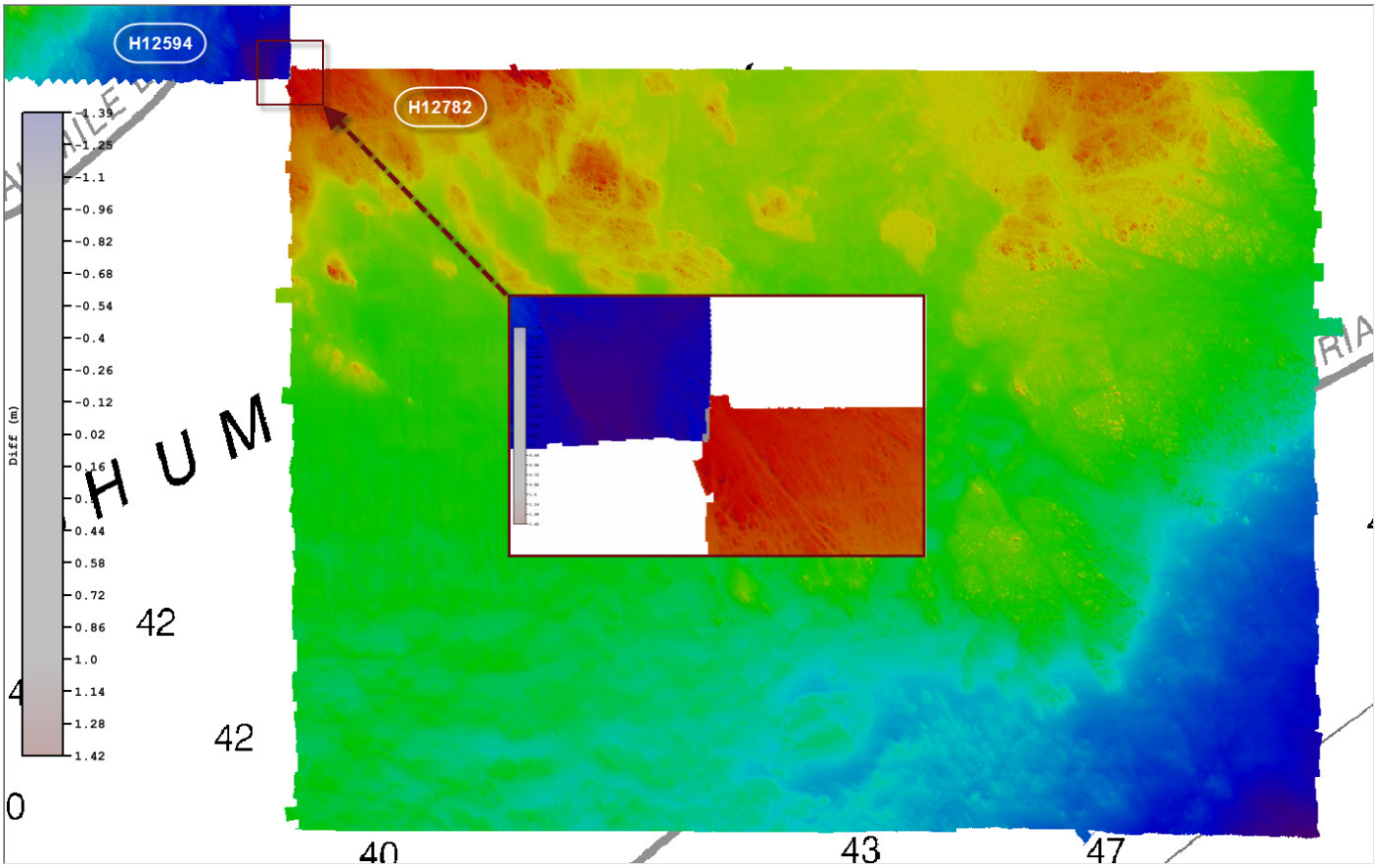
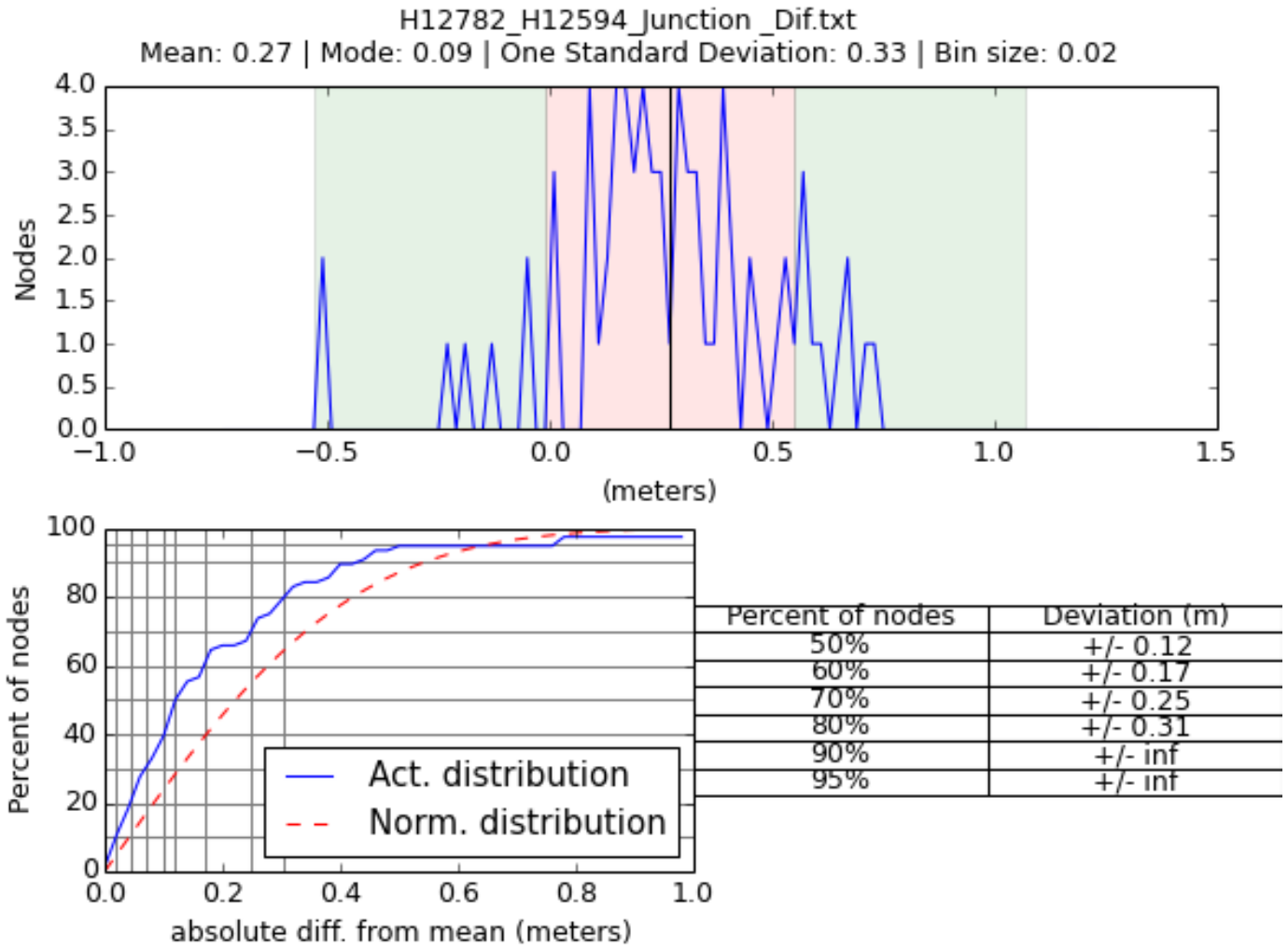


Figure 7: Graphical representation of difference between junction H12782 and H12594



Percent of nodes	Deviation (m)
50%	+/- 0.12
60%	+/- 0.17
70%	+/- 0.25
80%	+/- 0.31
90%	+/- inf
95%	+/- inf

Figure 8: Statistical information for junction comparison between sheet H12782 and H12594

H12781

Surface differencing in CARIS HIPS and SIPS was used to assess junction agreement between H12782_MB_8m_MLLW_Combined surface and H12781_MB_4m_MLLW_Combined surface. The difference between surfaces was generally -0.4m and 0.4m and the few areas of larger differences are believed to be caused by the rocky seafloor. See figure 9 for a graphical representation and figure 10 for statistical information of the surface differencing.

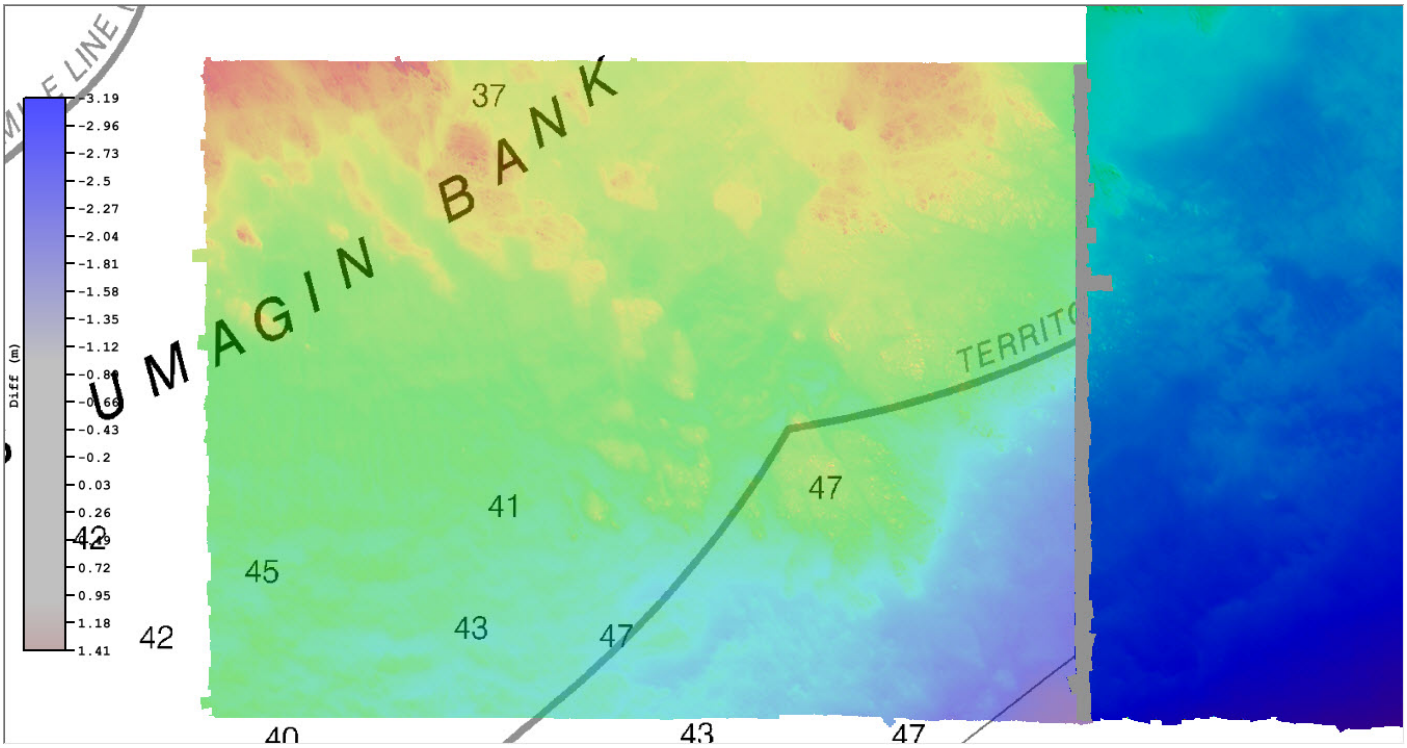
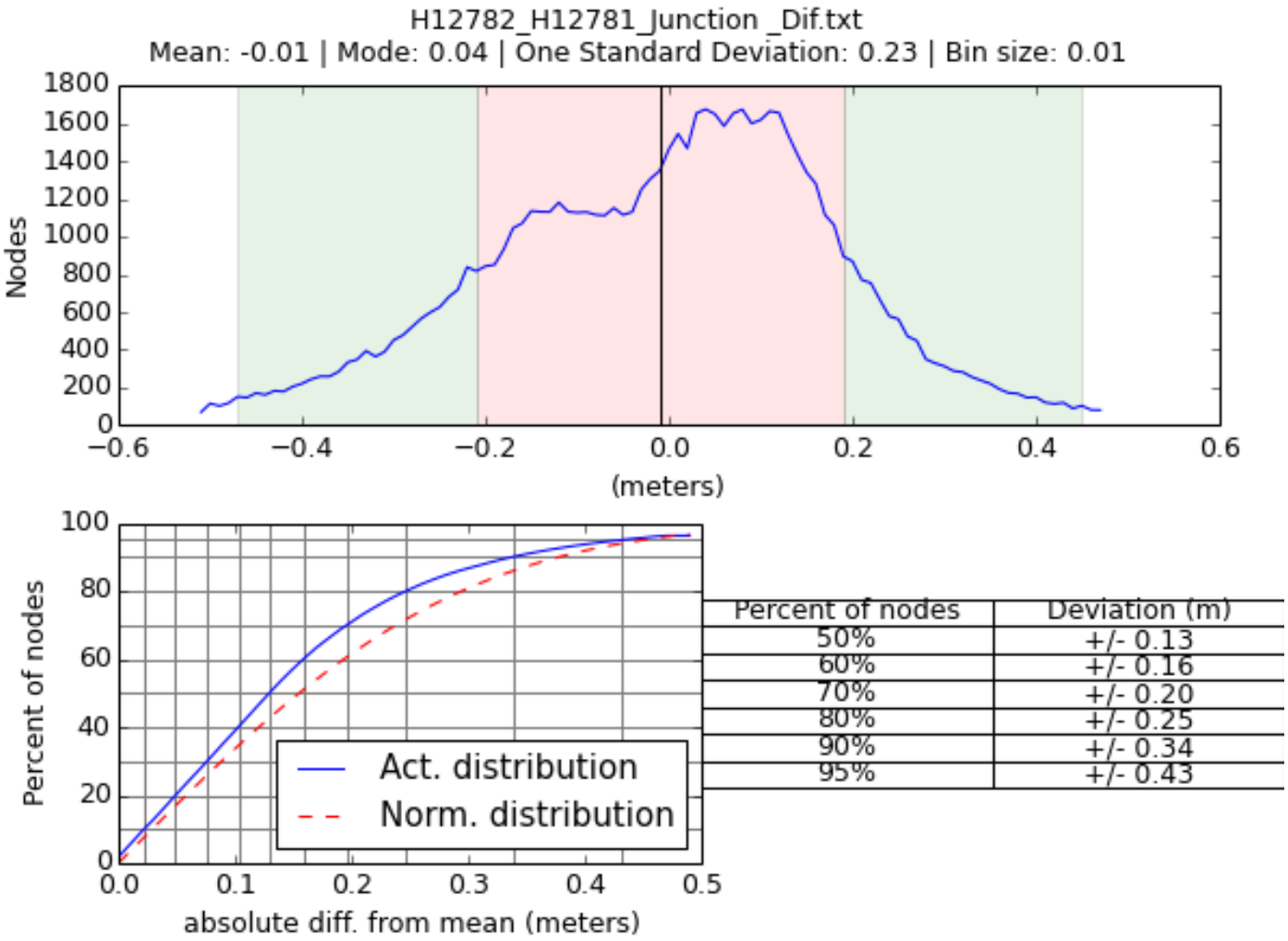


Figure 9: Graphical representation of difference between junction H12782 and H12781



Percent of nodes	Deviation (m)
50%	+/- 0.13
60%	+/- 0.16
70%	+/- 0.20
80%	+/- 0.25
90%	+/- 0.34
95%	+/- 0.43

Figure 10: Statistical information for junction comparison between sheet H12782 and H12781

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

SVP Profile Spikes

Numerous SVP casts were determined to be bad, spikes in the profiles are believed to be from the kelp affecting the sensors. Due to the number of bad casts the sensor was replaced with a new one. All bad casts were removed and near by casts were applied, using "Nearest in distance within time (2 hr)" instead of "Nearest in time". All of the data meets NOAA specs and deliverables. See figure 12: Example of bad SVP cast removed and not used.

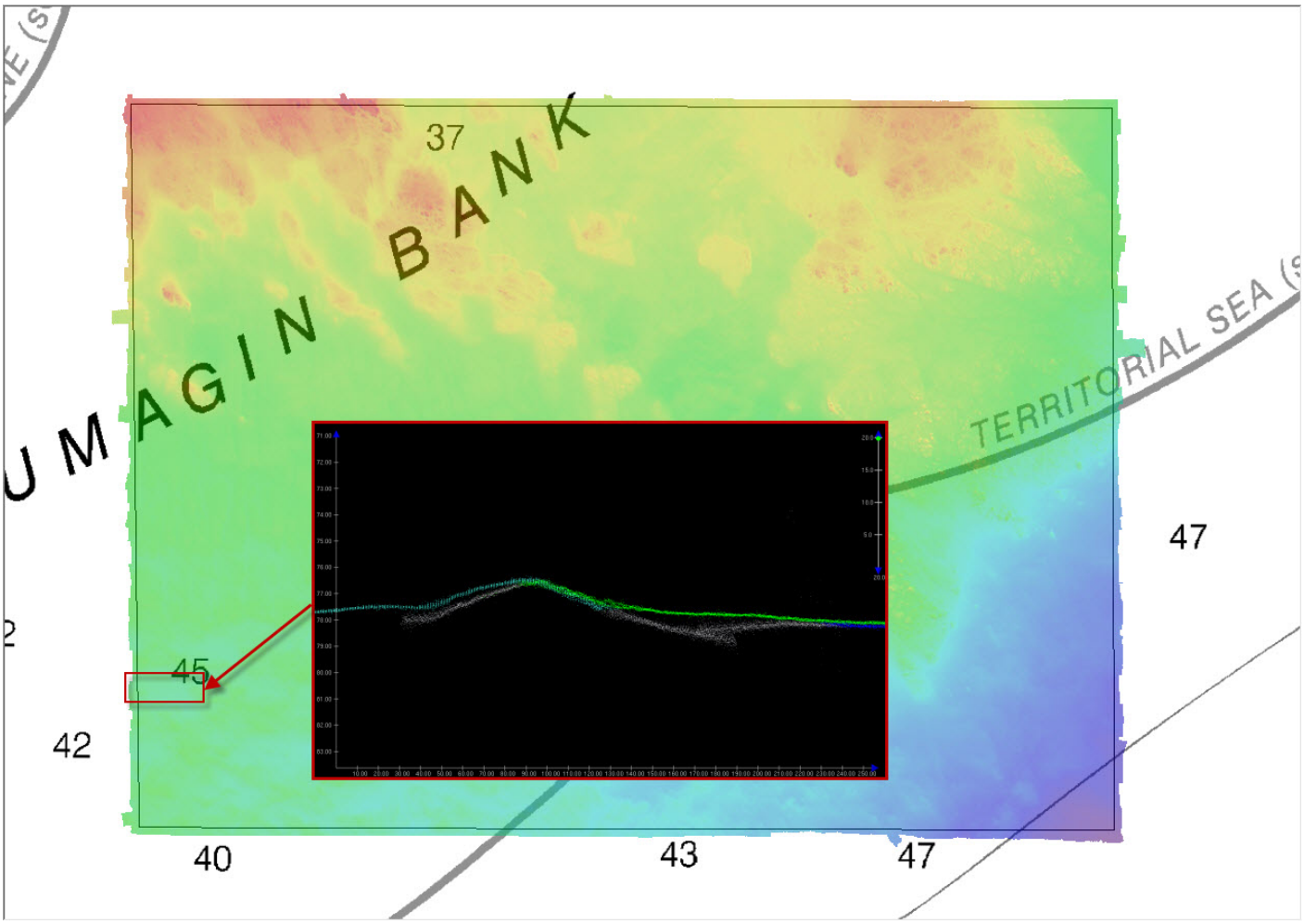


Figure 11: Area affected by bad SVP casts

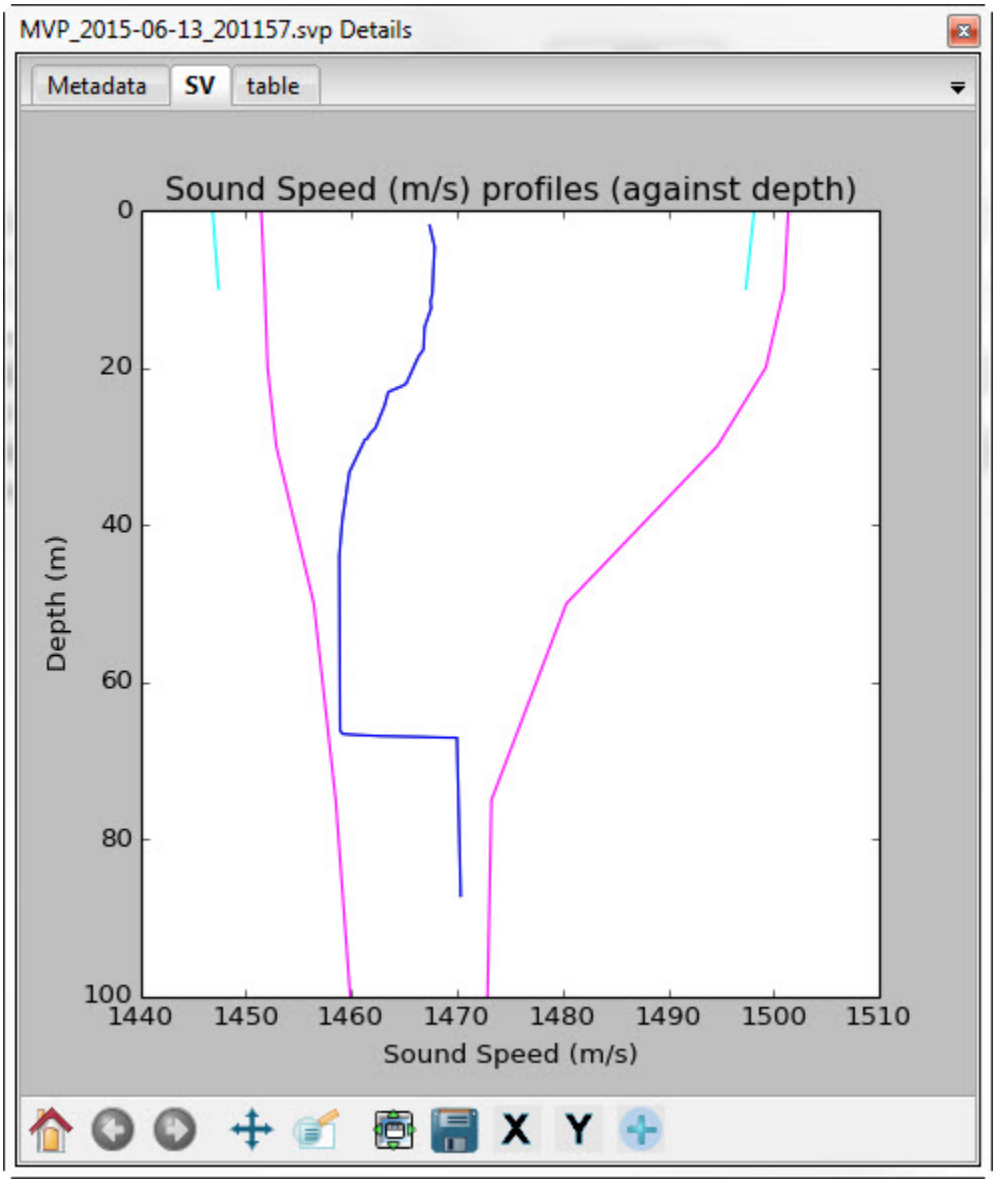


Figure 12: Example of bad SVP cast removed and not used

B.2.6 Factors Affecting Soundings

Sea State

During cleaning and data review processes of sheet H12782, it was found that due to sea conditions in the project area, S220 experienced hard pitching when surveying into seas and swell. As a result, numerous blowouts due to dynamic ship's attitude are present throughout H12782. The MBES data was reviewed in CARIS HIPS and SIPS subset editor with appropriate reference surfaces. The bathymetry accurately depicts the sea floor and none of the data gaps due to blowouts meet holiday specs. See figure 13 for a graphical representation.

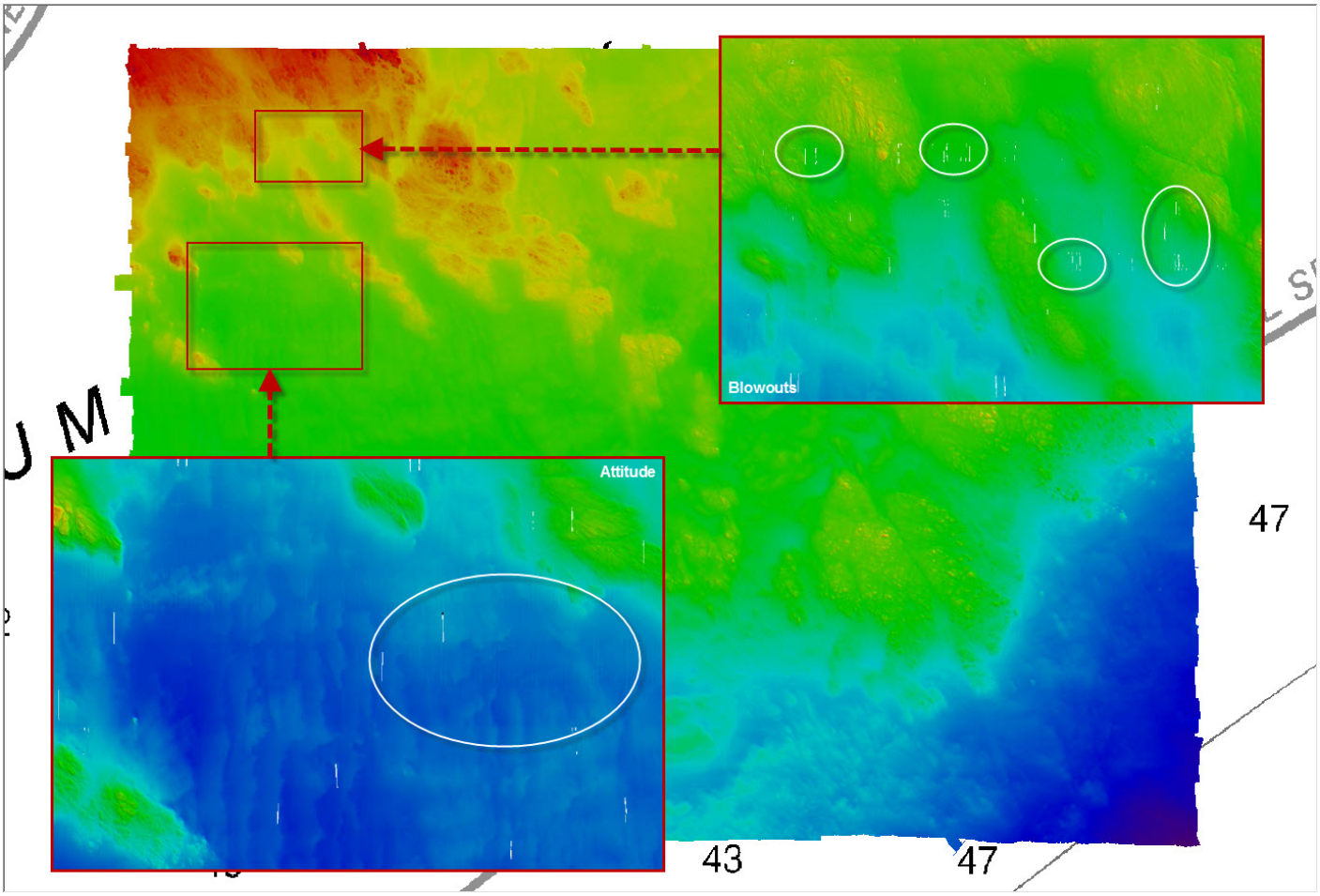


Figure 13: H12782 attitude and blowout artifacts observed in MBES

B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: Casts were conducted every 15-30 minutes while towing the Moving Vessel Profiler during ship acquisition, except for the last four lines at the south end of the sheet where stationary CTD cast were conducted every hour due to technical issues with the MVP. During launch acquisition casts were conducted about every two hours.

B.2.8 Coverage Equipment and Methods

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

B.2.9 IHO Uncertainty

It was found that 99.93% of nodes in the H12782_MB_4m_MLLW_Final.csar and 99.99% of nodes in the H12782_MB_8m_MLLW_Final.csar meet or exceed IHO Order 1 specifications for all survey soundings of survey H12782, see figures 15, 16 and Standards Compliance Review in Appendix II. To assess vertical accuracy standards, a child layer titled "IHO1" was created for each of the four meter and eight meter and "IHO2" for eight meter finalized surface using the equations as stated in section C.2.1 of the DAPR.

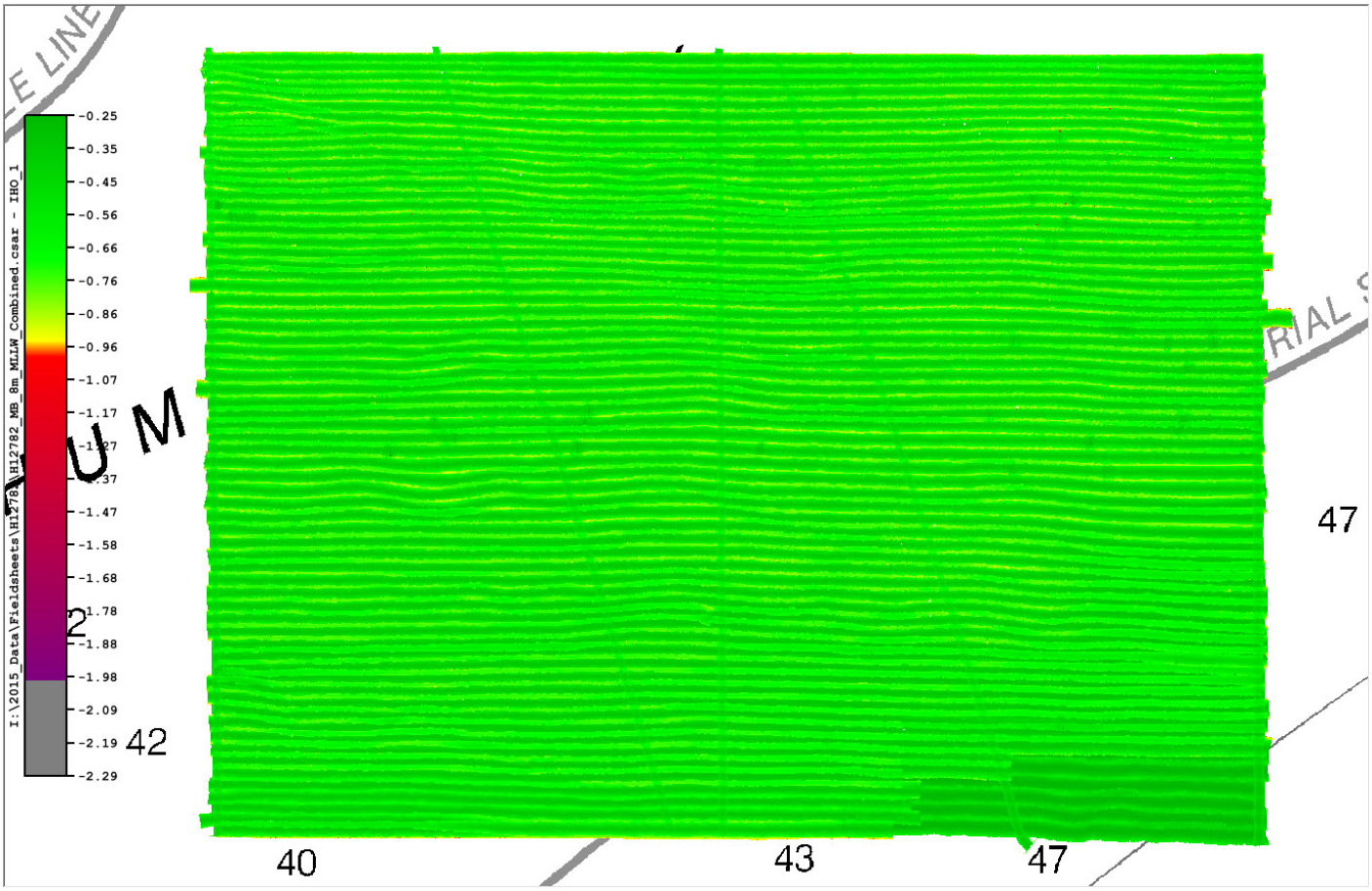


Figure 14: Graphical representation of IHO Uncertainty

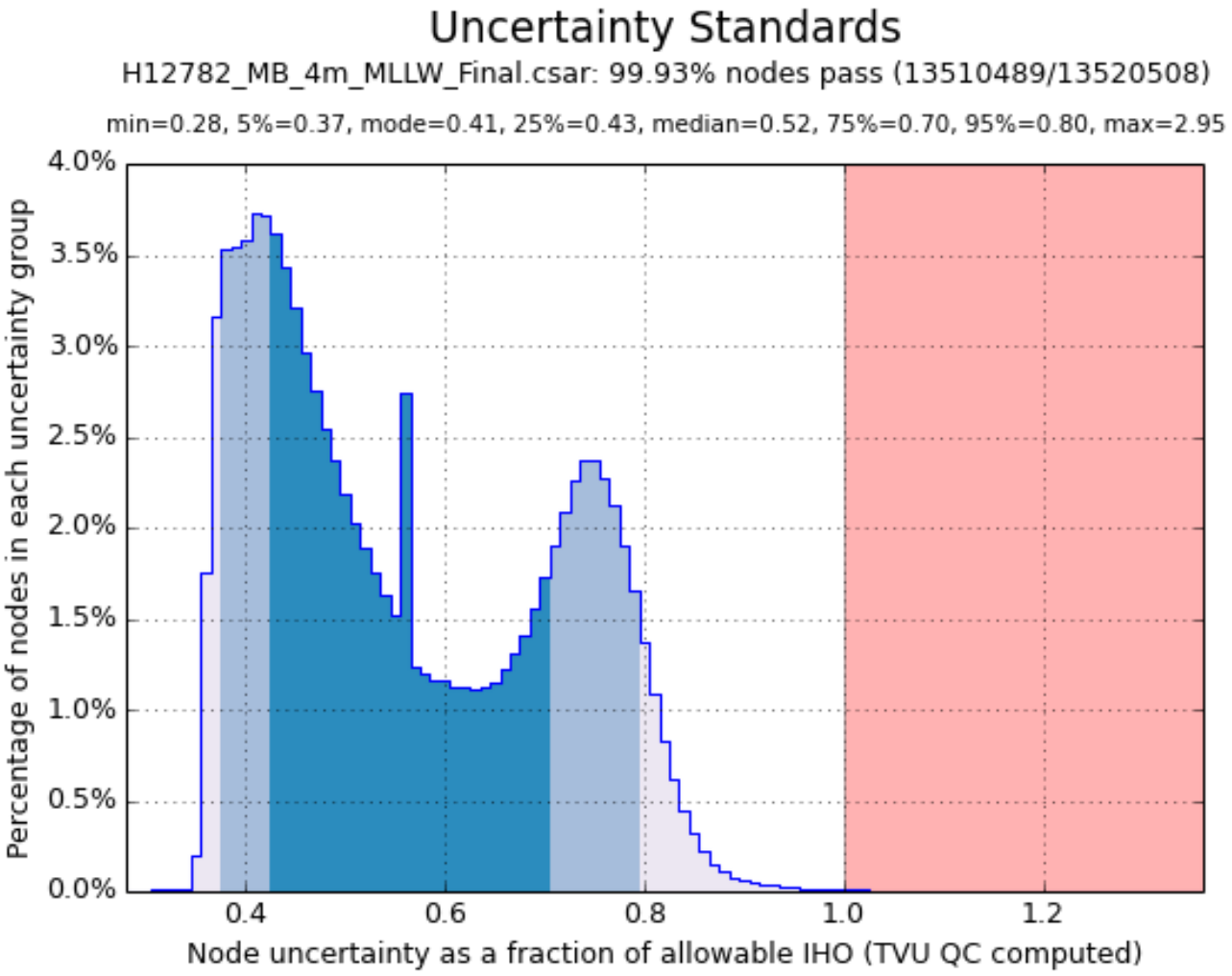


Figure 15: Statistical information for H12782_MB_4m_MLLW_Final.csar uncertainty

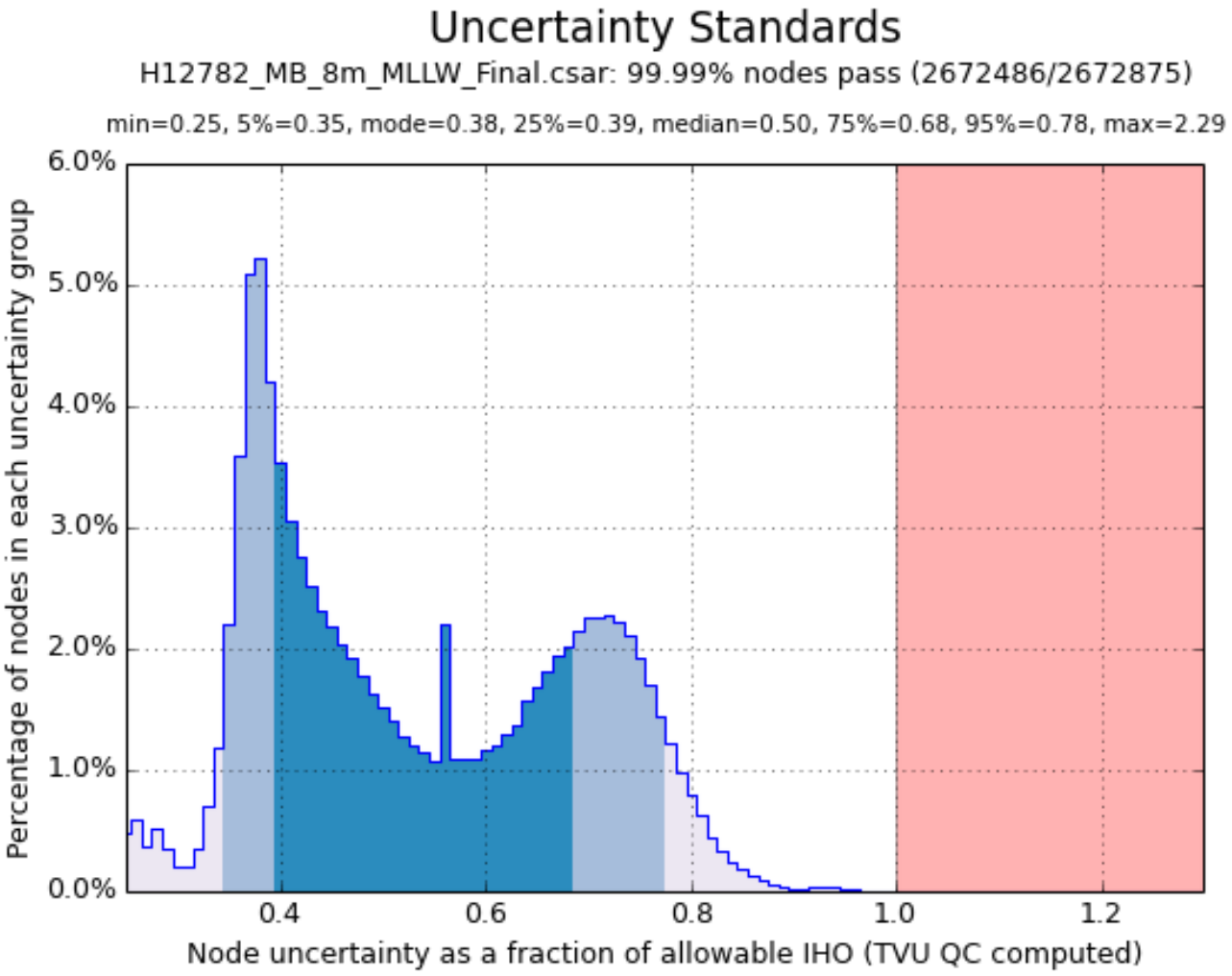


Figure 16: Statistical information for H12782_MB_8m_MLLW_Final.csar uncertainty

B.2.10 Density

Density requirements for H12782 were achieved with at least 99.97% of finalized surface nodes containing five or more soundings, see figures 18, 19 and Standard Compliance Review in Appendix II.

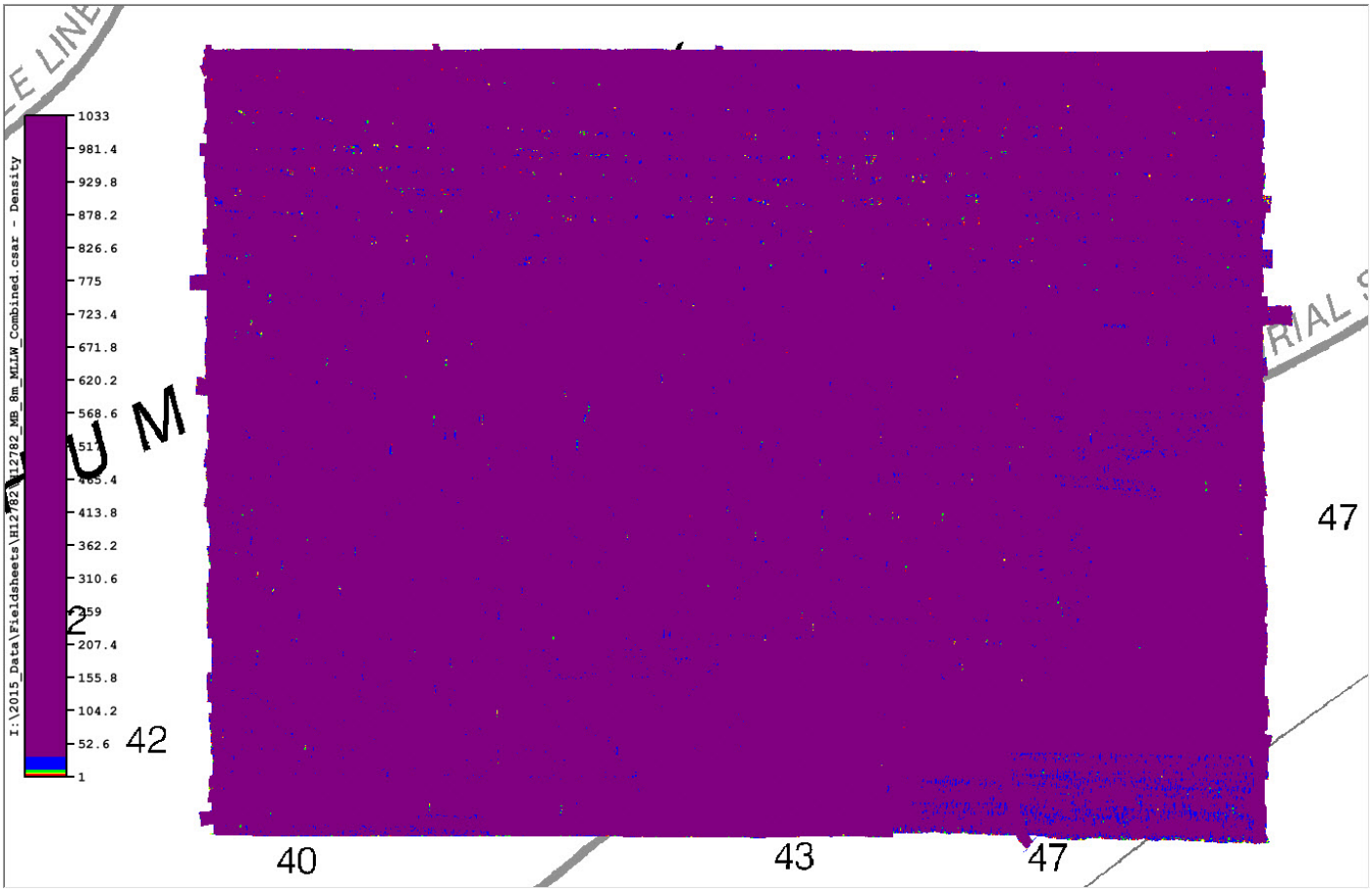


Figure 17: Graphical representation of density

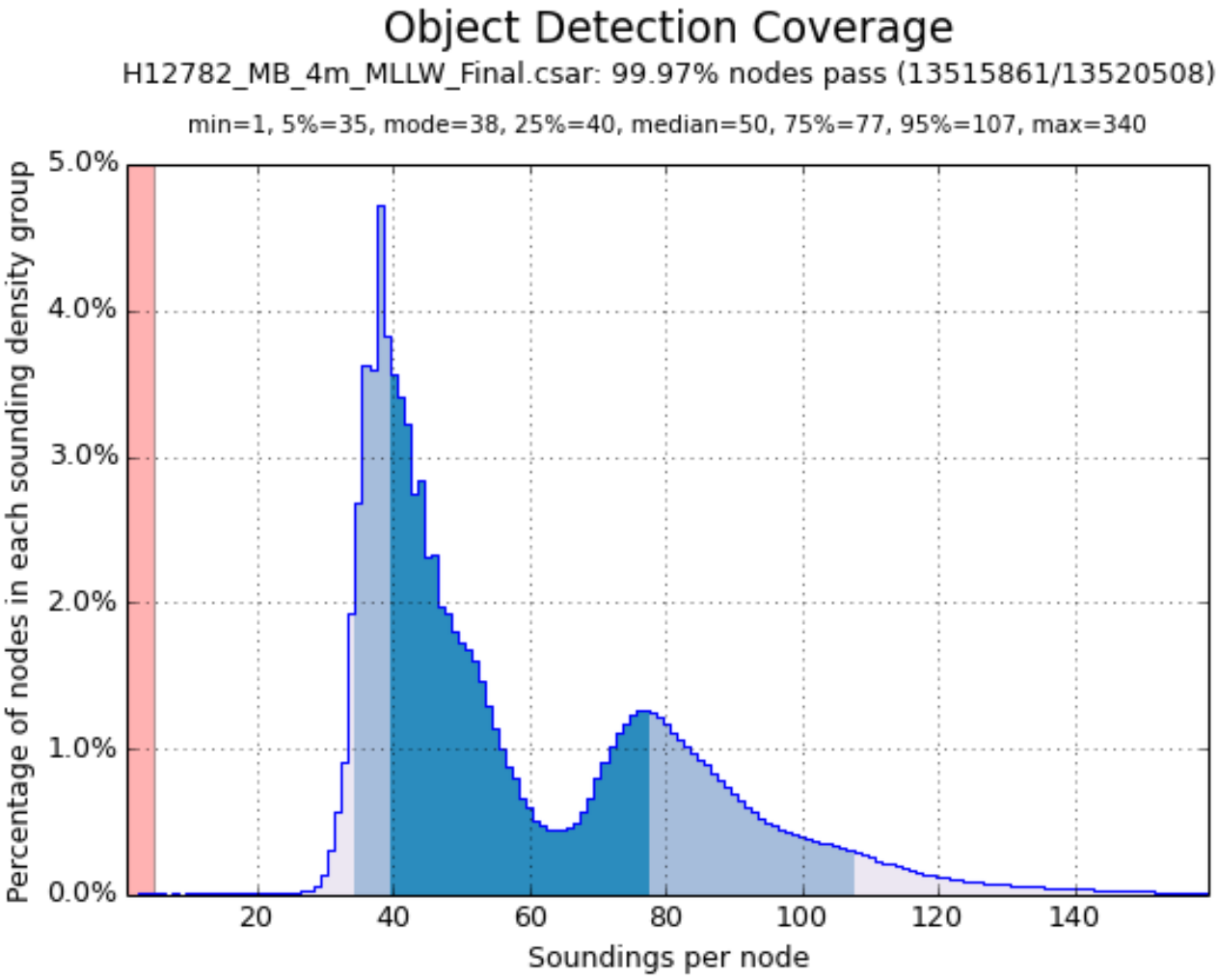


Figure 18: Statistical information for H12782_MB_4m_MLLW_Final.csar density

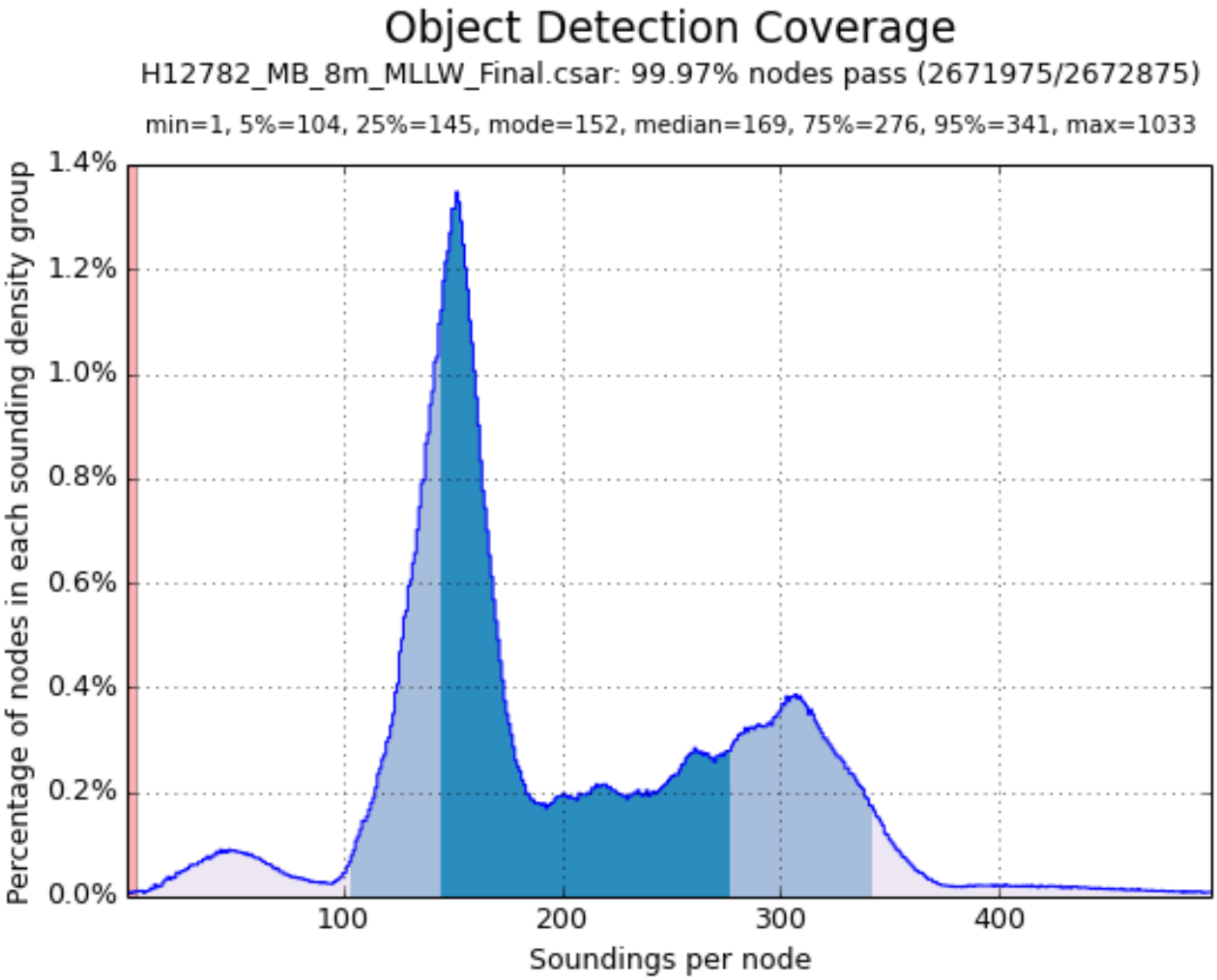


Figure 19: Statistical information for H12782_MB_8m_MLLW_Final.csar density

B.2.11 Holiday Assesment

Complete multibeam coverage was obtained with in the limits of H12782 as defined per the project instructions. No holidays the size of three surface grid nodes by three surface grid nodes or larger were found. Blowouts throughout H12782 are not considered holidays per the May 2015 HSSD Section 5.2.2.2 Complete Coverage. Per email correspondence from HSD OPS the May 2015 HSSD was used when assessing H12782 for holidays. A copy of the email is located in the project correspondence folder.

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 .7k file for Reson 7125 data. Kongsberg EM710 stores the backscatter data in the .all file. The data was submitted directly to NGDC to be archived and to PHB where the data will be processed. One line per day of backscatter was processed in the field by the field unit.

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	9.0.17

Table 9: Primary bathymetric 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
H12782_MB_4m_MLLW	CUBE	4 meters	-	NOAA_4m	Complete MBES
H12782_MB_8m_MLLW	CUBE	8 meters	-	NOAA_8m	Complete MBES
H12782_MB_4m_MLLW_Final	CUBE	4 meters	36 meters - 80 meters	NOAA_4m	Complete MBES
H12782_MB_8m_MLLW_Final	CUBE	8 meters	72 meters - 160 meters	NOAA_8m	Complete MBES

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
H12782_MB_8m_MLLW_Combined	CUBE	8 meters	-	NOAA_8m	Complete MBES

Table 10: Submitted Surfaces

The NOAA CUBE parameters mandated in HSSD were used for the creation of all CUBE Base surfaces in survey H12782. The surfaces have been reviewed for noisy data or "fliers" and these spurious soundings have been removed when they caused the surface to be shoaler or deeper than the reliably measured seabed by a distance greater than the maximum allowable Total Vertical Uncertainty at depth. After rejecting noisy data "fliers," surfaces were recomputed to accurately represent the sea floor.

B.5.3 Data Logs

Data acquisition and processing notes are included in the acquisition and processing logs, and additional processing such as final tide and sound velocity application is noted in the H12782 Data Log spreadsheet. All data logs are submitted digitally in the Separates I folder.

B.5.4 Critical Soundings

Designation of soundings followed procedures as outlined in section 5.2.1.2 of the HSSD.

Survey H12782 contained 32 soundings which were designated in CARIS HIPS. These designated soundings were used to draw the CUBE surface to the sounding which most accurately represented the sea floor in cases where the surface deviated from the sounding more than the vertical IHO requirements allowed. In general all designated soundings were found to be located in the rocky areas.

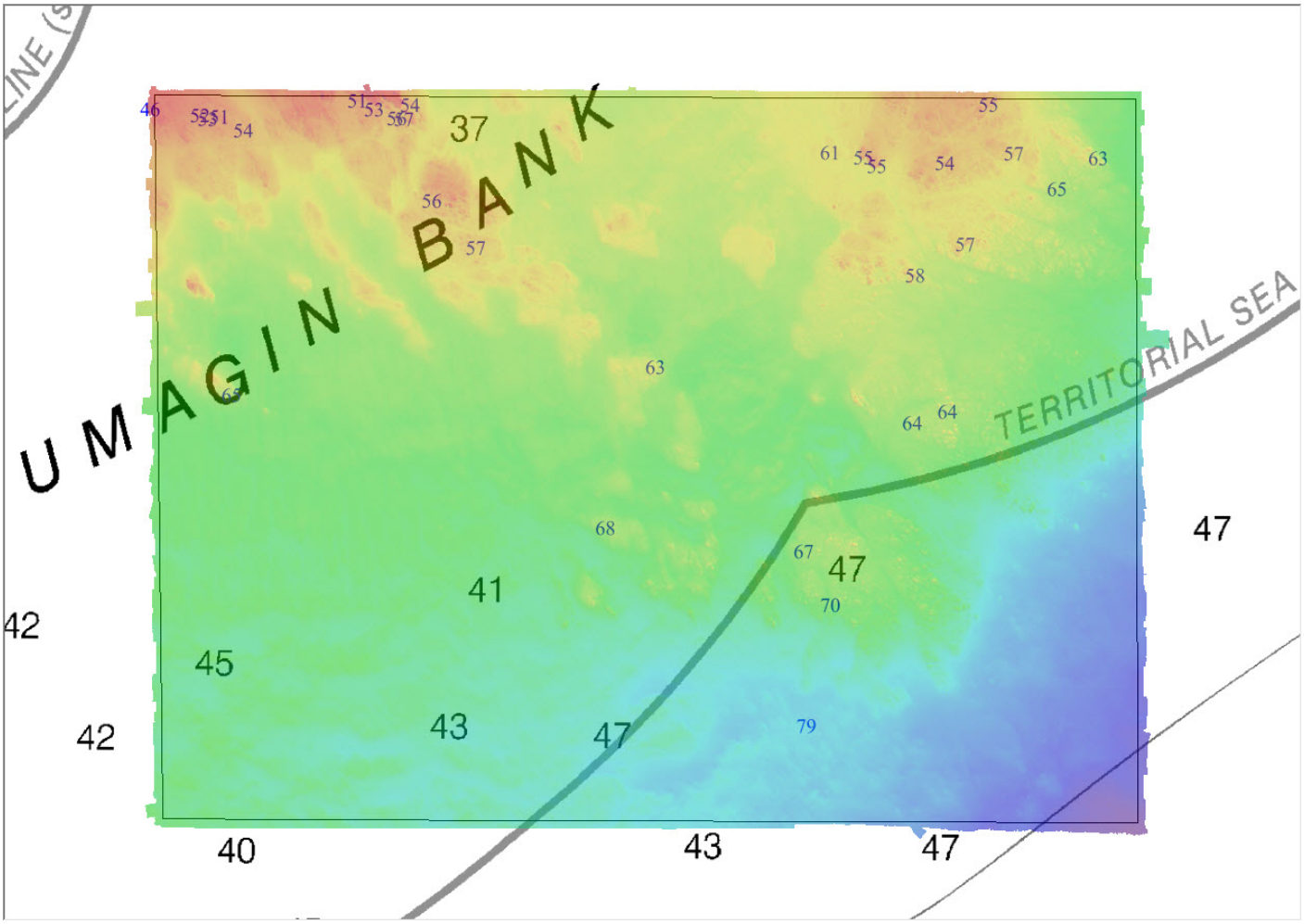


Figure 20: Total of 32 designated soundings

30 designated soundings (not 32) were noted in the submitted data.

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:

ERZT

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

Station Name	Station ID
Sand Point, AK	9459450

Table 11: NWLON Tide Stations

File Name	Status
9459450.tid	Final Approved

Table 12: Water Level Files (.tid)

File Name	Status
P183FA2015CORP_Reg.zdf	Final

Table 13: Tide Correctors (.zdf or .tc)

A request for final approved tides was sent to N/OPS1 on 06/18/2015. The final tide note was received on 06/23/2015.

Preliminary zoning was accepted as final.

Non-Standard Vertical Control Methods Used:

Constant Separation

Ellipsoid to Chart Datum Separation File:

OPR-P183-FA-15_ERZT_Seperation_Model

The Constant separation model file was applied in accordance with the FPM. Separation model was used for the vertical transformation of ellipsoid-referenced data to MLLW and is applied for data submission. Soundings were merged in CARIS HIPS and SIPS using the Apply GPS Tide function, and TPU was computed with the new separation model uncertainty value. See correspondence in Appendix II for additional information on separation model use and approval.

A Constant Separation model was not used for reduction to chart datum. ERZT and the associated separation model were used.

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 4 North.

The following PPK methods were used for horizontal control:

Single Base

Vessel Kinematic data was post processed using the Applanix POSPac processing software and the Single Base method was used as described in the DAPR. Smoothed Best Estimates of Trajectory (SBET) and associated error (RMS) data were applied to all MBES data in CARIS HIPS.

For further details regarding the processing and quality control checks performed see the H12782 POSPAC Processing Logs spreadsheet located in the SBET folder with the GNSS data. See also the OPR-P183-FA-15 Horizontal and Vertical Control report, submitted under separate cover.

The following user installed stations were used for horizontal control:

HVCR Site ID	Base Station ID
9677	Forsman

Table 14: User Installed Base Stations

Differential correctors from the US Coast Guard beacon at Cold Bay (289kHz) were used during real time acquisition.

The following DGPS Stations were used for horizontal control:

DGPS Stations
Cold Bay, AK (289kHz)

Table 15: USCG DGPS Stations

D. Results and Recommendations

D.1 Chart Comparison

A comparison was made between survey H12782 and chart 16540 and US3AK50M using CARIS HIPS and SIPS soundings and contours layers derived from the eight meter combined surface. The contours and soundings were overlaid on the chart to assess differences. All data from H12782 should supersede charted data.

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
16540	1:300000	13	10/2010	03/03/2015	02/14/2015

Table 16: Largest Scale Raster Charts

16540

Contours generated in CARIS HIPS and SIPS consist of 30, 40, and 50 fathoms. The 30 and 40 fathom contours are new and are not charted on 16540. The new 50 fathom contour runs parallel with the charted one and is approximately 1200 meters Northwest of the charted contour. See figure 21

The six soundings from survey H12782 generally agreed within zero to four fathoms with charted depths on chart 16540. See figures 23-26. The notable exception to this general agreement is the 47 fathom sounding on the eastern half of the sheet. The disagreement is approximately 9-15 fathoms between the charted depth 47 fathom and the surveyed depths with MBES at 32-38 fathoms. See figure 26

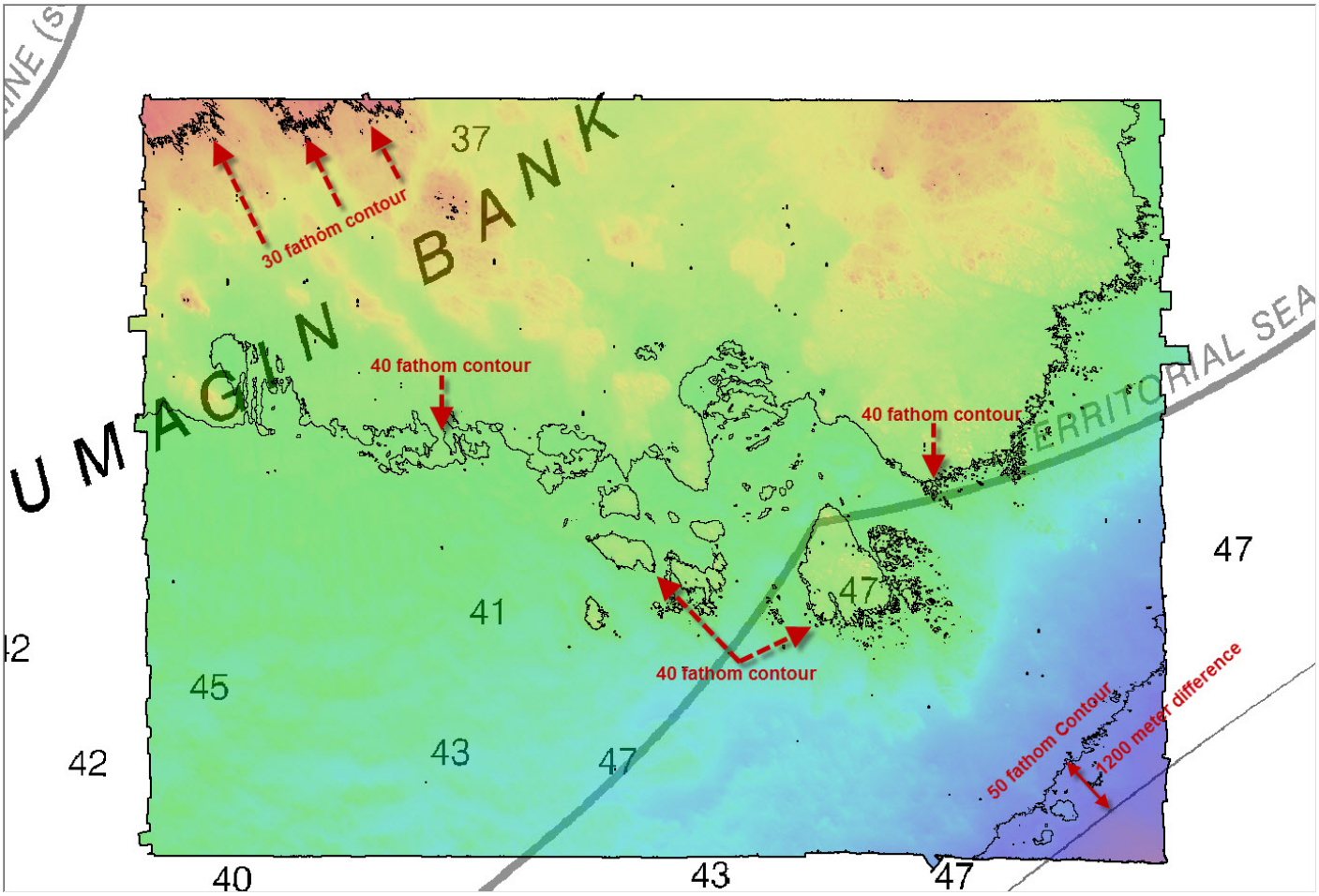


Figure 21: Discrepancy in contours

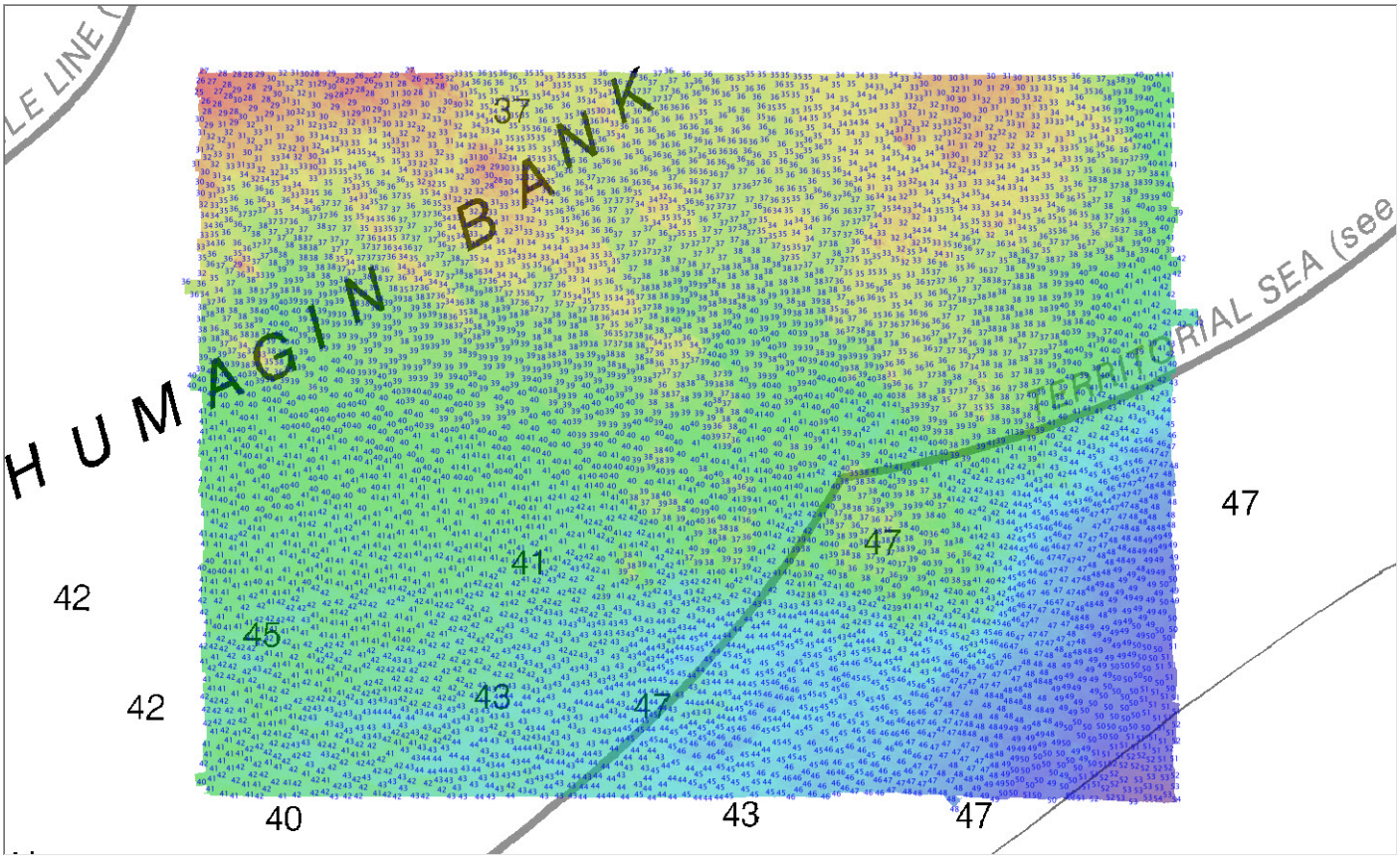


Figure 22: Overview of chart comparison

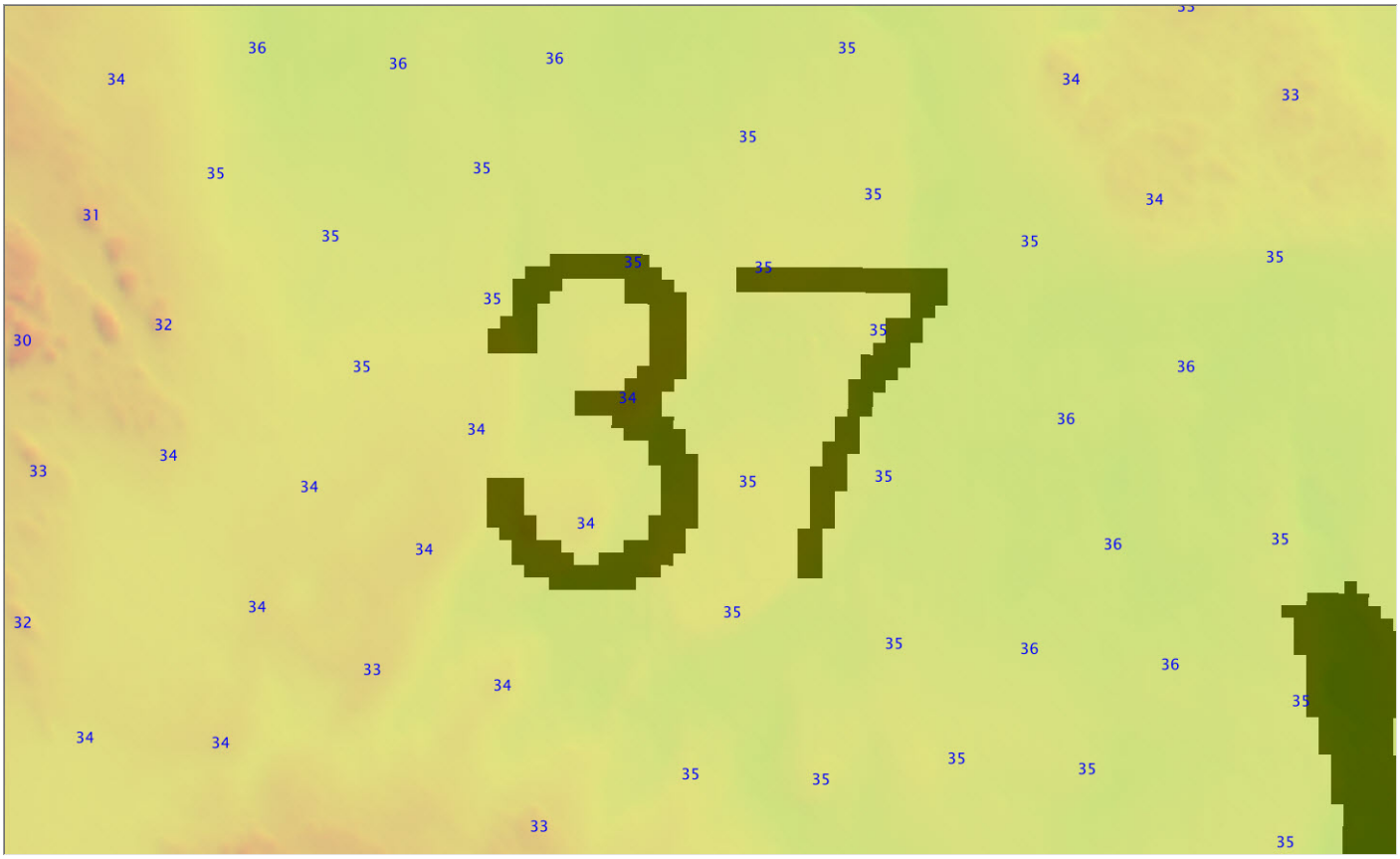


Figure 23: Discrepancy in charted depth vs surveyed depth (2-3 fathoms)

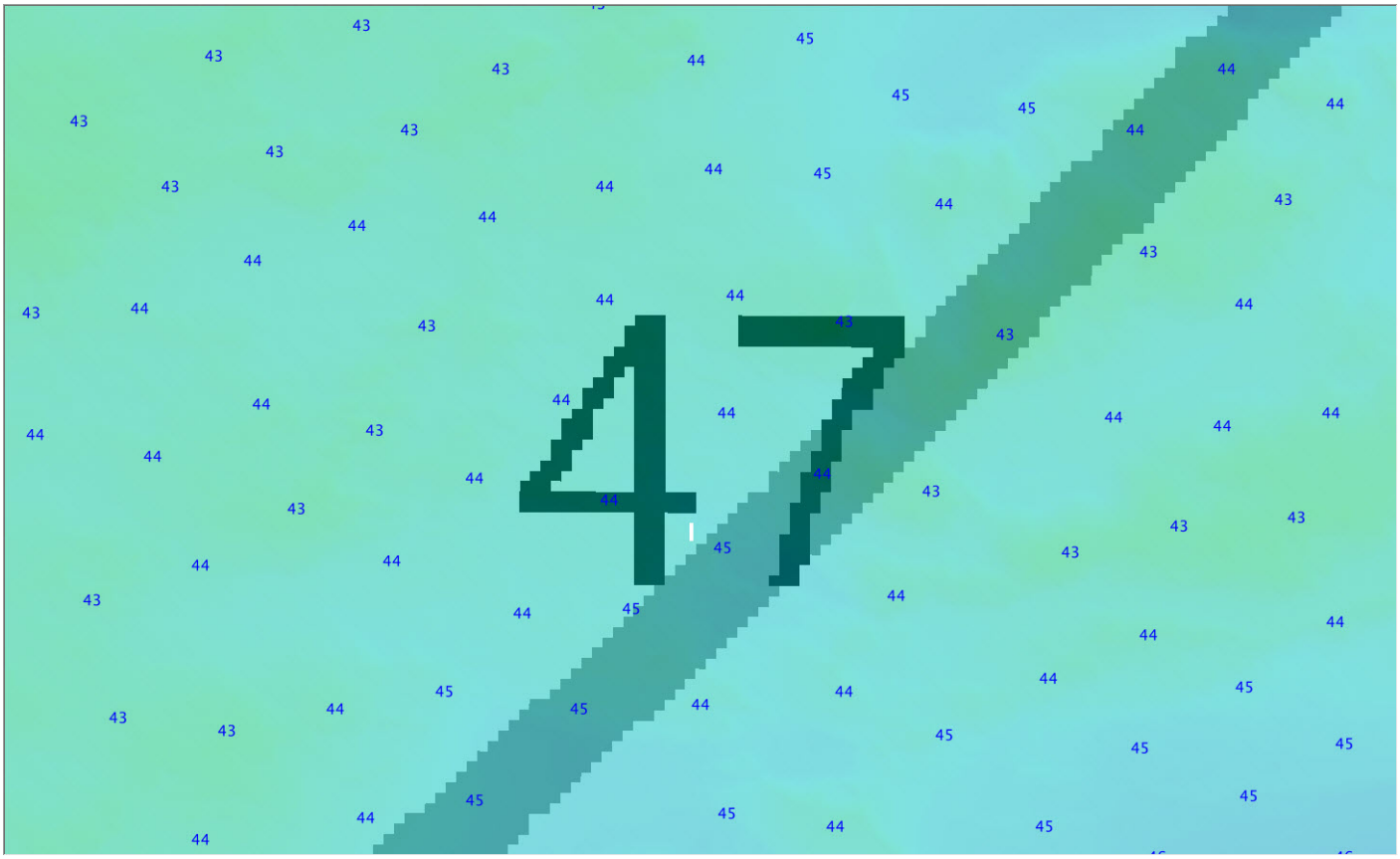


Figure 24: Discrepancy in charted depth vs surveyed depth (2-4fathoms)

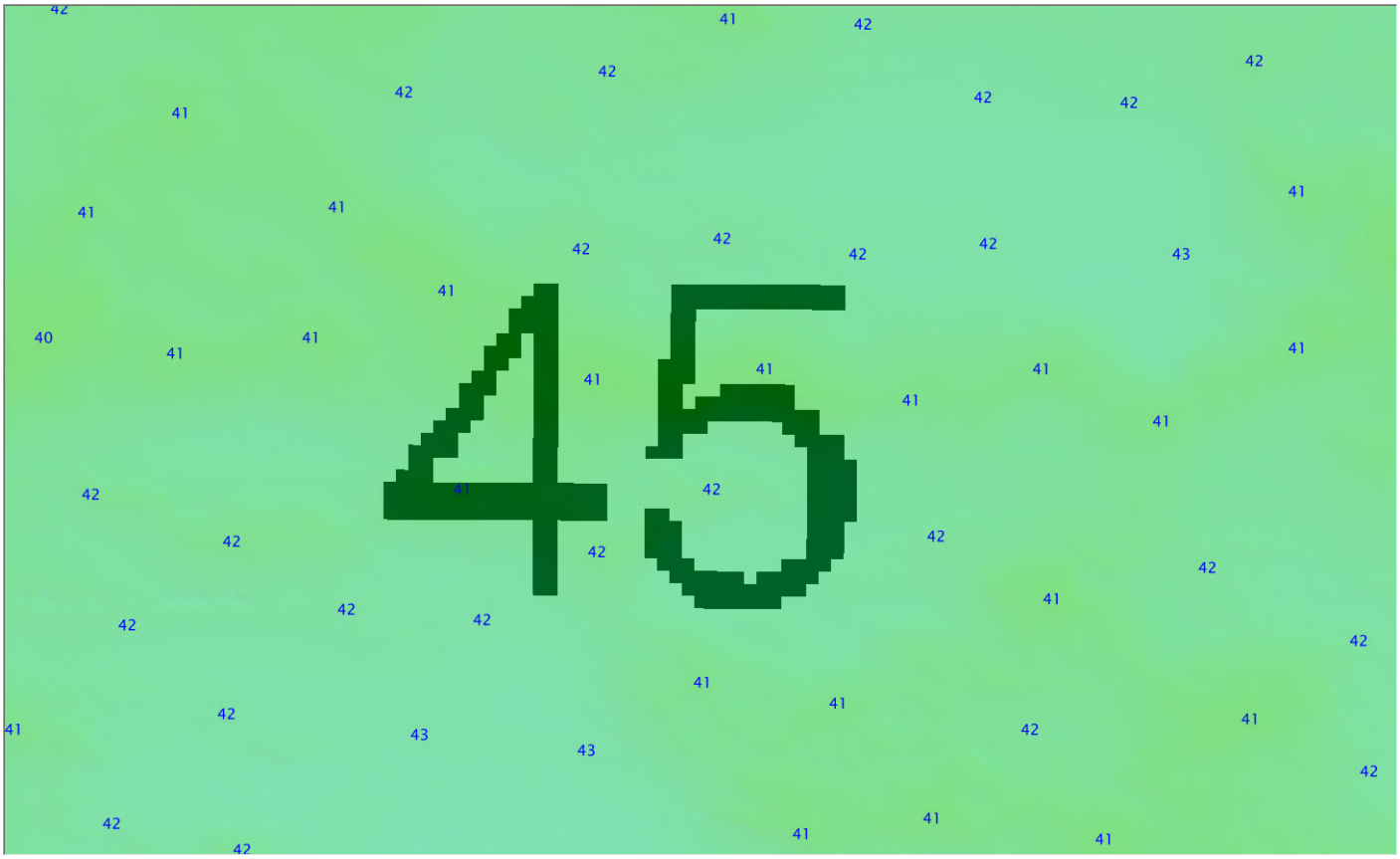


Figure 25: Discrepancy in charted depth vs surveyed depth (3-4 fathoms)

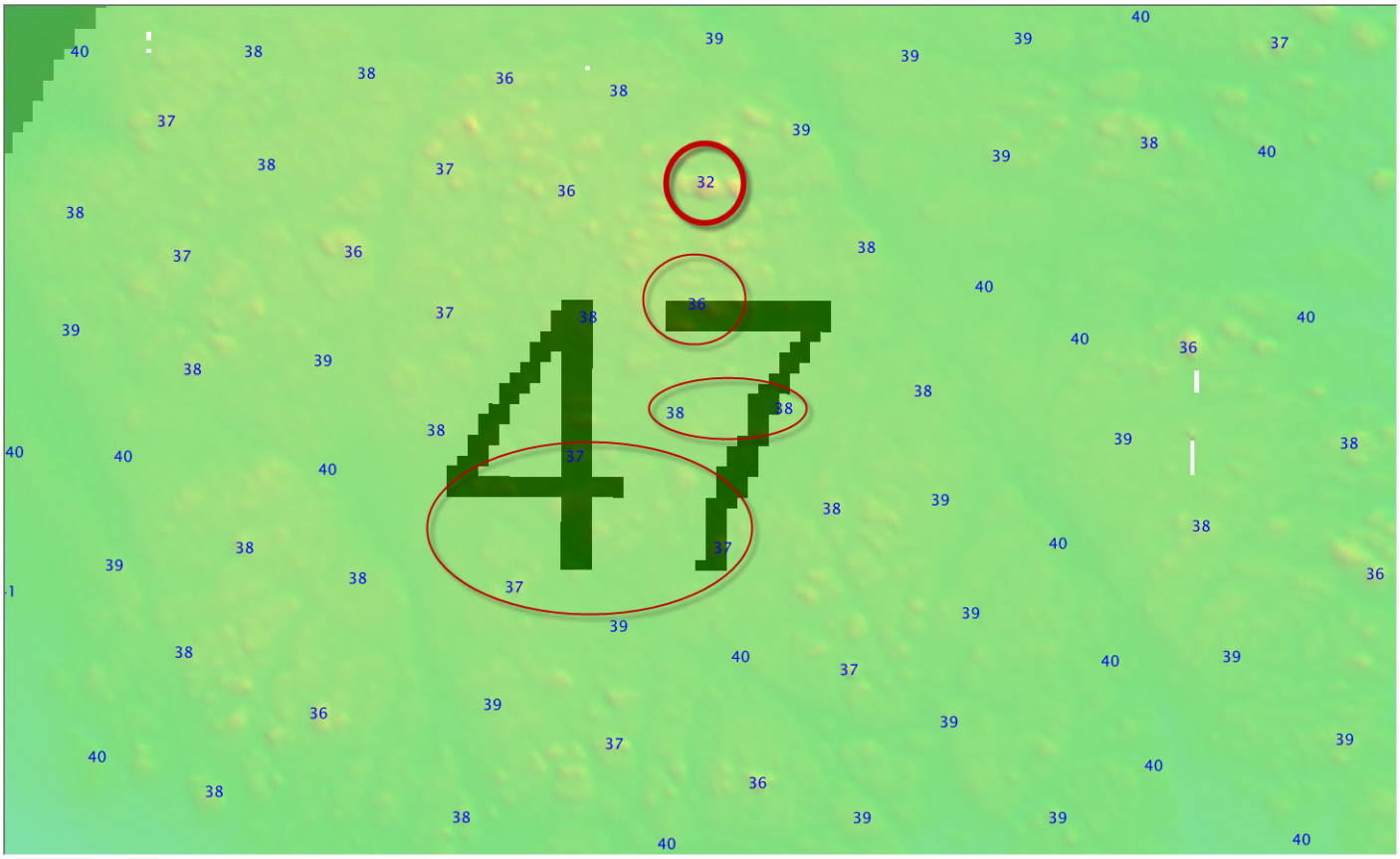


Figure 26: Discrepancy in charted depth vs surveyed depth (9-15 fathoms)

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?
US3AK50M	1:300000	17	04/09/2014	04/09/2014	NO

Table 17: Largest Scale ENCs

US3AK50M

Soundings from survey H12782 generally agree within zero to four fathoms of the soundings on chart US3AK50M. Contours in CARIS HIPS closely approximated the charted contours. See comments from Raster Chart 16540 for more information.

D.1.3 Maritime Boundary Points

No Maritime Boundary Points were assigned for this survey.

D.1.4 Charted Features

No charted features exist for this survey.

D.1.5 Uncharted Features

No uncharted features exist for this survey.

D.1.6 Dangers to Navigation

No Danger to Navigation Reports were submitted for this survey.

D.1.7 Shoal and Hazardous Features

No shoals or potentially hazardous features exist for this survey.

D.1.8 Channels

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

D.1.9 Bottom Samples

One bottom sample was assigned and investigated. The bottom sample is included in the H12782 Final Feature File.

D.2 Additional Results

D.2.1 Shoreline

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

D.2.2 Prior Surveys

No prior survey comparisons exist for this survey.

D.2.3 Aids to Navigation

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

D.2.4 Overhead Features

No overhead features exist for this survey.

D.2.5 Submarine Features

No submarine features exist for this survey.

D.2.6 Ferry Routes and Terminals

No ferry routes or terminals exist for this survey.

D.2.7 Platforms

No platforms exist for this survey.

D.2.8 Significant Features

No significant features exist for this survey.

D.2.9 Construction and Dredging

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

D.2.10 New Survey Recommendation

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

D.2.11 Inset Recommendation

No new insets are recommended for this area.

E. Approval Sheet

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

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

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

Report Name	Report Date Sent
Data Acquisition and Processing Report	2015-08-27
Coast Pilot Report	2015-09-01
Horizontal and Vertical Control Report	2015-09-01

Approver Name	Approver Title	Approval Date	Signature
CDR David J. Zezula	Chief of Party	08/25/2015	David Zezula 2015.09.02 23:56:06 -08'00'
LT Ryan A. Wartick	Field Operations Officer	08/25/2015	Ryan Wartick cn=Ryan Wartick, o=Fairweather, ou=OMAO, email=ryan.wartick@noaa.gov, c=US
LT Matthew M. Forney	Field Operations Officer	08/25/2015	Matthew Forney 2015.09.02 08:36:44 -08'00'
HCST Douglas A. Bravo	Chief Survey Technician	08/25/2015	
ENS Daniel R. Helmricks	Sheet Manager	08/25/2015	Daniel Helmricks 2015.08.29 15:47:47 -08'00'

F. Table of Acronyms

Acronym	Definition
AHB	Atlantic Hydrographic Branch
AST	Assistant Survey Technician
ATON	Aid to Navigation
AWOIS	Automated Wreck and Obstruction Information System
BAG	Bathymetric Attributed Grid
BASE	Bathymetry Associated with Statistical Error
CO	Commanding Officer
CO-OPS	Center for Operational Products and Services
CORS	Continually Operating Reference 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

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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : June 23, 2015

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-P183-FA-2015
HYDROGRAPHIC SHEET: H12782

LOCALITY: 12 NM South of Simeonof Island, Shumagin Islands, AK
TIME PERIOD: May 29 - June 14, 2015

TIDE STATION USED: 9459450 Sand Point, AK
Lat. 55° 19.9'N Long. 160° 30.3' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.988 meters

REMARKS: RECOMMENDED ZONING

Preliminary zoning is accepted as the final zoning for project OPR-P183-FA-2015, H12782, during the time period between May 29 - June 14, 2015.

Please use the zoning file P183FA2015CORP submitted with the project instructions for OPR-P183-FA-2015. Zones SWA204 and SWA206 are the applicable zones for H12782.

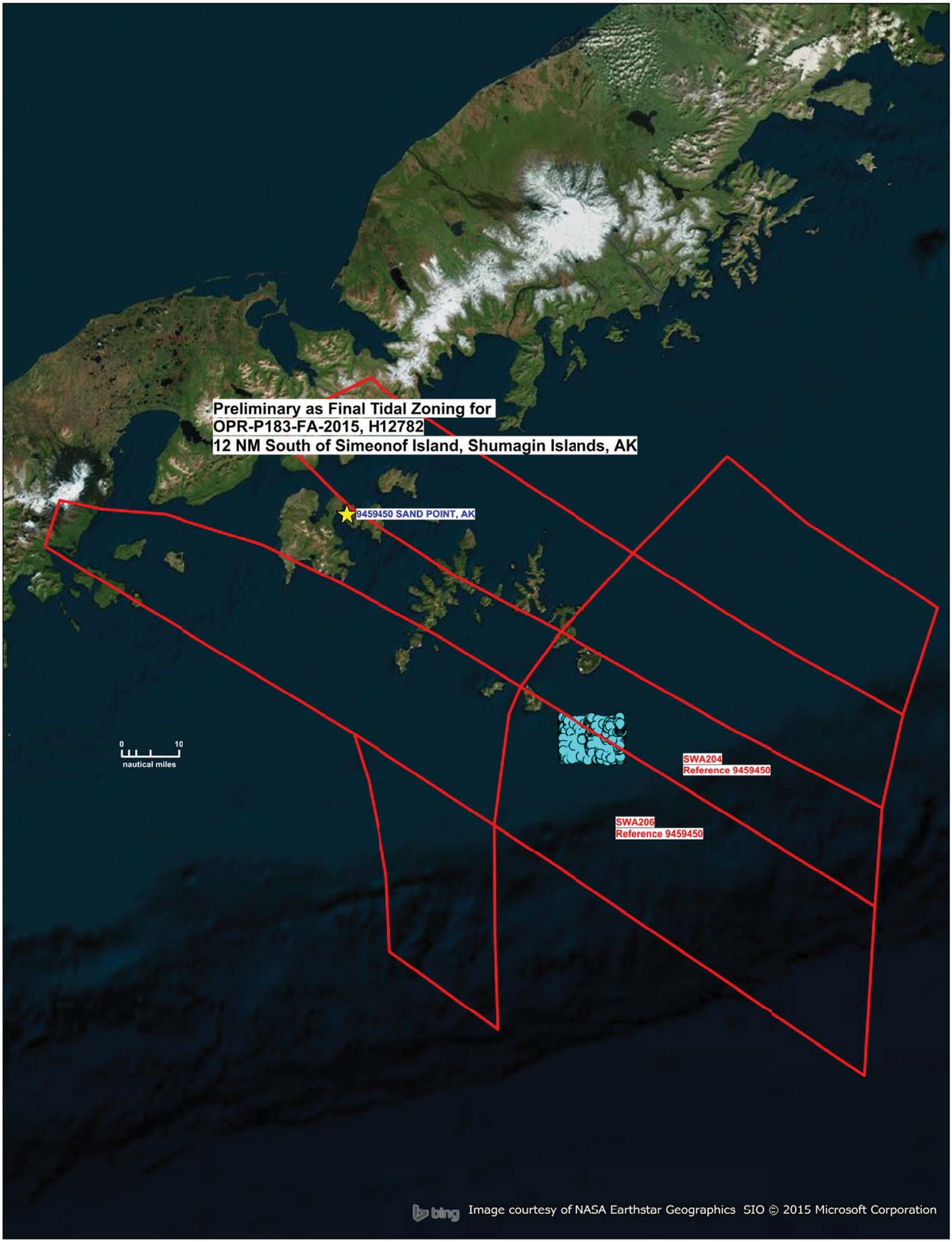
Refer to attachments for zoning information.

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: 2015.06.30 13:09:08 -04'00'

CHIEF, PRODUCTS AND SERVICES BRANCH


Preliminary as Final Tidal Zoning for
OPR-P183-FA-2015, H12782
12 NM South of Simeonof Island, Shumagin Islands, AK
9459450 SAND POINT, AK
0
10
nautical miles
SWA204
Reference 9459450
SWA206
Reference 9459450
bing
Image courtesy of NASA Earthstar Geographics SIO © 2015 Microsoft Corporation

APPROVAL PAGE

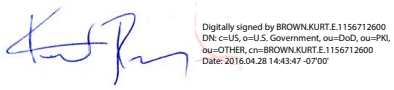
H12782

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

- H12782_DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- H12782_GeoImage.pdf

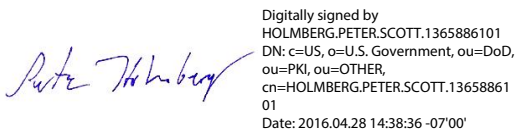
The survey evaluation and verification has been conducted according current OCS Specifications.



Approved:_____

Kurt Brown
Physical Scientist, Pacific Hydrographic Branch

The survey has been approved for dissemination and usage of updating NOAA's suite of nautical charts.



Approved:_____

Peter Holmberg
Acting Chief, Pacific Hydrographic Branch