H12454

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

DESCRIPTIVE REPORT

Type of Survey:	Navigable Area
Registry Number:	H12454

LOCALITY

State(s):	Alaska
General Locality:	Chirikof Island and Vicinity, AK
Sub-locality:	Offshore NE Chirikof Island

2012

CHIEF OF PARTY
Richard T. Brennan, CDR/NOAA

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Date:

U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	REGISTRY NUMBER:
HYDROGRAPHIC TITLE SHEET	**H12454**

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:	**Chirikof Island and Vicinity, AK**
Sub-Locality:	**Offshore NE Chirikof Island**
Scale:	**40000**
Dates of Survey:	**06/19/2012 to 08/31/2012**
Instructions Dated:	**05/15/2012**
Project Number:	**OPR-P133-RA-12**
Field Unit:	**NOAA Ship *Rainier***
Chief of Party:	**Richard T. Brennan, CDR/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. Notes in red were generated during office processing. The processing branch concurs with all information and recommendations in the DR unless otherwise noted. Page numbering may be interrupted or non-sequential. All pertinent records for this survey, including the Descriptive Report, 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 H12454

Project: OPR-P133-RA-12

Locality: Chirikof Island and Vicinity, AK

Sublocality: Offshore NE Chirikof Island

Scale: 1:40000

June 2012 - August 2012

NOAA Ship *Rainier*

Chief of Party: Richard T. Brennan, CDR/NOAA

A. Area Surveyed

The project area is referred to as Sheet 9: Offshore NE Chirikof Island within the Project Instructions. The area is offshore of the northeast corner of Chirikof Island in the Gulf of Alaska (Figure 1).

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
55° 58" 44.93' N 155° 28" 18.13' W	55° 50" 49.26' N 155° 18" 48.52' W

Table 1: Survey Limits

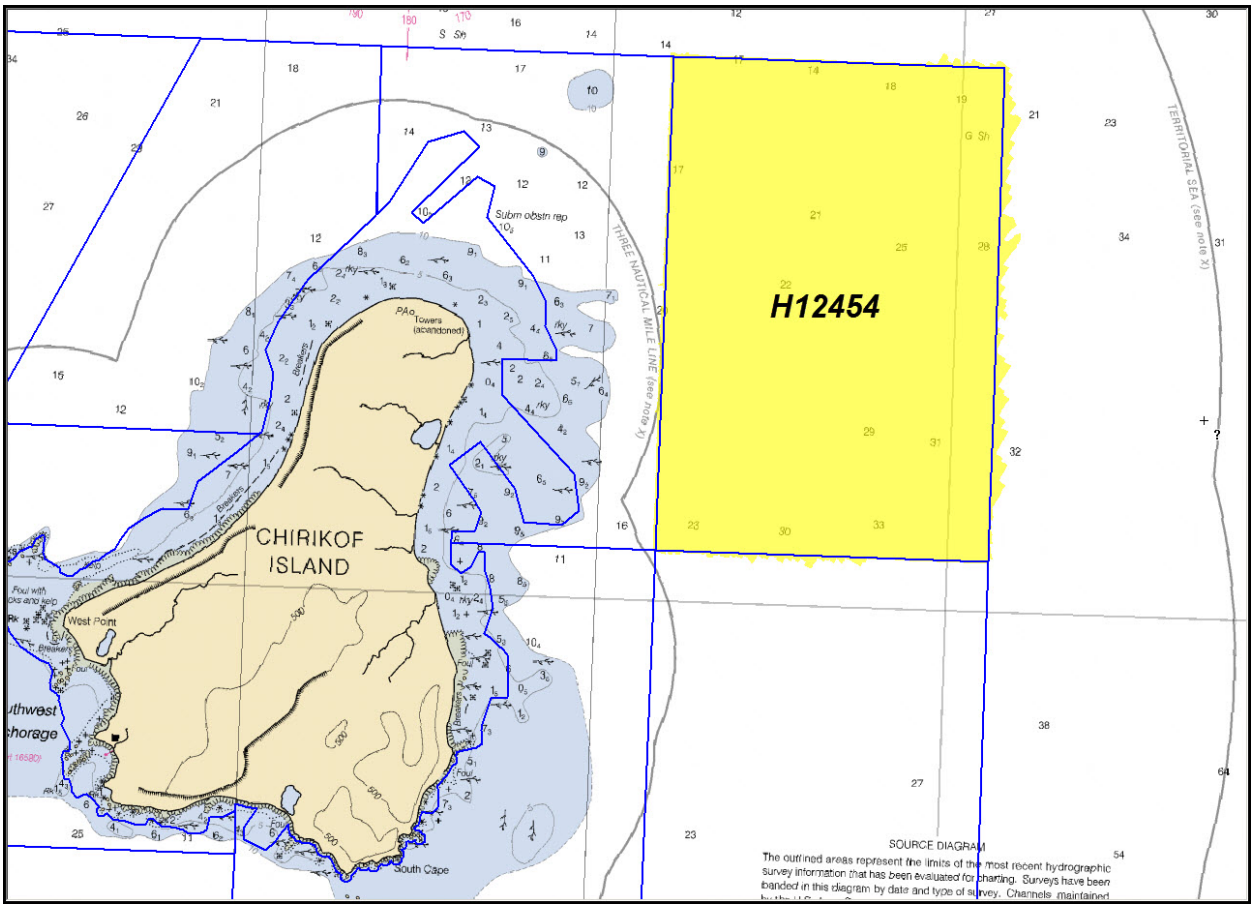


Figure 1: H12454 survey limits.

Survey limits were acquired in accordance with the requirements in the Project Instructions and the Hydrographic Surveys Specifications and Deliverables Manual (HSSDM).

A.2 Survey Purpose

This project is being conducted in support of NOAA's Office of Coast Survey to provide contemporary hydrographic data in order to update the nautical charting products and reduce the survey backlog within the area. The need for nautical chart updates are due to an increasing number of passenger vessels, tour vessels and large fishing fleets in the area. In addition, the data would be used to create DTM maps in support of the efficiencies in longline and pot fisheries, while minimizing habitat disruption.

A.3 Survey Quality

The entire survey is adequate to supersede previous data.

Data acquired on survey H12454 met complete multibeam coverage requirements, including the 5 soundings per node data density requirements outlined in Section 5.2.2.2 of the HSSDM (Figure 2). Overall, 99.9% of the nodes of H12454 are populated with 5 soundings or greater per node (Figure 3).

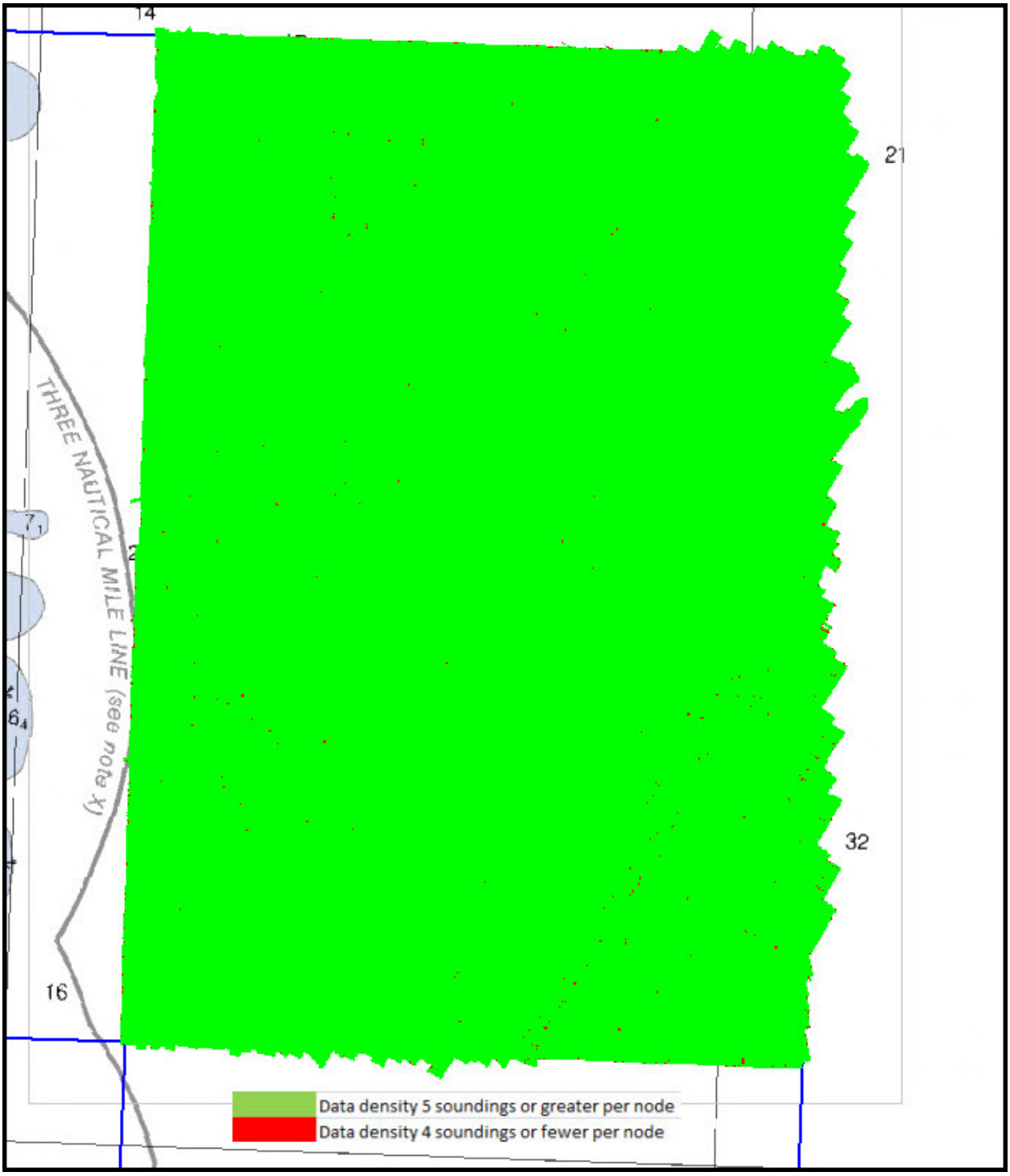


Figure 2: H12454 data density.

Resolution	Depth range	Number of nodes	Fewer than five soundings per node	Percent of nodes with greater than five soundings per node
2m	18to40m	17,272,458	11,409	99.9%
4m	36to80m	6,746,897	6,385	99.9%
	TOTAL:	24,019,355	17,794	99.9%
	TOTAL (by area):	708,160,736	591,184	99.9%

Figure 3: Summary table showing the percentage of nodes satisfying the 5 node sounding density requirements, sub-divided by the appropriate depth ranges. Note: The final row has a unit of square meters, and sums the number of different resolution nodes into a common unit of area.

A.4 Survey Coverage

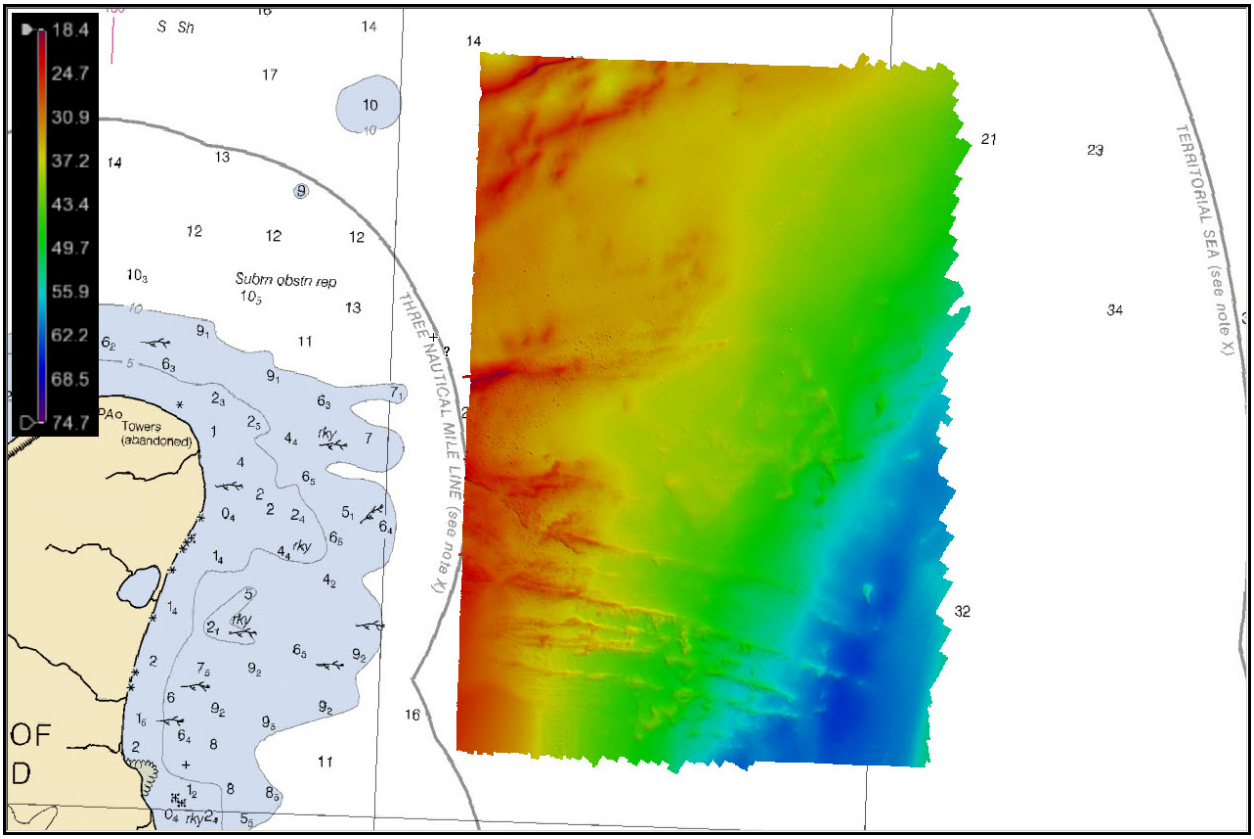


Figure 4: Acquired survey coverage overlaid on Chart 16587.

Complete multibeam echosounder (MBES) coverage was achieved within the limits of hydrography specified in the Project Instructions with the exception of multiple small holidays in the southeastern area of deeper water. These holidays are due to low data density (Figure 5). One additional holiday exists at 55/52/27.1 N 155/24/17.5 W due to the failure to anticipate a narrowing swath width as the bottom rapidly shoaled (Figure 6). These holidays do not exceed 3x3 grid nodes in size and were investigated to ensure

that least depths were found. In all cases, the significance of the holidays is minimal given the depth of the seafloor in the given area.

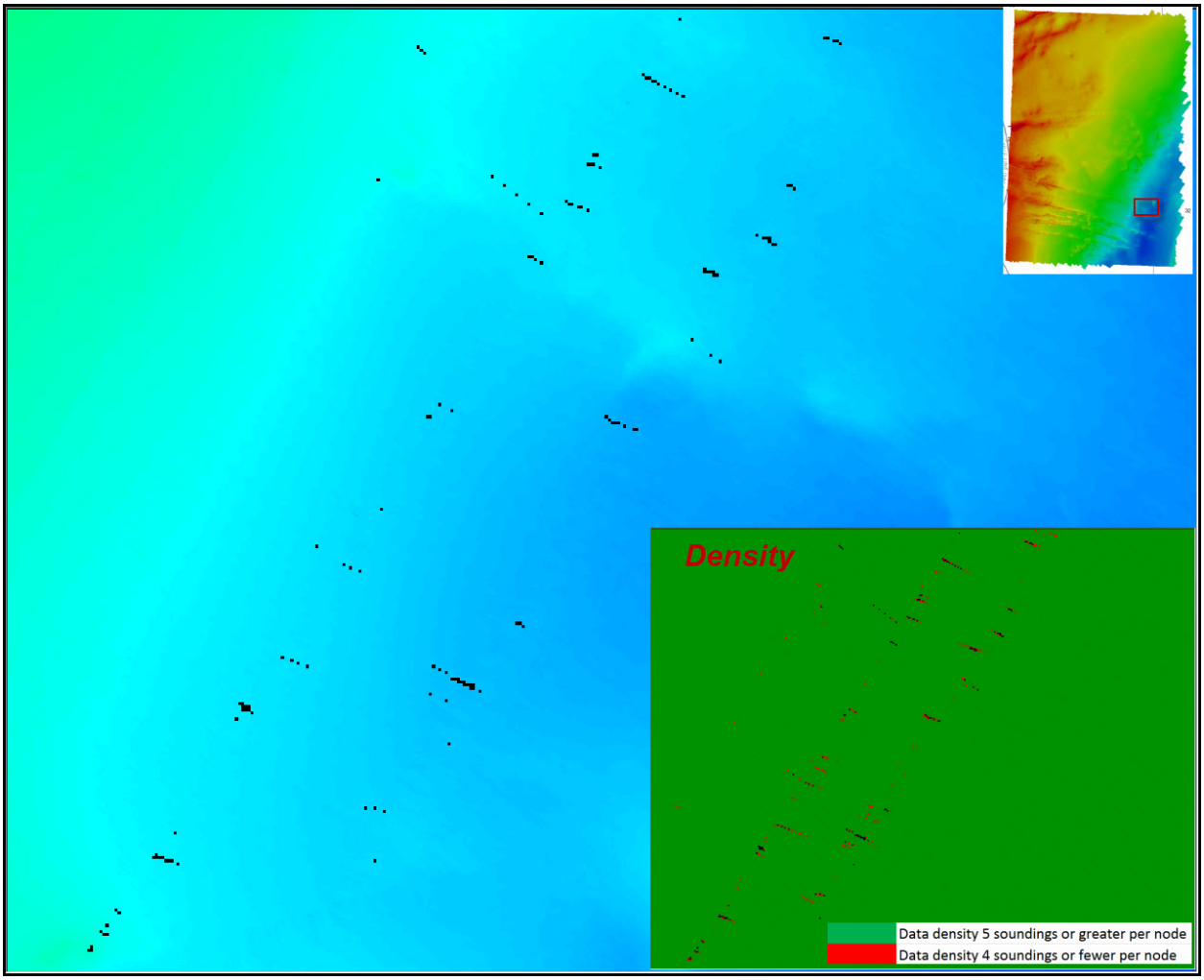


Figure 5: H12454 holidays due to low data density.

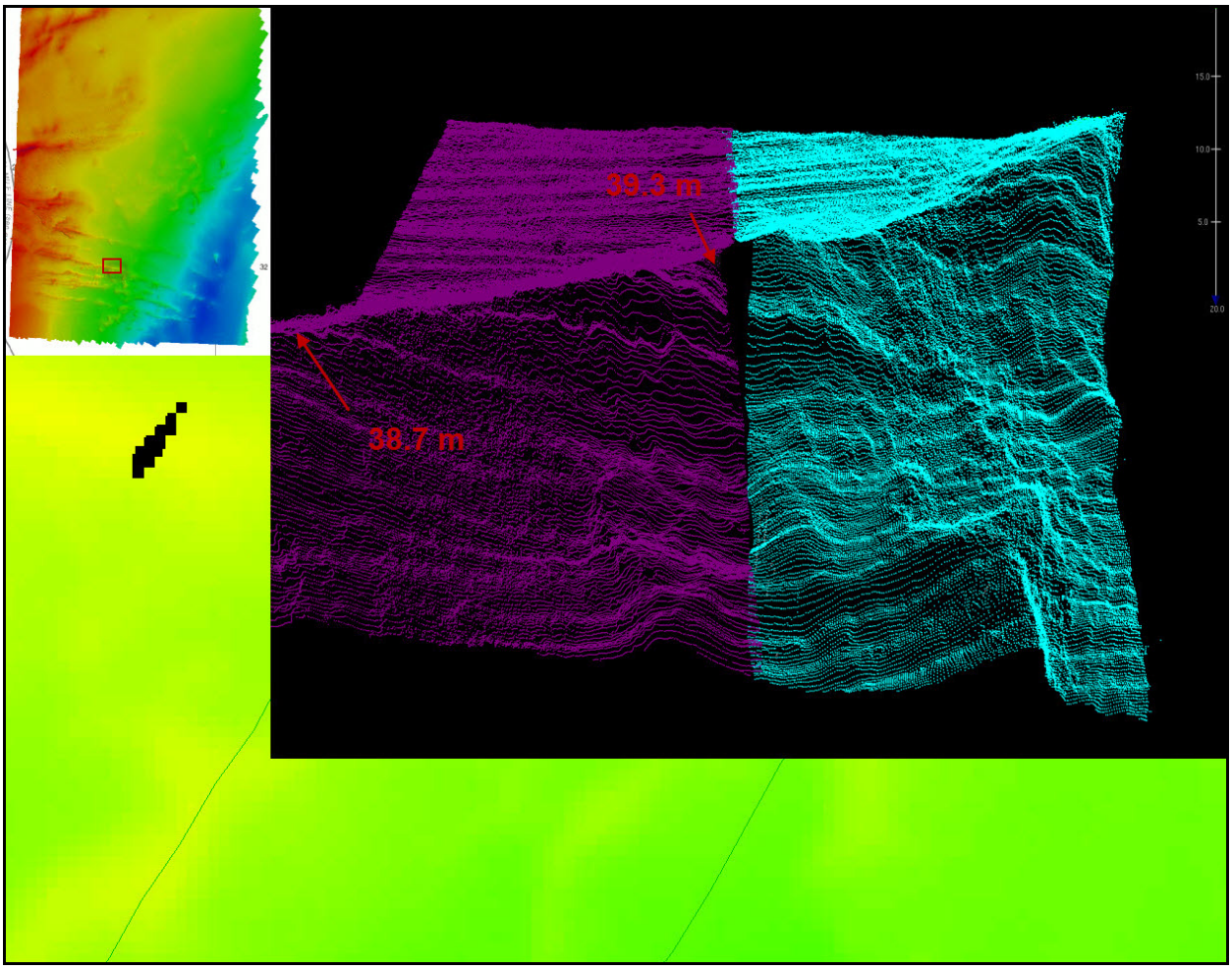


Figure 6: H12454 holiday due to sudden shoaling.

Data is adequate and within specifications to supersede charted data in the common area.

A.5 Survey Statistics

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

	Vessel	***S221***	***2801***	***2802***	***2803***	***2804***	***Total***
LNM	**SBES Mainscheme**	0	0	0	0	0	0
	MBES Mainscheme	311.2	99.4	53.9	66.7	111.8	642.9
	Lidar Mainscheme	0	0	0	0	0	0
	SSS Mainscheme	0	0	0	0	0	0
	SBES/MBES Combo Mainscheme	0	0	0	0	0	0
	SBES/SSS Combo Mainscheme	0	0	0	0	0	0
	MBES/SSS Combo Mainscheme	0	0	0	0	0	0
	SBES/MBES Combo Crosslines	0	14.3	0	0	62.0	76.3
	Lidar Crosslines	0	0	0	0	0	0
Number of Bottom Samples							6
Number AWOIS Items Investigated							0
Number Maritime Boundary Points Investigated							0
Number of DPs							0
Number of Items Items Investigated by Dive Ops							0
Total Number of SNM							44.51

Table 2: Hydrographic Survey Statistics

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

Survey Dates	Julian Day Number
06/19/2012	171
07/24/2012	206
07/25/2012	207
08/07/2012	220
08/08/2012	221
08/10/2012	223
08/11/2012	224
08/22/2012	235
08/23/2012	236
08/24/2012	237
08/30/2012	243
08/31/2012	244

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	*S-221*	*2801 (RA-4)*	*2802 (RA-5)*	*2803 (RA-3)*	*2804 (RA-6)*
LOA	231 feet	28 feet	28 feet	28 feet	28 feet
Draft	16.4 feet	3.5 feet	3.5 feet	3.5 feet	3.5 feet

Table 4: Vessels Used

Data was acquired by the RAINIER and her four survey launches (2801, 2802, 2803, and 2804). The vessels acquired MBES data, sound velocity profiles, and bottom samples.

B.1.2 Equipment

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

Manufacturer	Model	Type
Kongsberg	EM-710	MBES
Reson	7125	MBES
Applanix	POS-MV V4	Vessel Attitude and Positioning System
Seabird	SBE 19	Conductivity, Temperature, and Depth Sensor
Seabird	SBE 19 Plus	Conductivity, Temperature, and Depth Sensor
Odim Brooke Ocean (Rolls Royce Group)	MVP 200	Conductivity, Temperature, and Depth Sensor
Odim Brooke Ocean (Rolls Royce Group)	MVP 30	Conductivity, Temperature, and Depth Sensor
Reson	SVP 70	Sound Speed System
Reson	SVP 71	Sound Speed System

Table 5: Major Systems Used

B.2 Quality Control

B.2.1 Crosslines

Crosslines, acquired for this survey, totalled 8.4% of mainscheme acquisition.

Multibeam crosslines were acquired using the Reson 7125 on vessel 2801 (RA-4) and 2804 (RA-6). 76.3 NM of crosslines were acquired, which accounted for 11.8% of mainscheme hydrography. A 2-meter CUBE surface was created using strictly the mainscheme lines, while a second 2-meter CUBE surface was created using only crosslines, from which a surface difference was generated at a 2-meter resolution (Figure 8). Statistics were then derived from the difference surface and are shown in Figure 9. The average difference

between the depths derived from mainscheme and crosslines was 0.07 meters (crosslines being deeper) with a standard deviation of 0.25 meters.

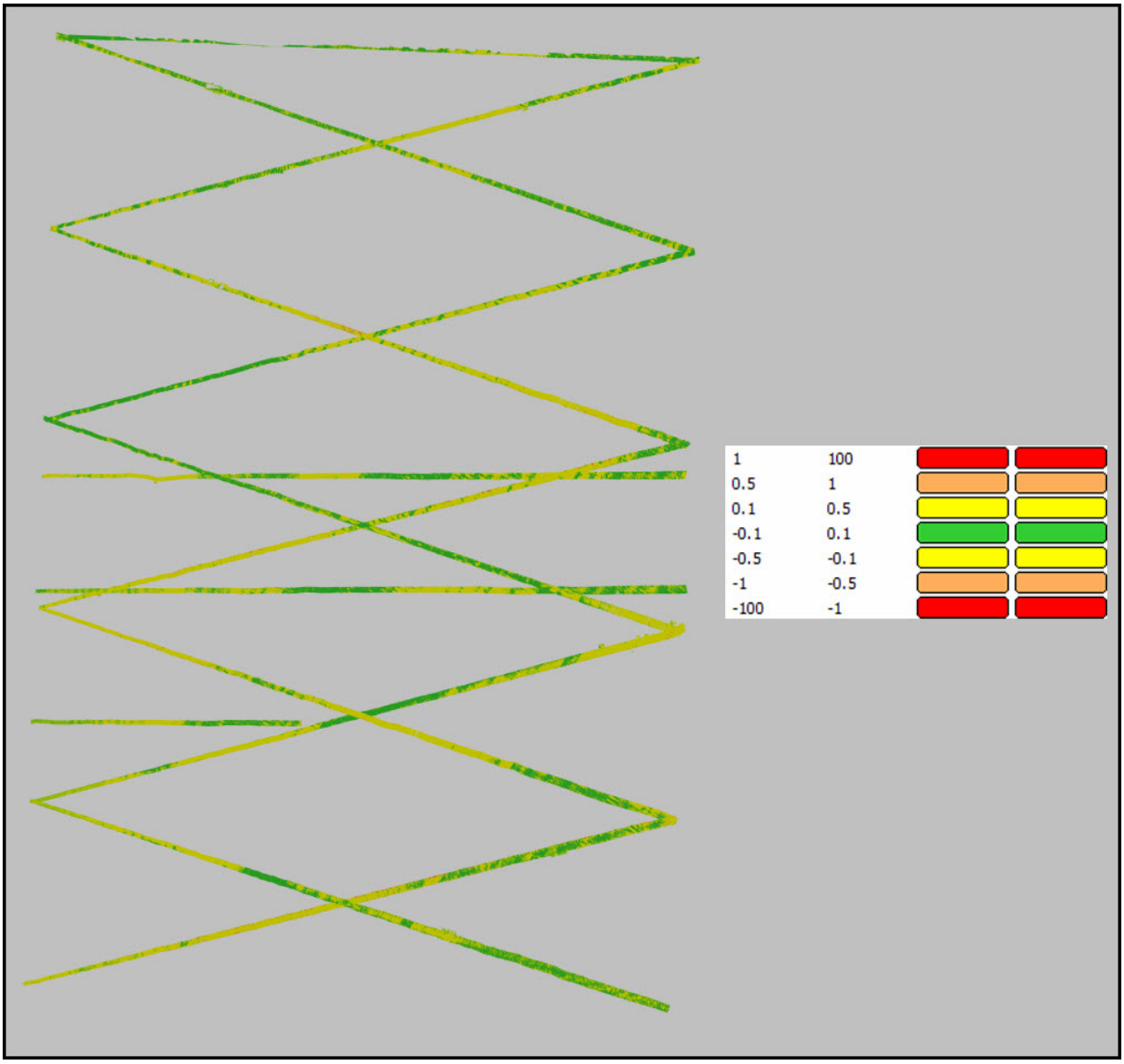


Figure 7: Crossline difference surface and distribution in meters for H12454.

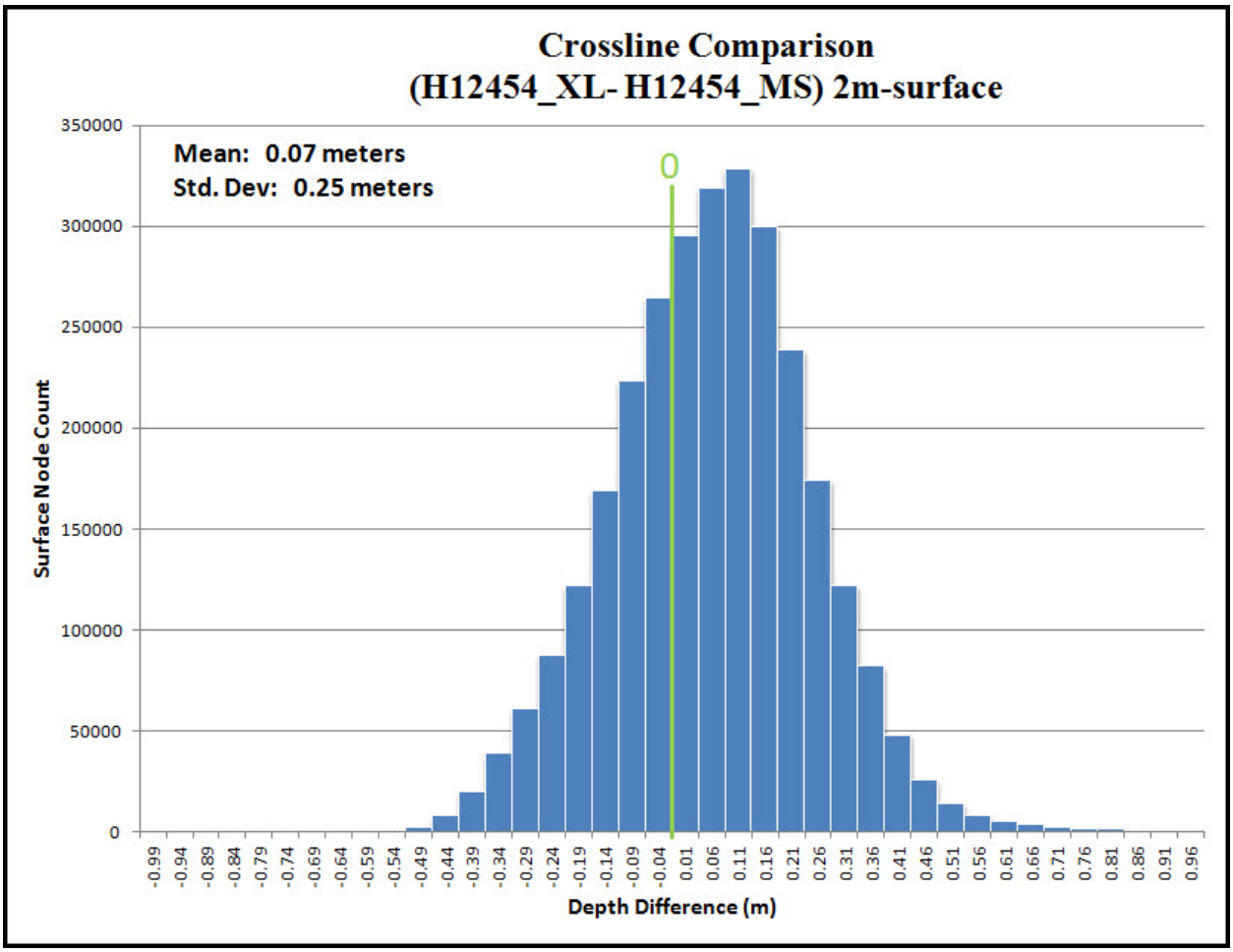


Figure 8: Difference surface statistics between mainscheme survey and crosslines for H12454. Average difference was 0.07 meters, with crosslines being the deeper of the two.

B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Measured	Zoning
0 meters	0.14 meters

Table 6: Survey Specific Tide TPU Values

Hull ID	Measured - CTD	Measured - MVP	Surface
S221		1 meters/second	.05 meters/second
2801	3 meters/second		.15 meters/second
2802	3 meters/second		.15 meters/second
2803	3 meters/second		.15 meters/second
2804	3 meters/second		.15 meters/second

Table 7: Survey Specific Sound Speed TPU Values

Uncertainty values of submitted finalized grids were calculated in CARIS using the "Greater of the Two" of among total propagated uncertainty and standard deviation (scaled to 95%). To visualize the locations in which accuracy requirements were met for each finalized surface, a custom "IHOness" layer was created, based on the difference between calculated uncertainty of the nodes and the allowable IHO uncertainty (Figure 10).

To quantify the extent to which accuracy requirements were met, the preceding "IHOness" layers were queried within CARIS and then exported to Excel (Figure 11). Note: Caris' own QC Surface Report tool was not fully used as the software would crash on the finer resolution surfaces (though the two methods produced the same results for surfaces in which both the Surface Report and the layer query were used). Overall, 100.0% of survey H12454 met the accuracy requirements stated in the HSSDM.

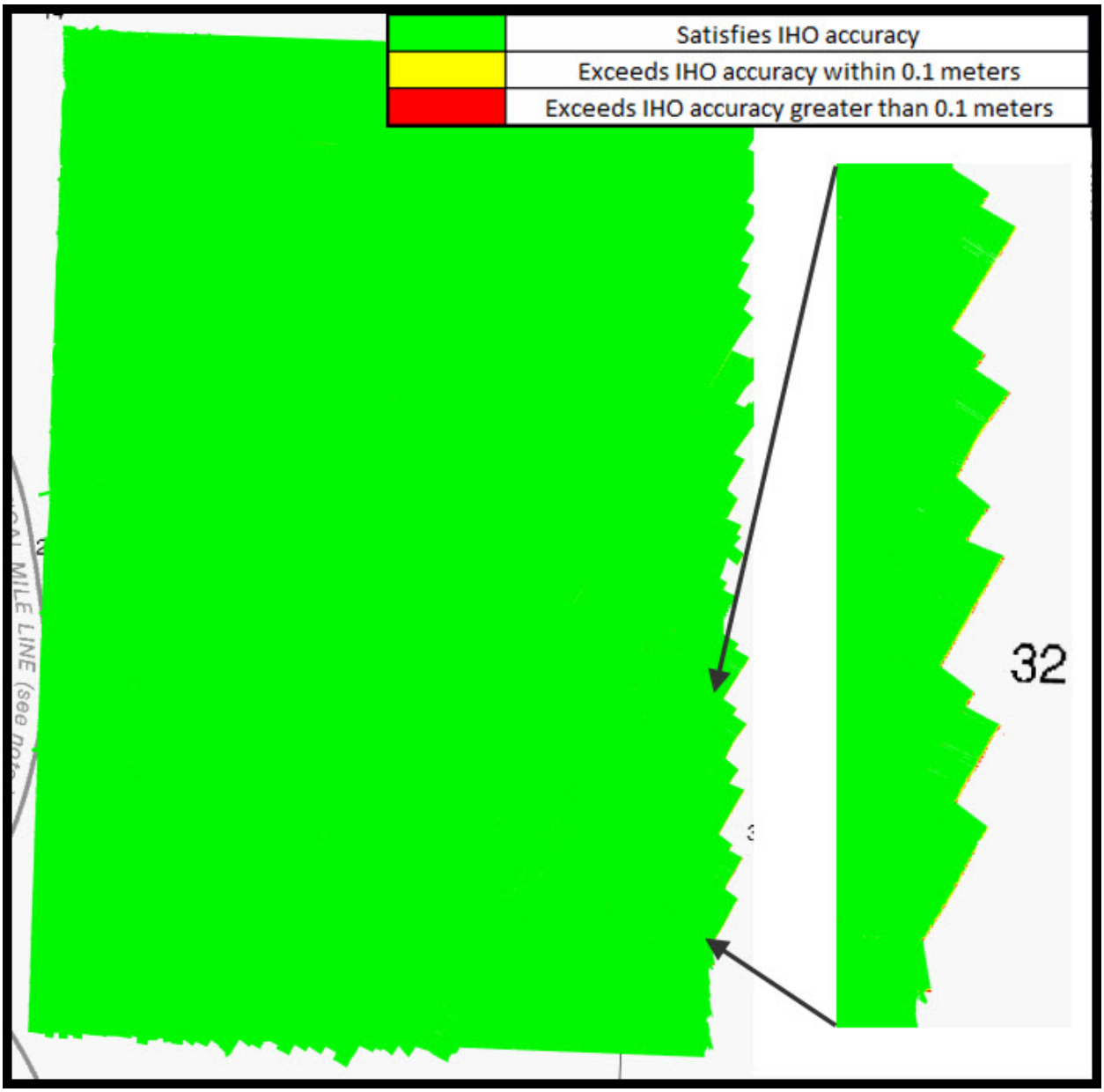


Figure 9: H12454 met the threshold IHO standards for accuracy.

H12454 IHO Accuracy Statistics					
Resolution	Depth Range	IHO Order	Number of Nodes	Nodes Satisfying IHO Accuracy	Percent nodes Satisfying IHO Accuracy
2m	18-40	Order 1a	17,348,686	17,348,684	100.0%
4m	36-80	Order 1a	6,703,808	6,703,806	100.0%
		TOTAL:	24,052,494	24,052,490	100.0%
		TOTAL (by area):	706,622,688	706,622,528	100.0%

Figure 10: Summary table showing the percentage of nodes satisfying the indicated IHO accuracy level, sub-divided by the appropriate depth ranges.

B.2.3 Junctions

Three junction comparisons were completed for H12454. All three junctioning surveys (H12449, H12450, H12455) were acquired concurrently with this survey (Figure 12). Depth comparisons were performed using the CARIS difference surfaces and Subset Editor.

The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
H12449	1:40000	2012	NOAA Ship RAINIER	SW
H12450	1:40000	2012	NOAA Ship RAINIER	W
H12455	1:40000	2012	NOAA Ship RAINIER	S

Table 8: Junctioning Surveys

H12449

Overlap with survey H12449 was a 180 by 150 meter area on the southwestern boundary of H12454. Depths in the junction area are approximately 27 meters. A difference surface analysis (Figure 13) showed H12454 to be, on average, 0.06 meters deeper than H12449 with a standard deviation of 0.08 meters (Figure 14). Migrating sand waves observed in this area are the likely explanation for the small amount of differences observed.

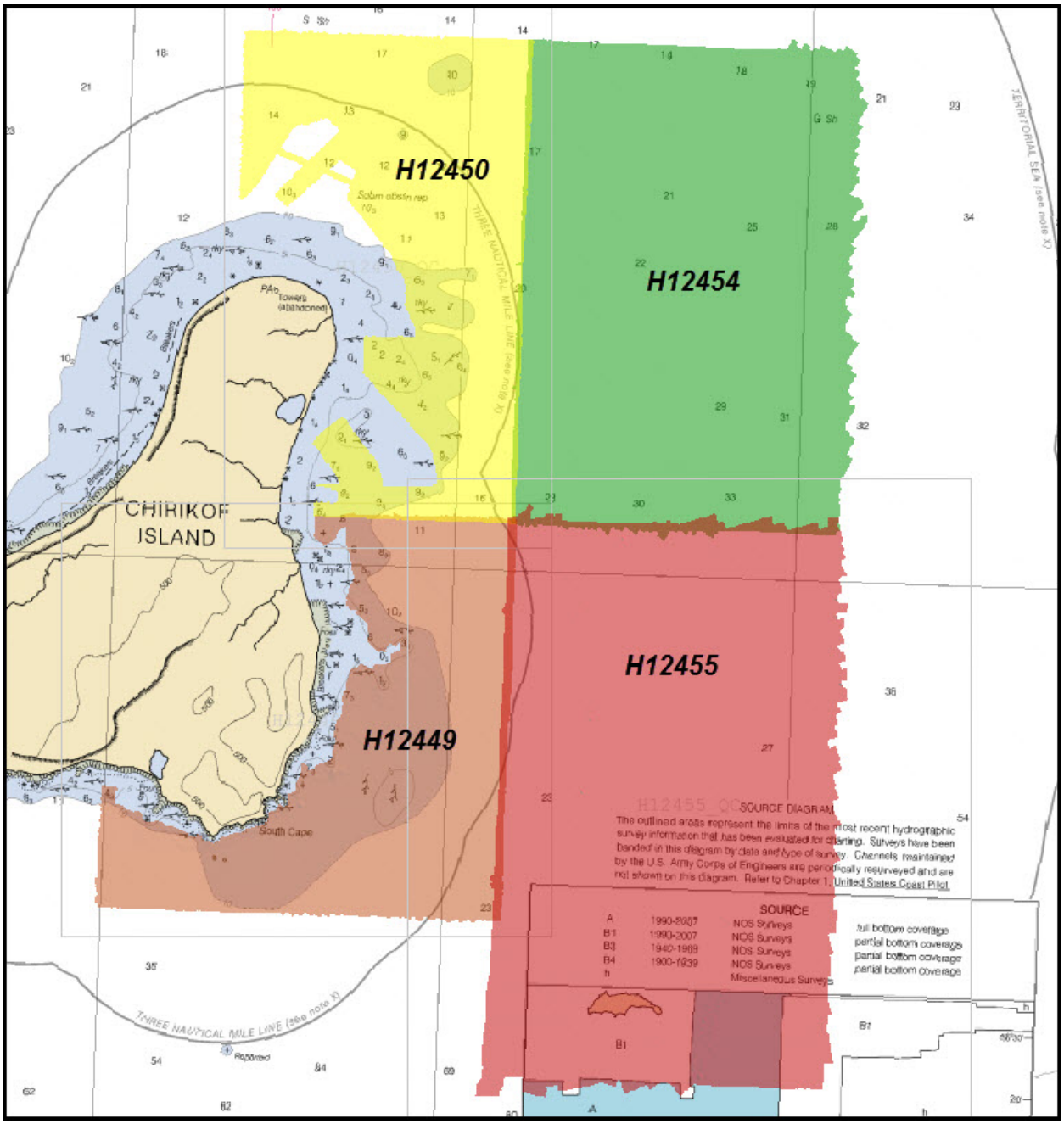


Figure 11: H12454 junction overview.

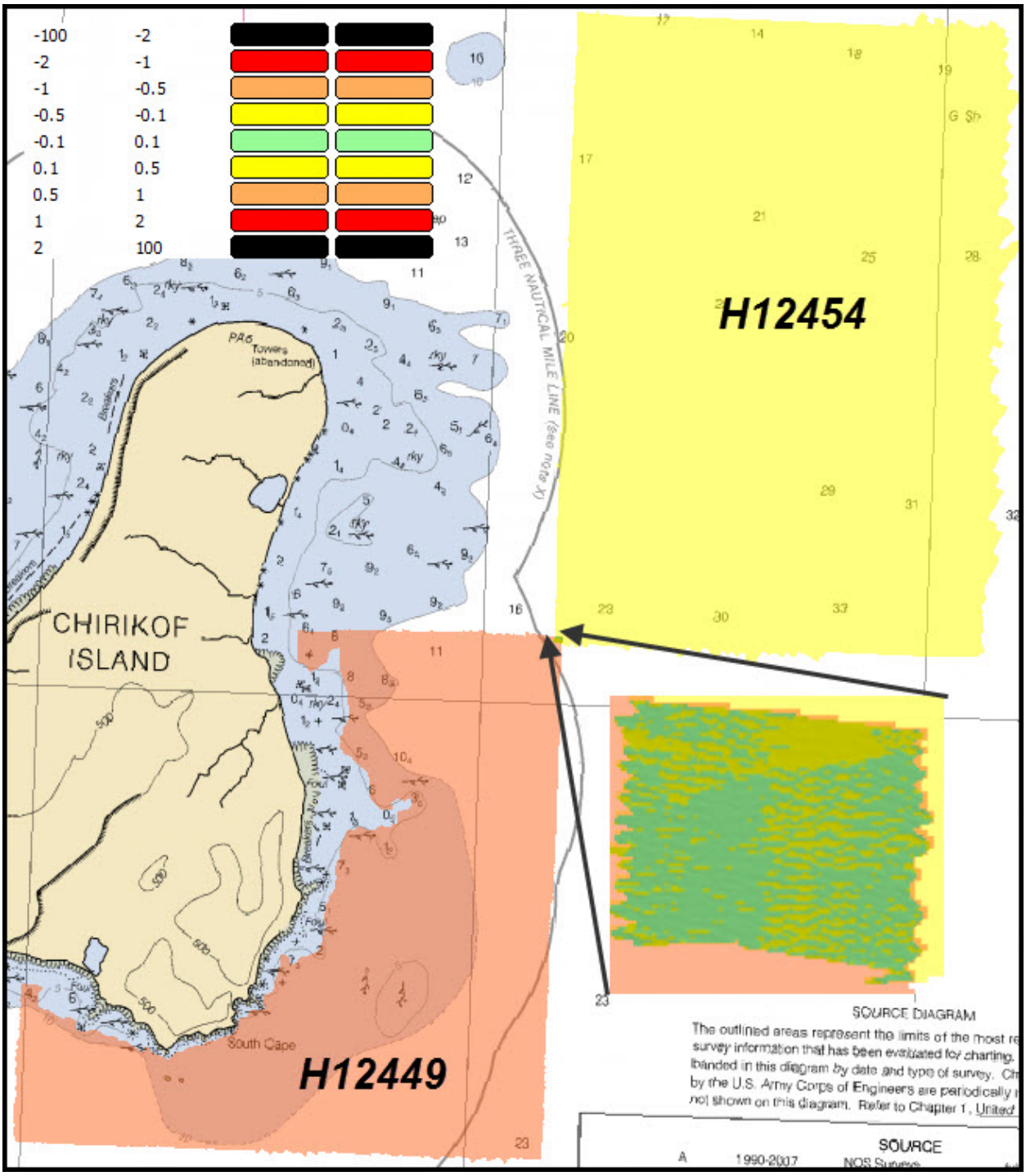


Figure 12: Junction between H12454 (yellow) and H12449 (orange) in meters on chart 16587.

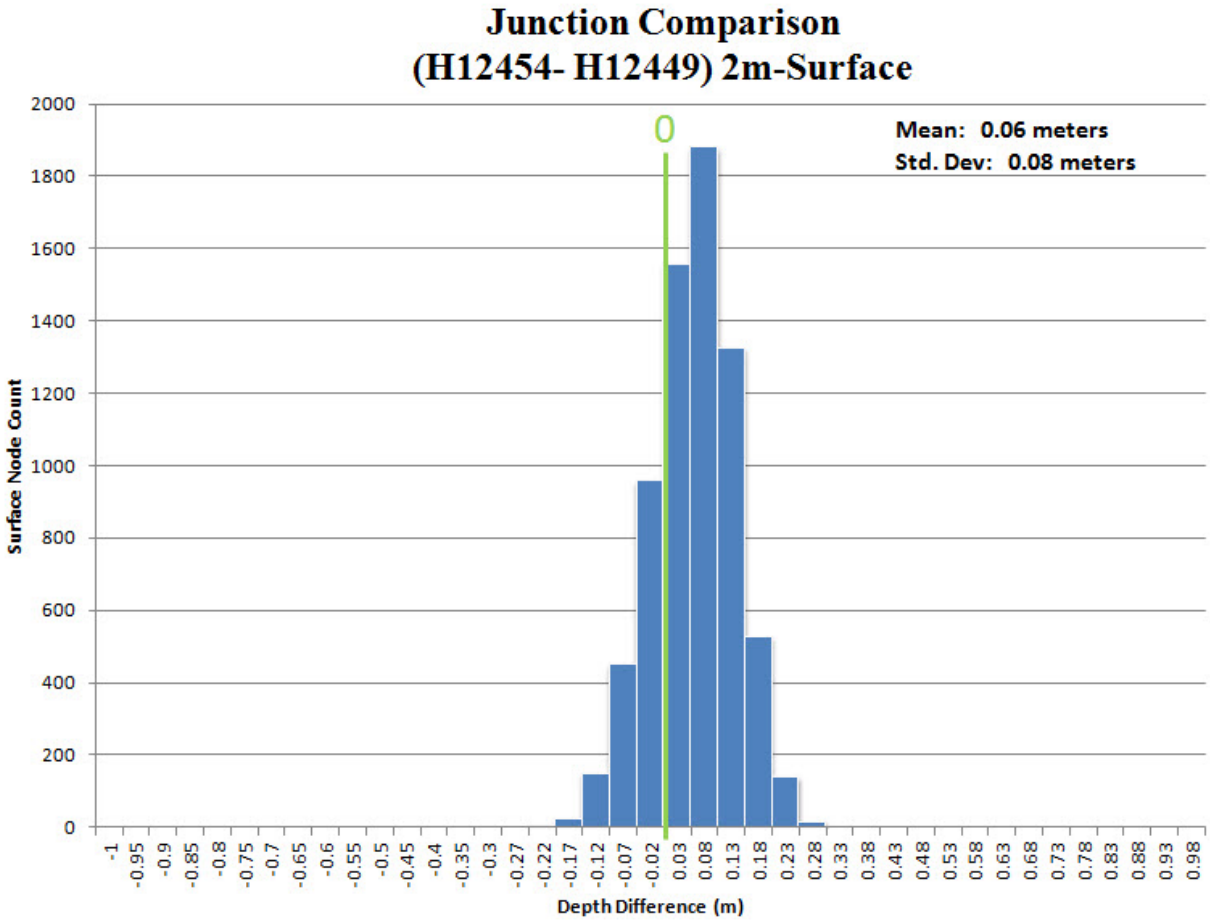


Figure 13: Difference surface statistics between junction of H12454 and H12449 2-meter surfaces.

H12450

Overlap with survey H12450 was 75 to 175 meters wide along the western boundary of H12454. Depths in the junction area are approximately 20 to 37 meters (Figure 15). A difference surface analysis showed H12450 to be, on average, 0.07 meters deeper than H12454 with a standard deviation of 0.13 meters (Figure 16). As shown in Figure 15, some of the areas of higher difference are due to either artifacts in the ship MBES data (refer to Section - B.2.5.1 Kongsberg EM710 Data Artifact) (northern inset) or shifting sand waves (southern inset).

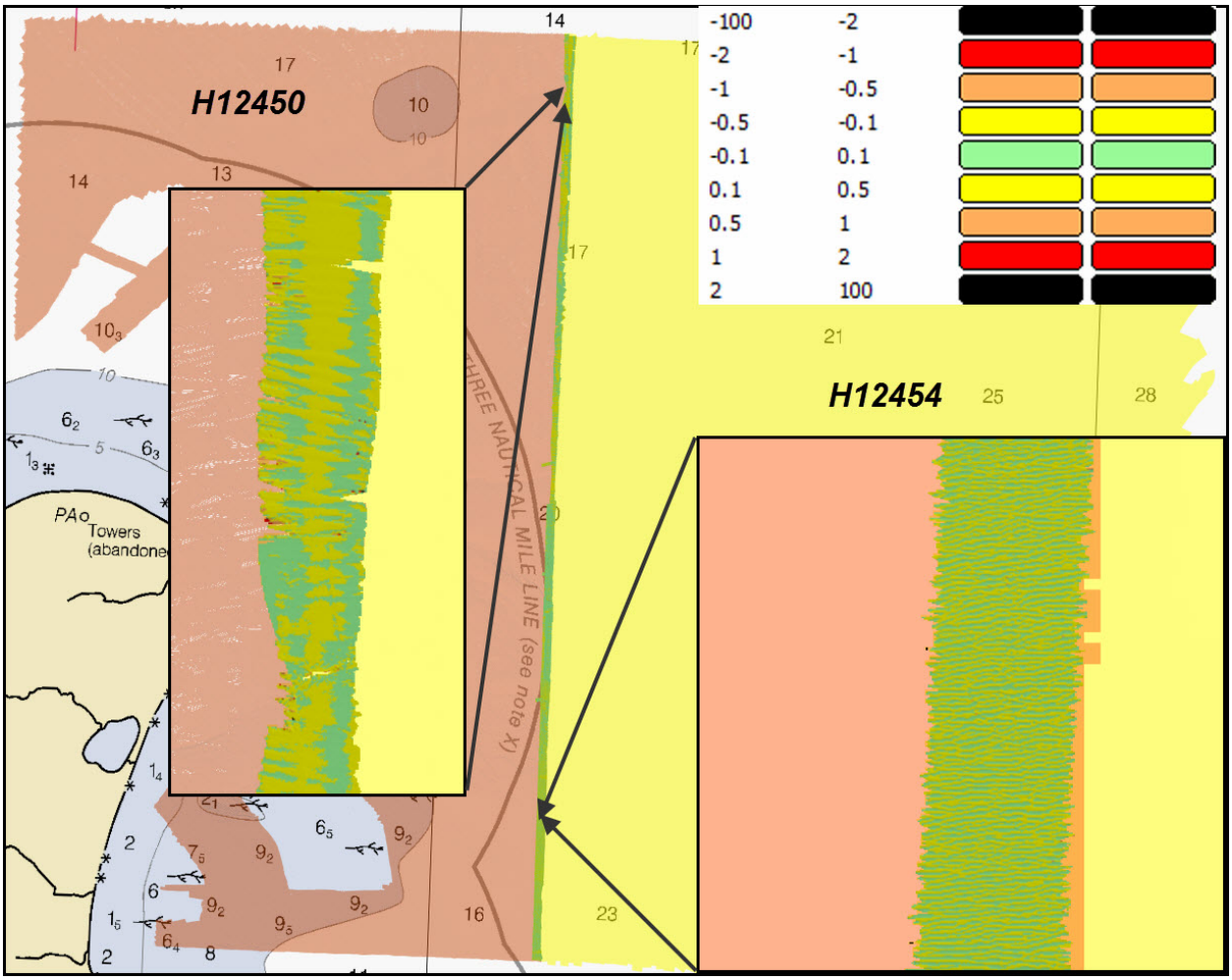


Figure 14: Junction between H12454 (yellow) and H12450 (orange) in meters on chart 16587. Insets show sources of difference; ship data artifacts in the north and sand waves in the south.

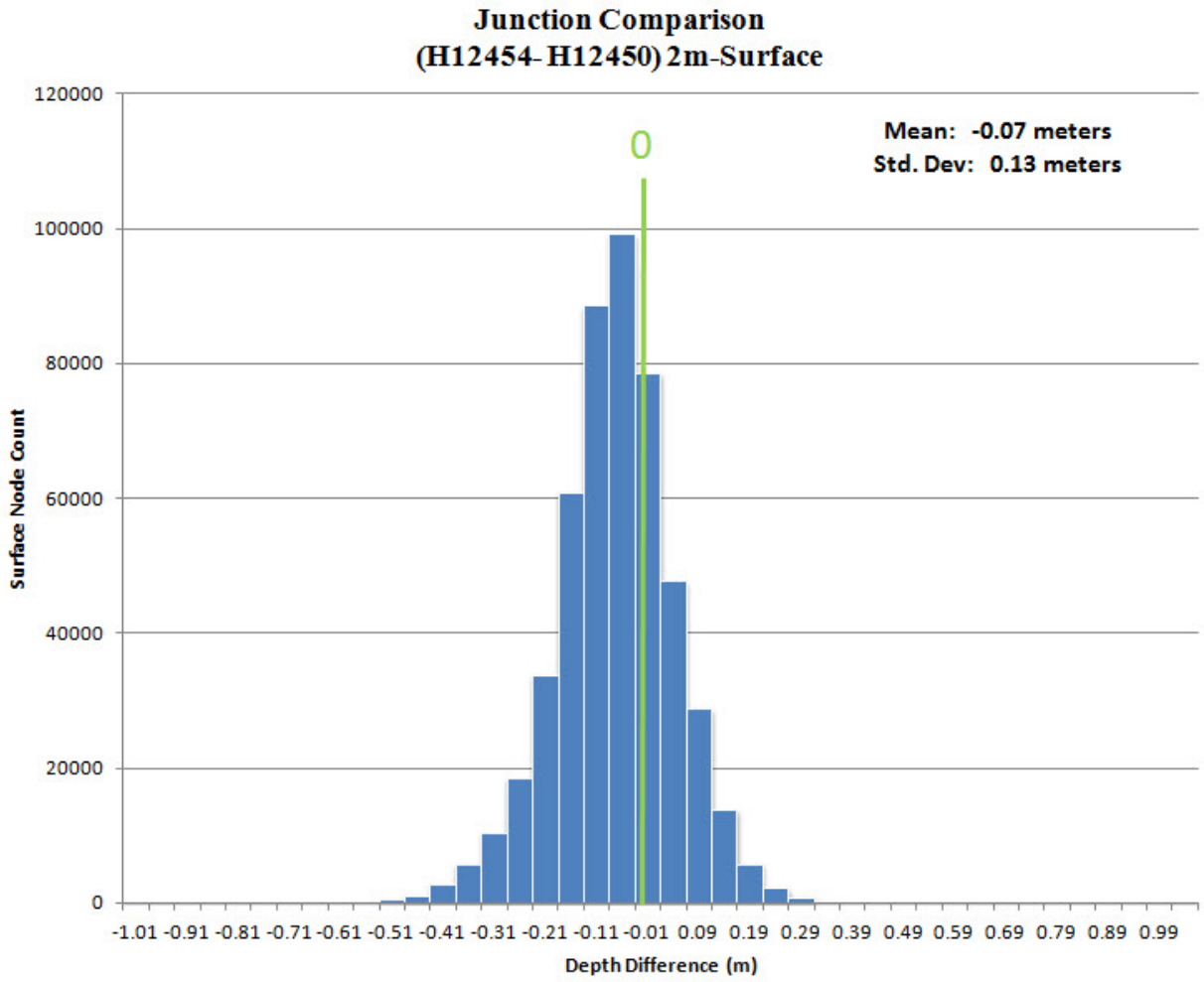


Figure 15: Difference surface statistics between junction of H12454 and H12450 2-meter surfaces.

H12455

Overlap with survey H12455 was 150 to 600 meters wide along the southern boundary of H12454. Depths in the junction area are approximately 26 to 67 meters (Figure 17). A difference surface analysis showed H12455 to be, on average, 0.17 meters deeper than H12454 with a standard deviation of 0.16 meters (Figure 18). As shown in Figure 17, some of the areas of higher difference are due to either sound velocity artifacts (eastern enlargement) or shifting sand waves (western enlargement). Note that the sound velocity artifacts observed were found in data from H12455 at the time the junction comparison was conducted and not H12454.

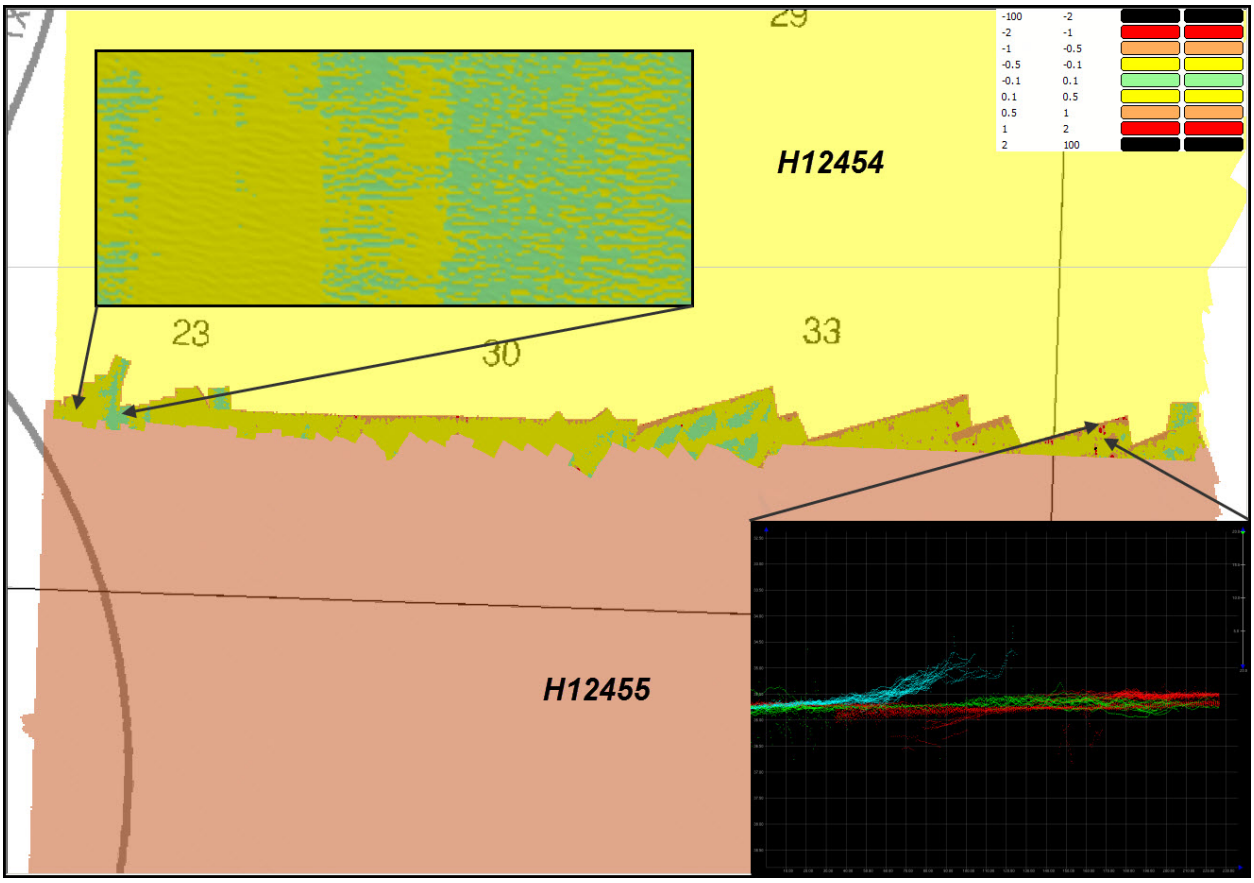


Figure 16: Junction between H12454 (yellow) and H12455 (orange) in meters on Chart 16587. Enlargements show sources of difference; sound velocity artifacts in the east and sand waves in the west.

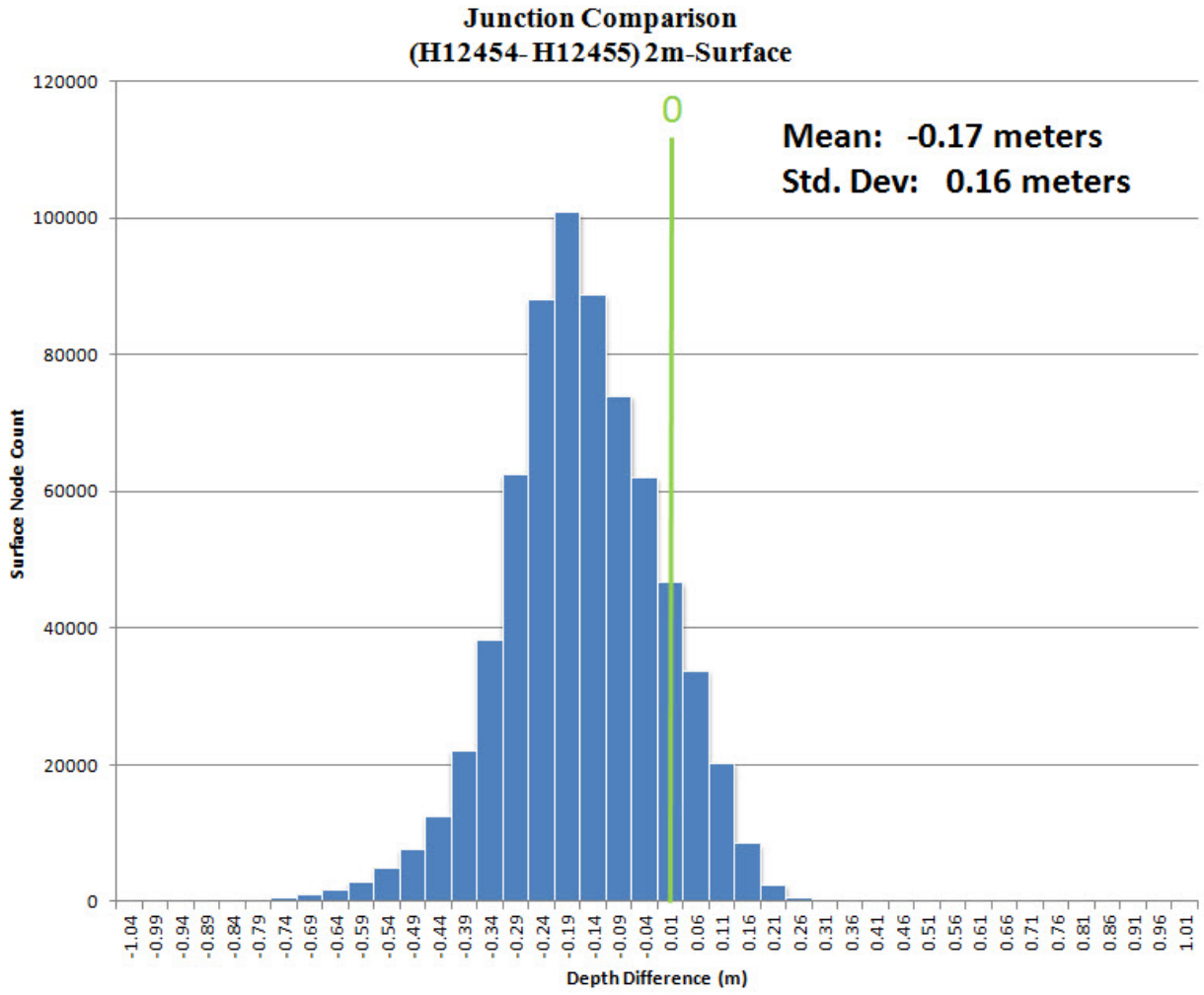


Figure 17: Difference surface statistics between junction of H12454 and H12455 2-meter surfaces.

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

Kongsberg EM710 Data Artifact

At the time of this writing, there is a suspected integration problem within RAINIER's workflow between acquired EM710 multibeam data (integrated with an Applanix POS M/V), and later processing said data within CARIS HIPS. The result is an apparent oscillation of the outerbeams, which in some cases exceeded ±0.25 meters in magnitude. For a further discussion, refer to Section B.3.1.1 - Processing EM710 data with CARIS SVC Module.

B.2.6 Factors Affecting Soundings

Conductivity Sensor Malfunction in Moving Vessel Profiler

Several sound speed casts collected by the ship were not applied to the data because of anomalous salinity profiles (Figure 19). In the erroneous casts, the MVP did not acquire the correct salinity, skewing the sound speed profile. Casts where the conductivity was less than historic ranges and significantly less than the subsequent casts were rejected.

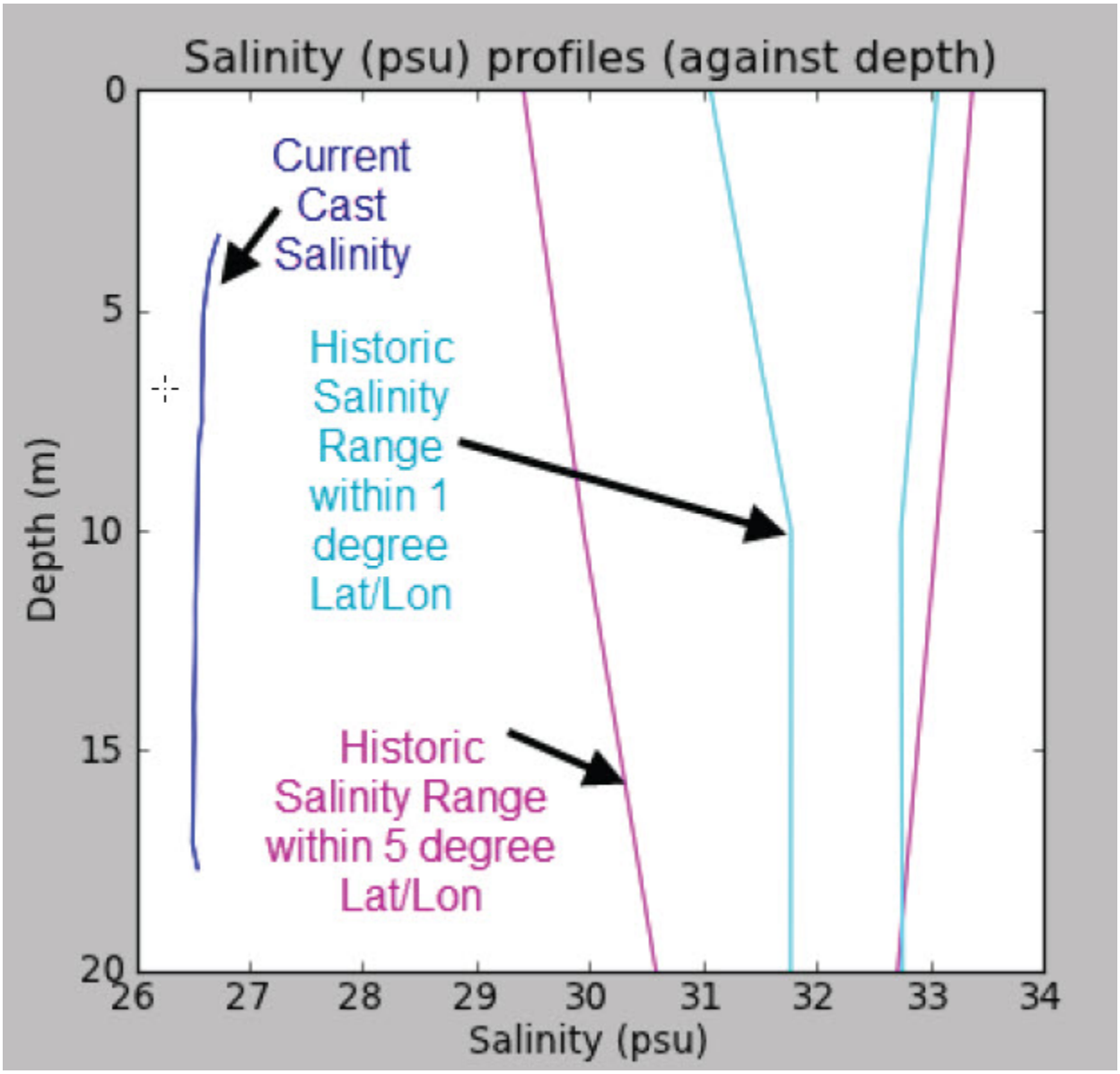


Figure 18: H12454 representative inaccurate salinity profile.

B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: Sound speed profiles were acquired using the SBE-19 and SBE-19 plus CTDs at discrete locations within the survey area approximately once every four hours, or when surveying in a new area.

Casts were aggregated into one master file for the entire survey and applied to all lines using the "Nearest in distance within time (4 hours)" selection method. This allowed the nearest cast to always be applied in cases where vessels were working in close proximity. On two separate days, two of NOAA Ship RAINIER's launches conducted acquisition concurrently in an experiment to test efficiency of a newly developed acquisition method. This new method involved the vessels acquiring data to be in close proximity to each other and in formation. Figure 20 shows mainscheme lines from DN223 (August 10) collected by 2802 (RA-5) and 2804 (RA-6). Coverage maps were exchanged from launch to launch via FreeWave radio allowing the vessels to acquire data by alternating lines. Due the the close proximity of acquisition, the Moving Vessel Profiler casts acquired by 2804 (RA-6) were applied to data collected by both launches on two separate days; 24 casts for 2801 (RA-4) on DN220 and 27 casts for 2802 (RA-5) on DN223.

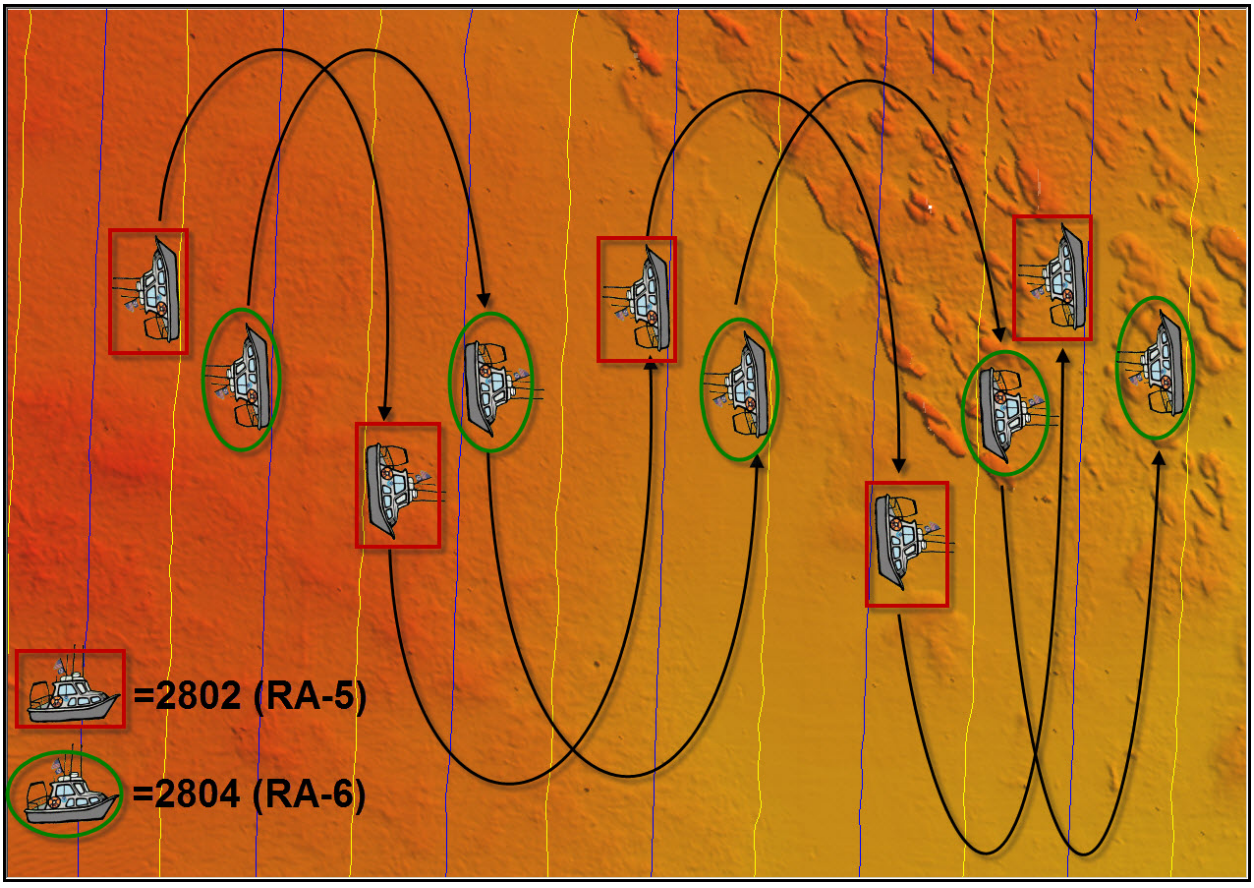


Figure 19: H12454 lines showing acquisition vessels running in formation.

B.2.8 Coverage Equipment and Methods

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

B.3 Echo Sounding Corrections

B.3.1 Corrections to Echo Soundings

B.3.1.1 - Processing EM710 data with CARIS SVC Module

At the time of this writing, both Kongsberg and CARIS have confirmed there is an error in the HIPS implementation of the Simrad Sound Velocity Correction (SVC) module, particularly when True Heave is applied to EM710 data (see Supplemental Correspondences - EM710_SV_Error_in_CARIS.pdf and TrueHeave_Error_in_CARIS.pdf). To circumvent this problem, all EM710 data was sound velocity corrected using a custom Simrad SVC-free license, which forced HIPS to use the CARIS (technically, OMG) SVC module. Figure 21 shows a comparison between the best results achieved when using the Simrad SVC module (top), and CARIS SVC module (bottom). It should be noted that a residual artifact still persists within the outerbeams (see Section B.2.5.1 - Kongsberg EM710 Data Artifact) and is being actively investigated by both ship's personnel and appropriate groups ashore.

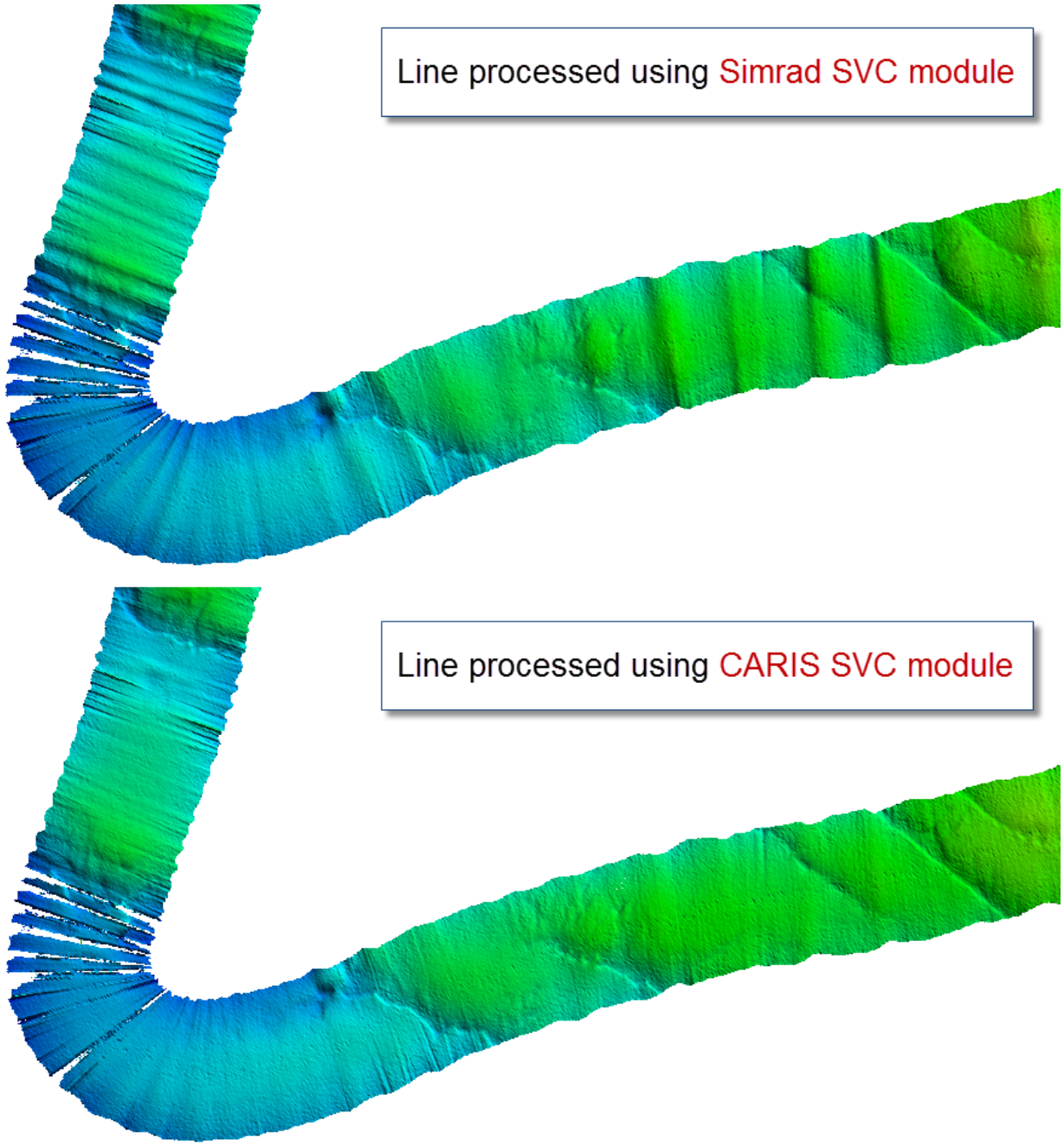


Figure 20: Comparison of gridded data when using the Simrad (top) versus CARIS (bottom) sound velocity correction module. Surfaces are not from survey H12454, but are representative of the artifact.
Supplemental Correspondences are appended to this report.

B.3.2 Calibrations

All sounding systems were calibrated as detailed in the DAPR.

B.4 Backscatter

Backscatter was logged as a 7k or .all file and submitted to NGDC. Backscatter is not included with the data submitted to the Branch.

B.5 Data Processing

B.5.1 Software Updates

There were no software configuration changes after the DAPR was submitted.

The following Feature Object Catalog was used: NOAA Catalogue Control Version 5.2 and NOAA Profile Product Version 2.0.

This survey was processed using CARIS HIPS 7.1 - Service Pack 2 - Hotfix 6. To prevent the use of the Simrad SVC, a custom HIPS license (CARIS_Cwsite1_26_04_2013_14_12_21.sit) was used. All other software programs and versions used for data processing are described in the DAPR.

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
H12454_2m	CUBE	2 meters	18 meters - 80 meters	NOAA_2m	Complete MBES
H12454_4m	CUBE	4 meters	18 meters - 80 meters	NOAA_4m	Complete MBES
H12454_2m_18to40_Final	CUBE	2 meters	18 meters - 40 meters	NOAA_2m	Complete MBES
H12454_4m_36to80_Final	CUBE	4 meters	36 meters - 80 meters	NOAA_4m	Complete MBES
H12454_4m_Combined	CUBE	4 meters	18 meters - 80 meters	NOAA_4m	Complete MBES

Table 9: Submitted Surfaces

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:

Discrete Zoning

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 10: NWLON Tide Stations

File Name	Status
9459450.tid	Final Approved

Table 11: Water Level Files (.tid)

File Name	Status
P133RA2012CORP.zdf	Final

Table 12: Tide Correctors (.zdf or .tc)

A request for final approved tides was sent to N/OPS1 on 09/01/2012. The final tide note was received on 09/10/2012.

Tide note is appended to this report.

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 5N.

The following PPK methods were used for horizontal control:

Single Base

In conjunction with this project, a GPS base station was established by RAINIER personnel on Chirikof Island. Vessel kinematic data was post-processed using Applanix POSPac processing software with Single Base processing methods described in the DAPR. PPK SBETs were applied to all survey data from DN171 (June 19) onward with exception to DN243 (August 30) which is addressed below. Spot checks in various locations showed improvement in positioning alignment between vessels and days after the application of SBETs.

The following user installed stations were used for horizontal control:

HVCR Site ID	Base Station ID
Chirikof Island, AK	N/A

Table 13: User Installed Base Stations

On DN243 (August 30), RAINIER personnel removed the base station set up on Chirikof Island prior to acquisition for that day in preparation for concluding survey operations and departing the survey area. Therefore, attitude data was processed using precise point positioning (PPP) and the resulting SBET was applied to data from this day. The data does not display any artifacts attributable to the SBETs, and positioning accuracy relative to PPK processed lines appears to be improved after application of PPP SBETs in spot CARIS Subset Editor comparisons.

The following DGPS Stations were used for horizontal control:

DGPS Stations
Kodiak (313 kHz)
Cold Bay (289 kHz)
Kenai (310 kHz)

Table 14: USCG DGPS Stations

D. Results and Recommendations

D.1 Chart Comparison

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
16587	1:135000	2	02/2012	10/30/2012	10/27/2012

Table 15: Largest Scale Raster Charts

16587

A comparison was performed with Chart 16587 (1:135000) using a CARIS sounding layer based on the 1-meter surface from H12454 and a contour layer based on an 8-meter surface generalized to 135 meters to correspond with the chart scale and eliminate small contour areas.

All soundings were examined for agreement to within 1 fathom. The data does not compare well with the charted soundings. Locations with sounding disagreements of greater than 1 fathom have been highlighted with red circles for areas that have shoaled and green circles for areas that have deepened (Figure 22). Areas that agreed to within 1 fathom are highlighted with black circles. On average, areas that are shoaler than charted soundings are approximately 3-4 fathoms shoaler and areas that are deeper than charted soundings are approximately 3-4 fathoms deeper. There is a 10 fathom sounding in the northwest corner of H12454 that will produce a new charted 10-fathom contour (Figure 23). It is recommended that H12454 data supersede all charted depths on Chart 16587.

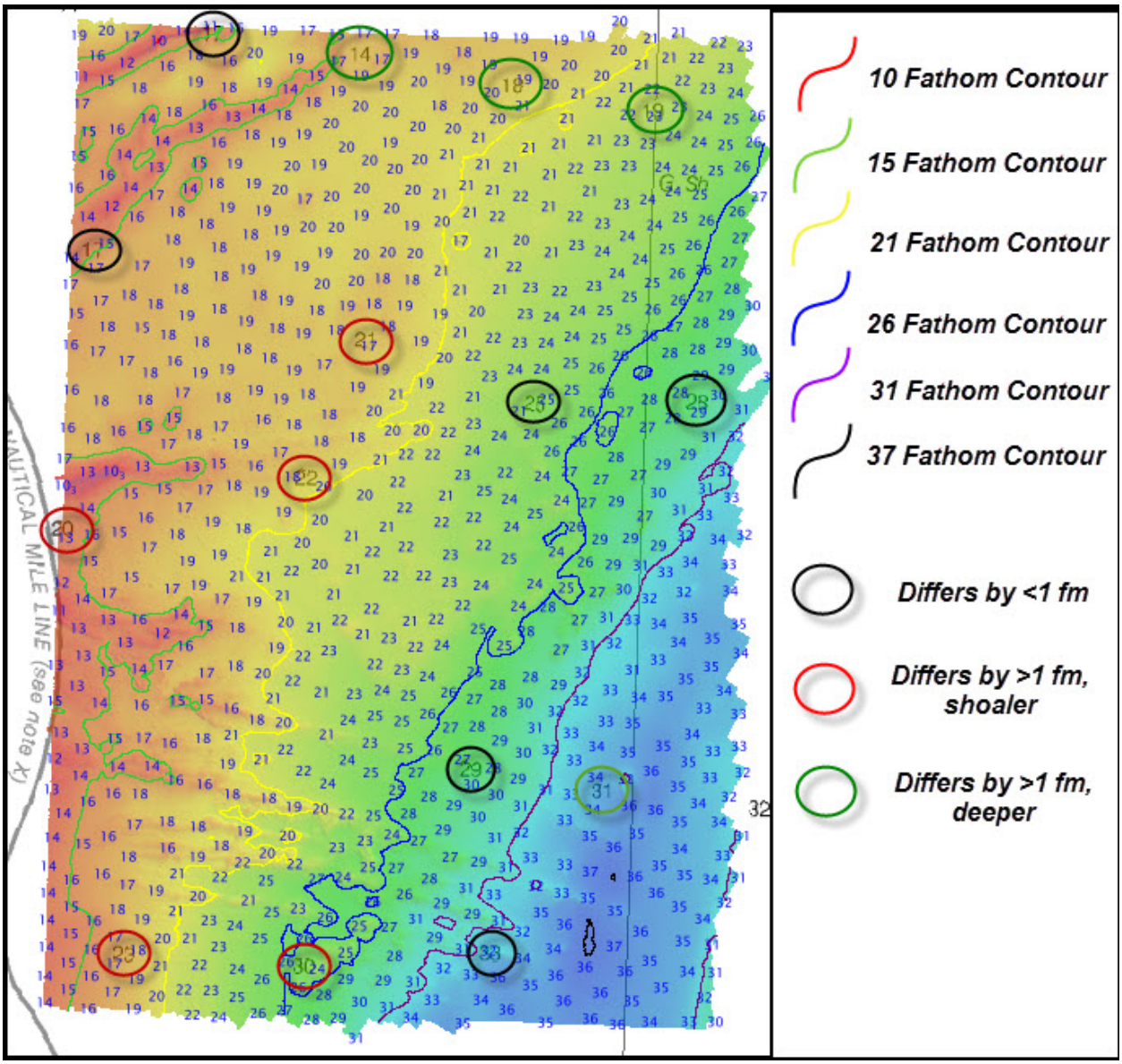


Figure 21: H12454 chart comparison.

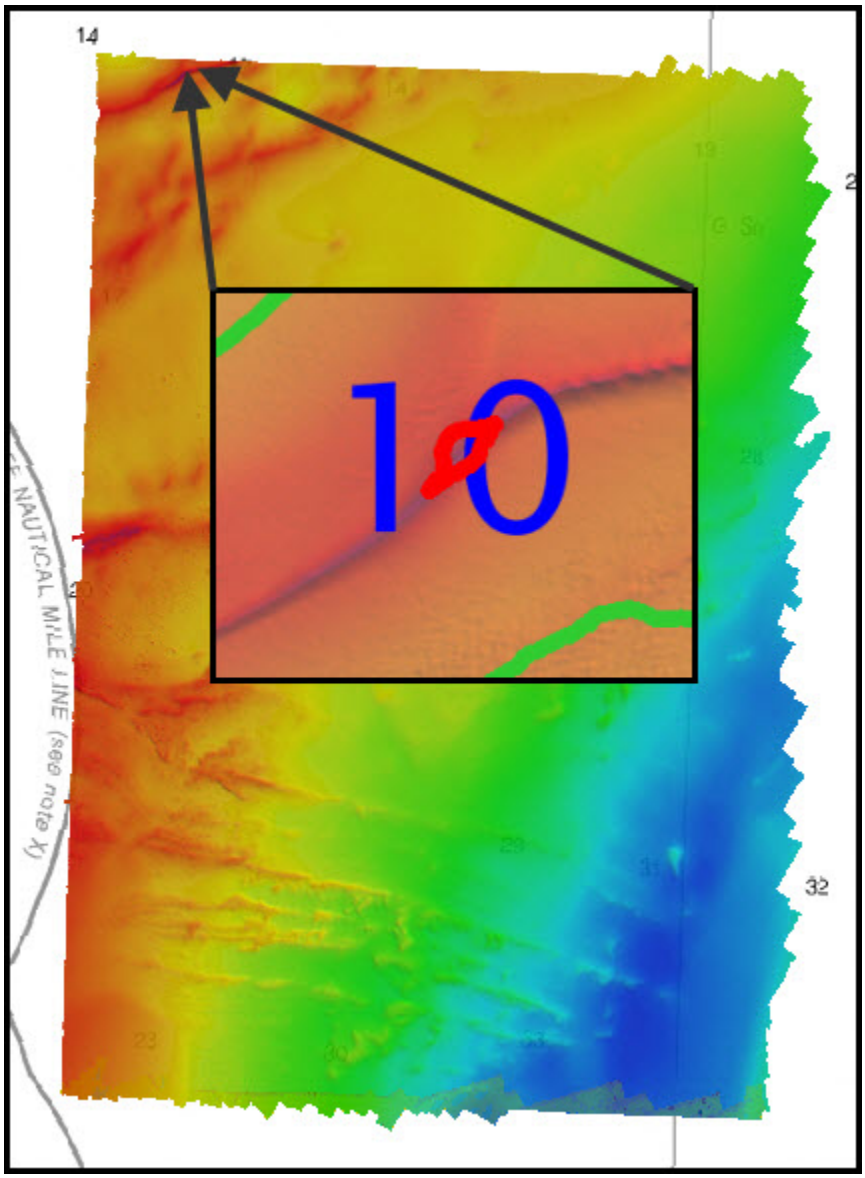


Figure 22: H12454 10-fathom contour in northwest corner.

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?
US4AK5XM	1:135000	1	01/31/2011	01/31/2011	NO

Table 16: Largest Scale ENCs

US4AK5XM

A comparison was performed with ENC US4AK5XM using the same methods as the comparison with raster Chart 16587 above (Figure 24). In all cases, soundings on US4AK5XM were observed to be shifted between 900-1,000 meters eastward from RNC soundings (Figure 25). Regardless of shift, the survey data does not compare well with the charted soundings on the ENC. It is recommended that H12454 data supersede all charted depths on ENC US4AK5XM.

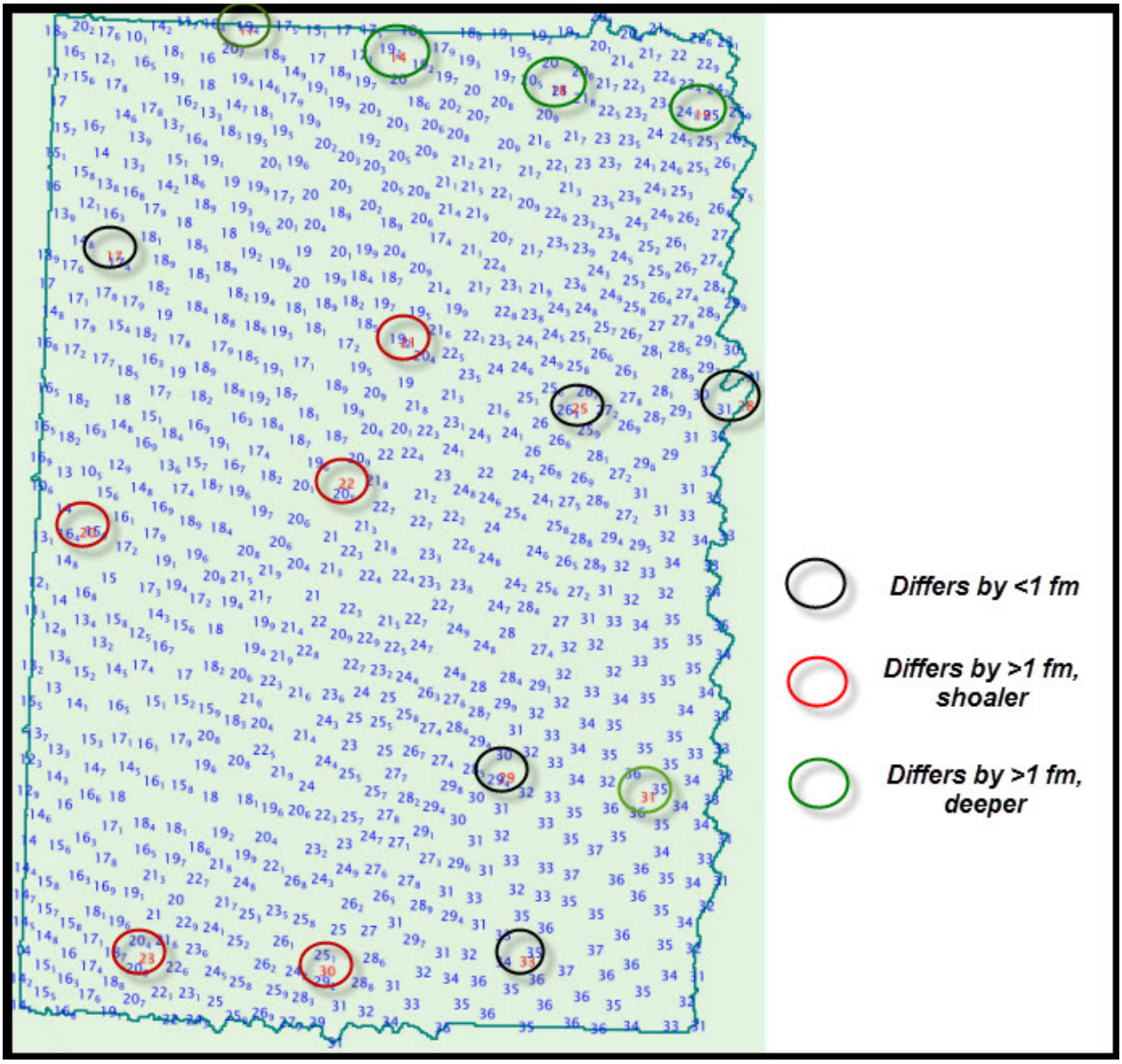


Figure 23: Chart comparison between H12454 digital data and US4AK5XM.

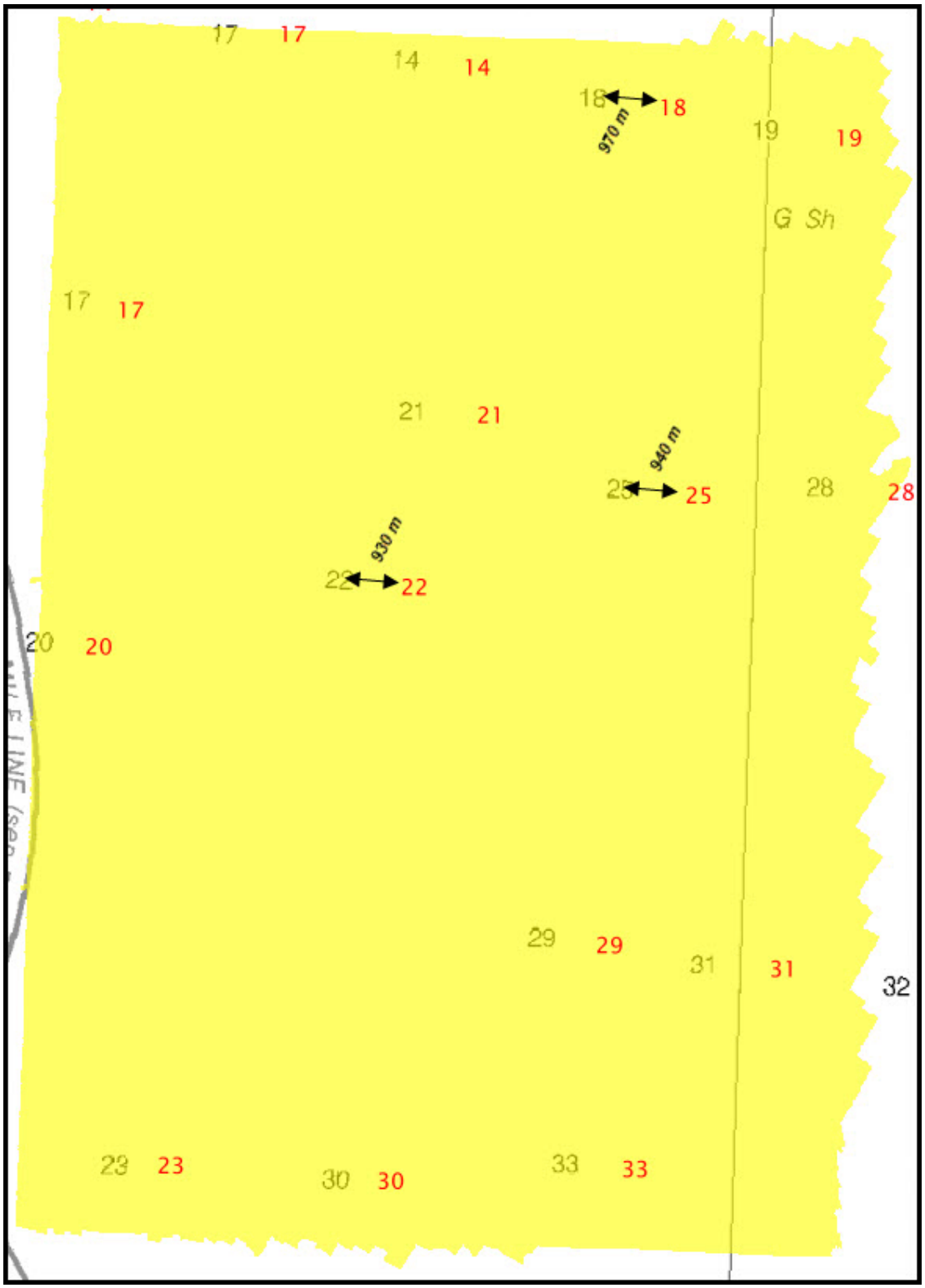


Figure 24: Chart comparison between raster 16587 and US4AK5XM. Soundings on ENC (red) are shifted 900-1,000 meters eastward relative to RNC soundings (gray).

A chart comparison for ENC US3AK5KM was not included by the field. A comparison was performed with ENC US3AK5KM (Kapp 2546; Scale 1:350000; Edition 14; Edition Date 01/2008; LNM Date

01/08/2008; NM Date 01/19/2008) using the same methods as the comparison with raster Chart 16580 above. The survey data does not compare well with the charted soundings on the ENC. In all cases, soundings on US3AK5KM had the same discrepancies as Chart 16580 discussed above. It is recommended that H12454 data supersede all charted depths on ENC US3AK5KM.

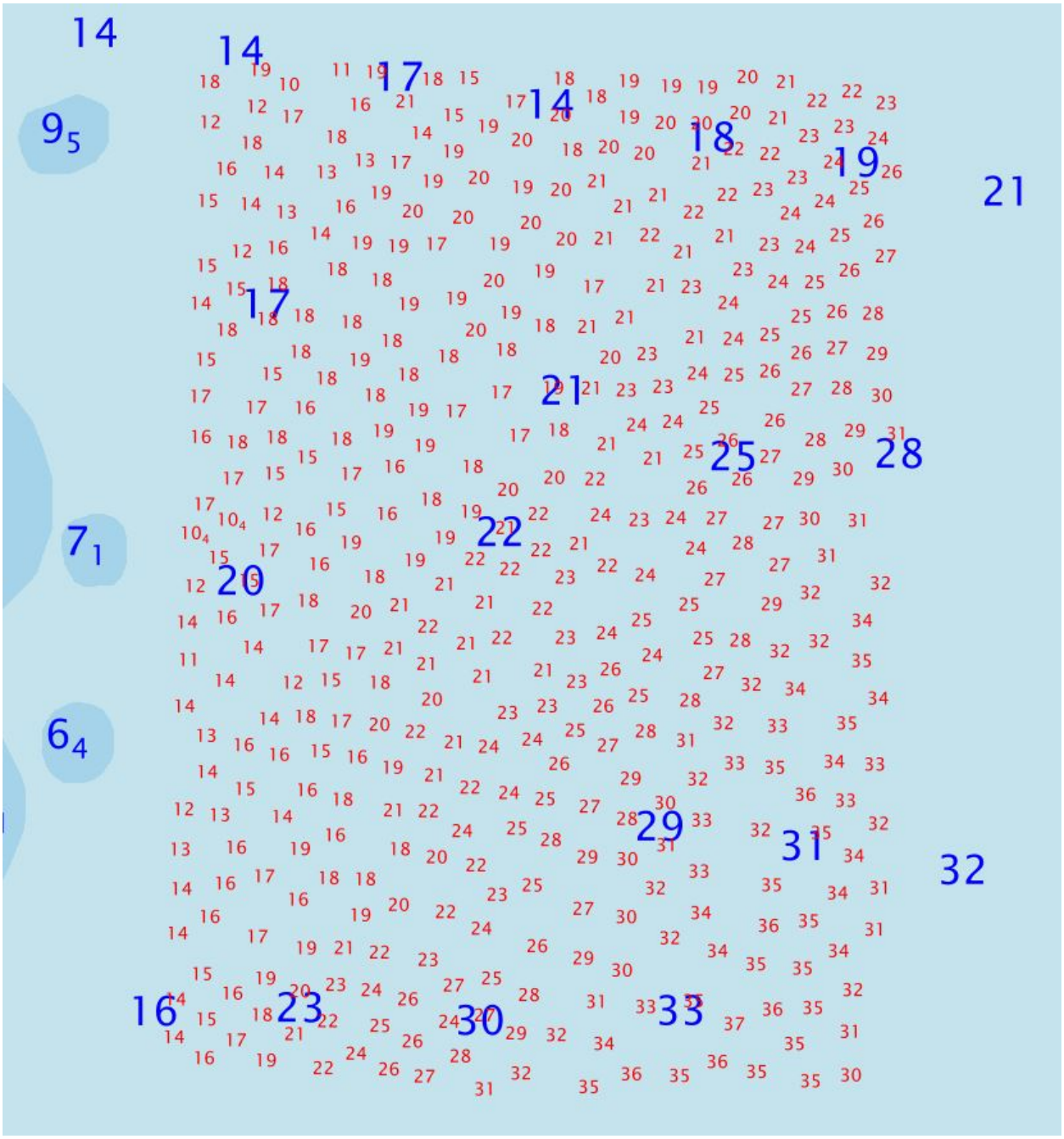


Chart comparison between H12454 survey soundings and ENC US3AK5KM.

D.1.3 AWOIS Items

No AWOIS items exist for this survey.

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. 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.1.10 Bottom Samples

Six bottom characteristics were included in the chart update product to be charted.

D.2 Additional Results

D.2.1 Shoreline

No features exist for H12454. Bottom samples were included in the Final Feature File submitted with the digital data.

D.2.2 Prior Surveys

No prior survey comparisons exist for this survey.

D.2.3 Aids to Navigation

Aids to navigation (ATONs) do not exist for this survey.

D.2.4 Overhead Features

Overhead features do not exist for this survey.

D.2.5 Submarine Features

Submarine features do not 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

There is no present or planned construction or dredging within the survey limits.

D.2.10 New Survey Recommendations

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

D.2.11 New Inset Recommendations

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, Standing and 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
Richard T. Brennan, CDR/NOAA	Commanding Officer, NOAA Ship RAINIER	05/20/2013	Richard T. Brennan 2013.05.24 15:25:54 -08'00'
Michael O. Gonsalves, LT/NOAA	Field Operations Officer, NOAA Ship RAINIER	05/20/2013	Michael O. Gonsalves 2013.05.20 11:30:47 -08'00'
James B. Jacobson	Chief Survey Technician, NOAA Ship RAINIER	05/20/2013	James Jacobson I have reviewed this document 2013.05.25 16:04:23 -08'00'
John R. Kidd, ENS/NOAA	Junior Offiecer, NOAA Ship RAINIER	05/20/2013	John R. Kidd Digitally signed by John R. Kidd DN: cn=John R. Kidd, o=NOAA, ou=Rainier, email=john.kidd@noaa.gov, c=US Date: 2013.05.24 18:14:47 -07'00'

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
TPU	Total Porpagated 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

---------- Forwarded message ----------
From: **Karen Hart** <karen.hart@caris.com>
Date: Fri, May 17, 2013 at 2:16 PM
Subject: Re: Caris and SIS QA
To: Glen Rice - NOAA Federal <glen.rice@noaa.gov>
Cc: Burns Foster <burns.foster@caris.com>, Olivia Hauser - NOAA Federal <olivia.hauser@noaa.gov>, Bill Lamey <bill.lamey@caris.com>, jamie.parsons@caris.com

Hi everyone,

I called Kongsberg (Seattle) back today to see if they would send me an email about this issue. They aren't going to, saying the email they received was cryptic and followed up by a call with someone yesterday morning, and would really like us to get technical answers from Norway. They will help identify a proper point of contact (a developer) for us there. This will have to wait until next week, however, as the entire country is on holiday until at least Tuesday.

I also asked if they thought the online SVC was working on the RA in SIS due to the reverse mount configuration. They don't know that for sure either, but it's something we will ask the developer when we speak to him.

Cheers,
Karen

> On Fri, May 17, 2013 at 12:07 PM, Karen Hart <karen.hart@caris.com> wrote:
> Hi Glen et al.,
>
> I spoke with Kongsberg (Seattle) yesterday and they informed me of the same. I am still waiting for an official email stating this, with hopefully a few more details, that I will gladly pass on to you. To be clear, we are as surprised as you are to hear that the current black box dll they gave us to use for SVC does not work. We have directly asked Kongsberg about the functionality of their solution for over a year and a half. Again this is NOT our SVC solution, but one they strongly recommend to use for any SVC of Kongsberg data...except for reversed transducers. When I spoke with folks in Seattle yesterday (who also just seemed to find this out), I informed them that at least we can use the already implemented solution from OMG for SVC to produce reasonable results.
>
> Kongsberg Seattle did pass along the recommendation to use the SIS QA "blackbox." We do not have SIS QA in our hands yet and also have asked for it repeatedly. We do not know how it works, therefore there is no current plan to implement it. They are now going to try to get it to Burns Tues or Wed next week before our trip, but there are no promises. The folks in Seattle seem to be responsive in that they will work for us to get these tools from Kongsberg Norway; however, they are not experts on the software.
>
> For now, we will be advising clients with the reverse mounted Kongsberg sonars to use the OMG/CARIS SVC (by providing them with a different license module to turn off the dll).
>
> Regards,
> Karen
>
> On 5/17/2013 11:43 AM, Glen Rice - NOAA Federal wrote:
>> Hello Caris folks,
>>
>> I talked with Kongsberg yesterday, and it sounds like there has been some communication with Caris about a resolution for the Rainier heave problem. Apparently the SVC module Caris is using does not support reversed transducers, and so Kongsberg is recommending that Caris switch to using SIS QA for reprocessing Kongsberg data. Clearly this is a longer term solution, and I am curious about your thoughts on this approach in terms of time / difficulty / etc. Do you think this is a viable solution given you history of dealing with Kongsberg?
>>
>> Thanks much,
>> Glen
>>
>> --
>> Glen Rice
>> Integrated Ocean and Coastal Mapping
>> 603-862-1397

---------- Forwarded message ----------
From: **Bill Lamey** <bill.lamey@caris.com>
Date: Thu, Apr 25, 2013 at 11:56 AM
Subject: Re: To heave or not to heave...
To: Glen Rice - NOAA Federal <glen.rice@noaa.gov>
Cc: Janice Eisenberg - NOAA Federal <janice.eisenberg@noaa.gov>, Olivia Hauser <Olivia.Hauser@noaa.gov>, Burns Foster <burns.foster@caris.com>, Karen Hart <karen.hart@caris.com>

Hi Glen,

Ok, I have some good news (sort of). I think I've proven that the issue with the heave compensation is indeed with the combination of Kongsberg SVC and TrueHeave application. As I described earlier, we have two possible algorithms for SVC when dealing with Kongsberg data. That is, the Kongsberg supplied 'black box' and the original OMG implementation.

So I processed the data using both algorithms, and the 'OMG' version seems to mostly (if not completely) compensate for the artifacts. There still seem to be some 'wobbles' in the outer beams, but these look more like roll artifacts to me. However, disabling the Kongsberg SVC is not really something the user can easily do (and not something we or Kongsberg promote). You'd need to get new HIPS license string that does *not* have the Kongsberg SVC license bit in it. However, if you would like one for further evaluation, I'm sure we can arrange it.

Unfortunately, this means that that usual Kongsberg workflow is broken right now when applying TrueHeave, and unfortunately we are a bit stuck waiting for some information from Kongsberg to help us better understand how to feed the 'black box' the right information in order to get this working properly.

I've attached a report that outlines my results. I also can make any of my data (surfaces, HIPS lines, vessel files, screen grabs, etc) available via FTP if you wish. Just let me know.

Cheers,
Bill.

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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : September 05, 2012

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-P133-RA-2012
HYDROGRAPHIC SHEET: H12454

LOCALITY: Offshore West Chirikof Island, Chirikof Island and Vicinity, AK
TIME PERIOD: June 19 - August 31, 2012

TIDE STATION USED: 9459450 Sand Point, AK
Lat. 55° 20.2'N Long. 160° 30.1' 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-P133-RA-2012, H12454, during the time period from June 19 to August 31, 2012.

Please use the zoning file P133RA2012CORP submitted with the project instructions for OPR-P133-RA-2012. Zones SWA145, SWA146, SWA175 and SWA180 are the applicable zones for H12454.

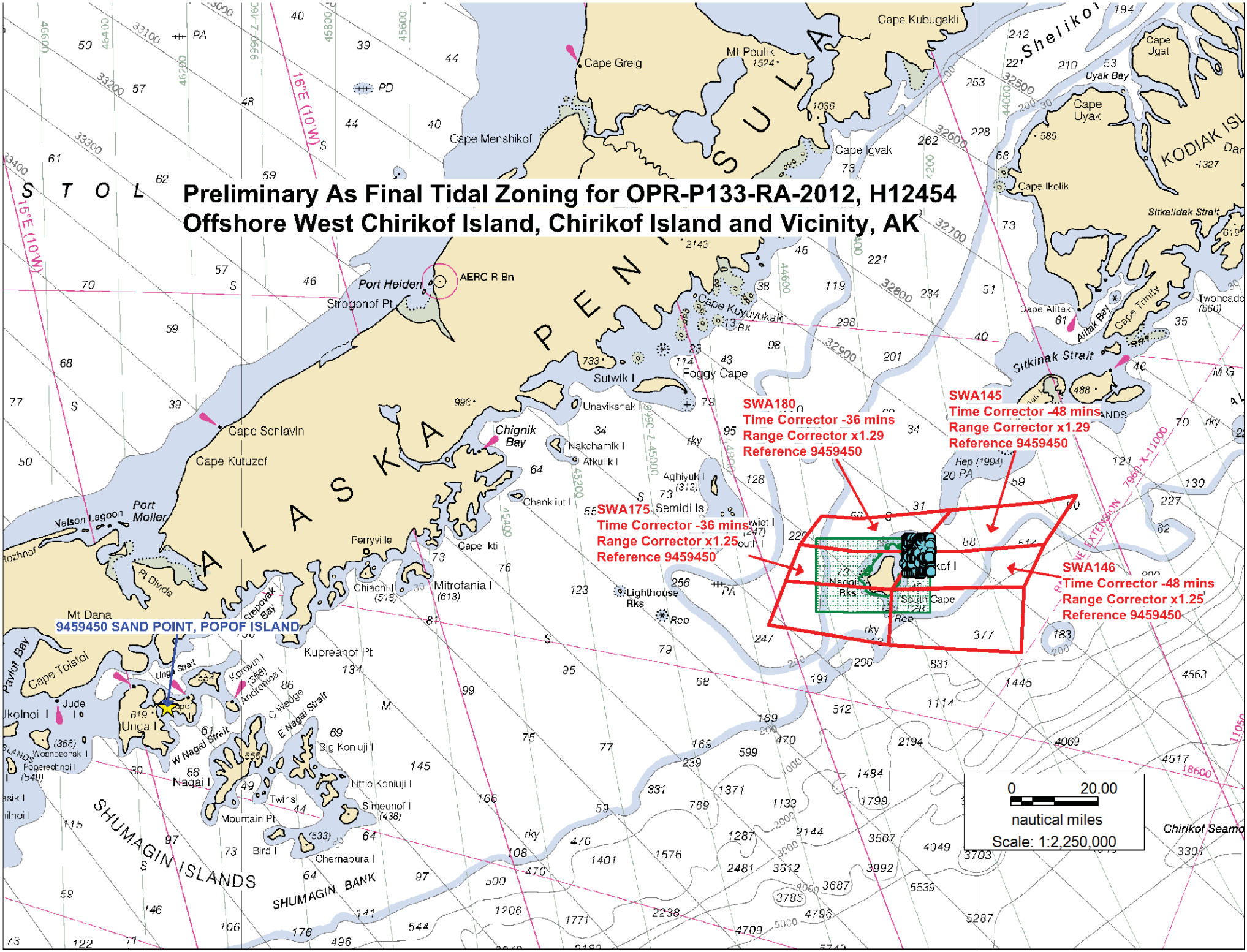
Refer to attachments for zoning information.

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.1365860250

Digitally signed by HOVIS.GERALD.THOMAS.1365860250
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=OTHER, cn=HOVIS.GERALD.THOMAS.1365860250
Date: 2012.09.07 15:37:52 -04'00'

CHIEF, PRODUCTS AND SERVICES BRANCH


Preliminary As Final Tidal Zoning for OPR-P133-RA-2012, H12454
Offshore West Chirikof Island, Chirikof Island and Vicinity, AK
SWA180
Time Corrector -36 mins
Range Corrector x1.29
Reference 9459450
SWA145
Time Corrector -48 mins
Range Corrector x1.29
Reference 9459450
SWA175
Time Corrector -36 mins
Range Corrector x1.25
Reference 9459450
SWA146
Time Corrector -48 mins
Range Corrector x1.25
Reference 9459450
9459450 SAND POINT, POPOF ISLAND
0 20.00
nautical miles
Scale: 1:2,250,000
ALASKA PEN
SHUMAGIN ISLANDS
SHUMAGIN BANK
Cape Greig
Mt Poulik
Cape Menshikof
Cape Igvak
Cape Kubugakli
Cape Uyak
Uyak Bay
KODIAK ISL
Cape Ikolik
Sitkalidak Strait
Port Heiden
AERO R Bn
Strogonof Pt
Cape Kuyuyukak
Foggy Cape
Sutwik I
Unavikshak I
Chignik Bay
Cape Kutuzof
Cape Scniavin
Nakchamik I
Atkulik I
Aghiyuk I
Semidi Is
Port Moller
Nelson Lagoon
Pt Divide
Perryville
Cape Ikt
Chiachi I
Mitrofania I
Lighthouse Rks
Mt Dana
Stepovak Bay
Kupreanof Pt
Cape Toistoi
Pavlof Bay
Unga Strait
Korovin I
Andronica I
Unga I
Jude I
Ukolnoi I
Popof
W Nagai Strait
E Nagai Strait
Big Koniuji I
Little Koniuji I
Nagai I
Twin s
Mountain Pt
Bird I
Simeonof I
Chernaoura I
Cape Alitak
Alitak Bay
Cape Trinity
Sitkinak Strait
Twohcadd
Hep (1994)
Rep
PA
PD

APPROVAL PAGE

H12454

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

- H12454_DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- H12454_GeoImage.pdf

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

Digitally signed by HOLMBERG.PETER.SCOTT.1365886101
Date: 2014.02.28 12:42:14 -08'00'

Approved:_____

Peter Holmberg
Cartographic Team Lead, Pacific Hydrographic Branch

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

Benjamin K. Evans
2014.02.28 11:46:50 -08'00'

Approved:_____

LCDR Benjamin K. Evans, NOAA
Chief, Pacific Hydrographic Branch