H12690

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

DESCRIPTIVE REPORT

Type of Survey:	Navigable Area
Registry Number:	H12690

LOCALITY

State(s):	Alaska
General Locality:	North Coast of Kodiak Island
Sub-locality:	Kupreanof Strait

2014

CHIEF OF PARTY
Edward J. Van Den Ameele CDR/NOAA

LIBRARY & ARCHIVES

Date:

U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	REGISTRY NUMBER:
HYDROGRAPHIC TITLE SHEET	**H12690**

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:	**North Coast of Kodiak Island**
Sub-Locality:	**Kupreanof Strait**
Scale:	**40000**
Dates of Survey:	**05/13/2014 to 10/16/2014**
Instructions Dated:	**04/02/2014**
Project Number:	**OPR-P136-RA-14**
Field Unit:	**NOAA Ship *Rainier***
Chief of Party:	**Edward J. Van Den Ameele 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/.

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Descriptive Report to Accompany Survey H12690

Project: OPR-P136-RA-14

Locality: North Coast of Kodiak Island

Sublocality: Kupreanof Strait

Scale: 1:40000

May 2014 - October 2014

NOAA Ship *Rainier*

Chief of Party: Edward J. Van Den Ameele CDR/NOAA

A. Area Surveyed

The project area is referred to as Sheet 3: "Kupreanof Strait". This survey corresponds to Sheet "3" within the Project Instructions. The area is directly north of Kupreanof Peninsula, AK (Figure 1,).

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
58° 3' 55.2" N 153° 18' 57.6" W	57° 56' 1.83" N 153° 2' 13.27" W

Table 1: Survey Limits

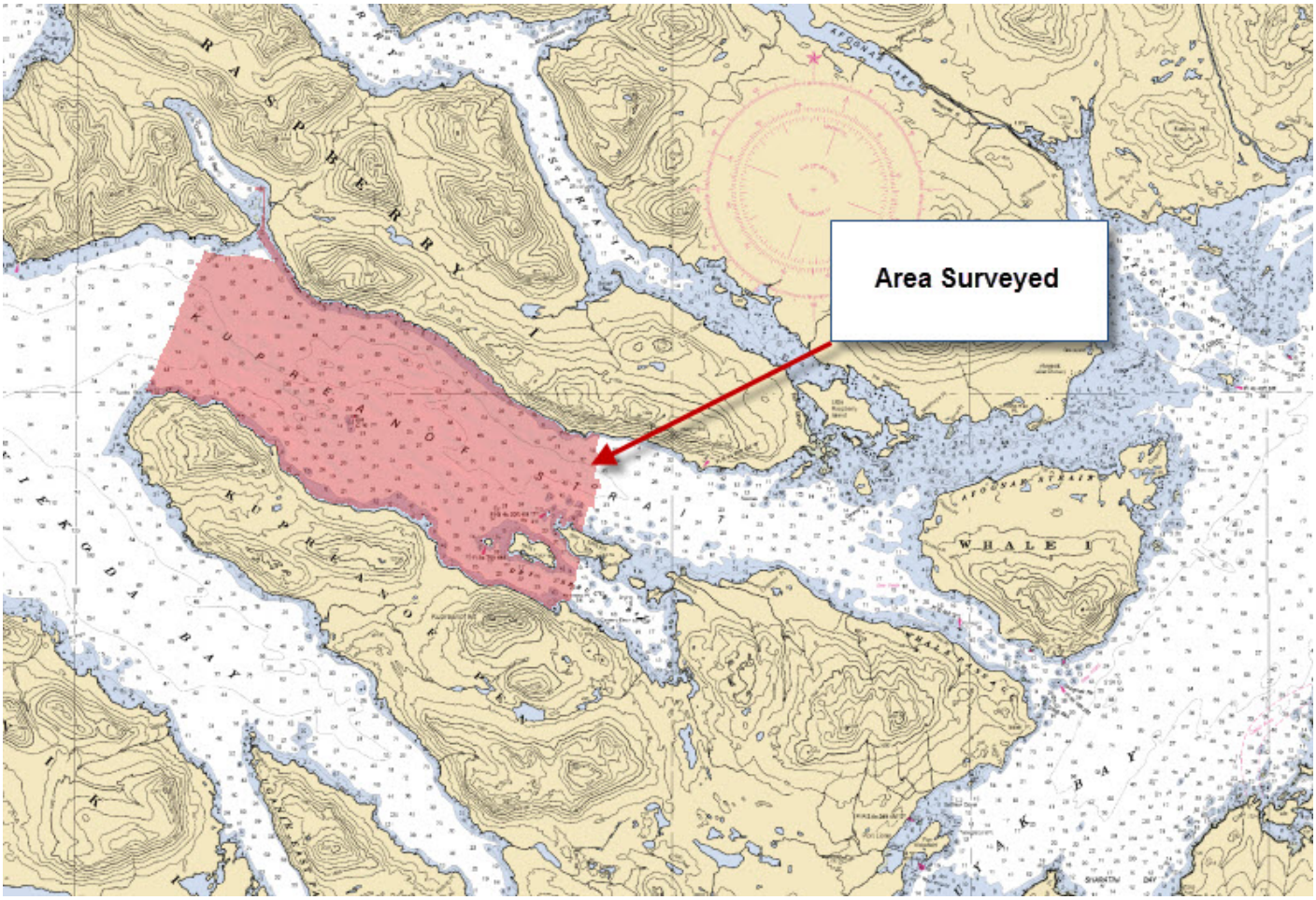


Figure 1: H12690 survey limits on Chart 16594

Survey data were acquired within the limits prescribed in the Project Instructions and the Hydrographic Surveys Specifications and Deliverables (HSSD) with the exception of Onion Bay and the adjacent near shore area of Ustia Pt. due to time constraints (Figure 2).

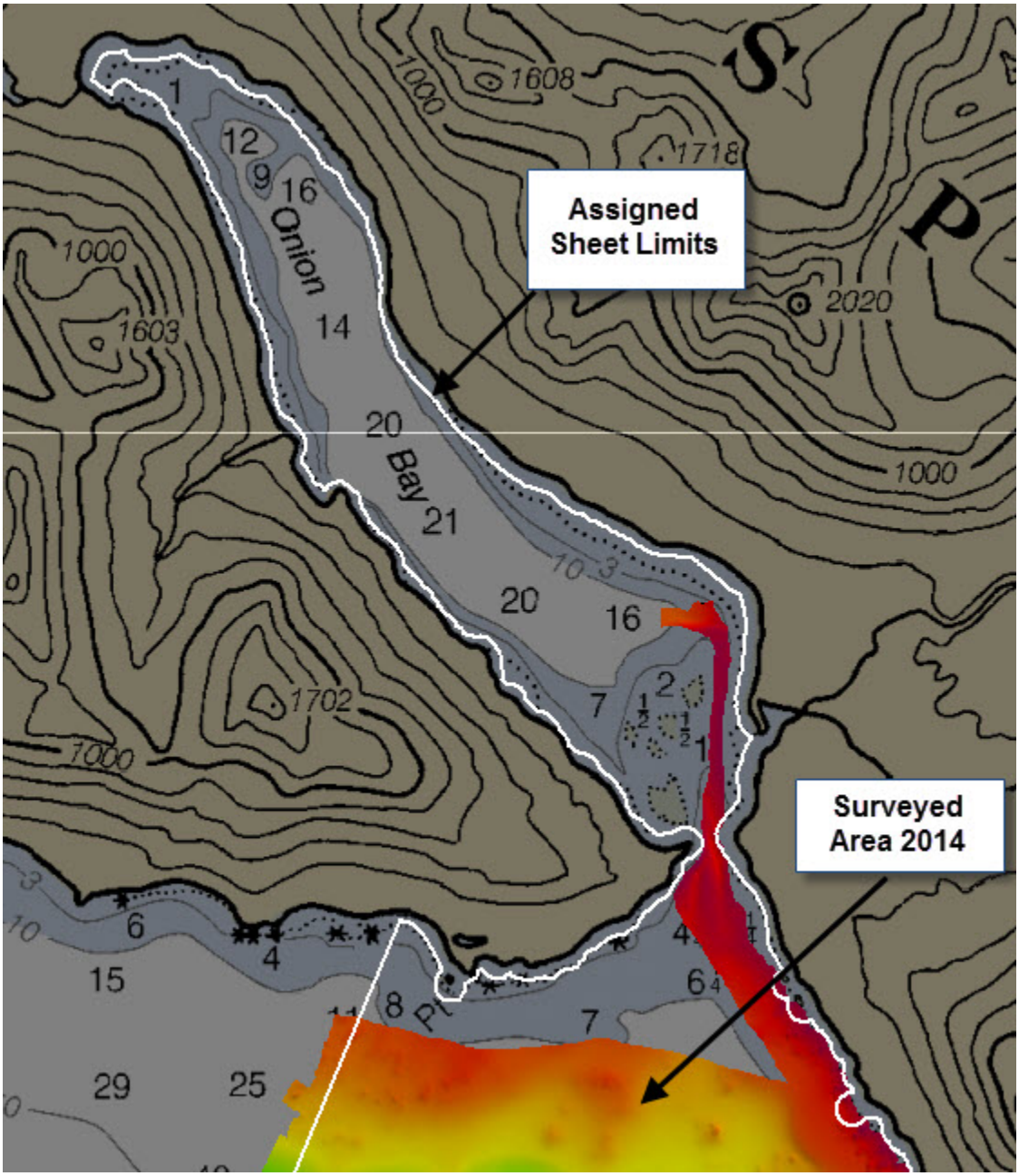


Figure 2: H12690 Deviations from Survey Limit Requirements

A.2 Survey Purpose

The purpose of this project is to provide contemporary surveys to update National Ocean Service (NOS) nautical charting products, which will support Kodiak's large fishing fleet and increasing levels of passenger vessel traffic.

A.3 Survey Quality

The entire survey is adequate to supersede previous data.

Data acquired on survey H12690 met complete multibeam coverage requirements outlined in section 5.2.2.2 of the HSSD, including data density requirements. In order to extract statistics of the data density achieved, the density layer of each finalized surface was queried within Caris then examined in Excel. Overall, the required data density was achieved in 99.95% of nodes.

A.4 Survey Coverage

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

Water Depth	Coverage Required

Complete multibeam echosounder (MBES) coverage was achieved within or exceeded the limits of hydrography as specified in the Project Instructions, (Figure 3) with the following minor exceptions:

Acoustic shadowing artifacts are present in several areas of the surveyed area (Figures 4 & 5). Holidays were examined to ensure that least depths were obtained over navigationally significant features.

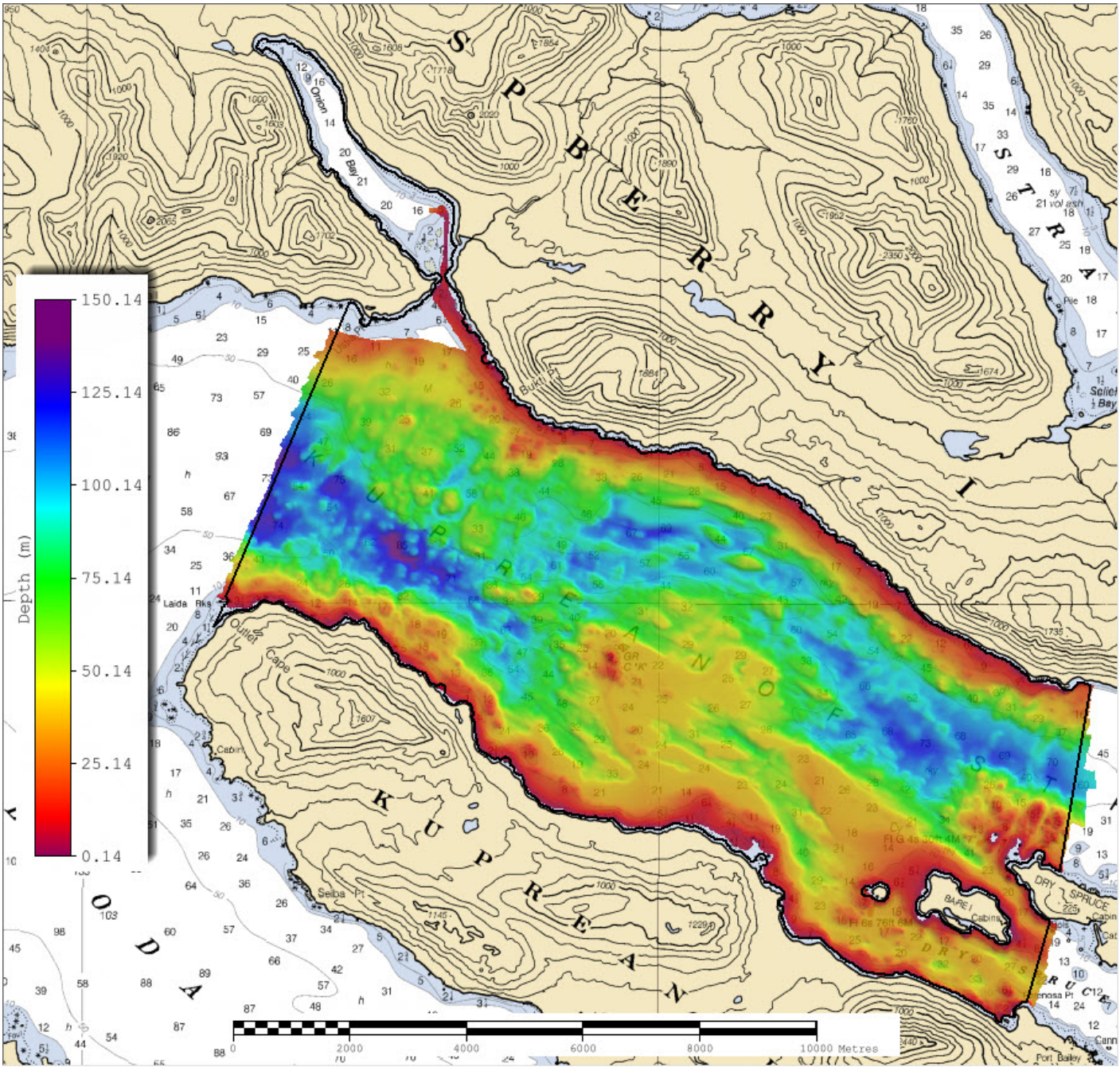


Figure 3: H12690 MBES coverage overlaid on Chart 16594.

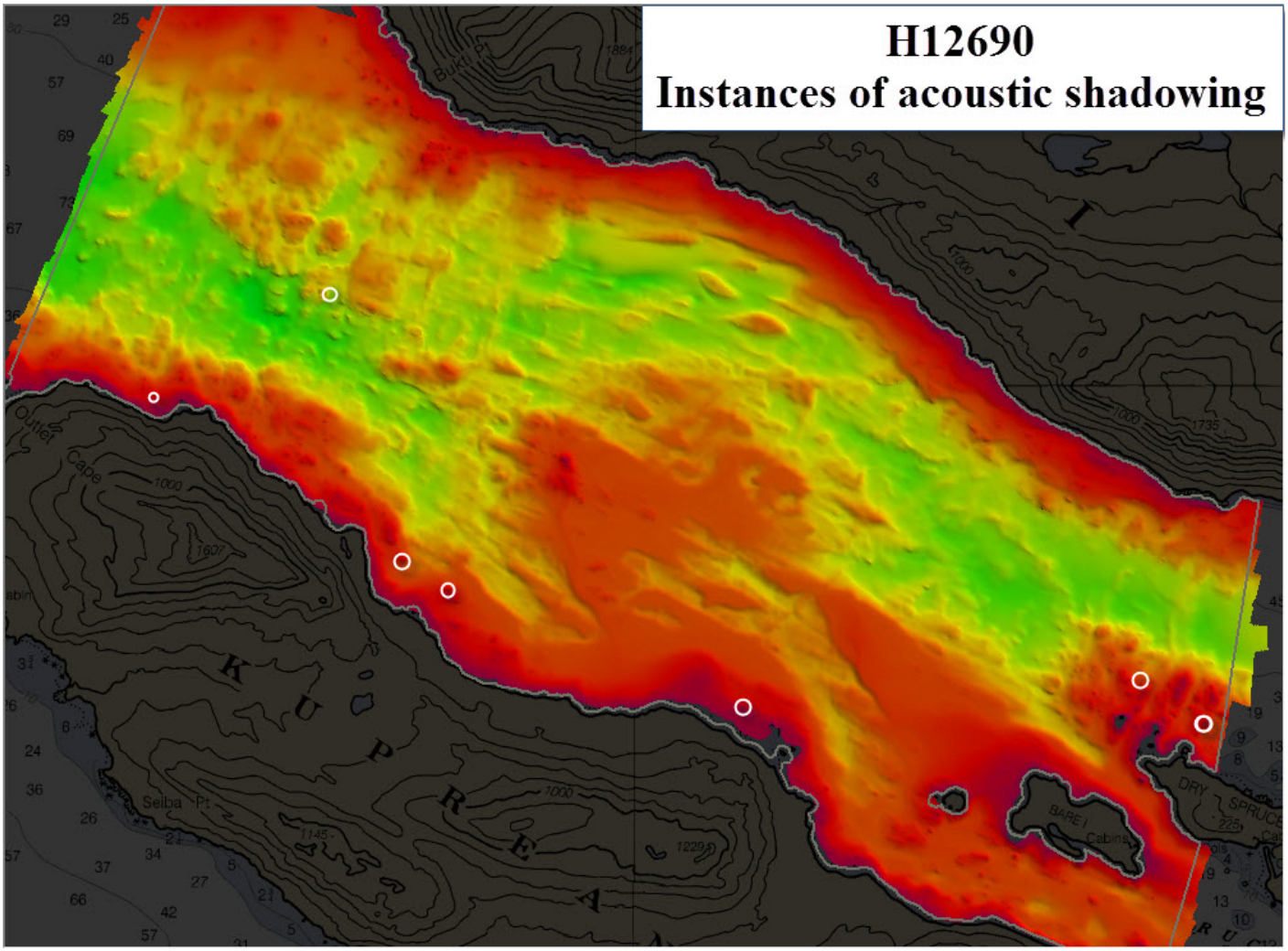


Figure 4: H12690 Acoustic Shadowing.

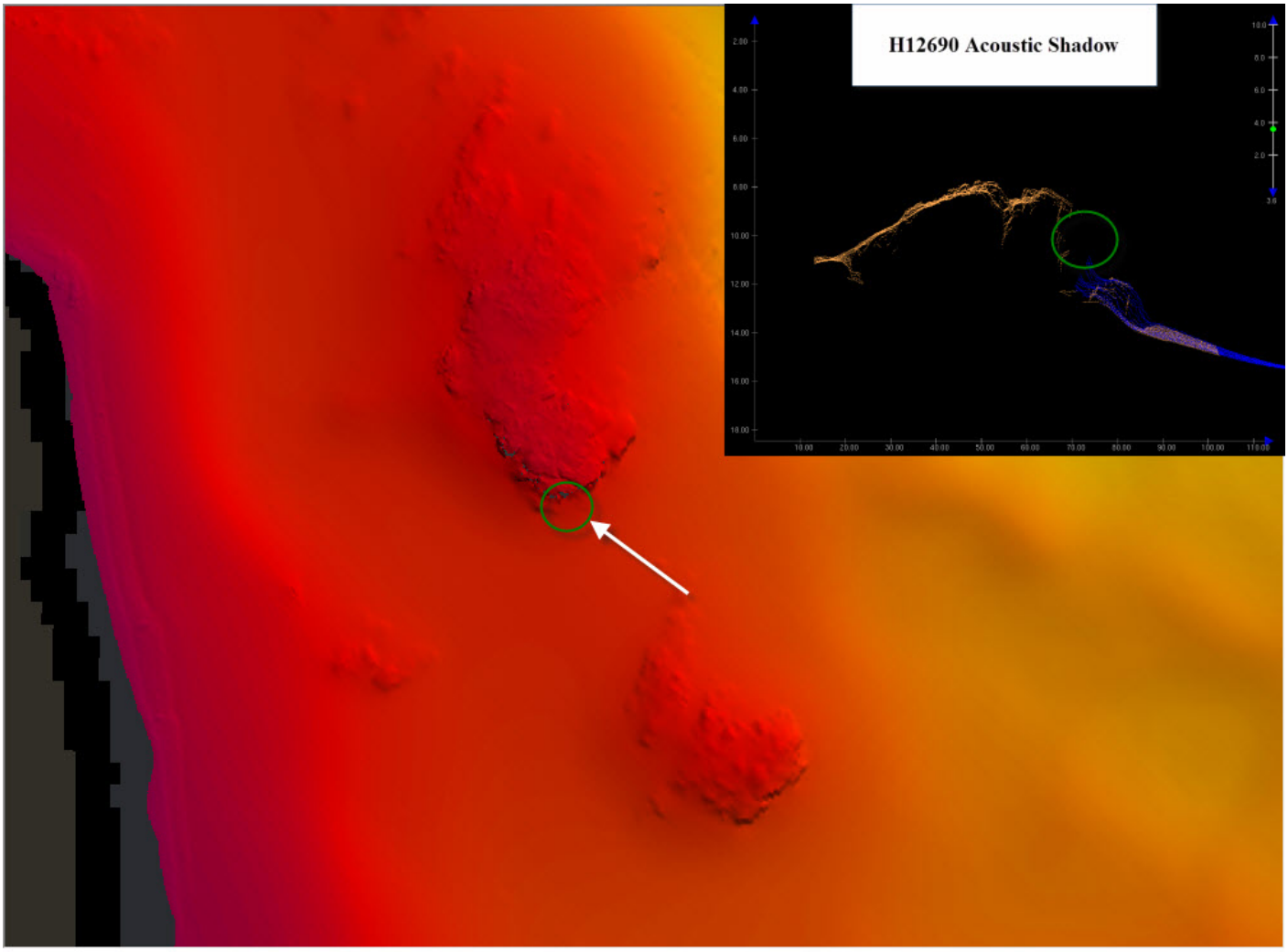


Figure 5: Subset image example of acoustic shadowing

A.5 Survey Statistics

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

	HULL ID	*2801*	*2802*	*2803*	*2804*	*S221*	*Total*
LNM	SBES Mainscheme	0	0	0	0	0	0
	MBES Mainscheme	80.20	82.48	133.48	60.25	97.73	454.14
	Lidar Mainscheme	0	0	0	0	0	0
	SSS Mainscheme	0	0	0	0	0	0
	SBES/SSS Mainscheme	0	0	0	0	0	0
	MBES/SSS Mainscheme	0	0	0	0	0	0
	SBES/MBES Crosslines	4.98	13.26	0.94	0	8.79	27.97
	Lidar Crosslines	0	0	0	0	0	0
Number of Bottom Samples							10
Number Maritime Boundary Points Investigated							0
Number of DPs							0
Number of Items Investigated by Dive Ops							0
Total SNM							24.22

Table 2: Hydrographic Survey Statistics

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

Survey Dates	Day of the Year
05/13/2014	133
06/15/2014	166

Survey Dates	Day of the Year
06/17/2014	168
06/30/2014	181
07/01/2014	182
08/31/2014	243
09/01/2014	244
09/02/2014	245
09/03/2014	246
09/04/2014	247
10/13/2014	286
10/14/2014	287
10/15/2014	288
10/16/2014	289

Table 3: Dates of Hydrography

The hydrographer collected 27 direct position (DP) features during survey operations, not zero.

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	*2801*	*2802*	*2803*	*2804*	*S221*	*1905*	*1906*
LOA	8.8 meters	8.8 meters	8.8 meters	8.8 meters	70.4 meters	5.7 meters	5.8 meters
Draft	1.1 meters	1.1 meters	1.1 meters	1.1 meters	14.7 meters	0.3 meters	0.3 meters

Table 4: Vessels Used

The draft for S221 in Table should not read 14.7 meters. The draft for S221 is 4.7 meters.

B.1.2 Equipment

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

Manufacturer	Model	Type
Applanix	POS MV v4	Positioning and Attitude System
Kongsberg	EM710	MBES
Reson	SeaBat 7125-B	MBES
Reson	SeaBat 7125 SV2	MBES
Reson	SVP70	Sound Speed System
Reson	SVP71	Sound Speed System
Sea-Bird Electronics	SBE 19plus SEACAT Profiler	Conductivity, Temperature, and Depth Sensor
Odim Brooke Ocean (Rolls Royce Group)	Moving Vessel Profiler 200	Conductivity, Temperature, and Depth Sensor

Table 5: Major Systems Used

Table 5 should also include Sea-Bird Electronics Model SBE 19, Conductivity, Temperature, and Depth Sensor, used in operations during survey H12690.

B.2 Quality Control

B.2.1 Crosslines

Crosslines acquired for this survey totaled 6.16% of mainscheme acquisition.

Multibeam crosslines were acquired using the Reson 7125 on Launch 2801 (RA-4), 2802 (RA-5), and the EM710 on S221. A 4m CUBE surface was created using only mainscheme lines, a second 4m CUBE surface was created using only crosslines, and a difference surface was generated in Caris at a 4m resolution. This difference surface was compared to the allowable uncertainty values within the HSSD for the observed depths, and statistics were calculated in Excel. In total, 99.7% of the depth differences between H12690 mainscheme and crossline data are within the requirements of the HSSD (Figure 6).

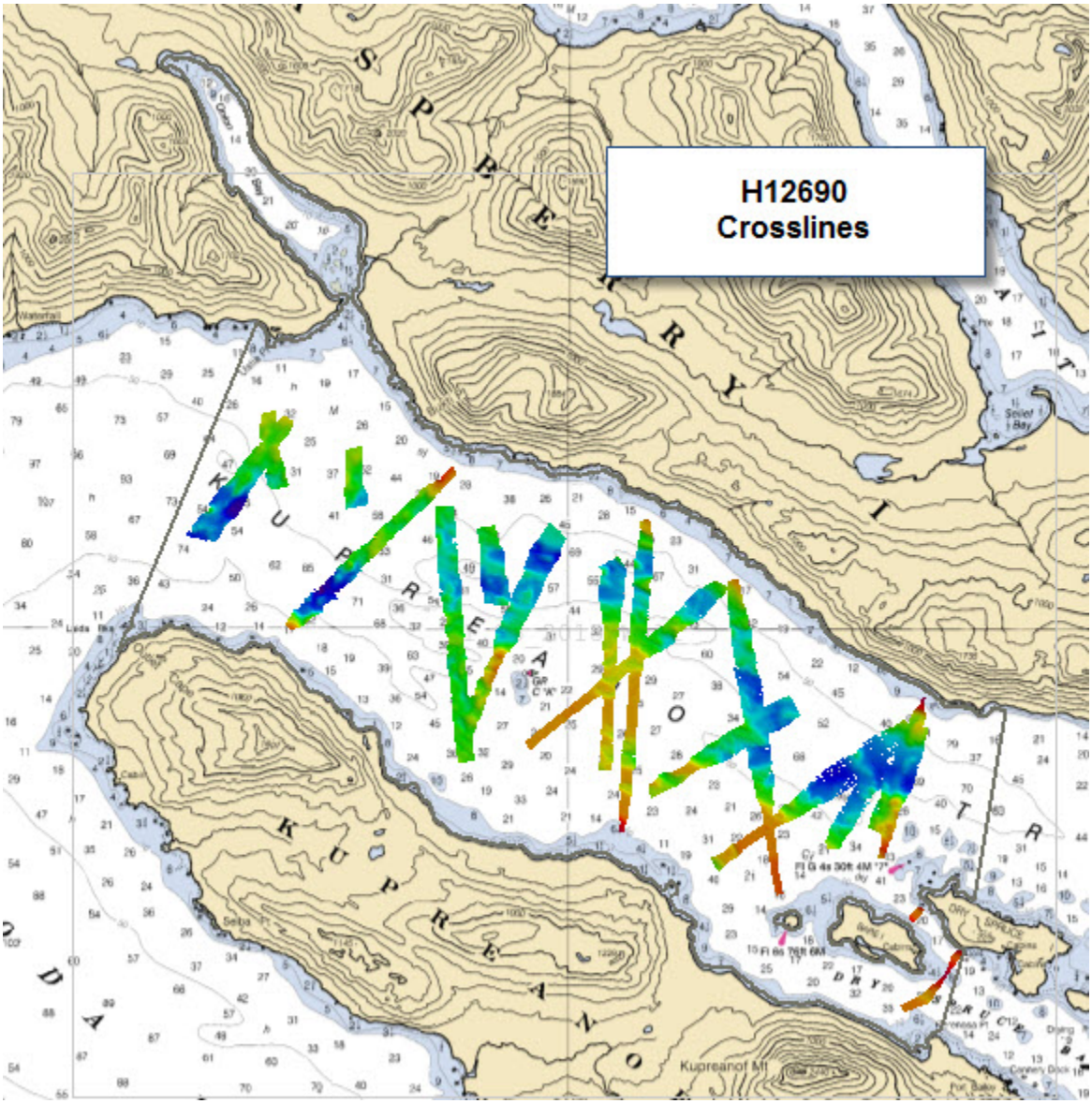


Figure 6: Depth-colored MBES overlay of acquired H12690 crossline data.

Figure 6 does not provide any information supporting the claim that 99.7% of depth differences between MS and crossline depths are within total uncertainty budgets. However, a review of a subset of the data indicated that this figure may be accurate.

B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Measured	Zoning	Method
0 meters	0.22 meters	

Table 6: Survey Specific Tide TPU Values

Hull ID	Measured - CTD	Measured - MVP	Surface
S221		1 meters/second	.05 meters/second
2801, 2802, 2803, 2804	3.0 meters/second		0.15 meters/second

Table 7: Survey Specific Sound Speed TPU Values

Uncertainty values were measured and applied in accordance with Section B.4 of the DAPR.

Uncertainty values of submitted finalized grids were calculated in Caris using the “Greater of the Two” of uncertainty and standard deviation (scaled to 95%). To visualize where uncertainty requirements were met, for each surface a custom “HSSD Compliance” layer was created, based on the difference between the calculated uncertainty of the nodes and the allowable uncertainty defined in the HSSD. To quantify the extent to which requirements were met, the HSSD Compliance layers were queried within Caris and examined in Excel. Overall, 99.3% of the nodes of survey H12690 met the uncertainty requirements specified in the HSSD. These HSSD Compliance layers were retained in the submitted surfaces.

A compliance analysis for gridded depth uncertainty was run during review, with results that disagree with the stated compliance rate of 99.3% of nodes. Each finalized surface was reviewed separately for compliance rates, with the minimum compliance rate found to be 99.8%.

B.2.3 Junctions

One junction comparison was completed for H12690 (Figure 7). Survey H12689 was acquired concurrently with this survey. Depth comparisons were performed using the Caris Difference Surface and Caris Subset Editor.

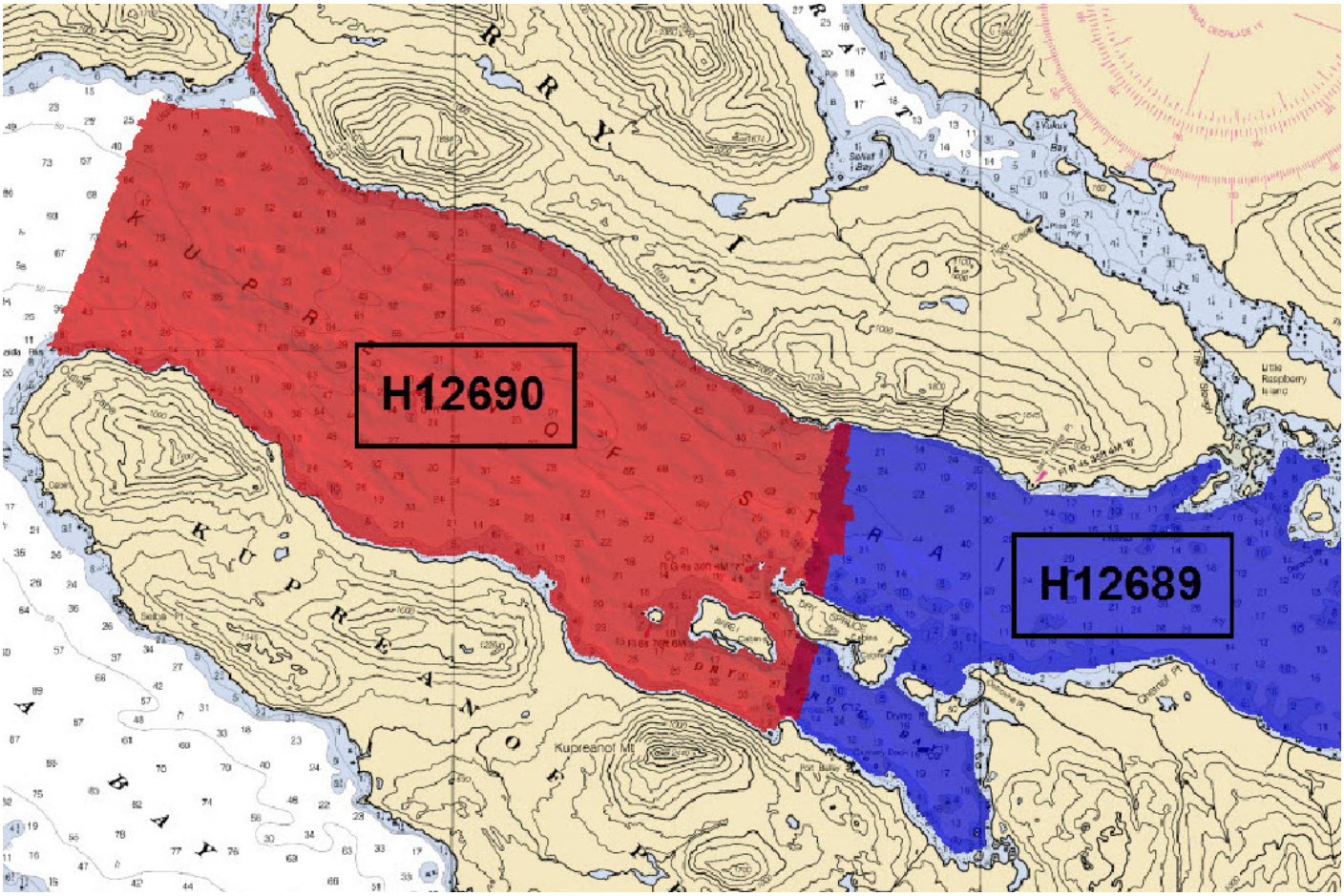


Figure 7: H12690/H12689 junction.

The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
H12689	1:78900	2014	NOAA Ship RAINIER	E

Table 8: Junctioning Surveys

H12689

Overlap with survey H12689 was approximately 300 to 600 meters wide, covering an area of 0.59 square nautical miles along the eastern boundary of H12690 (Figure 7). Depths in the junction area range from approximately 4 to 110 meters. For the respective depths, the difference surface was compared to the allowable TVU standards specified in the HSSD. In total, 99.031% of the depth differences between H12690 and junction survey H12689 are within allowable uncertainties.

The scale for survey number H12689 is 1:15,000, and not 1:78,900 as stated in Table 8.

Figure 7 does not provide any information supporting the claim that 99.7% of depth differences between MS and crossline depths are within total uncertainty budgets. However, a review of a subset of the data indicated that this figure may be accurate.

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

2802 (RA5) Along-Track Horizontal Offset

A depth scaled, along-track horizontal artifact is present in data acquired by launch 2802 (RA5) using both 200kHz and 400kHz. The maximum offset detected in spot checks was 3.01 meters northwest of Dry Spruce Island (Figure 8). No instances were found where artifact results exceeded HSSD horizontal requirements. The survey is adequate to supersede previous data. Based on data examination this artifact developed on this vessel mid-way through the 2014 field season and the cause is currently being evaluated. At present the affects of the artifact may be remedied by changing the pitch value in the Caris HIPS Vessel File (HVF) from -2.86 degrees to 0.0 degrees.

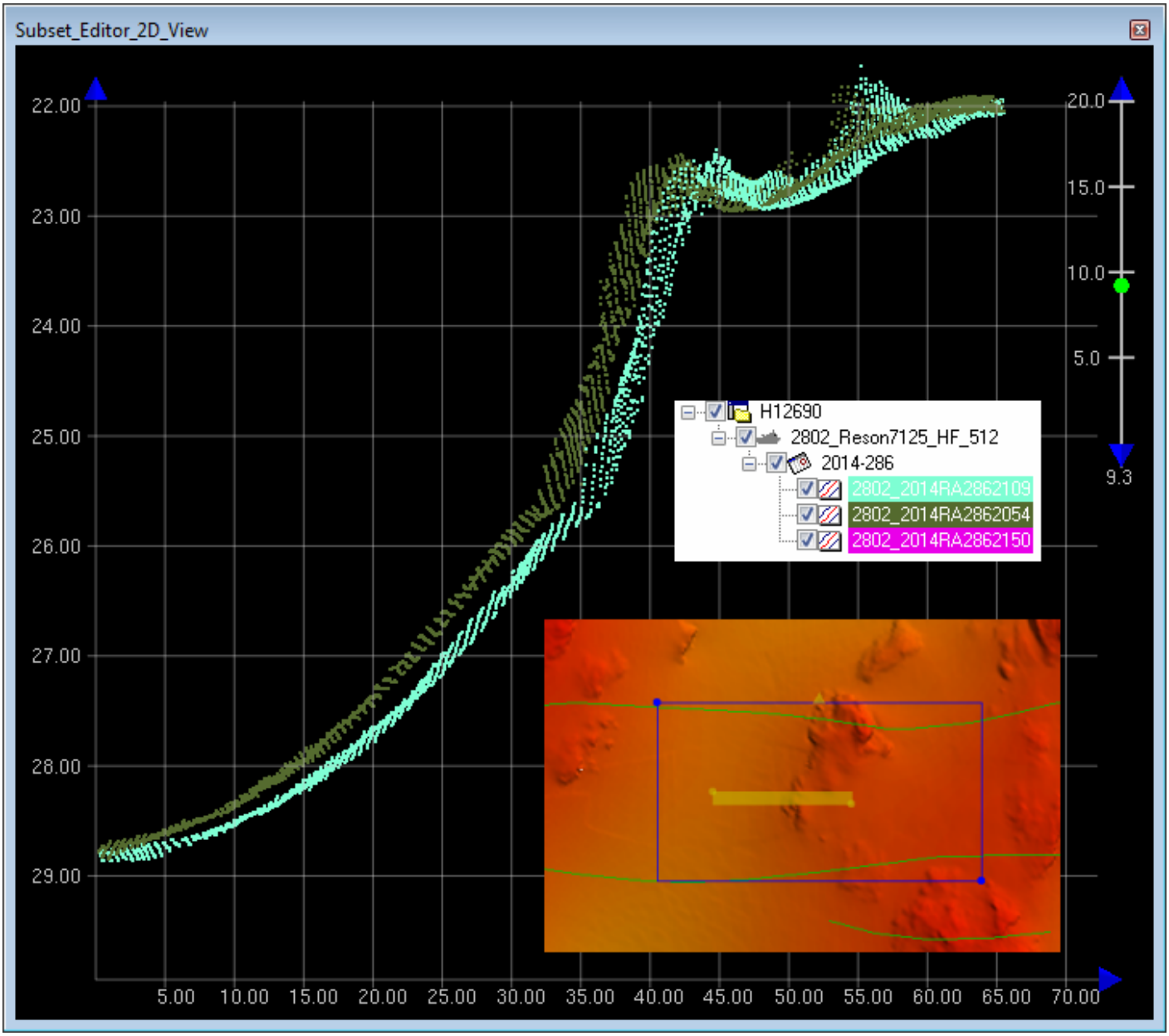


Figure 8: 2802 (RA5) Along-Track Horizontal Offset.

B.2.6 Factors Affecting Soundings

Vertical Offsets

A relatively dramatic vertical offset of approximately 0.42 - 1.2 meters was observed in the area northeast of Outlet Cape between lines 2802_2014RA2880103 and 0041_20140903_232616_Rainier, DN 287 and 246, respectively (Figure 9). Investigation of the issue with regard to tides yielded an approximate 54% reduction in the vertical offset with the application of GPS tides . The issue is also addressed in Section C.3.3.2.

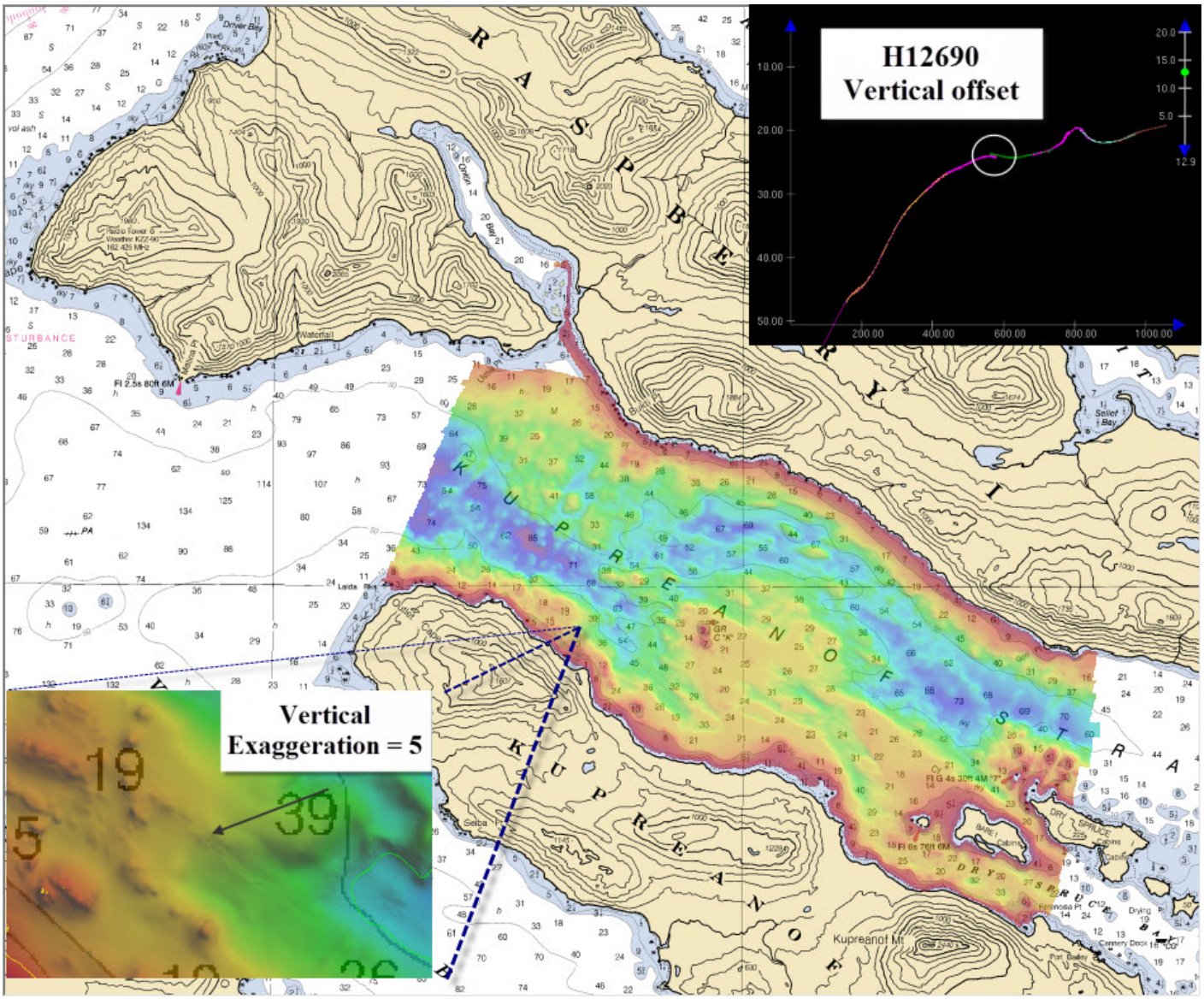


Figure 9: H12690 Vertical Offset Anomaly

Launch 2802 (RA-5) pitch value in the Caris HVF is -2.603, and not -2.86 as stated. It should further be noted that altering the HVF creates disagreement between 2802 (RA-5) data and data acquired by other platforms on other days. For this reason the patch derived pitch value of -2.603 was retained and used in the HVF when processing this data.

B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: All launch sound speed profiles were acquired using the SBE19 and SBE 19Plus SEACAT CTD probes at discrete locations within the survey area at least once every four hours, when significant changes in surface sound speed were observed, or when surveying a new area. A sheet-wide concatenated sound speed file was created and applied to survey lines using the "Nearest in distance within time (4 hours)" profile selection method.

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

Delayed Heave could not be applied to thirteen (13) lines acquired by S-221 DN245 because no POS data were acquired during acquisition: 0000_20140902_172814_Rainier, 0004_20140902_185117_Rainier, 0002_20140902_180020_Rainier, 0006_20140902_192814_Rainier, 0006_20140902_192814_Rainier, 0008_20140902_201327_Rainier, 0003_20140902_182117_Rainier, 0005_20140902_185814_Rainier, 0001_20140902_173019_Rainier, 0010_20140902_205328_Rainier, 0011_20140902_210938_Rainier, 0009_20140902_202328_Rainier, and 0012_20140902_212419. The affected data was examined in Caris Subset Editor. No artifacts are present among overlapping lines. The survey data meet the requirements set forth in the HSSD.

It should be clarified that the IMU was running, and positional data was being acquired in real-time but that no files were recorded/logged in this duration, making it not possible to post-process delayed heave and SBETs.

B.3.2 Calibrations

All sounding systems were calibrated as detailed in the DAPR.

B.4 Backscatter

Backscatter was not collected for this survey.

Backscatter data was collected during this survey, but not processed by the field unit. The data was submitted to NCEI.

B.5 Data Processing

B.5.1 Primary Data Processing Software

The following Feature Object Catalog was used: NOAA Profile V_5_2

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
H12690_MB_1m_MLLW	CUBE	1 meters	0 meters - 140 meters	NOAA_1m	Complete MBES
H12690_MB_2m_MLLW	CUBE	2 meters	0 meters - 140 meters	NOAA_2m	Complete MBES
H12690_MB_4m_MLLW	CUBE	4 meters	0 meters - 140 meters	NOAA_4m	Complete MBES
H12690_MB_8m_MLLW	CUBE	8 meters	0 meters - 140 meters	NOAA_8m	Complete MBES
H12690_MB_1m_MLLW_Final	CUBE	1 meters	0 meters - 20 meters	NOAA_1m	Complete MBES
H12690_MB_2m_MLLW_Final	CUBE	2 meters	18 meters - 40 meters	NOAA_2m	Complete MBES
H12690_MB_4m_MLLW_Final	CUBE	4 meters	36 meters - 80 meters	NOAA_8m	Complete MBES
H12690_MB_8m_MLLW_Final	CUBE	8 meters	72 meters - 160 meters	NOAA_8m	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
Kodiak Island	9457290
Seldovia	9455500

Table 10: NWLON Tide Stations

The following subordinate water level stations were established for this survey:

Station Name	Station ID
West Raspberry Island	9457535
SW Terror Bay	9457493

Table 11: Subordinate Tide Stations

File Name	Status
9457493.tid	Final Approved
9457535.tid	Final Approved

Table 12: Water Level Files (.tid)

File Name	Status
H12690CORF.zdf	Final

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

A request for final approved tides was sent to N/OPS1 on 10/16/2014. The final tide note was received on 01/09/2015.

A corrected tide was note received on 5/14/2015 after CO-OPS detected a stability issue with 9457535. Correspondence can be found in the Project Correspondence directory, in a document named Re_ Final Tide Note for OPR-P136-RA-2014, H12690.pdf.

C.2 Horizontal Control

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

The projection used for this project is Universal Transverse Mercator (UTM).

The following PPK methods were used for horizontal control:

Smart Base

The following CORS Stations were used for horizontal control:

HVCR Site ID	Base Station ID
KOD5	KODIAK 5
KOD6	KODIAK 6
AC34	OldHarbor_AK2006
AC39	ShuyaklsAPAK2006
AC26	Cape_Gull_AK2008
AC38	Quartz_CrkAK2005
AC08	CapDouglasAK2007
AC67	PILLARMTN AK2006

Table 14: CORS Base Stations

The following DGPS Stations were used for horizontal control:

DGPS Stations
Kodiak 313kHz
Kenai 310kHz

Table 15: USCG DGPS Stations

C.3 Additional Horizontal or Vertical Control Issues

3.3.1 Lines without SBETs

Smooth Best Estimate Trajectories (SBETs) could not be applied to lines: 0000_20140902_172814_Rainier, 0004_20140902_185117_Rainier, 0002_20140902_180020_Rainier, 0006_20140902_192814_Rainier, 0006_20140902_194327_Rainier, 0008_20140902_201327_Rainier, 0003_20140902_182117_Rainier, 0005_20140902_185814_Rainier, 0001_20140902_173019_Rainier, 0010_20140902_205328_Rainier, 0011_20140902_210938_Rainier, 0009_20140902_202328_Rainier and 0012_20140902_212419 acquired by Ship S-221 on DN245 due to the absence of POS data (Figure 10). As a result, all data from the ship acquired for those lines could not have SBETS applied. The survey data meets requirements set forth in the HSSD.

Figure 10: H12690 DN245 S221 Lines that do not have Delayed Heave or SBETs applied

3.3.2 Vertical Offset

Surface artifacts were discovered throughout the survey area, and occurred primarily from vertical offsets where tide data from two separate stations were applied (i.e. DN245 & DN286) (Figures 11 & 12). The affected multibeam data was referenced to the ellipsoid by applying GPS tides in Caris. Once referenced to the ellipsoid, the vertical offset between overlapping lines was reduced (Figures 13& 14). The area referenced in the aforementioned figures represents one of the most dramatic vertical offset discovered in the data from H12690, and was reduced from 1.25m to 0.71m, or 54% after the application of GPS tides.

Additional vertical offsets were observed in some areas where data were acquired by different vessels on different days, and in some cases the application of GPS tides data does not eliminate the issue. The source of the offsets is still unknown, but affected MBES data falls within NOAA HSSD standards.

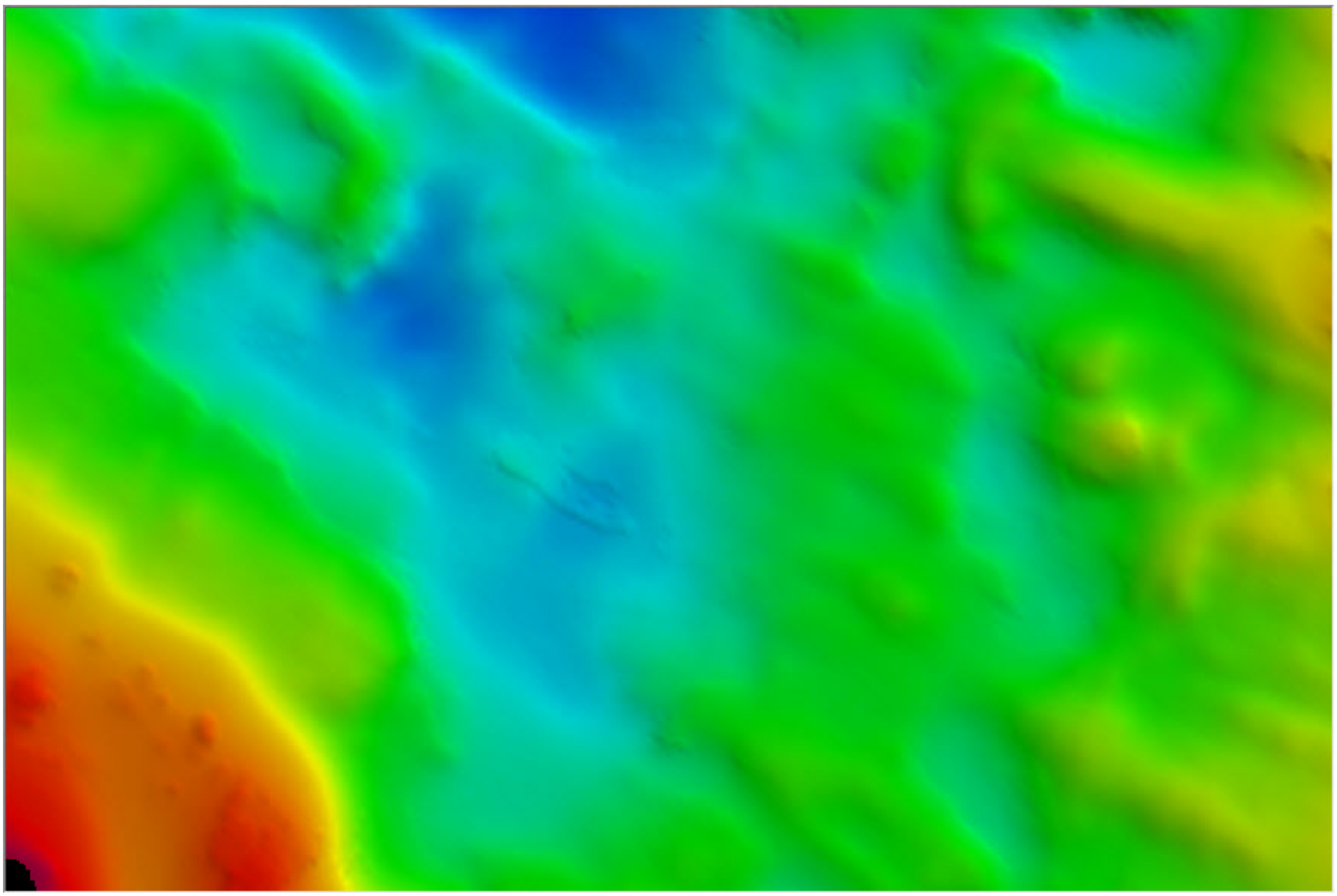


Figure 11: Section of H12690 4m surface showing artifacts caused by vertical offset (57-59-23.7N, 153-12-25.9W)

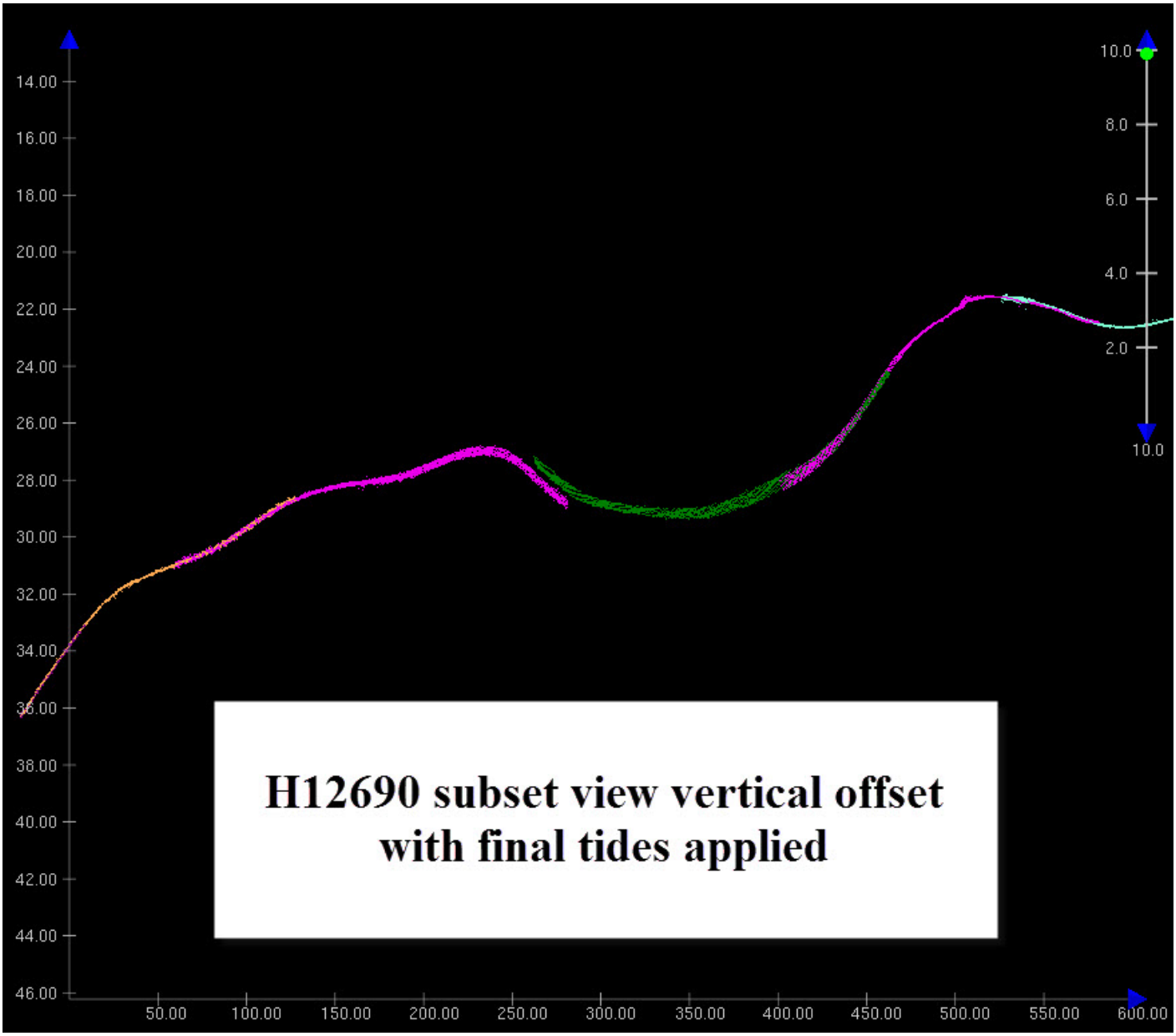


Figure 12: Final tides applied, subset view.

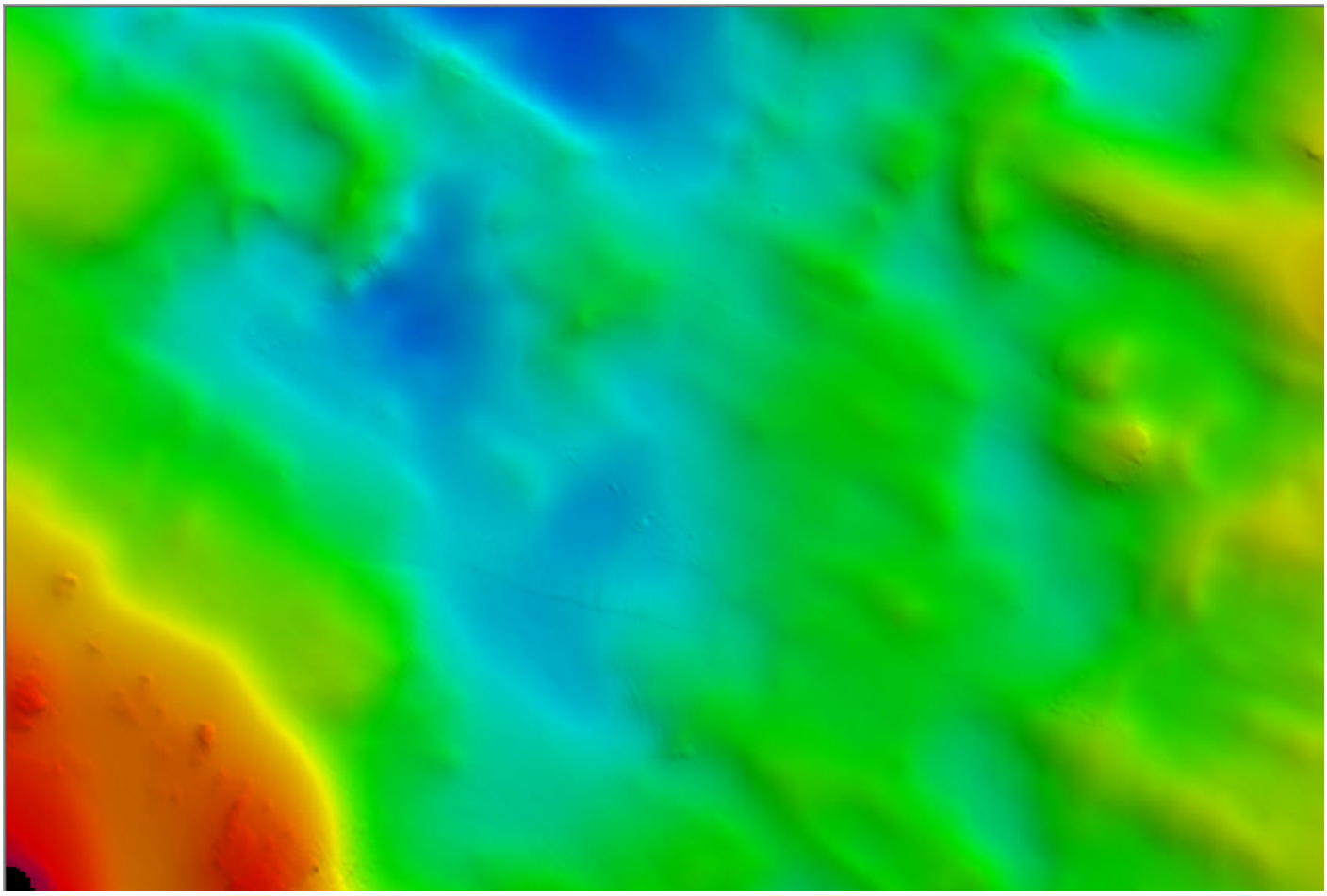


Figure 13: Section of H12690 4m surface showing reduced artifacts after the application of GPS tides.

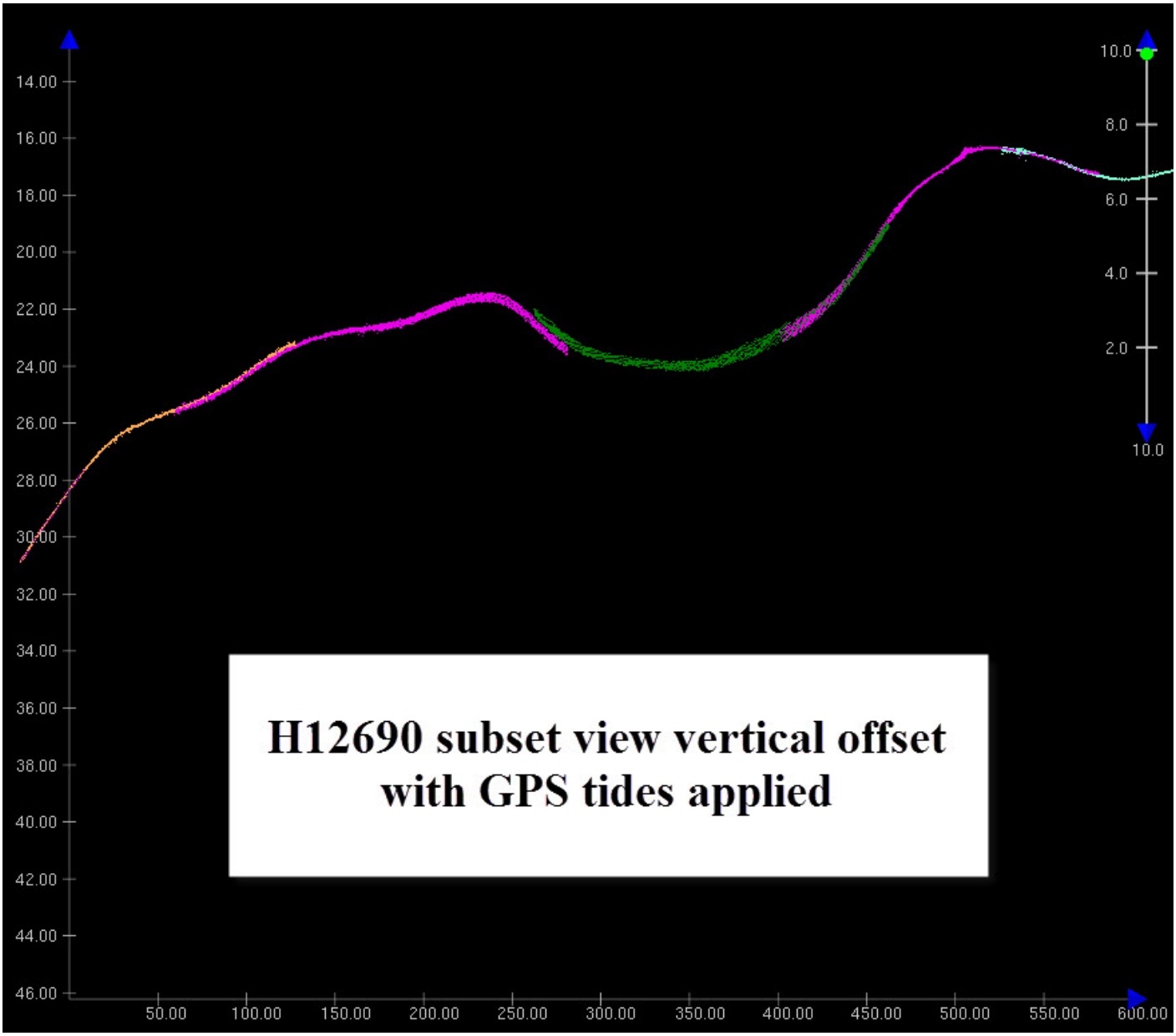


Figure 14: GPS tides applied, subset view.

D. Results and Recommendations

D.1 Chart Comparison

Chart comparisons were performed using a Caris sounding layer based on the 1m surface from H12690 and a contour layer based on the 4m surface, which is the most representative of the majority of depths within the

sheet limits. The contours and soundings were overlaid on the charts and compared for general agreement and to identify areas of significant change.

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
16594	1:78900	13	04/1998	12/16/2014	11/29/2014

Table 16: Largest Scale Raster Charts

16594

The comparison of soundings and contours from Chart 16594 and H12690 showed general agreement within two (2) fathoms, except for the following:

Thirty six (36) soundings throughout the survey do not agree within two (2) fathoms, tending to be shoaler than currently charted. Those soundings are shown in green in Figure 15.

Contours generated in Caris and overlaid on Chart 16594 revealed several navigationally significant areas where the 10fa contour could stand to be extended (Figures 16 & 17).

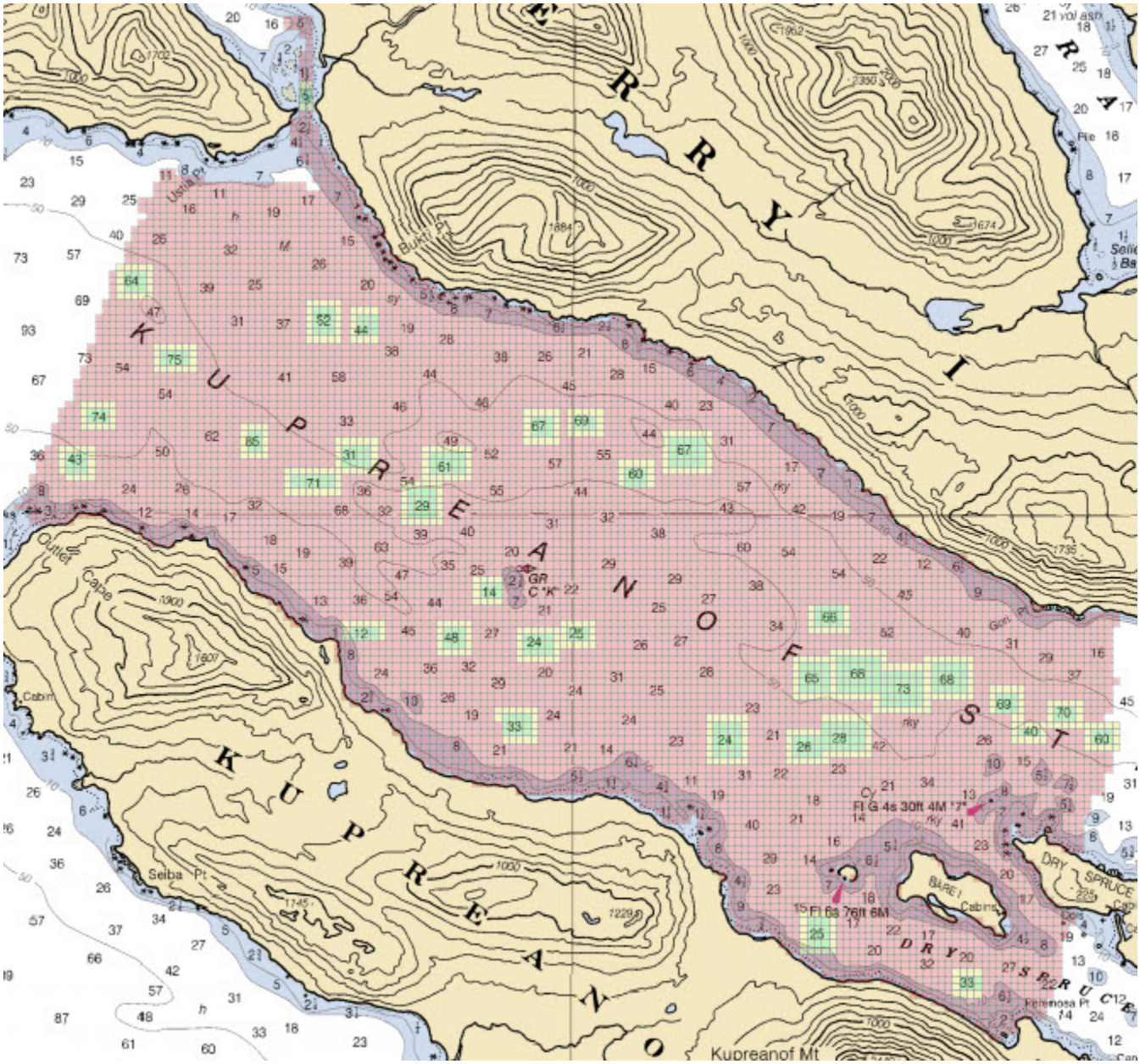


Figure 15: Chart 16954 soundings with discrepancies greater than 2 fathoms when compared to survey H12690 data.

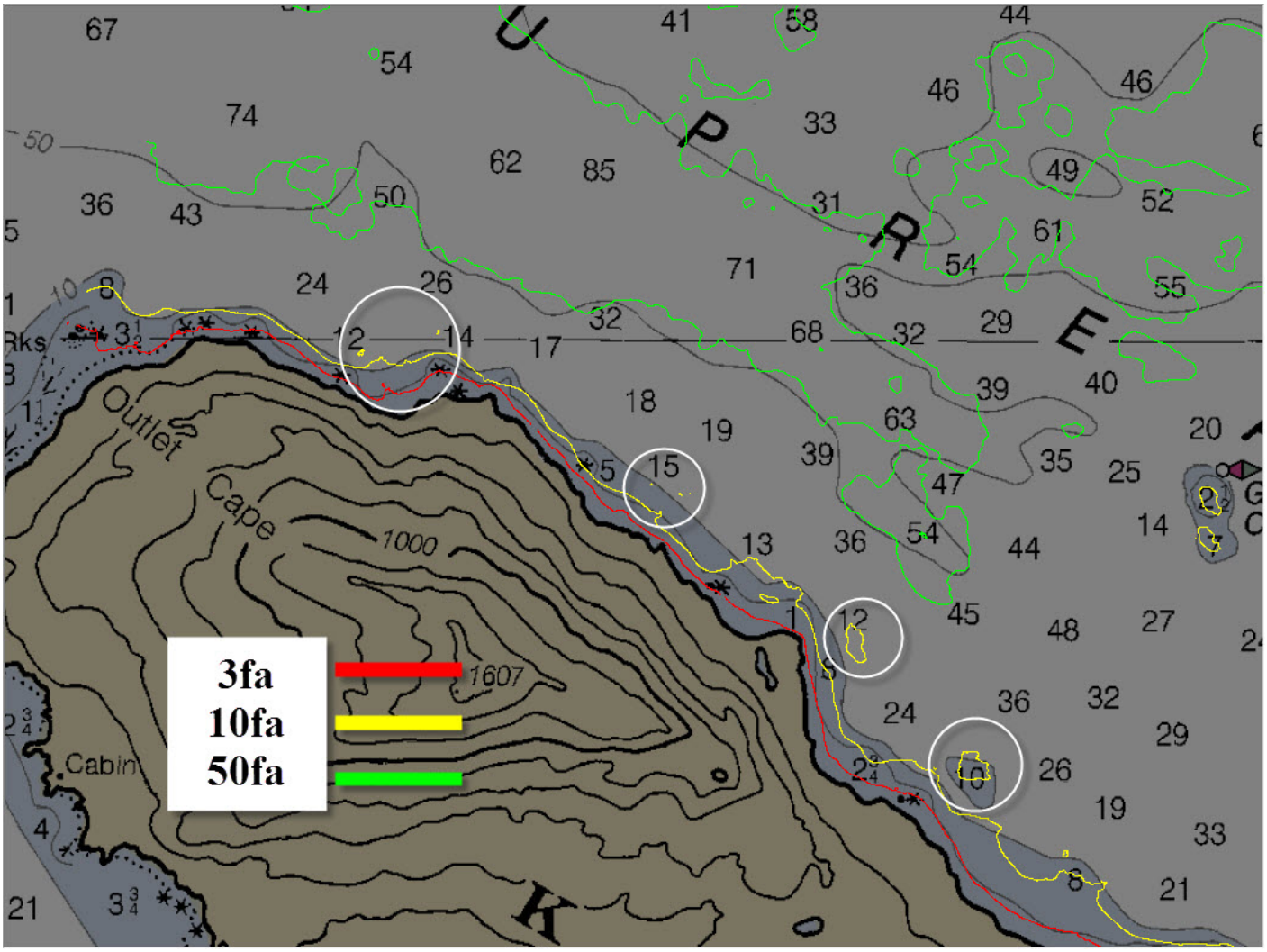


Figure 16: Southwest portion of the survey where the 10fa contour can be extended to encompass previously uncharted shoal.

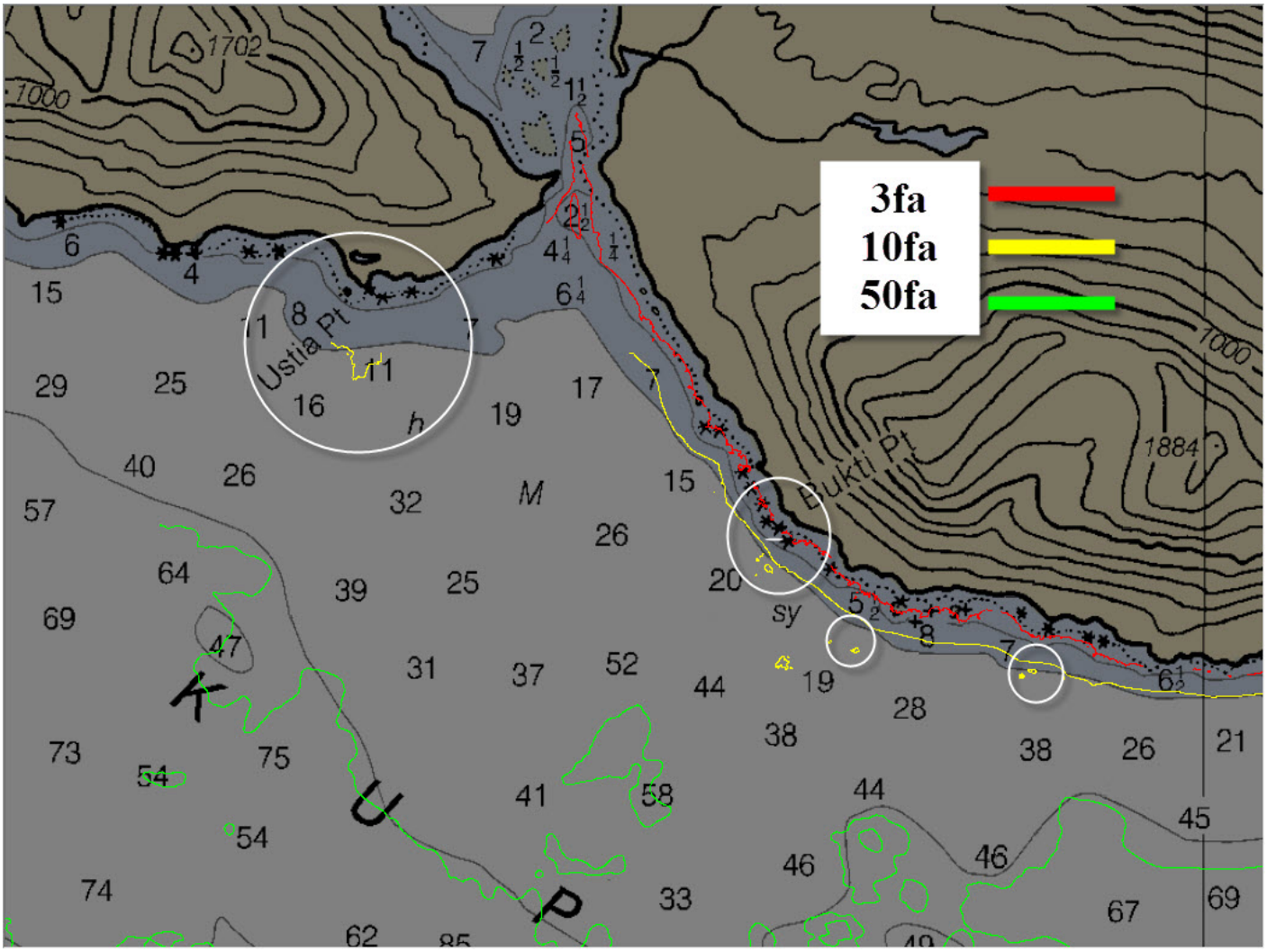


Figure 17: Northwest portion of the survey where the 10fa contour can be extended to encompass previously uncharted shoal.

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?
US4AK5PM	1:79800	4	07/08/2014	12/16/2014	NO
US4AK5QM	1:78900	4	02/03/2015	09/08/2014	NO

Table 17: Largest Scale ENCs

US4AK5PM

ENC US4K5PM coincides with raster 16594. The depths and contours on the ENC match the raster, and the comparison between survey H12690 and the ENC is equivalent to the preceding comparison with Chart 16594.

US4AK5QM

ENC US4AK5QM coincides with rasters 16594 & 16597 with the exception that of the northeast corner where soundings for the entire portion of the ENC that is within H12690 are excluded (Figure 18). It is recommended that NOS update ENC US4AK5QM to include soundings in this area. Inclusion of these soundings would improve safety and usability for the mariner, particularly if navigating primarily using ENCs.

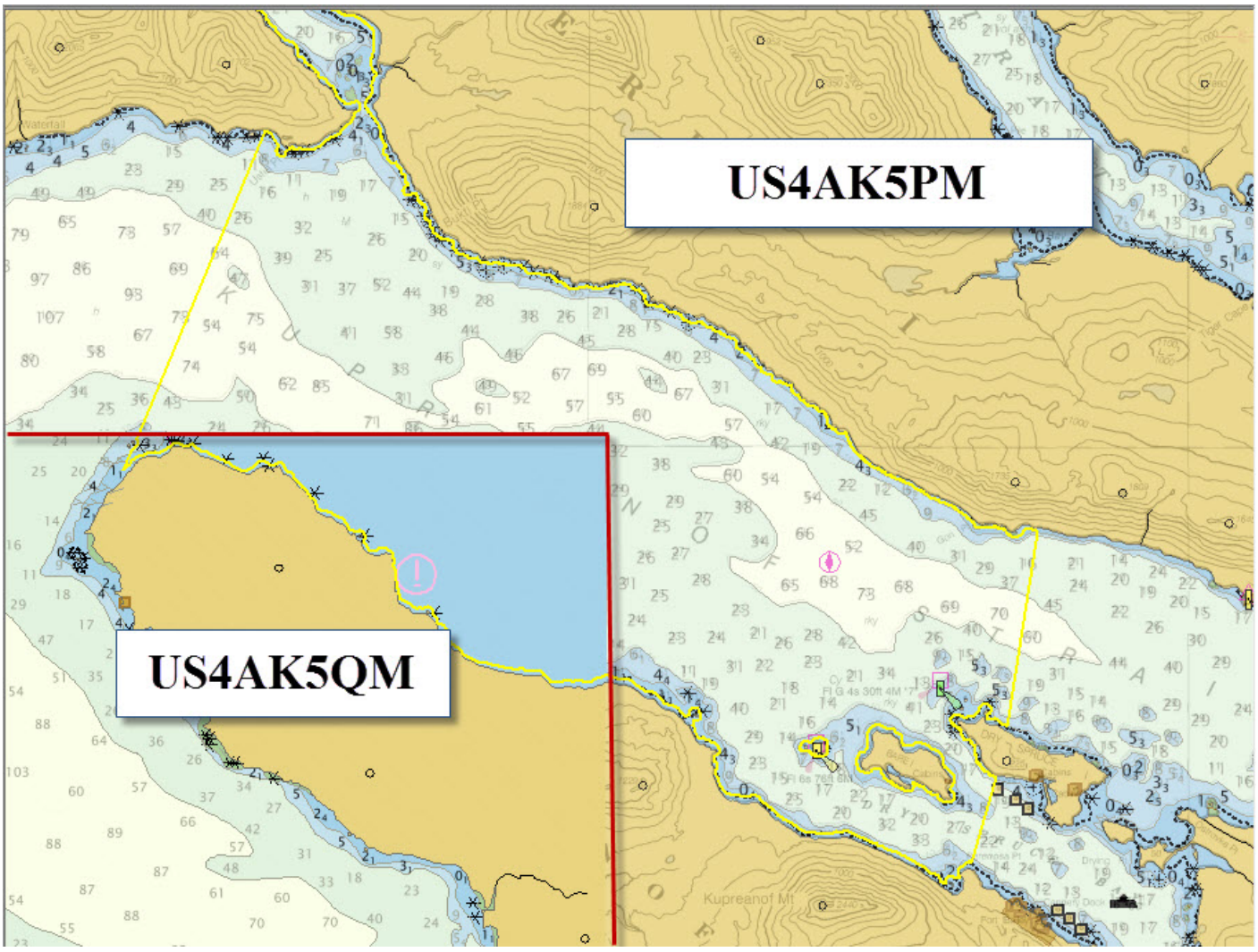


Figure 18: No portion of ENC US4K5QM contains sounding data within the sheet limits of H12690.

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

The following DTON reports were submitted:

DTON Report Name	Date Submitted
H12690 Danger to Navigation Report	2015-02-04

Table 18: DTON Reports

Danger to Navigation Reports are included in Appendix II of this report.

DTON report is attached to this report.

D.1.7 Shoal and Hazardous Features

All shoal and hazardous features were investigated in accordance with the Project Instruction and the HSSD, and are addressed in the Final Feature File submitted with this report.

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.

There is a pilot boarding area within the survey limits, though no pilotage activity was noted within the survey duration.

D.1.9 Bottom Samples

Seven (7) proposed bottom sample locations were identified in the Project Reference File and nine (9) were collected, including three (3) additional samples in order to obtain representative bottom type throughout

the surveyed area (see Appendix V: Supplemental Correspondence) . All samples were collected at the proposed sites. One (1) unassigned sample was not collected after three failed attempts at 57-58-17.9123N, 153-10-19.2967W. One (1) assigned sample was not collected due to time restraints at 58-04-02.53N, 153-15-26.41W. All bottom sample locations that were not sampled are marked as 'no sample' in the Final Feature File.

D.2 Additional Results

D.2.1 Shoreline

Shoreline verification was conducted near predicted low water in accordance with the applicable sections of the NOAA HSSDM and FPM. There were 76 assigned features for this survey. 75 assigned features were addressed as required with S-57 attribution and recorded in the H12690 Final Features File to best represent the features at chart scale. The single outstanding feature was not addressed during shoreline due to time constraints. It is recommended to retain the feature as charted. During shoreline verification, it was necessary to maneuver around fishing nets in some areas, which did not allow for seamless nearest-to-shore verification of said areas.

D.2.2 Prior Surveys

No prior survey comparisons exist for this survey.

D.2.3 Aids to Navigation

Aids to navigation (ATON) were present in the survey area, but were not assigned for investigation. All three ATON observed in the field appeared correctly charted and serve their intended purpose.

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

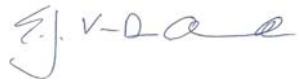
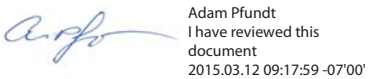
No new insets are recommended for this area.

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
Edward J. Van Den Ameele, CDR/NOAA	Commanding Officer, NOAA Ship RAINIER	03/12/2015	
Adam Pfundt, LTJG/NOAA	Field Operations Officer, NOAA Ship RAINIER	03/12/2015	 Adam Pfundt I have reviewed this document 2015.03.12 09:17:59 -07'00'
James B. Jacobson	Chief Survey Technician, NOAA Ship RAINIER	03/12/2015	 James Jacobson I have reviewed this document 2015.03.12 08:43:48 -07'00'
Steven J. Wall, ENS/NOAA	Junior Officer, NOAA Ship RAINIER	03/12/2015	

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 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

H12690 Danger to Navigation Report

Registry Number: H12690

State: Alaska

Locality: North Coast of Kodiak Island

Sub-locality: Kupreanof Strait

Project Number: OPR-P136-RA-14

Survey Dates: May 13, 2014 - October 15, 2014

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
16594	13th	04/04/1998	1:78,900 (16594_1)	USCG LNM: 1/21/2014 (2/25/2014) CHS NTM: None (1/31/2014) NGA NTM: 2/24/2007 (3/8/2014)
16576	4th	09/01/2003	1:80,000 (16576_1)	[L]NTM: ?
16580	14th	01/01/2008	1:350,000 (16580_1)	[L]NTM: ?
16013	30th	07/01/2006	1:969,761 (16013_1)	[L]NTM: ?
531	24th	07/01/2007	1:2,100,000 (531_1)	[L]NTM: ?
500	8th	06/01/2003	1:3,500,000 (500_1)	[L]NTM: ?
530	32nd	06/01/2007	1:4,860,700 (530_1)	[L]NTM: ?
50	6th	06/01/2003	1:10,000,000 (50_1)	[L]NTM: ?

* Correction(s) - *source: last correction applied (last correction reviewed--"cleared date")*

Features

No.	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	Shoal	14.53 m	58° 01' 27.0" N	153° 12' 33.7" W	---

1 - Dangers To Navigation

1.1) 164/67

DANGER TO NAVIGATION

Survey Summary

Survey Position:	58° 01' 27.0" N, 153° 12' 33.7" W
Least Depth:	14.53 m (= 47.68 ft = 7.947 fm = 7 fm 5.68 ft)
TPU (±1.96σ):	**THU (TPEh)** ±0.176 m ; **TVU (TPEv)** ±0.447 m
Timestamp:	2014-246.17:34:08.457 (09/03/2014)
Survey Line:	h12690 / 2804_reson7125_lf_256 / 2014-246 / 2804_2014ra2461733
Profile/Beam:	164/67
Charts Affected:	16594_1, 16576_1, 16580_1, 16013_1, 531_1, 500_1, 530_1, 50_1

Remarks:

[None]

Feature Correlation

Source	Feature	Range	Azimuth	Status
2804_2014ra2461733	164/67	0.00	000.0	Primary

Hydrographer Recommendations

[None]

Cartographically-Rounded Depth (Affected Charts):

8fm (16594_1, 16580_1, 16013_1, 530_1)

7fm 5ft (16576_1, 531_1)

14.5m (500_1, 50_1)

S-57 Data

[None]

Feature Images

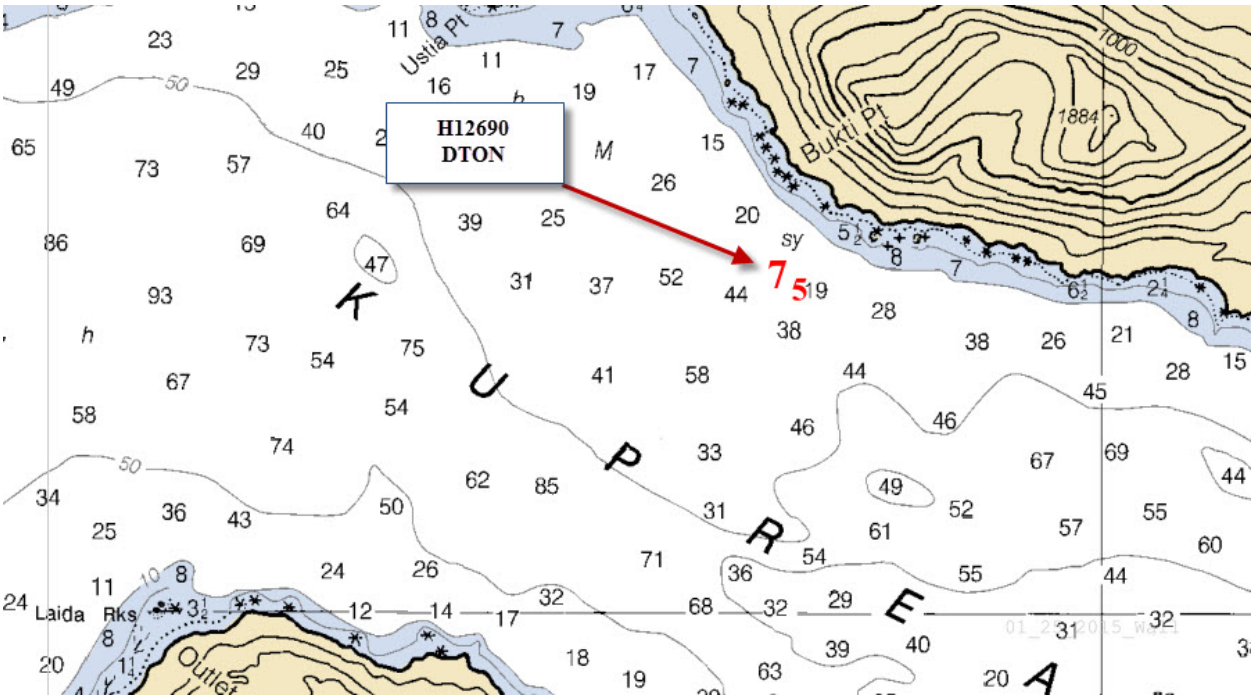


Figure 1.1.1

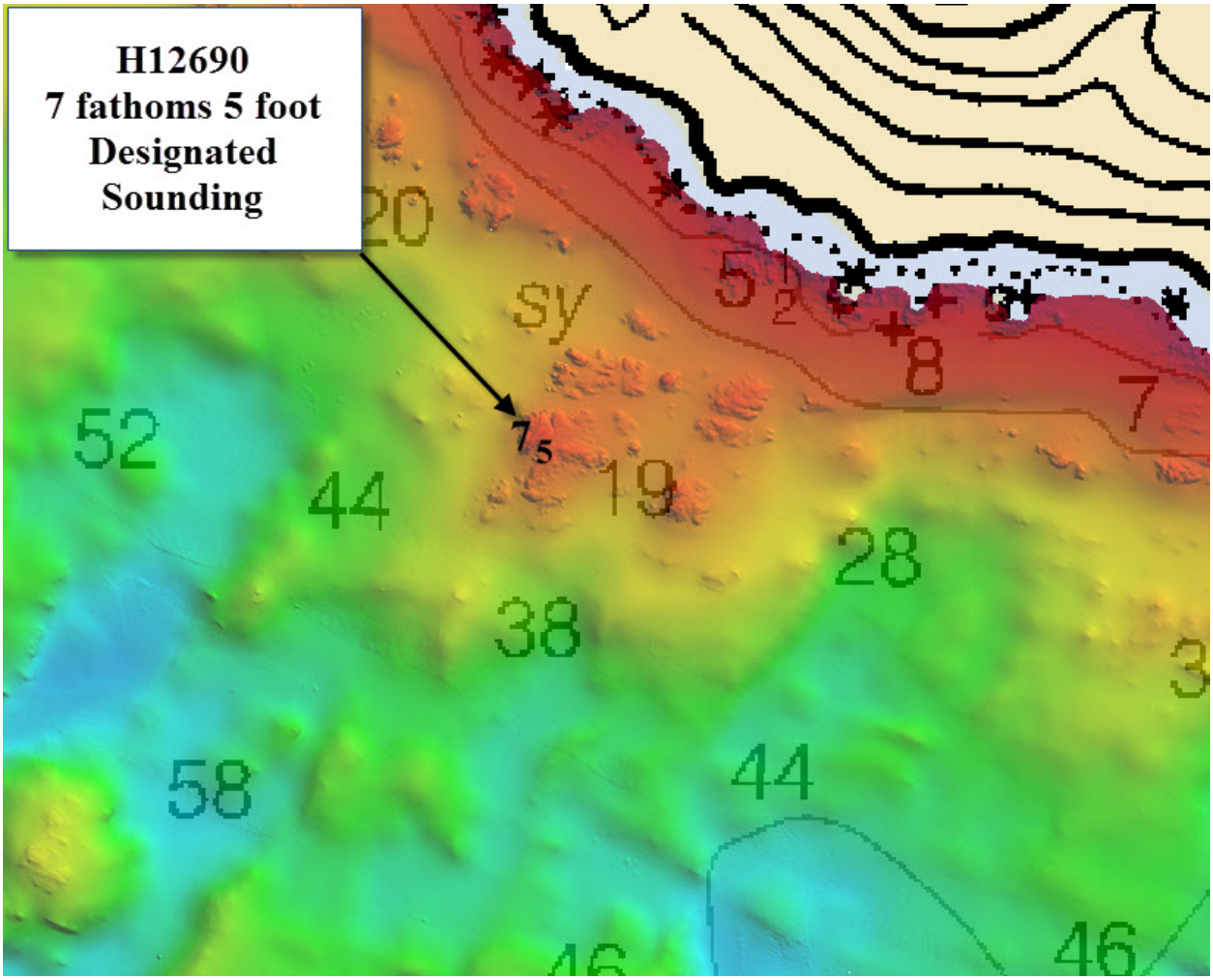

H12690
7 fathoms 5 foot
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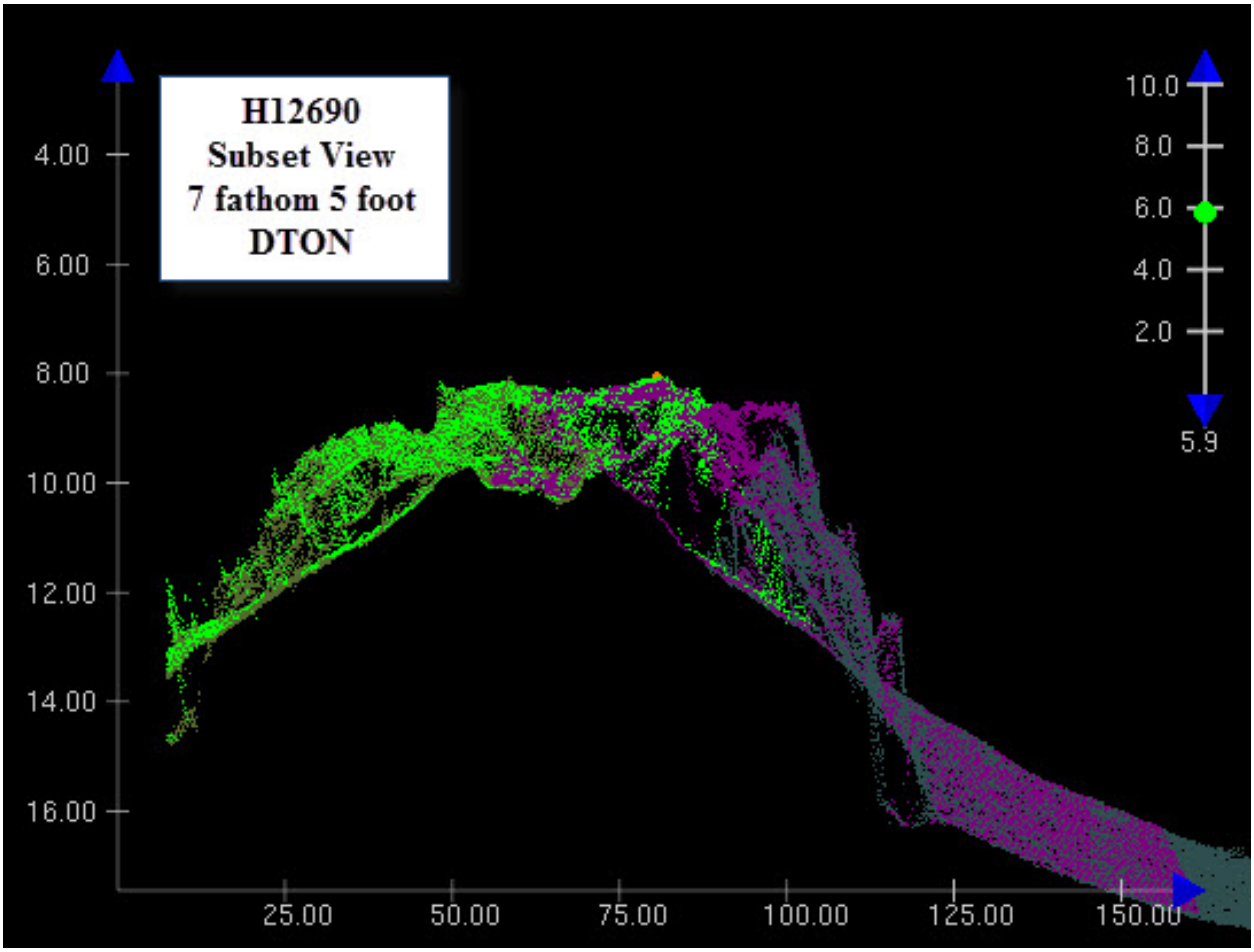
Figure 1.1.2


H12690
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5.9

Figure 1.1.3

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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : January 9, 2015

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-P136-RA-2014
HYDROGRAPHIC SHEET: H12690

LOCALITY: Kupreanof Strait, North Coast of Kodiak Island, AK
TIME PERIOD: May 13 - October 16, 2014

TIDE STATION USED: 975-7535 West Raspberry Island, AK
Lat. 58° 06.4'N Long. 153° 20.4' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 4.021 meters

TIDE STATION USED: 9457493 SW Terror Bay, AK
Lat. 57° 44.6' N Long. 153° 11.7' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 4.038 meters

ESTIMATED ZONING ERROR 0.22 m

REMARKS: RECOMMENDED ZONING

Use zone(s) identified as: SA19, SA20, SA21 and SA22

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).

Note 2: Use tide data from the appropriate station with applicable zoning correctors for each zone according to the order in which they are listed in the Tidezone corrector file (*.ZDF). For example, tide station one (TS1) would be the first choice for an applicable zone followed by TS2, etc. when data are not available.

HOVIS.GERALD.THOMAS.JR.1365860250

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DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=OTHER, cn=HOVIS.GERALD.THOMAS.JR.1365860250
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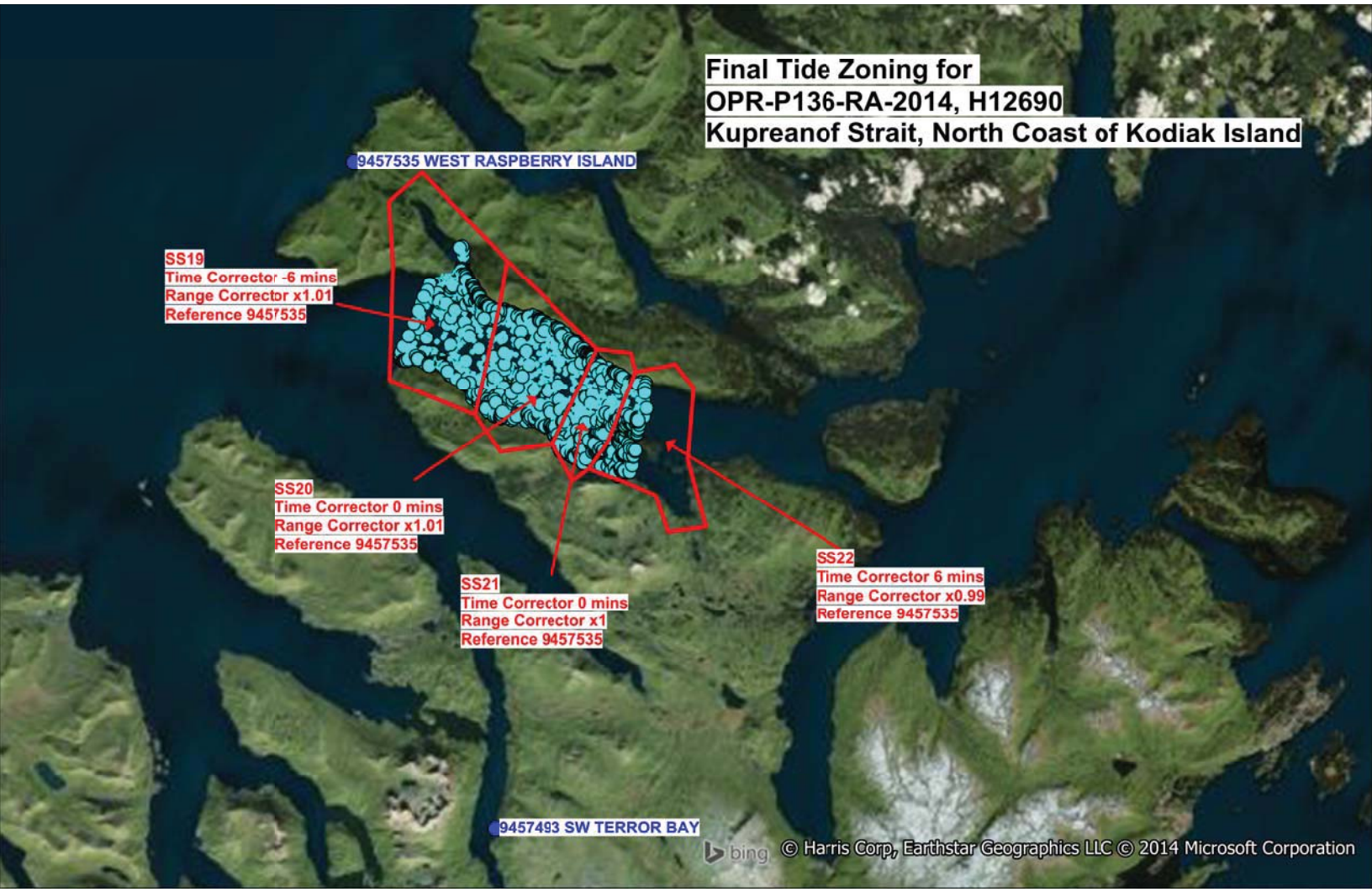
CHIEF, PRODUCTS AND SERVICES BRANCH


Final Tide Zoning for
OPR-P136-RA-2014, H12690
Kupreanof Strait, North Coast of Kodiak Island
9457535 WEST RASPBERRY ISLAND
SS19
Time Corrector -6 mins
Range Corrector x1.01
Reference 9457535
SS20
Time Corrector 0 mins
Range Corrector x1.01
Reference 9457535
SS21
Time Corrector 0 mins
Range Corrector x1
Reference 9457535
SS22
Time Corrector 6 mins
Range Corrector x0.99
Reference 9457535
9457493 SW TERROR BAY
bing
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APPROVAL PAGE

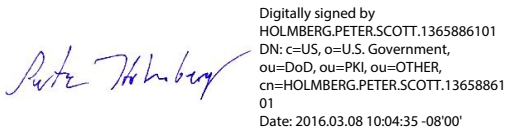
H12690

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

- H12690_DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- H12690_GeoImage.pdf

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



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.

Approved:_____

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