

H11128

NOAA FORM 76-35A

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SERVICE

DESCRIPTIVE REPORT

Type of Survey HYDROGRAPHIC

Field No. RA-10-07-06

Registry No. H11128

LOCALITY

State Alaska

General Locality Approaches to Sitka

Sublocality Southwest Biorka Channel

2006

CHIEF OF PARTY

..... Commander Guy T. Noll, NOAA

LIBRARY & ARCHIVES

DATE

HYDROGRAPHIC TITLE SHEET

H11128

INSTRUCTIONS - The hydrographic sheet should be accompanied by this form,
filled in as completely as possible, when the sheet is forwarded to the office.FIELD NO.
RA-10-07-06State AlaskaGeneral Locality Approaches to SitkaSublocality Southwest Biorka ChannelScale 1:10,000Date of Survey 5/28/2006 - 6/26/2006Instructions Dated 5/2/2006Project No. OPR-O112-RA-06Vessel RA-2 (1103), RA-4 (1016), RA-5 (1006), RA-6 (1015), RA1 (1101)Chief of Party Commander Guy T. Noll, NOAASurveyed by RAINIER PersonnelSoundings taken by echo sounder RESON 8101, RESON 8125, Elac 1180, Knudsen 320MGraphic record scaled by N/AGraphic record checked by N/AEvaluation by K. Brown Automated plot by N/AVerification by K. Brown, P. HolmbergSoundings in Fathoms and Feet at MLLWREMARKS: Time in UTC. UTM Projection Zone 8Revisions and annotations appearing as endnotes were
generated during office processing.As a result, page numbering may be interrupted or non-sequentialAll separates are filed with the hydrographic data.

Descriptive Report to Accompany Hydrographic Survey H11128

Project OPR-O112-RA-06
Approaches to Sitka, Alaska
Southwest Biorka Channel
Scale 1:10,000
May-June 2006

NOAA Ship RAINIER (s221)

Chief of Party: Commander Guy T. Noll, NOAA

A. AREA SURVEYED

This hydrographic survey was completed as specified by Hydrographic Survey Letter Instructions OPR-O112-RA-06 dated May 2, 2006 and all other applicable direction¹, with the exception of deviations noted in this report. The survey area is the approaches to Sitka, AK, specifically the area southwest of Biorka Channel and around Biorka Island. This survey corresponds to sheet "X" in the sheet layout provided with the Letter Instructions. OPR-112-RA-06 responds to a request from the Seventeenth U.S. Coast Guard District and Southeast Alaska Pilots Association for contemporary hydrography in the approaches to Sitka, Alaska. The purpose of this project is to provide contemporary hydrography with full bottom multibeam coverage, in Sitka Sound, Alaska, address inadequate chart data, and reduce the Critical survey backlog. Currently charted bathymetry dates from 1900 to 1969. Biorka Channel serves as an alternate route for large vessels approaching Sitka from the south. The entire survey area is extensively used by small commercial and recreational vessels based in Sitka.

One hundred percent multi-beam echosounder (MBES) coverage was obtained in the survey area. The inshore limit of hydrography for this survey was defined by the farthest offshore of the following: (1) the 4-meter depth contour, (2) the line defined by the distance seaward from the MHW line which is equivalent to 0.8 millimeters at the scale of the largest scale nautical chart (32 meters for areas covered by chart 17326 and 17328) or (3) areas in which the bathymetric data junctioned well with adjoining LIDAR survey H11427. Where safe to proceed inshore of this limit, Vertical-Beam Echosounder (VBES) and MBES data were acquired to verify least depths over specific items flagged as "investigation items" by the Pacific Hydrographic Branch from LIDAR survey H11427 and tasked to RAINIER.

Although not called for in the letter instructions, 100% side scan sonar (SSS) coverage was acquired in Symonds Bay, at the northeast corner of Biorka Island. Even though this area was within the limits of the LIDAR coverage and was not assigned to RAINIER, it is an anchorage used by small to medium sized vessels, including RAINIER, and was investigated with SSS for small objects which may have not been detected by LIDAR.

¹ Standing Instructions for Hydrographic Surveys (March 2004), NOS Hydrographic Surveys Specifications and Deliverables (March 2003), OCS Field Procedures Manual for Hydrographic Surveying v 2.1 (June 2006), and all Hydrographic Surveys Technical Directives issued through HSD 2006-5 dated June 2006.

Limited feature verification was performed as described in Section D.2.

Data acquisition was conducted from 28 May to 26 June 2006 (DN148 to DN177). Survey statistics were calculated for each vessel (See Table 1).

Data Acquisition Type	Hull Number						Total
	1101	1103	1021	1016	1006	1015	
VBES (Mainscheme NM)							
MBES (Mainscheme NM)				125.35	203.00	48.75	377.10
MBES+SSS (Mainscheme NM)						3.52	3.52
All Mainscheme (NM)							380.62
Dev (MBES NM)							
XL (MBES NM)						25.94	25.94
Shoreline (SSS, VBES NM)	2.59	0.6					3.19
Bottom Samples (# of)			9				9
Items Investigated (# of)							15
Sq. Nautical Miles							25.28

Table 1: Vessel survey statistics for H11128.

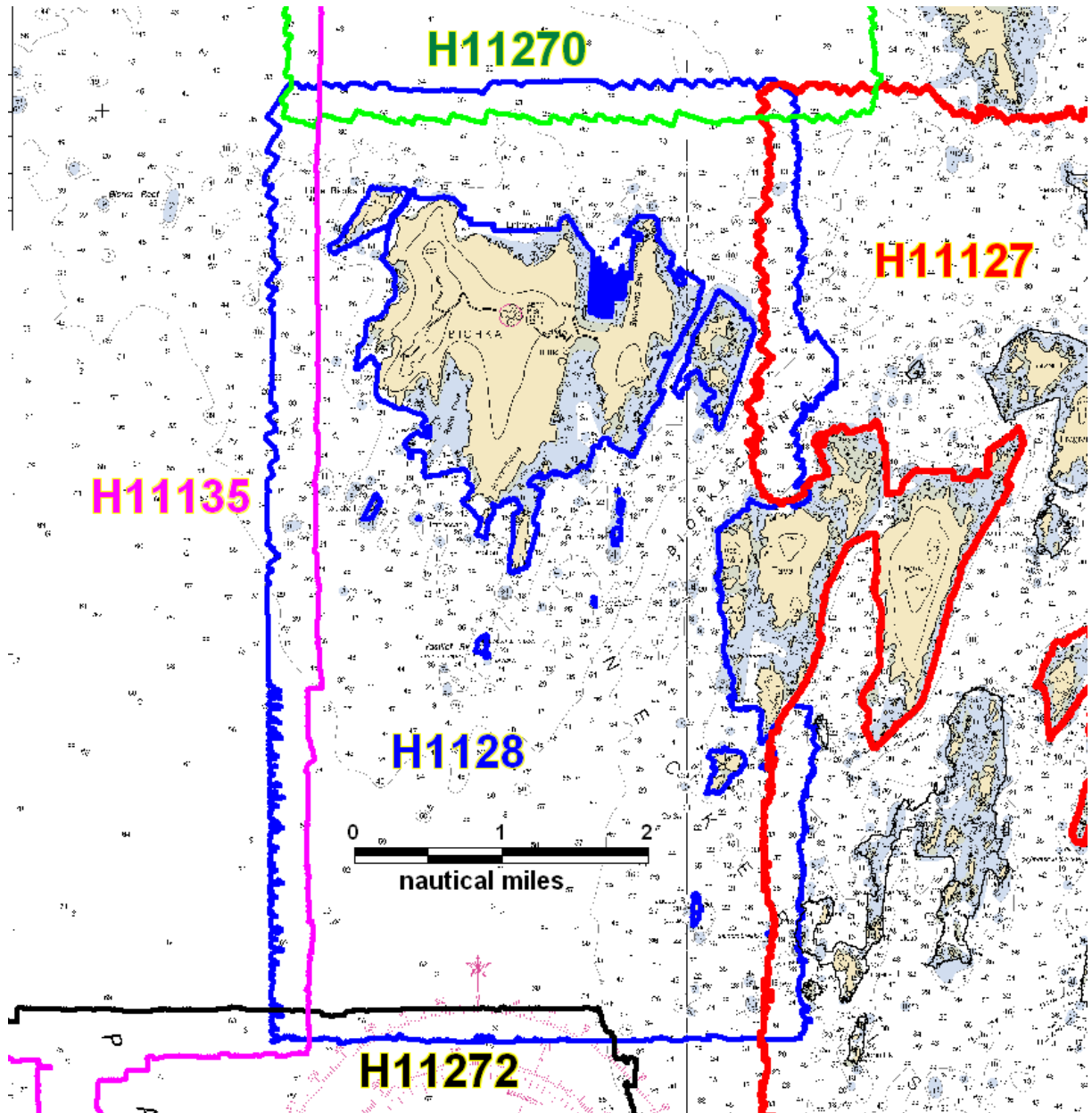


Figure 1. H11128 Survey limits and junctions overlaid on Chart17326. H11427's coverage area is inshore of and converging with H11128's survey outline.

B. DATA ACQUISITION AND PROCESSING

A complete description of data acquisition and processing systems, survey vessels, quality control procedures and data processing methods can be found in the *OPR-O112-RA-06 Data Acquisition and Processing Report (DAPR)*¹, submitted under separate cover. Items specific to this survey, and any deviations from the DAPR are discussed in the following sections.

Final Approved Water Levels have been applied to this survey. See Section C. for additional information.

B1. Equipment and Vessels

Data for this survey were acquired by the following vessels:

Hull Number	Name	Acquisition Type
1101	RA-1	Vertical-Beam Echosounder Detached Positions
1103	RA-2	Vertical-Beam Echosounder Detached Positions
1021	RA-3	Bottom Samples
1016	RA-4	Multi-Beam Echosounder
1006	RA-5	Multi-Beam Echosounder
1015	RA-6	Multi-Beam Echosounder Side Scan Sonar

Table 2. Data Acquisition Vessels for H11128.

Sound speed profiles were measured with SEACAT SBE-19 and 19+ profilers in accordance with the Specifications and Deliverables.

No unusual vessel configurations were used for data acquisition.

B2. Quality Control

Crosslines

Multi-beam Echosounder (MBES) crosslines (XL) totaled 25.94 nautical miles, comprising 6.96% of mainscheme MBES hydrography. The mainscheme bathymetry was manually compared to the crossline nadir beams in CARIS subset mode and agreed well, with negligible, if any, differences.²

A statistical Quality Control Report has been conducted on representative data acquired with each system used on this survey. Results of these tests are included in the updated 2006 RAINIER Hydrographic System Readiness Review package³ submitted with this survey.

Junctions

The following contemporary surveys junctions with H11128 (See Figure 1):

Registry #	Scale	Date	Junction side
H11127	1:10,000	2006	East
H11272	1:20,000	2005	Southwest
H11135	1:20,000	2005	West
H11270	1:10,000	2005	North
H11427 (LIDAR)	1:10,000	2005	Shoreline

Surveys H11127, H11135, and H11270 were compared with H11128 in CARIS HIPS Subset Mode and junction well with this survey. There are generally no discernable differences between the surveys' data.⁴

Survey H11272 junctions well with H11128, considering the junction area is in depths greater than 90 meters. In a few areas of the junction region, H11128 soundings were 1 – 2 meters shallower and were considerably “noisier” than those of H11272. All data from H11128 in this junction area were acquired using the Elac 1180 MBES mounted on Vessel 1015 (RA-6). The junction area is the most exposed portion of the survey, and weather and sea state conditions often approached the limits of effective launch hydrography during H11128 operations. Data from H11272 were acquired using RAINIER's Elac 1050D under benign conditions in Spring of 2005. Although resolution and accuracy of the two Elac systems is comparable, the additional stability of the larger ship platform and better prevailing conditions during H11272 operations yielded a more reliable dataset. The hydrographer recommends that H11272 data supersede that of H11128 in the common area.⁵

H11427 LIDAR bathymetry was provided by the Pacific Hydrographic Branch in CARIS HIPS format for junction comparison. H11128 survey soundings were continually compared to these data during data acquisition to ensure that echosounder coverage was extended sufficiently far inshore to provide approximately one MBES swath width of overlap with LIDAR soundings judged to be reliable by the hydrographer. (Note that the limit of “reliable” LIDAR bathymetry was typically found in approximately 15-20m of water, and often well inshore of the LIDAR coverage limit line provided with the data.) Junction comparison was good within this area of overlap, with differences between the surveys typically less than 0.5m. This difference can be attributed to the large sounding footprint of the LIDAR survey compared to those of the MBES survey, the steep slopes of the junction areas, and the generally rugged bathymetry in these areas. In some areas, the one full swath width of MBES overlap with the LIDAR data called for in the letter instructions could not be achieved because of the proximity to rapidly shoaling hazards. In these areas, however, good agreement of the depths and slope of the seafloor was obtained (See Figure 2). The hydrographer recommends that H11128 survey soundings supersede all H11427 bathymetry in all common areas.⁶

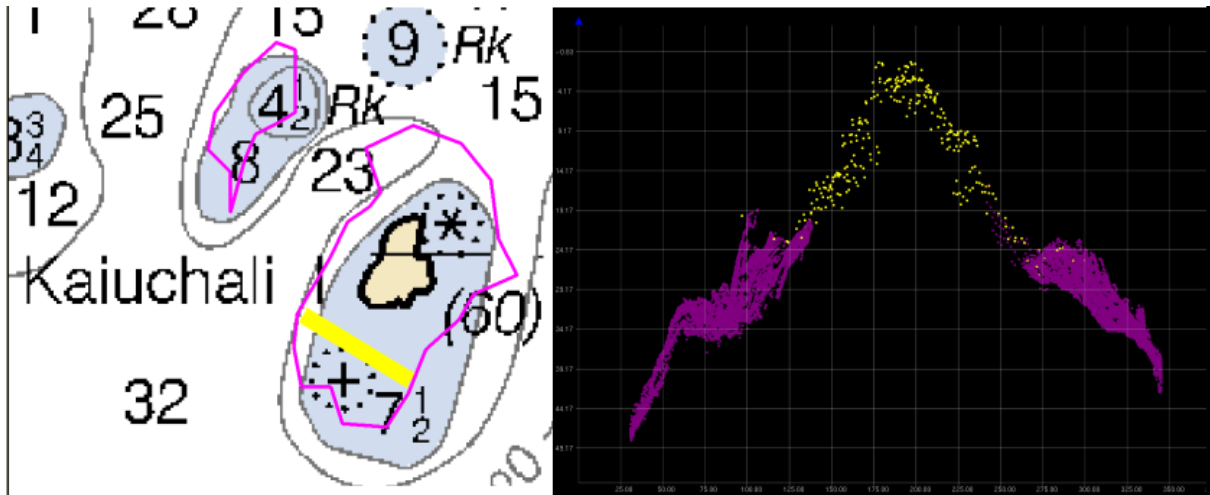


Figure 2. Right - Good Agreement between MB (purple) and LIDAR (yellow) data sets on Kaiuchali Is. Left - Delineated LIDAR data area around Kaiuchali Is. with cross section data slice.

Data Quality Factors

Elac TrueHeave on 1015 (RA-6)

The Elac 1180 MBES was used to acquire data in the southwest corner of the sheet in depths generally greater than 50 fathoms. There is an offset between the time stamps on the TrueHeave data and the Elac data as converted in CARIS. TrueHeave has not been applied to the Elac data for survey H11128. There are no discernable heave offsets in the data.

No other unusual conditions were encountered during the survey that affected the expected accuracy and quality of survey data.

B3. Data Reduction

Data reduction procedures for survey H11128 conform to those detailed in the *OPR-O112-RA-06 DAPR*. Final processing of the survey was conducted using version 7.2.0 of Pydro.

B4. Data Representation

Though many CUBE surfaces were used in processing of H11128, the final submission is shown in Figures 8 through 13. Finalized CUBE surface resolutions were chosen as a function of depth range to ensure accurate representation of the dynamic seafloor within the survey limits and were sized to have fewer than 20×10^6 nodes.

Data were acquired using the Elac 1180 MBES in the southwest corner of the survey area in depths of 90-110m. Although the Field Procedures Manual calls for 5m resolution BASE surfaces in this depth range, these data can support no higher resolution than 10 meters. There are no features in this area that are not adequately represented by this surface for charting purposes. The resolution limitations of this system are more fully discussed in section A.3 of the DAPR submitted for this project.

The seafloor within the limits of this survey is generally comprised of broken, rocky outcroppings. To better capture least depths of the dynamic bottom, higher resolution surfaces were finalized to greater depths than suggested in the Specifications and Deliverables. 0.5 meter resolution surfaces were finalized for depths between 0 and 25 meters; 1 meter resolution surfaces were finalized between for depths between 24 and 35 meters. All surfaces were examined against the sounding data using CARIS HIPS subset mode to ensure accurate least depth representation. In many cases, the CUBE surface did not match the shoalest reliable sounding to within the ½ IHO S-44 Order 1 error allowance given in the Field Procedures Manual. In some of these cases, the shoalest sounding was designated to force the surface to honor the sounding. However, due to the large number of these instances, the following navigational significance test was applied before designating any soundings.

Navigational Significance Test for Designation of Soundings

In cases where the BASE surface did not represent the least depth to within the required tolerance (½ IHO allowable error), but there was a nearby shallower or otherwise controlling feature, the deeper soundings were not designated. “Nearby” was defined as within 5mm at traditional chart compilation scale (twice the scale of the largest scale chart of the area). For H11128, this translates to 100m, or 5mm at twice the scale of chart 17326 (1:40,000). “Controlling”, in this case, referred to features that most accurately represented the most significant offshore shoal depth of each 100m area.⁷

The resultant surface accurately represents the least depths of controlling features within a reasonable scale based on the resolution of the current chart. In cases where soundings were not designated, the differences between the surface and the data were usually within total IHO error allowance for that depth, but not within ½ of that allowance. Figures 3-6 illustrate examples of features where this navigational significance test has been applied.

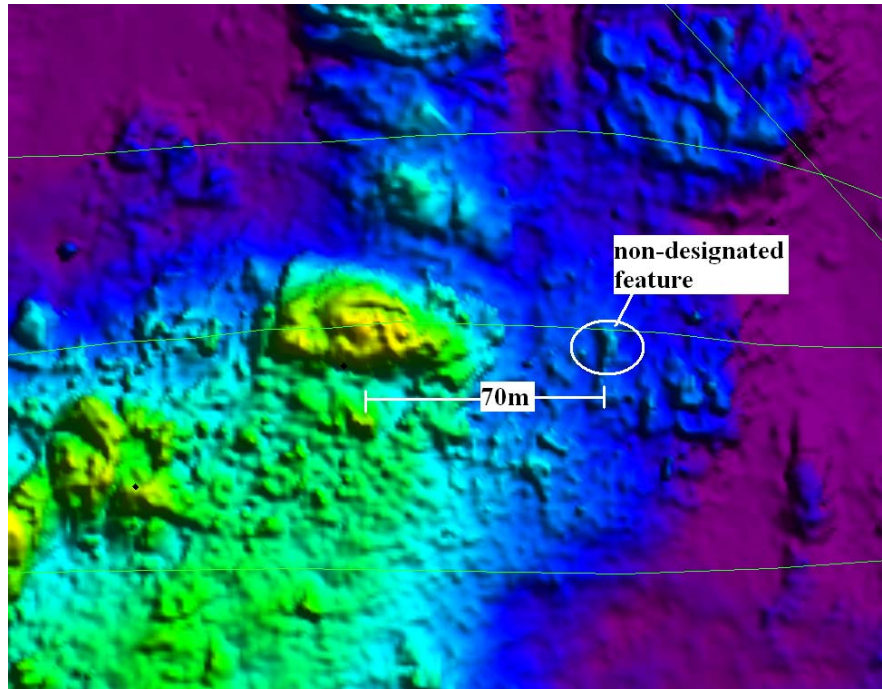


Figure 3: Area of the seafloor showing controlling feature and a non-designated feature.

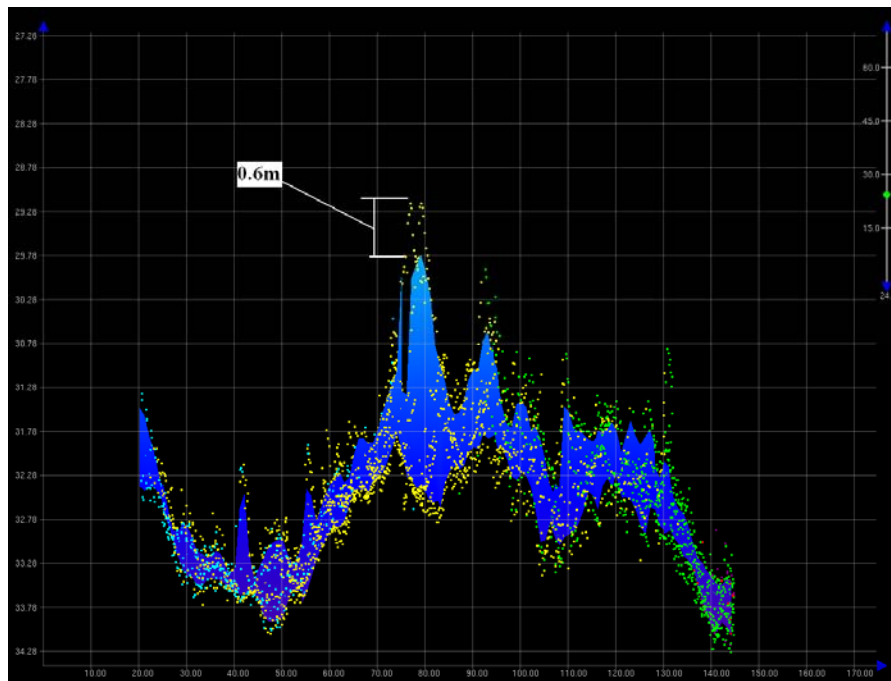


Figure 4: Difference between MBES soundings and their 1-meter BASE surface representation. One half the IHO S-44 Order 1 allowable error for this depth is ~25cm. Though the BASE surface is deeper than the shoalest reliable sounding by more than this allowance, this feature has not been designated as there is a nearby (within 100m) controlling feature.

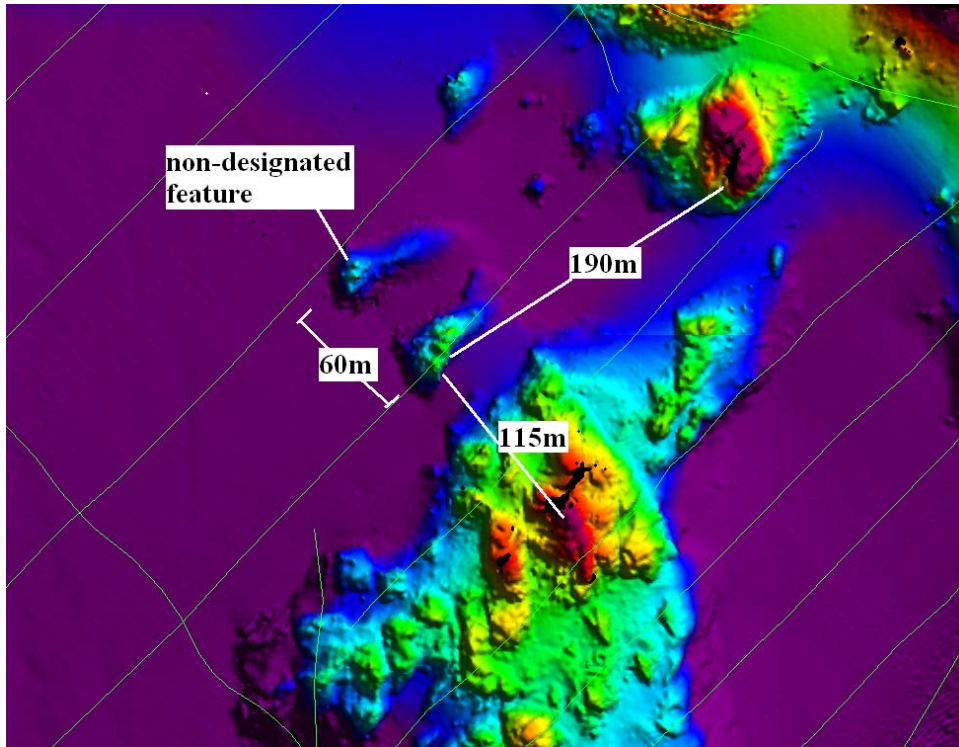


Figure 5: Area of the seafloor showing controlling feature and a non-designated feature.

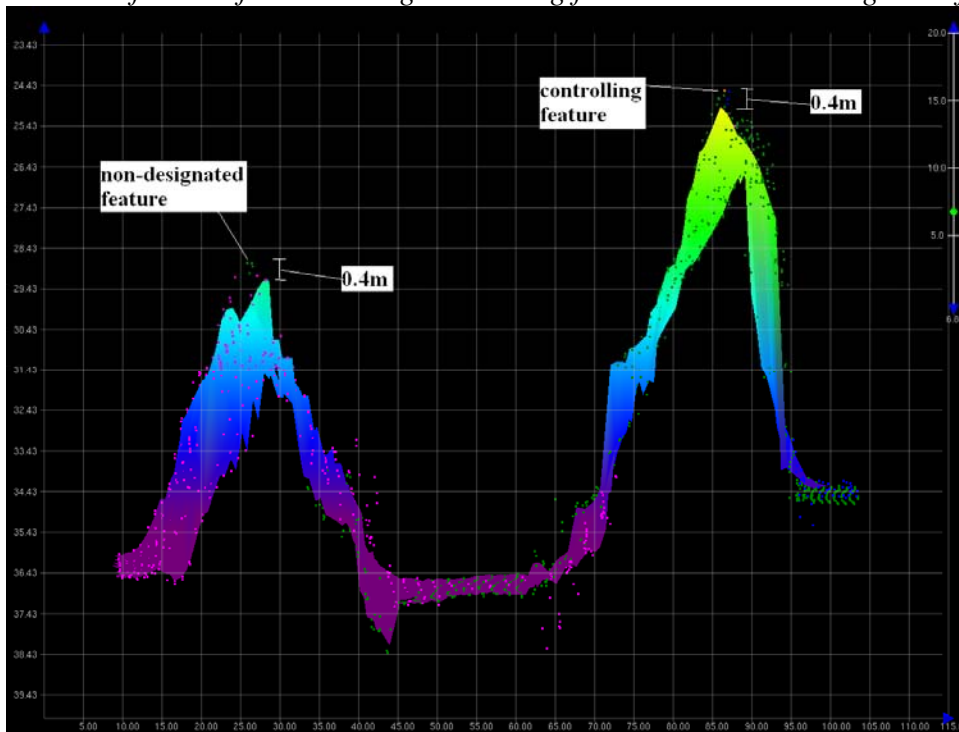


Figure 6: Difference between the data and its 1 meter representation. One half IHO S-44 Order 1 allowable error for this depth is ~30cm.

Erroneous Soundings

When the finalized CUBE surfaces were combined, the resultant surface honored two depths not representative of the seafloor. In an area about 0.7 nm SW of Vasilief Rk, the finalized combined surface shows a depth of 35 meters while the actual seafloor sits at approximately 89 meters (See figure 7). This spike is not found in any of the constituent surfaces from which the combined surface was created, and there are no accepted soundings in the dataset at that depth in the vicinity. The erroneous “spike” is on the southern edge of a field sheet whose surface resolution is one meter. This surface was finalized to 35 meters. There are no data around or above the spike at this depth.

Six hundred (600) meters SW of Kaiuchali Island, the finalized combined surface shows a depth of 22.7 meters (See figure 7). The actual seafloor sits at approximately 60 meters, the depth to which this survey’s 2-meter resolution CUBE surfaces were finalized. Like the above mentioned “spike”, this sounding is not found in any of the constituent surfaces from which the combined surface was created, and there are no accepted soundings in the dataset at that depth in the vicinity.

The hydrographer suggests that these depth spikes may be artifacts of computation of the finalized combined surface at the boundary of the field sheet, or at the boundary of the finalized depth zone. The combined surface is a product for field unit use, not an official deliverable, and is provided with the survey for reference only.⁸

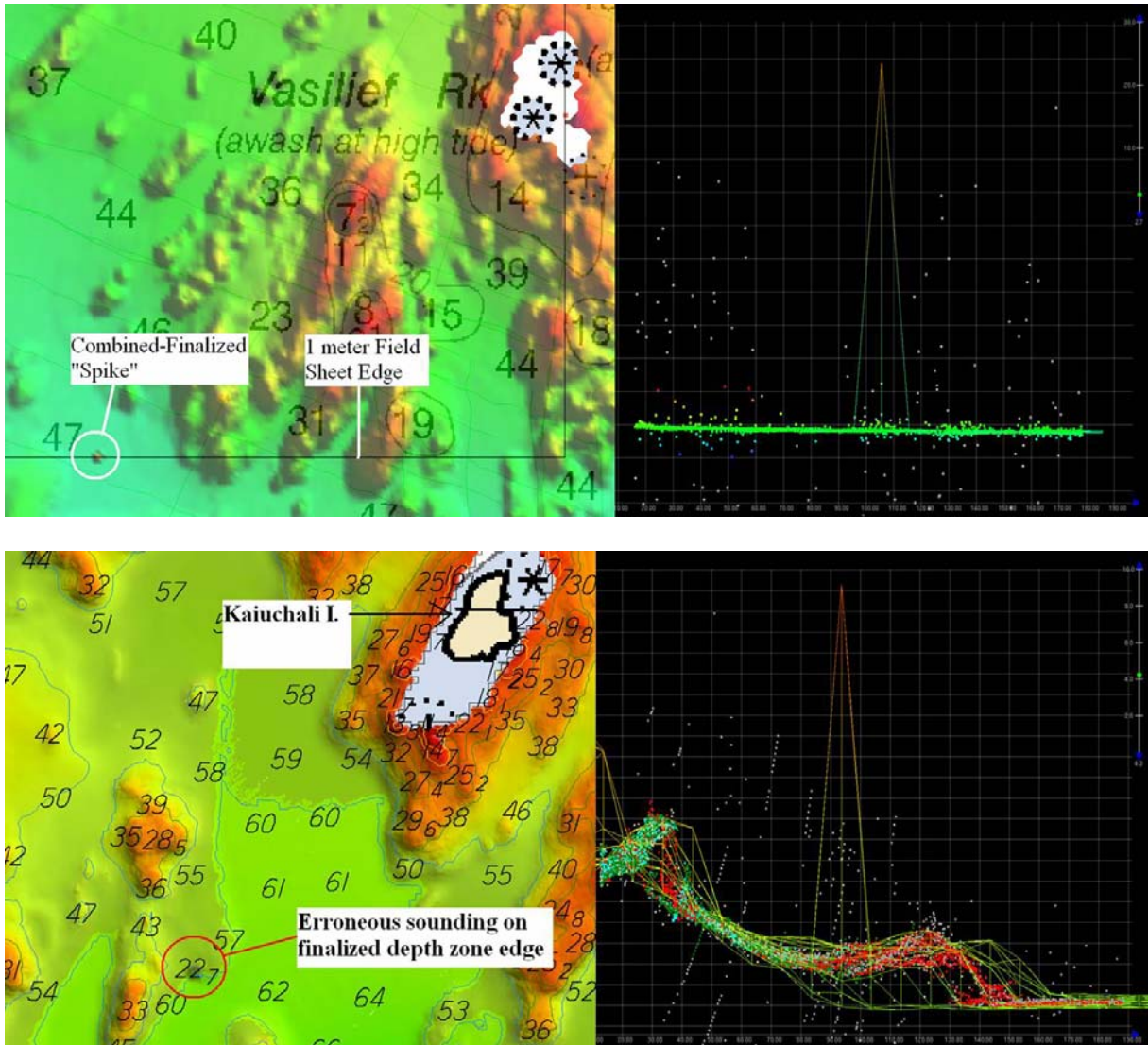


Figure 7: Erroneous surface spikes overlaid on chart 17326, and their representations in CARIS subset editor.

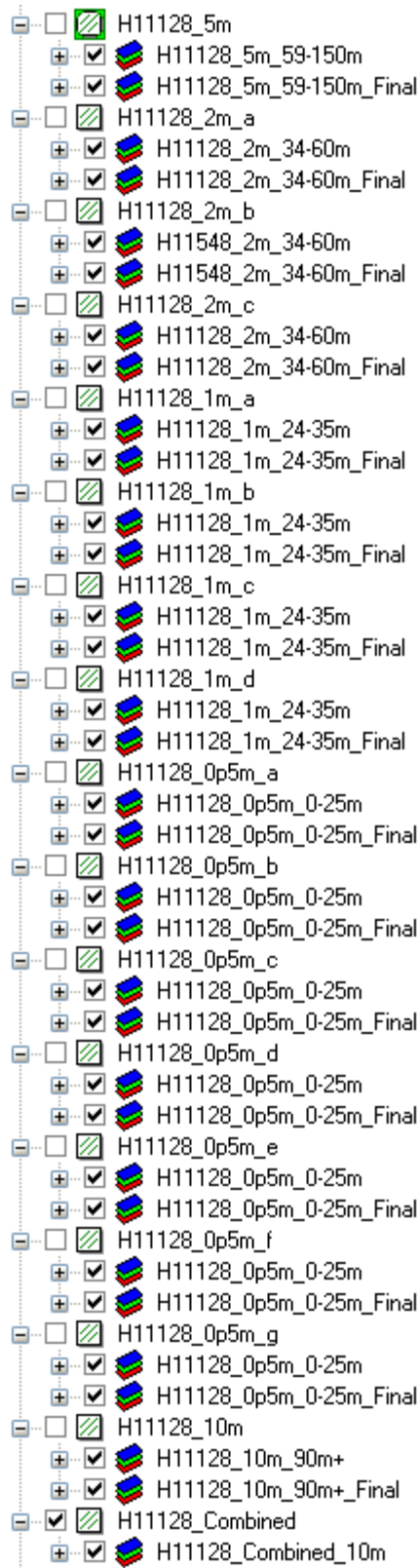


Figure8: Field sheets and CUBE surfaces submitted with H11128.

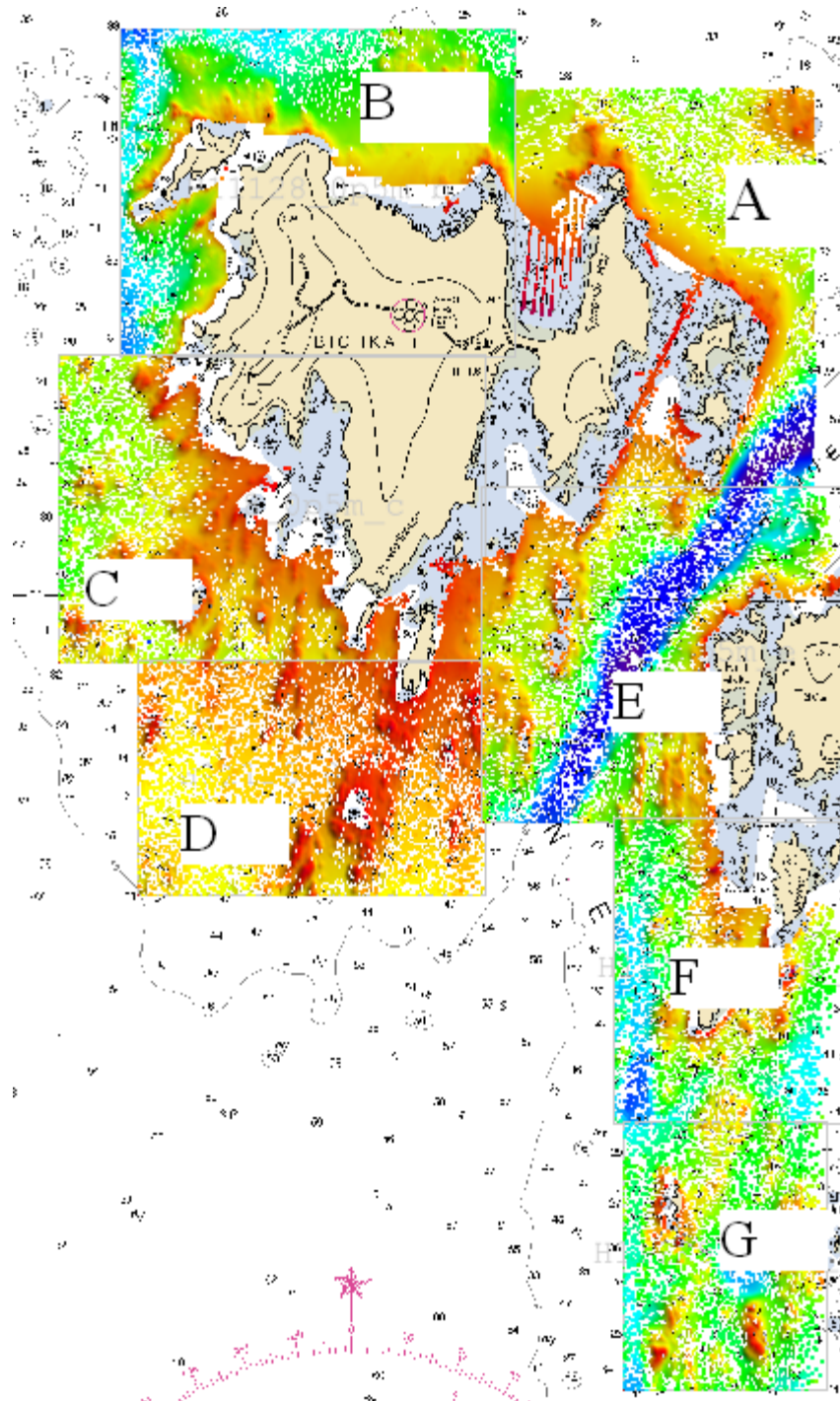


Figure 9: Layout of half-meter field sheets and CUBE surfaces for H11128, overlaid on Chart 17326.

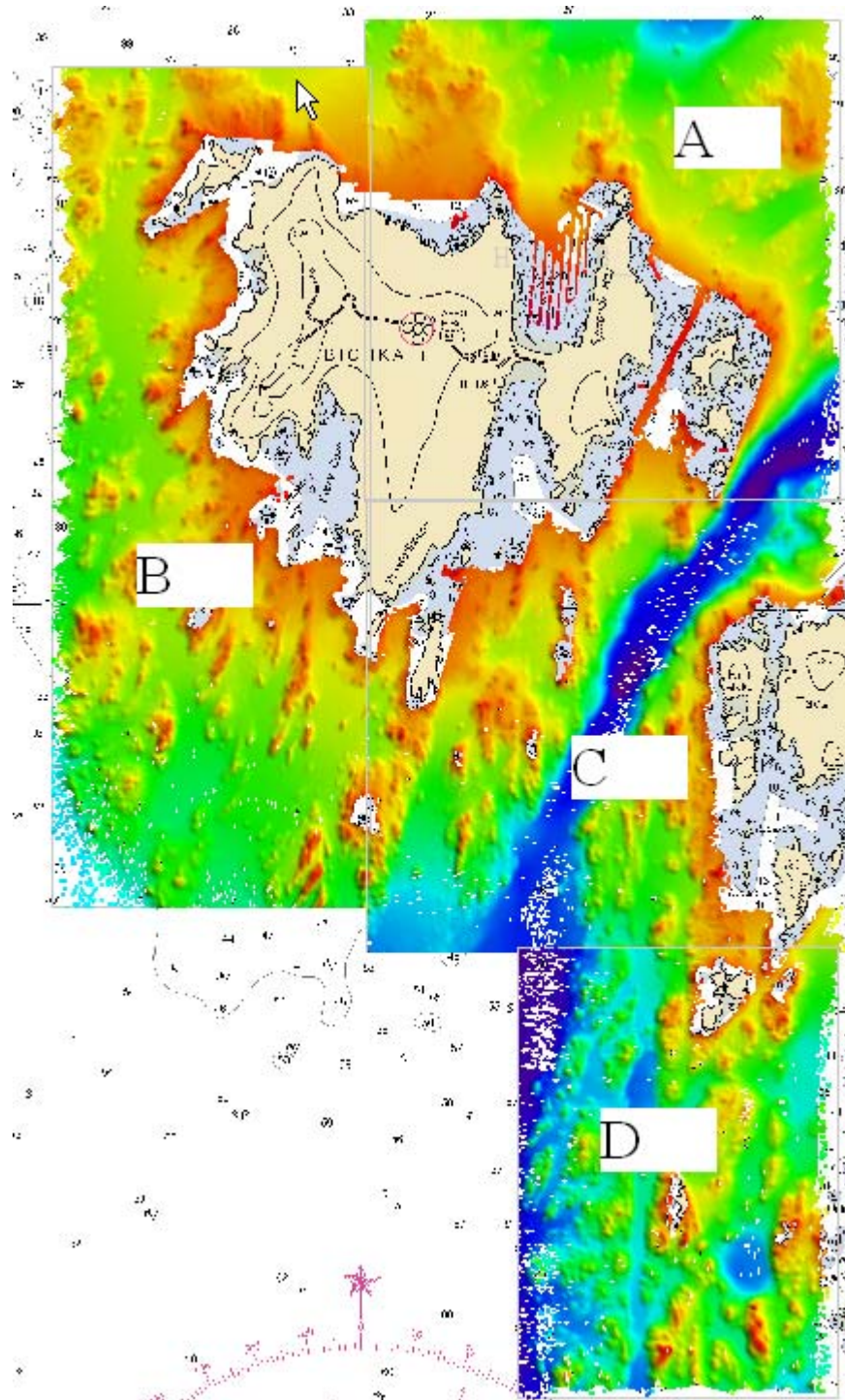


Figure 10: Layout of 1m field sheets and CUBE surfaces for H11128, overlaid on Chart 17326.

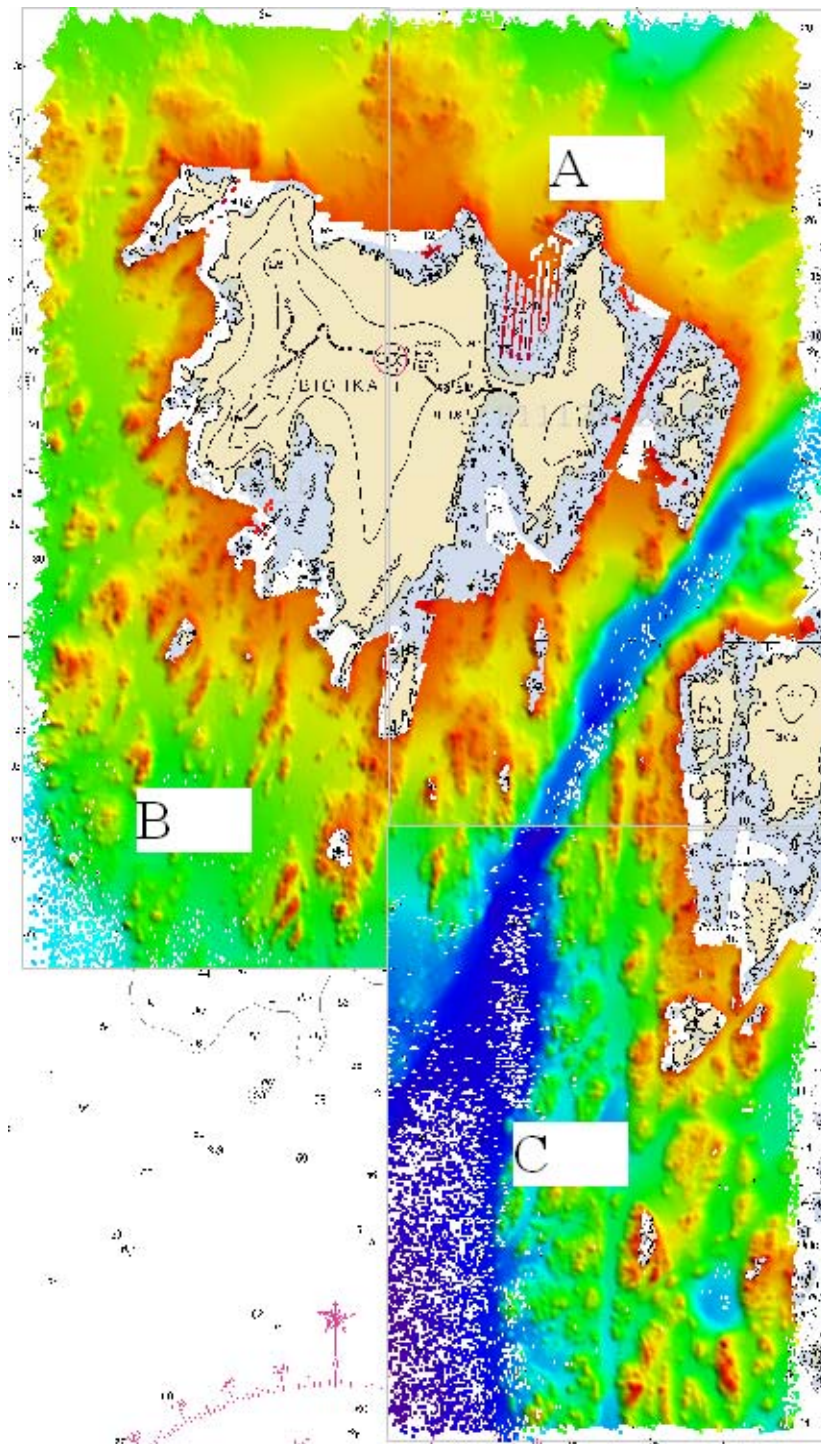


Figure 11: Layout of 2-meter field sheets and CUBE surfaces for H11128, overlaid on chart 17326.

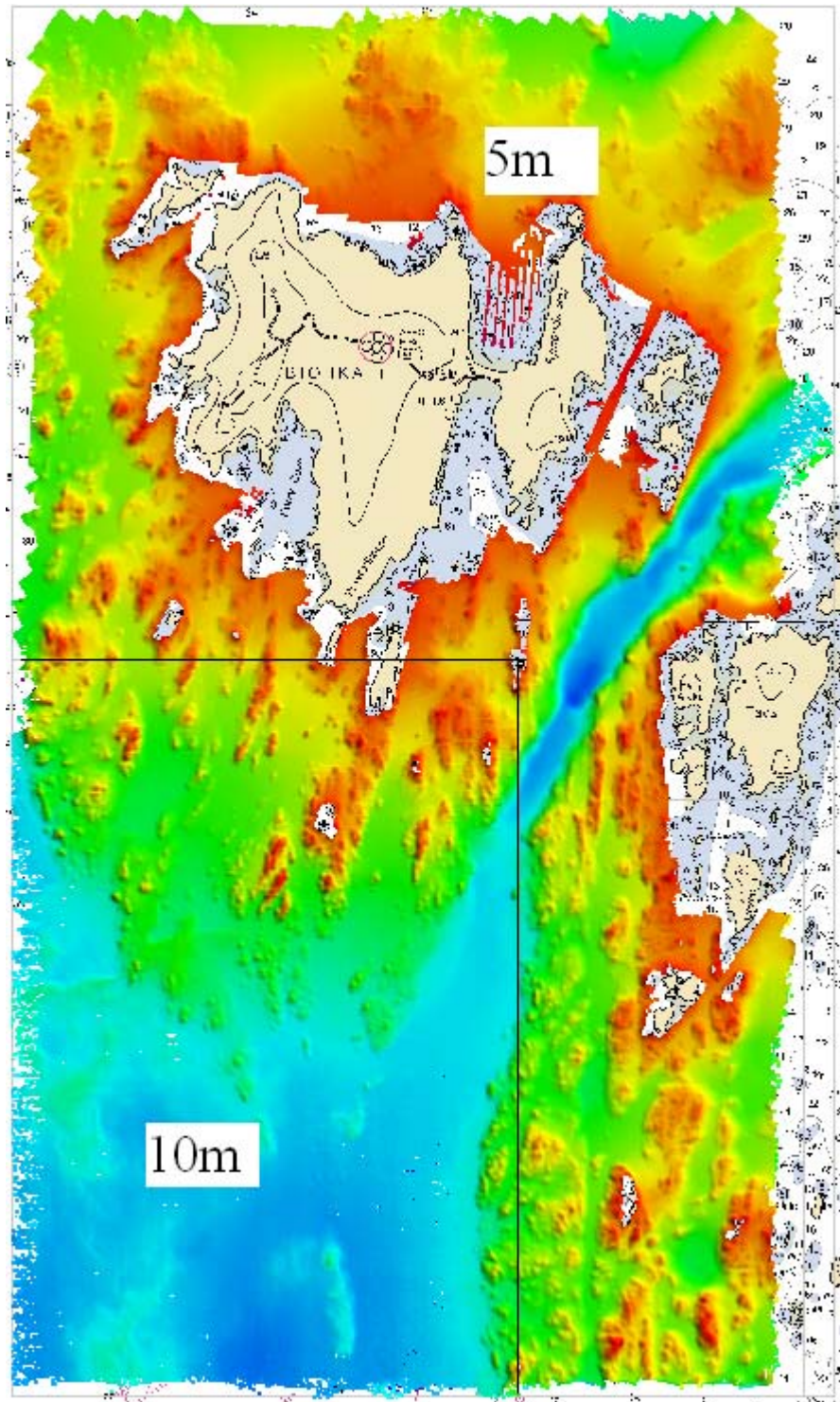


Figure 12: Layout of 5 meter and 10 meter field sheet and CUBE surface for H11128, overlaid on Chart 17326.

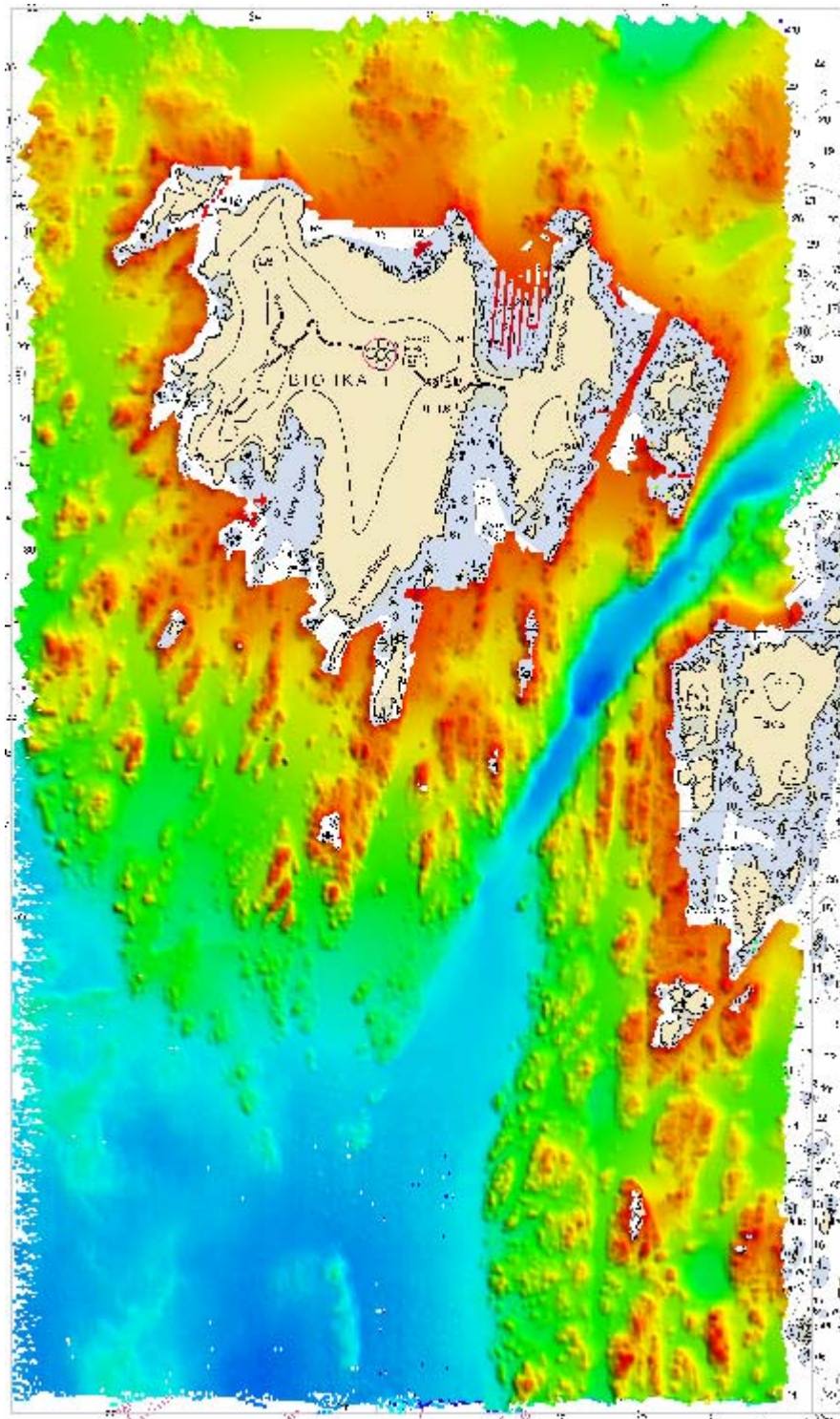


Figure 13: Layout of finalized, combined CUBE surface for H11128, overlaid on Chart 17326.

C. VERTICAL AND HORIZONTAL CONTROL

Project OPR-O112-RA-06 did not require static GPS observations or other horizontal control work, and all tide corrections were generated from CO-OPS maintained tide stations. Thus, no Horizontal and Vertical Control Report will be submitted. A summary of horizontal and vertical control for this survey follows.

Horizontal Control

The horizontal datum for this project is the North American Datum of 1983 (NAD83). Differential GPS (DGPS) was the sole method of positioning. The differential corrector beacon utilized for this survey is given in Table 3.

Location	Frequency	Operator	Distance	Priority
Biorka Is.	305 kHz	USCG	1nm	Primary

Table 3: Differential Corrector Source for H11128.

Vertical Control

The vertical datum for this project is Mean Lower-Low Water (MLLW). The operating National Water Level Observation Network (NWLON) primary tide station at Sitka, AK (945-1600) served as control for datum determination and as the primary source for water level reducers for survey H11128.

No tertiary gauges were required.

All data were reduced to MLLW using **Final Approved Water Levels** from station Sitka, AK (945-1600) using the tide file 9451600.tid and final time and height correctors using the zone corrector file O112RA2006CORP.zdf.

The request for Final Approved Water Levels for H11128 was submitted to CO-OPS on 09 Jul 2006 and the Final Tide Note was received on 23 Aug 2006. This documentation is included in Appendix IV.⁹

D. RESULTS AND RECOMMENDATIONS

D.1. Chart Comparison

D.1.a. Survey Agreement with Chart

RAINIER personnel compared H11128 survey data with the most recent editions of the paper and raster nautical charts with coverage of the survey area during data acquisition and processing. The results of these comparisons are described below, as well as in Sections D.2.b. through D.2.f.

H11128 survey soundings were formally compared with depths on the following chart:

Chart	Scale	Edition and Date	Cleared Through
17326	1:40,000	14 th Ed; Jun 2005	11/11/2006

Table 4: Chart compared with H11128

As previously mentioned, the seafloor within the limits of this survey is generally comprised of broken, rugged, rocky outcroppings. As much of the charted data in this area is from single beam sonar and lead line surveys, the 100% bottom coverage achieved by this survey revealed many differences from charted depths. Soundings northeast and north of Biorka Island generally agreed within 1 fathom of charted depths. There were several areas within the survey limits where survey data revealed significantly more shoal soundings than those charted, in some cases up to 9 fathoms difference. The hydrographer recommends that H11128 survey soundings supersede all charted depths in the common area¹⁰ (with the exception of the H11272 junction area discussed in Section B.2.)

Item	Surveyed (ftm)	Charted (ftm)
A	9	12
B	9.5	15
C	8.5	17
D	9.2	14
E	8.5	18

Table 5. Depths of several features found to be shoaler than charted.

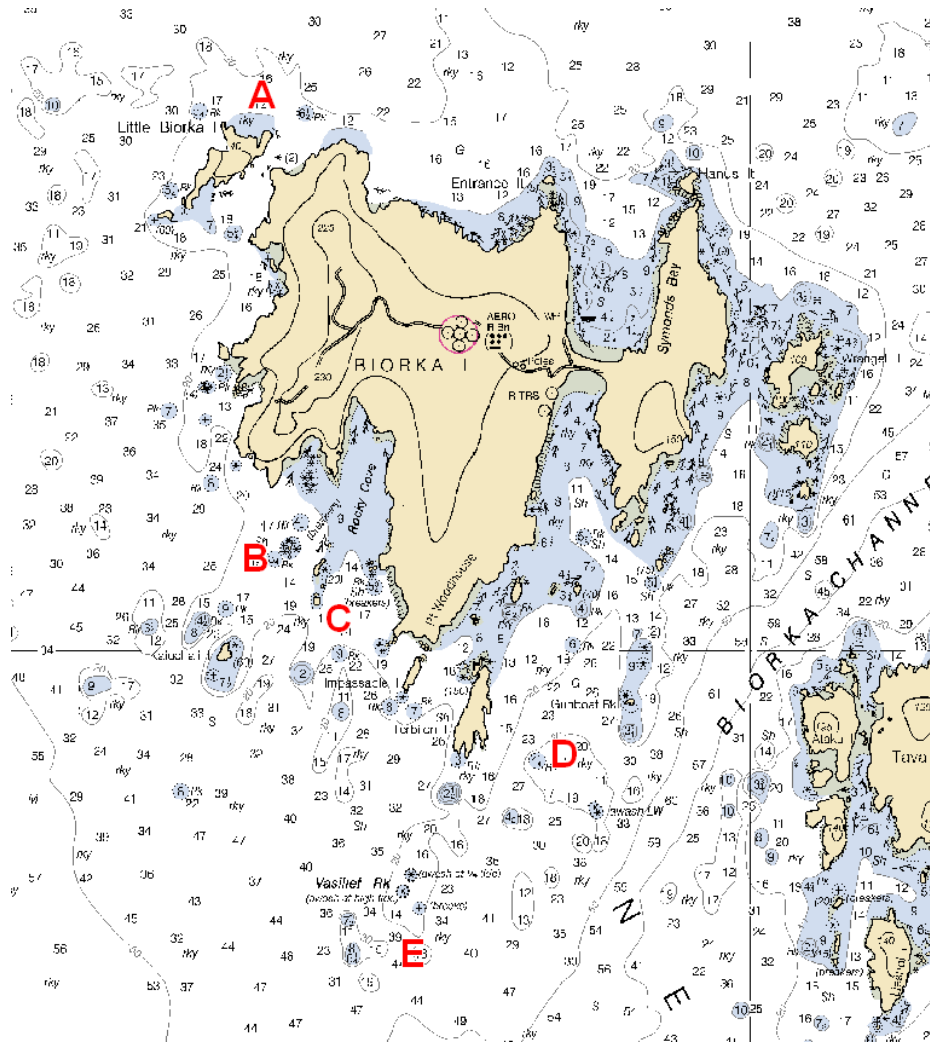


Figure 14: Positions of survey data vs. chart discrepancies, shown on chart 17326.

D.1.b. Dangers to Navigation

One (1) Danger to Navigation (DTON) was found within the limits of survey H11128, and reported to the Marine Chart Division via email on 29 July 2006. The original DTON submission package is included in Appendix I.¹¹ A description of the DTON is included in the Survey Feature Report in Appendix II.¹²

D.1.c. Other Features

Automated Wreck and Obstruction Information System (AWOIS) Investigations

Eight (8) AWOIS items fall within the limits of survey H11128, all of which were assigned for full investigation. The AWOIS items assigned to this survey are all rocks awash exposed to ocean swell, and thus full investigation by RAINIER units was not possible. RAINIER survey platforms approached as close to the investigation items as was safe. Each rock was visually confirmed by the presence of breaking waves, but MBES least depths or DPs could not be obtained. Multi-beam echosounder bathymetry that could be acquired

around the perimeter of these features was found to agree well with junctioning LIDAR data. The hydrographer recommends that these AWOIS items be charted and resolved as per the results of H11427.¹³ Descriptions of each AWOIS item investigation are included in the Survey Feature Report in Appendix II.

AWOIS item 53358, Vasilief Rock, found 1,760 meters, 207°T from Pt. Woodhouse currently charted at 56°49'00.88"N 135°32'34.67"W, is critical to a maritime boundary claim. LIDAR survey H11427 positioned this feature approximately 70 meters northwest of the charted position. RAINIER's MBES coverage does not cover most of this feature, however the MBES data agrees well with the LIDAR data in their common area. The hydrographer recommends using the LIDAR position and least depth to recompile this feature.¹⁴

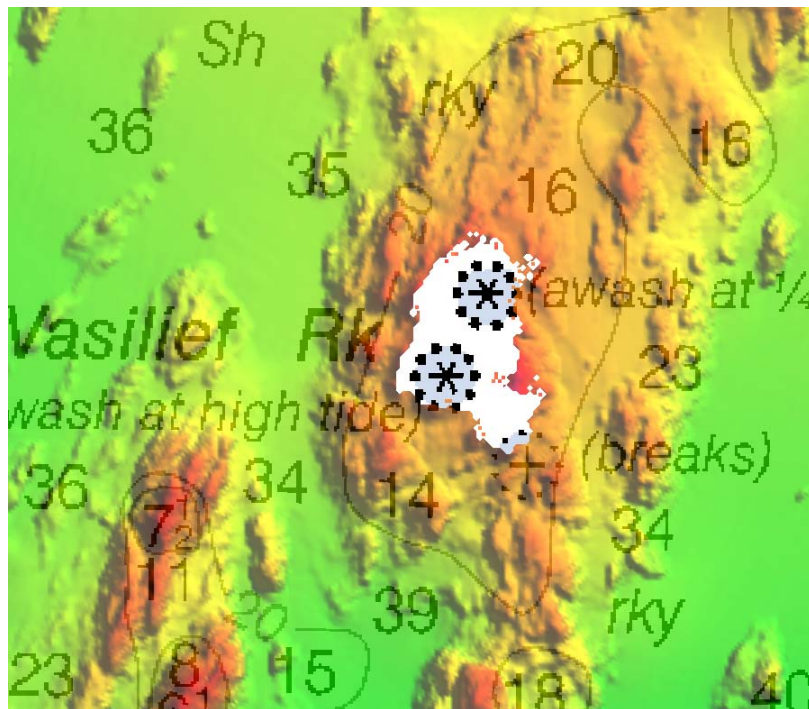


Figure 15: SWMB coverage around Vasilief Rk overlaid on Chart 17326.

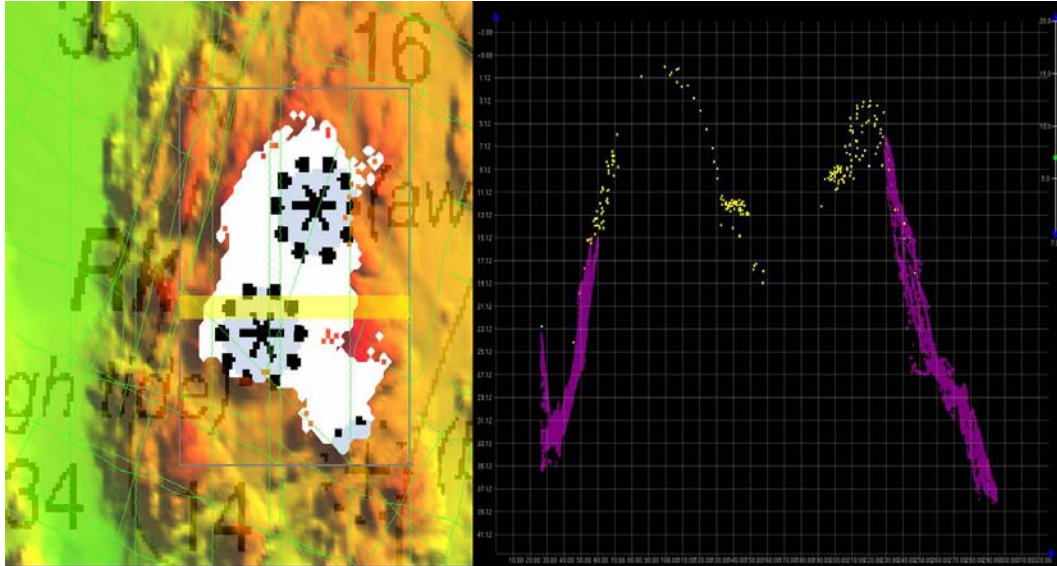


Figure 16: Data slice from CARIS HIPS Subset Mode, displaying the least depth from and H11128's junction with LIDAR survey H11427 (H11128 is purple, H11427 is yellow).

Additional Items

Additional features investigated within the limits of H11128 are described in the Survey Feature Report in Appendix II.

D.2. Additional Results

D.2.a. Prior Survey Comparison

Prior survey comparison with H11128 was not performed.

D.2.b. Shoreline Verification

Shoreline Source

The Pacific Hydrographic Branch provided RAINIER with a list of features from LIDAR survey H11427 selected for further investigation. These features fell into two categories:

- “LIDAR Investigation Features”: Features poorly resolved in LIDAR data and areas of possible features with sparse coverage.
- “LIDAR Disprovals”: Charted features not found in LIDAR survey data and recommended for removal from the chart.

In addition, vector photogrammetric data from project AK9703B were supplied by N/NGS3 in the form of digital Cartographic Feature File (CFF) GC10517. This source shoreline was used for orientation purposes in Hypack and on printed boat sheets utilized for investigation of the LIDAR items discussed above.

and features not found on the verified shoreline. In addition, annotations describing shoreline were recorded on hard copy plots¹⁵ of digital shoreline, and transferred to the “remrks” attribute on the corresponding features in Notebook. DP forms¹⁶ are included in the Detached Position directory of the *Separates to be Included with Survey Data*.

Investigation methods and recommendations are described in the Pydro “Remarks” and “Recommendations” tabs. Details of investigations of H11427 LIDAR features and all new items are included in the Survey Feature Report in Appendix II. DP forms are included in the *Separates to be Included with Survey Data*.

All shoreline data is submitted in Caris Notebook .hob files. The session H11128_NTBK.hsf contains the following:

HOB File	Purpose and Contents
H11128_Lidar_Updates.hob	“LIDAR Investigation Features” that were verified, modified, or not addressed by this survey. (Pydro keyword “LIDAR” and carto action “modify” or “add”.)
H11128_Updates.hob	New or revised features identified by this survey (including bottom samples), but not included in “LIDAR Investigation Features”. (Pydro keyword “SURVEY” and carto actions “add” or “modify”.)
H11128_LIDAR_Disprovals.hob	Features found in the LIDAR survey but disproved by this survey. (Pydro keyword “LIDAR” and carto action “delete”.)

Table 6. List and Description of Notebook HOB files.

Recommendations

The Hydrographer recommends that the shoreline as depicted in the Notebook .HOB files supersede and complement H11427 and the shoreline information compiled on the CFF and charts as described above.¹⁷

D.2.c. Aids to Navigation

There are no Aids to Navigation within the limits of survey H11128.¹⁸

D.2.d. Overhead features

There are no overhead features within the limits of survey H11128.¹⁹

D.2.e. Submarine Cables and Pipelines

There are no submarine cables or pipelines charted within the limits of H11128, and none were detected by the survey.²⁰

D.2.f. Ferry Routes

There are no ferry routes charted within the limits of survey H11128, and none were observed to be operating in the area.²¹

D.2.g. Bottom Samples

A total of nine (9) bottom samples were collected within the limits of survey H11128. The spacing and location of the bottom samples follows the guidelines outlined in NOS Field Procedures Manual for Hydrographic Surveying dated March 2005. At many of the sample positions, additional characteristics were noted besides those previously charted, see Appendix I, where the bottom samples are included in the Survey Feature Report in Appendix II.²²

D.2.h Miscellaneous


None.

E. APPROVAL

Field operations for hydrographic survey H11128 were conducted under my direct supervision, with frequent personal checks of progress and adequacy. I have reviewed the attached survey data and reports. The survey data meets or exceeds requirements as set forth in the NOS Hydrographic Surveys and Specifications Deliverables (March 2004 edition), Field Procedures Manual (May 2006 edition), Standing and Letter Instructions, and all HSD Technical Directives issued through October 2006. These data are adequate to supersede charted data in their common areas, with the exception of deficiencies noted in this report. This survey is complete and no additional work is required. All data and reports are respectfully submitted to N/CS34, Pacific Hydrographic Branch.


Listed below are supplemental reports submitted separately that contain additional information relevant to this survey:

<u>Title</u>	<u>Date Sent</u>	<u>Office</u>
Data Acquisition and Processing Report for OPR-O112-RA-06	02 April 2007	N/CS34
Coast Pilot Report for OPR-O112-RA-06	TBD	N/CS26


Approved and Forwarded:  Guy Noll
 I am approving this document
 2007.04.02 11:41:10 -07'00'

Guy T. Noll
 Commander, NOAA
 Commanding Officer

In addition, the following individuals were also responsible for overseeing data acquisition and processing of this survey:

Survey Sheet Manager:  Jamie Wasser
 I am the author of this document
 2007.04.02 15:54:52 Z

Jamie S. Wasser
 Lieutenant (junior grade), NOAA.

Chief Survey Technician:  James B Jacobson
 I have reviewed this document
 2007.04.06 13:48:19 Z

James B. Jacobson
 Chief Survey Technician, NOAA Ship RAINIER

Field Operations Officer:  LT Benjamin K. Evans, NOAA
 I have reviewed this document
 2007.04.02 17:43:33 Z

Benjamin K. Evans
 Lieutenant, NOAA

Revisions Compiled During Office Processing and Certification

¹ Filed with project records.

² Concur.

³ Filed with project records.

⁴ Concur.

⁵ Concur.

⁶ Concur. During compilation only data from LIDAR survey H11427 were included that were found to be shoaler than charted depths. Data from LIDAR survey H11427 was not used to disprove any charted features. Coastline data from LIDAR survey H11427 was used to supersede charted coastlines and agrees with bathymetric data from H11128 more closely than GC shoreline data. Differences between CG shoreline and LIDAR shoreline were minor in some regions and significant in others. Given the strong agreement between the LIDAR data from H11427 and the Sonar data from H11128, LIDAR data depicting the coastline is being recommended to supersede the GC shoreline.

⁷ Concur.

⁸ BASE surface used for HCell compilation did not contain spikes in the data.

⁹ Tide note is appended to this report.

¹⁰ Concur.

¹¹ DTON report is appended to this report.

¹² The Survey Feature Report is filed with the hydrographic records. Note: the survey feature report does not include all features from H11128. Additional features were added, some removed, and some modified in CARIS Notebook after the feature report was generated from Pydro. All features included in the compilation of H11128 have come directly from CARIS Notebook, which is the official features deliverable for this survey.

¹³ Concur with clarification, all rocks surveyed in H11427 are included in H11128_CS.000.

¹⁴ Concur.

¹⁵ Hard copy plots are filed with hydrographic records.

¹⁶ DP forms are filed with hydrographic records.

¹⁷ Concur with clarification, the information provided from these files was reduced to an appropriate level of detail for the scale of chart 17326. Chart per H11128_CS.000.

¹⁸ Concur.

¹⁹ Concur.

²⁰ Concur.

²¹ Concur.

²² Only five bottom samples were delivered via H11128_updates.hob. Four of the five collected bottom samples are included in H11128_CS.000. The remaining one was excluded due to being located in an area that was deemed rocky from the DTMs of the area. All charted bottom samples not lying within areas categorized as rocky are recommended to be retained as charted.

H11128_DTON_1

Registry Number: H11128
State: AK
Locality: Sitka Sound
Sub-locality: Southwest Biorka Channel
Project Number: OPR-O112-RA-06
Survey Date: 06/26/2006

Charts Affected

Number	Version	Date	Scale
17326	14th Ed.	06/01/2005	1:40000
17320	17th Ed.	11/01/2005	1:217828
16016	20th Ed.	11/01/2003	1:969756
531	23rd Ed.	01/01/2006	1:2100000
500	8th Ed.	06/01/2003	1:3500000
530	31st Ed.	06/01/2005	1:4860700
50	6th Ed.	06/01/2003	1:10000000

Features

No.	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	Sounding	0.10 m	056° 50' 42.669" N	135° 30' 20.345" W	---

1 - Danger To Navigation

1.1) Profile/Beam - 1/1 from h11128 / 1101_nonechosounder_dp / 2006-177 / dp_1101_dn177

DANGER TO NAVIGATION

Survey Summary

Survey Position: 056° 50' 42.669" N, 135° 30' 20.345" W
Least Depth: 0.10 m
Timestamp: 2006-177.18:07:13.000 (06/26/2006)
DP Dataset: h11128 / 1101_nonechosounder_dp / 2006-177 / dp_1101_dn177
Profile/Beam: 1/1
Charts Affected: 17326_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

New Awash RK

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11128/1101_nonechosounder_dp/2006-177/dp_1101_dn177	1/1	0.00	000.0	Primary
H11128_RA_Investigations_Final.xls	5	25.82	153.7	Secondary

Hydrographer Recommendations

[None]

Cartographically-Rounded Depth (Affected Charts):

0fm (17326_1, 17320_1, 16016_1, 530_1)

0fm 0ft (531_1)

.1m (500_1, 50_1)

S-57 Data

[None]

Feature Images



Figure 1.1.1 Facing NW

H11128 AWOIS report

Registry Number: H11128
State: AK
Locality: Sitka Sound
Sub-locality: Southwest Biorka Channel
Project Number: OPR-O112-RA-06
Survey Date:

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
17326	14th	06/01/2005	1:40,000 (17326_1)	[L]NTM: ?
17320	17th	11/01/2005	1:217,828 (17320_1)	[L]NTM: ?
16016	20th	11/01/2003	1:969,756 (16016_1)	[L]NTM: ?
531	23rd	01/01/2006	1:2,100,000 (531_1)	[L]NTM: ?
500	8th	06/01/2003	1:3,500,000 (500_1)	[L]NTM: ?
530	31st	06/01/2005	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	AWOIS	[no data]	[no data]	[no data]	---
1.2	AWOIS	[no data]	[no data]	[no data]	---
1.3	AWOIS	[no data]	[no data]	[no data]	---
1.4	AWOIS	[no data]	[no data]	[no data]	---
1.5	AWOIS	[no data]	[no data]	[no data]	---
1.6	AWOIS	[no data]	[no data]	[no data]	---
1.7	AWOIS	[no data]	[no data]	[no data]	---
1.8	AWOIS	[no data]	[no data]	[no data]	---

1 - AWOIS

1.1) AWOIS #53358 - OBSTRUCTION

No Primary Survey Feature for this AWOIS Item

Search Position: 56° 49' 00.9" N, 135° 32' 34.7" W
Historical Depth: [None]
Search Radius: 60
Search Technique: VS, VBES, MBES, S2
Technique Notes: UPDATE POSITION AND HEIGHT IN SUPPORT OF MARITIME BOUNDARY CLAIM

History Notes:

H04554/25-- A RK FOUND 1760M, 207DEG(TRUE) FROM WOODHOUSE CURRENTLY CHARTED AT 56/49/00.88N 135/32/34.67W NEEDS TO BE REPOSITIONED FOR A MARITIME BOUNDARY CLAIM. (ENTERED 4/26/06, SME)

Survey Summary

Charts Affected: 17326_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

Feature approached with MB launch as close as was safely possible
 MB data junctions well with LIDAR data

Feature Correlation

Address	Feature	Range	Azimuth	Status
H11128	AWOIS # 53358	0.00	000.0	Primary

Hydrographer Recommendations

Chart as Rk awash at position of LIDAR least depth of 0.01m

S-57 Data

Geo object 1: Cartographic symbol (\$CSYMB)

Office Notes

Do not concur. Chart rock from LIDAR with height of -3.4m at 56-49-01.27N, 135-32-36.43W.

1.2) AWOIS #53370 - OBSTRUCTION

No Primary Survey Feature for this AWOIS Item

Search Position: 56° 48' 56.6" N, 135° 32' 27.4" W
Historical Depth: [None]
Search Radius: 60
Search Technique: VS, VBES, MBES, S2
Technique Notes: Conduct search within the limits of the survey.

History Notes:

Probable source H04554, 1925; Charted position of rock is offset from source position. Conduct search to verify or disprove charted rock. (Entered by KRW, 04/28/2006)

Survey Summary

Charts Affected: 17326_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

Feature approached with MB launch as close as was safely possible
 MB data junctions well with LIDAR data

Feature Correlation

Address	Feature	Range	Azimuth	Status
H11128	AWOIS # 53370	0.00	000.0	Primary

Hydrographer Recommendations

Chart as Rk awash at position of LIDAR least depth of 0.86m

S-57 Data

Geo object 1: Cartographic symbol (\$CSYMB)

Office Notes

Concur.

1.3) AWOIS #53372 - OBSTRUCTION

No Primary Survey Feature for this AWOIS Item

Search Position: 56° 48' 02.0" N, 135° 29' 44.6" W
Historical Depth: [None]
Search Radius: 60
Search Technique: VS, VBES, MBES, S2
Technique Notes: Conduct search within the limits of the survey.

History Notes:

Probable source H04554, 1925; Charted position of rock awash is offset from source position. Conduct search to verify or disprove charted rock. (Entered by KRW, 04/28/2006)

Survey Summary

Charts Affected: 17326_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

Feature approached with MB launch as close as was safely possible
 MB data junctions well with LIDAR data

Feature Correlation

Address	Feature	Range	Azimuth	Status
H11128	AWOIS # 53372	0.00	000.0	Primary

Hydrographer Recommendations

Chart as Rk awash at position of LIDAR least depth of 0m

S-57 Data

Geo object 1: Cartographic symbol (\$CSYMB)

Office Notes

Do not concur. Chart rock from LIDAR with height of -0.9m at 56-48-03.24N, 135-29-45.11W.

1.4) AWOIS #53373 - OBSTRUCTION

No Primary Survey Feature for this AWOIS Item

Search Position: 56° 49' 56.7" N, 135° 30' 47.6" W
Historical Depth: [None]
Search Radius: 60
Search Technique: VS, VBES, MBES, S2
Technique Notes: Conduct search within the limits of the survey.

History Notes:

Probable source H04554, 1925; Charted position of rock awash is offset from source position. Conduct search to verify or disprove charted rock. (Entered by KRW, 04/28/2006)

Survey Summary

Charts Affected: 17326_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

Feature approached with MB launch as close as was safely possible
 MB data junctions well with LIDAR data

Feature Correlation

Address	Feature	Range	Azimuth	Status
H11128	AWOIS # 53373	0.00	000.0	Primary

Hydrographer Recommendations

Chart as Rk awash at position of LIDAR least depth of 0.5m

S-57 Data

Geo object 1: Cartographic symbol (\$CSYMB)

Office Notes

Do not concur. Chart rock from LIDAR with height of 0.3m at 56-49-58.0N, 135-30-50.5W.

1.5) AWOIS #53374 - OBSTRUCTION

No Primary Survey Feature for this AWOIS Item

Search Position: 56° 50' 00.7" N, 135° 30' 46.9" W
Historical Depth: [None]
Search Radius: 60
Search Technique: VS, VBES, MBES, S2
Technique Notes: Conduct search within the limits of the survey.

History Notes:

Probable source H04554, 1925; Charted position of rock awash is offset from source position. Conduct search to verify or disprove charted rock. (Entered by KRW, 04/28/2006)

Survey Summary

Charts Affected: 17326_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

Feature approached with MB launch as close as was safely possible
 MB data junctions well with LIDAR data

Feature Correlation

Address	Feature	Range	Azimuth	Status
H11128	AWOIS # 53374	0.00	000.0	Primary

Hydrographer Recommendations

Chart as Rk awash at position of LIDAR least depth of 0.05m

S-57 Data

Geo object 1: Cartographic symbol (\$CSYMB)

Office Notes

Do not concur. Chart rock from LIDAR with height of -1.8m at 56-50-01.18N, 135-30-49.94W.

1.6) AWOIS #53375 - OBSTRUCTION

No Primary Survey Feature for this AWOIS Item

Search Position: 56° 49' 53.7" N, 135° 33' 59.4" W
Historical Depth: [None]
Search Radius: 60
Search Technique: VS, VBES, MBES, S2
Technique Notes: Conduct search within the limits of the survey.

History Notes:

Probable source H04554, 1925; Charted position of rock is offset from source position. Conduct search to verify or disprove charted rock. (Entered by KRW, 04/28/2006)

Survey Summary

Charts Affected: 17326_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

Feature approached with MB launch as close as was safely possible
 MB data junctions well with LIDAR data

Feature Correlation

Address	Feature	Range	Azimuth	Status
H11128	AWOIS # 53375	0.00	000.0	Primary
H11128_RA_Investigations_Final.xls	17	38.52	189.6	Secondary

Hydrographer Recommendations

Chart as Rk awash at position of LIDAR least depth of 0.35m

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)
Attributes: WATLEV - 5:awash

Office Notes

Concur.

1.7) AWOIS #53392 - OBSTRUCTION

No Primary Survey Feature for this AWOIS Item

Search Position: 56° 47' 06.4" N, 135° 28' 55.6" W
Historical Depth: [None]
Search Radius: 60
Search Technique: VS, VBES, MBES, S2
Technique Notes: Conduct search within the limits of the survey.

History Notes:

Probable source H04554, 1925; Charted position of rock awash is offset from source position. Conduct search to verify or disprove charted rock. (Entered by KRW, 04/28/2006)

Survey Summary

Charts Affected: 17326_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

Chd feature covered by Lidar and MB, junctions well. Use offset position where MB could not be obtained.

Feature Correlation

Address	Feature	Range	Azimuth	Status
H11128	AWOIS # 53392	0.00	000.0	Primary

Hydrographer Recommendations

Chart as Rk Awash at LIDAR least depth position, where MB could not be obtained

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)
Attributes: WATLEV - 3:always under water/submerged

Office Notes

Do not concur. Rock positioned by Lidar at 56-47-06.36N, 135-28-55.62W. Height from Lidar not clear. Chart rock awash, height unknown.

1.8) AWOIS #53395 - OBSTRUCTION

No Primary Survey Feature for this AWOIS Item

Search Position: 56° 49' 04.8" N, 135° 32' 31.1" W
Historical Depth: [None]
Search Radius: 60
Search Technique: VS, VBES, MBES, S2
Technique Notes: Conduct search within the limits of the survey.

History Notes:

Probable source H04554, 1925; Charted position of rock awash is offset from source position. Conduct search to verify or disprove charted rock. (Entered by KRW, 04/28/2006)

Survey Summary

Charts Affected: 17326_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

Feature approached with MB launch as close as was safely possible
 MB data junctions well with LIDAR data

Feature Correlation

Address	Feature	Range	Azimuth	Status
H11128	AWOIS # 53395	0.00	000.0	Primary

Hydrographer Recommendations

Chart as Rk awash at position of LIDAR least depth of 0.01m

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)
Attributes: WATLEV - 5:awash

Office Notes

Do not concur. Chart rock from LIDAR with height of -1.5m at 56-49-05.93N, 135-32-31.60W.



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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : August 23, 2006

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-0112-RA-2006
HYDROGRAPHIC SHEET: H11128

LOCALITY: Southwest Biorka Channel, Approaches to Sitka, AK
TIME PERIOD: May 28 - June 26, 2006

TIDE STATION USED: 945-1600 Sitka, AK
Lat. 57° 03.1'N Long. 135° 20.5' W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 2.791 meters

REMARKS: RECOMMENDED ZONING

Preliminary zoning is accepted as the final zoning for project OPR-0112-RA-2006, H11128, during the time period between May 28 - June 26, 2006.

Please use the zoning file "O112RA2006CORP" submitted with the project instructions for O112RA2006. Zones SEA200, PAC294, PAC294A & PAC294B are the applicable zones for H11128.

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).

For 

CHIEF, PRODUCT AND SERVICES DIVISION



Final Tidal Zoning
OPR-O112-RA-2006, H11128
Southwest Biorka Channel, Approaches to Sitka, AK
(Preliminary as Final)

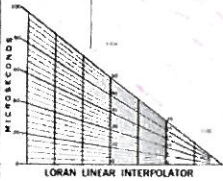
945-1600 SITKA

SEA200
Time Corrector 0 mins.
Range Corrector x1.00
Reference 945-1600

PAC294
Time Corrector 0 mins.
Range Corrector x1.00
Reference 945-1600

PAC294B
Time Corrector 0 mins.
Range Corrector x0.97
Reference 945-1600

PAC294A
Time Corrector 0 mins.
Range Corrector x0.99
Reference 945-1600



Depth (Fathoms)	Distance (Microseconds)
0	0
1	10
2	20
3	30
4	40
5	50
6	60
7	70
8	80
9	90
10	100

H11128 HCell Report
Peter Holmberg, Physical Scientist
Pacific Hydrographic Branch

Introduction

The primary purpose of the HCell is to provide new survey information in International Hydrographic Organization (IHO) format S-57 to update the largest scale ENC and RNC in the region: NOAA ENC US5AK3VM and NOAA RNC 17326.

HCell compilation of survey H11128 used Office of Coast Survey HCell Specifications Version 3.0 and HCell Reference Guide Version 1.0.

1. Compilation Scale

Depths for HCell H11128 were compiled to the largest scale chart in the region, 17326, 1:40,000. The density and distribution of soundings from H11126 were selected to emulate the distribution on chart 17326. Non-bathymetric features have been generalized to chart scale.

2. Soundings

A survey-scale sounding (SOUNDG) feature object layer was built from the 5-meter combined surface, **H11128_Combined_5m**, in CARIS BASE Editor. A shoal-biased selection was made at 1:10,000 scale for the main chart area using a Radius Table file with values shown in the table, below. The resultant sounding layer contains depths ranging from 0.3 to 118.9 meters.

Upper limit (m)	Lower limit (m)	Radius (mm)
0	10	3
10	20	4
20	50	4.5
50	120	5

In CARIS BASE Editor soundings were manually selected from the high density sounding layers and imported into a new layer created to accommodate chart density depths. Manual selection was used to accomplish a density and distribution that closely represents the seafloor morphology.

3. Depth Areas and Depth Contours

3.1 Depth Areas

The extents of the highest resolution BASE Surface together with the extents of the soundings layer were used to digitize the hydrographic extents, which were then used to create the single, all encompassing depth area (DEPARE). One depth range, from 0.0 to 120.00 meters, was used for the depth area object. Upon conversion to NOAA charting units, the depth range is 0.0 to 65.6 fathoms.

3.2 Depth Contours

Depth contours at the intervals on the largest scale chart are included in the *_SS HCell for MCD raster charting division to use for guidance in creating chart contours. The generalized metric and fathom equivalent contour values are shown in the table below.

Chart Contours in Fathoms	Metric Equivalent of Chart Contours	Metric Equivalent of Chart Contours NOAA Rounded	Actual Value of Chart Contours
0	0.00	0.2286	0.00
5	9.144	9.3726	5.125
10	18.288	18.5166	10.125
20	36.576	37.9476	20.750
50	91.44	92.8116	50.750

Contours delivered in the *_SS file have not been deconflicted against shoreline features, soundings and hydrography as all other features in the *_CS file and soundings in the *_SS have been. This results in conflicts between the *_SS file contours and HCell features at or near the survey limits. Conflicts with M_COVR, M_QUAL, DEPARE and COALNE, should be expected. HCell features should be honored over *_SS.000 file contours in all cases where conflicts are found.

4. Meta Areas

The following Meta object areas are included in HCell 11128:

M_QUAL
M_COVR

Meta area objects were constructed on the basis of the limits of the hydrography. (See 3.1 *Depth Areas*.)

5. Features

Shoreline features for H1128 were delivered from the field in three hob files defining new features, modification to GC or charted features, disprovals and LIDAR

investigations. An additional hob file addressing conflicts with disprovals was created during the survey acceptance review. All of these were deconflicted against GC shoreline, the chart and hydrography during office processing.

Features from junctioning LIDAR survey H11427 was manually digitized from the smooth sheets and de-conflicted against the features submitted with H11128.

There was one DTON reported from survey H11128.

There were 46 DTONs reported from LIDAR survey H11427, All DTONs from H11427 are addressed in HCell H11128.

There were 8 AWOIS items within the limits of survey H11128. Refer to the AWOIS report.

Five bottom samples were collected during survey H11128. Refer to section D.2.g of the Descriptive Report for further details.

H11128_CS.000 is a very complicated survey. Data from H11128 (sonar), H11428 (lidar), and chart 17326 were blended together during compilation in a conservative fashion. Despite the extents of contributing coverage from H11128 and H11427 depicted via the M_QUAL layer some isolated point features are located outside their main M_QUAL areas to supplement otherwise sparse sections of data. The source of all features included in the H11128_CS.000 is identified by the object's SORIND field.

6. S-57 Objects and Attributes

The *_CS HCell contains the following Objects:

SOUNDG	Chart scale soundings
DEPARE	All-encompassing depth area
DEPCNT	Zero contours
COALNE	GC and charted MHW line
LNDARE	Islet features
WATTUR	Breakers
LNDELV	Height features for islets
UWTROC	Rock features
WEDKLP	Kelp features
SLCONS	Pier
SBDARE	Bottom samples, and rocky seabed areas
M_COVR	Data coverage Meta object
M_QUAL	Data quality Meta object
\$CSYMB	Blue notes

The *_SS HCell contains the following Objects:

SOUNDG	Soundings at the survey scale density
DEPCNT	NOAA rounded contours at chart scale intervals

All S-57 Feature Objects in the *_CS HCell have been attributed as fully as possible based on information provided by the Hydrographer and in accordance with current guidance and the OCS HCell Specifications.

7. Blue Notes

Notes to the RNC and ENC chart compilers are included in the HCell as \$CSYMB features with the Blue Note information located in the INFORM field. The NINFOM field is populated with the charting disposition

8. Spatial Framework

8.1 Coordinate System

All spatial map and base cell file deliverables are in an LLDG geographic coordinate system, with WGS84 horizontal, MHW vertical, and MLLW (1983-2001 NTDE) sounding datums.

8.2 Horizontal and Vertical Units

DUNI, HUNI and PUNI are used to define units for depth, height and horizontal position in the chart units HCell, as shown below.

Chart Unit Base Cell Units:

Depth Units (DUNI):	Fathoms and feet
Height Units (HUNI):	Feet
Positional Units (PUNI):	Meters

During creation of the HCell in CARIS BASE Editor and CARIS S-57 Composer, all soundings and features are maintained in metric units with as high precision as possible. Depth units for soundings measured with sonar maintain millimeter precision. Depths on rocks above MLLW and heights on islets above MHW are typically measured with range finder, and therefore have lower precision. Units and precision are shown below.

BASE Editor and S-57 Composer Units:

Sounding Units:	Meters rounded to the nearest millimeter
Spot Height Units:	Meters rounded to the nearest decimeter

Conversion to charting units and application of NOAA rounding is completed in the same

step, at the end of the HCell compilation process.

Conversion to fathoms and feet charting units with NOAA rounding ensures that:

- All depths deeper or equal to 11 fathoms display as whole fathoms.
- All depth units between 0 fathoms (MLLW) and 11 fathoms display as fathoms and whole feet.
- All depth units above MLLW (0 fathoms) to 2.0 feet above MHW display in feet for values that round to 5 feet or less, and in fathoms and feet above that.
- All height units (HUNI) which have been converted to charting units, and that are 2.0 feet above MHW and greater, are shown in feet.

In an ENC viewer fathoms and feet depth units (DUNI) display in the format X.YZZZ, where X is fathoms, Y is feet, and ZZZ is decimals of the foot. In an ENC viewer, heights (HUNI) display as whole feet.

9. Data Processing Notes

9.1 Junctions

Refer to section B.2 of the descriptive report for information on junction surveys.

9.2 Conflicts between Shoreline and Hydrography

There are instances of GC shoreline in conflict with hydrography. These were examined using the highest resolution Surfaces. Conflicts were resolved making modifications to the GC shoreline.

10. QA/QC and ENC Validation Checks

H11128 was subjected to QA checks in S-57 Composer prior to exporting to the HCell base cell (000) file. The millimeter precision metric S-57 HCell was converted to a chart units and NOAA rounding applied. dKart Inspector was then used to further check the data set for conformity with the S-58 ver. 2 standard (formerly Appendix B.1 Annex C of the S-57 standard). All tests were run and warnings and errors investigated and corrected unless they have been approved by MCD as inherent to and acceptable for HCells.

11. Products

11.1 HSD, MCD and CGTP Deliverables

- H11128 Base Cell File, Chart Units, Soundings compiled to 1:40,000
- H11128 Base Cell File, Chart Units, Soundings compiled to 1:10,000
- H11128 Base Cell File, Metric Units, Features compiled to 1:10,000

- H11128 Descriptive Report including end notes compiled during office processing and certification, the HCell Report, and supplemental items
- H11128 Survey Outline to populate SURDEX

11.2 File Naming Conventions

- Chart units base cell file, chart scale soundings H11128_CS.000
- Chart units base cell file, survey scale soundings H11128_SS.000
- Metric base cell file, survey scale features H11128_Features.000
- Descriptive Report package H11128_DR.pdf
- Survey outline H11128_Outline.gml & *xsd

11.3 Software

CARIS HIPS Ver. 6.1	Inspection of Combined BASE Surfaces
CARIS BASE Editor Ver. 2.2	Creation of soundings and bathy-derived features, creation of the depth area, meta area objects, and Blue Notes; Survey evaluation and verification; Initial HCell assembly.
CARIS S-57 Composer Ver. 2.0	Final compilation of the HCell, correct geometry and build topology, apply final attributes, export the HCell, and QA.
CARIS GIS 4.4a	Setting the sounding rounding variable for conversion of the metric HCell to NOAA charting units with NOAA rounding.
CARIS HOM Ver. 3.3	Perform conversion of the metric HCell to NOAA charting units with NOAA rounding.
HydroService AS, dKart Inspector Ver. 5.1	Validation of the base cell file.
Newport Systems, Inc., Fugawi View ENC Ver.1.0.0.3	Independent inspection of final HCells using a COTS viewer.

12. Contacts

Inquiries regarding this HCell content or construction should be directed to:

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APPROVAL SHEET
H11128

The survey evaluation and verification has been conducted according to branch processing procedures and the HCell compiled per the latest OCS HCell Specifications.

The survey and associated records have been inspected with regard to survey coverage, delineation of the depth curves, development of critical depths, S-57 classification and attribution of soundings and features, cartographic characterization, and verification or disapproval of charted data within the survey limits. The survey records and digital data comply with OCS requirements except where noted in the Descriptive Report and are adequate to supersede prior surveys and nautical charts in the common area.

I have reviewed the HCell, accompanying data, and reports. This survey and accompanying digital data meet or exceed OCS requirements and standards for products in support of nautical charting except where noted in the Descriptive Report.