

H11938

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.

Registry No. H11938

LOCALITY

State Alaska

General Locality Kachemak Bay

Sublocality Vicinity of Archimandritof

2008

CHIEF OF PARTY

Captain Douglas D. Baird, Jr. NOAA

LIBRARY & ARCHIVES

DATE

<p style="text-align: center;">U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION</p> <p style="text-align: center;">HYDROGRAPHIC TITLE SHEET</p>	<p>REGISTRY No</p> <p style="text-align: center;">H11938</p>
<p>INSTRUCTIONS – The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.</p>	<p>FIELD No: N/A</p>
<p>State <u>Alaska</u></p> <p>General Locality <u>Kachemak Bay</u></p> <p>Sub-Locality <u>Vicinity of Archimandritof Shoals</u></p> <p>Scale <u>1:10,000</u> Date of Survey <u>07/10/2008 to 09/02/2008</u></p> <p>Instructions dated <u>7/24/2008</u> Project No. <u>OPR-P357-FA-08</u></p> <p>Vessel <u>FAIRWEATHER</u></p> <p>Chief of party <u>CAPT Douglas D. Baird, NOAA</u></p> <p>Surveyed by <u>ENS Mark Andrews, NOAA; CST Lynnette Morgan; LT Matthew Ringel, NOAA</u></p> <p>Soundings by <u>Reson 8111, Reson 8101ER</u></p> <p>SAR by <u>Matt Andring</u> Compilation by <u>Fernando Ortiz</u></p> <p>Soundings compiled in <u>Fathoms</u></p>	
<p>REMARKS: <u>All times are UTC. UTM Zone 5</u></p> <p><u>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. Revisions and end notes in red were generated during office processing. Page numbering may be interrupted or non sequential.</u></p>	

Descriptive Report to Accompany Hydrographic Survey H11938

Project OPR-P357-FA-08

Kachemak Bay, Alaska

Scale 1:10,000

July - September 2008

NOAA Ship *Fairweather*

Chief of Party: Commander Douglas D. Baird, Jr., NOAA

A. AREA SURVEYED

The survey area was located in Kachemak Bay, within the sub-locality of “Vicinity Archimandritof Shoals.” This survey corresponds to Sheet F in the sheet layout provided with the Project Instructions, as shown in Figure 1 below.

Data acquisition was conducted from July 10 to September 2, 2008 (DN 192 to DN 246).

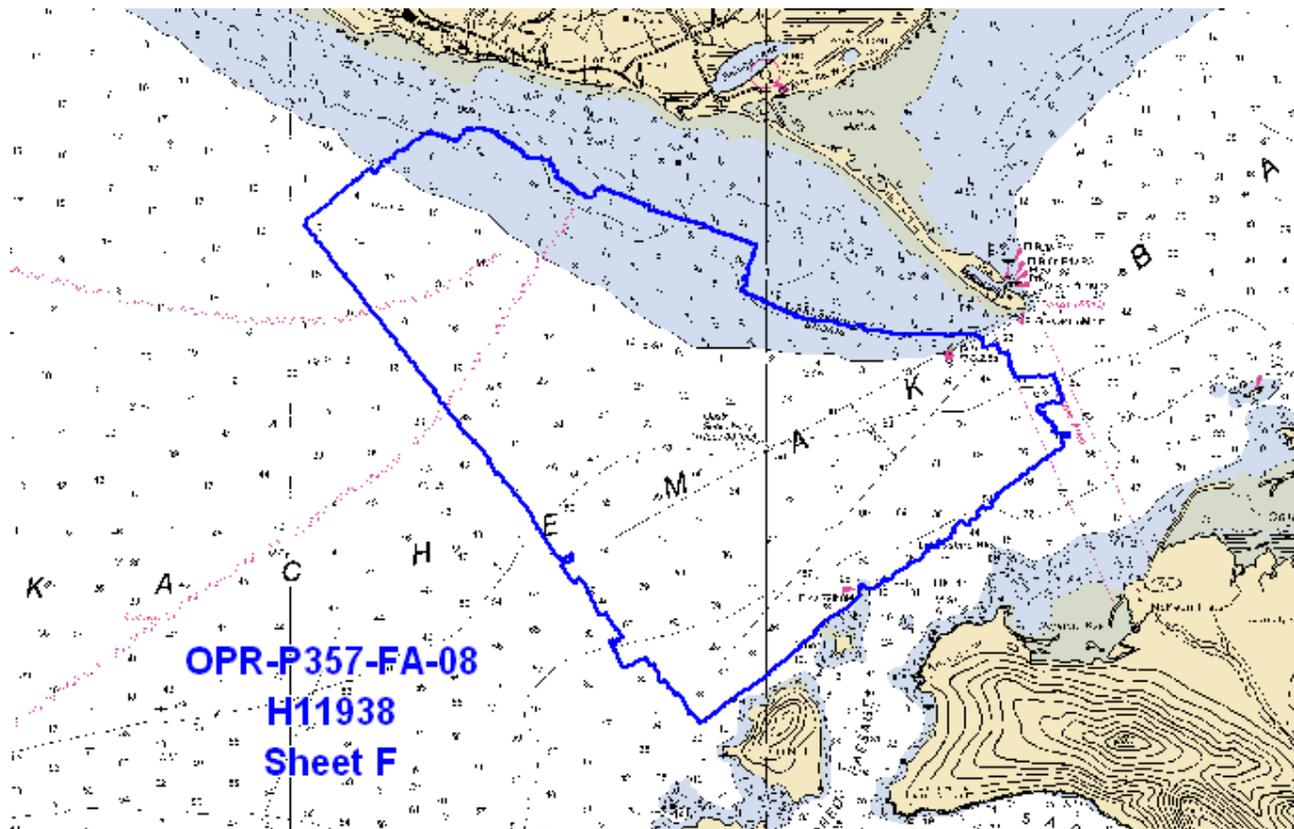


Figure 1: H11938 Survey Outline

One-hundred percent multibeam echosounder (MBES) coverage was obtained in the survey area. Coverage was obtained around Sixty Foot Rock in the south to the inshore limit of hydrography as specified by Hydrographic Survey Project Instructions OPR-P357-FA-08 dated July 24, 2008. However,

due to time constraints and vessel breakdowns, the inshore limit was not reached in the northeast part of the survey near Homer Spit where the 8 meter contour was found in only a few areas.¹

Shoreline verification for survey H11938 was conducted seaward of the Navigable Area Limit Line (NALL) in accordance with the Field Procedures Manual May, 2008 (FPM). No new shoreline features were encountered during this survey.

Main scheme and crossline mileage for MBES and shoreline acquisition were calculated and are displayed in Table 1 below.

MAIN SCHEME - Mileage	
0	Single Beam MS
459.19	Multibeam MS mileage
41.71	FAIRWEATHER S-220
246.16	Launch 1010
171.32	Launch 1018
0	SideScan MS
459.19	Total MS
CROSSLINE - Mileage	
0	Single Beam XL
41.32	Multibeam XL
6.07	FAIRWEATHER S-220
19.32	Launch 1010
15.93	Launch 1018
41.32	Total XL
OTHER	
2.95	Developments/AWOIS - Mileage
7.33	Shoreline/Nearshore Investigation - Mileage
1	Total # of Investigated Items
14	Total Bottom Samples
24.54	Total SNM
7/10 to 7/13/08, 8/16 to 8/18/08, 8/22/08, 8/26/08, 8/27/08, 9/2/08	Specific Dates of Acquisition
192, 193, 194, 195, 229, 230, 231, 235, 239, 240, 246	Specific Dn#s of Acquisition

Table 1: H11938 Survey Statistics

B. DATA ACQUISITION AND PROCESSING

A complete description of data acquisition/processing systems and survey vessels along with quality control procedures and data processing methods is included and described in the NOAA Ship *Fairweather* 2008 *Data Acquisition and Processing Report* (DAPR)² submitted under separate cover. Items specific to this survey and any deviations from the aforementioned report are discussed in the following sections.

B.1. Equipment and Vessels

Equipment and vessels used for data acquisition and survey operations during this survey are listed below in Table 2.

	<i>Fairweather</i>	Launch 1010	Launch 1018	Ambar 550
Hull Registration Number	S220	1010	1018	2302
Builder	Aerojet-General Shipyard	The Boat Yard, Inc.	The Boat Yard, Inc.	Marine Silverships, Inc
Length Overall	231 feet	28' 10"	28' 10"	23'
Beam	42 feet	10' 8"	10' 8"	9' 4"
Draft, Maximum	15' 6"	4' 0" DWL	4' 0" DWL	1' 4"
Cruising Speed	12.5 knots	24 knots	24 knots	22 knots
Max Survey Speed	10 knots	10 knots	10 knots	
Primary Echosounder	RESON 8111 & RESON 8160	RESON 8101	RESON 8101	
Sound Velocity Equipment	SBE 19plus & 45, MVP 200	SBE 19plus	SBE 19plus	
Attitude & Positioning Equipment	POS/MV V4	POS/MV V4	POS/MV V4	
Type of operations	MBES, Bottom samples	MBES	MBES, Tide	Shoreline, Tide

Table 2: Vessel Inventory

No vessel configurations used during data acquisition deviated from the DAPR.

B.2. Quality Control

All data were examined in CARIS Subset Editor and found to be internally consistent from line-to-line, day-to-day, and vessel-to-vessel.

B.2.a. Crosslines

Shallow water multibeam crosslines for this survey totaled 41.32 linear nautical miles (lnm), comprising 8.3% of the 500.51 lnm of total MBES hydrography. Both main scheme and crossline mileage are summarized in Table 1 above.

Main scheme lines and crosslines were compared by surface differencing in Fledermaus. Crosslines were filtered to reject data beyond 45 degrees from nadir in order to remove outerbeam noise. A 16 meter resolution Bathymetry Associated with Statistical Error (BASE) surface was then created from the crosslines and compared to a 16 meter resolution BASE surface comprised of main scheme lines alone. It was found that crosslines agreed with main scheme lines within 0.019 meters on average with a standard deviation of 0.468 meters (see Figure 2 below).³ A Tagged Image File (TIF) showing the surface difference is included in the Separates\IV Crossline_Comparison folder.

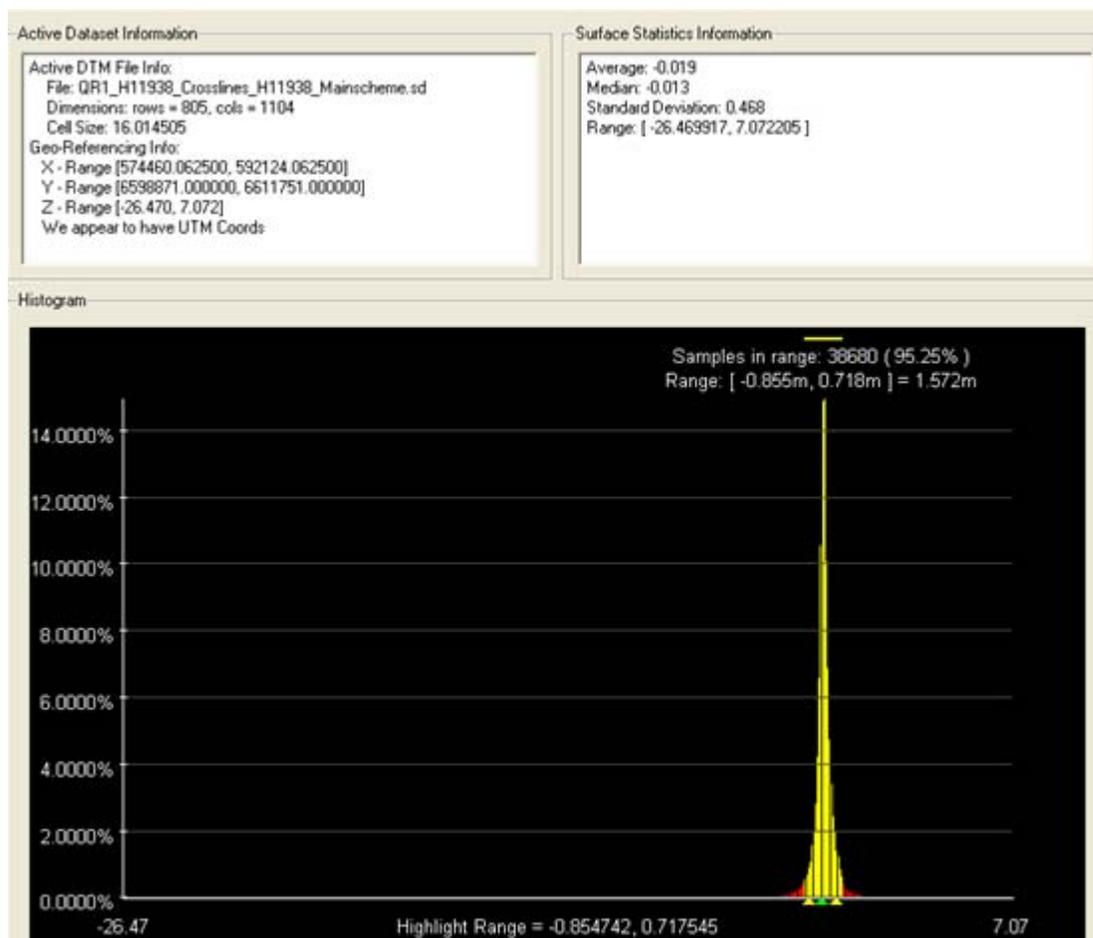


Figure 2: Comparison of 16 meter BASE surfaces from crosslines and main scheme lines

B.2.b. Junctions

Survey H11938 junctions with H11935, which is Sheet C of the same project (see Table 3).⁴ The area of overlap between the sheets was reviewed in CARIS Subset Editor and the final combined 16 meter resolution BASE surfaces for the two surveys were compared by surface differencing in Fledermaus. Data were found to be in agreement within 0.233 meters on average with a standard deviation of 0.526 meters. The sheet limits and area of overlap for Sheets F and C are shown in Figure 3. Fledermaus surface differencing statistics are summarized in Figure 4.

Junction Survey	Survey Scale	Date of Survey	Survey Location
H11935	1:10,000	August –September 2008	Vicinity of Homer Spit

Table 3: Junction Surveys

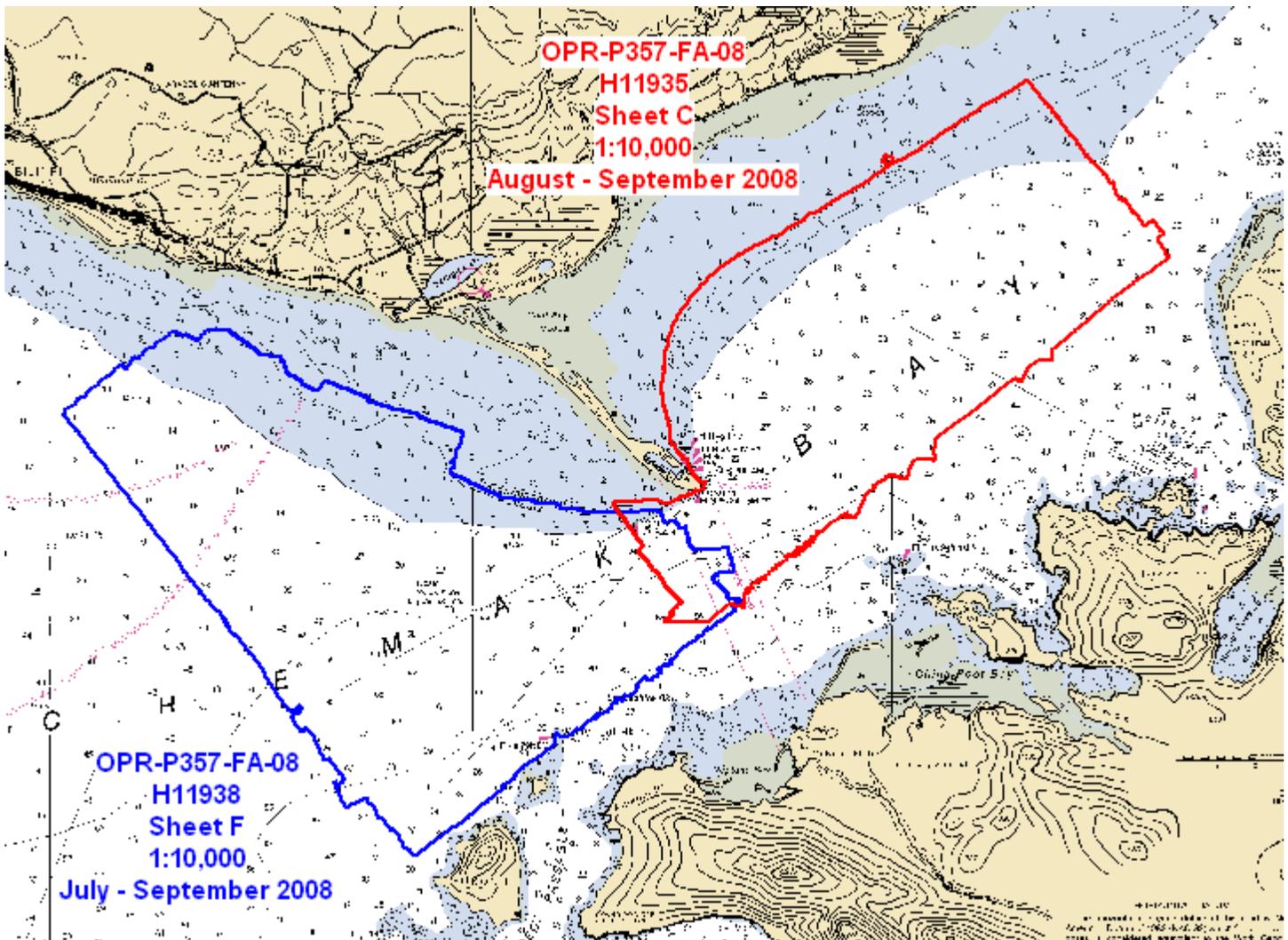


Figure 3: Junction between H11938 and H11935

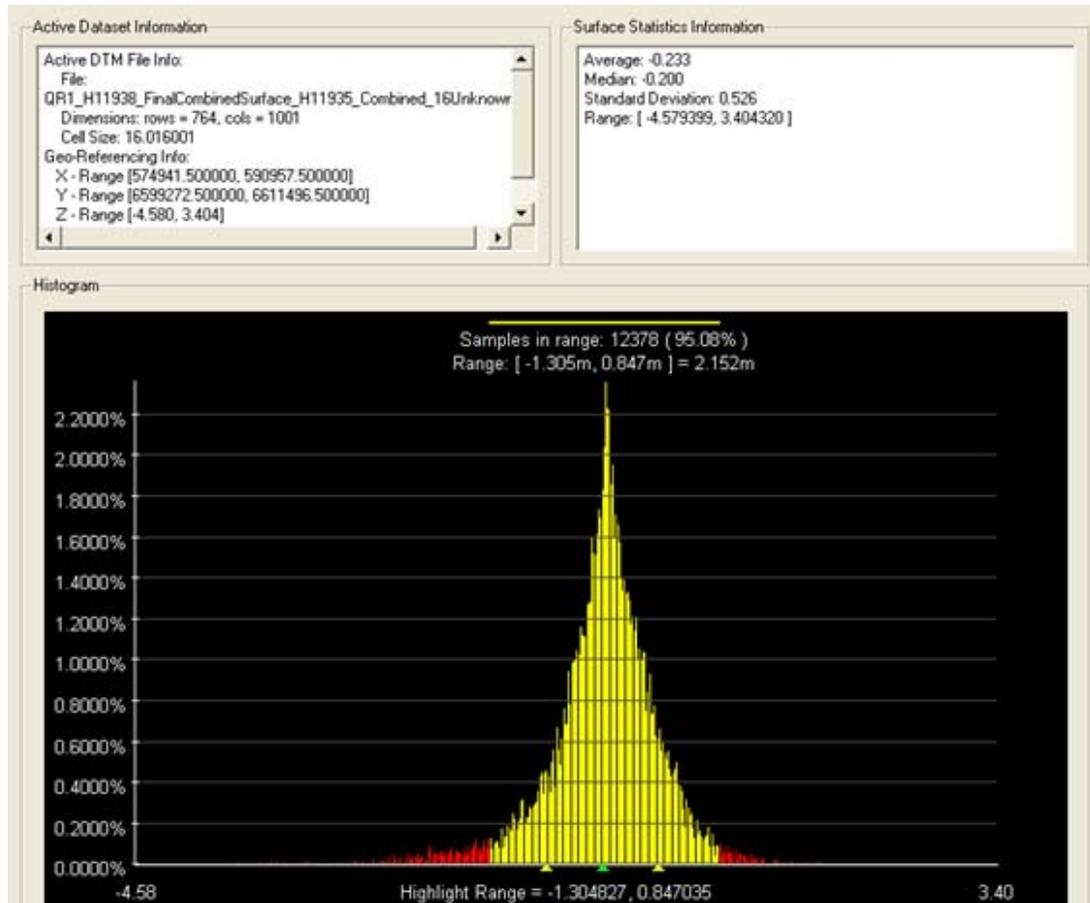


Figure 4: Comparison of final combined 16 meter base surfaces from H11938 and H11935

B.2.c. Quality Control Checks

MBES quality control checks were conducted as discussed in the quality control section B of the DAPR.

B.2.d. Data Quality Factors

TRUEHEAVE

TrueHeave data was logged and applied to all lines during post-processing except for S220 line 232-0130 on August 18, 2008 (DN231). A computer crash had stopped the TrueHeave file during this line and the system operator neglected to resume logging. Comparing this line to adjacent lines shows that MBES data quality was not adversely affected by the lack of TrueHeave. This is as one would expect since the weather was calm and the ship is a relatively stable platform.

A common problem on this survey was a processing issue wherein CARIS was unable to apply the TrueHeave file. This occurred for Launch 1010 data on DN 192, 194, 195, 235, and 246 and for Launch 1018 data on DN 192, 193, 194, and 195. The problem was easily corrected by running the CARIS program fixTrueHeave.exe. In all cases the “fixed” TrueHeave file was able to be applied to the data.

BOTTOM SAMPLES

Bottom samples over most of the survey area were acquired in accordance with section 2.5.3.6.1 of the FPM. However, because no small boats were in working order at the time, all bottom samples on survey H11938 had to be collected from the ship. Due to the risk associated with operating the ship close to shore, no bottom samples were obtained in waters shallower than 10 fathoms.

DESIGNATED SOUNDINGS

Designation of soundings followed procedures as outlined in section 5.1.1.3 of the NOS Hydrographic Surveys Specifications and Deliverables (HSSDM) dated April 2008. A total of 53 soundings were designated to preserve shoal depths. Fifty-two of these designated soundings are on relatively small features measuring roughly 1 m by 1 m by 1 m. These features could easily be mistaken for noise except that they all are described by nadir or near-nadir soundings from multiple lines and examination of the MBES backscatter reveals their presence.⁵ These could be manmade features as there is an active crab fishery in the vicinity. The Hydrographer did, however, note dozens of boulders of approximately these dimensions on the beach or exposed at low tide.

B.2.e. Accuracy Standards

A child layer showing IHO Order 1 compliance was created in CARIS HIPS and SIPS and imported into Fledermaus for analysis. The results of this analysis are summarized in Figure 5. This survey meets the data accuracy specifications for IHO Order 1 as stated in the HSSDM.

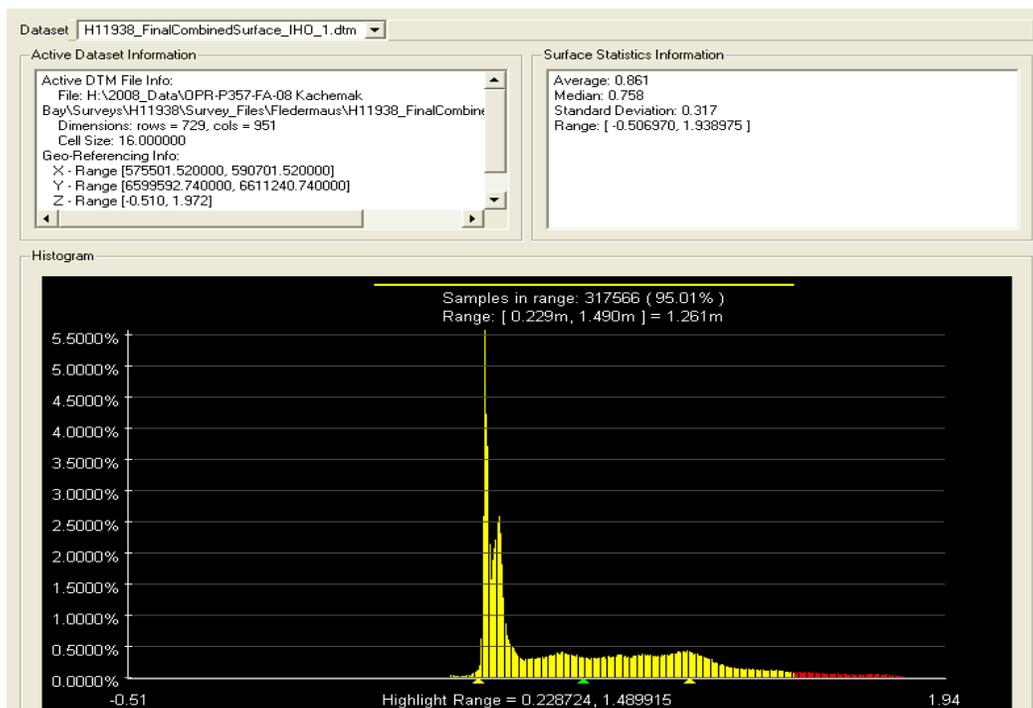


Figure 5: IHO Order 1 statistics

B.3. Corrections to Echo Soundings

Data reduction procedures for survey H11938 conform to those detailed in the DAPR.

B.4. Data Processing

Initial data acquisition and processing notes are included in the acquisition and processing logs. Additional processing such as final tides and sound velocity applied is most accurately tracked in the survey wide query in the Reviewer_Qry tab of the H11398_Data_Log. All of the logs are included with the digital Separates I.

Data processing procedures for survey H11938 conform to those detailed in the DAPR. Further processing details regarding Total Propagated Uncertainty (TPU/TPE) and Combined Uncertainty and Bathymetry Estimator (CUBE) Surfaces and Parameters utilized are discussed below.

B.4.a. TPE Values

The survey specific parameters used to compute TPE in CARIS for H11938 are listed in Table 4.

Tide values:	Measured	0.00 m	Zoning	0.00 m
Sound Speed Values:	Measured	1.00 m/s	Surface	1.00 m/s

Table 4: Survey Specific CARIS TPE Parameters

Tide values of 0.00 m were used because final water levels were determined by Tidal Constituent and Residual Interpolation (TCARI). When using TCARI, uncertainty values are automatically applied and no TPE values are manually entered in CARIS.

B.4.b. CUBE Surfaces

The CARIS HIPS CUBE surfaces created and the associated resolutions are listed below in Table 5. One field sheet covers the entire survey area. The resolutions and depth ranges used were selected based on an analysis of past *Fairweather* data as reported in the DAPR.

Fieldsheet Name	Surface Name	Depth Ranges (m)	Resolution (m)
H11938_QC	H11938_2m	All	2
	H11938_4m	All	4
	H11938_8m	All	8
	H11938_16m	All	16
	H11938_2m_0to20m_Final	0-20	2
	H11938_4m_15to40m_Final	15-40	4
	H11938_8m_35to80m_Final	35-80	8
	H11938_16m_70to200m_Final	70-200	16
	H11938_FinalCombinedSurface_16m	All	16

Table 5: Depth Ranges and Resolutions

B.4.c. CUBE Parameters ⁶

The parameters utilized for creating CUBE surfaces are included in Table 5. The CUBE parameters Extensible Markup Language (XML) file is included with digital data in the vessel configuration folder.

Surface Resolutions	CUBE Parameters				
Grid Resolution	Profile Name	EOV	CDS	CDM	HES
2m	2MeterGrid	4.0	1.0	1.41	2.95
4m	4MeterGrid	4.0	1.0	2.83	2.95
8m	8MeterGrid	4.0	1.0	5.65	2.95
16m	16MeterGrid	4.0	10.0	11.31	2.95

Table 6: CUBE parameters used during this survey

B.4.d. Surface Filtering

The Surface Filtering function was utilized in CARIS HIPS and SIPS. For lines from DN192 to 195, surfaces were filtered at a confidence level (CL) setting of 15. Upon review, it was discovered that the surface filter had rejected good data on the steep slope of Sixty Foot Rock. This data was manually reaccepted and a less aggressive filter setting of CL30 was used for the remainder of the project. All surfaces were manually reviewed after filtering.⁷

C. HORIZONTAL AND VERTICAL CONTROL

A complete description of horizontal and vertical control for survey H11938 can be found in the *OPR-P357-FA-08 Horizontal and Vertical Control Report* ⁸ submitted under separate cover. A summary of horizontal and vertical control for this survey follows.

C.1. 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. Differential corrections from the U.S. Coast Guard beacon at Kenai, AK, (310 kHz) were used.

C.2. Vertical Control

The vertical datum for this project is Mean Lower Low Water (MLLW) as specified in the Project Instructions. The operating National Water Level Observation Network (NWLON) primary tide station at Seldovia, AK, (945-5500) served as control for datum determination and as the primary source for water level correctors for survey H11938.

Fairweather personnel installed Sutron 8210 “bubbler” tide gauges at the tertiary stations listed below. Gauge #17 (S/N 79049) was the gauge used for Kasitsna Bay. Gauge #08 (S/N 78255) was installed at Bear Cove. Details for both installations are listed in Table 7. The gauges were installed in order to provide information to the Center for Operational Oceanographic Products and Services (CO-OPS N/OPS1) for the determination of time and height correctors in accordance with the Project Instructions.

Station Name	Station Number	Type of Gauge	Date of Installation	Date of Removal
Kasitsna Bay	945-5517	Tertiary 30 Day	July 2, 2008	September 3 , 2008
Bear Cove	945-5595	Tertiary 30 Day	July 3, 2008	August 29, 2008

Table 7: Tide Gauge Information

Refer to the *OPR-P357-FA-08 Horizontal and Vertical Control Report* for further information about the tide stations.

A request for delivery of final approved (smooth) tides for survey H11938 was forwarded to N/OPS1 on September 7, 2008, in accordance with the FPM. A copy of the request is included in Appendix IV.⁹

As per the Project Instructions, all data were reduced to MLLW using the final approved water levels (smooth tides) from the Seldovia, AK, station (954-5500) by applying tide file 9455500.txt and time and height correctors through the final TCARI grid file H11938-TCARI.tc. **It will not be necessary for the Pacific Hydrographic Branch to reapply the final approved water levels (smooth tides) to the survey data during final processing.**

D. RESULTS AND RECOMMENDATIONS

D.1. Chart Comparison

Chart comparison procedures were followed as outlined in section 4.5 of the FPM and section 8.1.3-D.1 of the HSSDM utilizing MapInfo and CARIS HIPS and SIPS software programs.

Survey H11938 was compared with the following charts listed in Table 8.¹⁰

NOAA Chart Number	Chart Scale	Edition Number	Edition Date	Updated Through
16645	1:82,662	18 th Ed.	January 12, 2002	December 4, 2008
16646	1:15,000	13 th Ed.	November 1, 2007	November 8, 2008

Table 8: NOAA Charts compared with Survey H11938

D.1.a. Chart 16645

Depths from survey H11938 generally agreed within one to two fathoms with depths on chart 16645. A few exceptions are outlined below.

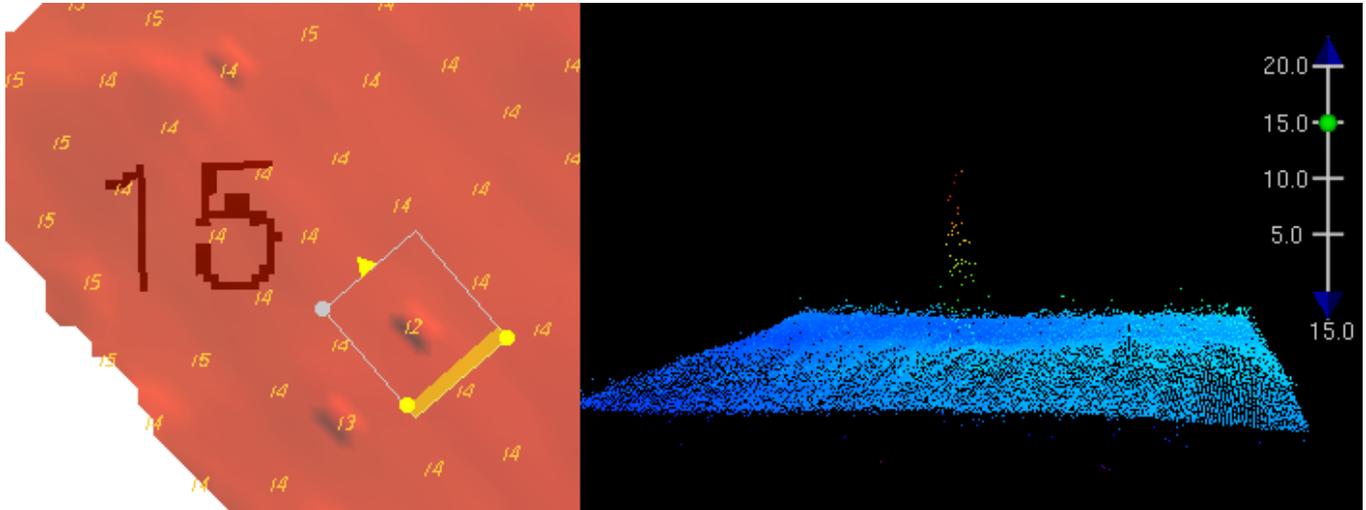


Figure 6: Three features near lat 59°36.9'N, long 151°39.4'W

In Figure 6, distinct features are seen rising from an otherwise flat and featureless bottom near lat 59°36.9'N, long 151°39.4'W.¹¹ The Hydrographer does not believe these features to be noise because they are defined by nadir or near-nadir beams from at least two different lines and are seen in the MBES backscatter. This example in the northwest corner of the survey shows 3 such features. Throughout the survey there are 52 designated soundings that describe features of this nature.

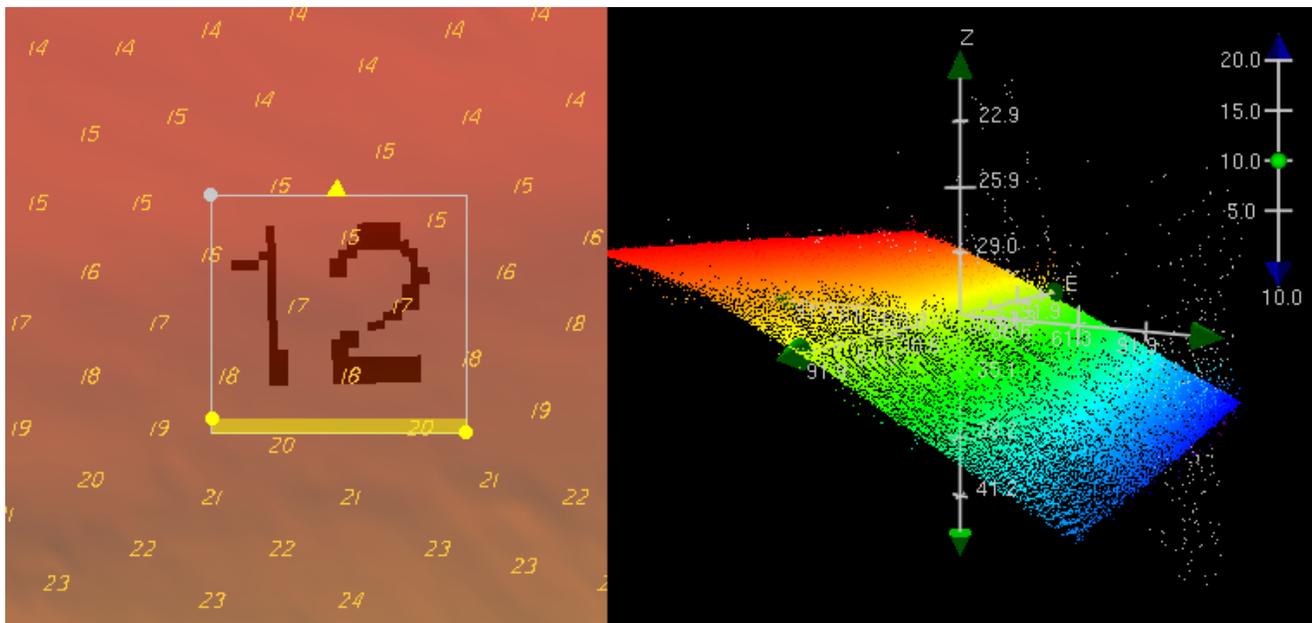


Figure 7: Charted sounding is too shallow at lat 59°35.4'N, long 151°33.7'W.

In Figure 7, a charted 12 fathom sounding at lat 59°35.4'N, long 151°33.7'W is clearly shallower than the actual bathymetry. The 3D image from CARIS Subset Editor shows total bottom coverage with no features coming up from the gently sloping bottom.¹²

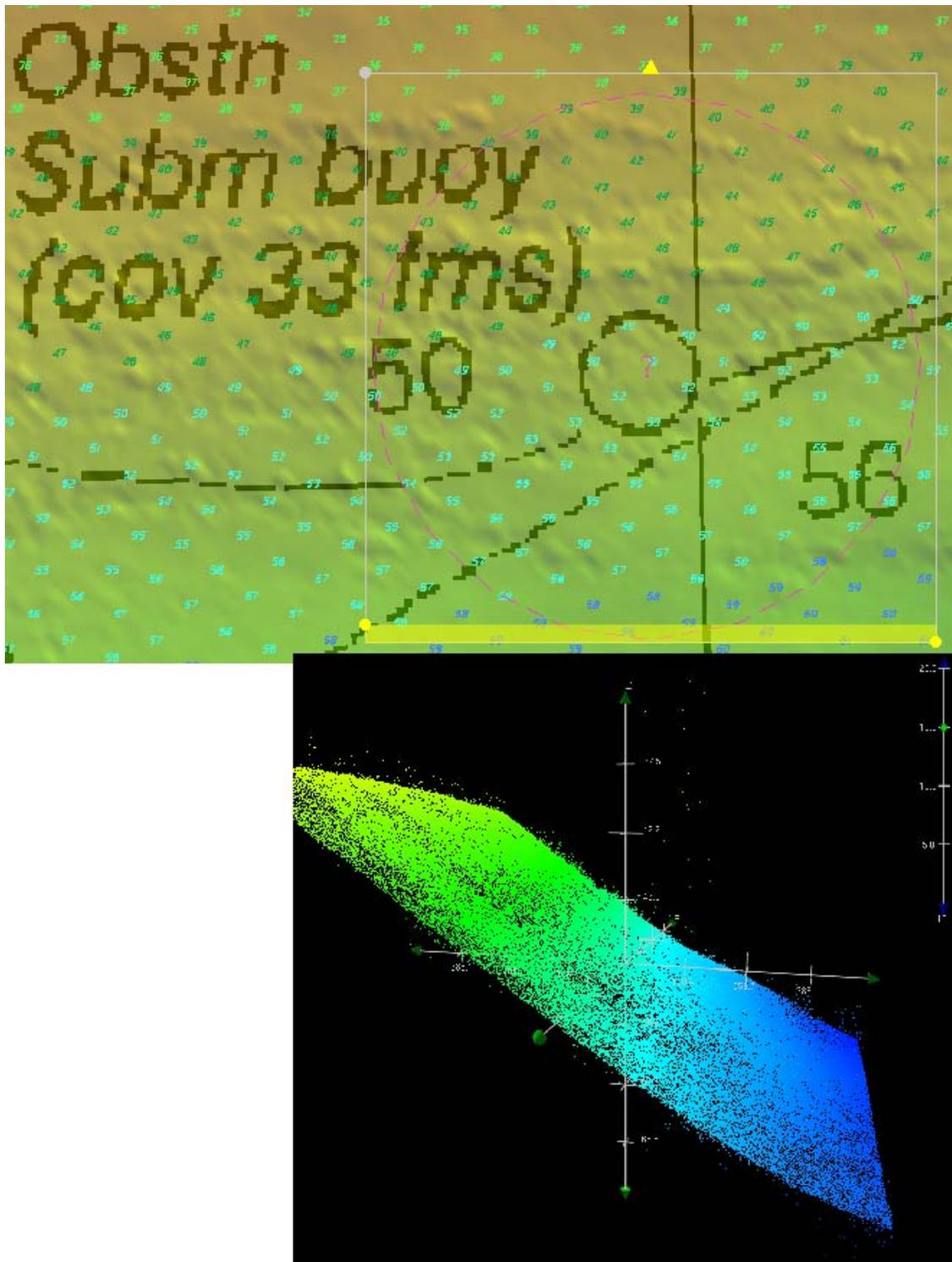


Figure 8: Charted obstruction at lat 59°34.5'N, long 151°30.1'W was not found.

In Figure 8, a submerged buoy is charted as an obstruction at lat 59°34.5'N, long 151°30.1'W. No evidence of this obstruction was found in either CARIS Subset Editor or in the MBES backscatter.¹³ However, MBES is not the ideal tool for object detection at these depths. See the Automated Wreck and Obstruction Information System (AWOIS) Investigations section below for further information

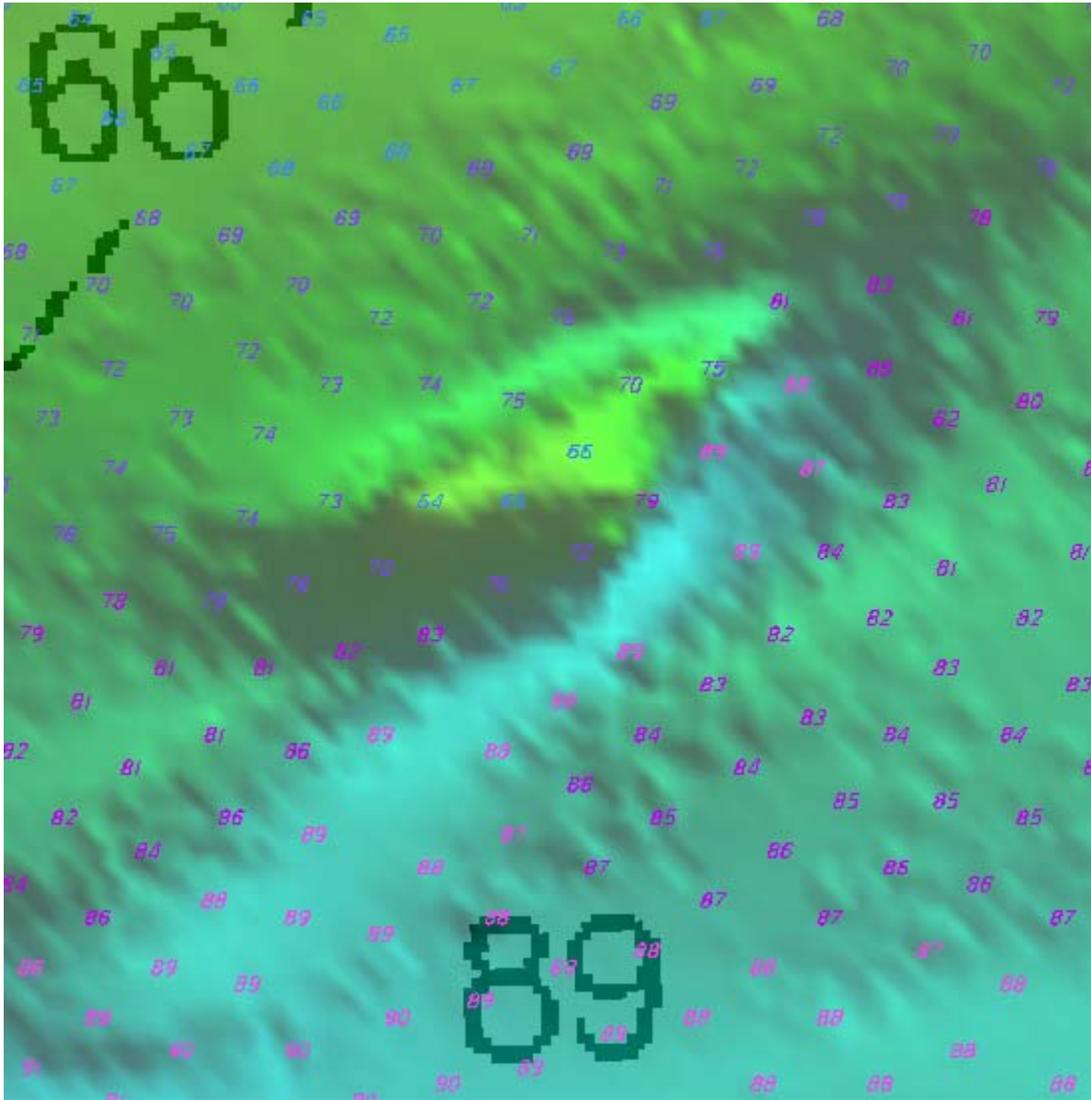


Figure 9: Feature at lat 59°34.1'N, long 151°27.2'W not represented on the chart

Figure 9 depicts a feature at lat 59°34.1'N, long 151°27.2'W that is not represented on the chart. This feature is 10 to 20 fathoms shallower than what would be expected at this location.¹⁴

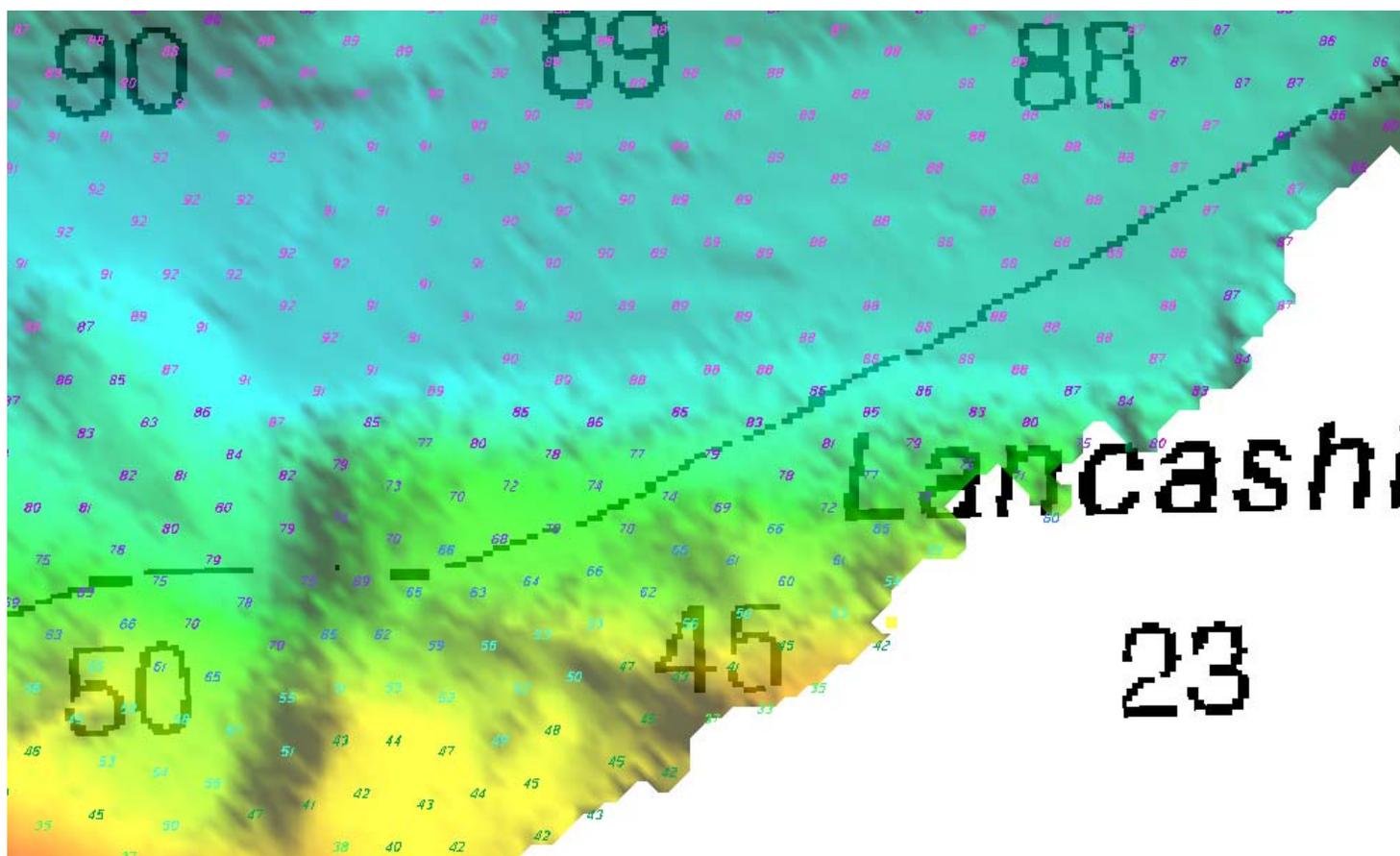


Figure 10: The charted 50 fathom contour line northeast of Sixty Foot Rock

In figure 10, the charted 50 fathom contour line northeast of Sixty Foot Rock passes through water far deeper than 50 fathoms.¹⁵

D.1.b. Chart 16646

Depths from survey H11938 generally agreed within one to two fathoms with depths on chart 16646.¹⁶

D.1.c. Chart Comparison Recommendations

The Hydrographer has determined that bottom coverage requirements have been met and data accuracy meets requirements specified by the HSSDM. **The surveyed soundings are adequate to supersede prior surveys in their common areas.**¹⁷

D.1.d. Automated Wreck and Obstruction Information System (AWOIS) Investigations

There was one AWOIS item located within the limits of H11938. This item (AWOIS# 53702) was addressed with 100% MBES and is included in the H11938_AWOIS_Report.pdf in Appendix II¹⁸. While nothing of navigational significance was found within the search radius, the Hydrographer does not

believe the resolution of the data is sufficient to definitively disprove the existence of a small submerged buoy in waters of this depth.¹⁹

D.1.e. Dangers to Navigation

There were no dangers to navigation found within the survey limits.²⁰

D.2. Additional Results

D.2.a. Shoreline Source

A composite source file (CSF) in .000 format from HSD's Operations Branch was provided with the project instructions. Shoreline sources that were used in the composite source file included geographic cell (GC), prior survey H09877, reports from the US Coast Guard, and charts 16645 and 16646 (see Table 10). The original file was imported into CARIS Notebook, converted to a .hob file, clipped to the sheet limits, and named H11938_Original_Composite_Source.hob to be included with the deliverables. This file was copied and named H11938_Field_Verified.hob to be utilized during verification and to contain field edits.

D.2.b. Shoreline Verification

Fairweather personnel conducted shoreline verification at times near predicted low water, in accordance with the Project Instructions and section 3.5.5 of the FPM. Detached positions (DPs) and geographic positions (GPs) acquired during shoreline verification were recorded in TerraSync and on paper DP forms. Scanned copies of the DP forms and boat sheets with field annotations are included in the digital Separates I folder.

The Navigable Area Limit Line (NALL) was determined in the field as the farthest off-shore of either the Mean High Water (MHW) buffer line or the 4-meter depth contour. The MHW buffer for this survey was offset from the composite source MHW line by 64 meters (0.8 mm at a scale of 1:80,000). All shoreline features from the composite source seaward of the NALL were verified or disproved during shoreline operations.

D.2.c. Shoreline Data Processing

Only one feature was encountered seaward of the NALL. This feature, Archimandritof Shoals Lighted Buoy 1 (Light List # 26195), was processed in GPS Pathfinder Office as a geographic position (GP) since no tide correction was needed. It was inserted into Pydro, given S57 attribution, and resolved according to Pydro flagging logic. This feature did not require editing, so no change was made in CARIS Notebook.

Unmodified source shoreline features were left with their original SORIND and SORDAT values. The SORIND/SORDAT information for shoreline features included in the final CARIS Notebook H11938_Field_Verified.hob file is included in Table 10.

Shoreline Source	SORIND	SORDAT
RSD	US,US,graph,GC10700	20010600
Survey	US,US,graph,surveyH09877	19800000
Chart	US,US,graph,chart 16645	20020112
Chart	US,US,graph,chart 16646	19980919
Report	US,US,reprt,17thCGD,ATONIS	20040507
Report	US,US,reprt,17thCGD,ATONIS	20040719
Report	US,US,reprt,17thCGD,LNM 37/07	20070911
Survey	US,US,survey,H11938	20080902

Table 10: SORIND/SORDAT Shoreline Features

D.2.d. Source Shoreline Changes, New Features, and Charted Features

No shoreline features were added, disproved, or modified.

D.2.e. Shoreline Recommendations

The Hydrographer recommends no changes to the shoreline information compiled on the CSF and charts.

D.2.f. Aids to Navigation

Survey H11938 included two aids to navigation (ATONs). A geographic position (GP) was taken on Archimandritof Shoals Lighted Buoy 1 (Light List # 26195). Sixty Foot Rock Light (Light List # 26190) was noted but not positioned. Each of these ATONs was found to serve its intended purpose.²¹

D.2.g. Bottom Samples

Bottom samples were collected on August 26 and 27, 2008 (DN239 and 240) and are included as seabed areas in the Notebook H11938_Field_Verified.hob file. Bottom samples collected in the field have source indication (SORIND) and source date (SORDAT) attribute fields populated to reflect the survey number (US,US,survey,H11938) and final survey date.²²

E. SUPPLEMENTAL REPORTS

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>
Hydrographic Systems Certification Report 2008	May 14, 2008	N/CS34
Data Acquisition and Processing Report 2008	November 14, 2008	N/CS34
Horizontal and Vertical Control Report for OPR-P357-FA-08	December 19, 2008	N/CS34
Tides and Water Levels Package for OPR-P357-FA-08	September 18, 2008	N/OPS1
Coast Pilot Report for OPR-P357-FA-08	December 16, 2008	N/CS26



UNITED STATES DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration
NOAA Marine and Aviation Operations
NOAA Ship FAIRWEATHER S-220
1010 Stedman Street
Ketchikan, AK 99901

December 16, 2008

MEMORANDUM FOR: CAPT David Neander, NOAA
Chief, Pacific Hydrographic Branch

FROM: CDR Douglas D. Baird, NOAA
Commanding Officer

Digitally signed by Doug Baird
DN: cn=Doug Baird, o=NOAA Ship
FAIRWEATHER, ou=NOAA, email=co.
fairweather@noaa.gov, c=US
Reason: I am approving this document
Date: 2008.12.17 08:36:48 -08'00'

TITLE: Approval of Hydrographic Survey H11938,
OPR-P357-FA-08

As Chief of Party, I have ensured that standard field surveying and processing procedures were adhered to during acquisition and processing of hydrographic survey H11938 in accordance with the Hydrographic Manual, Fourth Edition; Field Procedures Manual, May 2008; and the NOS Hydrographic Surveys Specifications and Deliverables, as updated for April 2008. Additional guidance was provided by applicable Hydrographic Technical Directives. These data are adequate to supersede charted data in their common areas. This survey is complete and no additional work is required. All data and reports are respectfully submitted to N/CS34, Pacific Hydrographic Branch.

I acknowledge that all of the information contained in this report is complete and accurate to the best of my knowledge.

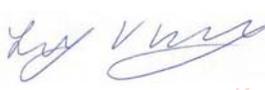
In addition, the following individuals were responsible for oversight of acquisition and processing of this survey:

 Mark Andrews
2008.12.16 21:25:04 Z

ENS Mark Andrews, NOAA
Survey Manager

 Matthew Ringel
2008.12.16 13:27:38
-08'00'

LT Matthew Ringel, NOAA
Field Operations Officer

 Digitally signed by Lynnette Morgan
DN: cn=Lynnette Morgan, c=US,
o=NOAA, ou=NOAA Ship Fairweather,
email=lynnette.v.morgan@noaa.gov
Date: 2008.12.17 06:17:30 -09'00'

CST Lynnette V. Morgan
Chief Survey Technician

Attachment



Revisions and Corrections Compiled During Office Processing and Certification

- ¹ Concur. Coverage requirements were not met in the northern inshore portion of the survey as described in DR.
- ² Filed with project records.
- ³ Concur.
- ⁴ Concur, survey H11938 junction to survey H11935 to the East. A common junction was made with an adjoining portion of survey H11935.
- ⁵ Concur, designated soundings were preserved in the SS layer and compiled to the HCell as appropriate.
- ⁶ Concur with clarification. H11938_FinalCombined_8m resolution grid was used to compile survey H11938. The 16 meters submitted grid by the field was too coarse for the data.
- ⁷ Concur, the shoalest depths on Sixty Foot Rock are well represented. A 2 fathoms and 3 feet submerged rock is included in the Hcell.
- ⁸ Filed with project records.
- ⁹ Tide note is appended to this report.
- ¹⁰ Concur with clarification. During office compilation survey H11938 was compiled using the chart 16645, 19th Edition. Edition Date July,2010.
- ¹¹ Concur.
- ¹² Concur.
- ¹³ Concur, a blue note has been added to retain the submerged buoy.
- ¹⁴ Concur, a sounding is included in the HCell to represent this shoal area.
- ¹⁵ Concur, adjust contour lines based on new survey area.
- ¹⁶ Concur.
- ¹⁷ Concur
- ¹⁸ AWOIS report is appended to this report.
- ¹⁹ Concur with the hydrographers recommendations. A blue note was added to retain the submerged buoy.
- ²⁰ Concur.
- ²¹ Chart according to the latest ATONIS information.
- ²² 17 Bottom samples are included in the HCell. 14 Bottom samples from the survey and 3 were retained.

H11938 AWOIS Report

Registry Number: H11938
State: Alaska
Locality: Kachemak Bay
Sub-locality: Vicinity Archimandritof Shoals
Project Number: OPR-P357-FA-08
Survey Dates: 7/10/08 - 9/2/08

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
16645	18th	01/12/2002	1:82,662 (16645_1)	USCG LNM: 09/16/2008 (10/28/2008) CHS NTM: None (09/26/2008) NGA NTM: 11/27/2004 (11/08/2008)
16647	3rd	05/12/2001	1:100,000 (16647_1)	[L]NTM: ?
16640	24th	09/15/2001	1:200,000 (16640_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

Feature No.	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	AWOIS	[no data]	[no data]	[no data]	---

1 - AWOIS Features

1.1) AWOIS #53702 - OBSTRUCTION

No Primary Survey Feature for this AWOIS Item

Search Position: 59° 34' 32.1" N, 151° 30' 05.7" W
Historical Depth: [None]
Search Radius: 500
Search Technique: SSS, MB
Technique Notes: 200% SSS or 100% SWMB

History Notes:

UNKNOWN-- SUBMERGED BUOY (COVERED 44 FTMS) APPEARED SOMETIME AFTER 1991 UP TO 2001 IN THE POSITION 59/34/32.0N and 151/30/5.7W (NAD83). (Entered 7/23/08, EAN)

Survey Summary

Charts Affected: 16645_1, 16647_1, 16640_1, 16013_1, 531_1, 500_1, 530_1, 50_1

Remarks:

Unknown Submerged Buoy, AWOIS# 53702

INVESTIGATION SUMMARY: The item was investigated with 100% MBES on Dn194 using Reson 8101 on Launch 1018. Additional data was collected on Dn231 using Reson 8111 on NOAA Ship FAIRWEATHER S220. No evidence of a submerged buoy was found. However, MBES is not ideal for object detection at the depths in question (buoy covered 44 fathoms). Nothing of navigational significance was found during the investigation.

Feature Correlation

Address	Feature	Range	Azimuth	Status
H11938_AWOIS	AWOIS # 53702	0.00	000.0	Primary

Hydrographer Recommendations

While nothing of navigational significance was found, the Hydrographer does not believe the item was definitively disproved.

S-57 Data

[None]

Feature Images

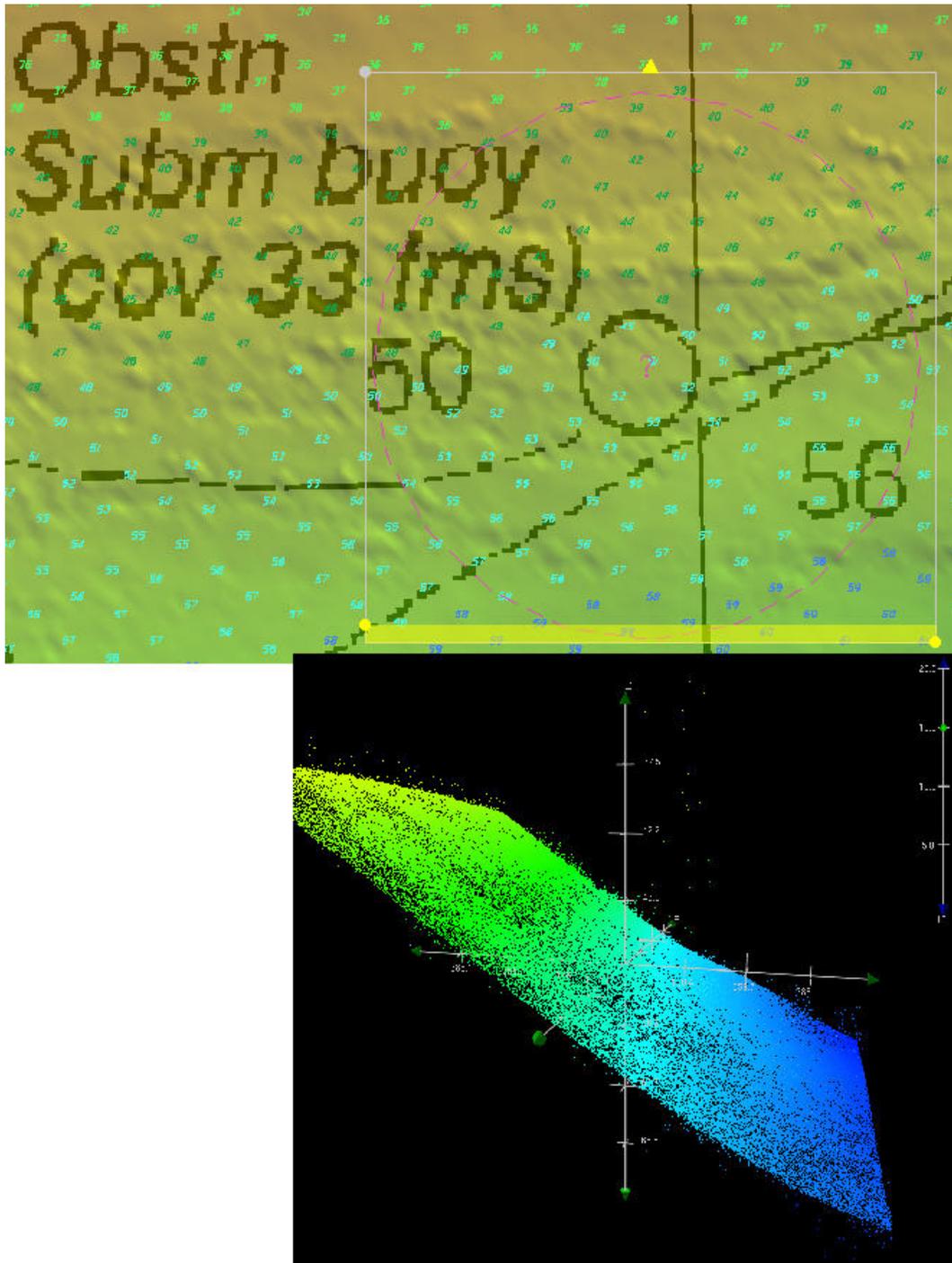


Figure 1.1.1



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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : October 22, 2008

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-P357-FA-2008
HYDROGRAPHIC SHEET: H11938

LOCALITY: Vicinity of Archimandritof Shoals, Katchemak Bay, AK
TIME PERIOD: July 10 - September 2, 2008

TIDE STATION USED: 945-5500 Seldovia, AK
Lat. 59° 26.4' N Long. 151° 43.2' W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 5.252 meters

REMARKS: RECOMMENDED ZONING

Please use the TCARI grid, "H11938-TCARI.tc" posted at ftp://140.90.121.83/pub/outgoing/HPT/Smooth_Tides_TCARI, as the final grid for project OPR-P357-RA/FA-2008, H11938, during the time period between July 10 - September 2, 2008.

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: The water levels stations installed at Bear Cove, Ak (9455595) and Kasitsna Bay, AK (9455517), did not meet the requirements specified in the OCS Hydro Specifications and Deliverables manual. CO-OPS could not verify the stability of the stations sensors or staffs. Therefore, Bear Cove and Katsitna Bay provided only harmonic constants and preliminary datums for this TCARI grid.

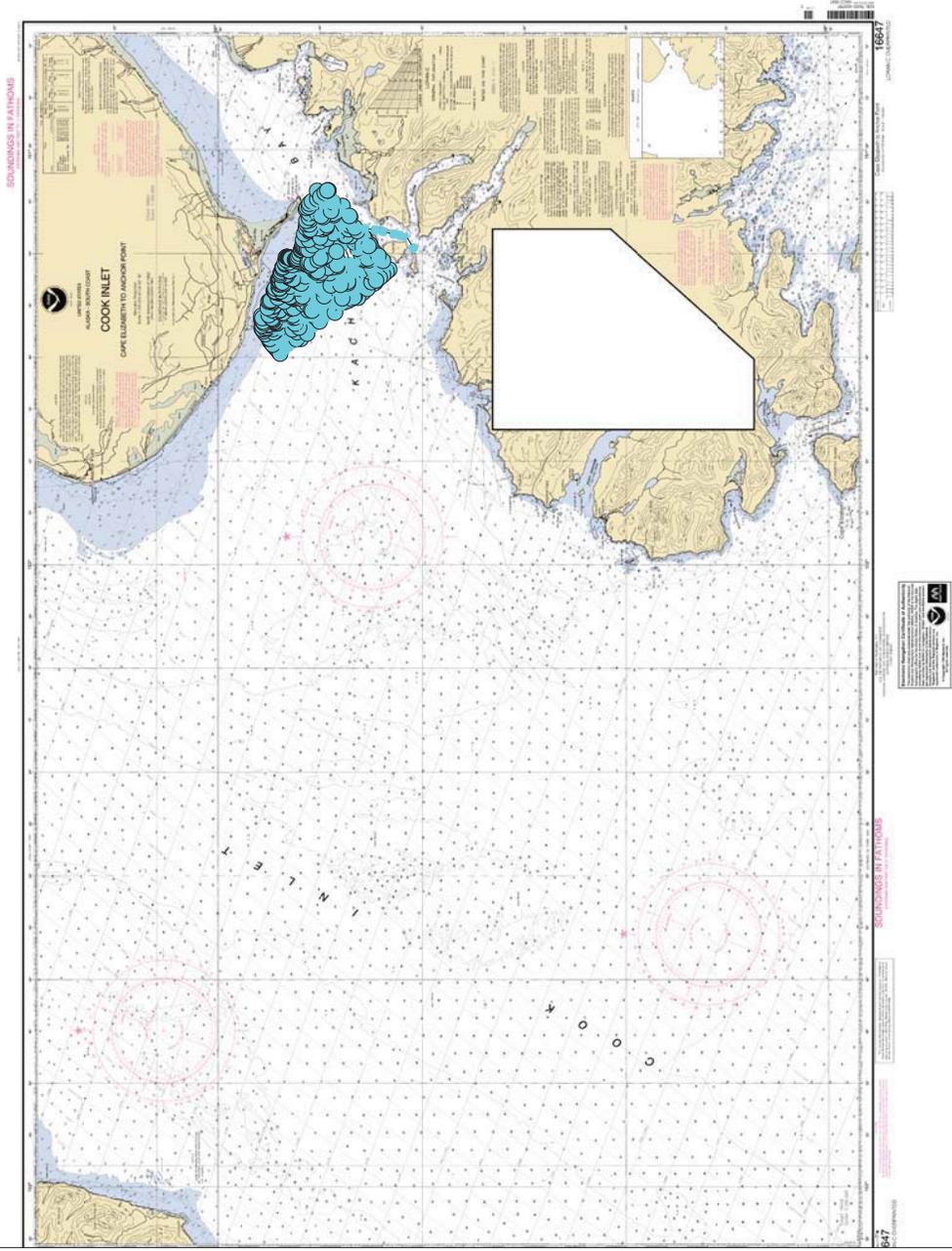
Stephen K. Gill

Digitally signed by Stephen K. Gill
DN: c=US, st=Maryland, l=Silver Spring, ou=Center for Operational Oceanographic Products & Serv., o=National Oceanic and Atmospheric Administration, cn=Stephen K. Gill,
email=Stephen.Gill@noaa.gov
Date: 2008.10.22 17:54:58 -04'00'

CHIEF, OCEANOGRAPHIC DIVISION



**Final Tides for
OPR-P357-FA-2008, H11938
Vicinity of Archimandritof Shoals, AK
Final TCARI Grid**



H11938 HCell Report
 Fernando Ortiz, Physical Scientist
 Pacific Hydrographic Branch

1. Specifications, Standards and Guidance Used in HCell Compilation

HCell compilation of survey H11938 used:

Office of Coast Survey HCell Specifications: Draft, Version: 4.0, 17 March 2010.
 HCell Reference Guide: Version 2.0, July 29, 2010.

2. Compilation Scale

Depths and features for HCell H11935 were compiled to the largest scale raster charts shown below:

Chart	Scale	Edition	Edition Date	NTM Date
16646_3	1:15,000	13 th	11/2007	07/10/2010

The following ENC's were also used during compilation:

Chart	Scale
US5AK1BM	

3. Soundings

A survey-scale sounding (SOUNDG) feature object layer was built from the 8-meter Combined Surface in CARIS BASE Editor. A shoal-biased selection was made at 1:10,000 for the 16646_3 chart, and 1:15,000 for chart 16645_1 at survey scale using a Radius Table file with values shown in the table, below.

Shoal Limit (m)	Deep Limit (m)	Radius (mm)
0	10	2
10	20	3
20	50	3.5
50	500	4

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

4. 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 metric and fathom equivalent contour values are shown in the table below.

Chart Contour Intervals in fathoms from Chart 16646_3, 16645_1	Metric Equivalent to Chart Fathoms, Arithmetically Rounded	Metric Equivalent of Chart Fathoms, with NOAA Rounding Applied	Fathoms with NOAA Rounding Applied	Fathoms with NOAA Rounding Removed for Display on H11938_SS.000
3	5.4864	5.715	3.125	3
5	9.144	9.3726	5.125	5
10	18.288	18.5166	10.125	10
20	36.576	37.9476	20.75	20
30	54.864	56.2356	30.75	30
40	73.152	74.5236	40.75	40
50	91.44	92.8116	50.75	50
60	109.728	111.0996	60.75	60

5. Meta Areas

The following Meta object areas are included in HCell H11938:

M_QUAL
M_CSCL

The Meta area objects were constructed on the basis of the limits of the hydrography.

6. Features

Features addressed by the field units are delivered to PHB where they are deconflicted against the hydrography and the largest scale chart. These features, as well as features to be retained from the chart and features digitized from the Base Surface, are included in the HCell. The geometry of these features may be modified to emulate chart scale per the HCell Reference Guide on compiling features to the chart scale HCell.

7.S-57 Objects and Attributes

The *_CS HCell contains the following Objects:

\$CSYMB	Blue Notes-Notes to the MCD chart Compiler
M_CSCL	Chart Scale Meta Object
M_QUAL	Data quality Meta object
SBDARE	Bottom samples
SOUNDG	Soundings at the chart scale density

The *_SS HCell contains the following Objects:

DEPCNT	Contours at chart scale intervals
SOUNDG	Soundings at the survey scale density

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, so precision is less. 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

See the HCell Reference Guide for details of conversion from metric to charting units, and application of NOAA rounding.

9. Data Processing Notes

There were no significant deviations from the standards and protocols given in the HCell Specification and HCell Reference Guide.

10. QA/QC and ENC Validation Checks

H11938 was subjected to QA checks in S-57 Composer prior to exporting to the metric HCell base cell (000) file. The millimeter precision metric S-57 HCell was converted to 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 are MCD approved as inherent to and acceptable for HCells.

11. Products

11.1 HSD, MCD and CGTP Deliverables

H11938_CS.000	Base Cell File, Chart Units, Soundings and features compiled to 1:15,000
H11938_SS.000	Base Cell File, Chart Units, Soundings and Contours compiled to 1:15,000
H11938_DR.pdf	Descriptive Report including end notes compiled during office processing and certification, the HCell Report, and supplemental items
H11938_outline.gml	Survey outline
H11938_outline.xsd	

11.2 Software

CARIS HIPS Ver. 6.1	Inspection of Combined BASE Surfaces
CARIS BASE Editor Ver. 2.3	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. 2.1	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, SP 1	Validation of the base cell file.
Northport 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:

Fernando Ortiz
Physical Scientist
Pacific Hydrographic Branch
Seattle, WA
206.526.6859
Fernando.ortiz@noaa.gov.

APPROVAL SHEET
H11938

Initial Approvals:

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 disproof 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.