

H11848

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey Hydrographic Survey

Field No. _____

Registry No. H11848

LOCALITY

State Alaska

General Locality Shumagin Islands

Sublocality NW Spectacle Island to SW Turner Island

2008

CHIEF OF PARTY

CDR Douglas Baird, 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;">H11848</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:</p>
<p>State <u>Alaska</u></p> <hr/> <p>General Locality <u>Shumagin Islands</u></p> <hr/> <p>Sub-Locality <u>NW Spectacle Island to SW Turner Island</u></p> <hr/> <p>Scale <u>1:10,000</u> Date of Survey <u>06/26/2008 to 08/14/2008</u></p> <p>Instructions dated <u>4/21/2008</u> Project No. <u>OPR-P183-FA-08</u></p> <p>Vessel <u>NOAA Ship Fairweather</u></p> <hr/> <p>Chief of party <u>CDR Douglas Baird, NOAA</u></p> <p>Surveyed by <u>CST Lynn Morgan, LT Matthew Ringle, ENS Nicholas Morgna</u></p> <p>Soundings by <u>Reson 8111ER, Reson 8111</u></p> <p>SAR by <u>M. Herzog</u> Compilation by <u>Kurt Brown</u></p> <p>Soundings compiled in <u>Fathoms</u></p>	
<p>REMARKS: <u>All times are UTC. UTM Zone 4 North</u></p> <hr/> <p><u>The purpose of this survey is to provide contemporary surveys to update National Ocean Service (NOS) nautical charts. Revisions and end notes in red were generated during office processing.</u></p> <hr/> <p><u>Page numbering may be interrupted or non sequential.</u></p> <hr/> <p><u>All pertinent records for this survey, including the Descriptive Report, are archived at the National Geophysical Data Center (NGDC) and can be retrieved via http://www.ngdc.noaa.gov/.</u></p>	

Descriptive Report to Accompany Hydrographic Survey H11848

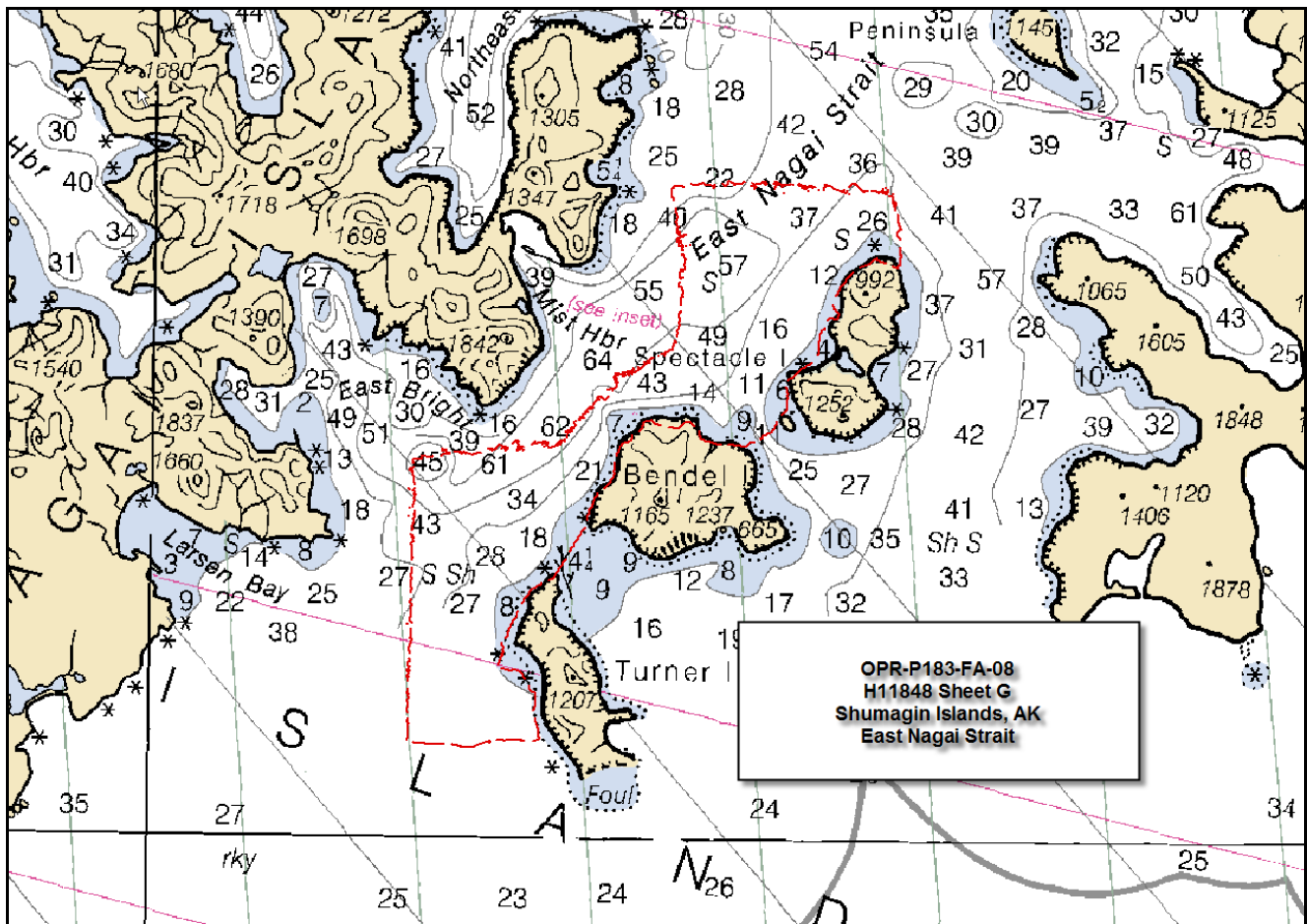
Project OPR-P183-FA
Shumagin Islands, Alaska
Scale 1:10,000
June-August 2008
NOAA Ship *Fairweather*
Chief of Party: Commander Douglas D. Baird, Jr., NOAA

A. AREA SURVEYED

The survey area was located in the Shumagin Islands within the sub-locality of NW Spectacle Island to SW Turner Island. This survey corresponds to Sheet G in the sheet layout provided with the Project Instructions, as shown in Figure 1 below.

Data acquisition was conducted from June 26 to August 14, 2008 (DN 178 to DN 227).

Figure 1: H11848 Survey Outline



One-hundred percent multibeam echosounder (MBES) coverage was obtained in the survey area to at least the 8-meter curve in the survey area where safe to navigate¹. When circumstances permitted, areas such as

long flat slopes or beaches, launch crews were able to survey inshore of 8 meters. Additional coverage was obtained in order to determine least depths over features or shoals.

Limited shoreline verification was conducted in 2007, as per Field Procedures Manual 2007 and the Hydrographic Survey Technical Directive 2007-7. The relevant shoreline files can be found with survey H11682 from the *Fairweather* 2007 field season.

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

MAIN SCHEME - Mileage	
0	Single Beam MS
258.25	Multibeam MS mileage
29.57	FAIRWEATHER S-220
105.95	Launch 1010
122.73	Launch 1018
0	SideScan MS
258.25	Total MS
CROSSLINE - Mileage	
0	Single Beam XL
32.98	Multibeam XL
0.00	FAIRWEATHER S-220
9.43	Launch 1010
23.55	Launch 1018
32.98	Total XL
OTHER	
0	Developments/AWOIS - Mileage
0	Shoreline/Nearshore Investigation - Mileage
0	Total # of Investigated Items
13	Total Bottom Samples
15.7748	Total SNM
6/26, 6/27, 6/28, 8/12, 8/14	Specific Dates of Acquisition
178, 179, 180, 225, 227	Specific Dn#s of Acquisition

Table 1: H11848 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 are included and described in the NOAA Ship *Fairweather* 2008 *Data Acquisition and Processing Report* (DAPR), submitted under separate cover. Items specific to this survey and any deviations from the aforementioned report are discussed in the following sections. This hydrographic survey was completed as specified by Hydrographic Survey Project Instructions OPR-P183-FA-08, dated April 21, 2008.

B1. Equipment and Vessels

Equipment and vessels used for data acquisition and survey operations during this survey are listed below in Table 1.

	FAIRWEATHER	Launch 1010	Launch 1018
Hull Registration Number	S220	1010	1018
Builder	Aerojet-General Shipyard	The Boat Yard, Inc.	The Boat Yard, Inc.
Length Overall	231 feet	28' 10"	28' 10"
Beam	42 feet	10' 8"	10' 8"
Draft, Maximum	15' 6"	4' 0" DWL	4' 0" DWL
Cruising Speed	12.5 knots	24 knots	24 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	SBE19plus
Attitude & Positioning Equipment	POS/MV V4	POS/MV V4	POS/MV V4
Type of operations	MBES	MBES	MBES

Table 2: Vessel Inventory

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

B2. Quality Control

Crosslines

Shallow water multibeam crosslines for this survey totaled 32.98 linear nautical miles (lnm), comprising 12.77% of the 258.25 lnm of total MBES hydrography². Both main scheme and crossline mileage are summarized in Table 1 above.

The crosslines were filtered to include only data 45 degrees from nadir on port and starboard sides in an effort to eliminate the noisy outer beams from affecting the mainscheme to crossline comparison. The crosslines and mainscheme lines were compared by the Surface Differencing method in Fledermaus. This involved creating separate surfaces and using the Surface Differencing tool to gather statistics and make a georeferenced raster image in tagged image file format (.tfw and .tif) displaying areas of disagreement. The products including the raster image and surface statistics with histogram can be located in the digital Separates IV.

The surface statistics computed the average difference between surfaces is 0.029m, median was -0.031m, standard deviation was 0.426m. The crosslines were also viewed in Subset Editor which showed similar results as the surface differencing method.

Junctions

Survey H11848 junctions with H11676, H11682, H11607, and H11606³. The area of overlap between the sheets was reviewed in CARIS Hips Subset Editor and CARIS Notebook for consistency, and data were found to be in good general agreement within International Hydrographic Organization (IHO) Order 1 standards⁴. Figure 2, below, displays the overlap of adjoining surveys.

Junction Survey	Survey Scale	Date of Survey	Survey Location
H11676	1:10,000	2007	East Nagai Strait to Cape Thompson
H11682	1:20,000	2007	East Turner Island to East Spectacle Island
H11607	1:10,000	2006	East Bight to Larsen Bay
H11606	1:10,000	2006	Northeast Bight to East Bight

Table 3: Junction Surveys

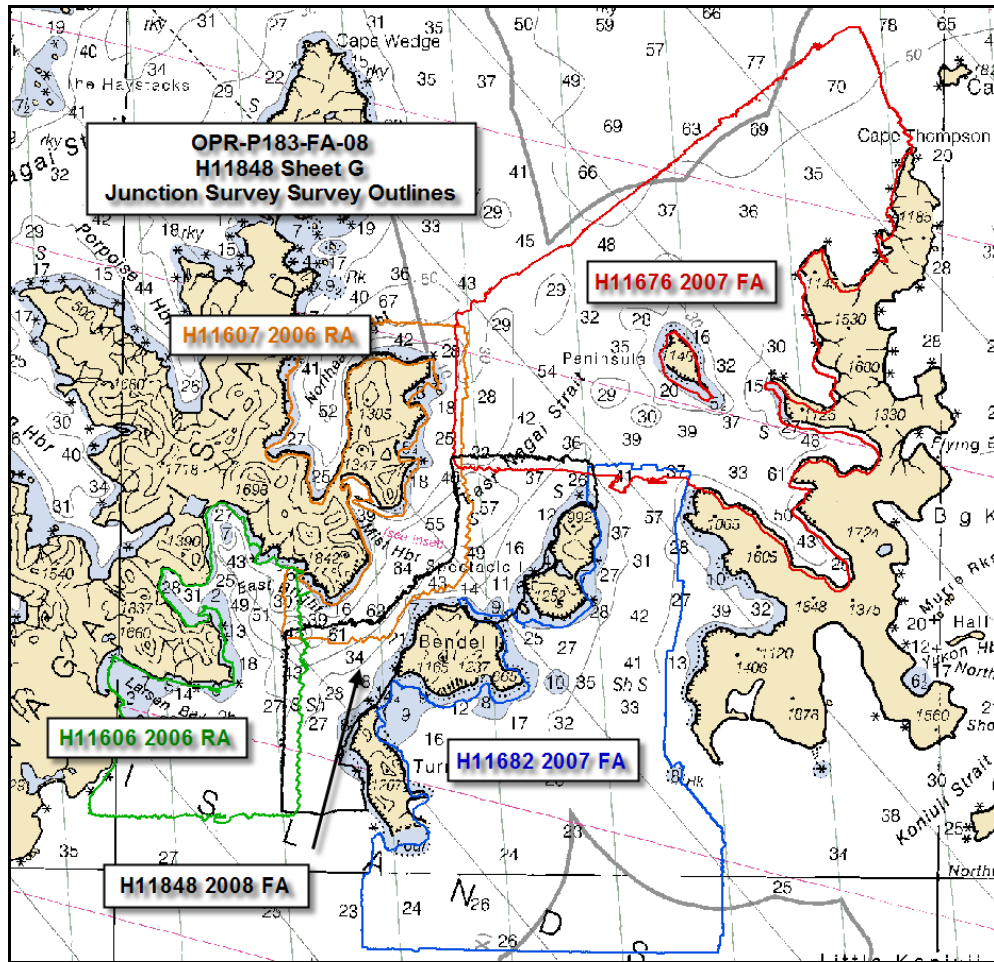


Figure 2: H11848 Junction Survey Survey Outlines

Junction Survey H11606:

HDCS data was not provided for the H11606 survey, so a soundings layer was used in CARIS Notebook to compare to the H11848_8m Combined Uncertainty and Bathymetry Estimator (CUBE) surface. The depth range throughout almost all of the overlapping area was greater than 70 meters which corresponds to an allowable IHO Order 1 error limit of at least 1.038 meters. The difference between surfaces was found to be within that tolerance.⁵

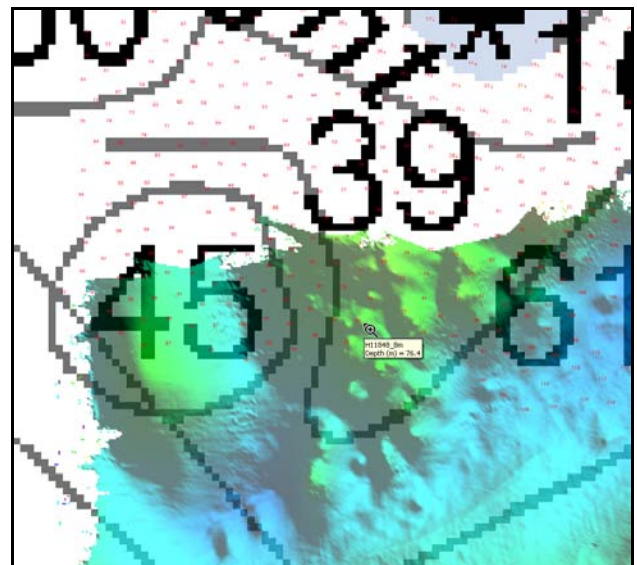


Figure 3: Using Soundings to Compare to 8m Surface

Junction Surveys H11607, H11676, and H11682:

HDCS data for H11607, H11676, and H11682 was available and the surfaces were compared to H11848 data using Subset Editor. The compared depths for these 3 junction surveys also agreed with the H11848 data within IHO Order 1 limits.⁶

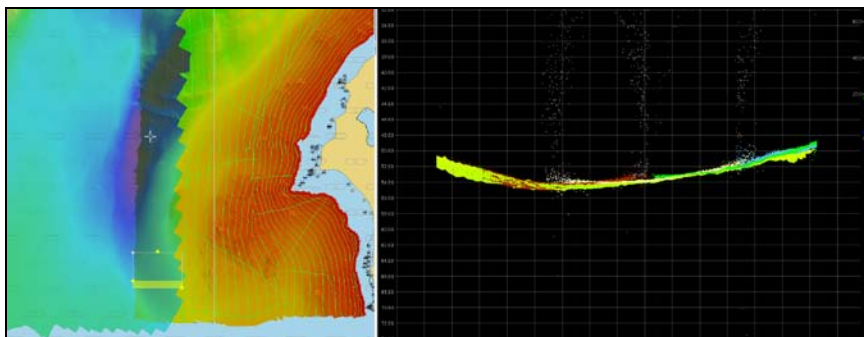


Figure 4: H11607 Surface Overlayed on H11848 Data in Subset Editor

Quality Control Checks

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

Data Quality Factors

POSITIONING:

Initially when reviewing the data, a 3.5 meter horizontal offset was noticed on lines that were run from launch 1018. The same offset was noticed on data from previous surveys from this field season. After some inspection of launch 1018's acquisition system, it was discovered that the GPS antenna cables for the POS MV were reversed, thus creating a horizontal offset correlating with the spacing of the GPS antennas. The antenna cabling problem was corrected after the day's surveying on DN 225. The HIPS Vessel File (HVF) Navigation setting for the X value was adjusted to 1.833m on DN 154 to deal with the reversed antennas through DN 225. After the antenna cables were correctly installed, a new GAMS calibration was run and the HVF Navigation settings were set back to zero for DN 226 and later. The data were reviewed with the adjusted HVF and the problem was determined resolved⁷.

The Differential Global Positioning System (DGPS) signal from Cold Bay (289 kHz) was periodically blocked by terrain. It was specifically noted in the acquisition logs of S-220 and Launch 1010 that DGPS signal was lost. There was an effort to receive DGPS correctors through a NAVCOM system which is a system used to receive differential correctors from a satellite. After review of the data, no visible effects from the loss of DGPS were found⁸.

TRUEHEAVE:

Of the mainscheme and cross line data, TrueHeave was applied to all but six lines. Launch 1018 had 2 lines, 178-1722, 178-1722-1, where according to the acquisition log, TrueHeave data was unavailable. Launch 1010 had one line, 227-1801, in which according to the acquisition log, TrueHeave was not logged by operator. The ship had three lines, 225-1916, 225-1931, 225-1947, in which according to the acquisition log, TrueHeave was not logged by operator.

The Fix TrueHeave application was used for data acquired by Launch 1010 on days 179 and 180, as well as for Launch 1018 on days 178 and 180.

In the six lines where TrueHeave was ultimately unavailable, no heave artifacts are present and the data quality meets specifications.⁹

SOUND VELOCITY:

Sound velocity issues were generally not a problem throughout the survey, however, there was a small area where it affected the surface. The area is located in the southeast portion of the survey in approximately 40 meters of water. Outer beam data was rejected where the soundings affected by sound velocity were noticeably influencing the surface. Even after the cleaning of the outerbeams, it appears that the remaining error is on the order of about 0.30m to 0.40m. For this depth of water, the amount of allowable error is less than 0.73m which is within IHO Order 1 tolerance¹⁰. The figure below shows an example.

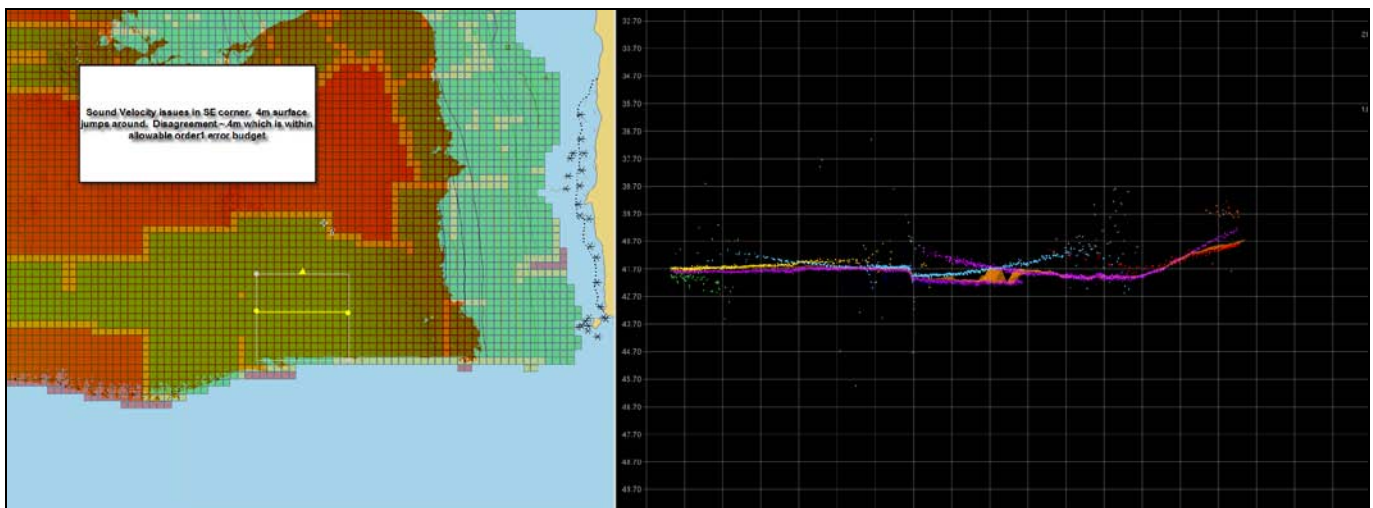


Figure 5: Sound Velocity Error Launch 1010 Dn 179

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. They were chosen such that they were no closer than 2mm at the largest scale chart of the area. Since chart 16556 at 1:80,000 was the largest scale chart, designated soundings should be no closer than 160 meters apart.

A total of 20 designated soundings were selected. Most of these designated soundings are in areas where the surface's resolution is not fine enough to follow the seafloor such as rocky seabed areas¹¹.

OTHER DATA ISSUES

On Dn 225, with platform S-220 8111, it is apparent that gaps in the data occur in regular intervals. The lines were also reviewed using Navigation Editor which showed "cut-outs" in the navigation information as well. The raw .XTF files were reviewed and after some examination, it appears that the problem was

most likely an ethernet issue. These gaps only occur on day 225 and have not been seen in other surveys throughout the field season, thus, the field party is unsure of what may have caused the problem. It is located in the northwest portion of the survey and can be seen in Figure 8 below. Figures 6 and 7 show the gaps in Subset Editor and Navigation Editor. The gaps in data are at deep enough depths, that only one holiday (red circle figure 6) appears in the depth defined surfaces. The gaps were reviewed closely and it was determined that no navigationally significant features could exist in the gaps at those depths¹².

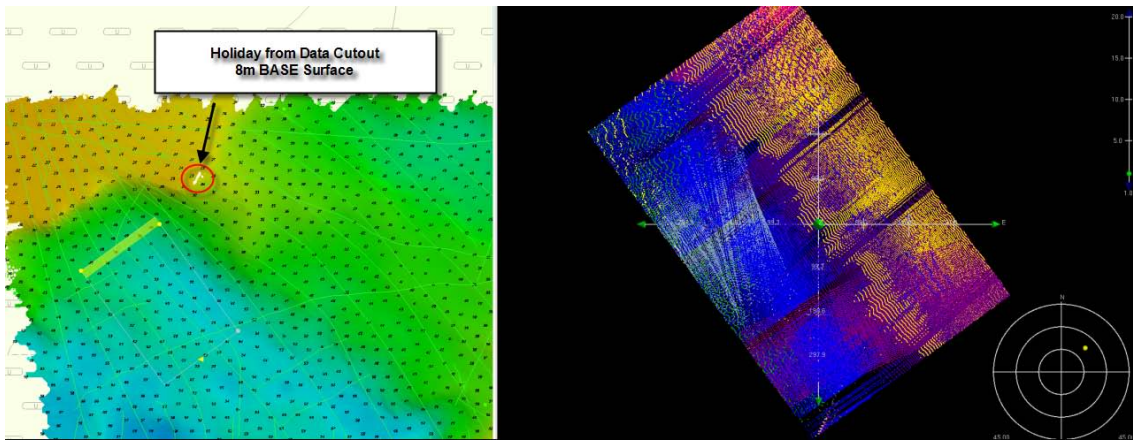
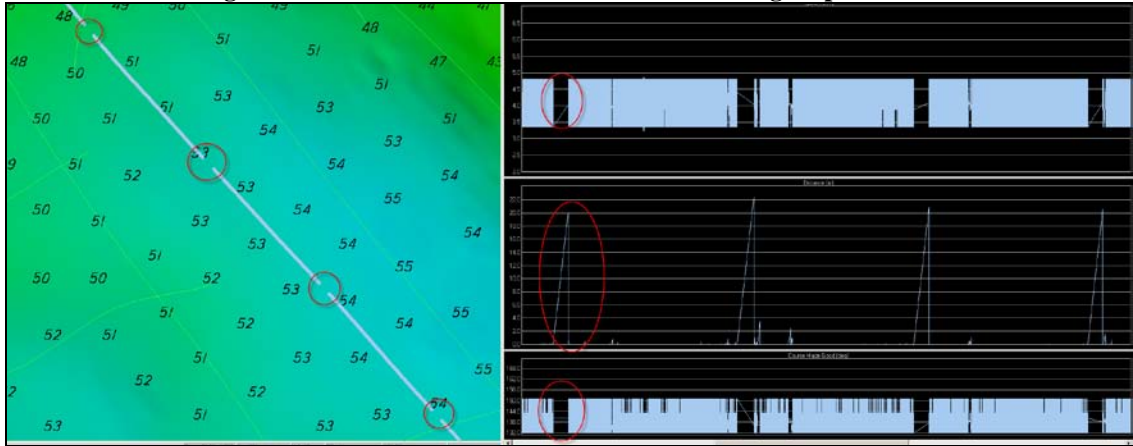


Figure 6 and 7: Possible Ethernet Cutouts Causing Gaps in Data



Accuracy Standards

New child layers in HIPS to highlight data not within IHO Order 1 uncertainty limits were added to each finalized surface and the combined 16m surface. Each of these surfaces were reviewed to determine if 95% of the nodes within each surface meet the IHO Order 1 standards. A histogram was made using Fledermaus to calculate the percentage. All of the surfaces mentioned above meet this criteria. In the figure below is an example of the histogram produced for the 16m combined surface. As indicated by the display circled in orange, 99.85% of the data is within the range of acceptable IHO Order 1 uncertainty¹³.

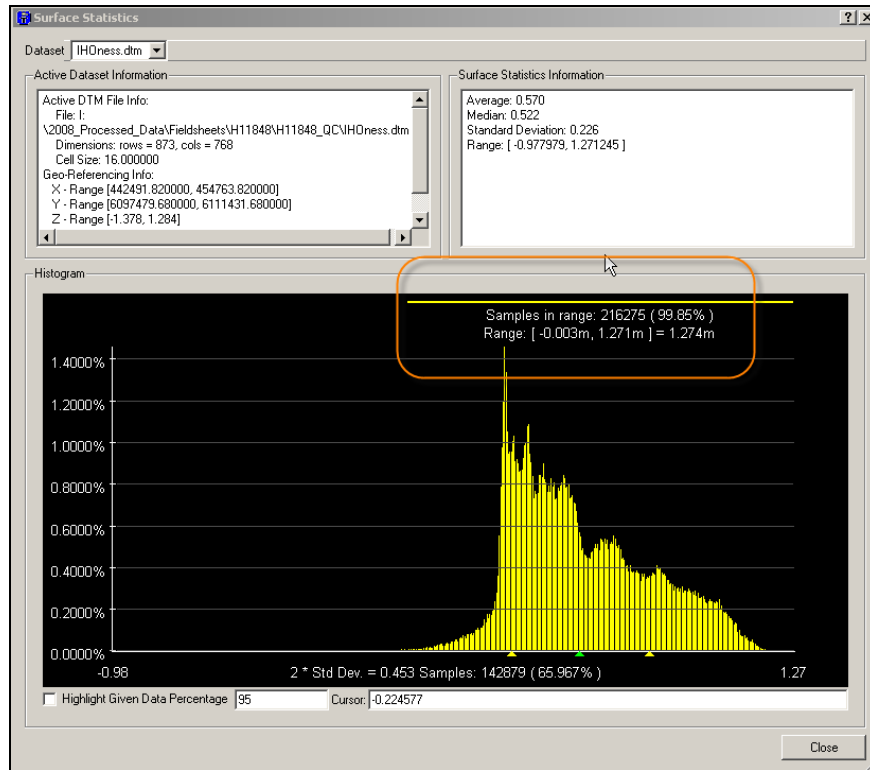


Figure 8: Fledermaus IHO Uncertainty Surface Statistics 99.85% within limits

B3. Corrections to Echo Soundings

Data reduction procedures for survey H11848 conform to those detailed in the DAPR, with the exceptions as discussed below.

B4. Data Processing

Initial data acquisition and processing notes are included 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 MBES MS (mainscheme) tab of the H11848_Data_Log. All of the logs are included with the digital Separates I.

Data processing procedures for survey H11848 conform to those detailed in the DAPR. Further processing details regarding Total Propagated Uncertainty/Error (TPU/TPE) and CUBE Surfaces and Parameters utilized, along with any the deviations from the processing procedures outlined in the DAPR are discussed below.

TPE VALUES:

The survey specific parameters used to compute TPE in CARIS for H11848 are listed in Table 4.

Tide values:	Measured	0.02 m	Zoning	0.13 m
Sound Speed Values:	Measured	1.0 m/s	Surface	1.0 m/s

Table 4: Survey Specific CARIS TPE Parameters

CUBE SURFACES:

CUBE base surface resolutions utilized are listed below in Table 5.

Fieldsheet Name	Surface Name	Depth Ranges (m)	Resolution (m)
H11848_QC	H11848_2m	all	2
H11848_QC	H11848_4m	all	4
H11848_QC	H11848_8m	all	8
H11848_QC	H11848_16m	all	16
H11848_QC	H11848_2m_Final_0to30	0-30	2
H11848_QC	H11848_4m_Final_25to45	25-45	4
H11848_QC	H11848_8m_Final_40to80	40-80	8
H11848_QC	H11848_16m_Final_70to200	70-200	16
H11848_QC	H11848_16m_Combined	all	16

Table 5: Depth Ranges and Resolutions

The depth ranges for the finalized CUBE Surfaces were based on data density as well as bottom type. For instance, the 2 meter surface was extended out to 30 meters because a higher resolution surface was needed to represent a rocky seabed area. The 4 meter surface was not able to reach some of the sharp rocks without many designated soundings. The data density from depth range 25-30 meters begins to get thin for a 2m resolution surface, however, this range overlaps with the 4m surface to provide proper coverage. The figures to the right show the 2 meter finalized depth surface and density surface. The color key for the density surface is shown below at soundings per node.

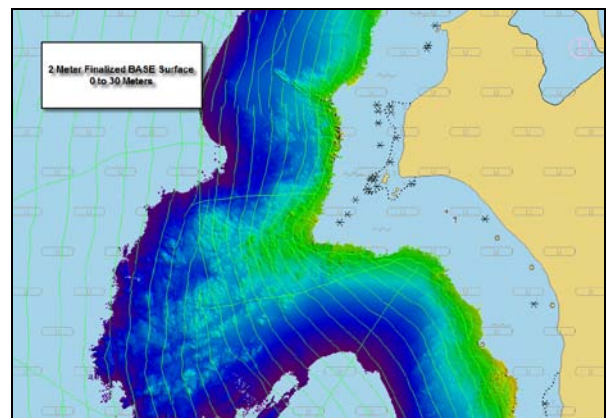


Figure 9: 2m Final BASE surface

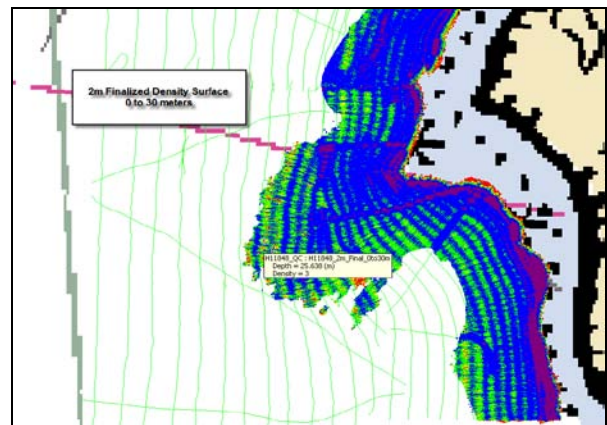


Figure 11: 2m final density surface

Min (m)	Max (m)	Start	End
0.000	3.000		
3.010	5.000		
5.010	10.000		
10.010	30.000		
30.010	600.000		

Figure 10: Density Surface Color Scheme

CUBE PARAMETERS:

The CUBE parameters utilized for creating CUBE surfaces are included in Table 6. The CUBE parameters .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	5.67	2.95
16m	16metergrid	4.0	10.0	11.31	2.95

Table 6: Cube Parameters Used

SURFACE FILTERING:

After a rough initial manual cleaning in Subset Editor, the Surface Filtering function was utilized in CARIS HIPS and SIPS. The confidence level (CL) setting was utilized to limit the filtering. Multiple settings were tested ranging from 10 to 20, but the final CL that was chosen was 18. This filter provided an efficient method of eliminating gross fliers. After running the surface filter, the data were reviewed very closely, especially in rocky areas, to ensure that good data were not rejected. In the few cases it did reject good data, the soundings were reaccepted manually by the Hydrographer.

C. HORIZONTAL AND VERTICAL CONTROL

A report of horizontal and vertical control was not required or submitted for *OPR-P183-FA-08*. 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. Differential corrections from the U.S. Coast Guard beacon at Cold Bay (323 kHz) were used to increase the precision of the GPS signal used by the survey platforms. At times the signal was intermittent and was noted in the Acquisition and Processing logs on those particular days and lines. On DN 225 for platform S-220, there was an effort to use CNAV during the times when the Cold Bay beacon was not being received. The CNAV appeared unreliable as well however. The lack of reliable DGPS did not noticeably affect the data during the times of outages. For further detail see the Acquisition and Processing logs located in Separates I.

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 Sand Point, AK (945-9450) served as control for datum determination and as the primary source for water level correctors for survey H11848.

A request for delivery of final approved (verified) tides for survey H11848 was forwarded to Center for Operational Oceanographic Products and Services (CO-OPS) on August 21, 2008 in accordance with the Field Procedures Manual (FPM), dated May, 2008. A copy of the request is included in Appendix V¹⁴.

As per the Project Instructions, all data were reduced to MLLW using the final approved water levels (verified) from the Sand Point station (945-9450) by applying tide file 9459450.tid and time and height correctors through the zone corrector file H11848CORP.zdf (preliminary zoning was approved). **It will not be necessary for the Pacific Hydrographic Branch to reapply the final approved water levels (verified 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 CARIS HIPS & SIPS software program.

Survey H11848 was compared with the following charts listed in Table 7¹⁵. There were no new changes since the charts were updated with the Notice to Mariners within the survey area.

NOAA Chart Number	Chart Scale	Edition Number	Edition Date	Updated with Notice to Mariners through
16540	1:300,000	12	01/01/2005	03/04/2008
16556	1:80,000	05	04/01/2006	03/04/2008

Table 7: NOAA Charts compared with Survey H11848

The relevant charts were compared in CARIS HIPS and SIPS by using a shoal biased soundings layer overlaid on the existing charts. Where disagreements were found, the data from H11848 was examined closer in Subset Editor to ensure that no shoals were missed by the soundings layer. Below are the discovered discrepancies of each chart, as well as snapshots of the view in Subset Editor for each location.

Chart 16556

SOUNDING COMPARISON:

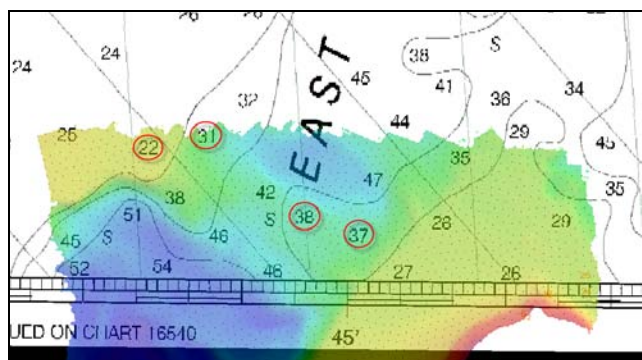


Figure 12: Chart 16556

Chart 16556 had 4 soundings that were surveyed deeper than what was charted. In the locations of each sounding, the data was examined closer in Subset Editor to ensure no pinnacles were missed by the surface.¹⁶

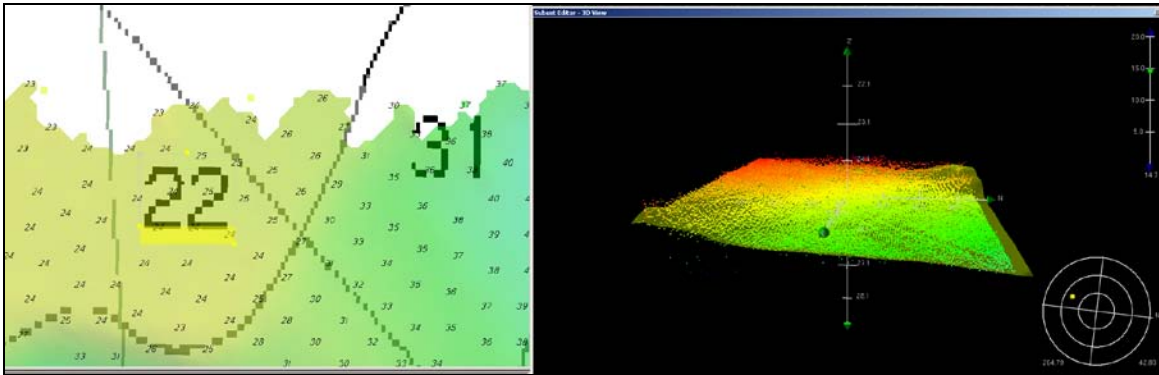


Figure 13: Surveyed 24 Fathoms on Charted (16556) 22 Fathom Sounding

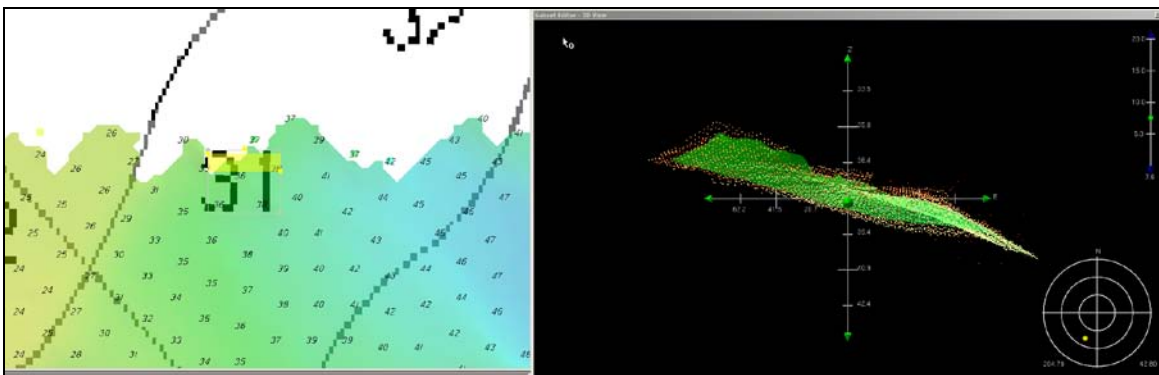


Figure 14: Surveyed 36 Fathoms on Charted (16556) 31 Fathom Sounding

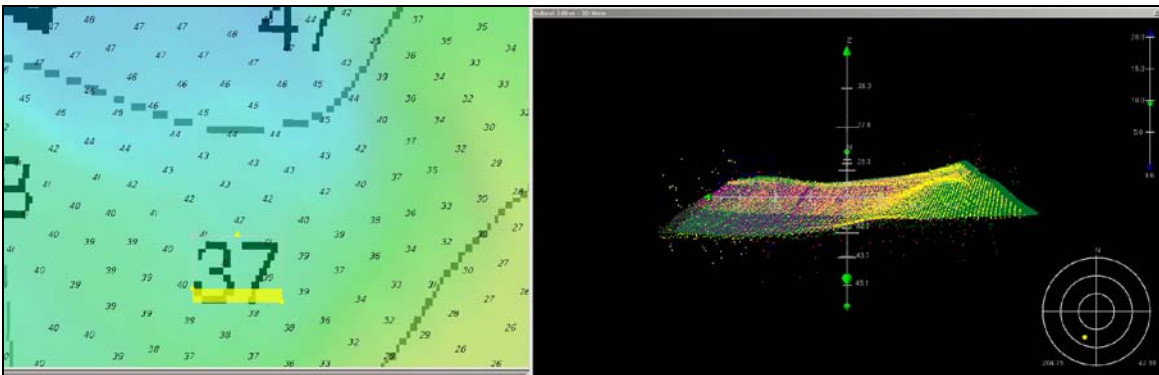


Figure 15: Surveyed 40 Fathoms on Charted (16556) 37 Fathom Sounding

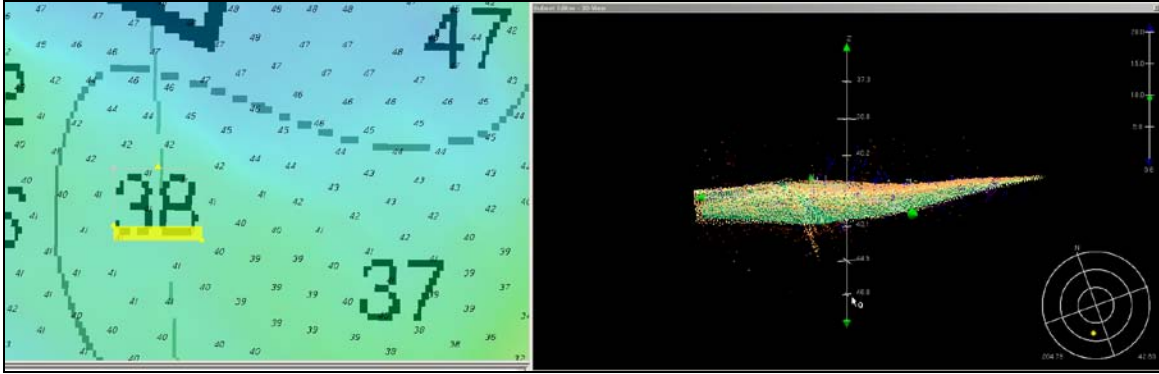


Figure 16: Surveyed 41 Fathoms on Charted (16556) 38 Fathom Sounding

Chart 16540

SOUNDING COMPARISON:

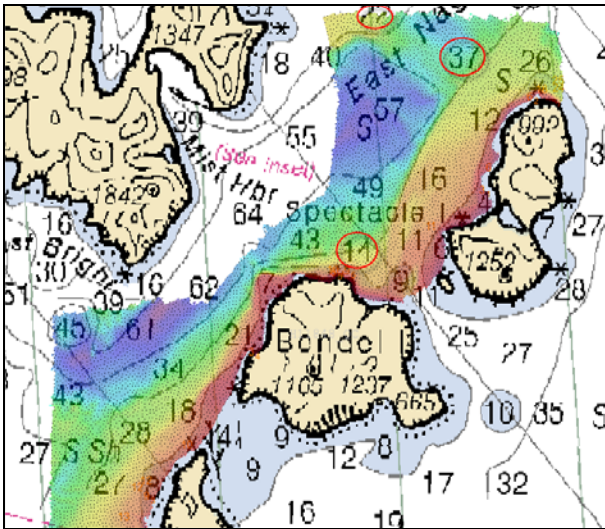


Figure 17: Chart 16540 Chart Comparisons

Chart 16540 had 3 soundings where the data showed deeper than what was previously charted. The 3 areas were again examined in Subset Editor to ensure no pinnacles were missed by the surface.¹⁷

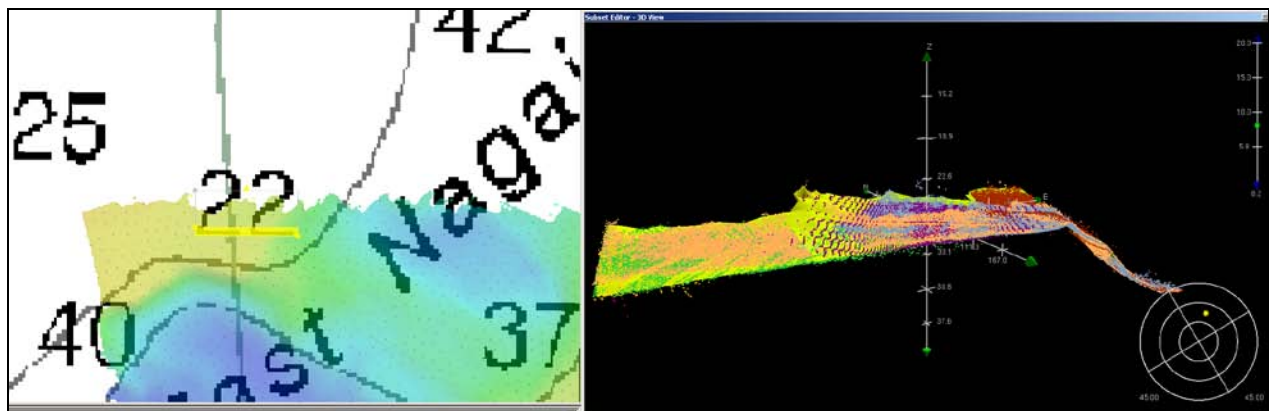


Figure 18: Surveyed 24 fathom sounding on charted (16540) 22 fathom sounding

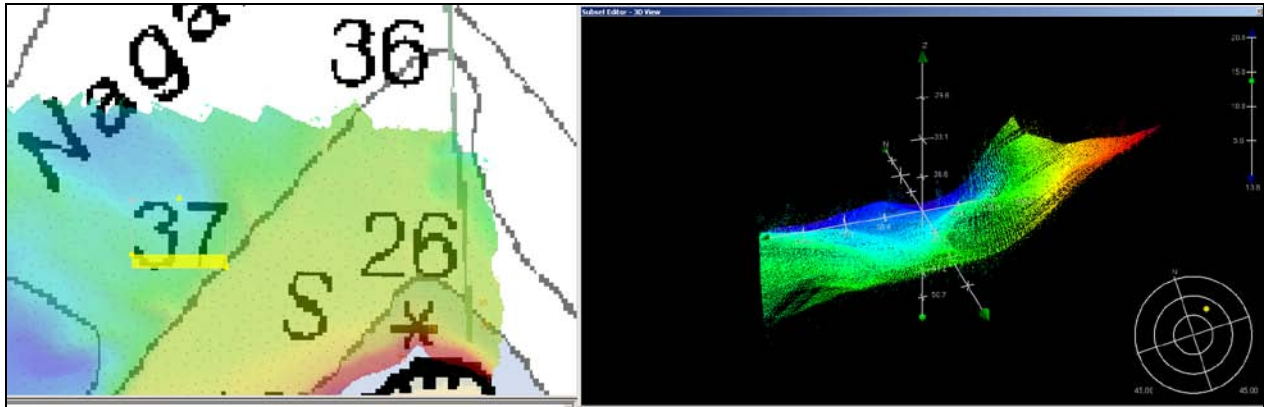


Figure 19: Surveyed 40 fathom sounding on charted (16540) 37 fathom sounding

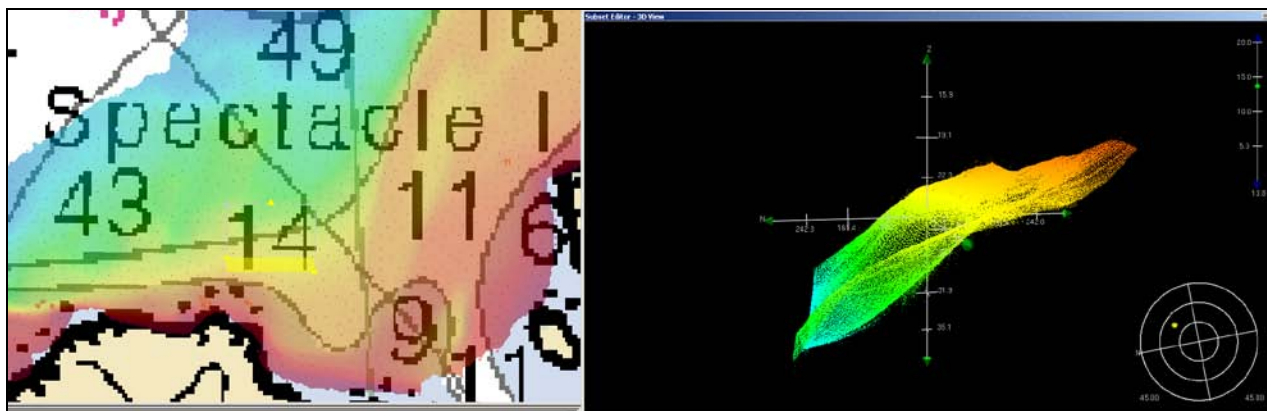


Figure 20: Surveyed 24 fathom sounding on charted 14 fathom sounding

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.**¹⁸

Automated Wreck and Obstruction Information System (AWOIS) Investigations

There were no AWOIS items located within the limits of H11848.¹⁹

Dangers to Navigation

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

D.2 Additional Results

Shoreline Verification

Shoreline Verification was not conducted during survey H11848. The shoreline located within the H11848 survey area, was completed in 2007 with survey H11682²¹. H11682 shoreline files did not include bottom samples for the H11848 area, thus, bottom samples are the only files accompanying the bathymetry.

Aids to Navigation

There were no aids to navigation within the survey limits.²²

Bottom Samples

Bottom samples were collected on August 12, 2008 (DN225) and are included as seabed classifications along with the other S57 features in the Pydro Preliminary Smooth Sheet. The bottom sample positions were also imported into the Notebook H11848_Field_Verified.hob file.²³

Additional Recommendations

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 Readiness Review Memo 2008	May 14, 2008	N/CS34
Data Acquisition and Processing Report 2008	November 14, 2008	N/CS34
Coast Pilot Report for OPR-P183-FA-08	TBD	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

November 24, 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: 2008.11.21 15:37:28 -08'00'

TITLE: Approval of Hydrographic Survey H11848,
OPR-P183-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 H11848 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:

Nicholas Morgan
2008.11.21 13:34:39 -08'00'

ENS Nicholas Morgan
Survey Manager

Matthew Ringel
2008.11.21 13:14:26 -08'00'

LT Matthew Ringel
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: 2008.11.21 13:25:46 -09'00'

CST Lynnette V. Morgan
Chief Survey Technician

Attachment



Revisions Compiled During Office Processing and Certification

¹ Concur

² Concur

³ All the listed junctioning surveys have been compiled and a common junction was made with each during compilation of H11848.

⁴ Concur

⁵ Concur

⁶ Concur

⁷ Concur

⁸ Concur

⁹ Concur

¹⁰ Concur

¹¹ Designated soundings were reviewed and applied in the HCell as appropriate to scale and surrounding soundings.

¹² Concur. The data gaps were deemed insignificant and are not shown in the HCell.

¹³ During the SAR, the reviewer determined that the submitted surfaces did not meet IHO Order 1 standards and recreated surfaces using higher resolutions and the “Shallow” CUBE parameters. The new surfaces were within spec and used to create the final combined surface (H11848_Final_Combined_8m) for compilation.

¹⁴ See attached tide note dated August 29, 2008.

¹⁵ Survey H11676 falls within the area of a planned 1:80,000 scale chart. The HCell was therefore compiled to 1:80,000. In their common areas, survey H11676 was compared to charts 16556 (1:80,000, 5th edition, 4/2006, corrected through NTM dated 10/23/2010), 16553 (1:80,000, 6th edition, 7/2008, corrected through NTM dated 10/23/2010) and 16540 (1:300,000, 12th edition, 1/2005, corrected through NTM dated 10/23/2010)

¹⁶ Concur. Chart according to HCell H11848.

¹⁷ The 1:300,00 scale of chart 16540 does not allow an accurate comparison. The 14 fathom sounding is located further inshore but at the 1:300,00 scale of the chart is shown in an area of deeper depths.

¹⁸ Concur

¹⁹ Concur

²⁰ Concur

²¹ During survey H11848, full SWMB coverage was obtained over three rocks that were previously recommended to be retained in survey H11682. In these cases the rocks were bluenoted to be removed from the chart.

²² Concur

²³ 4 bottom samples were retained as charted and 15 were imported from the survey.



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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : August 29, 2008

HYDROGRAPHIC BRANCH: Pacific Hydrographic Branch
HYDROGRAPHIC PROJECT: OPR-P183-FA-2008
HYDROGRAPHIC SHEET: H11848

LOCALITY: East Nagai Strait, Shumagin Islands, AK
TIME PERIOD: June 26 - August 14, 2008

TIDE STATION USED: 945-9450 Sand Point, AK
Lat. 55° 19.9'N Long. 160° 30.3' W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.988 meters

REMARKS: RECOMMENDED ZONING

Preliminary zoning is accepted as the final zoning for project OPR-P183-FA-2008, H11848, during the time period between June 26 to August 14, 2008.

Please use the zoning file "P183FA2008CORP" submitted with the project instructions for OPR-P183-FA-2008. Zones SWA193 & SWA204 are the applicable zones for H11848.

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).

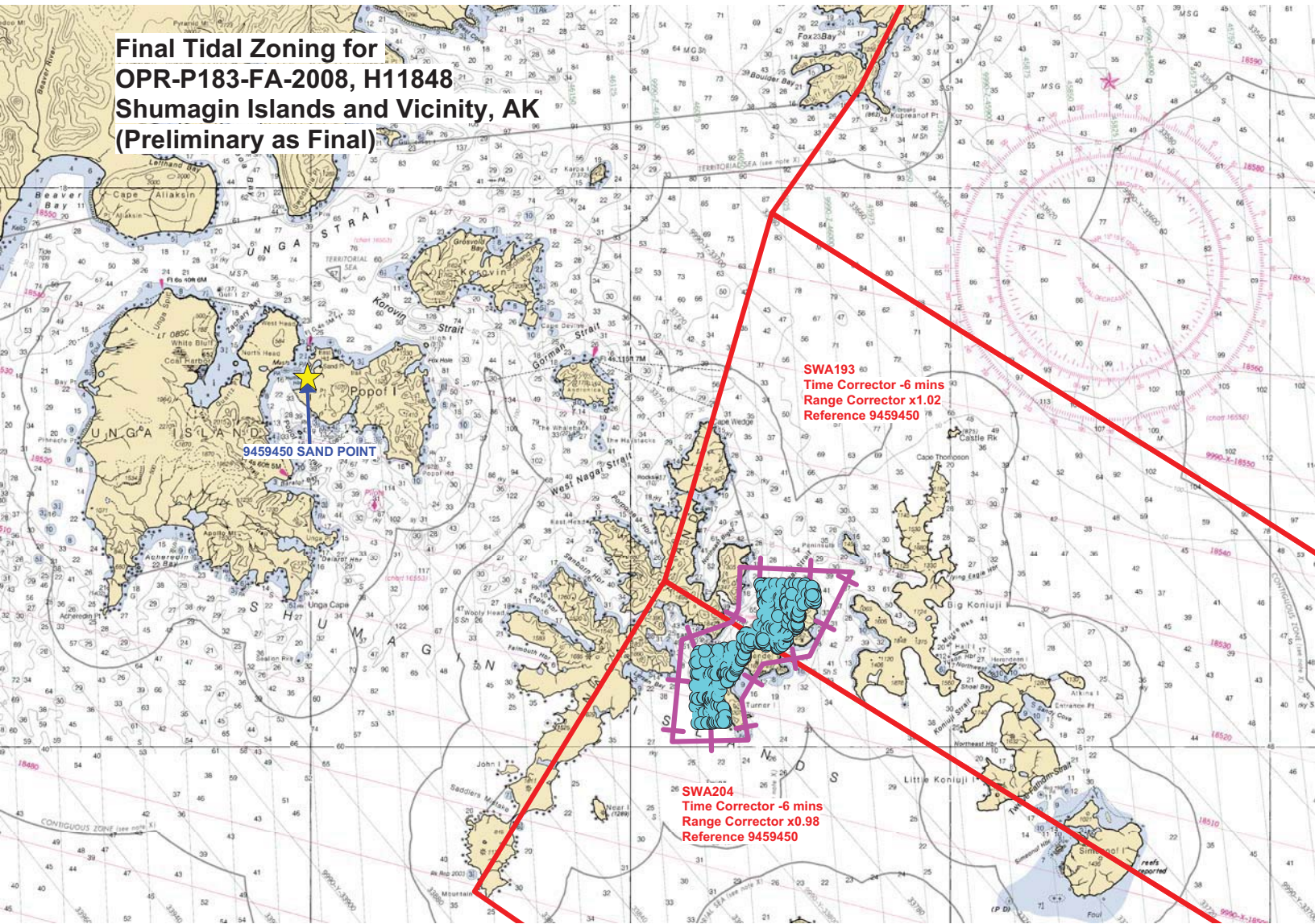
Stephen K. Gill

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: 2008.09.05 16:26:38 -04'00'

CHIEF, PRODUCT AND SERVICES DIVISION



**Final Tidal Zoning for
OPR-P183-FA-2008, H11848
Shumagin Islands and Vicinity, AK
(Preliminary as Final)**



SWA193
Time Corrector -6 mins
Range Corrector x1.02
Reference 9459450

SWA204
Time Corrector -6 mins
Range Corrector x0.98
Reference 9459450

H11848 HCell Report
Kurt Brown, Physical Scientist
Pacific Hydrographic Branch

1. Specifications, Standards and Guidance Used in HCell Compilation

HCell compilation of survey H11848 used:

Office of Coast Survey HCell Specifications: Draft, Version: 4.0, 17 March, 2010.
HCell Reference Guide: Version 2.0, 22 February, 2010.

2. Compilation Scale

Depths and features for HCell H11848 were compiled to the largest scale raster charts shown below:

Chart	Scale	Edition	Edition Date	NTM Date
16556	1:80,000	5th	04/01/2006	06/26/2010
16553	1:80,000	6th	07/01/2008	10/23/2010

The following ENC was also used during compilation:

Chart	Scale
US4AK58M	1:80,000
US4AK57M	1:80,000

The majority of survey H11848 is covered by the 1:300,000 scale chart 16540 (12th Ed., 01/01/2005, NTM date 06/26/2010), and ENC US3AK50M. However, in anticipation of a planned 1:80,000 scale Shumagin Islands chart joining 16553 and 16556 to the south, this area of H11848 was compiled at 1:80,000 instead of at 1:300,000.

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 1:15,000 survey scale using a single defined radius of 5m.

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 used on chart 16540 are included in the *_SS HCell as this chart covers the majority of the survey whereas the larger scale chart 16556 only covers a small section in the north. The contours are included 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 16556	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 H11676_SS.000
3	5.4864	5.715	3.125	3
5	9.144	9.3726	5.125	5
10	18.288	18.517	10.125	10
20	36.576	37.9476	20.75	20
30	54.864	56.236	30.750	30
40	74.5236	73.152	40.750	40
50	91.44	92.812	50.750	50

5. Meta Areas

The following Meta object area is included in HCell H11848:

M_QUAL

The Meta area object was constructed on the basis of the limits of the hydrography.

6. Features

The only features included in the survey were bottom samples, all of which are included in the HCell.

7. S-57 Objects and Attributes

The *_CS HCell contains the following Objects:

\$CSYMB	Blue Notes-Notes to the MCD chart Compiler
M_QUAL	Data quality Meta object
SBDARE	Bottom samples and Rocky Seabed Areas
SOUNDG	Soundings at the chart scale density

The *_SS HCell contains the following Objects:

DEPCNT	Generalized 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

H11848 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

H11848_CS.000	Base Cell File, Chart Units, Soundings and features compiled to 1:80,000
H11848_SS.000	Base Cell File, Chart Units, Soundings and Contours compiled to 1:20,000
H11848_DR.pdf	Descriptive Report including end notes compiled during office processing and certification, the HCell Report, and supplemental items
H11848_outline.gml	Survey outline
H11848_outline.xsd	Survey outline

11.2 Software

CARIS BASE Editor Ver. 3.0	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:

Kurt Brown
Physical Scientist
Pacific Hydrographic Branch
Seattle, WA
206-526-6839
kurt.brown@noaa.gov

APPROVAL SHEET
H11848

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.