

H12143

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.* ..... H12143

### LOCALITY

*State* ..... Alaska

*General Locality* ..... Northern Glacier Bay

*Sublocality* ..... Southern Extent of Muir Inlet

2009

### CHIEF OF PARTY

..... Captain David O. Neander, 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;"><b>HYDROGRAPHIC TITLE SHEET</b></p>	<p>REGISTRY No</p> <p style="text-align: center;"><b>H12143</b></p>
<p><b>INSTRUCTIONS</b> – 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>Northern Glacier Bay</u></p> <hr/> <p>Sub-Locality <u>Southern Extent of Muir Inlet</u></p> <hr/> <p>Scale <u>1:40,000</u> Date of Survey <u>October 11, 2009 - November 06, 2009</u></p> <hr/> <p>Instructions dated <u>9/2/2009</u> Project No. <u>OPR-O351-FA-09</u></p> <hr/> <p>Vessel(s) <u>NOAA Ship Fairweather (S220), FA Launches 1010 &amp; 1018, Ambar 2302, RA Launches 2801 &amp; 2802</u></p> <hr/> <p>Chief of party <u>Captain David O. Neander, NOAA</u></p> <hr/> <p>Surveyed by <u>FAIRWEATHER Personnel</u></p> <hr/> <p>Soundings by <u>Reson 7111, Reson 8160, Reson 8101, Reson SeaBat 7125</u></p> <hr/> <p>SAR by <u>Toshi Wozumi</u> Compilation by <u>Katie Reser</u></p> <hr/> <p>Soundings compiled in <u>Fathoms</u></p>	
<p><b>REMARKS:</b> <u>All times are UTC. UTM Zone 8N.</u></p> <hr/> <p><u>The purpose of this survey is to provide contemporary surveys to update</u></p> <hr/> <p><u>National Ocean Service (NOS) nautical charts.</u></p> <hr/> <p><u>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</u></p> <hr/> <p><u>National Geophysical Data Center (NGDC) and can be retrieved via <a href="http://www.ngdc.noaa.gov/">http://www.ngdc.noaa.gov/</a>.</u></p>	

## Descriptive Report to Accompany Hydrographic Survey H12143

Project OPR-O351-FA-09

Upper Glacier Bay

Scale 1:40,000

October – November 2009

**NOAA Ship *Fairweather***

Chief of Party: Captain David O. Neander, NOAA

### A. AREA SURVEYED

The survey area was located in Glacier Bay, within the sub-locality of the Southern Extent of Muir Inlet. This survey corresponds to Sheet D in the sheet layout provided with the Project Instructions, as shown in Figure 1 below. The survey area was extended in the field with concurrence with the Chief, Operations Branch, Hydrographic Surveys Division to include Sturgess Island and Sandy Cove. Undirected additional coverage beyond the planned sheet limit in eastern Adams Inlet was also obtained.

Data acquisition was conducted from October 11 to November 6, 2009 (DN 284 to DN 310).

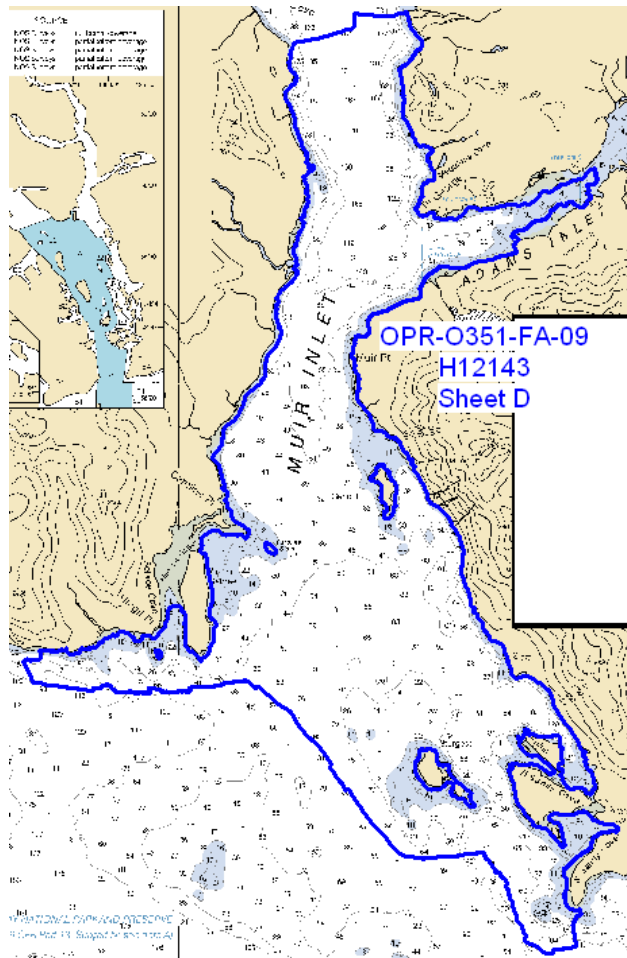


Figure 1: H12143 Survey Outline

Complete multibeam echosounder (MBES) coverage was obtained in the survey area to at least the 4-meter curve, the mean high water buffer, or as close to shore as safely possible. Additional coverage was obtained in order to determine least depths over features or shoals. Where appropriate, shoreline features were given S-57 attribution and included for submission in Notebook .hob files.

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
486.16	Multibeam MS mileage
103.77	FAIRWEATHER S-220
124.50	Launch 1010
12.03	Launch 1018
114.99	Launch 2801
130.88	Launch 2802
0	Side Scan MS
486.16	Total MS
CROSSLINE - Mileage	
0	Single Beam XL
25.47	Multibeam XL
9.96	FAIRWEATHER S-220
4.01	Launch 1010
0.00	Launch 1018
7.65	Launch 2801
3.85	Launch 2802
25.47	Total XL
OTHER	
0.51	Developments/AWOIS - Mileage
0	Shoreline/Nearshore Investigation - Mileage
12	Total # of Investigated Items
4	Total Bottom Samples
32.45	Total SNM
10/11/09-10/16/09, 10/20/09-10/23/09, 10/27/09, 10/28/09, 11/3/09, 11/6/09	
284, 285, 286, 287, 288, 289, 293, 294, 295, 296, 300, 301, 307, 310	
Specific Dates of Acquisition	
Specific Dn#s of Acquisition	

Table 1: H12143 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 2009 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. Survey H12143 was completed as specified by Hydrographic Survey Project Instructions OPR-O351-FA-09, dated Sep 2, 2009, with the exception of additional coverage south of the original sheet layout to include Sandy Cove.

### B.1. Equipment and Vessels

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

	<b>FAIRWEATHER</b>	<b>Launch 1010</b>	<b>Launch 1018</b>	<b>Launch 2801</b>	<b>Launch 2802</b>	<b>Ambar 2302</b>
<b>Hull Registration Number</b>	S220	1010	1018	2801	2802	2302
<b>Builder</b>	Aerojet-General Shipyard	Jensen	Jensen	All American Marine	All American Marine	Marine Silverships, Inc
<b>Length Overall</b>	231 feet	28' 10"	28' 10"	28' 4.25"	28' 4.25"	23'
<b>Beam</b>	42 feet	10' 8"	10' 8"	9' 6.25"	9' 6.25"	9' 4"
<b>Draft, Maximum</b>	15' 6"	4' 0" DWL	4' 0" DWL	4' 0" DWL	4' 0" DWL	1' 4"
<b>Cruising Speed</b>	12.5 knots	24 knots	24 knots	28 knots	28 knots	22 knots
<b>Max Survey Speed</b>	6 knots	6 knots	6 knots	8 knots	8 knots	
<b>Primary Echo-sounder(s)</b>	RESON 7111 & RESON 8160	RESON 8101	RESON 8101	RESON 7125	RESON 7125	
<b>Sound Velocity Equipment</b>	SBE 19plus, MVP 200, SVP70	SBE 19plus	SBE19plus	SBE19plus	SBE19plus	
<b>Attitude &amp; Positioning Equipment</b>	POS/MV V4	POS/MV V4	POS/MV V4	POS/MV V4	POS/MV V4	
<b>Type of operation</b>	MBES	MBES	MBES	MBES	MBES	Shoreline, Shore Station

**Table 2: Vessel Inventory**

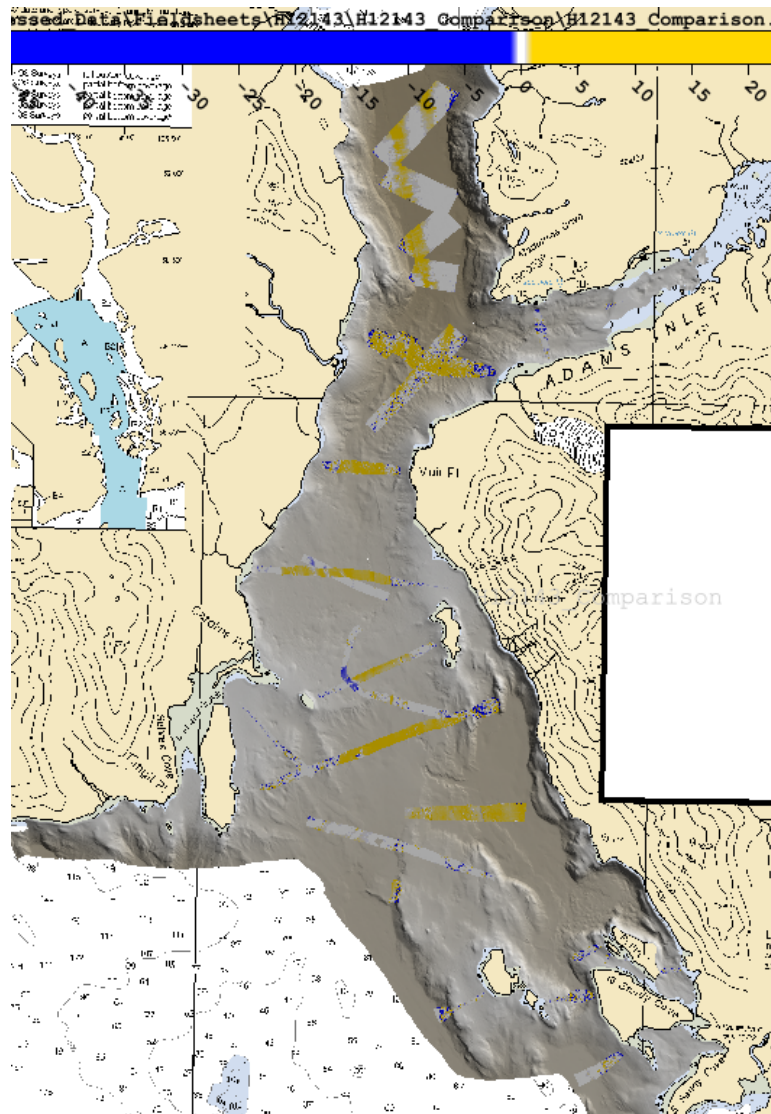
No vessel configurations used during data acquisition deviated from those described in the DAPR.

## B.2. Quality Control

### B.2.1. Crosslines

Multibeam crosslines for this survey totaled 25.51 linear nautical miles (lnm), comprising 5.28% of the 483.35 lnm of mainscheme MBES hydrography. Both mainscheme and crossline mileage are summarized in Table 1 above.

Surface differencing in CARIS Bathymetry DataBase was used to assess crossline agreement with mainscheme lines. Figure 2 shows a visual depiction of the differences spatially. The area located around the outlet of Adams Inlet shows differences which are attributed to sound velocity artifacts in the MBES data caused by inflow of water coming from Adams Inlet and a freshwater source on the western shore.<sup>1</sup>



**Figure 2: Crossline and main scheme differences (grey indicates agreement, warm colors indicate XLs shallower than mainscheme and cool colors indicate XLs deeper than mainscheme).**

### B.2.2. Junctions

Survey H12143 junctions with H12142 (Sheet C) and H12144 (Sheet E) of the same project.<sup>2</sup> Both surveys were completed October-November 2009. The area of overlap between the sheets was reviewed in CARIS Subset Editor for consistency and data were found to be in agreement within 1-2 meters in depths shoaler than 100 meters. The greatest differences, 3-5 meters, occur in depths of 300 meters where the Reson 7111 data has sound velocity and bottom detection issues (see section B.4 of this report). The sheet limits and areas of overlap are shown in Figure 3.<sup>3</sup>

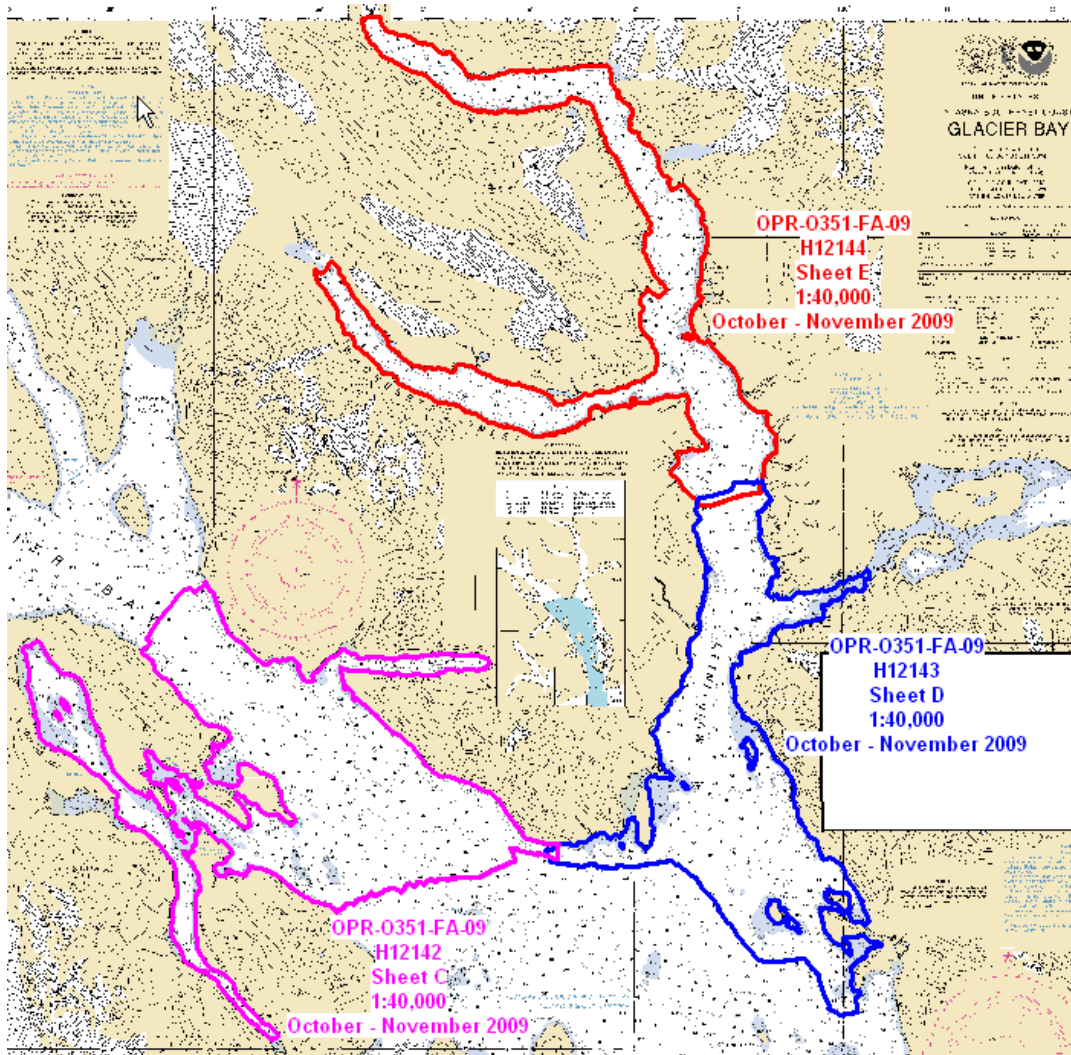


Figure 3: Junction between H12142, H12143 and H12144.

### B.2.3. Quality Control Checks

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

## B.2.4. Data Quality Factors

### COVERAGE ASSESSMENT:

For holidays larger than three surface nodes, the corresponding multibeam pseudo side scan data were examined in CARIS HIPS and no navigationally significant items were found; additionally, the least depths are represented. One large holiday was found during analysis after leaving the working grounds. Figure 4 below shows the location and subset views of this holiday located in South Sandy Cove, in the nearshore area approximately 40 meters from a charted rock.<sup>4</sup>

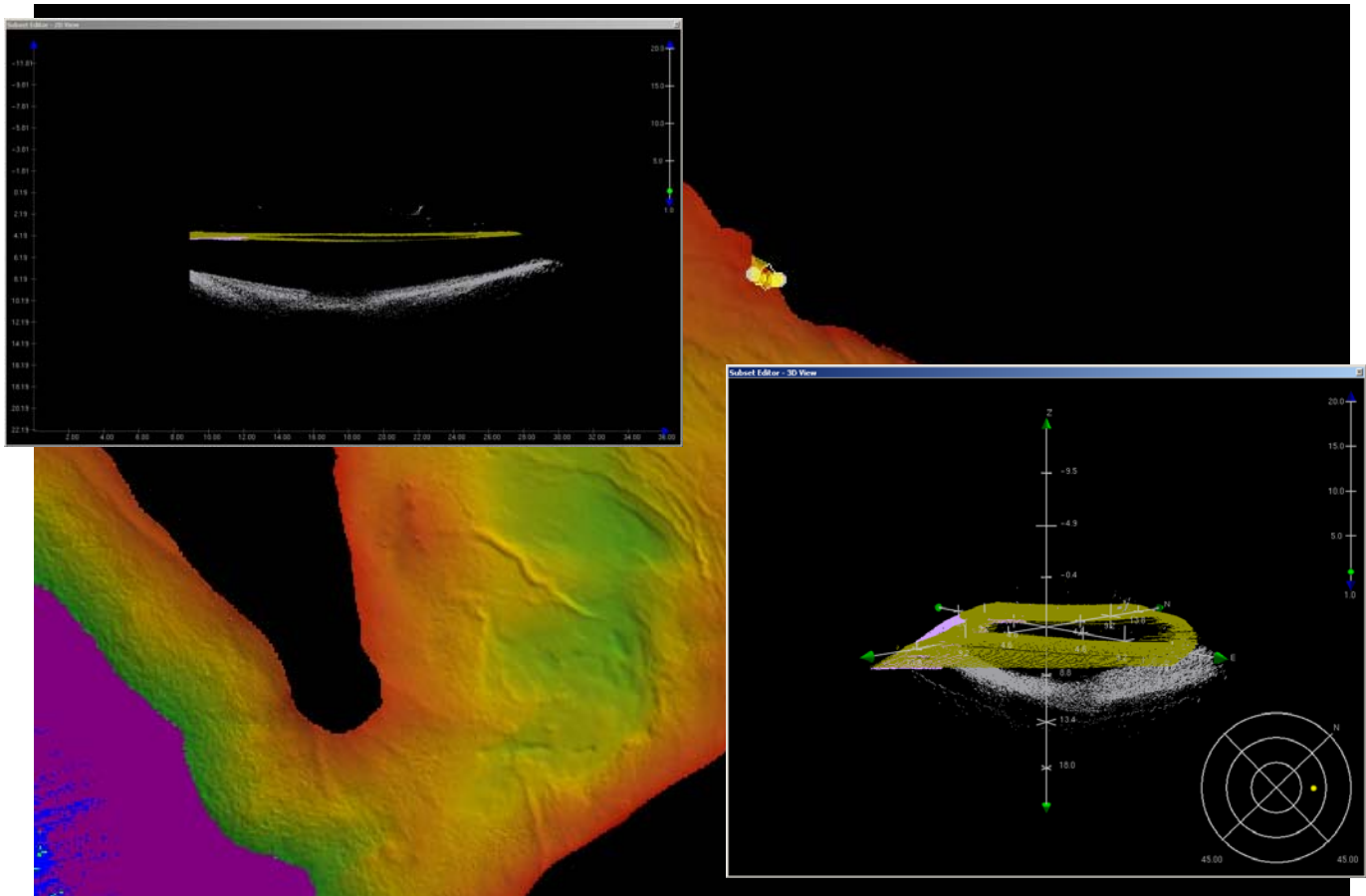


Figure 4: Holiday views in CARIS Subset editor (58°42'42"N, 135°58'55"W).

### TRUEHEAVE:

To allow the application of true heave in CARIS HIPS some POS/MV true heave files were “fixed” using the *fixTrueHeave.exe* utility from CARIS. Fixed files were assigned an additional \*.fixed suffix. This utility was used for the following vessel-day POS/MV .000 files<sup>5</sup>:

Launch 1010 days 287 and 300

Launch 2801 days 293, 295 and 300

Launch 2802 day 296



*Fairweather* (S220) day 295

**SOUND VELOCITY:**

All CARIS HDCS lines were re-SVP corrected on March 5, 2010, using CARIS HIPS 7.0 SP1 HF3. This was necessary due to application errors in prior versions of HIPS for applying sound velocity correctors.<sup>6</sup> Additional information from CARIS regarding this issue is included in Appendix V Supplemental\_Survey\_Records\_&\_Correspondence.<sup>7</sup>

**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 2009. Seven designated soundings were selected within H12143. Five were selected to ensure surfaces represent the shoalest depth of the seafloor and two were selected for submission as dangers to navigation.<sup>8</sup>

**UNUSUAL CONDITIONS:**

Sub-aquatic vegetation thought to be kelp appears in the data around Tlingit Point, north of Garforth Island and in the vicinity of North Sandy Cove. Data in areas where kelp was positively identified in the data were cleaned using the hydrographer's best ability to accurately depict the seafloor.<sup>9</sup>

**B.2.5. Accuracy Standards**

All data meet the accuracy specifications specified by the HSSDM.<sup>10</sup> Figure 5 shows vertical IHO Order I child layers shown on finalized layers for all depth ranges. Green indicates that the node uncertainty is less than the allowable vertical IHO Order I tolerance for the depth of the node. Red indicates that the node uncertainty is greater than the allowable vertical IHO Order I tolerance for the depth of the node.

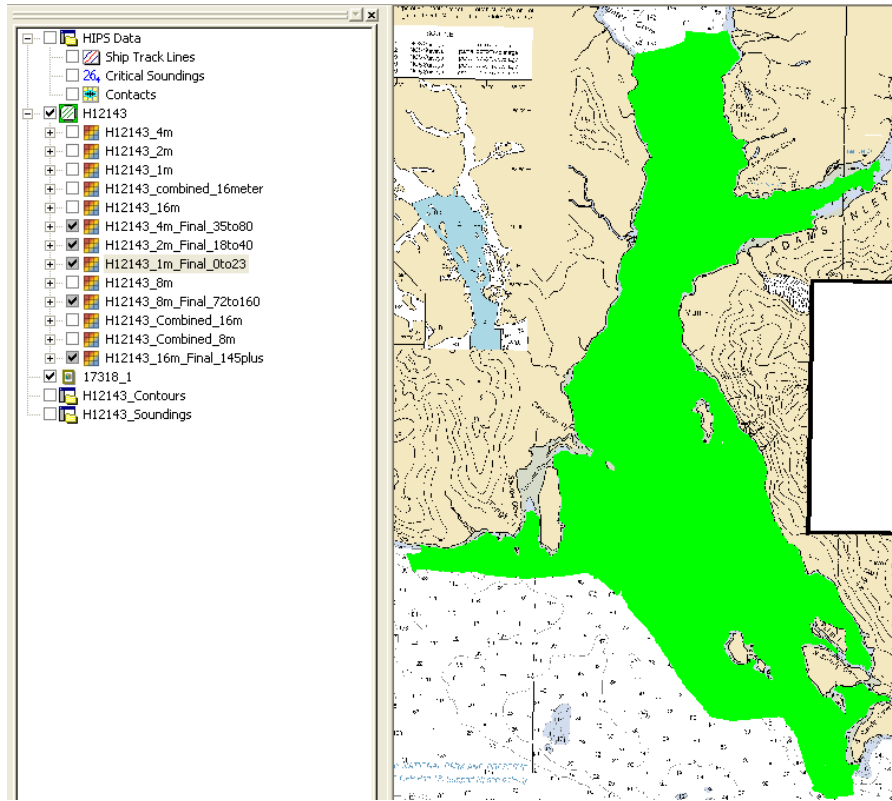


Figure 5: IHO Order 1 Pass (green) or Fail (red).

**B.3. Corrections to Echo Soundings**

Data reduction procedures for survey H12143 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 information such as application of final tides and sound velocity are contained in the Reviewer\_Qry tab of the H12143\_Data\_Log spreadsheet. All logs are submitted digitally in the Separates I folder.

Data processing procedures for survey H12143 conform to those detailed in the DAPR except where noted in this report. Data were processed initially using CARIS HIPS & SIPS v7.0, Hotfix 3, 5 and 6 beta. During the course of H12143, processing computers used for computing surfaces and finalizing data for submission were updated to CARIS HIPS & SIPS v7.0, Hotfix 6, Service Pack 1 beta and Service Pack 1 Hotfix 3, 4 and 5. Additional processing details regarding Total Propagated Uncertainty (TPU/TPE) and Combined Uncertainty and Bathymetry Estimator (CUBE) Surfaces and Parameters utilized, along with deviations from processing procedures outlined in the DAPR are discussed below.

**TPU VALUES:**

The survey specific parameters used to compute TPU in CARIS for H12143 are listed in Table 3.

<b>Tide values:</b>	Measured	0.01 m	Zoning	0.20 m
<b>Sound Speed Values:</b>	Measured (8101)	1.00 m/s	Surface (8101)	1.00 m/s
	Measured (7125)	1.00 m/s	Surface (7125)	0.50 m/s
	Measured (7111 & 8160)	0.50 m/s	Surface (7111 & 8160)	0.50 m/s

**Table 3: Survey Specific CARIS TPU Parameters**

#### CUBE SURFACES:

The CARIS HIPS CUBE surfaces and their associated resolutions are listed below in Table 4. All surfaces in H12143 are contained within one fieldsheet named H12143 and all finalized surfaces have been combined in a 16-meter surface.<sup>11</sup>

The CUBE parameters utilized for creating CUBE surfaces are also included in Table 4. The CUBE parameters .xml file is included with digital data in the vessel configuration folder.

Fieldsheet Name	Surface Name	Depth Ranges (m)	Resolution (m)	CUBE Parameters
H12143	H12143_1m	All	1	NOAA_1m
	H12143_2m	All	2	NOAA_2m
	H12143_4m	All	4	NOAA_4m
	H12143_8m	All	8	NOAA_8m
	H12143_16m	All	16	NOAA_16m
	H12143_1m_Final_-15to23	-15-23	1	
	H12143_2m_Final_18to40	15-40	2	
	H12143_4m_Final_35to80	30-80	4	
	H12143_8m_Final_75to160	70-160	8	
	H12143_16m_Final_155plus	145plus	16	

**Table 4: Depth Ranges, Resolutions, and CUBE Parameters**

#### HIPS DEVICE MODEL FOR RESON 7111:

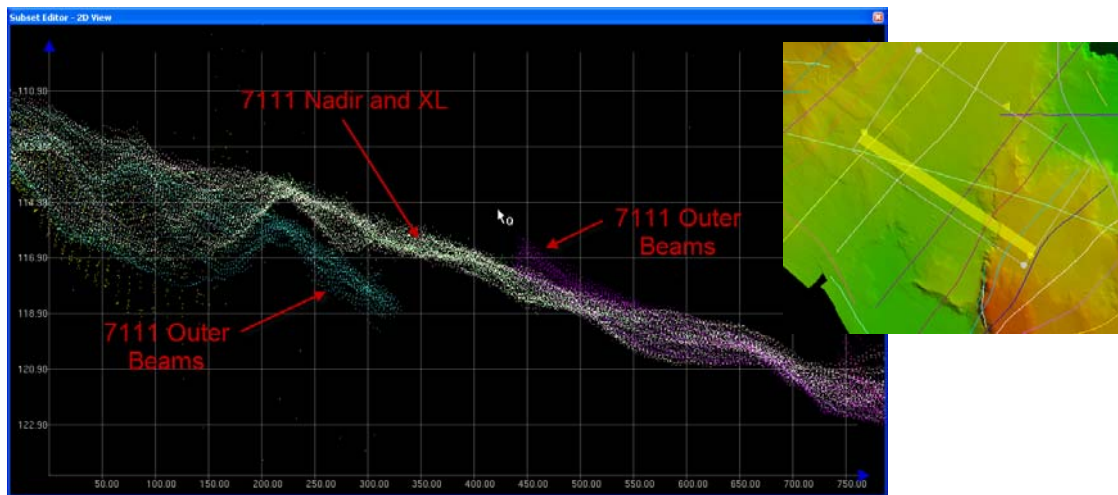
During initial processing of H12143 the uncertainty values associated with CUBE surfaces created with Reson 7111 data were unusually high and well outside of allowable IHO vertical tolerances. Reson and CARIS were contacted and ultimately the device model for the CARIS HIPS device model was corrected with appropriate parameters for the Reson 7111. All Reson 7111 HIPS HDCS data have been remerged using the updated device model and affected CUBE surfaces regenerated. Additional documentation regarding this issue is included in Appendix V Supplemental Survey Records & Correspondence of this report.<sup>12</sup>

#### RESON 7111 REAL-TIME PITCH STABILIZATION:

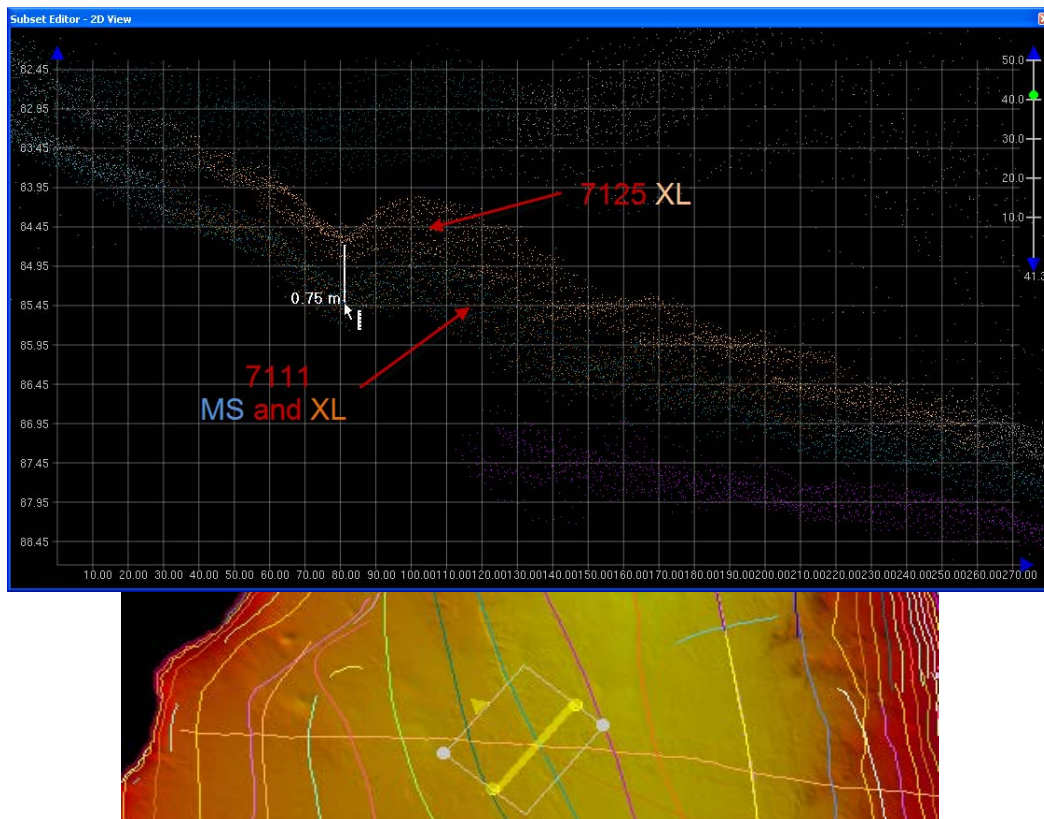
The Reson 7111 is a pitch-stabilized system that is designed to apply real time pitch correction data sent via Ethernet from the POS/MV to the Reson 7111 to improve beam steering. However, during post acquisition data analysis of the Reson 7111 acquired on H12143 a small Hypack Hysweep .7k file was sent to LT Samuel Greenaway at the University of New Hampshire for decoding and it was determined that real-time pitch data was not applied in real-time during the acquisition of that individual file. Though *Fairweather* is not equipped with tools to determine whether all Reson 7111 files acquired on OPR-O351-FA-10 were pitch-corrected during real-time data acquisition, it is suspected that none of the files acquired were pitch stabilized. The Reson 7111 CARIS HVF used to process data acquired on OPR-O351-FA-10 is set to apply pitch during post processing. Additionally the weather during acquisition was primarily calm the pitch attitude measurements small. Though the Reson 7111 data acquired on H12143 meet IHO accuracy requirements this issue remains under investigation.<sup>13</sup>

**RESON 7111 DATA QUALITY ISSUE AND FILTERING:**

During post processing of H12143, various data quality issues with Reson 7111 data were identified, the most significant of which are apparent in the outer beams. These issues ultimately lead to a new bottom detection algorithm to be implemented in the Reson processing software. The figures below depict cases in which outer beams from the Reson 7111 do not align with adjacent lines. A 60/60-degree filter was applied to all Reson 7111 lines except on lines near shore for which the upslope beams were crucial for defining the slope. For near shore lines only the down-slope beams were filtered to 60 degrees.

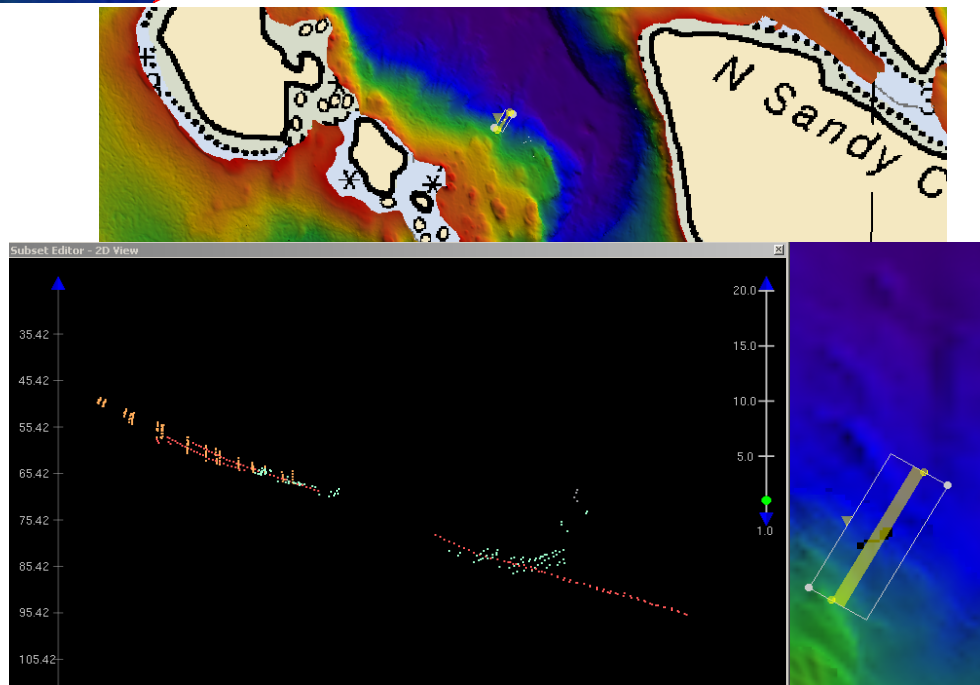
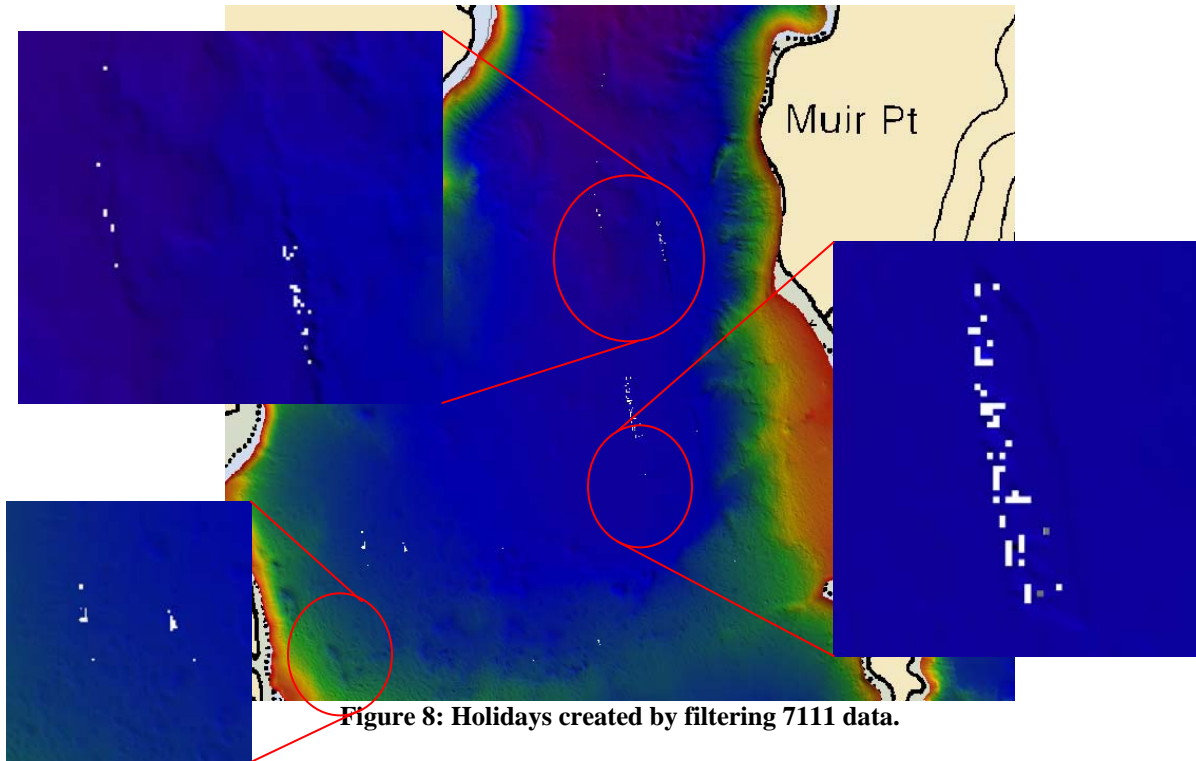


**Figure 6: Location and Subset of effected data showing outer beams compared to nadir (58°44'55"N, 136°06'22"W).**



**Figure 7: Location and Subset showing near nadir 7111 beams compared to 7125 beams (58°47'58"N, 136°06'57"W).**

Where filtering resulted in holidays, the hydrographer reviewed the data in CARIS Subset editor and accepted data after reviewing the quality of the soundings. The figures shown on the following page depict areas where holidays were created and the hydrographer determined that soundings should not be accepted.<sup>14</sup>



## C. HORIZONTAL AND VERTICAL CONTROL

A complete description of horizontal and vertical control for survey H12143 can be found in the *OPR-O351-FA-09 Horizontal and Vertical Control Report (HVCR)*, 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). Single Base Post Processed Kinematic (PPK) was the sole method of positioning of MBES soundings on H12143. Differential correctors from the U.S. Coast Guard beacon at Gustavus (288 kHz) were used during real-time acquisition when not otherwise noted in the acquisition logs, and were the sole method of positioning of detached positions (DP) and bottom samples as there is currently no functionality for applying Single Best Estimated Trajectory (SBET) files to these types of data. For the duration of data acquisition on H12143 the base station “SOG 1970” was used with the exception of DN 307 when base station “LAST No1 1940” was used. Vessel POS/MV files were post processed into SBET files using Applanix POSPac software and applied to the MBES data along with their associated error files (smrmsg files) in CARIS HIPS for increased kinematic accuracy. For further detail see the Acquisition and Processing logs for the particular days located in the Separates I folder. All raw base station files are submitted with the HVCR digital data for this project.

### 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 Elfin Cove, AK (945-2634) served as control for datum determination and as the preliminary source for water level correctors for survey H12143.

*Fairweather* personnel installed Sutron 8210 “bubbler” tide gauges at the tertiary stations listed below in Table 5. 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	Gauge #	S/N
Composite Island	945-2682	Tertiary 30 Day	September 25, 2009	Nov 6, 2009	12	85173
Muir Inlet	945-2584	Tertiary 30 Day	September 26, 2009	Nov 7, 2009	10	97043
Wachusett Inlet	945-2632	Tertiary 30 Day	October 12, 2009	Nov 11, 2009	17	79049
Tarr Inlet	945-2749	Tertiary 30 Day	October 8, 2009	Nov 8, 2009	14	86002

**Table 5: Tide Gauge Information**

Refer to the *OPR-O351-FA-09 Horizontal and Vertical Control Report* for further information about the tide stations.

A request for delivery of final approved (smooth) tides for survey H12143 was forwarded to N/OPS1 on November 12, 2009 in accordance with the Field Procedures Manual (FPM), dated April 2009. A copy of the request is included in Appendix IV. Final tides were received on April 6, 2010.

As per the final Tide Note, all data were reduced to MLLW using the final approved water levels (smooth tides) from the Muir Inlet, AK, station (945-2584) by applying tide file 9452584.tid and time and height correctors through the zone corrector file H12143CORF.zdf.<sup>15</sup> **It will not be necessary for the Atlantic Hydrographic Branch to reapply the final approved water levels (smooth tides) to the survey data during final processing.**<sup>16</sup>

## 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 7.0 software program.

Survey H12143 was compared with the following charts listed in Table 6.

NOAA Chart Number	Chart Scale	Edition Number	Edition Date	Updated with Notice to Mariners through
17318	1:80,000	7 <sup>th</sup> Ed.	March, 2009	August 25, 2007 (34/07)

Table 6: NOAA Charts compared with Survey H12143

#### D.1.1. Chart 17318

Depths from survey H12143 generally agree within one to three fathoms with depths on chart 17318.<sup>17</sup> Some of the shoaler depths represented on the chart near the shoreline appear to have been pulled off shore for cartographic representation, but remain accurate within the scale of the chart.<sup>18</sup>

Note B on chart 17318 states: “Due to tidal zoning differences between Muir Inlet and Adams Inlet tide gauges, a possible error may exist in some of the charted soundings in this area. The greatest portion of the error would probably occur in the narrow passages leading to the upper portion of Adams Inlet. The average error is 7 feet.” The data acquired in Adams Inlet, especially the coverage obtained outside of the planned sheet limit, shows differences in soundings and shoal areas. Due to the highly dynamic bottom with likely frequent changes and without adequate tidal information for Adams Inlet careful consideration should be taken in using those data to supersede charted depths.<sup>19</sup>

The Hydrographer has determined that bottom coverage requirements have been met and data accuracy meets requirements specified by the *HSSDM* except where noted in this report. **The surveyed soundings are adequate to supersede prior surveys in their common areas.**<sup>20</sup>

## **D.2. Automated Wreck and Obstruction Information System (AWOIS) Investigations**

There is one AWOIS item located within the limits of H12143 for background information only on a shoal sounding southeast of Garforth Island.<sup>21</sup> Development lines were run over the feature to be sure the least depth was acquired. The least depth on the rock feature was submitted at a danger to navigation.<sup>22</sup>

No AWOIS items were located within H12143 for full investigation.<sup>23</sup>

## **D.3. Dangers to Navigation**

Two dangers to navigation (DTON) were found and reported to the Marine Chart Division (MCD) for verification and final submission on June 11, 2010.<sup>24</sup> A copy of the preliminary DTON Report is included in Appendix I.<sup>25</sup>

## **D.4. Additional Results**

### **D.4.1. Shoreline Source**

A composite source file (CSF) in .000 format from HSD's Operations Branch was provided with the Project Instructions. The original file was imported into CARIS Notebook, converted to a .hob file, clipped to the sheet limits, and named H12143\_Original\_Composite\_Source.hob to be included with the deliverables. This file was copied and named H12143\_Feature\_File.hob to be utilized during field verification. Shoreline sources that were included in the composite source file for survey H12143 included Geographic Cell (GC) and charted features from chart 17318, see Table 7.

### **D.4.2. Shoreline Verification**

*Fairweather* personnel were unable to conduct limited shoreline verification at times near predicted low water, as directed in the Project Instructions and section 3.5.5.3 of the FPM. Areas that required feature investigations were visited at the lowest stage of tide that was available which corresponded to approximately 4 feet of positive tide on DN 310. Detached positions were acquired and edits to the daily field H12143\_Feature\_File\_TR2\_Dn310.hob were recorded in CARIS Notebook and on paper DP forms and boat sheets. Scanned copies of the DP forms and boat sheets with field annotations are included in the digital Separates I folder.

Charts 17318 (1:80,000) was the largest scale chart for the project area. A Mean High Water (MHW) Buffer line, offset 64 meters (0.8 mm at scale of 1:80,000) from the composite source MHW, was used during data acquisition to determine the Navigable Area Limit Line (NALL). The NALL, that defines the inshore limit of multibeam acquisition, was determined in the field as the farthest off-shore of either the MHW buffer listed above, the 4-meter depth contour, or the inshore limit of safe navigation.



### D.4.3. Shoreline Data Processing

Acquired and edited positions during shoreline verification operations were processed in CARIS Notebook. Features that required tide correction were processed using the Load Tide function in CARIS Notebook. Approved water levels were applied to tide correct features where appropriate.

Numerous charted ledges and MLLW lines are in conflict with hydrography. After discussion with Physical Scientists from both the Pacific Hydrographic Branch and the Atlantic Hydrographic Branch, the ledge area features have not been adjusted and instead left for shore side personnel to make the appropriate changes.

New features and features requiring revision were given S-57 attribution. As outlined in section 4.4.10 of the FPM, features were delineated, attributed and placed on either the survey edited H12143\_Final\_Feature\_File.hob (compiled from the field daily files) or H12143\_Disprovals.hob. Features not in the disprovals layer nor labeled with the survey source indication (SORIND) that were of an ambiguous nature or that required a field remark were flagged with a marker note for further clarification.

Source features collected or edited by the field have SORIND and source date (SORDAT) attribute fields populated to reflect the survey number (US,US,survey,H12143) and final survey date 20091106. Unmodified source shoreline features were left with their original SORIND and SORDAT values. The SORIND/SORDAT information for shoreline features included in the final Notebook .hob files is included in Table 7.

Shoreline Source	SORIND	SORDAT
RSD	US,US,graph,GC10779	20040600
Chart	US,US,graph,chart 17318	20010113
Survey	US,US,survey,H12143	20091106

Table 7: SORIND/SORDAT Shoreline Features

### D.5. Source Shoreline Changes, New Features and Charted Features

In accordance with section 4.4.10 of the FPM, feature field notes made by the Hydrographer are provided in the Remarks field and when appropriate, recommendations to the cartographer are included in the Recommendations field.

Disproved features were moved from the H12143\_Final\_Feature\_File.hob to the H12143\_Disprovals.hob file.<sup>26</sup>

#### D.5.1. Shoreline Recommendations

The Hydrographer recommends that the shoreline depicted in the CARIS Notebook files and final sounding files supersede and complement shoreline information compiled on the CSF and charts.<sup>27</sup>

### D.6. Aids to Navigation

There were no aids to navigation within the survey limits of H12143.<sup>28</sup>

**D.7. Bottom Samples**

Bottom samples were acquired on November 6, 2009 (DN 310) and are included as seabed classifications along with the other S-57 features in the Notebook H12143\_Final\_Feature\_File.hob file.<sup>29</sup>

**D.8. Supplemental Reports**

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

<b><u>Title</u></b>	<b><u>Date Sent</u></b>	<b><u>Office</u></b>
Hydrographic Systems Readiness Review 2009	May 15, 2009	N/CS34
Data Acquisition and Processing Report 2009	Dec. 18, 2009	N/CS34
Horizontal and Vertical Control Report for OPR-O351-FA-09	May 28, 2010	N/CS34
Tides and Water Levels Package for OPR-O351-FA-09	Nov. 20, 2009	N/OPS1
Coast Pilot Report for OPR-O351-FA-09	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

June 10, 2010

MEMORANDUM FOR: LCDR Richard T. Brennan, NOAA  
Chief, Atlantic Hydrographic Branch

FROM: CAPT David O. Neander, NOAA  
Commanding Officer

David O. Neander  
2010.06.12 10:01:55  
-07'00'

TITLE: Approval of Hydrographic Survey H12143,  
OPR-O351-FA-09

As Chief of Party, I have ensured that standard field surveying and processing procedures were adhered to during acquisition and processing of hydrographic survey H12143 in accordance with the Hydrographic Manual, Fourth Edition; Field Procedures Manual, April 2009; and the NOS Hydrographic Surveys Specifications and Deliverables, as updated for April 2009. 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/CS33, Atlantic 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:

David Moehl  
2010.06.10 21:56:35  
Z

---

AST David T. Moehl  
Survey Manager

Briana Welton  
I attest to the accuracy and  
integrity of this document  
2010.06.12 14:42:38 Z

---

LT Briana J. Welton  
Field Operations Officer

Briana Welton  
I have reviewed this  
document  
2010.06.12 20:31:47 Z

---

CST Lynnette V. Morgan  
Chief Survey Technician

Attachment



## **Revisions and Corrections Compiled During Office Processing and Certification**

<sup>1</sup> Concur. Higher differences are expected in areas of freshwater outflow. The data has been inspected and deemed adequate for charting.

<sup>2</sup> A common junction was made with H12144 which has already been compiled. A common coverage junction was made with H12142. A common junction with the bathymetry and features will be made when that survey is compiled.

<sup>3</sup> Concur with clarification. The SAR reviewer noted depth differences of up to 9 m in the Reson 7111 data. The differences due to bottom detection and sound speed errors in 300m of water are not navigationally significant and therefore acceptable.

<sup>4</sup> Due to the fact the holiday is within 40m of a charted rock, it was determined that it was not navigationally significant at chart scale.

<sup>5</sup> The data from the lines with “fixed” TrueHeave files applied are acceptable and show no evidence of heave errors.

<sup>6</sup> The data meets specification after the SVP was re-applied. See attached correspondence.

<sup>7</sup> Do not concur. Correspondence with CARIS regarding the SVP correction issue in HIPS was not included in Appendix V or in the Project Correspondence folder.

<sup>8</sup> Concur. All DTONs have been applied to the chart and all are included in the HCell.

<sup>9</sup> Concur. The seafloor is adequately represented and the data is adequate for charting.

<sup>10</sup> Concur.

<sup>11</sup> A 16-meter combined surface created during the SAR was used as the basis for compilation.

<sup>12</sup> See attached correspondence.

<sup>13</sup> Concur. The data from the Reson 7111 are adequate to supersede charted data in the common area.

<sup>14</sup> Concur. The holidays are located in deep water and are not navigationally significant. The holidays were not preserved in the HCell coverage.

<sup>15</sup> See attached Tide Note dated March 25, 2010.

<sup>16</sup> H12143 was submitted to Pacific Hydrographic Branch for review and compilation.

<sup>17</sup> Concur.

<sup>18</sup> Concur with clarification. Cartographic generalization of depths offshore is no longer an accepted practice. Chart depths and features as depicted in the HCell.

<sup>19</sup> Concur with clarification. The tide zoning was expanded to cover the data outside the planned sheet limit. The poor tidal information on the chart should be updated with the latest information from the tide data collected during this survey. Chart depths and features as depicted in the HCell.

<sup>20</sup> Concur.

<sup>21</sup> Concur with clarification. There are two AWOIS items within the limits of H12143. Only one was included as reference for this survey.

<sup>22</sup> Concur. The DTON has been applied to the chart and is included in the HCell. It is noted in the HCell as both a DTON and AWOIS 51001.

<sup>23</sup> Concur.

<sup>24</sup> Concur with clarification. An additional DTON was found during the SAR and was submitted to MCD. All three DTONs have been applied to the charts and all are included in the HCell.

<sup>25</sup> See attached DTON reports.

<sup>26</sup> The submitted hob files were used in the compilation of HCell H12143.

<sup>27</sup> Concur with clarification. The shoreline files were applied as appropriate to chart scale. Chart features as depicted in the HCell.

<sup>28</sup> Concur.

<sup>29</sup> Four bottom samples were collected during H12143 and are included in the HCell. Two charted bottom samples were imported from the ENC to be retained. Two rocky bottom types were blue noted to be removed because it was clear from the BASE surface that the general bottom relief in the area of the bottom types was not rocky in nature.

# H12143 Danger to Navigation Report

**Registry Number:** H12143  
**State:** Alaska  
**Locality:** Northern Glacier Bay  
**Sub-locality:** Southern Extent of Muir Inlet  
**Project Number:** OPR-O351-FA-09  
**Survey Dates:** 10/12/2009 - 10/27/2009

Two shoal soundings identified north and south of Garforth Island in Glacier Bay, AK.

## Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
17318	7th	03/01/2009	1:80,000 (17318_1)	USCG LNM: 05/19/2009 (08/18/2009) CHS NTM: None (07/31/2009) NGA NTM: 07/14/2001 (08/29/2009)
17300	31st	09/01/2005	1:209,978 (17300_1)	[L]NTM: ?
16016	21st	10/01/2007	1:969,756 (16016_1)	[L]NTM: ?
531	24th	07/01/2007	1:2,100,000 (531_1)	[L]NTM: ?
500	8th	06/01/2003	1:3,500,000 (500_1)	[L]NTM: ?
530	32nd	06/01/2007	1:4,860,700 (530_1)	[L]NTM: ?
50	6th	06/01/2003	1:10,000,000 (50_1)	[L]NTM: ?

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

## Features

No.	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	Rock	5.61 m	58° 46' 42.3" N	136° 03' 17.0" W	---
1.2	Shoal	4.25 m	58° 48' 06.0" N	136° 04' 59.3" W	---

# **1 - Danger To Navigation**

**1.1) Profile/Beam - 178/169 from h12143 /  
2801\_rsn7125\_400khz\_512bms\_2009 / 2009-285 / 2009d\_2852122**

**DANGER TO NAVIGATION**

**Survey Summary**

**Survey Position:** 58° 46' 42.3" N, 136° 03' 17.0" W  
**Least Depth:** 5.61 m (= 18.41 ft = 3.068 fm = 3 fm 0.41 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 0.079$  m ; **TVU (TPEv)**  $\pm 0.399$  m  
**Timestamp:** 2009-285.21:23:55.187 (10/12/2009)  
**Survey Line:** h12143 / 2801\_rsn7125\_400khz\_512bms\_2009 / 2009-285 / 2009d\_2852122  
**Profile/Beam:** 178/169  
**Charts Affected:** 17318\_1, 17300\_1, 16016\_1, 531\_1, 500\_1, 530\_1, 50\_1

**Remarks:**

Shoal sounding corresponds to AWOIS #13296 (charted sounding) provided with Project Instructions for information only.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h12143/2801_rsn7125_400khz_512bms_2009/2009-285/2009d_2852122	178/169	0.00	000.0	Primary

**Hydrographer Recommendations**

Chart shoal sounding.

**Cartographically-Rounded Depth (Affected Charts):**

3fm (17300\_1, 16016\_1, 530\_1)

3fm 0ft (17318\_1, 531\_1)

5.6m (500\_1, 50\_1)

**S-57 Data**

**Geo object 1:** Sounding (SOUNDG)  
**Attributes:** QUASOU - 1:depth known  
 SORDAT - 20091106

SORIND - US,US,survey,H12143

STATUS - 1:permanent

TECSOU - 3:found by multi-beam

**Geo object 2:** Underwater rock / awash rock (UWTROC)

**Attributes:** VALSOU - 5.611 m



### Feature Images

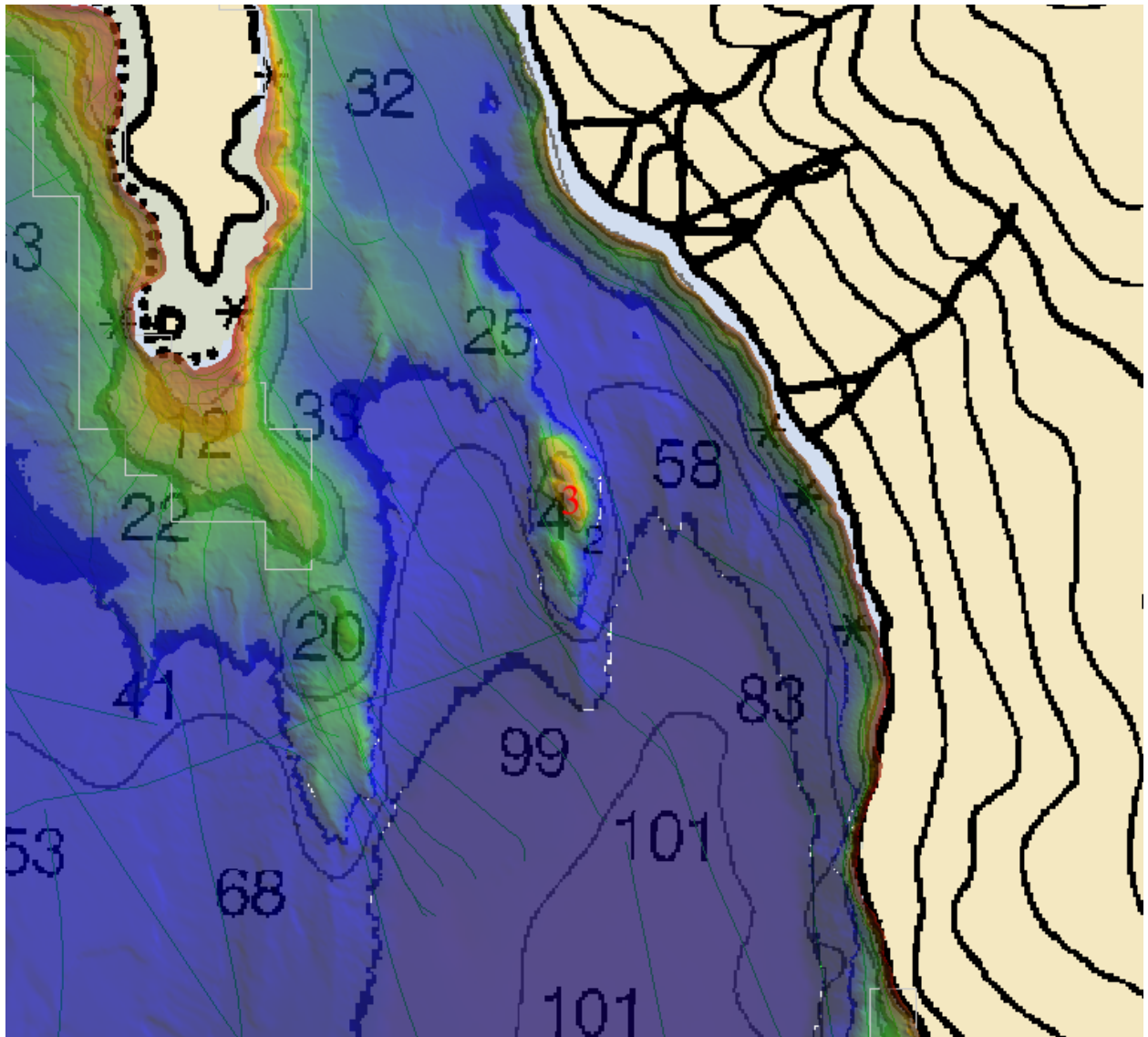


Figure 1.1.1

**1.2) Profile/Beam - 740/101 from h12143 / fa\_1010\_reson8101\_2009 / 2009-300 / 2009d\_3002027**

**DANGER TO NAVIGATION**

**Survey Summary**

**Survey Position:** 58° 48' 06.0" N, 136° 04' 59.3" W  
**Least Depth:** 4.25 m (= 13.94 ft = 2.323 fm = 2 fm 1.94 ft)  
**TPU (±1.96σ):** **THU (TPEh)** ±0.100 m ; **TVU (TPEv)** ±0.432 m  
**Timestamp:** 2009-300.20:28:15.999 (10/27/2009)  
**Survey Line:** h12143 / fa\_1010\_reson8101\_2009 / 2009-300 / 2009d\_3002027  
**Profile/Beam:** 740/101  
**Charts Affected:** 17318\_1, 17300\_1, 16016\_1, 531\_1, 500\_1, 530\_1, 50\_1

**Remarks:**

Shoal sounding found within complete multibeam echosounder coverage.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h12143/fa_1010_reson8101_2009/2009-300/2009d_3002027	740/101	0.00	000.0	Primary

**Hydrographer Recommendations**

Chart shoal sounding.

**Cartographically-Rounded Depth (Affected Charts):**

- 2 ¼fm (17300\_1, 16016\_1, 530\_1)
- 2fm 2ft (17318\_1, 531\_1)
- 4.2m (500\_1, 50\_1)

**S-57 Data**

**Geo object 1:** Sounding (SOUNDG)  
**Attributes:** QUASOU - 1:depth known  
 SORDAT - 20091106  
 SORIND - US,US,survey,H12143

STATUS - 1:permanent

TECSOU - 3:found by multi-beam

### Feature Images

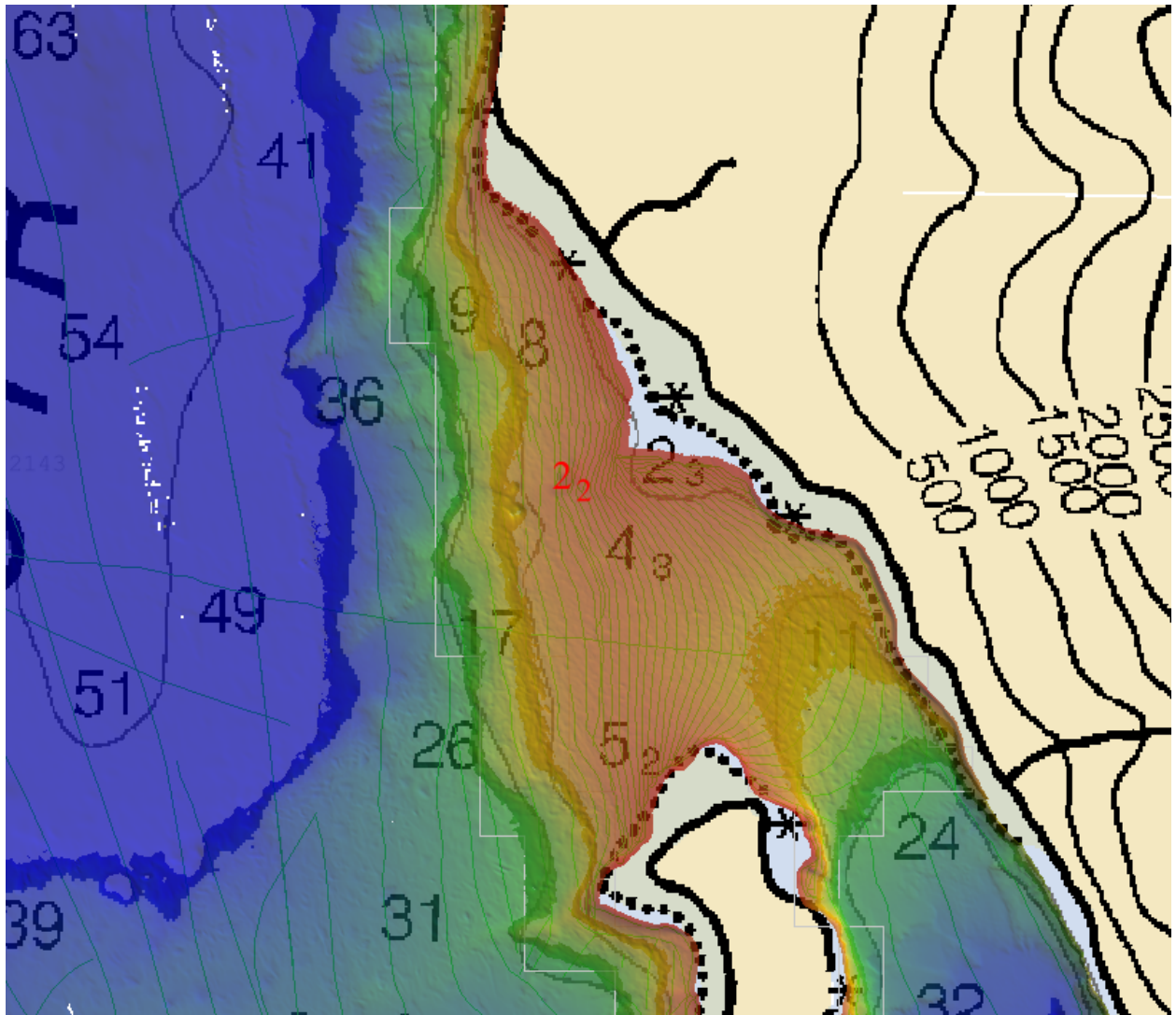


Figure 1.2.1

# Dton Report for Survey H12143

**Registry Number:** H12143  
**State:** Alaska  
**Locality:** Nothern Glacier Bay  
**Sub-locality:** Southern Extent of Muir Inlet  
**Project Number:** OPR-O351-RA-09  
**Survey Dates:** 10/11/2009 - 11/06/2009

## Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
17318	7th	03/01/2009	1:80,000 (17318_1)	USCG LNM: 7/6/2010 (4/19/2011) CHS NTM: None (3/25/2011) NGA NTM: 7/14/2001 (4/30/2011)
17300	31st	09/01/2005	1:209,978 (17300_1)	[L]NTM: ?
16016	21st	10/01/2007	1:969,756 (16016_1)	[L]NTM: ?
531	24th	07/01/2007	1:2,100,000 (531_1)	[L]NTM: ?
500	8th	06/01/2003	1:3,500,000 (500_1)	[L]NTM: ?
530	32nd	06/01/2007	1:4,860,700 (530_1)	[L]NTM: ?
50	6th	06/01/2003	1:10,000,000 (50_1)	[L]NTM: ?

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

## Features

No.	Feature Type	Survey Depth	Survey Latitude	Survey Longitude
1.1	Rock	3.50 m	58° 42' 47.5" N	136° 01' 56.6" W

## **1 - Danger To Navigation**

**1.1) Profile/Beam - 966/295 from h12143 /  
2801\_rsn7125\_400khz\_512bms\_2009 / 2009-293 / 2009d\_2932015**

**DANGER TO NAVIGATION**

**Survey Summary**

**Survey Position:** 58° 42' 47.5" N, 136° 01' 56.6" W  
**Least Depth:** 3.50 m (= 11.47 ft = 1.912 fm = 1 fm 5.47 ft)  
**TPU (±1.96σ):** **THU (TPEh)** ±0.080 m ; **TVU (TPEv)** ±0.399 m  
**Timestamp:** 2009-293.20:18:49.395 (10/20/2009)  
**Survey Line:** h12143 / 2801\_rsn7125\_400khz\_512bms\_2009 / 2009-293 / 2009d\_2932015  
**Profile/Beam:** 966/295  
**Charts Affected:** 17318\_1, 17300\_1, 16016\_1, 531\_1, 500\_1, 530\_1, 50\_1

**Remarks:**

New rock found during office processing.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h12143/2801_rsn7125_400khz_512bms_2009/2009-293/2009d_2932015	966/295	0.00	000.0	Primary

**Hydrographer Recommendations**

Chart new rock as surveyed.

**Cartographically-Rounded Depth (Affected Charts):**

- 1 ¾fm (17300\_1, 16016\_1, 530\_1)
- 1fm 5ft (17318\_1, 531\_1)
- 3.5m (500\_1, 50\_1)

**S-57 Data**

**Geo object 1:** Underwater rock / awash rock (UWTROC)  
**Attributes:** QUASOU - 6:least depth known  
 SORDAT - 20091106  
 SORIND - US,US,graph,H12143

TECSOU - 3:found by multi-beam

VALSOU - 3.497 m

WATLEV - 3:always under water/submerged



FOID	Type	Latitude	Longitude	Depth	Acronym	obstim	userid	remarks	SORIND	SORDAT	NATQUA	NATSUR	COLOUR	obsdpt	VALSOU	tidaj	tidfil	TECSOU	QUASOU	WATLEV	RECDAT	SCAMIN	ELEVAT
US 0000000511 00001	Point	58-50.95N	136-01.83W		SBDARE	20091106T211551	231112	fine gy 5ft	US,US,survey,H12143	20091106		1	3	7									
US 0000000412 00001	Point	58-41.38N	136-00.27W		UWTR0C	20091106T180025	231101	new pos Chd (17318) rk	US,US,survey,H12143	20091106													
US 0000000460 00001	Point	58-46.45N	136-08.91W		SBDARE	20091106T204658	231111	stk gy CI med P brk Sh	US,US,survey,H12143	20091106	5,2,4	2,7,17	7	-3	-4.6	1.6	1\2009_Processed_Data\Tide\OPR_0351_FA_09\Final_Tides\H12143\9452584_Muir_Inh	12	1	4			
US 0000000460 00001	Point	58-46.45N	136-08.91W		SBDARE	20091106T204658	231111	stk gy CI med P brk Sh	US,US,survey,H12143	20091106	5,2,4	2,7,17	7	-3	-4.6	1.6	1\2009_Processed_Data\Tide\OPR_0351_FA_09\Final_Tides\H12143\9452584_Muir_Inh	12	1	4			
US 0000000425 00001	Point	58-42.43N	135-59.23W		SBDARE	20091106T184512	231105	stk gy M CI brk Sh	US,US,survey,H12143	20091106	5,0,4	1,2,17	7	-1.3	-3.6	2.3	1\2009_Processed_Data\Tide\OPR_0351_FA_09\Final_Tides\H12143\9452584_Muir_Inh	12	1	4			
US 0000000420 00001	Point	58-41.42N	136-00.21W		UWTR0C	20091106T181617	231103	new rk	US,US,survey,H12143	20091106													
US 0000000459 00001	Line				SBDARE			new extent GC (10779) ldg	US,US,survey,H12143	20091106													
US 0000000462 00001	Point	58-41.47N	136-00.08W		UWTR0C		23:49.1	new pos chd (17318) rk	US,US,survey,H12143	20091106													
US 0000000462 00001	Point	58-41.47N	136-00.08W		UWTR0C	20091106T192851	231107	Chd (17318) rk vfd, DP for ht	US,US,survey,H12143	20091106													
US 0000000524 00001	Line				SBDARE			Chd (17318) ldg extents modified	US,US,survey,H12143	20091106													
US 0000000524 00001	Line				SBDARE			Chd (17318) ldg extents modified	US,US,survey,H12143	20091106													
US 0000000551 00114	Point	58-42.30N	135-59.69W		UWTR0C	20091106T183227	231104	Chd (17318) rk vfd, DP for ht	US,US,survey,H12143	20091106													
US 0000000551 00114	Point	58-42.30N	135-59.69W		UWTR0C	20091106T183227	231104	Chd (17318) rk vfd, DP for ht	US,US,survey,H12143	20091106													
US 0000000442 00001	Point	58-41.40N	136-00.17W		UWTR0C	20091106T181055	231102	Chd (17318) rk vfd, DP for ht	US,US,survey,H12143	20091106													
US 0000000442 00001	Point	58-41.40N	136-00.17W		UWTR0C	20091106T181055	231102	Chd (17318) rk vfd, DP for ht	US,US,survey,H12143	20091106													
US 0000000442 00001	Point	58-46.53N	136-07.64W		OBSTRN	20091106T200815	231110	hpr reef, not sig	US,US,survey,H12143	20091106													
US 0000000429 00001	Point	58-44.94N	136-09.45W		LNDBRE			Chd (17318) rk is islet, hpr ldg	US,US,survey,H12143	20091106													
US 0000000429 00001	Point	58-44.94N	136-09.45W		LNDBRE			Chd (17318) rk is islet, hpr ldg	US,US,survey,H12143	20091106													
US 0000000430 00001	Point	58-44.94N	136-09.45W		LNDELV			Chd (17318) rk is islet, see DP #231108	US,US,survey,H12143	20091106													
US 0000000430 00001	Point	58-44.94N	136-09.45W		LNDELV			Chd (17318) rk is islet, see DP #231108	US,US,survey,H12143	20091106													
US 0000000428 00001	Point	58-44.16N	136-03.25W		SBDARE	20091106T190310	231106	stk gy M CI fine/med P	US,US,survey,H12143	20091106				1,2,7	7								

Subject:  
Re: Reson 7111 device model  
From:  
Corey Collins <corey.collins@caris.com>  
Date:  
Thu, 21 Jan 2010 14:41:14 -0400  
To:  
Eric Maillard <Eric.Maillard@reson.com>  
CC:  
foo fairweather <FOO.Fairweather@noaa.gov>, "glen.rice" <Glen.Rice@noaa.gov>, Brett Evans <Brett.Evans@reson.com>, Michael Mutschler <Michael.Mutschler@reson.com>, chiefst Fairweather <ChiefST.Fairweather@noaa.gov>, Jack Riley <Jack.Riley@noaa.gov>, Edward.J.Vandenameele@noaa.gov, Olivia Hauser <Olivia.Hauser@noaa.gov>, "caryn.arnold" <Caryn.Arnold@noaa.gov>, LCDR Rick Brennan NOAA <Richard.T.Brennan@noaa.gov>, Jeremy Nicholson <jeremy.nicholson@caris.com>

Hi Eric,

Thanks for the prompt replay and I will go ahead and get this fixed up in our software as soon as possible.

Regards,  
Corey

----- Original Message -----

Subject: Re: Reson 7111 device model  
From: Eric Maillard <Eric.Maillard@reson.com>  
To: Corey Collins <corey.collins@caris.com>, foo fairweather <FOO.Fairweather@noaa.gov>  
Cc: "glen.rice" <Glen.Rice@noaa.gov>, "Brett Evans" <Brett.Evans@reson.com>, "Michael Mutschler" <Michael.Mutschler@reson.com>, "chiefst Fairweather" <ChiefST.Fairweather@noaa.gov>, "Jack Riley" <Jack.Riley@noaa.gov>, Edward.J.Vandenameele@noaa.gov, "Olivia Hauser" <Olivia.Hauser@noaa.gov>, "caryn.arnold" <Caryn.Arnold@noaa.gov>, "LCDR Rick Brennan NOAA" <Richard.T.Brennan@noaa.gov>, "Jeremy Nicholson" <jeremy.nicholson@caris.com>  
Date: Thursday, January 21, 2010 2:39:31 PM

>  
> Hi Corey,  
>  
>  
>  
> Yes, you should be using the same algorithm for 8111 and 7111.

>  
>  
>  
> Thanks for looking into that,

>  
> Eric

>  
>  
>  
> From: Corey Collins [mailto:corey.collins@caris.com]  
> Sent: Thursday, January 21, 2010 8:24 AM  
> To: foo fairweather; Eric Maillard  
> Cc: glen.rice; Brett Evans; Michael Mutschler; chiefst Fairweather; Jack Riley; Edward.J.Vandenameele@noaa.gov; Olivia Hauser; caryn.arnold; LCDR Rick Brennan NOAA; Jeremy Nicholson  
> Subject: Re: Reson 7111 device model

>  
>  
>  
> All,  
>  
> I think we have quickly gotten to the bottom of this. First a little background information on how the TPU algorithms are implemented in HIPS and SIPS. We initially received from UNH a list of devices that specific algorithms had been developed for. We implemented those and tagged specific device models from the devicemodels.xml file in HIPS to the pertinent TPU algorithms provided from UNH. Since receiving these algorithms a lot of clients have requested to be able to compute TPU for sonars not contained in the group of sonars as tested and studied by UNH. So what we have done in order to accommodate these clients, as we do not have access to specific sonars to test and develop algorithms for, we have added device models to the devicemodels.xml file and then used a set of generic TPU algorithms for those sonars. So after digging in regards to this situation with the 8111 and the 7111 on our end this is what we have discovered.

>  
> The 8111 was indeed part of the original TPU algorithms provided to us by UNH and therefore it has specific algorithms that are being called and used. The 7111 was not in that list so we are using the generic TPU algorithms as described for Swath Sonars. So with that said, my question to Reson is, should we be using the same algorithms for the 7111 as we are using for the 8111?

>  
> I apologize for not thinking of this beforehand, but if Reson confirms that we should be using the same algorithms as with the 8111 then we can have this fixed up very quickly.

>  
> Regards,  
> Corey

>  
> ----- Original Message -----  
> Subject: Re: Reson 7111 device model  
> From: Corey Collins <corey.collins@caris.com>  
> To: foo fairweather <FOO.Fairweather@noaa.gov>  
> Cc: Eric Maillard <Eric.Maillard@reson.com>, "glen.rice" <Glen.Rice@noaa.gov>, Brett Evans <Brett.Evans@reson.com>, Michael Mutschler <Michael.Mutschler@reson.com>, chiefst Fairweather <ChiefST.Fairweather@noaa.gov>, Jack Riley <Jack.Riley@noaa.gov>, "Edward.J.Vandenameele@noaa.gov" <Edward.J.Vandenameele@noaa.gov>, Olivia Hauser <Olivia.Hauser@noaa.gov>, "caryn.arnold" <Caryn.Arnold@noaa.gov>, LCDR Rick Brennan NOAA <Richard.T.Brennan@noaa.gov>  
> Date: Thursday, January 21, 2010 12:05:23 PM

>  
> Hi Bri,  
>  
> We are looking now on our end as I think there is something amiss in our software. I hope to have feedback to provide on this next week at FPW. So as you put it below, I think this may be something silly and should be easy to fix on our end.

>  
> Corey  
>  
> ----- Original Message -----  
> Subject: Re: Reson 7111 device model  
> From: foo fairweather <FOO.Fairweather@noaa.gov>  
> To: Eric Maillard <Eric.Maillard@reson.com>  
> Cc: "glen.rice" <Glen.Rice@noaa.gov>, Brett Evans <Brett.Evans@reson.com>, Michael Mutschler <Michael.Mutschler@reson.com>, Corey Collins <corey.collins@caris.com>, chiefst Fairweather <ChiefST.Fairweather@noaa.gov>, Jack Riley <Jack.Riley@noaa.gov>, "Edward.J.Vandenameele@noaa.gov" <Edward.J.Vandenameele@noaa.gov>, Olivia Hauser <Olivia.Hauser@noaa.gov>, "caryn.arnold" <Caryn.Arnold@noaa.gov>, LCDR Rick Brennan NOAA <Richard.T.Brennan@noaa.gov>

> Date: Wednesday, January 20, 2010 4:25:08 PM

>

> Hi Eric,

>

> I tried these values and the uncertainty actually increased slightly.

>

> Jack,

>

> I've attached our device model file with the values Eric suggested and our 7111 hvf for your review.

>

> All (HSTP, Reson, Caris),

>

> I'm at a loss as to what is going on with the 7111 uncertainty. Glen sent me some theoretical background material on device model creation but I honestly don't have time to digest it. Jack has agreed to come over to the ship on Monday while he's here in Seattle for FPW to noodle around. In the meantime, let us know if you think of something. Hopefully this is something simple and silly that can be fixed easily.

>

> Many thanks,

>

> Bri

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>  
> If the above mentioned changes don't bring the uncertainty to a level compatible with the true performances of the system, we will have to start questioning the model itself.

>  
>  
>  
> Hope this helps,

>  
> Eric

>  
>  
>  
> From: foo fairweather [mailto:FOO.Fairweather@noaa.gov]  
> Sent: Tuesday, January 12, 2010 3:08 PM  
> To: Eric Maillard  
> Cc: glen.rice; Brett Evans; Michael Mutschler; Corey Collins; chiefst Fairweather  
> Subject: Reson 7111 device model

>  
>  
>  
> Hi Eric,

>  
> Attached is the current device model that we're using. I believe this is the second iteration of it. We're still seeing relatively high uncertainty values with the 7111 (outside of IHO tolerances) The attached color maps is:

> 0-2 meters is green  
> 2-4 meters is yellow  
> 4-10 meters is red  
> and the yellow lines that are selected are 7111 lines.

>  
> Thanks,

>  
> Bri

>  
>  
>  
>  
>  
>  
> ----- Original Message -----

>  
> Subject:

>  
>  
> [Fwd: Re: Reson 8125 and 7111 manuals]

>  
> Date:  
>  
>  
> Tue, 03 Nov 2009 09:01:01 -0900

>  
> From:  
>  
>  
> foo.fairweather <foo.fairweather@noaa.gov>

>

> To:  
>  
>  
> Brett Evans <Brett.Evans@reson.com>  
>  
>  
> Hi Brett,  
>  
> This is the original email thread. I didn't originally type your  
> correct email address.  
>  
> Thanks,  
>  
> Bri  
>  
> --  
> LT Briana Welton  
> Field Operations Officer  
> NOAA Ship Fairweather  
> 1010 Stedman St  
> Ketchikan, AK 99901  
> 907-254-2842 (ship's cell)  
> 808-659-0054 (ship's sat)  
>  
>  
>  
>  
>  
>  
>  
> --  
> LT Briana Welton  
> Field Operations Officer  
> NOAA Ship Fairweather  
> 1010 Stedman St  
> Ketchikan, AK 99901  
> 907-254-2842 (ship's cell)  
> 808-659-0054 (ship's sat)  
>  
> Fairweather communications are often unreliable. If you suspect email is not going to or from the foo.fairweather  
> email account, try emailing briana.welton@noaa.gov or calling me on my personal cell at 520-227-9269.  
>  
>  
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> --  
>  
> \_\_\_\_\_  
> Corey M. Collins  
> CARIS HIPS/SIPS/Notebook Product Manager  
> CARIS  
> 115 Waggoners Lane, Fredericton, New Brunswick, Canada, E3B 2L4  
> Tel: +1.506.458.8533 Fax: +1.506.459.3849  
> \_\_\_\_\_

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> March 22-25, 2010, Miami, Florida, United States  
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>  
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>  
> --

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> Corey M. Collins  
> CARIS HIPS/SIPS/Notebook Product Manager  
> CARIS  
> 115 Waggoners Lane, Fredericton, New Brunswick, Canada, E3B 2L4  
> Tel: +1.506.458.8533 Fax: +1.506.459.3849

---

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--

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Corey M. Collins  
CARIS HIPS/SIPS/Notebook Product Manager  
CARIS  
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Tel: +1.506.458.8533 Fax: +1.506.459.3849

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**Subject:** RE: RMA#502584: Reson 7111 transceiver

**From:** Brett Evans <Brett.Evans@reson.com>

**Date:** Fri, 21 May 2010 16:13:54 -0700

**To:** Caryn Arnold <Caryn.Arnold@noaa.gov>, "ops.fairweather" <ops.fairweather@noaa.gov>, Larry Loewen <Larry.Loewen@noaa.gov>

**CC:** Jim Lynn <Jim.Lynn@noaa.gov>, Olivia Hauser <Olivia.Hauser@noaa.gov>, chiefet fairweather <chiefet.fairweather@noaa.gov>, Matthew Jaskoski <matthew.jaskoski@noaa.gov>,

Edward.J.Vandenameele@noaa.gov, \_NMAO MOP XO Fairweather <xo.fairweather@noaa.gov>, Todd Irby <Todd.Irby@noaa.gov>, co fairweather <co.fairweather@noaa.gov>, Michael Mutschler <Michael.Mutschler@reson.com>, Eric Schug <Eric.Schug@reson.com>, Justin Friesner <Justin.Friesner@reson.com>

Dear Caryn, Bri and All,

We plan to send Eric Schug to Ketchikan this weekend. His contact info is as follows:

Eric Schug

Direct: +1-805-964-6271 ex 550

Cell: +1-805-708-0097

E-mail: [eric.schug@reson.com](mailto:eric.schug@reson.com)

He plans to travel on Sunday May 23 with the repaired 7111 Txcvr, spare parts and tools. He is scheduled to arrive in Ketchikan at approximately 4PM.

He was able to get in a have the PPD Test started this afternoon.

As he is only going to be able to travel with one large item (the 7111 Txcvr) we will send the 7125-SV Processor (RMA#502555) and large white ship case for 7111 Txcvr Box to Larry Loewen's attention in Seattle before May 27.

Re: faults on 7111 Txcvr Box - we found the reported faults to be related to the following:

"Two of the Receiver Cards were faulty. The problem with the Transceiver was that one of the Receiver Boards was overloading the Gain control signal therefore limiting the Gain range. The reduced Gain range made it appear as though the Transmit Power was too low. When the Gain set to 83dB in the UI the effective gain was ~15dB. The Gain control is an analog signal that sets the Gain in all channels in parallel.

The Transceiver, running with our test wet-end and 7111 Processor Box for the last 24 hours, is working now."

Please let me know if you have any questions.

Regards,  
Brett Evans  
RESON Support

-----Original Message-----

From: Brett Evans

Sent: Thursday, May 20, 2010 1:33 PM

To: 'Caryn Arnold'; 'ops.fairweather'; 'Larry Loewen'

Cc: 'Jim Lynn'; 'Olivia Hauser'; 'chiefet fairweather'; 'Matthew

Jaskoski'; '[Edward.J.Vandenameele@noaa.gov](mailto:Edward.J.Vandenameele@noaa.gov)'; '\_NMAO MOP XO Fairweather';

'Todd Irby'; 'co fairweather'; Michael Mutschler; Justin Friesner; Eric

Schug

Subject: RE: RMA#502584: Reson 7111 transceiver

Dear Caryn and All,

FYI, we received the Fairweather's 7111 Txcvr Box this morning.

We are working on it now and will send some more info on our findings shortly.

Regards,  
Brett Evans  
RESON Support

-----Original Message-----

From: Brett Evans  
Sent: Wednesday, May 19, 2010 5:26 PM  
To: 'Caryn Arnold'; ops.fairweather; 'Larry Loewen'  
Cc: Jim Lynn; Olivia Hauser; chiefet fairweather; Matthew Jaskoski;  
[Edward.J.Vandenameele@noaa.gov](mailto:Edward.J.Vandenameele@noaa.gov); \_NMAO MOP XO Fairweather; 'Todd Irby';  
co fairweather; Michael Mutschler; Justin Friesner  
Subject: RE: RMA#502584: Reson 7111 transceiver

Dear Caryn, Bri and All,

Thanks for your email.

I just spoke with Caryn, and this is the plan:

1. We understand that the "loaner" 7111 Txcvr Box did not work upon receipt. At this point, we don't know what else can be done to troubleshoot it by telephone. (see #4 below)
2. The Fairweather 7111 Txcvr is due (per FedEx website) at RESON by 10:30am tomorrow. We will test it immediately upon receipt.
3. The Fairweather 7125-SV Processor (RMA#502555) has been tested but no fault found to date. We will continue to test it non-stop for the next 1-2 days. If still no fault found, we will ship it back to either Ketchikan or Seattle for scheduled in-port.
4. Tentatively, we plan to send a Sr. Level Engineer to the Fairweather with the 7111 Tx Box and 7125-SV Processor. We will try to get him and the equipment up there by Sunday, May 23rd as "Plan A". I will meet with our shipping manager tomorrow to discuss the logistics of getting the two boxes of equipment up to Ketchikan on short notice, assuming we have to ship it on Thursday or Friday.
5. "Plan B" is that our Engineer will meet the Fairweather in Seattle on May 27th.
6. Regardless, we will start to put together spare parts and tools for this trip. We will be prepared to test and repair either the 7111 Processor Box or the 7111 Txcvr Box.

Yes, both of these cases will be treated as Warranty RMA's.

Please let me know if you have any further questions. I can be reached by email or cell phone (805)701-6697 as main POC for this field visit.

Regards,  
Brett Evans  
RESON Support

-----Original Message-----

From: Caryn Arnold [<mailto:Caryn.Arnold@noaa.gov>]  
Sent: Wednesday, May 19, 2010 11:49 AM  
To: ops.fairweather  
Cc: Brett Evans; Jim Lynn; Justin Friesner; Olivia Hauser; chiefet  
fairweather; Matthew Jaskoski; Larry Loewen;  
[Edward.J.Vandenameele@noaa.gov](mailto:Edward.J.Vandenameele@noaa.gov); \_NMAO MOP XO Fairweather; 'Todd Irby';  
co fairweather  
Subject: Re: Reson 7111 transceiver

Hello All,

This is a critical piece of equipment for the upcoming projects. Since we still have Reson Support days I think this is a time to utilize some of them. If Reson can get the Fairweather transceiver working, will they

be able to send a Rep, along with the 7111 transceiver, to Ketchikan, AK

before the ship heads south on Sunday, May 23rd? At this time the Reson Rep could also return Launch 2806's 7125SV Processor. Reson hasn't been able to reproduce the power issue, however, the loaner from Reson that was installed is not having any problems. If a Reson Rep is going to the

ship then they could observe the 7125 in the field.

v/r,  
Caryn

ops.fairweather wrote:

Hi Brett,

Does Eric have any more things for us to try to get the loaner 7111 transceiver working? The 7111 is the primary system we plan to use for

June- Sept and we haven't even patch tested it yet. It's critical that

we get that system back up before we in-port in Seattle May 27 so that

we can patch test it before the start of the upcoming ship projects, especially since we'll be operating in very remote areas over the next

four months.

Many thanks,

Bri

PS/FYI

Our schedule for the next few weeks/months:

~May 23/24: Start transit from Behm Canal (Ketchika, AK) to Seattle, doing a 1000-ftm contour survey for the Canadian Government on the way

south with the Reson 8160

May 27 -June 1: In port in Seattle

June 1 - July 2: Olympic Coast National Marine Sanctuary Survey

July 7 - Sept 8: Bering Strait Survey

On 5/18/2010 9:09 PM, Brett Evans wrote:

Hi Bri,

One of our engineers, Eric Schug, will call you shortly about the 7111.

Regards,

Brett Evans

RESON Support

\*From:\* Justin Friesner  
\*Sent:\* Tuesday, May 18, 2010 1:52 PM  
\*To:\* Brett Evans  
\*Subject:\* Bri on fairweather

Brett,

Bri's number is 907-254-0032

justin

Justin P. Friesner

Senior Field Engineer

Reson Inc.

100 Lopez Road

Goleta

CA 93117

USA

Tel: +1 805 964 6260

Fax: +1 805 964 7537

Cell: +1 805 708 5059

--

LT Briana Welton  
Field Operations Officer  
NOAA Ship Fairweather  
1010 Stedman St  
Ketchikan, AK 99901  
907-254-2842 (ship's cell)  
808-659-0054 (ship's sat)

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907-254-0032.



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

**TIDE NOTE FOR HYDROGRAPHIC SURVEY**

**DATE :** March 25, 2010

**HYDROGRAPHIC BRANCH:** Pacific  
**HYDROGRAPHIC PROJECT:** OPR-O351-FA-2009  
**HYDROGRAPHIC SHEET:** H12143

**LOCALITY:** Southern Extend of Muir Inlet, Northern Glacier Bay, AK  
**TIME PERIOD:** October 11 - November 6, 2009

**TIDE STATION USED:** 945-2584 Muir Inlet, AK  
Lat. 58° 54.8'N Long. 136° 06.8' W

**PLANE OF REFERENCE (MEAN LOWER LOW WATER):** 0.000 meters  
**HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE:** 4.788 meters

**REMARKS: RECOMMENDED ZONING**

**Use zone(s) identified as:** SEA310, SEA311, SEA312, SEA312A, SEA312B  
and SEA314

**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).

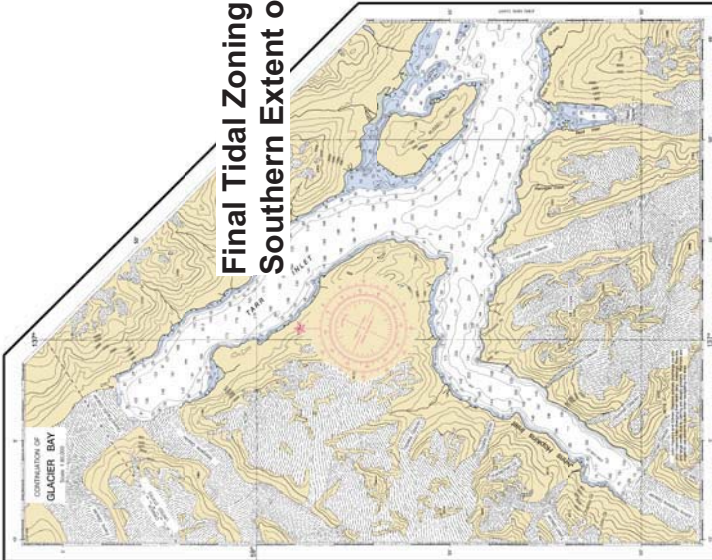
**Peter J. Stone**

Digitally signed by Peter J. Stone  
DN: cn=Peter J. Stone, o=CO-OPS, ou=NOAA/  
NOS, email=peter.stone@noaa.gov, c=US  
Date: 2010.04.06 07:13:40 -04'00'

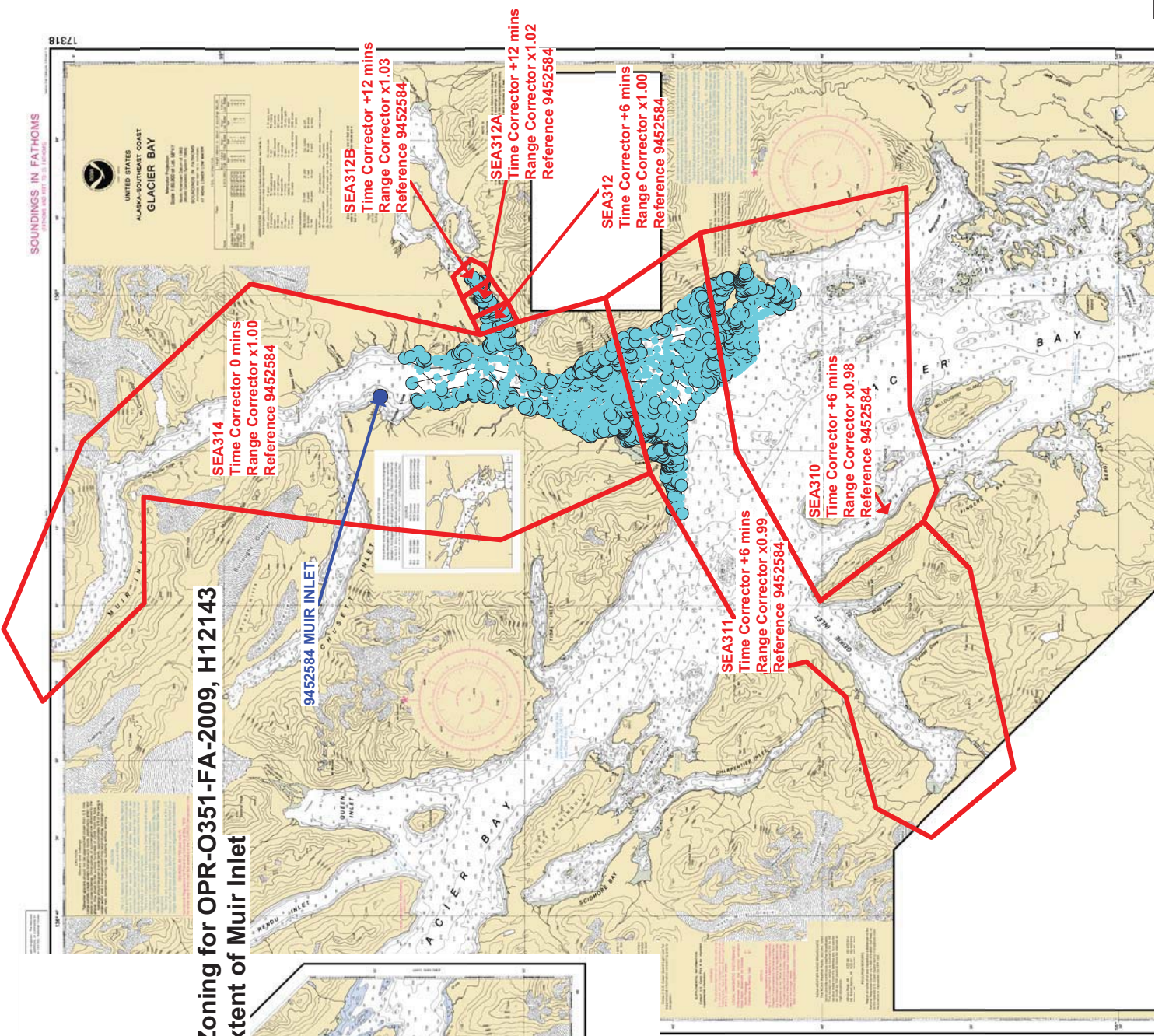
---

CHIEF, OCEANOGRAPHIC DIVISION





**Final Tidal Zoning for OPR-0351-FA-2009, H12143  
Southern Extent of Muir Inlet**



**SEA314**  
Time Corrector 0 mins  
Range Corrector x1.00  
Reference 9452584

**SEA312B**  
Time Corrector +12 mins  
Range Corrector x1.03  
Reference 9452584

**SEA312A**  
Time Corrector +12 mins  
Range Corrector x1.02  
Reference 9452584

**SEA312**  
Time Corrector +6 mins  
Range Corrector x1.00  
Reference 9452584

**SEA311**  
Time Corrector +6 mins  
Range Corrector x0.99  
Reference 9452584

**SEA310**  
Time Corrector +6 mins  
Range Corrector x0.98  
Reference 9452584

**SOUNDINGS IN FATHOMS**  
PUBLISHED BY THE U.S. NAVY

UNITED STATES  
ALASKA-SOUTHWEST COAST  
GLACIER BAY

REVISION 10/2009  
SOUNDINGS IN FATHOMS  
ENCLOSURES IN METERS  
BY THE U.S. NAVY



**H12143 HCell Report**  
Katie Reser, Physical Scientist  
Pacific Hydrographic Branch

**1. Specifications, Standards and Guidance Used in HCell Compilation**

HCell compilation of survey H12143 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 H12143 were compiled to the largest scale raster chart(s) shown below:

Chart	Scale	Edition	Edition Date	NTM Date
17318	1:80,000	7 <sup>th</sup>	03/01/2009	07/02/2011

The following ENC(s) were also used during compilation:

Chart	Scale
US4AK3DM	1:80,000

**3. Soundings**

A survey-scale sounding (SOUNDG) feature object layer was built from a 16-meter multibeam combined surface in CARIS BASE Editor. A shoal-biased selection was made at 1:15,000 survey scale using a Radius Table file with values shown in the table, below.

Shoal Limit (m)	Deep Limit (m)	Radius (mm)
-5	10	3
10	20	4
20	50	4.5
50	500	5

In CARIS BASE Editor soundings were manually selected from the high density sounding layer (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	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 H12143_SS.000
0	0.000	0.2286	0.125	0
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	20.750	20
30	54.864	56.2356	30.750	30
50	91.44	92.8116	50.750	50
100	182.88	184.2516	100.750	100

With the exception of the zero contours included in the \*\_CS file, contours 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 may result in conflicts between the \*\_SS file contours and HCell features at or near the survey limits. Conflicts with M\_QUAL and SBDARE objects, and with DEPCNT objects representing MLLW, should be expected. HCell features should be honored over \*\_SS.000 file contours in all cases where conflicts are found.

#### 5. Meta Areas

The following Meta object areas are included in HCell H12143:

M\_QUAL

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
DEPCNT	Zero contours
*LNDARE	Islet
*LNDELV	Height on islet
M_QUAL	Data quality meta object
SBDARE	Bottom types and reef
SOUNDG	Soundings at the chart scale density
UNSARE	Unsurveyed area
*UWTROC	Rocks

\* The M\_QUAL is adequate for NDB product searches except for features in these object classes which reside outside the M\_QUAL limits.

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**

H12143 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**

H12143_CS.000	Base Cell File, Chart Units, Soundings and features compiled to 1:80,000
H12143_SS.000	Base Cell File, Chart Units, Soundings and Contours compiled to 1:15,000
H12143_DR.pdf	Descriptive Report including end notes compiled during office processing and certification, the HCell Report, and supplemental items
H12143_Outline.gml	Survey outline
H12143_Outline.xsd	Survey outline

## 11.2 Software

CARIS HIPS Ver. 7.0	Inspection of Combined BASE Surfaces
CARIS BASE Editor Ver. 3.2	Creation of soundings and bathy-derived features, meta area objects, and blue notes; Survey evaluation and verification; Initial HCell assembly.
CARIS S-57 Composer Ver. 2.2	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.
Northport Systems, Inc., Fugawi Marine ENC Ver.3.1.0.435	Independent inspection of final HCells using a COTS viewer.

## 12. Contacts

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

Katie Reser  
Physical Scientist  
Pacific Hydrographic Branch  
Seattle, WA  
206-526-6864  
[katie.reser@noaa.gov](mailto:katie.reser@noaa.gov)

APPROVAL SHEET  
H12143

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.