

H11703

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.* ..... H11703

### LOCALITY

*State* ..... Alaska

*General Locality* ..... Chatham Strait

*Sublocality* ..... North and South Arm Hood Bay

2007

### CHIEF OF PARTY

..... Dean Moyles, Fugro Pelagos, Inc.

### 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>H11703</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 style="text-align: center;"><b>NA</b></p>
<p>State <u>Alaska</u></p> <p>General Locality <u>Chatham Strait</u></p> <p>Sub-Locality <u>North and South Arm Hood Bay</u></p> <p>Scale <u>1:10,000</u> Date of Survey <u>September 1, 2007 - September 9, 2007</u></p> <p>Instructions dated <u>6/15/2006</u> Project No. <u>OPR-O322-KR-07</u></p> <p>Vessel(s) <u>R/V Davidson (1066485), R/V R2 (623241), R/V D2 (647782), Shoreline Skiff (WN6739NW)</u></p> <p>_____</p> <p>_____</p> <p>Chief of party <u>DEAN MOYLES</u></p> <p>Surveyed by <u>ORTHMANN, REYNOLDS, GILL, MOUNT, STOCK, FARLEY, BRIGGS, POECKERT, ET AL.</u></p> <p>Soundings by <u>Reson 8101 (R2 &amp; D2 - Hull Mount), Reson 8111 (Davidson - Hull Mount), and Reson 8125 (Skiff - Pole Mount)</u></p> <p>SAR by <u>Fernando Ortiz</u> Compilation by <u>Katie Reser</u></p> <p>Soundings compiled in <u>Fathoms</u></p>	
<p><b>REMARKS:</b> <u>All times are UTC. UTM Projection 8N.</u></p> <p><u>The purpose of this survey is to provide contemporary surveys to update</u></p> <p><u>National Ocean Service (NOS) nautical charts.</u></p> <p><u>All separates are filed with the hydrographic data.</u></p> <p><u>Revisions and end notes in red were generated during office processing.</u></p> <p><u>Page numbering may be interrupted or non sequential.</u></p>	



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**A - Area Surveyed**

H11703 (Sheet J) is bound by the coordinates listed below, which encompass North and South Arm Hood Bay.

Hydrographic data collection began on September 1, 2007 and ended on September 9, 2007.

**Table 1 – H11703 Sheet Limits<sup>1</sup>**

Sheet Limits H11703 Sheet J Scale 1:10,000		
Point #	Positions on NAD83	
	Degrees Latitude (N)	Degrees Longitude (W)
1	57-25-49.63 N	134-28-44.54 W
2	57-25-49.63 N	134-18-40.50 W
3	57-19-19.57 N	134-18-40.50 W
4	57-19-19.67 N	134-25-10.26 W
5	57-20-45.34 N	134-25-10.26 W
6	57-20-45.46 N	134-28-44.54 W

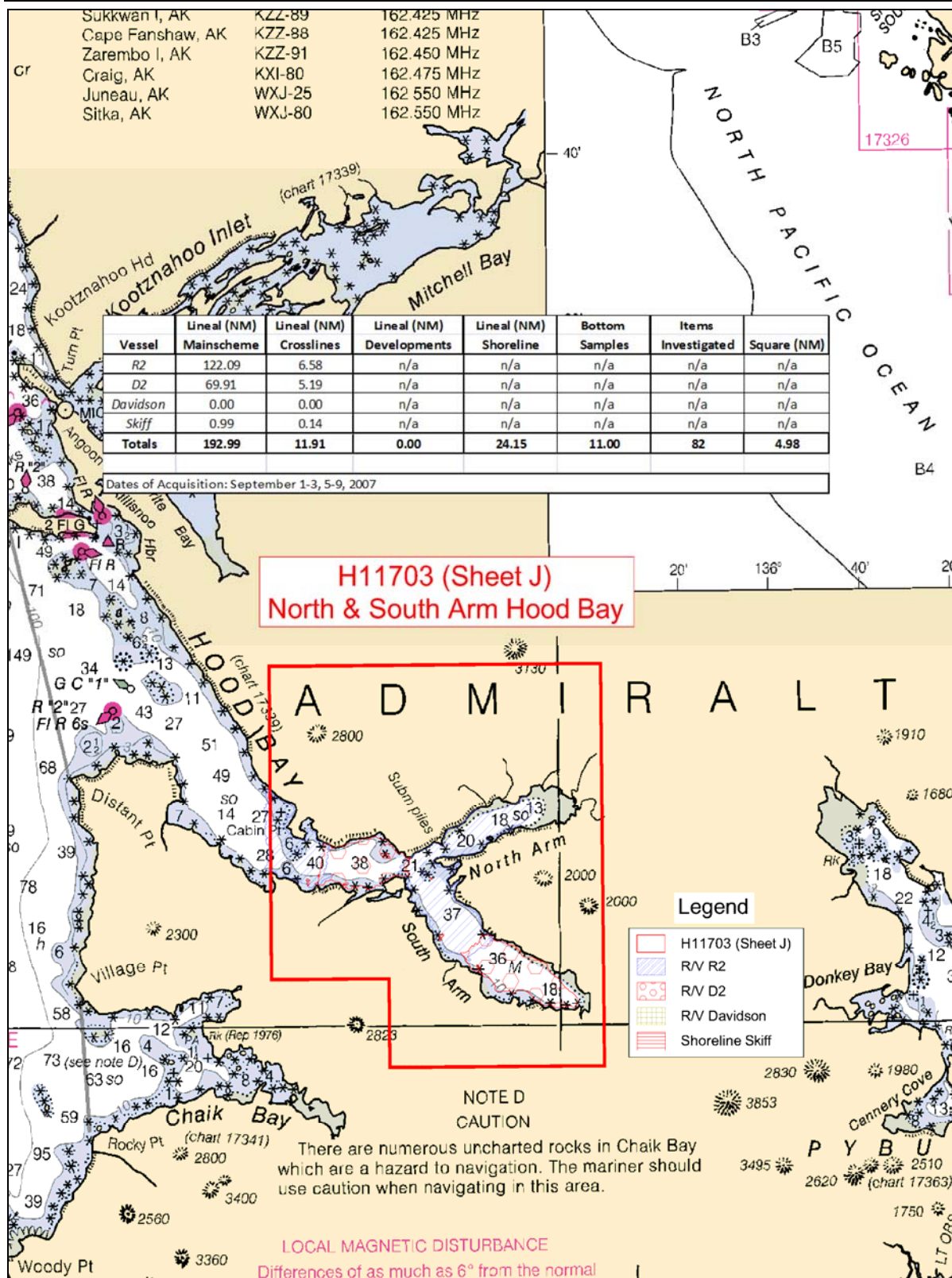


Figure 1 H11703 Area Surveyed



## **B – Data Acquisition & Processing**

Refer to the OPR-O322-KR-07 Data Acquisition and Processing Report<sup>2</sup> for a detailed description of all equipment, survey vessels, processing procedures, and quality control features. Items specific to this survey and any deviations from the Data Acquisition and Processing Report are discussed in the following sections.

### Equipment & Vessels

R/V R2, R/V D2, and the Shoreline Skiff acquired all soundings for H11703. R/Vs R2 & D2, 29 feet in length with a draft of 5.7 feet, were equipped with a 240 kHz Reson 8101 with option 033 (pseudo Side Scan) for multibeam data acquisition. The Shoreline Skiff, 24 feet in length with a draft of 1.42 feet, was equipped with a 455 kHz Reson 8125 with option 033 (pseudo Side Scan) for multibeam data acquisition. All vessels were also equipped with two AML sound velocity and pressure sensors (SV&P) for sound velocity profiles. Vessel attitude and position were measured using an Applanix Position and Orientation System for Marine Vessel (POS/MV 320) (v4) with XTF files logged in Triton ISIS (v7.0.413.9).

Heights were taken on features awash or above the water level by visual estimation, using simultaneous comparison to a known reference (the vessel's bow).

Refer to OPR-O322-KR-07 Data Acquisition & Processing Report for a complete listing of equipment and vessel descriptions.

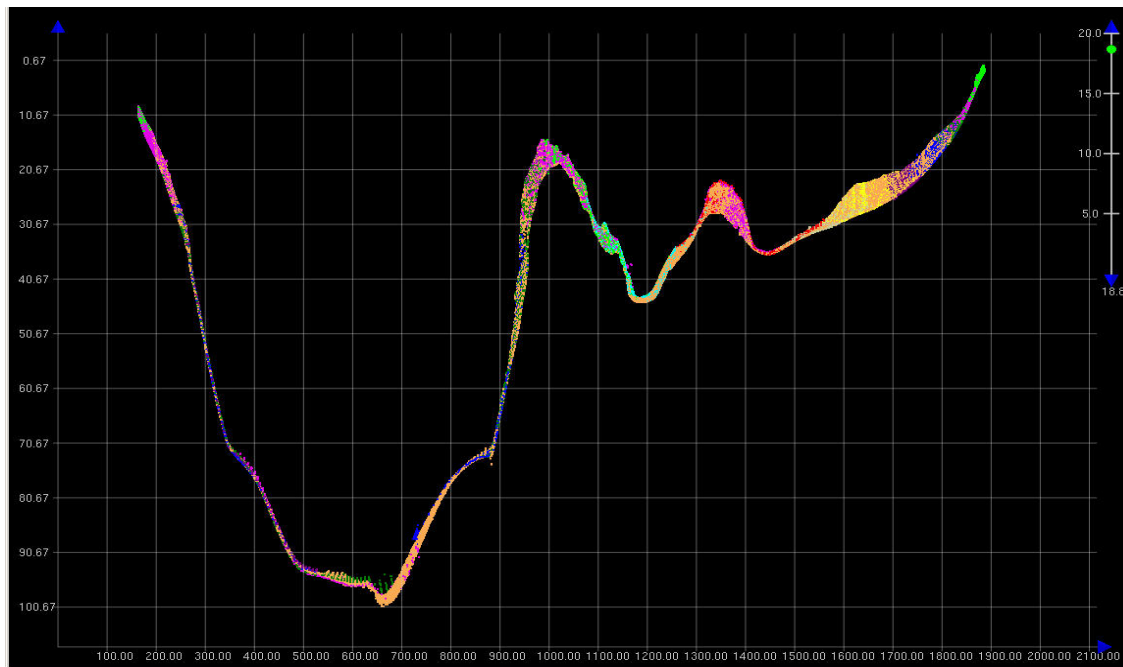
### Quality Control

#### Crosslines

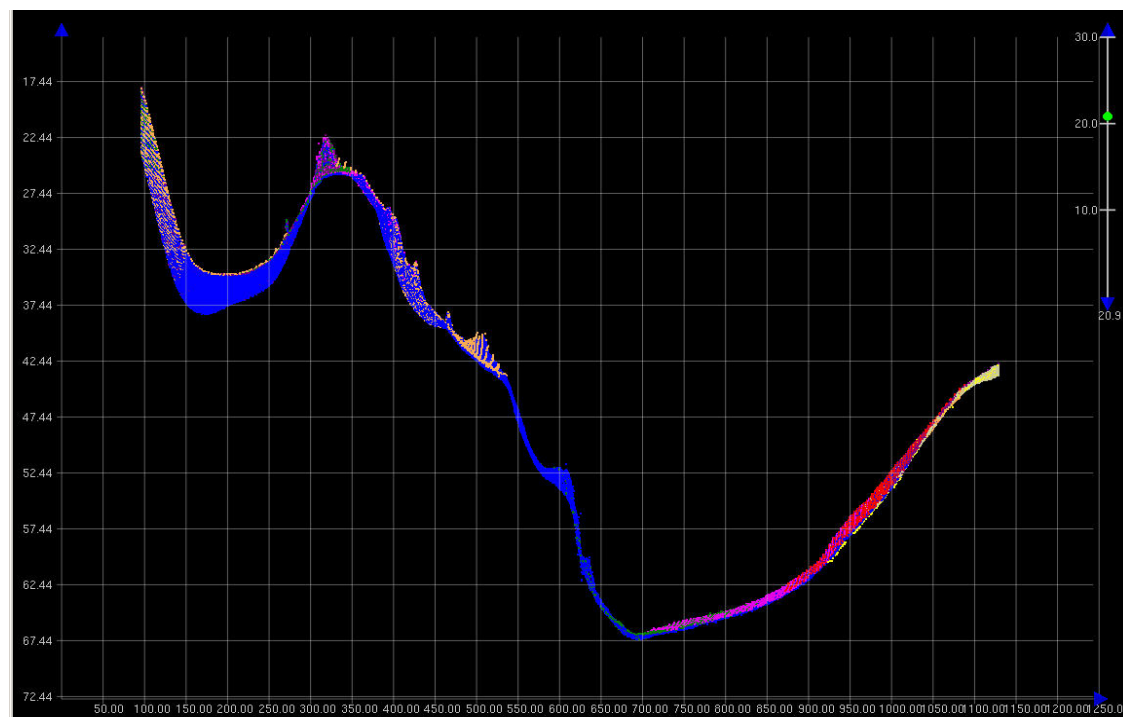
Crosslines were planned and well distributed throughout the survey to ensure adequate quality control. Total crossline length surveyed was 11.91 nautical miles or 6.2 percent of the total main scheme line length, exceeding the 5 percent planned. Each crossline was compared to all main scheme lines it intersected, using the CARIS HIPS QC report routine.

The majority of QC Reports fall well within the required accuracy specifications. However, beams that fall below the 95 percent confidence level in the QC report are associated with areas and conditions illustrated below. It should be noted that these locations are in agreement with the surrounding adjacent lines and are considered well within the required specifications.<sup>3</sup>

The majority of beams that fall below the 95 percent confidence level are located in areas having extremely steep slopes and/or rocks. Figures 2 and 3 below provide examples.



**Figure 2 Profile of 1J04-TIE04**



**Figure 3 Profile of 1J04-TIE05**



Note: The QC reports were generated based on the given accuracy specification of:

$$\pm \sqrt{a^2 + (b * d)^2}$$

where,  $a = 0.5$ ,  $b = 0.013$ , and  $d = \text{depth}$ .

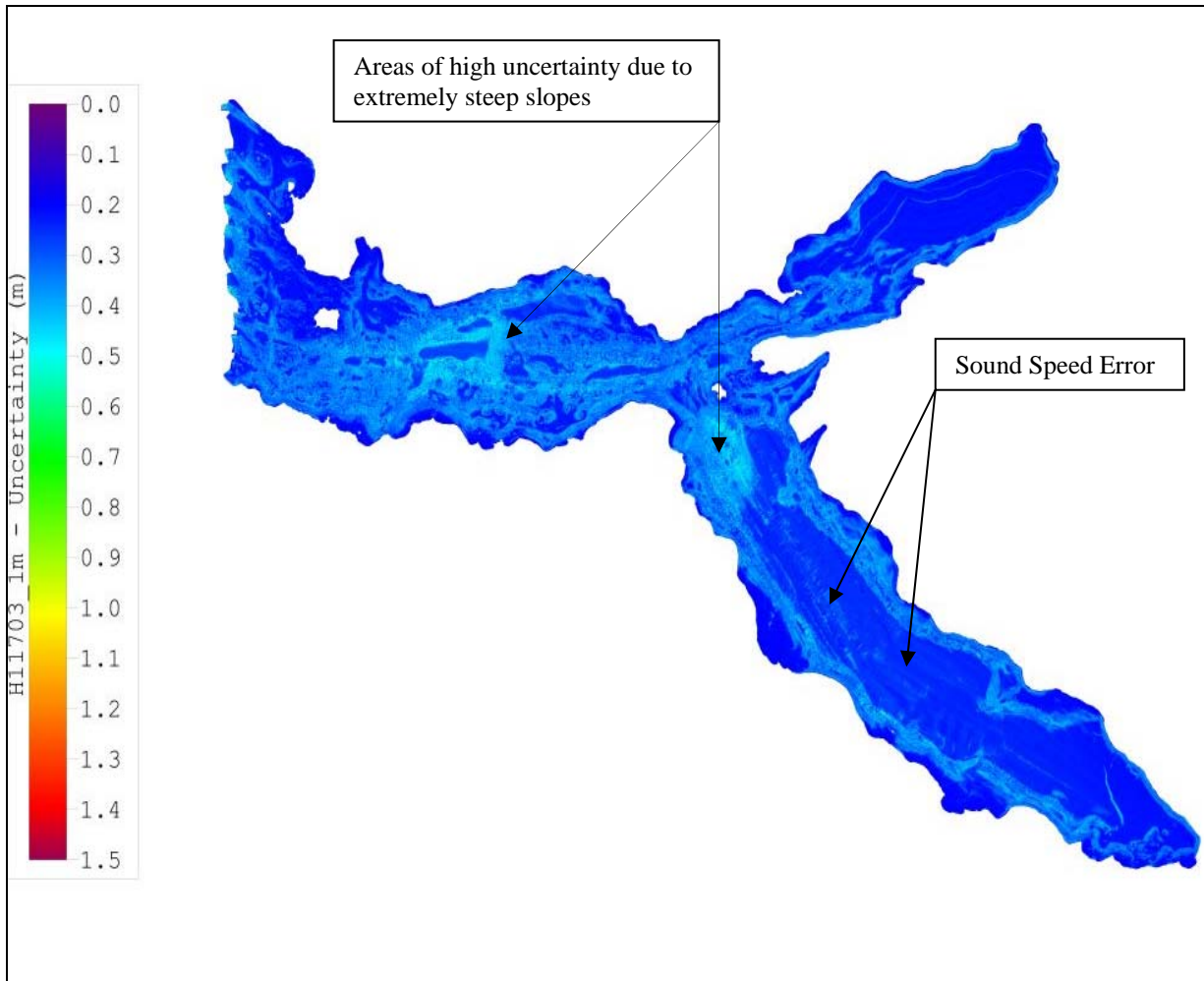
However, since a variance of a difference, rather than a variance from a mean is being used, the  $a$  and  $b$  values were defined in the user defined option within the CARIS HIPS QC Report routine:

$$a = 0.5 * \sqrt{2} = 0.707$$

$$b = 0.013 * \sqrt{2} = 0.018$$

### Uncertainty Values (CARIS BASE Surface)

The majority of H11703 had an uncertainty of about 0.20 to 0.25 meters, except for the deep water areas having extremely steep slopes or deemed to be rocky, where values ranged from 0.3 to 0.5 meters. No uncertainty values were greater than the IHO level Order 1.<sup>4</sup>



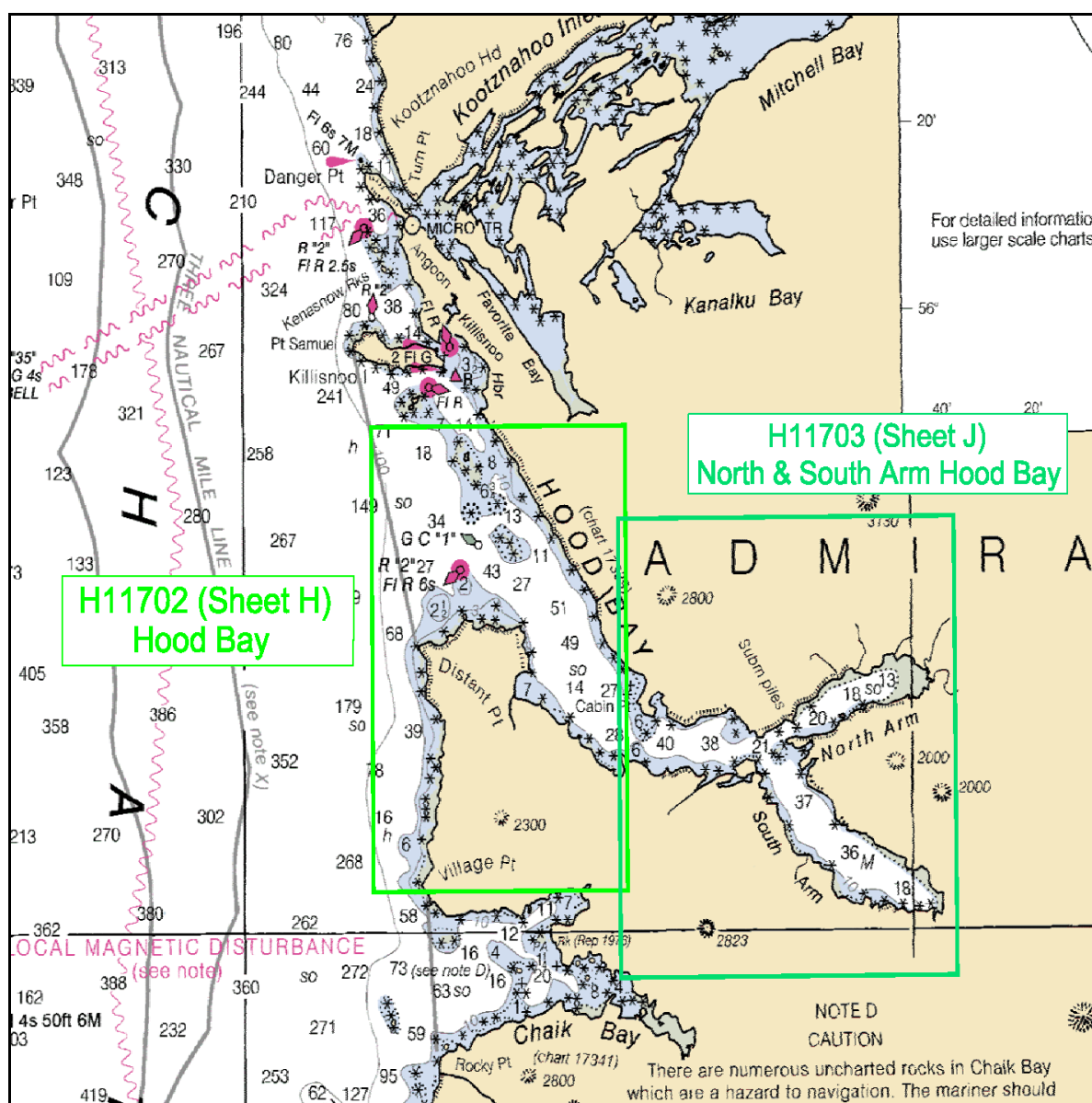
**Figure 4 H11703 Uncertainty DTM**



## Survey Junctions

H11703 (Sheet J) junctions with: <sup>5</sup>

Registry #	Scale	Date	Junction Side
H11702	1:10,000	2007	West



### Figure 5 H11703 Survey Junctions

The surveys are in agreement along their common borders. The agreement was noted in the field using the CARIS CUBE surfaces during subset cleaning. The conformity is also apparent in the final combined BASE surfaces.<sup>6</sup>



### Quality Control Checks

During the hydrographic survey OPR-O322-KR-07 the survey vessels conducted a number of confidence checks. These consisted of the vessels running two lines in the opposite direction over a reference surface (normally the patch test site). The data sets collected with the Reson 8125 (Shoreline Skiff), and 8101 (R2 & D2) compared within 5 to 10 centimeters.

Positioning system confidence checks were conducted on a daily basis using the POS/MV controller software. The controller software had numerous real time displays that were monitored throughout the survey to ensure the positional accuracies specified in the NOS Hydrographic Surveys Specifications and Deliverables (April 2007) were achieved. These include, but were not limited to the following: GPS Status, Position Accuracy, Receiver Status (which included HDOP), and Satellite Status. During periods of high HDOP and/or low number of available satellites, survey operations were suspended.

### Data Quality

In general, the multibeam data quality for H11703 was excellent. One notable problem follows:

- During data acquisition and routine processing, a general downward and/or upward cupping was noticed in the across track sounding profiles for certain areas. This is possibly due to a high volume of thermal layering and strong undercurrents in the water column. This problem was addressed by conducting SVP casts more frequently and reducing the line spacing interval. Even though this SVP error is noticeable on the uncertainty surface DTM in Figure 4 above, the data are well within the required specifications.<sup>7</sup>

### Corrections to Echo Soundings

Refer to the OPR-O322-KR-07 Data Acquisition and Processing Report for a detailed description of all corrections to echo soundings. No deviations from the report occurred.

### Data Processing

Refer to the OPR-O322-KR-07 Data Acquisition and Processing Report for a detailed description of the processing flow.

The final Bathymetric with Associated Statistical Error (BASE) surface for H11703 is called H11703 and it contains four different BASE surfaces of different resolutions. To ensure sufficient overlap between these surfaces the follow parameters were used:<sup>8</sup>



Depth Threshold: 0 to 17 meters, resolution = 1m, Name in BASE Surface H11703\_1m  
Depth Threshold: 12 to 45 meters, resolution = 2m, Name in BASE Surface H11703\_2m  
Depth Threshold: 40 to 60 meters, resolution = 4m, Name in BASE Surface H11703\_4m  
Depth Threshold: 50 to Max depth, resolution = 5m, Name in BASE Surface H11703\_5m

The final S57 file for this project is called “H11703\_S57\_Features.000”. This file contains all shoreline and bottom sample feature data for this project in S57 format as required in the Specifications and Deliverables.<sup>9</sup>

## C – Horizontal & Vertical Control

Refer to the OPR-O322-KR-07 Horizontal and Vertical Control Report<sup>10</sup> for a detailed description of the horizontal and vertical control used. No deviations from the report occurred. A summary of the project’s horizontal and vertical control follows.

### Horizontal Control

The horizontal control datum for this survey was the North American Datum of 1983 (NAD83). All raw positions were originally collected in WGS84 and transformed to NAD83 during the post-processed kinematic GPS (PPK) routine.

It was necessary to acquire dual frequency GPS data at known locations on the ground so that a PPK solution could be used for final positioning. Sub-contractor John Oswald and Associates LLC (JOA) established two local control points: station “Angoon A” and station “Angoon B” in Angoon, AK. Refer to Appendix II in the “OPR-O322-KR-07 Horizontal & Vertical Control Report” for additional information.

Vessel position was determined in real time using a Trimble Zephyr L1/L2 GPS antenna, which was connected to a Trimble BD950 L1/L2 GPS card residing in the POS/MV. The POS/MV was set up via Com 2 to accept USCG differential corrections, which were output from a CSI MBX-3S Coast Guard beacon receiver. Note: since the pseudo range corrections received by the POS/MV are based on the NAD83 position of the reference station antenna, all DGPS-based final positions are NAD83. However, final positions were determined by a post-processed kinematic (PPK) solution using POSpac 4.3 processing software, which output a final solution in NAD83. (Refer to the “2007-NOAAProcessingProcedures” document for PPK processing procedure).

**Table 2 - DGPS Stations**

Station	ID	Latitude	Longitude	Freq.	Tx. Rate
Biorka, AK USCG	890	56°51’18” N	135°32’05”W	305	100BPS
Level Island, AK USCG	891	56°28’03” N	133°04’32” W	295	100BPS



### Vertical Control

All sounding data were initially reduced to mean lower low water (MLLW) using unverified tidal data from three tide stations located in Warm Spring Bay, False Bay, and Mitchell Bay, AK. Sub-contractor John Oswald & Associates LLC (JOA) operated the gauges and e-mailed the data to the R/V Davidson at the end of every Julian day.

**Table 3 - Tide Gauges**

Gauge	Model	Gauge Type	Location	Latitude	Longitude	Operational
9451625	H350XL/355	Digital Bubbler	Warm Spring Bay, AK	57°05'18"N	134°49'30" W	April-September
9452328	H350XL/355	Digital Bubbler	False Bay, AK	57°40'00"N	134°56'06" W	April-September
9451953	H350XL/355	Digital Bubbler	Mitchell Bay, AK	57°32'24"N	134°25'30" W	August-September

### TIDES

All sounding data were reduced to MLLW initially using unverified tidal data from the three tide stations located in Warm Spring Bay, False Bay, and Mitchell Bay, AK. Tidal data for a twenty-four hour period UTC, (Alaska Daylight Time to UTC was +8 hours) was assembled by JOA and e-mailed to the R/V Davidson at the end of every Julian Day. A cumulative file for the gauges was updated each day by appending the new data. Refer to the OPR-O322-KR-07 Horizontal and Vertical Control Report for additional tidal information and station descriptions.

The tidal zoning was modified by JOA, providing a more elaborate zoning scheme from those zones issued in the Statement of Work. For additional information, refer to JOA's Final Technical Report.

November 5, 2007, JOA issued verified tidal data and final zoning for H11696, H11697, H11698, H11699, H11702, H11703, H11704, H11705, H11706, H11707, & H11708 of OPR-O322-KR-07. On January 2, 2008, JOA issued verified tidal data and final zoning for H11700 & H11701 of OPR-O322-KR-07. All sounding data were then re-merged using CARIS HIPS and SIPS tide routine. Verified tidal data were used for all final Navigation BASE surfaces and S57 Feature files.<sup>11</sup>

## **D – Results and Recommendations**

### Chart Comparison

H11703 survey was compared with charts:<sup>12</sup>

Chart No.	Scale	Edition	Edition Date
17341	20,000	8th	May 2000
17339	30,000	11th	Mar. 1998
17320	217,828	17th	Nov. 2005

Note: Electronic chart (US3AK3BM) covers only a portion of the survey.<sup>13</sup>

### Comparison of Soundings

In general, the soundings from chart 17339 coincide with the soundings from H11703 to within 1 to 5 fathoms; areas that do vary to any degree are as follows:<sup>14</sup>

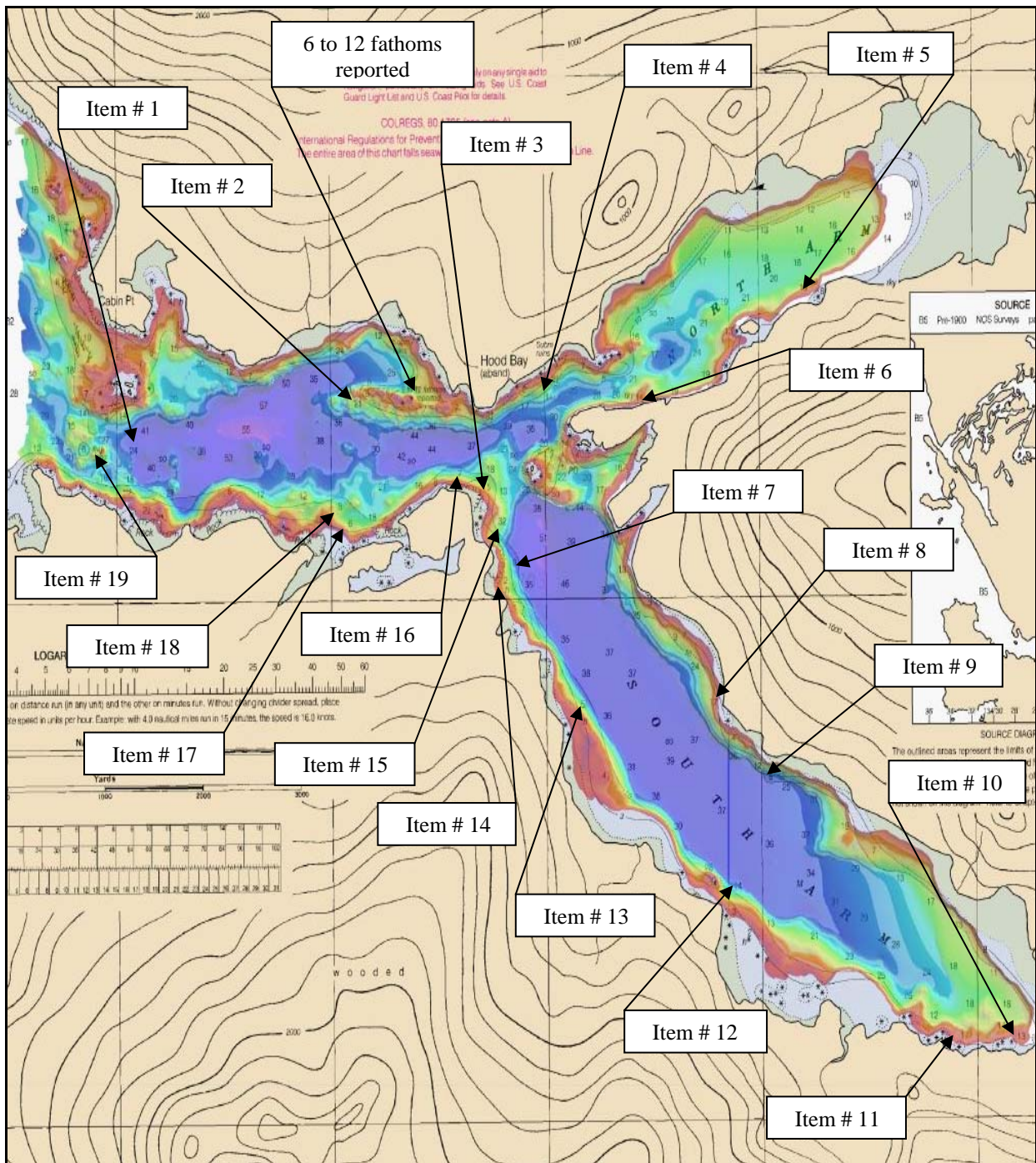
- Item # 1: Hydrographic survey H11703 revealed a depth of 36 fathoms in the vicinity of a 24 fathom sounding on chart 17339 located at 57°22'34" N, 134°27'50" W. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.
- Item # 2: Hydrographic survey H11703 revealed a depth of 14 fathoms in the vicinity of a 21 fathom sounding on chart 17339 located at 57°22'45" N, 134°25'44" W. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.
- Item # 3: Hydrographic survey H11703 revealed a depth of 13 fathoms in the vicinity of a 5 fathom sounding on chart 17339 located at 57°22'25" N, 134°24'31" W. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.
- Item # 4: Hydrographic survey H11703 revealed a depth of 21 fathoms in the vicinity of a 11 fathom sounding on chart 17339 located at 57°22'46" N, 134°23'57" W. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.
- Item # 5: Hydrographic survey H11703 revealed a depth of 9 fathoms in the vicinity of a 19 fathom sounding on chart 17339 located at 57°23'10" N, 134°21'34" W. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.
- Item # 6: Hydrographic survey H11703 revealed a depth of 7 fathoms in the vicinity of a 14 fathom sounding on chart 17339 located at 57°22'45" N, 134°23'06" W. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.
- Item # 7: Hydrographic survey H11703 revealed a depth of 31 fathoms in the vicinity of a 9 fathom sounding on chart 17339 located at 57°22'08" N, 134°24'16" W. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.
- Item # 8: Hydrographic survey H11703 revealed a depth of 6 fathoms in the vicinity of a 17 fathom sounding on chart 17339 located at 57°21'35" N, 134°22'26" W. This

area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.

- Item # 9: : Hydrographic survey H11703 revealed a depth of 33 fathoms in the vicinity of a 8 fathom sounding on chart 17339 located at 57°21'18" N, 134°21'54" W. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.
- Item # 10: Hydrographic survey H11703 revealed a depth of 4 fathoms in the vicinity of a 13 fathom sounding on chart 17339 located at 57°20'18" N, 134°19'35" W. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.
- Item # 11: Hydrographic survey H11703 revealed a depth of 6 fathoms in the vicinity of a 17 fathom sounding on chart 17339 located at 57°20'18" N, 134°20'07" W. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.
- Item # 12: : Hydrographic survey H11703 revealed a depth of 30 fathoms in the vicinity of a 14 fathom sounding on chart 17339 located at 57°20'53" N, 134°22'13" W. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.
- Item # 13: Hydrographic survey H11703 revealed a depth of 19 fathoms in the vicinity of a 5 ½ fathom sounding on chart 17339 located at 57°21'35" N, 134°23'39" W. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.
- Item # 14: Hydrographic survey H11703 revealed a depth of 10 fathoms in the vicinity of a 2 fathom sounding on chart 17339 located at 57°22'04" N, 134°24'21" W. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.
- Item # 15: Hydrographic survey H11703 revealed a depth of 14 fathoms in the vicinity of a 32 fathom sounding on chart 17339 located at 57°22'17" N, 134°24'23" W. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.
- Item # 16: Hydrographic survey H11703 revealed a depth of 18 fathoms in the vicinity of a 7 fathom sounding on chart 17339 located at 57°22'28" N, 134°24'47" W. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.
- Item # 17: Hydrographic survey H11703 revealed a depth of 15 fathoms in the vicinity of a 6 fathom sounding on chart 17339 located at 57°22'17" N, 134°25'48" W. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.
- Item # 18: Hydrographic survey H11703 revealed a depth of 16 fathoms in the vicinity of a 8 fathom sounding on chart 17339 located at 57°22'21" N, 134°25'54" W. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.
- Item # 19: Hydrographic survey H11703 revealed a depth of 20.4 fathoms in the vicinity of a 6 fathom sounding on chart 17339 located at 57°22'35" N, 134°28'18" W. This area was surveyed with 100% multibeam coverage. It should be noted that



located approximately 177 meters to the East is a 5 fathom sounding. The shoaling is centered in the area depicted below.

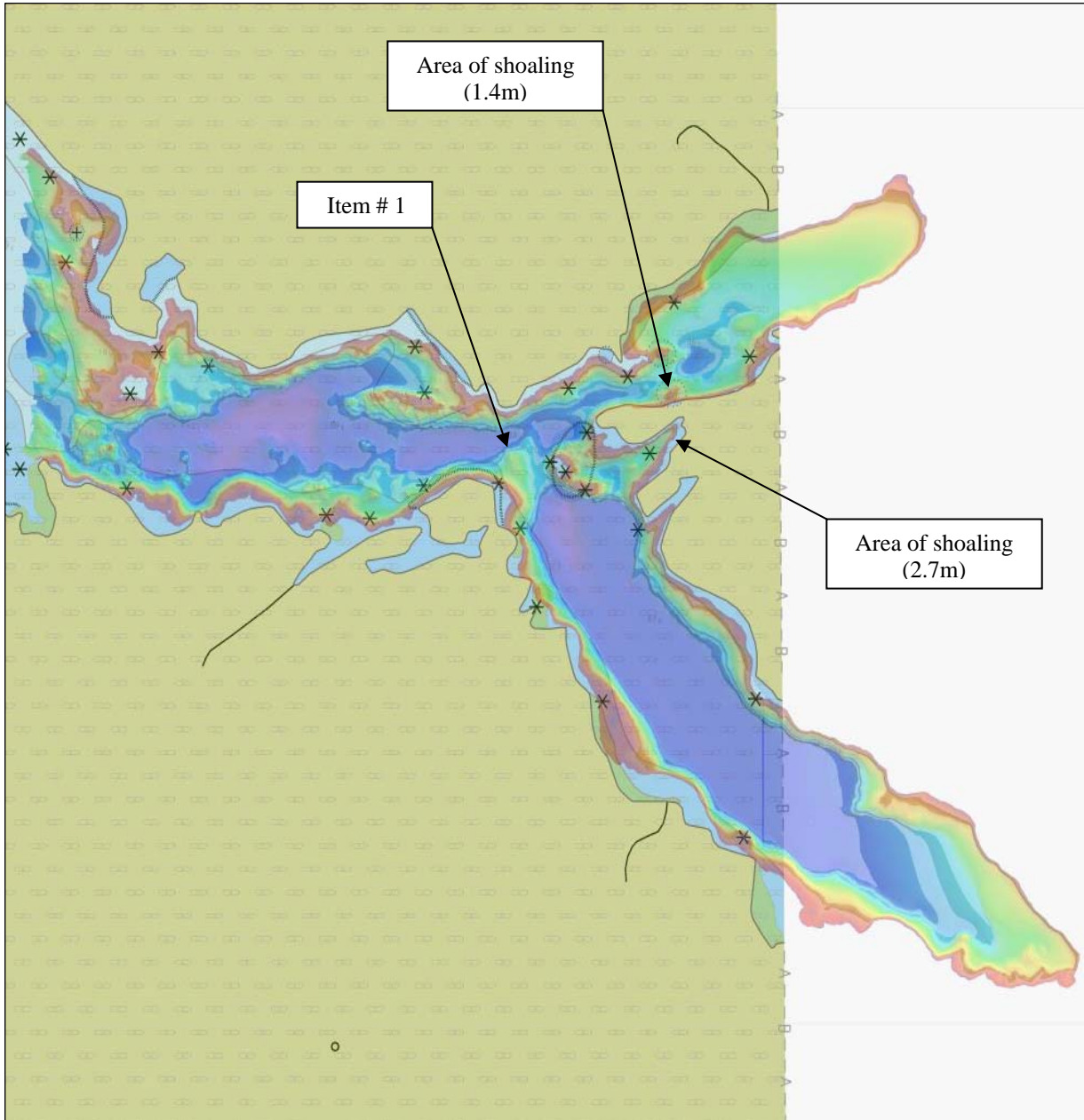


**Figure 6 H11703 Chart Comparison 1 (Chart 17339)**

It should also be noted that the soundings from chart 17320 coincide with the soundings from H11703 to within 1 to 5 fathoms.<sup>15</sup>

In general, the soundings from electronic chart US3AK3BM coincide with the soundings from H11703 to within 5 to 15 meters; areas that do vary to any degree are as follows:

- Item # 1: Hydrographic survey H11703 revealed a depth of 64 meters in the vicinity of a 38.4 meter sounding on electronic chart US3AK3BM located at 57°22'36" N, 134°24'29" W. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.



**Figure 7 H11703 Electronic Chart Comparison (Chart US3AK3BM)**





### Automated Wreck and Observation Information System

There were no AWOIS items assigned to H11703.<sup>16</sup>

### Charted Features

All charted features residing on charts incorporated within H11703 (see Listing of Charts above) were investigated and are as follows:

- (Rep 1992) 6 fathom shoal located at 57°22'35" N and 134°28'18" W; survey lines were conducted to provide 200% coverage over the area. The multibeam data was reviewed in CARIS HIPS and the shoal was not located. H11703 survey did reveal a shoal with a least depth of 4.9 fathoms (8.9 meters) located approximately 177 meters to the East. It is noted as Item # 19 above in Figure 6 H11703 Chart Comparison (Chart 17339). It is recommended that the (Rep 1992) 6 fathom shoal be removed from the charts and the charts updated to reflect the submitted H11703 CARIS BASE Surface.<sup>17</sup>
- 6 to 12 fathoms reported located at 57°22'49" N and 134°25'11" W; survey lines were conducted to provide 200% coverage over the area. The multibeam data was reviewed in CARIS HIPS and least depth of 7.5 fathoms (13.8 meters) was located.<sup>18</sup> It is noted above in Figure 6 H11703 Chart Comparison (Chart 17339).
- Electronic Chart US3AK3BM revealed an isolated 1.4 meter shoal located at 57°22'57" N and 134°23'10" W; survey lines were conducted to provide 200% coverage over the area. The multibeam data was reviewed in CARIS HIPS and the shoal was located with a least depth of 1.7 meters.<sup>19</sup> It is noted as "Area of Shoaling (1.4m)" in Figure 7 H11703 Electronic Chart Comparison (Chart US3AK3BM).
- Electronic Chart US3AK3BM revealed an isolated 2.7 meter shoal located at 57°22'47" N and 134°23'05" W; survey lines were conducted to provide 200% coverage over the area. The multibeam data was reviewed in CARIS HIPS and the shoal was located with a least depth of 2.9 meters.<sup>20</sup> It is noted as "Area of Shoaling (2.7m)" in Figure 7 H11703 Electronic Chart Comparison (Chart US3AK3BM).

### Dangers to Navigation

Eleven Dangers to Navigation were located during the survey of H11703. The Dangers to Navigation were reported on September 11, 2007 and September 14, 2007 (See Appendix I for submitted reports).<sup>21</sup>



### Bottom Samples

The R/Vs R2 and D2 were fitted to obtain bottom samples as specified in the Statement of Work. The purpose of this was to characterize the bottom in charted anchorages and for general bottom classification.

Samples were taken with a Van Veen grab sampler and position was recorded with WinFrog (v3.7.0). Sediment retrieved from the sampler was analyzed and then encoded with the appropriate S57 attributes. Positions and descriptions of all samples are found in the H11703\_S57\_Features file.<sup>22</sup>

### Aids to Navigation

There were no charted aids to navigation in the survey area. No uncharted aids to navigation were found in the survey area.<sup>23</sup>

### Shoreline Verification Results

Remote Sensing Division (RSD) provided the shoreline detail (AK0401B) for this survey. Since the RSD shoreline was the official shoreline source provided by NOAA, primary focus was given to its verification during this survey. However, charted features were investigated if practical as were any significant new features observed during the course of shoreline verification. Significant features were deemed to be those potentially dangerous to navigation and / or seaward of the 4m contour.

Visual inspection during shoreline verification determined the RSD shoreline to be very accurate. RSD foul areas commonly needed some adjustment but the MHW line and point features provided by RSD were particularly good. Any discrepancies are detailed below.

The Hydrographer recommends that the RSD MHW from (AK0401B) supersede previously charted shoreline where any discrepancies occur unless noted below.<sup>24</sup>

The following tables itemize any errors or discrepancies found in the RSD source and charted shoreline. Note that RSD and charted features that were found to be positioned accurately are not itemized here and are not included in the S57 feature file. New features (features not in the RSD source/chart but found during field investigation) do appear in the S57 feature file, but are generally not itemized here.<sup>25</sup>



<b>RSD Source (AK0401B) Changes and Discrepancies</b>				
RSD Feature	RSD Position	Remarks	Actions Taken in S57 Feature File / Recommendations	Applicable DP form(s)
Rock	57 22 30.30 N 134 28 36.91 W	RSD Rock 45277 was positioned corrected but was observed to be an islet.	Remove RSD rock and chart islet as depicted in the S-57 feature file.	JD252_098
Rock	57 23 17.94 N 134 20 13.80 W	RSD Rock 45347 not found through observation.	Do not chart.	JD252_030_R2
Rock	57 23 10.61 N 134 27 34.53 W	RSD Rock 45279 not found, full MBES coverage at position.	Do not chart.	N/A

<b>Charted Feature Changes and Discrepancies</b>				
Chart No. and Feature	Charted Position	Remarks	Recommendations	Applicable DP form(s)
17339 Rock	57 22 30.30 N 134 28 36.91 W	Charted rock was positioned corrected but should be charted as an islet.	Remove RSD rock and chart islet as depicted in the S-57 feature file.	JD252_098
17339 Ledge	Centered at: 57 22 25.79 N 134 28 28.86 W	Ledge exists but doesn't conform to MBES data and was observed to extend beyond the charted ledge extents.	Remove existing ledge and chart ledge as depicted in the S-57 feature file.	JD252_103 JD252_105
US3AK3BM Rock	57 22 24.61 N 134 27 59.26 W	Charted rock not found, full MBES coverage at position.	Remove.	N/A
17339 Ledge	Centered at: 57 22 15.11 N 134 27 39.64 W	Ledge exists but doesn't conform to MBES data.	Remove existing ledge and chart ledge as depicted in the S-57 feature file.	N/A
17339 Ledge	Extents: 57 22 16.26 N 134 27 15.07 W  57 22 13.18 N 134 26 03.33 W	Ledge was observed to be two separate ledges and doesn't conform to the MBES data.	Remove existing ledge and chart two ledges as depicted in the S-57 feature file.	JD252_119 JD252_122



<b>Charted Feature Changes and Discrepancies</b>				
Chart No. and Feature	Charted Position	Remarks	Recommendations	Applicable DP form(s)
US3AK3BM Rock	57 22 17.45 N 134 26 11.84 W	Charted rock not found, full MBES coverage at position.	Remove.	N/A
US3AK3BM Rock	57 22 16.38 N 134 25 48.37 W	Charted rock not found, full MBES coverage at position.	Remove.	N/A
17339 Ledge	Centered at: 57 22 16.46 N 134 25 23.32 W	Ledge exists but doesn't conform to MBES data.	Remove existing ledge and chart ledge as depicted in the S-57 feature file.	N/A
US3AK3BM Rock	57 22 24.59 N 134 25 19.28 W	Charted rock not found, full MBES coverage at position.	Remove.	N/A
17339 Ledge	Centered at: 57 22 24.73 N 134 24 43.06 W	Ledge exists but doesn't conform to MBES data.	Remove existing ledge and chart ledge as depicted in the S-57 feature file.	N/A
US3AK3BM Rock	57 22 25.17 N 134 24 38.71 W	Charted rock not found, full MBES coverage at position.	Remove.	N/A
US3AK3BM Rock	57 22 13.58 N 134 24 27.37 W	Charted rock not found, full MBES coverage at position.	Remove.	N/A
17339 Ledge	Centered at: 57 22 08.97 N 134 24 27.16 W	Through observation and partial MB coverage the ledge was not found.	Remove.	JD252_142
17339 Shoal	Centered at: 57 21 57.42 N 134 24 15.18 W	Shoal boundary is inaccurate in reference to the MBES data.	Revise shoal boundary to conform to MBES data.	N/A
17339 Shoal	Extents: 57 21 42.49 N 134 23 59.27 W  57 20 57.69 N 134 22 54.41 W	Shoal boundary is inaccurate in reference to the MBES data.	Revise shoal boundary to conform to MBES data.	N/A



Charted Feature Changes and Discrepancies				
Chart No. and Feature	Charted Position	Remarks	Recommendations	Applicable DP form(s)
US3AK3BM Rock	57 21 29.56 N 134 23 43.58 W	Charted rock not found, full MBES coverage at position.	Remove.	N/A
US3AK3BM Rock	57 21 29.78 N 134 22 21.34 W	Charted rock not found, full MBES coverage at position.	Remove.	N/A
US3AK3BM Rock	57 22 12.78 N 134 23 23.98 W	Charted rock not found, full MBES coverage at position.	Remove.	N/A
US3AK3BM Rock <sup>26</sup>	57 22 32.14 N 134 23 17.17 W	Charted rock not found, full MBES coverage at position.	Remove.	N/A
17339 Rock <sup>27</sup>	57 22 32.14 N 134 23 17.17 W	Charted rock not found, full MBES coverage at position.	Remove.	JD252_165
17339 Ledge	Centered at: 57 22 32.51 N 134 23 59.38 W	Ledge exists but doesn't conform to MBES data.	Remove existing ledge and chart ledge as depicted in the S-57 feature file.	N/A
17339 & US3AK3BM Foul/Obstruction	Centered at: 57 22 32.28 N 134 23 57.09 W	Charted foul/obstruction not found, full MBES coverage at position.	Remove.	N/A
US3AK3BM Rock	57 22 37.54 N 134 23 51.05 W	Charted rock not found, full MBES coverage at position.	Remove.	N/A
US3AK3BM Rock	57 22 56.39 N 134 22 22.89 W	Charted rock not found, full MBES coverage at position.	Remove.	N/A
17339 Shoal	Extents: 57 23 38.88 N 134 20 52.86 W  57 22 56.68 N 134 23 27.67W	Shoal boundary is inaccurate in reference to the MBES data.	Revise shoal boundary to conform to MBES data.	N/A



<b>Charted Feature Changes and Discrepancies</b>				
Chart No. and Feature	Charted Position	Remarks	Recommendations	Applicable DP form(s)
US3AK3BM Rock	57 23 10.08 N 134 23 03.53 W	Charted rock not found, full MBES coverage at position.	Remove.	N/A
US3AK3BM Rock	57 22 51.59 N 134 23 28.80 W	Charted rock not found, full MBES coverage at position.	Remove.	N/A
US3AK3BM Rock	57 22 48.87 N 134 24 00.77 W	Charted rock not found, full MBES coverage at position.	Remove.	N/A
17339 Ledge	Centered at: 57 22 43.78 N 134 24 38.95 W	Ledge exists but doesn't conform to MBES data.	Remove existing ledge and chart ledge as depicted in the S-57 feature file.	N/A
17339 Ledge	Centered at: 57 22 47.86 N 134 24 49.49 W	Ledge exists but doesn't conform to MBES data.	Remove existing ledge and chart ledge as depicted in the S-57 feature file.	N/A
US3AK3BM Rock	57 22 48.03 N 134 25 18.30 W	Charted rock not found, full MBES coverage at position.	Remove.	N/A
US3AK3BM Rock	57 22 59.58 N 134 25 23.35 W	Charted rock not found, full MBES coverage at position.	Remove.	N/A
US3AK3BM Rock	57 22 55.19 N 134 27 14.86 W	Charted rock not found, full MBES coverage at position.	Remove.	N/A
US3AK3BM Rock	57 22 58.90 N 134 27 41.53 W	Charted rock not found, full MBES coverage at position.	Remove.	N/A
17339 Rock	57 22 49.21 N 134 27 41.34 W	Charted rock not found, full MBES coverage at position.	Remove.	N/A
17339 Rock	57 22 45.02 N 134 28 07.64 W	Charted rock not found, full MBES coverage at position.	Remove.	N/A



Charted Feature Changes and Discrepancies				
Chart No. and Feature	Charted Position	Remarks	Recommendations	Applicable DP form(s)
17339 Rock <sup>28</sup>	57 22 49.35 N 134 28 21.75 W	Charted rock not found, full MBES coverage at position.	Remove.	N/A
17339 Ledge	Extents:  57 23 02.14 N 134 27 47.14 W  57 23 15.90 N 134 28 16.51 W  57 23 33.51 N 134 28 00.10 W  57 23 42.71 N 134 28 26.92 W	Ledge exists but doesn't conform to MBES data.	Remove existing ledge and chart ledge as depicted in the S-57 feature file.	N/A
17339 Rock <sup>29</sup>	57 23 19.87 N 134 28 42.06 W	Charted rock not found, full MBES coverage at position.	Remove.	N/A
US3AK3BM Rock	57 23 21.83 N 134 28 31.25 W	Charted rock not found, full MBES coverage at position.	Remove.	N/A
17339 Rocks (4)	Centered at:  57 23 25.56 N 134 28 25.00 W	Charted submerged rocks not found, full MBES coverage at position.	Remove.	N/A
17339 Rock	57 23 25.78 N 134 28 10.86 W	Charted rock not found, full MBES coverage at position.	Remove.	N/A
17339 Ledge	Centered at:  57 23 28.02 N 134 28 17.93 W	Charted ledge not found, full MBES coverage at position.	Remove.	N/A
17339 Rock	57 23 33.71 N 134 28 17.89 W	Charted rock not found, full MBES coverage at position.	Remove.	N/A
US3AK3BM Rock	57 23 29.42 N 134 28 25.21 W	Charted submerged rock not found, full MBES coverage at position.	Remove.	N/A



Charted Feature Changes and Discrepancies				
Chart No. and Feature	Charted Position	Remarks	Recommendations	Applicable DP form(s)
17339 Rock	57 23 35.71 N 134 28 35.71 W	Charted rock not found, full MBES coverage at position.	Remove.	N/A
17339 Rock	57 23 36.12 N 134 28 31.28 W	Charted rock not found, full MBES coverage at position.	Remove.	N/A
US3AK3BM Rock	57 23 43.36 N 134 28 39.64 W	Charted rock not found, full MBES coverage at position.	Remove.	N/A





## Shoreline Correlator Sheet

ArcMap (v9.2) with the Shoreline Correlator add-on, written by the Fugro Pelagos Inc. GIS department, aided in the processing of the investigation results. The Correlator utilized the WinFrog log files to create an individual DP form for all acquired DPs. The Correlator was mapped to the log file, tide file, photos, NOAA Chart (largest scale available), and CARIS BASE Surfaces to calculate and display the desired information for each DP. The DP forms and raw field records can be found on the Project USB Drive under; OPR-O322-KR-07\H11703\Final\_Deliverables\Reports\Descriptive Report\H11703 Shoreline.

**DP ITEM NUMBER : JD252\_098**

DP Form

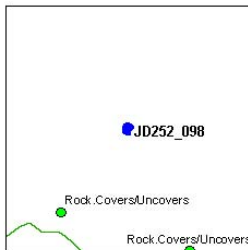
Date: 09 September, 2007  
Julian Day: 252  
UTC Time: 16:10:27  
Latitude: 57 22 33.49 N  
Longitude: 134 28 39.90 W  
Northing: 6359358.89  
Easting: 531404.78  
Raw (+Depth) or (-Height) (m): -5.00  
Draft Corrector (m): N/A  
SV Corrector (m): N/A  
Tide Corrector (m): 0.26  
Corrected to MLLW (m): -5.26  
Corrected to MLLW (fathoms): -2.88  
Corrected to MLLW (feet): -17.26  
DP Comment: J45277 and chl'drk ok should be an islet pic #101-0784

Correlating DP Item Numbers:  
N/A N/A  
N/A N/A

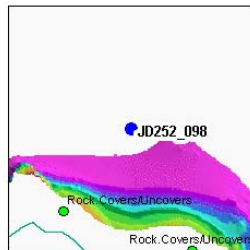
Correlating MB Least Depth:  
None

Remarks/Recommendations:  
RSD Rock 45277 positioned correctly but was observed to be an islet. Remove RSD rock and chart as islet as depicted in the S-57 feature file.

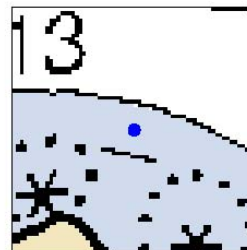
Chart: 17339\_1 Topo: Carto Code: None



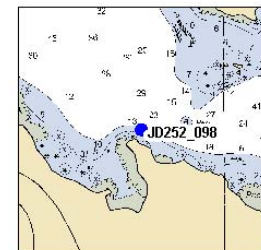
200m x 200m



200m x 200m



200m x 200m



2000m x 2000m



## E – Approval Sheet

### Approval Sheet

For

**H11703**

Standard field surveying and processing procedures were followed in producing this survey in accordance with the following documents:

OPR-O322-KR-07 Statement of Work and 2007 Specifications & Deliverables;  
Fugro Pelagos, Inc. Acquisition Procedures (2007- NOAAAcquisitionProcedures);  
Fugro Pelagos, Inc. Processing Procedures (2007-NOAAProcessingProcedures);

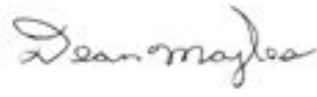
The data were reviewed daily during acquisition and processing.

This report has been reviewed and approved. All records are forwarded for final review and processing to the Chief, Pacific Hydrographic Branch.

Approved and forwarded,

Dean Moyles,  
Lead Hydrographer  
Fugro Pelagos, Inc. Survey Party

 Invalid signature

X 

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Dean Moyles  
ACSM Certified



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

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- <sup>1</sup> Do not concur. The bounding box of the survey has the following corners;  
SW – 57-20-12.282N, 134-29-02.019W NE – 57-23-54.692N, 134-19-02.603W
- <sup>2</sup> Filed with project records.
- <sup>3</sup> Concur.
- <sup>4</sup> Concur.
- <sup>5</sup> During compilation, a junction was made with H11702 which has already been compiled and submitted.
- <sup>6</sup> Concur.
- <sup>7</sup> Concur.
- <sup>8</sup> Concur with clarification. A 5m combined surface was created during the Survey Acceptance Review and was the basis of compilation. See Survey Acceptance Review Checklist filed with hydrographic records.
- <sup>9</sup> Concur.
- <sup>10</sup> Filed with project records.
- <sup>11</sup> Concur.
- <sup>12</sup> Charts used during compilation were Chart 17339, 12<sup>th</sup> Ed., August 2007 and Chart 17320, 18<sup>th</sup> Ed., March 2008.
- <sup>13</sup> Concur with clarification. ENC US3AK3UM covers the remaining portion of the survey area not covered by US3AK3BM.
- <sup>14</sup> Concur. Compiler agrees with field chart comparison. Supersede charted data in the common area.
- <sup>15</sup> Concur. Compiler agrees with field chart comparison. Supersede charted data in the common area.
- <sup>16</sup> Concur with clarification. There were no AWOIS items located within the limits of H11703.
- <sup>17</sup> Concur.
- <sup>18</sup> Concur with clarification. Update charts with survey depths and features included in the HCell.
- <sup>19</sup> Concur with clarification. Update charts with survey depths and features included in the HCell.
- <sup>20</sup> Concur with clarification. Update charts with survey depths and features included in the HCell.
- <sup>21</sup> Concur with clarification. There were 16 DTONs reported from H11703. All 16 reported DTONs have been charted and all are included in the HCell.
- <sup>22</sup> Eleven bottom samples were collected during H11703 and 9 are included in the HCell. Three charted bottom samples were blue noted to be retained.
- <sup>23</sup> Concur.
- <sup>24</sup> Concur.
- <sup>25</sup> Concur with clarification. All items addressed in the tables have been reviewed during compilation and are either included in the HCell or have been blue noted to be removed or modified as appropriate.
- <sup>26</sup> Charted rock is located at 57-22-30.377N, 134-23-50.021W as indicated in the DP form. Compiler concurs with recommendation to remove rock.
- <sup>27</sup> Charted rock is located at 57-22-30.377N, 134-23-50.021W as indicated in the DP form. Compiler concurs with recommendation to remove rock.
- <sup>28</sup> No charted rock exists at this position. No action required.
- <sup>29</sup> No charted rock exists at this position. No action required.

**Hydrographic Survey Registry Number: H11703**

**Survey Title:**           **State:**                   **ALASKA**  
                                 **Locality:**               **Chatham Strait**  
                                 **Sub-locality:**           **North and South Arm Hood Bay**

**Project Number: OPR-O322-KR-07**

**Survey Dates: May-June & August-September, 2007**

Depths are reduced to Mean Lower Low Water using preliminary tides.

Positions are based on the NAD83 horizontal datum.

**Charts Affected:**

Chart No.	Scale	Edition	Edition Date
16016	969,756	20th	Nov. 2003
17320	217,828	17th	Nov. 2005
17339	30,000	11th	Mar. 1998

**DANGER TO NAVIGATION:**

<b>Feature</b>	<b>Depth (fms ft)</b>	<b>Latitude</b>	<b>Longitude</b>
Sounding	4 fms 5 ft	57-22-34.55N	134-28-07.86W
Sounding	7 fms 2 ft	57-22-38.23N	134-28-18.01W
Sounding	8 fms 3 ft	57-22-24.05N	134-26-15.45W
Rock	"awash"	57-22-22.98N	134-23-52.19W
Sounding	8 fms 5 ft	57-20-29.13N	134-20-29.15W
Sounding	8 fms 0 ft	57-20-23.25N	134-19-55.01W
Sounding	6 fms 3 ft	57-21-04.26N	134-21-10.84W
Rock	1 fms 3 ft	57-22-47.23N	134-23-05.47W
Rock	0 fms 5 ft	57-22-57.29N	134-23-10.78W
Sounding	3 fms 0 ft	57-22-59.49N	134-22-16.91W

**COMMENTS:**

Questions concerning this report should be directed to the Chief, Pacific Hydrographic Branch at (206) 526-6835.

**Hydrographic Survey Registry Number: H11703**

**Survey Title:**           **State:**                   **ALASKA**  
                                 **Locality:**               **Chatham Strait**  
                                 **Sub-locality:**           **North and South Arm Hood Bay**

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17339	30,000	11th	Mar. 1998

**DANGER TO NAVIGATION:**

<b>Feature</b>	<b>Depth (fms ft)</b>	<b>Latitude</b>	<b>Longitude</b>
----------------	-----------------------	-----------------	------------------

Area of shoaling in North Arm:

Sounding	0 fms 5 ft	57-23-11.04N	134-21-24.59W
Sounding	0 fms 2 ft	57-23-13.12N	134-21-23.03W
Sounding	0 fms 3 ft	57-23-16.64N	134-21-04.36W
Sounding	0 fms 2 ft	57-23-26.18N	134-20-47.57W
Sounding	0 fms 0 ft	57-23-31.16N	134-20-47.03W
Sounding	0 fms 2 ft	57-23-33.76N	134-20-51.25W

**COMMENTS:** PHB: The field unit found significant shoaling in the eastern end of North Arm. PHB recommends adding a cautionary note to the chart.

Deeper soundings inshore of the soundings noted above should be removed from the chart.

Questions concerning this report should be directed to the Chief, Pacific Hydrographic Branch at (206) 526-6835.

**H11703 HCell Report**  
Katie Reser, Physical Scientist  
Pacific Hydrographic Branch

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

HCell compilation of survey H11703 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 H11703 were compiled to the largest scale raster charts shown below:

Chart	Scale	Edition	Edition Date	NTM Date
17339	1:30,000	12th	08/01/2007	09/26/2009

The following ENC's were also used during compilation:

Chart	Scale
US3AK3BM	1:217,828
US3AK3UM	1:217,828

**3. Soundings**

A survey-scale sounding (SOUNDG) feature object layer was built from the 5-meter combined surface in CARIS BASE Editor. A shoal-biased selection was made at 1:7,500 survey scale using a Radius Table file with values shown in the table, below.

Shoal Limit (m)	Deep Limit (m)	Radius (mm)
0	10	3
10	20	4
20	50	4.5
50	400	5

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

#### 4. Depth Contours

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

Chart Contour Intervals in Fathoms from Chart 17339	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 H11703_SS.000
0	0	0.000	0.000	0
3	5.4864	5.715	3.125	3
10	18.288	18.517	10.125	10
50	91.44	92.812	50.750	50

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, COALNE and SBDARE objects 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 H11703:

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
COALNE	GC coastline
DEPCNT	Zero contours defining intertidal area features
LNDARE	Islet
LNDELV	Height on islet
M_QUAL	Data quality Meta object
PILPNT	Ruined pile
SBDARE	Ledges and reef, bottom samples, and rocky seabed areas
SOUNDG	Soundings at the chart scale density
UWTROC	Rock features
WEDKLP	Kelp features

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

H11703 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

H11703_CS.000	Base Cell File, Chart Units, Soundings and features compiled to 1:30,000
H11703_SS.000	Base Cell File, Chart Units, Soundings and Contours compiled to 1:7,500
H11703_DR.pdf	Descriptive Report including end notes compiled during office processing and certification, the HCell Report, and supplemental items
H11703_Outline.gml	Survey outline
H11703_Outline.xsd	Survey outline

## 11.2 Software

CARIS HIPS Ver. 6.1	Inspection of Combined BASE Surfaces
CARIS BASE Editor Ver. 2.2	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. 2.0	Final compilation of the HCell, correct geometry and build topology, apply final attributes, export the HCell, and QA.
CARIS GIS 4.4a	Setting the sounding rounding variable for conversion of the metric HCell to NOAA charting units with NOAA rounding.
CARIS HOM Ver. 3.3	Perform conversion of the metric HCell to NOAA charting units with NOAA rounding.
HydroService AS, dKart Inspector Ver. 5.1	Validation of the base cell file.
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  
H11703

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.