

H11718

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey Hydrographic Survey

Field No. N/A

Registry No. H11718

LOCALITY

State Alaska

General Locality Akutan Pass

Sublocality Beaver Inlet

2007

CHIEF OF PARTY
DEAN MOYLES

LIBRARY & ARCHIVES

DATE

<p style="text-align: center;">U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION</p> <p style="text-align: center;">HYDROGRAPHIC TITLE SHEET</p>	<p>REGISTRY No</p> <p style="text-align: center;">H11718</p>
<p>INSTRUCTIONS – The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.</p>	<p>FIELD No: N/A</p>
<p>State <u>Alaska</u></p> <p>General Locality <u>Akutan Pass</u></p> <p>Sub-Locality <u>Beaver Inlet</u></p> <p>Scale <u>1:10,000</u> Date of Survey <u>June 15 to July 15, 2007</u></p> <p>Instructions dated <u>6/15/2006</u> Project No. <u>OPR-Q191-KR-07</u></p> <p>Vessel <u>R/V Davidson (1066485) , R/V R2 (623241), R/V D2 (647782)</u></p> <hr/> <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 & D2 - HULL MOUNT), RESON 8111 (DAVIDSON - HULL MOUNT)</u></p> <p>SAR by <u>Annie Raymond</u> Compilation by <u>Annie Raymond</u></p> <p>Soundings compiled in <u>Fathoms</u></p>	
<p>REMARKS: <u>All times are UTC. UTM Zone 3N</u></p> <p><u>The purpose of this survey is to provide contemporary surveys to update National Ocean Service (NOS) nautical charts. All separates are filed with the hydrographic data. Revisions and end notes in red were generated during office processing. Page numbering may be interrupted or non sequential.</u></p> <hr/> <p><u>All pertinent records for this survey, including the Descriptive Report, are archived at the National Geophysical Data Center (NGDC) and can be retrieved via http://www.ngdc.noaa.gov/.</u></p>	



A - Area Surveyed

H11718 (Sheet G) is bound by the coordinates listed below, which encompasses Beaver Inlet.

Hydrographic data collection began on June 15, 2007 and ended on July 15, 2007.

Table 1 – H11718 Sheet Limits

Sheet Limits H11718 Sheet G Scale 1:10,000		
Point #	Positions on NAD83	
	Degrees Latitude (N)	Degrees Longitude (W)
1	53-49-22.80 N	166-10-29.64 W
2	53-49-22.80 N	166-17-25.08 W
3	53-54-45.72 N	166-17-25.08 W
4	53-54-45.72 N	166-10-29.64 W

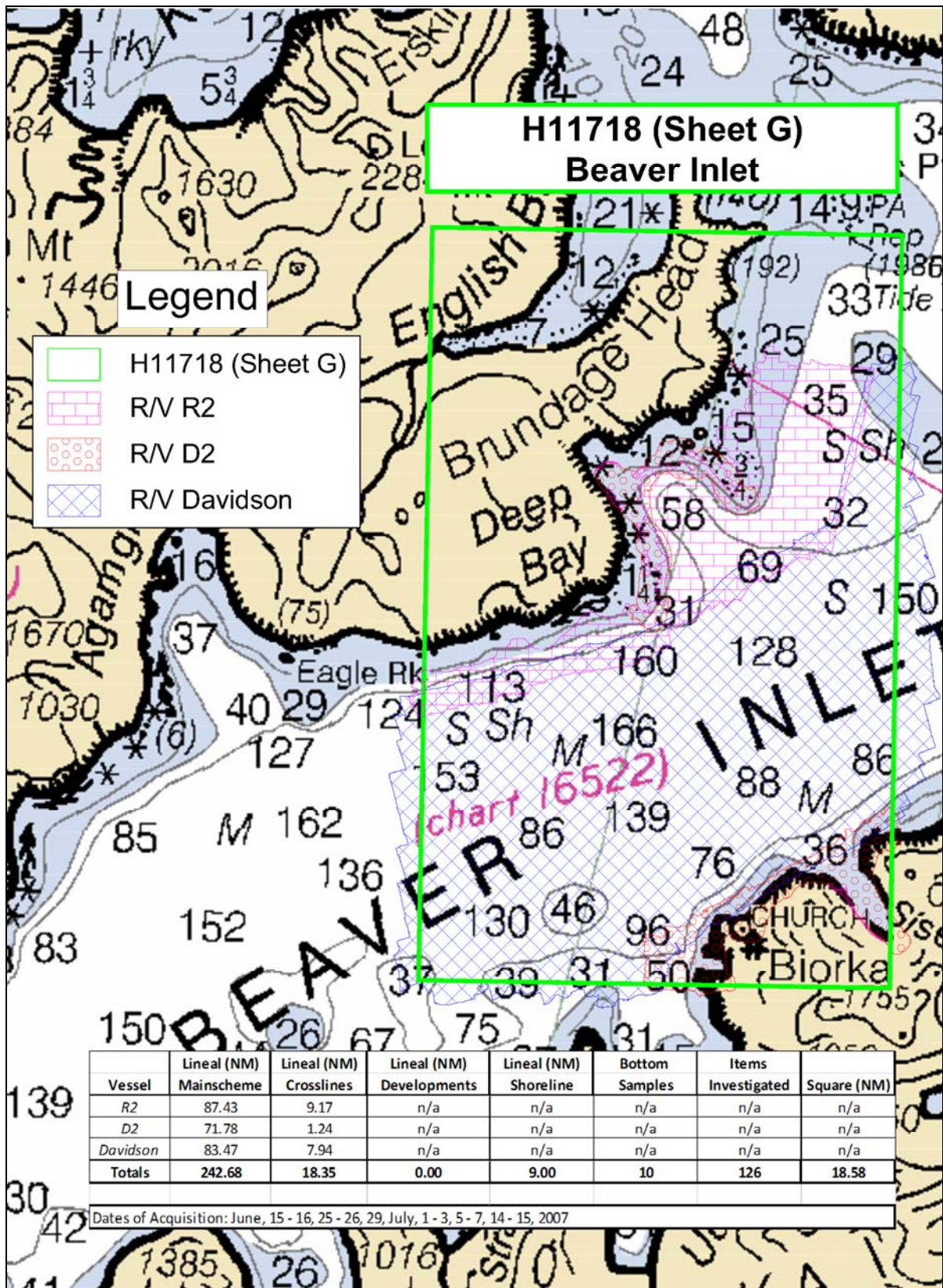


Figure 1 H11718 Area Surveyed



B – Data Acquisition & Processing

Refer to the OPR-Q191-KR-07 Data Acquisition and Processing Report 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

The R/V Davidson, R/V R2, and R/V D2 acquired all soundings for H11718. The R/V Davidson, 175 feet in length with a draft of 17.75 feet, was equipped with a 100 kHz Reson 8111 with option 033 (pseudo Side Scan) for multibeam data acquisition. 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. 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-Q191-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 18.35 nautical miles or 7.56 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. ¹

The majority of beams that fall below the 95 percent confidence level are located in areas having extremely steep slopes and/or rocks². Figures 2 and 3 below provide examples.

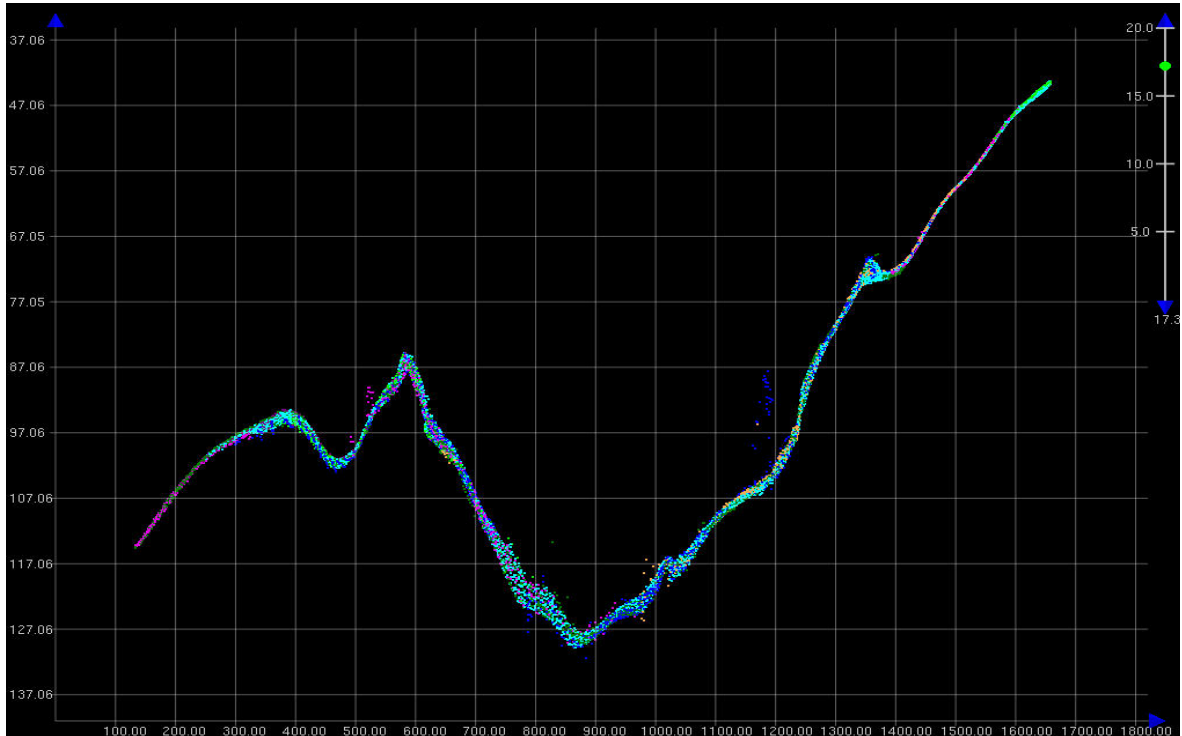


Figure 2 Profile of 2G03-TIE01

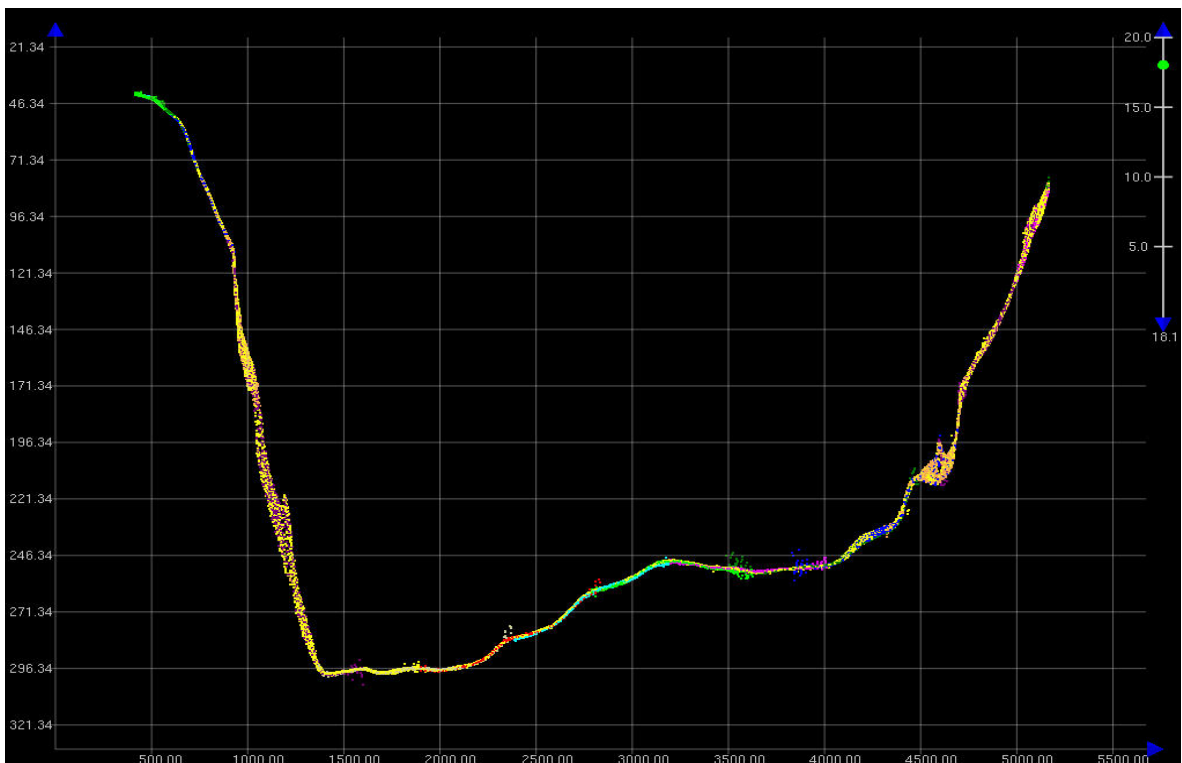


Figure 3 Profile of 3G02-TIE02

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 = 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 H11718 had an uncertainty of about 0.20 to 0.50 meters, except for the deep water areas having extremely steep slopes or deemed to be rocky, where values ranged from 0.60 meters and greater. No uncertainty values were greater than the IHO level Order 1.³

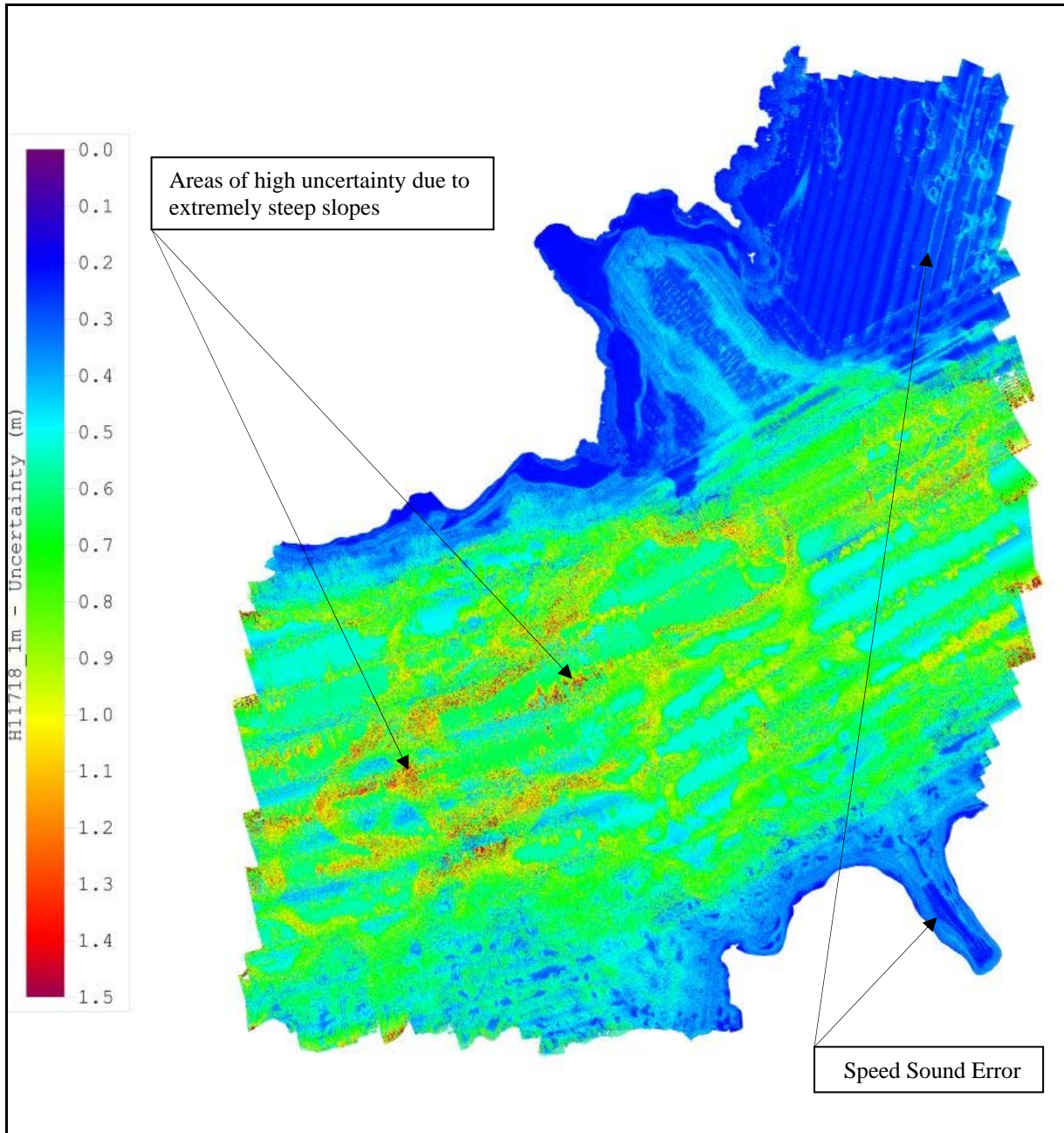


Figure 4 H11718 Uncertainty DTM

Survey Junctions

H11718 (Sheet G) junctions with⁴:

Registry #	Scale	Date	Junction Side
H11715	1:10,000	2007	North
H11717	1:10,000	2007	East

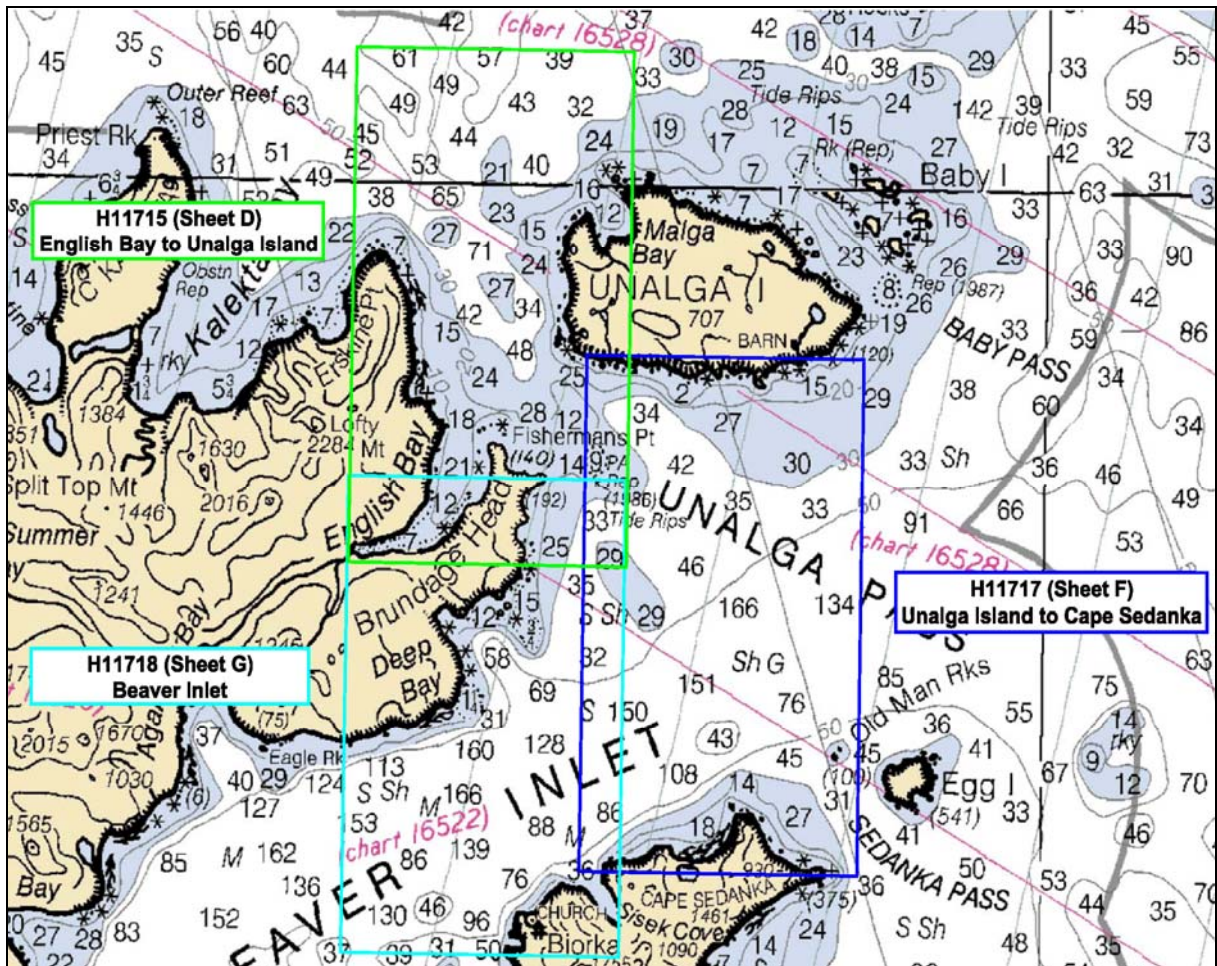


Figure 5 H11718 Survey Junctions

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.⁵

Quality Control Checks

During the hydrographic survey OPR-Q191-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 8101 (R2 & D2), and 8111 (Davidson) 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 H11718 was excellent. Two notable problems follow:

- 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.⁶
- During routine processing, tidal offsets were noticed in the survey area. In addition to tide gauge information, GPS heights from the survey vessels were examined and used to derive final tide zoning and to provide a better understanding of the tides within this area. No uncertainty values were greater than the IHO level Order 1.⁷

Corrections to Echo Soundings

Refer to the OPR-Q191-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-Q191-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 H11718 is called H11718, and it contains five different BASE surfaces of different resolutions. To ensure sufficient overlap between these surfaces the follow parameters were used:

Depth Threshold: 0 to 35 meters, resolution = 1m, Name in BASE Surface H11718_1m
Depth Threshold: 30 to 45 meters, resolution = 2m, Name in BASE Surface H11718_2m
Depth Threshold: 40 to 60 meters, resolution = 4m, Name in BASE Surface H11718_4m
Depth Threshold: 50 to 150 meters, resolution = 5m, Name in BASE Surface H11718_5m
Depth Threshold: 130 to Max depth, resolution = 10m, Name in BASE Surface H11718_10m

The final S57 file for this project is called "H11718_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.⁸

C – Horizontal & Vertical Control

Refer to the OPR-Q191-KR-07 Horizontal and Vertical Control Report 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. John Oswald and Associates LLC (JOA) established two local control points: station "Malga A" and station "Malga B" in Malga Bay on Unalga Island, AK. Refer to Appendix II in the "OPR-Q191-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 Station**

Station	ID	Latitude	Longitude	Freq.	Tx. Rate
Cold Bay, AK USCG	898	55°11'25" N	162°42'24"W	289	100BPS

Vertical Control

All sounding data were initially reduced to mean lower low water (MLLW) using unverified tidal data from two tide stations located in Reef Bight and Biorka Village, 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	Gauge Type	Location	Latitude	Longitude	Operational
9462645	Sutron Xpert/Paroscientific Digiquartz (DAA H355 digital bubbler gauge)	Biorka Village, AK	53°49'44"N	166°12'59" W	June-August
9462662	Seabird SBE26 (w/submersible pressure gauge)	Reef Bight, AK	54°09'25"N	166°04'24" W	June-August

TIDES

All sounding data were reduced to MLLW initially using unverified tidal data from the two tide stations located in Reef Bight and Biorka Village, 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.

January 10, 2008, JOA issued verified tidal data and final zoning for OPR-Q191-KR-07. 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 Report in Appendix I, in the "OPR-Q191-KR-07 Horizontal & Vertical Control Report". 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.⁹

During the OPR-Q191-KR-07 survey there were some unusual conditions regarding tidal information to note. Refer to the "OPR-Q191-KR-07 Horizontal & Vertical Control Report", Appendix I, for a more detailed description (Tidal Zoning for Krenitzens.doc) and tidal data.

¹⁰



D – Results and Recommendations

Chart Comparison¹¹

H11718 survey was compared with charts:

Chart No.	Scale	Edition	Edition Date
16522	40,000	6th	Feb. 2004
16528 ¹²	40,000	16th	Jun. 1998
16520 ¹³	300,000	22nd	Mar. 2004

Note: Electronic Charts US3AK61M and US5AK6CM

Comparison of Soundings¹⁴

In general, the soundings from chart 16522 coincide with the soundings from H11718 to within 1 to 5 fathoms; areas that do vary to any degree are as follows:

- Item # 1: Hydrographic survey H11718 revealed a depth of 62 fathoms in the vicinity of a 86 fathom sounding on chart 16522 located at 53°51'54" N, 166°16'35" W. This comparison can also be found on Chart 16528, Item # 8. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.
- Item # 2: Hydrographic survey H11718 revealed a depth of 132 fathoms in the vicinity of a 144 fathom sounding on chart 16522 located at 53°50'07" N, 166°16'04" W. This comparison can also be found on Chart 16528, Item # 6. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.
- Item # 3: Hydrographic survey H11718 revealed a depth of 95 fathoms in the vicinity of a 111 fathom sounding on chart 16522 located at 53°49'20" N, 166°16'15" W. This comparison can also be found on Chart 16528, Item # 5. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.
- Item # 4: Hydrographic survey H11718 revealed a depth of 116 fathoms in the vicinity of a 132 fathom sounding on chart 16522 located at 53°51'32" N, 166°12'04" W. This comparison can also be found on Chart 16528, Item # 2. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.

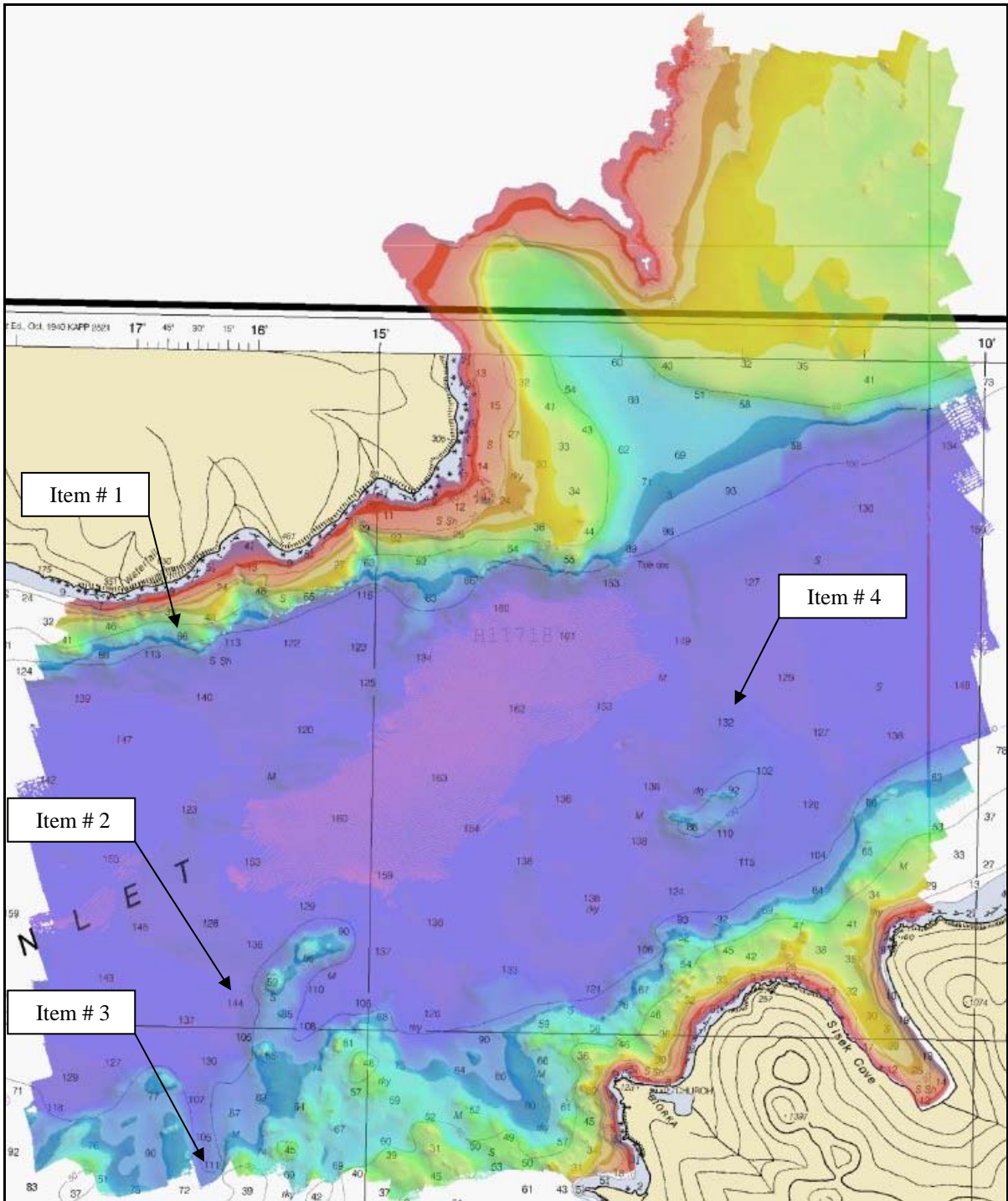


Figure 6 H11718 Chart Comparison (Chart 16522)

In general, the soundings from chart 16528 coincide with the soundings from H11718 to within 1 to 5 fathoms; areas that do vary to any degree are as follows:

- Item # 1: Hydrographic survey H11718 revealed a depth of 13 fathoms in the vicinity of a 5 ¾ fathom sounding on chart 16528 located at 53°53'11" N, 166°14'09" W. This area was surveyed with 100% multibeam coverage.¹⁵
- Item # 2: Hydrographic survey H11718 revealed a depth of 115 fathoms in the vicinity of a 132 fathom sounding on chart 16528 located at 53°51'31" N, 166°12'03" W. This comparison can also be found on Chart 16522, Item # 4. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.
- Item # 3: Hydrographic survey H11718 revealed a depth of 129 fathoms in the vicinity of a 138 fathom sounding on chart 16528 located at 53°50'55" N, 166°12'38" W. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.
- Item # 4: Hydrographic survey H11718 revealed a depth of 97 fathoms in the vicinity of a 109 fathom sounding on chart 16528 located at 53°49'45" N, 166°16'04" W. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.
- Item # 5: Hydrographic survey H11718 revealed a depth of 92 fathoms in the vicinity of a 111 fathom sounding on chart 16528 located at 53°49'19" N, 166°16'13" W. This comparison can also be found on Chart 16522, Item # 3. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.
- Item # 6: Hydrographic survey H11718 revealed a depth of 131 fathoms in the vicinity of a 144 fathom sounding on chart 16528 located at 53°50'07" N, 166°16'03" W. This comparison can also be found on Chart 16522, Item # 2. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.
- Item # 7: Hydrographic survey H11718 revealed a depth of 121 fathoms in the vicinity of a 136 fathom sounding on chart 16528 located at 53°50'23" N, 166°15'55" W. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.
- Item # 8: Hydrographic survey H11718 revealed a depth of 61 fathoms in the vicinity of a 86 fathom sounding on chart 16528 located at 53°51'54" N, 166°16'34" W. This comparison can also be found on Chart 16522, Item # 1. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.

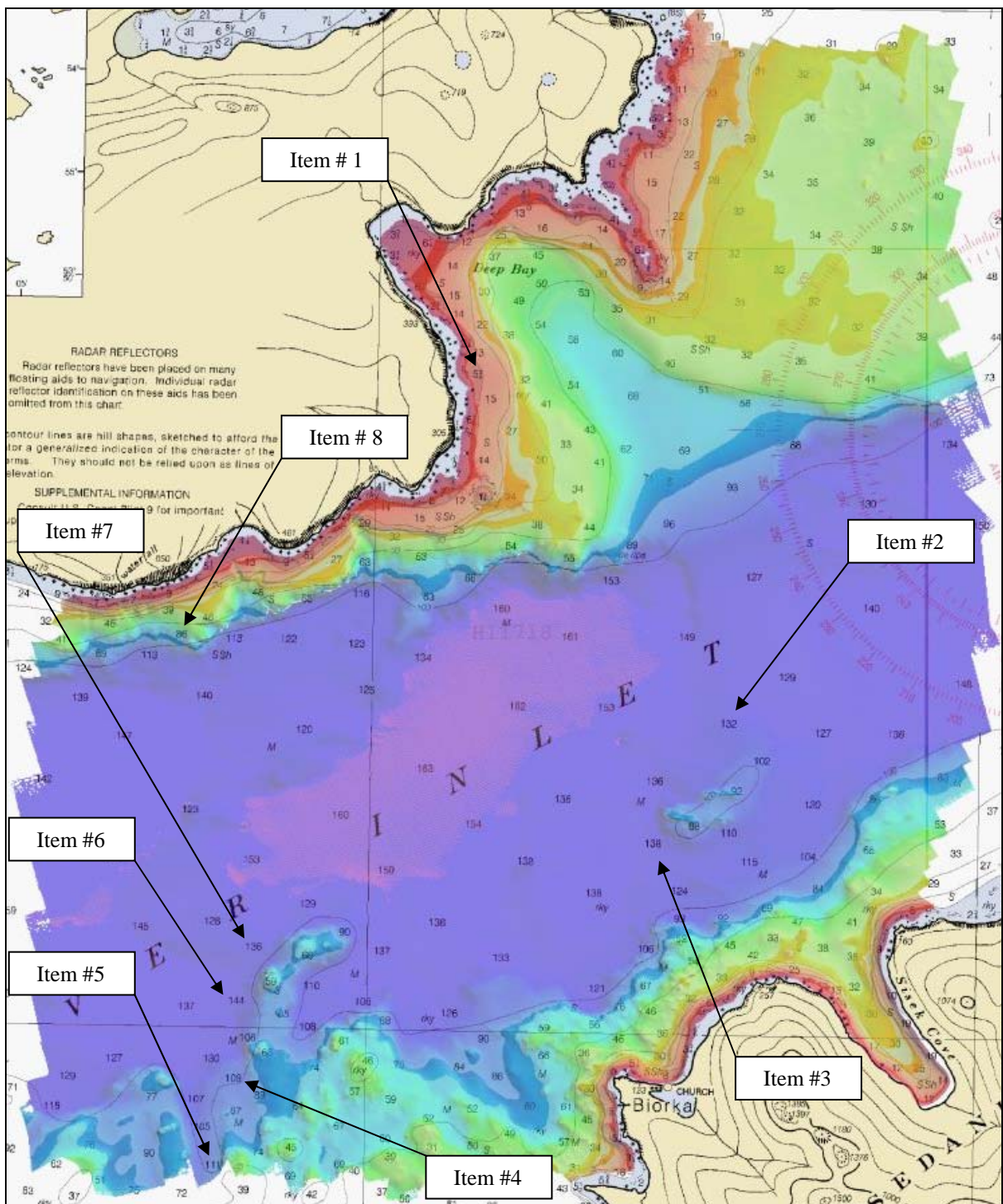


Figure 7 H11718 Chart Comparison (Chart 16528)

In general, the soundings from chart 16520 coincide with the soundings from H11718 to within 1 to 5 fathoms; areas that do vary to any degree are as follows:

- Item # 1: Hydrographic survey H11718 revealed a depth of 146 fathoms in the vicinity of a 153 fathom sounding on chart 16520 located at 53°51'09" N, 166°17'02" W. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.

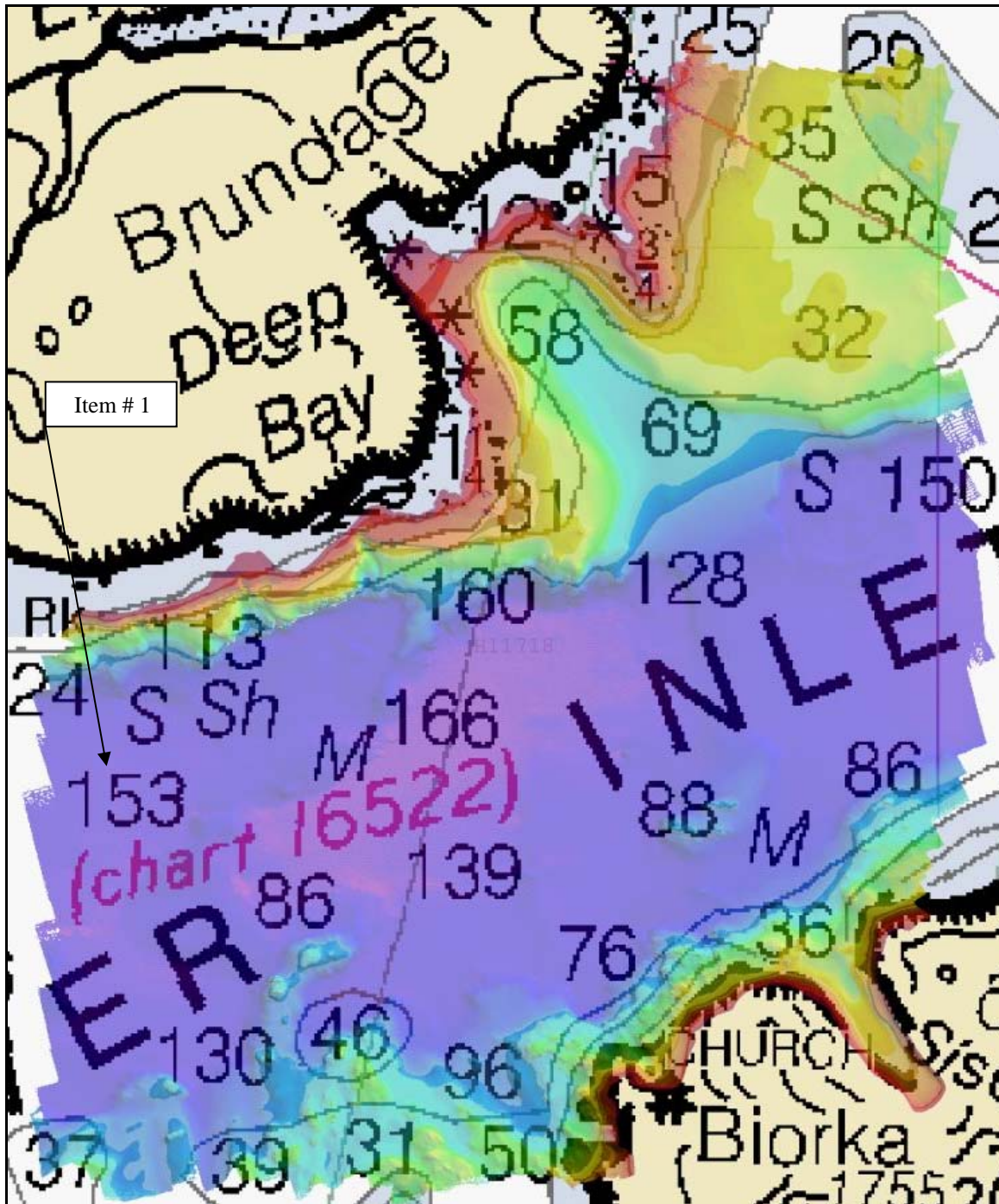


Figure 8 H11718 Chart Comparison (16520)



In general soundings from chart US3AK61M coincide with the soundings from H11718 to within 5 to 15 meters; areas that do vary to any degree are as follows¹⁶:

- Item # 1: Hydrographic survey H11718 revealed a depth of 82.5 fathoms in the vicinity of a 206.6 fathom sounding on chart US3AK61M located at 53°51'55" N, 166°16'26" W. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.
- Item # 2: Hydrographic survey H11718 revealed a depth of 169 fathoms in the vicinity of a 292.6 fathom sounding on chart US3AK61M located at 53°52'11" N, 166°14'13" W. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.
- Item # 3: Hydrographic survey H11718 revealed a depth of 251 fathoms in the vicinity of a 274.3 fathom sounding on chart US3AK61M located at 53°52'46" N, 166°10'21" W. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.
- Item # 4: Hydrographic survey H11718 revealed a depth of 230.5 fathoms in the vicinity of a 138.9 fathom sounding on chart US3AK61M located at 53°50'25" N, 166°13'07" W. This area was surveyed with 100% multibeam coverage.
- Item # 5: Hydrographic survey H11718 revealed a depth of 268 fathoms in the vicinity of a 157.2 fathom sounding on chart US3AK61M located at 53°30'38" N, 166°15'39" W. This area was surveyed with 100% multibeam coverage.
- Item # 6: Hydrographic survey H11718 revealed a depth of 110 fathoms in the vicinity of a 56.4 fathom sounding on chart US3AK61M located at 53°49'26" N, 166°14'52" W. This area was surveyed with 100% multibeam coverage.

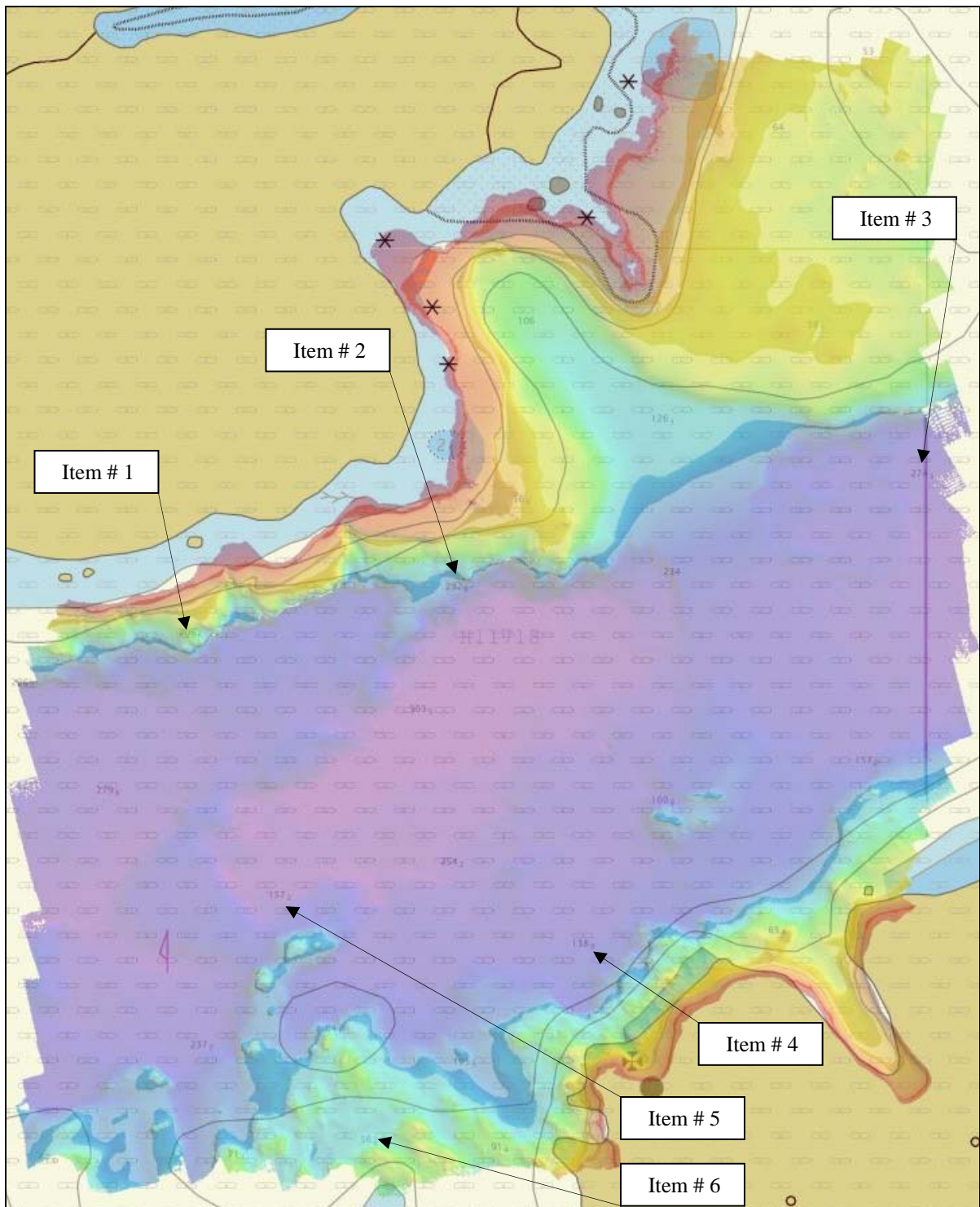


Figure 9 H11718 Electronic Chart Comparison (US3AK61M)



In general, the soundings from chart US5AK6CM coincide with the soundings from H11718 to within 5 to 15 meters; areas that do vary to any degree are as follows¹⁷:

- Item # 1: Hydrographic survey H11718 revealed a depth of 111 fathoms in the vicinity of a 157.2 fathom sounding on chart US5AK6CM located at 53°51'54" N, 166°16'34" W. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.
- Item # 2: Hydrographic survey H11718 revealed a depth of 241.6 fathoms in the vicinity of a 263.3 fathom sounding on chart US5AK6CM located at 53°50'07" N, 166°16'04" W. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.
- Item # 3: Hydrographic survey H11718 revealed a depth of 171.6 fathoms in the vicinity of a 202.9 fathom sounding on chart US5AK6CM located at 53°49'20" N, 166°16'14" W. This comparison can also be found on Chart 16522, Item # 3, and also on Chart 16528, Item # 5. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.

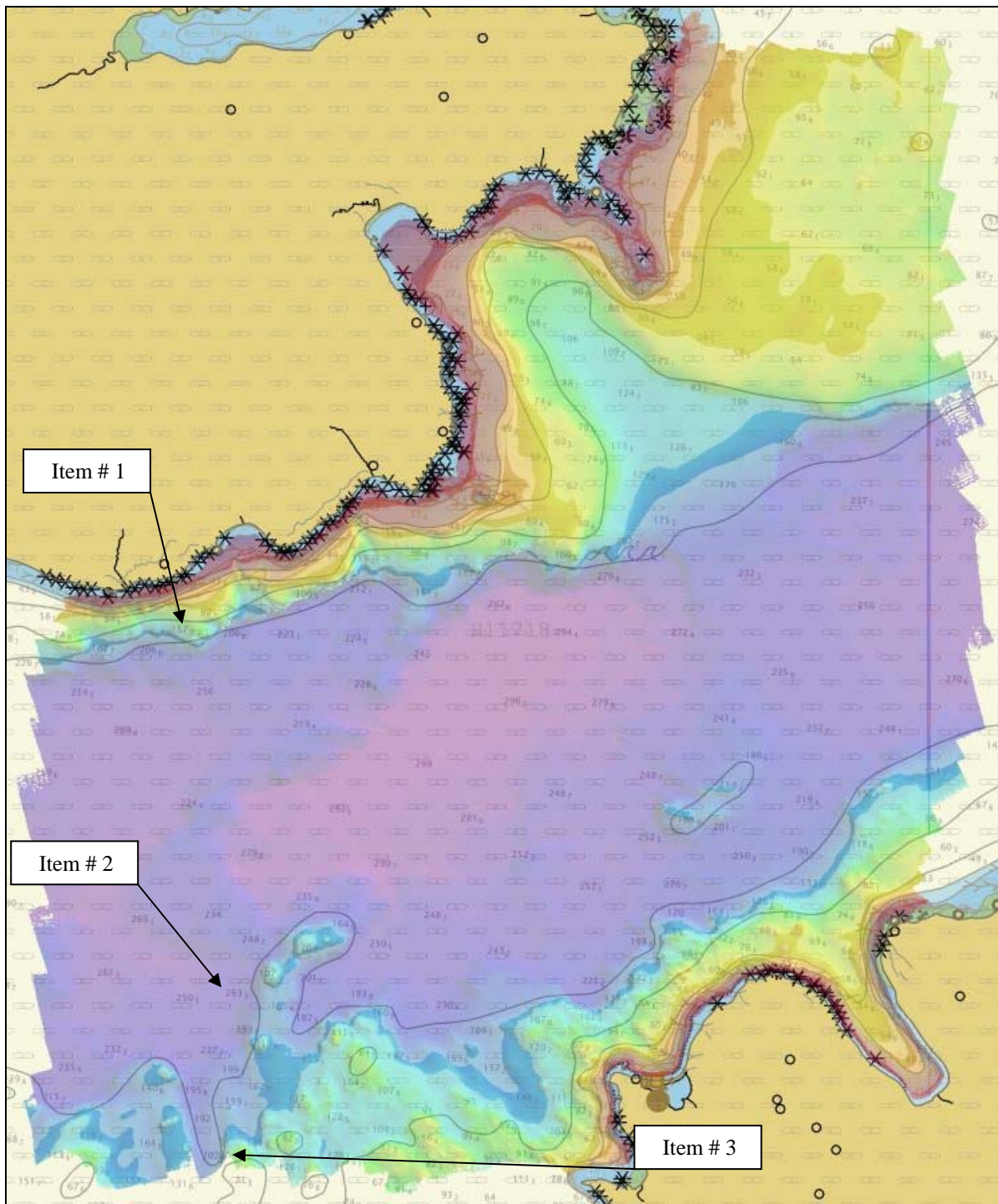


Figure 10 H11718 Electronic Chart Comparison (US5AK6CM)



Automated Wreck and Observation Information System

There were no AWOIS items assigned to H11718. ¹⁸

Charted Features

There were no charted features labeled PA, ED, PD, or Rep within the limits of H 11718. ¹⁹

Dangers to Navigation

One Danger to Navigation was located during the survey of H11718. The Danger to Navigation was reported on August 1, 2007 (See Appendix I for submitted reports). ²⁰

Bottom Samples

The R/Vs Davidson, 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 H11718_S57_Features file. ²¹

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. ²²



Shoreline Verification Results

Remote Sensing Division (RSD) provided the shoreline detail (CM-8306) 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 very accurate. RSD foul and kelp 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 CM-8306 supersede previously charted shoreline where any discrepancies occur unless noted below.²³

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.²⁴

RSD Source (CM-8306) Changes and Discrepancies				
RSD Feature	RSD Position	Remarks	Actions Taken in S57 Feature File / Recommendations	Applicable DP form(s)
Rock	53 53 23.55 N 166 14 20.09 W	RSD rock 53999 not found, full MBES coverage and visual inspection performed.	Do not chart. ²⁵	JD207_079_R2
Rock	53 53 15.39 N 166 14 20.04 W	RSD rock 53998 not found, full MBES coverage and visual inspection performed.	Do not chart.	JD207_084_R2
Rock	53 52 36.71 N 166 14 56.33 W	RSD rock 53992 not found, full MBES coverage and visual inspection performed.	Remove.	JD207_120_R2




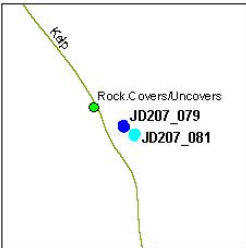
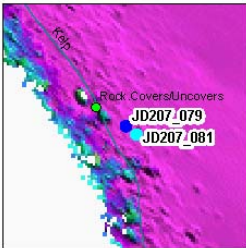
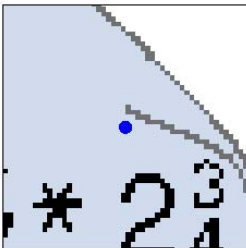
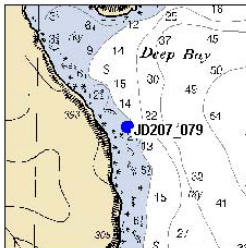
Charted Feature Changes and Discrepancies				
Chart No. and Feature	Charted Position	Remarks	Recommendations	Applicable DP form(s)
16528 and US5AK6CM Islet	53 54 36.34 N 166 12 38.92 W	Charted islet not found, full MBES coverage at position.	Remove.	N/A
16528 and US5AK6CM Rock	53 54 31.22 N 166 12 38.14 W	Charted rock not found, full MBES coverage at position.	Remove.	N/A
16528 and US5AK6CM Rock	53 54 22.61 N 166 12 56.64 W	Charted rock not found, full MBES coverage at position.	Remove.	N/A
16528 and US5AK6CM Rock	53 53 53.30 N 166 14 14.23 W	Charted rock not found, full MBES coverage at position.	Remove.	N/A
16528 and US5AK6CM Islet	53 53 50.71 N 166 14 21.83 W	Charted islet not found, full MBES coverage at position.	Remove.	N/A
16528 and US5AK6CM Submerged Rock	53 53 51.23 N 166 14 30.47 W	Charted rock not found, full MBES coverage at position.	Remove.	N/A
16528 and US5AK6CM Rock	53 53 33.54 N 166 14 38.89 W	Charted rock not found, full MBES coverage at position.	Remove.	N/A
US5AK6CM Rock	53 53 23.55 N 166 14 20.09 W	Charted rock not found, full MBES coverage and visual inspection performed.	Remove. ²⁶	JD207_079_R2
US5AK6CM Rock	53 53 15.39 N 166 14 20.04 W	Charted rock not found, full MBES coverage and visual inspection performed.	Remove.	JD207_084_R2
US5AK6CM Rock	53 52 36.71 N 166 14 56.33 W	Charted rock not found, full MBES coverage and visual inspection performed.	Remove.	JD207_120_R2
16528 and US5AK6CM Islet	53 52 34.60 N 166 15 07.87 W	Charted islet 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)
16528 and US5AK6CM Rock	53 52 28.98 N 166 15 15.11 W	Charted rock not found, full MBES coverage at position.	Remove.	N/A
16528 and US5AK6CM Rock	53 52 23.44 N 166 15 26.44 W	Charted rock not found, full MBES coverage at position.	Remove.	N/A
16528, 16522 and US5AK6CM Rock	53 50 11.50 N 166 11 10.58 W	Charted rock not found, full MBES coverage at position. Possibly RSD rock to the South.	Remove.	N/A
16528 and US5AK6CM Rocks (3)	Centered at: 53 50 05.68 N 166 11 04.22 W	Three charted rocks not found, full MBES coverage at position and visual inspection performed.	Remove.	JD207_025_D2
16528, 16522 and US5AK6CM Rock	53 49 52.26 N 166 10 45.02 W	Charted rock not found, full MBES coverage at position and visual inspection performed.	Remove.	JD207_028_D2

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 DVD under Reports\Descriptive Report\H11718 Shoreline.

DP ITEM NUMBER : JD207_079		DP Form																																						
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Date:</td><td>26 July, 2007</td></tr> <tr><td>Julian Day:</td><td>207</td></tr> <tr><td>UTC Time:</td><td>21:39:38</td></tr> <tr><td>Latitude:</td><td>53 53 23.04 N</td></tr> <tr><td>Longitude:</td><td>166 14 18.71 W</td></tr> <tr><td>Northing:</td><td>5971964.24</td></tr> <tr><td>Easting:</td><td>418602.42</td></tr> <tr><td>Raw (+Depth) or (-Height) (m):</td><td>12.11</td></tr> <tr><td>Draft Corrector (m):</td><td>N/A</td></tr> <tr><td>SV Corrector (m):</td><td>N/A</td></tr> <tr><td>Tide Corrector (m):</td><td>0.96</td></tr> <tr><td>Corrected to MLLW (m):</td><td>11.15</td></tr> <tr><td>Corrected to MLLW (fathoms):</td><td>6.09</td></tr> <tr><td>Corrected to MLLW (feet):</td><td>36.57</td></tr> <tr><td>DP Comment:</td><td>G_RSD53999 not observed</td></tr> </table>	Date:	26 July, 2007	Julian Day:	207	UTC Time:	21:39:38	Latitude:	53 53 23.04 N	Longitude:	166 14 18.71 W	Northing:	5971964.24	Easting:	418602.42	Raw (+Depth) or (-Height) (m):	12.11	Draft Corrector (m):	N/A	SV Corrector (m):	N/A	Tide Corrector (m):	0.96	Corrected to MLLW (m):	11.15	Corrected to MLLW (fathoms):	6.09	Corrected to MLLW (feet):	36.57	DP Comment:	G_RSD53999 not observed	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Correlating DP Item Numbers:</td></tr> <tr><td>N/A N/A</td></tr> <tr><td>N/A N/A</td></tr> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Correlating MB Least Depth:</td></tr> <tr><td>None</td></tr> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Remarks/Recommendations:</td></tr> <tr><td>RSD rock 53999 / US5AK6CM rock not found, full MBES coverage and visual inspection performed. Do not chart / remove. RSD kelp line okay.</td></tr> <tr><td>Chart: 16528 Topo: Carto Code: None</td></tr> </table>	Correlating DP Item Numbers:	N/A N/A	N/A N/A	Correlating MB Least Depth:	None	Remarks/Recommendations:	RSD rock 53999 / US5AK6CM rock not found, full MBES coverage and visual inspection performed. Do not chart / remove. RSD kelp line okay.	Chart: 16528 Topo: Carto Code: None	
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 <p>DPs and RSD CM-8306 200m x 200m</p>	 <p>DPs, RSD CM-8306, and MBES coverage 200m x 200m</p>	 <p>DP and Chart 200m x 200m</p>	 <p>DP and Chart 2000m x 2000m</p>																																					



E – Approval Sheet

Approval Sheet

For

H11718

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

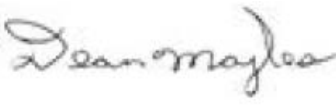
OPR-Q191-KR-07 Statement of Work and 2007 Specifications & Deliverables;
Fugro Pelagos, Inc. Acquisition Procedures (2007- NOAAAcquisitionProcedures);
Fugro Pelagos, Inc. Processing Procedures (2007-NOAAProcessingProcedures);

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

X 

Dean Moyles
ACSM Certified



¹ Concur.

² Concur.

³ Concur.

⁴ A common junction was created between H11718 and surveys H11715 and H11717.

⁵ Concur.

⁶ Concur.

⁷ Concur.

⁸ H11718_S57_features.000 was used in the compilation of H11718_CS.000

⁹ Concur.

¹⁰ No tidal errors visible in survey.

¹¹ The HCell was compiled to chart 16528. Chart 16522 at the same scale partially falls in the survey area. Discrepancies exist between the charted features of 16528 and 16522, mainly in the inshore areas of the charts, possibly due to the most recent RSD shoreline not being fully applied to 16522. Features falling within the survey area were de-conflicted and recommendations made in the HCell, however many of the features inshore of the survey were not addressed. Recommend a review of the charted features on the two charts be conducted.

¹² 17th Edition, 7/08, Corrected through NM July 12th, 2008.

¹³ 23rd Edition, 8/08, Corrected through NM August 9th, 2008.

¹⁴ Concur generally with the hydrographers sounding comparison unless otherwise noted.

Chart soundings per HCell.

¹⁵ A 2.500 fathom rock present near charted 5 $\frac{3}{4}$ fathom sounding. Chart per HCell

¹⁶ All units on items 1-6 should read meters rather than fathoms.

¹⁷ All units on items 1-3 should read meters rather than fathoms.

¹⁸ Concur.

¹⁹ Concur.

²⁰ See attached DTON report. The DTON is charted. The DTON falls in the area where surveys H11718 and H11715 overlap. During compilation a common junction was made and the DTON item was compiled with H11715.

²¹ Ten new bottom samples compiled and 18 retained as charted. Chart bottom samples in accordance with HCell.

²² Concur.

²³ Concur.

²⁴ Concur with itemized features unless otherwise noted. Chart features per HCell.

²⁵ Concur with clarification. A rock is present 20m NW of this position. Chart per HCell.

²⁶ Concur with clarification. A rock is present 20m NW of this position. Chart per HCell.

**Appendix IV - Tides and Water Levels**

Abstract of Times of Hydrography for Smooth Tides

Project Number: OPR-Q191-KR-07

Registry Number: H11718

Contractor Name: Fugro Pelagos Inc.

Date: March 13, 2008

Sheet Letter: G

Inclusive Dates: June 15, 2007 and ended on July 15, 2007

Fieldwork is complete and verified tides were applied for the production of the final combined soundings and S-57 feature file.

Final Tide Zones

Zone	Primary			
	Site	Number	Time	Range Ratio
KR01	9462645	Biorka Village, AK	-12	1.03
KR02	9462645	Biorka Village, AK	-6	1.02
KR03	9462645	Biorka Village, AK	0	1
KR04	9462645	Biorka Village, AK	6	1
KR05	9462662	Reef Bight, AK	18	0.8
KR06	9462662	Reef Bight, AK	12	0.8
KR07	9462662	Reef Bight, AK	12	0.8
KR08	9462662	Reef Bight, AK	18	0.9
KR09	9462662	Reef Bight, AK	12	0.9
KR10	9462662	Reef Bight, AK	6	0.9
KR20	9999920	*Biorka Village & Reef Bight, AK	0	1
KR21	9999921	*Biorka Village & Reef Bight, AK	0	1
KR22	9999922	*Biorka Village & Reef Bight, AK	0	1
KR23	9999923	*Biorka Village & Reef Bight, AK	0	1
KR24	9999924	*Biorka Village & Reef Bight, AK	0	1
KR25	9999925	*Biorka Village & Reef Bight, AK	0	1
KR26	9999926	*Biorka Village & Reef Bight, AK	0	1
KR27	9999927	*Biorka Village & Reef Bight, AK	0	1
KR28	9999928	*Biorka Village & Reef Bight, AK	0	1
KR30	9999930	*Biorka Village & Reef Bight, AK	0	1
KR31	9999931	*Biorka Village & Reef Bight, AK	0	1
KR32	9999932	*Biorka Village & Reef Bight, AK	0	1
KR33	9999933	*Biorka Village & Reef Bight, AK	0	1
KR34	9999934	*Biorka Village & Reef Bight, AK	0	1
KR35	9999935	*Biorka Village & Reef Bight, AK	0	1
KR36	9999936	*Biorka Village & Reef Bight, AK	0	1
KR37	9999937	*Biorka Village & Reef Bight, AK	0	1
KR38	9999938	*Biorka Village & Reef Bight, AK	0	1

*see "Tidal Zoning for Krenitzins.doc" in OPR-Q191-KR-07 Horizontal & Vertical Control Report", Appendix I.

Abstract of Times of Hydrography for R/V R2

YEAR	DAY	START TIME (UTC)	END TIME (UTC)	COMMENTS
2007	166	15:49:38	23:59:59	
2007	167	00:00:00	02:38:51	
2007	176	15:28:32	23:59:59	
2007	177	00:00:00	02:23:16	
2007	183	00:04:39	02:40:04	
2007	183	16:53:44	00:27:26	
2007	187	15:55:35	23:59:59	
2007	188	00:00:00	02:07:25	
2007	195	20:16:11	23:53:16	

Abstract of Times of Hydrography for R/V D2

YEAR	DAY	START TIME (UTC)	END TIME (UTC)	COMMENTS
2007	166	15:58:07	23:59:59	
2007	167	00:00:00	01:38:05	
2007	183	15:34:14	23:59:59	
2007	184	00:00:00	02:14:23	
2007	195	19:53:08	20:13:10	

Abstract of Times of Hydrography for R/V Davidson

YEAR	DAY	START TIME (UTC)	END TIME (UTC)	COMMENTS
2007	180	17:54:59	19:28:29	
2007	182	15:29:51	19:42:56	
2007	183	15:45:49	18:46:40	
2007	186	20:30:38	23:42:25	
2007	195	20:01:00	23:59:59	
2007	196	00:00:00	04:07:55	

Hydrographic Survey Registry Number: H11718

Survey Title: **State:** **ALASKA**
Locality: **Akutan Pass**
Sub-locality: **Beaver Inlet**

Project Number: OPR-Q191-KR-07

Survey Dates: June – July 2007

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

Positions are based on the NAD83 horizontal datum.

Charts Affected:

Chart No.	Scale	Edition	Edition Date
16528	40,000	16th	June 1998
16520	300,000	22nd	March 2004

DANGER TO NAVIGATION:

Feature	Depth (fathoms)	Latitude	Longitude
Sounding	4 ½ fms	53-54-48.77 N	166-12-28.86 W

COMMENTS:

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

H11718 HCell Report
Annie Raymond, Physical Scientist
Pacific Hydrographic Branch

1. Specifications, Standards and Guidance Used in HCell Compilation

HCell compilation of survey H11718 used:

Office of Coast Survey HCell Specifications: Version: 4.0, 2 June, 2010.
HCell Reference Guide: Version 2.0, 2 June, 2010.

2. Compilation Scale

Depths and features for HCell H11718 were compiled to the largest scale raster charts shown below:

Chart	Scale	Edition	Edition Date	NTM Date
16528	1:40,000	17th	07/01/2008	10/23/2010
16522	1:40,000	6th	02/01/2004	12/25/2010

The following ENC's were also used during compilation:

Chart	Scale
US5AK6CM	1:40,000

3. Soundings

A survey-scale sounding (SOUNDG) feature object layer was built from the 10-meter Combined Surface in CARIS BASE Editor. A shoal-biased selection was made at 1:10,000 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	200	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 H11718_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 16528	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 H11718_SS.000
0	0	0.000	0.000	0
3	5.4864	5.715	3.125	3
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 H11718_CS file, contours have not been deconflicted against shoreline features, soundings and hydrography, as all other features in the H11718_CS file and soundings in the H11718_SS have been. This may result in conflicts between the H11718_SS file contours and HCell features at or near the survey limits. Conflicts with M_QUAL, COALNE and SBDARE objects, and with DEPCNT objects representing MLLW, should be expected. HCell features should be honored over H11718_SS.000 file contours in all cases where conflicts are found.

5. Meta Areas

The following Meta object areas are included in HCell H11718:

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. Spatial Framework

7.1 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.

7.2 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.

8. Data Processing Notes

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

9. QA/QC and ENC Validation Checks

H11718 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.

10. Products

10.1 HSD, MCD and CGTP Deliverables

H11718_CS.000	Base Cell File, Chart Units, Soundings and features compiled to 1:40,000
H11718_SS.000	Base Cell File, Chart Units, Soundings and Contours compiled to 1:10,000

H11718_DR.pdf	Descriptive Report including end notes compiled during office processing and certification, the HCell Report, and supplemental items
H11718_outline.gml	Survey outline
H11718_outline.xsd	Survey outline

10.2 Software

CARIS HIPS Ver. 6.1	Inspection of Combined BASE Surfaces
CARIS BASE Editor Ver. 3.0, HF9	Creation of soundings and bathy-derived features, creation of the depth area, meta area objects, and Blue Notes; Survey evaluation and verification; Initial HCell assembly.
CARIS S-57 Composer Ver. 2.1, HF5	Final compilation of the HCell, correct geometry and build topology, apply final attributes, export the HCell, and QA.
CARIS GIS 4.4a	Setting the sounding rounding variable for conversion of the metric HCell to NOAA charting units with NOAA rounding.
CARIS HOM Ver. 3.3	Perform conversion of the metric HCell to NOAA charting units with NOAA rounding.
HydroService AS, dKart Inspector Ver. 5.1, SP 1	Validation of the base cell file.
Northport Systems, Inc., Fugawi View ENC Ver.1.0.0.3	Independent inspection of final HCells using a COTS viewer.

11. Contacts

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

Annie Raymond
Physical Scientist
Pacific Hydrographic Branch
Seattle, WA
206-526-6849
Annemieke.raymond@noaa.gov

APPROVAL SHEET
H11718

Initial Approvals:

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

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

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