

H11701

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. H11701

LOCALITY

State Alaska

General Locality Chatham Strait

Sublocality Mitchell Bay and Kanalku Bay

2007

CHIEF OF PARTY

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

LIBRARY & ARCHIVES

DATE

NOAA FORM 77-28 (11-72)		U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION		REGISTER NO. H11701
HYDROGRAPHIC TITLE SHEET				
INSTRUCTIONS - The hydrographic sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the office.				FIELD NO.
State <u>Alaska</u>				
General Locality <u>Chatham Strait</u>				
Sublocality <u>Mitchell Bay and Kanalku Bay</u>				
Scale <u>1:10,000</u>		Date of Survey <u>August 22, 2007 -September 11, 2007</u>		
Instructions Dated <u>6/15/2006</u>		Project No. <u>OPR-O322-KR-07</u>		
Vessel <u>R/V Davidson (1066485), R/V R2 (623241), R/V D2 (647782), Shoreline Skiff (WN6739NW)</u>				
Chief of Party <u>DEAN MOYLES</u>				
Surveyed by <u>ORTHMANN, REYNOLDS, GILL, MOUNT, STOCK, FARLEY,</u> <u>BRIGGS, POECKERT, ET AL</u>				
Soundings taken by echo sounder <u>RESON 8101 (R2 & D2 - HULL MOUNT), RESON 8111 (DAVIDSON -</u> <u>HULL MOUNT) and RESON 8125 (SKIFF - POLE MOUNT)</u>				
Graphic record scaled by <u>N/A</u>				
Graphic record checked by <u>N/A</u>				
Evaluation by <u>G. Froelich</u>		Automated plot by <u>N/A</u>		
Verification by <u>G. Froelich, K. Reser</u>				
Soundings in <u>Fathoms and Feet</u> at <u>MLLW</u>				
REMARKS: <u>Time in UTC. UTM Projection Zone 8</u>				
<u>Revisions and annotations appearing as endnotes were</u>				
<u>generated during office processing.</u>				
<u>As a result, page numbering may be interrupted or non-sequential</u>				
<u>All separates are filed with the hydrographic data.</u>				



A - Area Surveyed

H11701 (Sheet G) is bound by the coordinates listed below, which encompass the area of Mitchell Bay and Kanalku Bay.

Hydrographic data collection began on August 22, 2007 and ended on September 11, 2007.

Table 1 – H11701 Sheet Limits¹

Sheet Limits H11701 Sheet G Scale 1:10,000		
Point #	Positions on NAD83	
	Degrees Latitude (N)	Degrees Longitude (W)
1	57-27-39.73 N	134-21-18.35 W
2	57-27-39.73 N	134-28-56.50 W
3	57-34-14.71 N	134-28-56.50 W
4	57-34-14.71 N	134-21-18.35 W

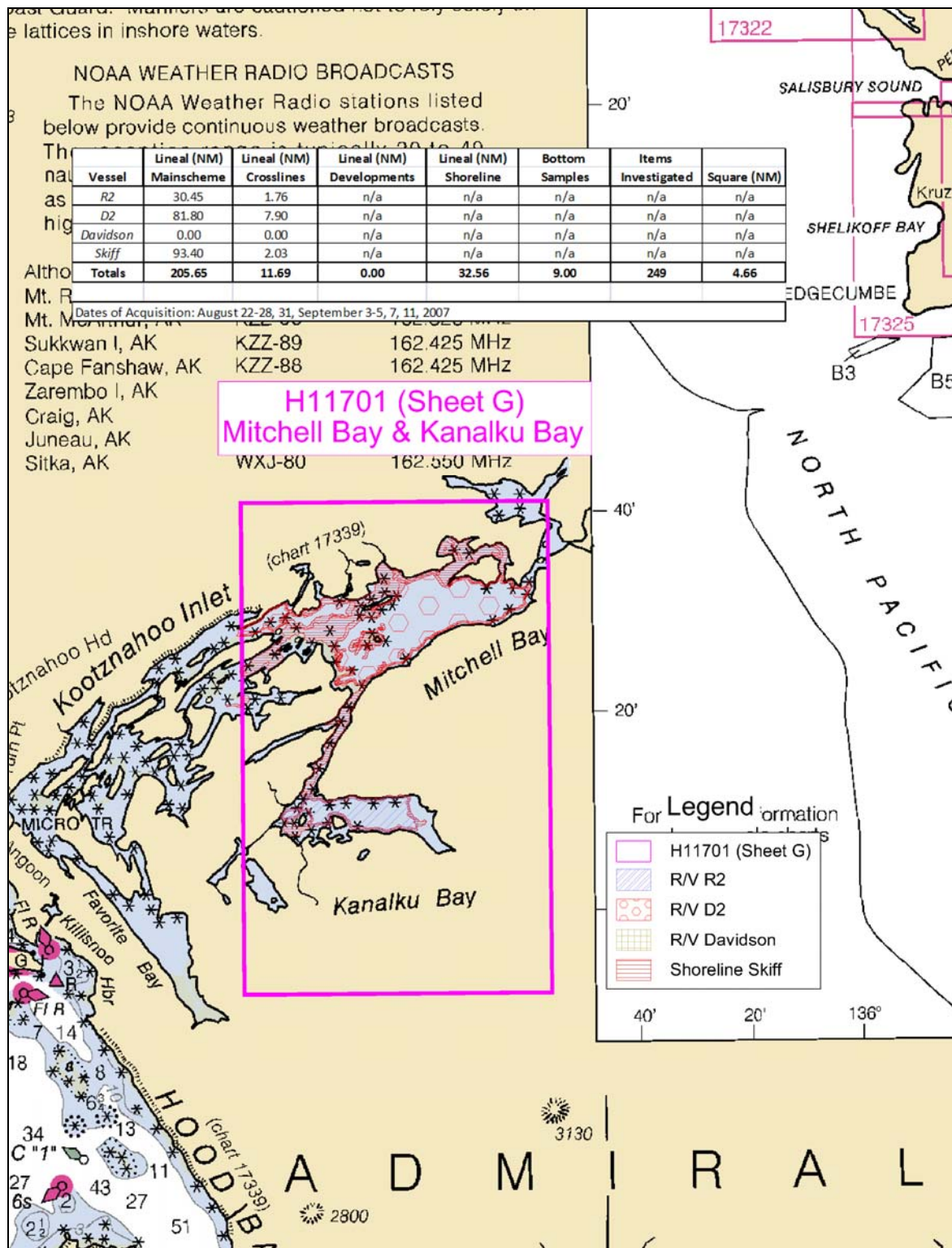


Figure 1 H11701 Area Surveyed



B – Data Acquisition & Processing

Refer to the OPR-O322-KR-07 Data Acquisition and Processing Report² 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 H11701. 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 11.69 nautical miles or 5.7 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.³

The majority of beams that fall below the 95 percent confidence level are located in areas having extremely steep slopes and/or rocks. Figure 2 below provides an example.

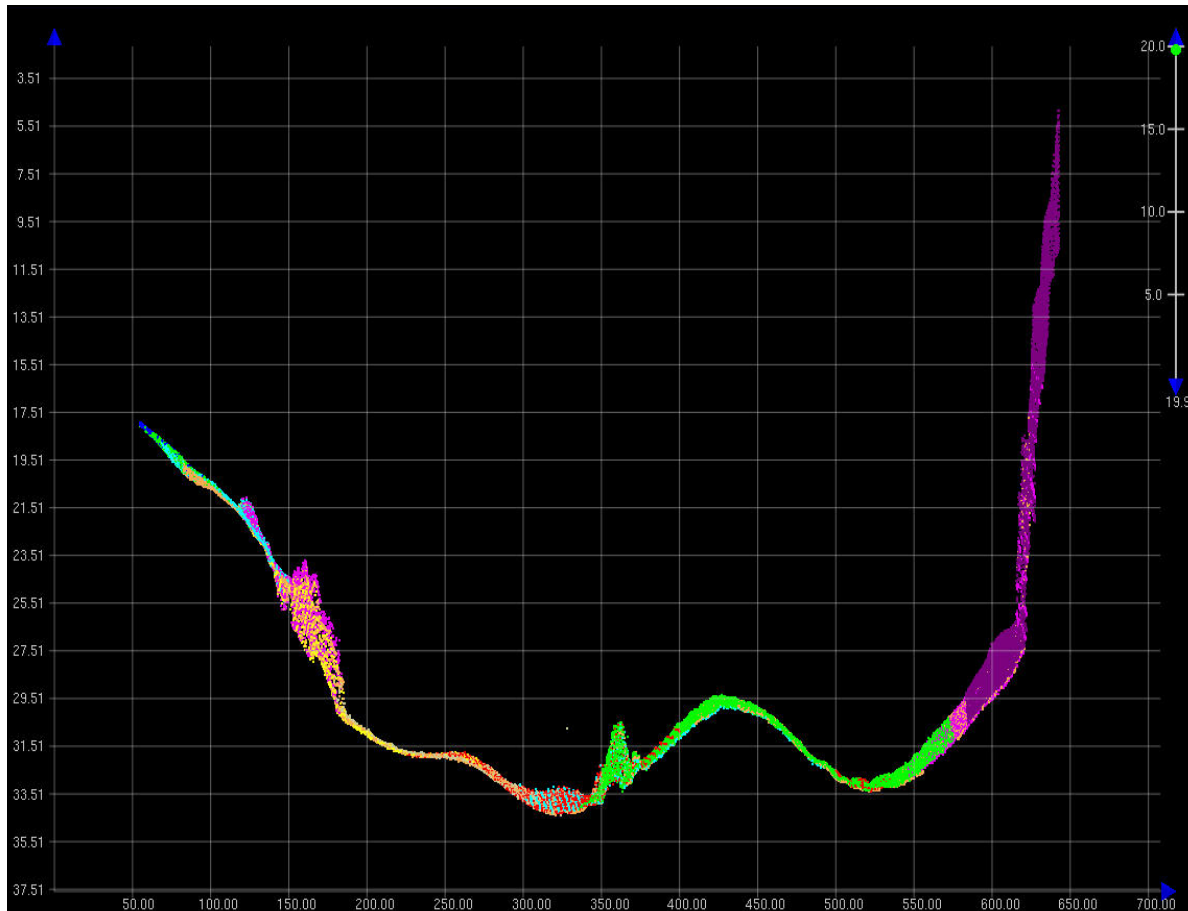


Figure 2 Profile of 2G01-TIE02

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 H11701 had an uncertainty of approximately 0.20 to 0.40 meters. An exception to this is found in the nearshore areas in water depths of 1 to 2 meters where the uncertainty values ranged from 1.5 meters and higher. This was due to sparse data density of the outer beams, and from having no overlap. No uncertainty values were greater than the IHO level Order 1.⁴

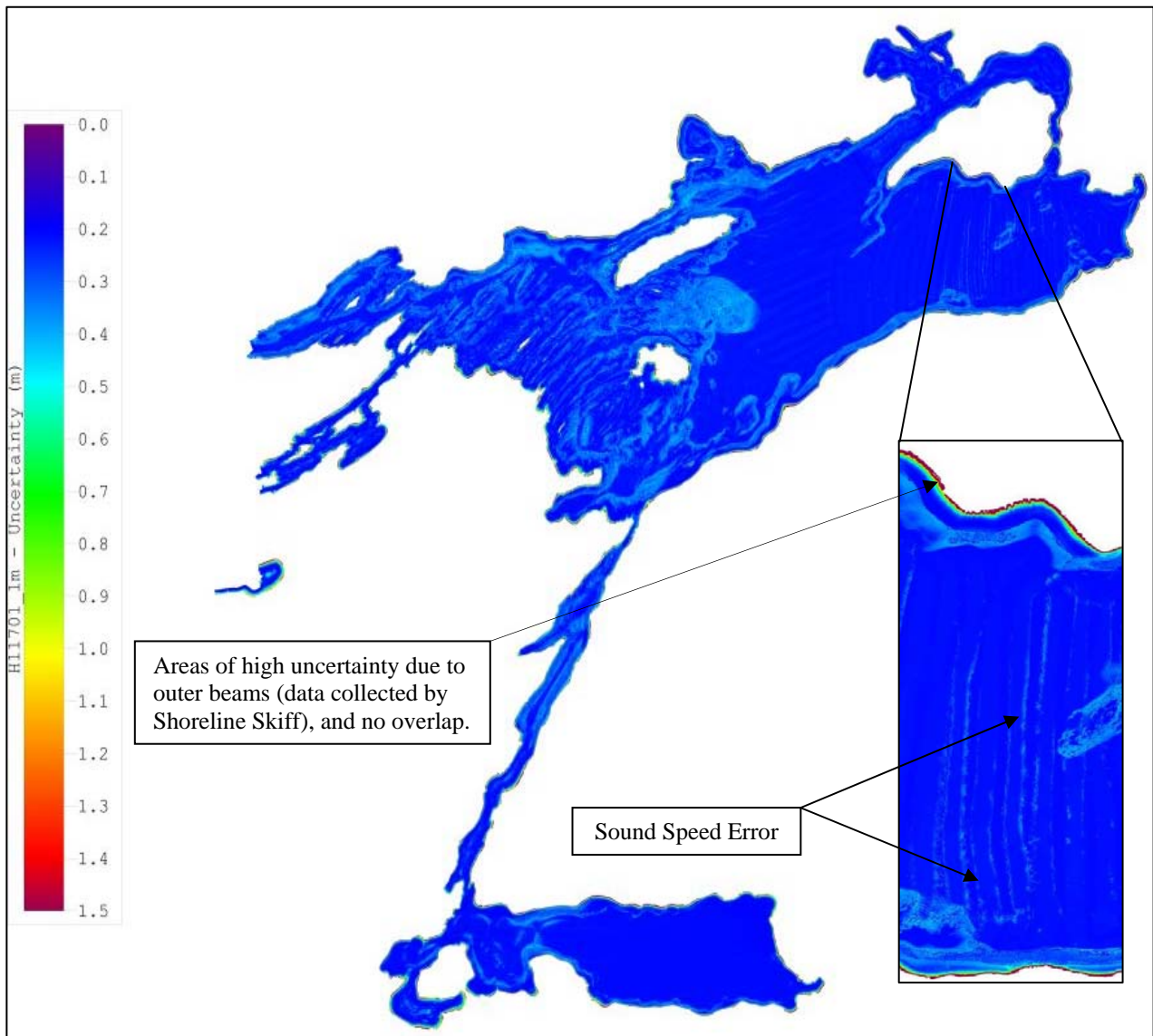


Figure 3 H11701 Uncertainty DTM

Survey Junctions

H11701 (Sheet G) junctions with:

Registry #	Scale	Date	Junction Side
H11700	1:10,000	2007	West

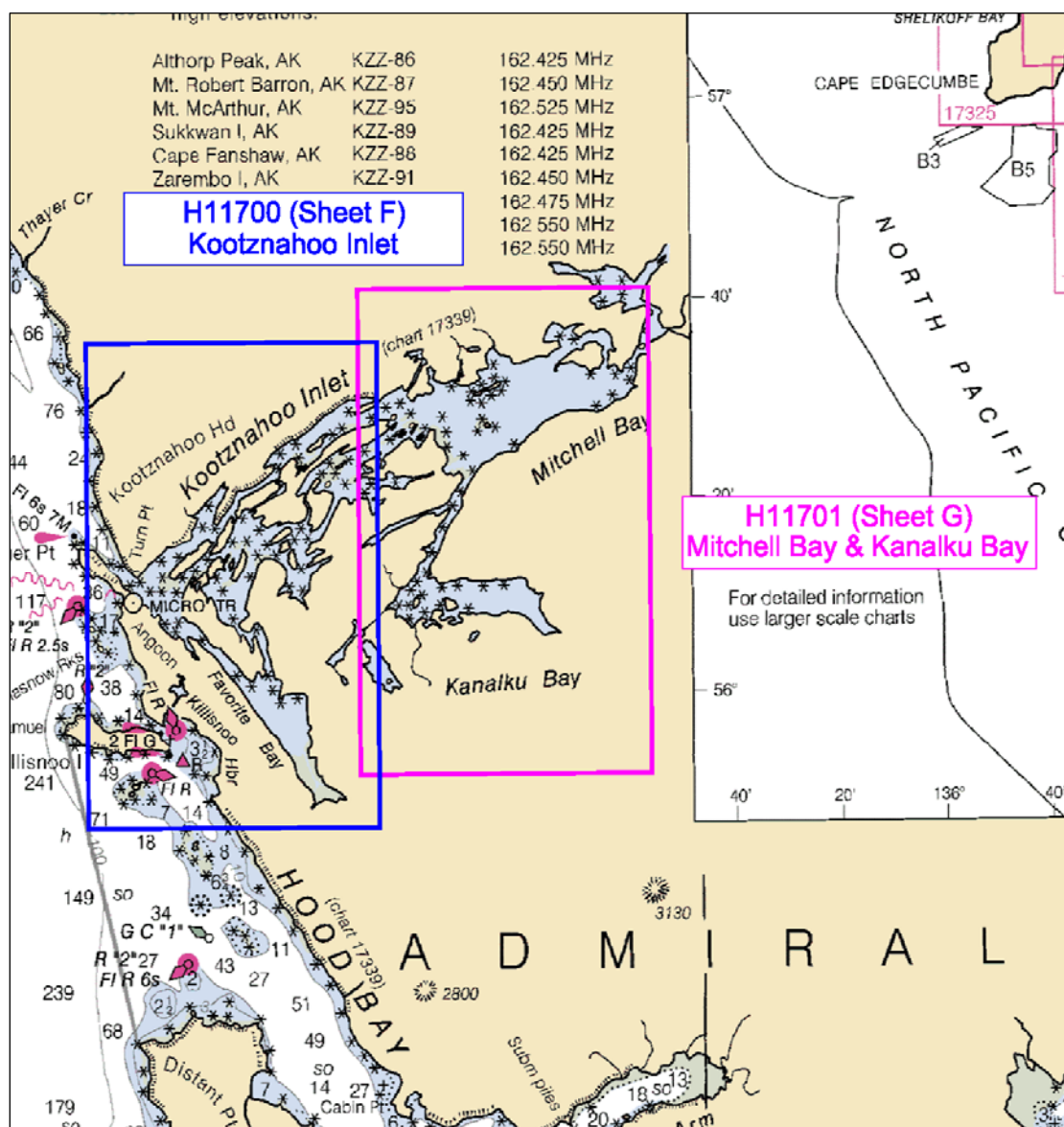


Figure 4 H11701 Survey Junctions

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-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), 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 H11701 was excellent. Two notable problems 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 3 above, the data are well within the required specifications.⁶
- During routine processing, tidal offsets were noticed throughout the survey area. This was due to water flow constrictions in and around the bays in the area. This problem was resolved by using GPS heights from the GPS buoy and survey vessel to derive final tide zoning and to provide a better understanding of the tides within these areas. No uncertainty values were greater than the IHO level Order 1.⁷ Refer to Appendix I in the “OPR-O322-KR-07 Horizontal & Vertical Control Report” for additional information.⁸

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 H11701 is called H11701 and it contains six different BASE surfaces of different resolutions. To ensure sufficient overlap between these surfaces the follow parameters were used⁹:

Depth Threshold: 0 to 15 meters, resolution = 1m, Name in BASE Surface H11701_1m
Depth Threshold: 10 to 45 meters, resolution = 2m, Name in BASE Surface H11701_2m
Depth Threshold: 40 to 60 meters, resolution = 4m, Name in BASE Surface H11701_4m
Depth Threshold: 50 to 150 meters, resolution = 5m, Name in BASE Surface H11701_5m
Depth Threshold: 130 to 500 meters, resolution = 10m, Name in BASE Surface H11701_10m
Depth Threshold: 400 to Max depth, resolution = 15m, Name in BASE Surface H11701_15m

The final S57 file for this project is called "H11701_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.¹⁰

C – Horizontal & Vertical Control

Refer to the OPR-O322-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. 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-NOAA Processing Procedures” 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.¹¹

D – Results and Recommendations

Chart Comparison

H11701 survey was compared with charts¹²:

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

Note: Electronic chart (US3AK3BM).

Comparison of Soundings

Chart 17339 covers the entire survey area for H11701; however, there is no recent hydrography to compare with the current data collected.¹³

Chart 17320 covers the entire survey area for H11701; however, there is no recent hydrography to compare with the current data collected.¹⁴

Electronic chart US3AK3BM covers a large portion of survey area H11701; however no soundings were available to compare with the current data collected.¹⁵

Automated Wreck and Observation Information System

There were no AWOIS items assigned to H11701.¹⁶

Charted Features

There were no charted features labeled PA, ED, PD, or Rep within the limits of H11701.¹⁷

Dangers to Navigation

Two Dangers to Navigation were located during the survey of H11701. The Dangers to Navigation were reported on September 14, 2007 (See Appendix I for submitted reports).¹⁸



Bottom Samples

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 H11701_S57_Features file.¹⁹

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.²⁰

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 and ledges commonly needed some adjustment but the MHW line and point features provided by RSD were particularly good. Any discrepancies are detailed below.

Fugro Pelagos' LIDAR system was used to collect data in this sheet as well. The LIDAR sounding data was used strictly to provide reconnaissance data to assist vessel operations in the field. Geo-referenced photo-mosaics provided by LIDAR were also utilized as a layer during S-57 attribution to help delineate shoreline features (such as kelp area extents). The matchup between the LIDAR photo-mosaic, RSD source shoreline, and vessel multibeam data was excellent. Note that no heights / depths in the S-57 feature file were LIDAR-derived.

The Hydrographer recommends that the RSD MHW from (AK0401B) supersede previously charted shoreline where any discrepancies occur unless noted below.²¹

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



generally not itemized here and 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.²²

RSD Source (AK0401B) Changes, Discrepancies, and Comments				
RSD Feature	RSD Position	Remarks	Actions Taken in S57 Feature File / Recommendations	Applicable DP form(s)
Foul	57 29 51.13 N 134 27 09.38 W	RSD foul not accurate.	Revised using MBES coverage and photo-mosaic. Chart as depicted in S57 file.	JD238_014 JD238_016 JD238_025
Foul	57 30 20.91 N 134 27 18.65 W	RSD foul does not exist. Full MBES coverage.	Do not chart.	JD238_081
Rock	57 31 47.05 N 134 25 55.73 W	RSD rock not found, full MBES coverage.	Do not chart.	N / A
Rock	57 32 07.03 N 134 24 48.48 W	RSD rock not found. Position is extent of new ledge.	Do not chart. Chart ledge as depicted in S57 file.	JD254_178
Foul	57 32 56.41 N 134 21 48.13 W	RSD foul area extends further seaward.	Chart foul area as depicted in S57 file.	JD254_162
Rock	57 32 50.19 N 134 26 32.21 W	RSD rock not found. Full MBES coverage.	Do not chart.	N / A
Rock	57 32 44.51 N 134 26 17.16 W	RSD rock not found. Full MBES coverage.	Do not chart.	JD254_115
Foul	57 31 15.37 N 134 26 51.20 W	RSD foul is not foul; area found to be a mudflat.	Do not chart as foul.	JD238_079

Charted Feature Changes, Discrepancies, and Comments				
Chart No. and Feature	Charted Position	Remarks	Recommendations	Applicable DP form(s)
17339 Rock	57 30 16.02 N 134 25 42.56 W	Charted rock not found; insignificant feature on beach not a rock	Remove.	JD238_044
17339 Rock	57 30 17.23 N 134 25 10.74 W	Charted rock not found; a ledge extends to this point.	Remove. Chart as ledge as depicted in S57 file.	JD238_042



Charted Feature Changes, Discrepancies, and Comments				
Chart No. and Feature	Charted Position	Remarks	Recommendations	Applicable DP form(s)
17339 Rocks (5)	57 30 00.85 N 134 27 39.38 W 57 29 59.25 N 134 27 36.46 W 57 29 57.99 N 134 27 40.43 W 57 29 57.05 N 134 27 37.17 W 57 29 55.34 N 134 27 39.93 W	Charted rocks non-distinct within the RSD foul area.	Remove. Chart the RSD rocks / foul and S57 ledges.	JD238_059
17339 Ledge	57 31 45.40 N 134 26 10.09 W	Charted ledge inaccurate; refined using MBES coverage and photo-mosaic.	Chart ledges this area (Passage Pt) as depicted in the S57 file.	N / A
17339 Rock	57 32 05.64 N 134 24 48.53 W	Charted rock not found. Area is a small ledge.	Remove. Chart ledge as depicted in S57 file.	JD254_179
17339 Rock	57 33 30.16 N 134 22 22.39 W	Charted rock not found, full MBES coverage.	Remove.	JD254_147
17339 Ledge	57 33 04.03 N 134 25 39.05 W	Charted ledge inaccurate; refined using MBES coverage and photo-mosaic.	Chart ledge this area as depicted in the S57 file.	JD254_086
17339 Ledge	57 32 27.29 N 134 25 42.31 W	Charted ledge inaccurate; refined using MBES coverage and photo-mosaic.	Chart ledges as depicted in S57 file.	JD254_199
17339 Ledge	57 30 16.42 N 134 26 24.46 W	Charted rock not found. Position is extent of a small ledge.	Remove. Chart ledge as depicted in S57 file.	JD238_048
17339 Reef	57 32 31.66 N 134 27 46.68 W	Charted reef not accurate; refined using MBES coverage and photo-mosaic.	Chart reef as depicted in S57 file.	JD255_015



Charted Feature Changes, Discrepancies, and Comments				
Chart No. and Feature	Charted Position	Remarks	Recommendations	Applicable DP form(s)
17339 Reef	57 32 05.83 N 134 28 40.35 W	Charted reef not accurate; refined using MBES coverage and photo-mosaic.	Chart reef as depicted in S57 file.	JD255_030

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 forms²³ and raw field records can be found on the Project USB Drive under; OPR-O322-KR-07\H11701\Final_Deliverables\Reports\Descriptive Report\H11701 Shoreline.

DP ITEM NUMBER : JD238_042

DP Form

Date:	26 August, 2007
Julian Day:	238
UTC Time:	18:20:48
Latitude:	57 30 16.53 N
Longitude:	134 25 08.51 W
Northing:	6373705.84
Easting:	534813.37
Raw (+Depth) or (-Height) (m):	-1.50
Draft Corrector (m):	N/A
SV Corrector (m):	N/A
Tide Corrector (m):	0.79
Corrected to MLLW (m):	-2.29
Corrected to MLLW (fathoms):	-1.25
Corrected to MLLW (feet):	-7.53
DP Comment:	G chit rk is ledge to mhw

Correlating DP Item Numbers:

N/A	N/A
N/A	N/A

Correlating MB Least Depth:

None

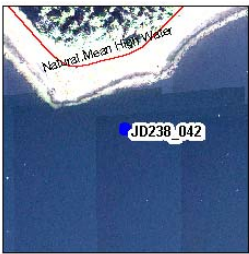
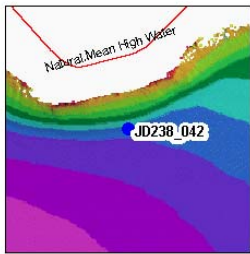
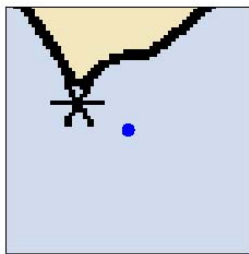

Remarks/Recommendations:

Charted rock not found; a ledge extends to this point. Remove. Chart as ledge as depicted in S57 file.

Chart: 17339_1

Topo:

Carto Code: None

DPs, LiDAR photo-mosaic, RSD AK0401B
200m x 200m

DPs, MBES coverage, RSD AK0401B
200m x 200m

DP and Chart
200m x 200m

DP and Chart
2000m x 2000m



E – Approval Sheet

Approval Sheet

For

H11701

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

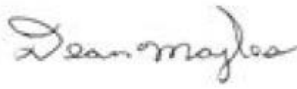
OPR-O322-KR-07 Statement of Work and 2007 Specifications & Deliverables;
Fugro Pelagos, Inc. Acquisition Procedures (2007- NOAAAcquisitionProcedures);
Fugro Pelagos, Inc. Processing Procedures (2007-NOAAProcessingProcedures);

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

X 

Dean Moyles
ACSM Certified



Revisions Compiled During Office Processing and Certification

- ¹ Do not concur. The bounding box of the survey has the following corners:
SW – 57-29-30.27N, 134-29-42.20W NE – 57-33-59.04N, 134-21-05.37W
- ² Filed with project records.
- ³ Concur.
- ⁴ Concur with clarification. During the Survey Acceptance Review, the data was found to be outside IHO Order 1 specifications. However, all the data from survey H11701 was inspected and deemed sufficient for charting despite having uncertainties that do not meet specifications.
- ⁵ Concur.
- ⁶ Concur.
- ⁷ Concur.
- ⁸ Filed with project records.
- ⁹ Concur with clarification. The 10m and 15m BASE surfaces were not submitted due to the depth range of this survey. 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.
- ¹⁰ Concur.
- ¹¹ Concur.
- ¹² The charts used during compilation are Chart 17339, 12th Ed., August, 2007 and Chart 17320, 18th Ed., March 2008.
- ¹³ Concur. Update Chart 17339 with new sounding data.
- ¹⁴ Concur. Update Chart 17320 with new sounding data.
- ¹⁵ Concur. Update ENC with new sounding data.
- ¹⁶ Concur.
- ¹⁷ Concur with clarification. It is recommended that all “No recent hydrography” notes that fall within H11701 be removed from the charts.
- ¹⁸ Concur. Both DTONs have been applied to the charts and all are included in HCell H11701.
- ¹⁹ Ten bottom samples were collected during H11701 and 7 are included in the HCell. No charted bottom samples were retained.
- ²⁰ Concur.
- ²¹ Concur.
- ²² 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.
- ²³ Filed with hydrographic records.

Hydrographic Survey Registry Number: H11701

Survey Title: **State:** **ALASKA**
 Locality: **Chatham Strait**
 Sub-locality: **Mitchell Bay and Kanalku 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:

Feature	Depth (fms ft)	Latitude	Longitude
Rock	"uncovers 3 ft"	57-32-32.42N	134-25-29.27W
Rock	"awash"	57-32-37.74N	134-26-24.34W

COMMENTS:

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

H11701 HCell Report
Katie Reser, Physical Scientist
Pacific Hydrographic Branch

Introduction

The primary purpose of the HCell is to provide new survey information in International Hydrographic Organization (IHO) format S-57 to update the largest scale ENC's and RNC's in the region: NOAA ENC US3AK3BM and NOAA RNC's 17339 and 17320.

HCell compilation of survey H11701 used Office of Coast Survey HCell Specifications Version 3.0 and HCell Reference Guide Version 1.0.

1. Compilation Scale

Depths for HCell H11701 were compiled to the largest scale chart in the region, 17339, 1:30,000. The density and distribution of soundings from H11701 were selected to emulate the distribution on the chart. Non-bathymetric features have been generalized to chart scale.

2. Soundings

A survey-scale sounding (SOUNDG) feature object layer was built from the 5-meter combined surface, **H11701_Combined_5m**, in CARIS BASE Editor. A shoal-biased selection was made at 1:7,500 scale for the main chart area using a Radius Table file with values shown in the table, below. The resultant sounding layer contains depths ranging from 0.0 to 74.9 meters.

Upper limit (m)	Lower limit (m)	Radius (mm)
0	10	3
10	20	4
20	50	4.5
50	150	5

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

3. Depth Areas and Depth Contours

3.1 Depth Areas

The extents of the **H11701_Combined_5m** surface generated during contour creation were used to create the single, all encompassing depth area (DEPARE). Two depth

ranges, from -2.3 to 0 meters and 0 to 150 meters, were used for the depth area objects. Upon conversion to NOAA charting units, the depth ranges are -1.26 to 0 fathoms and 0 to 82.02 fathoms.

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

Chart Contours in Fathoms	Metric Equivalent of Chart Contours	Metric Equivalent of Chart Contours NOAA Rounded	Actual Value of Chart Contours
0	0.00	0.2286	0.00
3	5.4864	5.715	3.125
10	18.288	18.5166	10.125
50	91.44	92.8116	50.750
100	182.88	184.2516	100.75

Contours delivered in the *_SS file 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 results in conflicts between the *_SS file contours and HCell features at or near the survey limits. Conflicts with M_COVR, M_QUAL, DEPART and COALNE, should be expected. HCell features should be honored over *_SS.000 file contours in all cases where conflicts are found.

4. Meta Areas

The following Meta object areas are included in HCell 11701:

M_QUAL
M_COVR

Meta area objects were constructed on the basis of the limits of the hydrography. (See 3.1 *Depth Areas*.)

5. Features

Shoreline features for H11701 were delivered from the field in one S-57 file defining new features and modification to GC or charted features. The features included in the HCell were de-conflicted against GC shoreline, the chart and hydrography during office processing.

There were two DTONs reported from survey H11701. All reported DTONs have been applied to the charts and all are included in HCell H11701.

There were no AWOIS items in the limits of H11701.

Ten bottom samples were collected during H11701 and 7 are included in the HCell. No charted bottom samples were retained.

The source of all features included in the H11701 HCell can be determined by the SORIND field.

6. S-57 Objects and Attributes

The *_CS HCell contains the following Objects:

SOUNDG	Chart scale soundings
DEPARE	All-encompassing depth area and intertidal depth areas
DEPCNT	Zero-meter contour defining intertidal areas
COALNE	GC MHW line
LNDARE	GC Islets to be retained
UWTROC	Rock features
OBSTRN	Foul areas
SBDARE	Bottom samples, reefs, ledges and rocky seabed areas
WATTUR	Areas with tide rips
WEDKLP	Kelp and sea grass features
M_COVR	Data coverage Meta object
M_QUAL	Data quality Meta object
\$CSYMB	Blue notes

The *_SS HCell contains the following Objects:

SOUNDG	Soundings at the survey scale density
DEPCNT	NOAA rounded contours at chart scale intervals

All S-57 Feature Objects in the *_CS HCell have been attributed as fully as possible based on information provided by the Hydrographer and in accordance with current guidance and the OCS HCell Specifications.

7. Blue Notes

Notes to the RNC and ENC chart compilers are included in the HCell as \$CSYMB features with the Blue Note information located in the INFORM field. The NINFOM field is populated with the charting disposition

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, and therefore have lower precision. 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

Conversion to charting units and application of NOAA rounding is completed in the same step, at the end of the HCell compilation process.

Conversion to fathoms and feet charting units with NOAA rounding ensures that:

- All depths deeper or equal to 11 fathoms display as whole fathoms.
- All depth units between 0 fathoms (MLLW) and 11 fathoms display as fathoms and whole feet.
- All depth units above MLLW (0 fathoms) to 2.0 feet above MHW display in feet for values that round to 5 feet or less, and in fathoms and feet above that.
- All height units (HUNI) which have been converted to charting units, and that are 2.0 feet above MHW and greater, are shown in feet.

In an ENC viewer fathoms and feet depth units (DUNI) display in the format X.YZZZ, where X is fathoms, Y is feet, and ZZZ is decimals of the foot. In an ENC viewer, heights (HUNI) display as whole feet.

9. Data Processing Notes

9.1 Junctions

H11701 junctions with survey H11700. H11700 has already been compiled and a common junction was made between the two surveys.

9.2 Conflicts between Shoreline and Hydrography

There are instances of GC shoreline in conflict with hydrography. These were examined using the highest resolution Surfaces. Conflicts were given a blue note with a recommendation to adjust the GC shoreline using the new survey data.

10. QA/QC and ENC Validation Checks

H11701 was subjected to QA checks in S-57 Composer prior to exporting to the HCell base cell (000) file. The millimeter precision metric S-57 HCell was converted to a 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 have been approved by MCD as inherent to and acceptable for HCells.

11. Products

11.1 HSD, MCD and CGTP Deliverables

- H11701 Base Cell File, Chart Units, Soundings compiled to 1:30,000
- H11701 Base Cell File, Chart Units, Soundings compiled to 1:7,500
- H11701 Base Cell File, Metric Units, Features compiled to 1:10,000
- H11701 Descriptive Report including end notes compiled during office processing and certification, the HCell Report, and supplemental items
- H11701 Survey Outline to populate SURDEX

11.2 File Naming Conventions

- | | |
|--|----------------------------|
| • Chart units base cell file, chart scale soundings | H11701_CS.000 |
| • Chart units base cell file, survey scale soundings | H11701_SS.000 |
| • Metric base cell file, survey scale features | H11701_S57_Features.000 |
| • Descriptive Report package | H11701_DR.pdf |
| • Survey outline | H11701_Outline.gml & *.xsd |

11.3 Software

CARIS HIPS Ver. 6.1	Inspection of Combined BASE Surfaces
CARIS BASE Editor Ver. 2.2	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. 2.0	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.
Newport Systems, Inc., Fugawi View ENC Ver.1.0.0.3	Independent inspection of final HCells using a COTS viewer.

12. Contacts

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

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APPROVAL SHEET
H11701

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 disproval 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.