H11720

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. H11720

LOCALITY

State Alaska

General Locality Akutan Pass

Sublocality West of Egg Island

2007

CHIEF OF PARTY

Dean Moyles

LIBRARY & ARCHIVES

DATE

NOAA FORM 77-28
(11-72)

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

REGISTRY No

HYDROGRAPHIC TITLE SHEET

H11720

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 **Alaska**

General Locality **Akutan Pass**

Sub-Locality **West of Egg Island**

Scale **1:10,000** Date of Survey **June 16, 2007 - July 22, 2007**

Instructions dated **6/15/2007** Project No. **OPR-Q191-KR-07**

Vessel **R/V DAVIDSON (1066485), R/V D2 (647782)**

Chief of party **Dean Moyles**

Surveyed by **ORTHMANN, REYNOLDS, GILL, MOUNT, STOCK, FARLEY, BRIGGS, POECKERT, ET. AL.**

Soundings by echo sounder, hand lead, pole **RESON 8101, RESON 8111**

Graphic record scaled by **FUGRO PELAGOS, INC. PERSONNEL**

Graphic record checked by **FUGRO PELAGOS, INC. PERSONNEL** Automated Plot **N/A**

Verification by **Grant Froelich** Evaluation By **Matt Andring, Grant Froelich**

Soundings in **Fathoms and Feet** at **MLLW**

REMARKS: **All times are UTC.**

The purpose of this survey was 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.

NOAA FORM 77-28 SUPERSEDES FORM C&GS-537

A - Area Surveyed

H11720 (Sheet J) is bound by the coordinates listed below, which encompasses an area West of Egg Island.

Hydrographic data collection began on June 16, 2007 and ended on July 22, 2007.

Table 1 – H11720 Sheet Limits

Sheet Limits H11720 Sheet J Scale 1:10,000		
Point #	Positions on NAD83	
	Degrees Latitude (N)	Degrees Longitude (W)
1	53-47-15.00 N	165-55-18.84 W
2	53-47-15.00 N	166-01-29.28 W
3	53-52-20.64 N	166-01-29.28 W
4	53-52-20.64 N	165-59-14.64 W
5	53-53-49.56 N	165-59-16.44 W
6	53-53-49.56 N	165-55-18.84 W

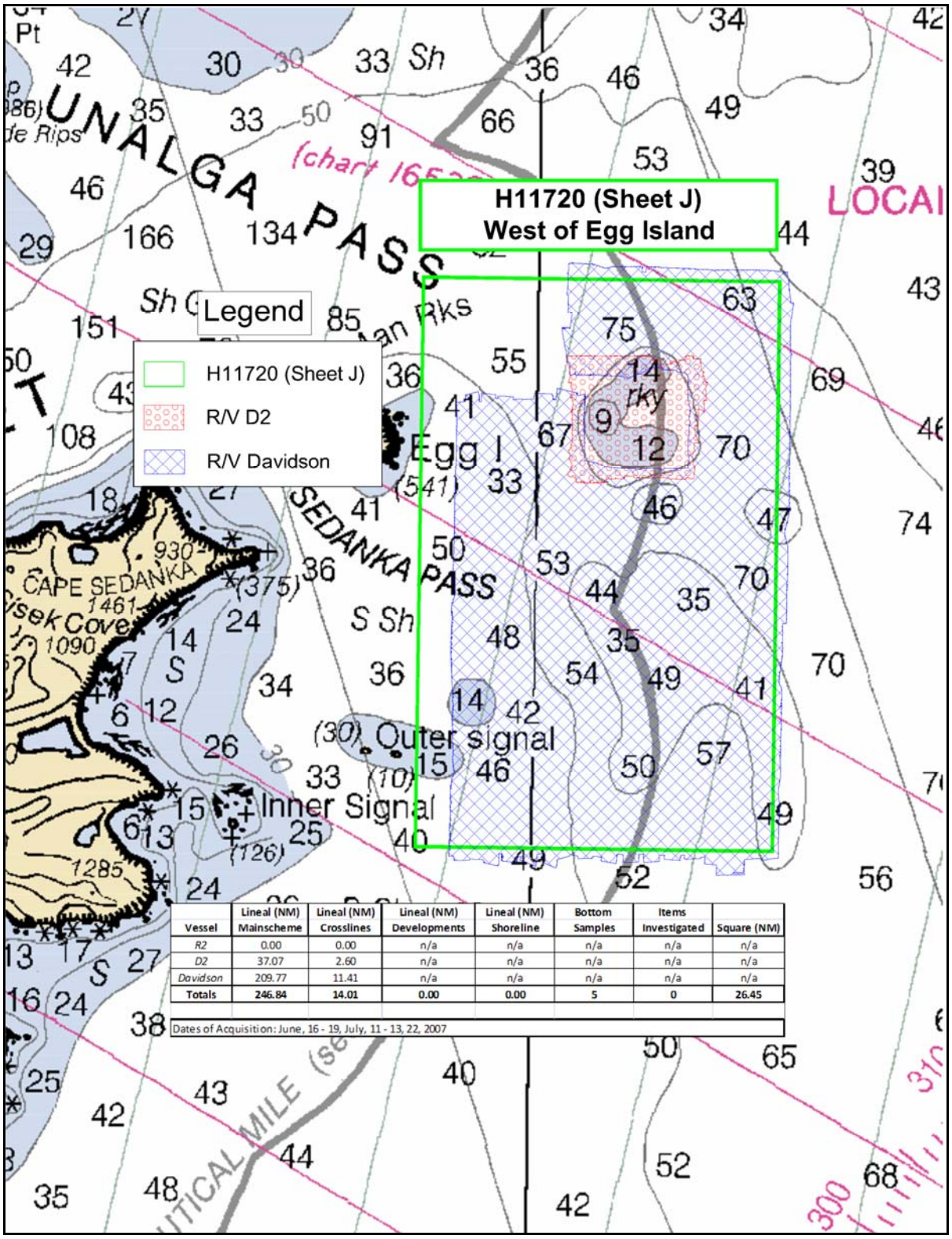


Figure 1 H11720 Area Surveyed

B – Data Acquisition & Processing

Refer to the OPR-Q191-KR-07 Data Acquisition and Processing Report[1] 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 and R/V D2 acquired all soundings for H11720. 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/V D2, 29 feet in length with a draft of 5.7 feet, was equipped with a 240 kHz Reson 8101 with option 033 (pseudo Side Scan) for multibeam data acquisition. Both 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 22.11 nautical miles or 6.5 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.

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.

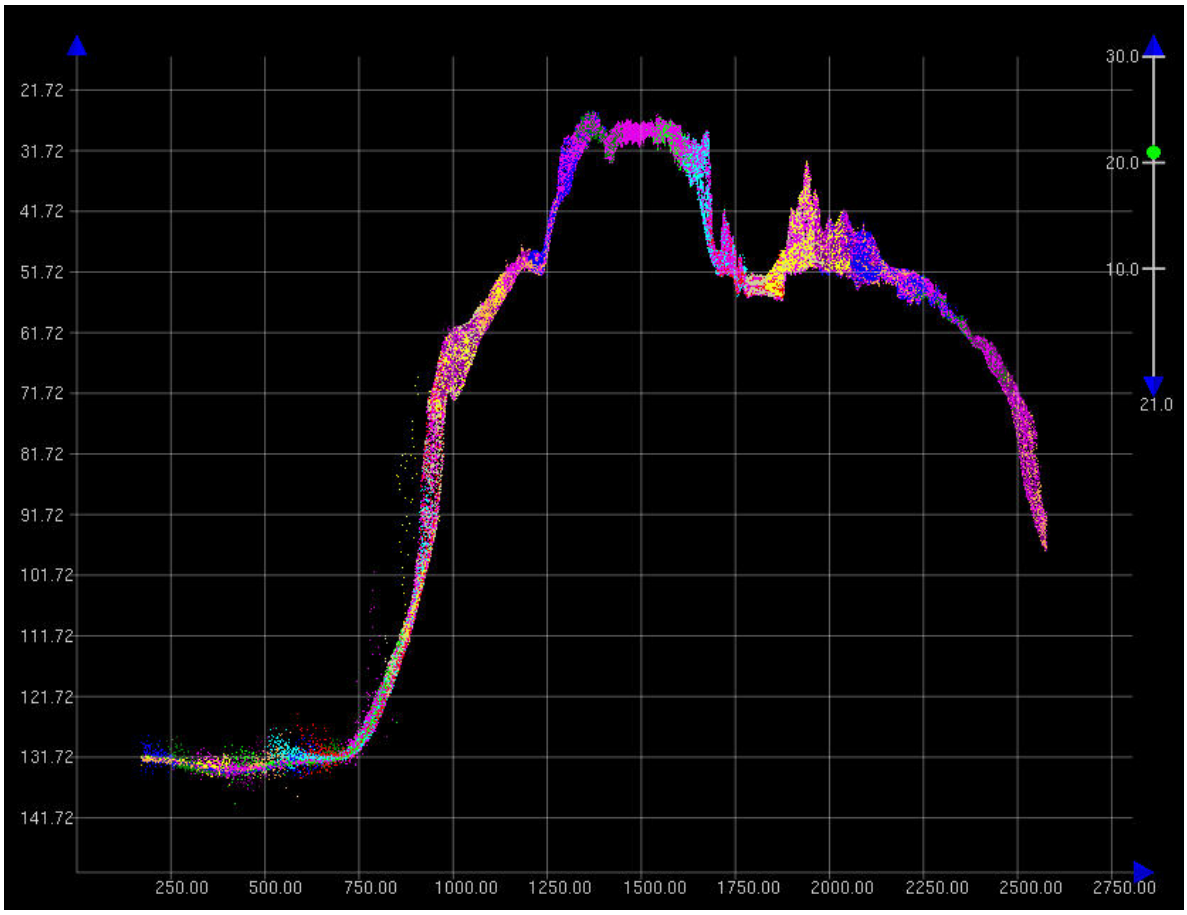


Figure 2 Profile of 2J01-TIE01

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 H11720 had an uncertainty of about 0.25 to 0.50 meters, except for areas having extremely steep slopes or deemed to be rocky, where values ranged from 0.60 to 0.85 meters. No uncertainty values were greater than the IHO level Order 1.[2]

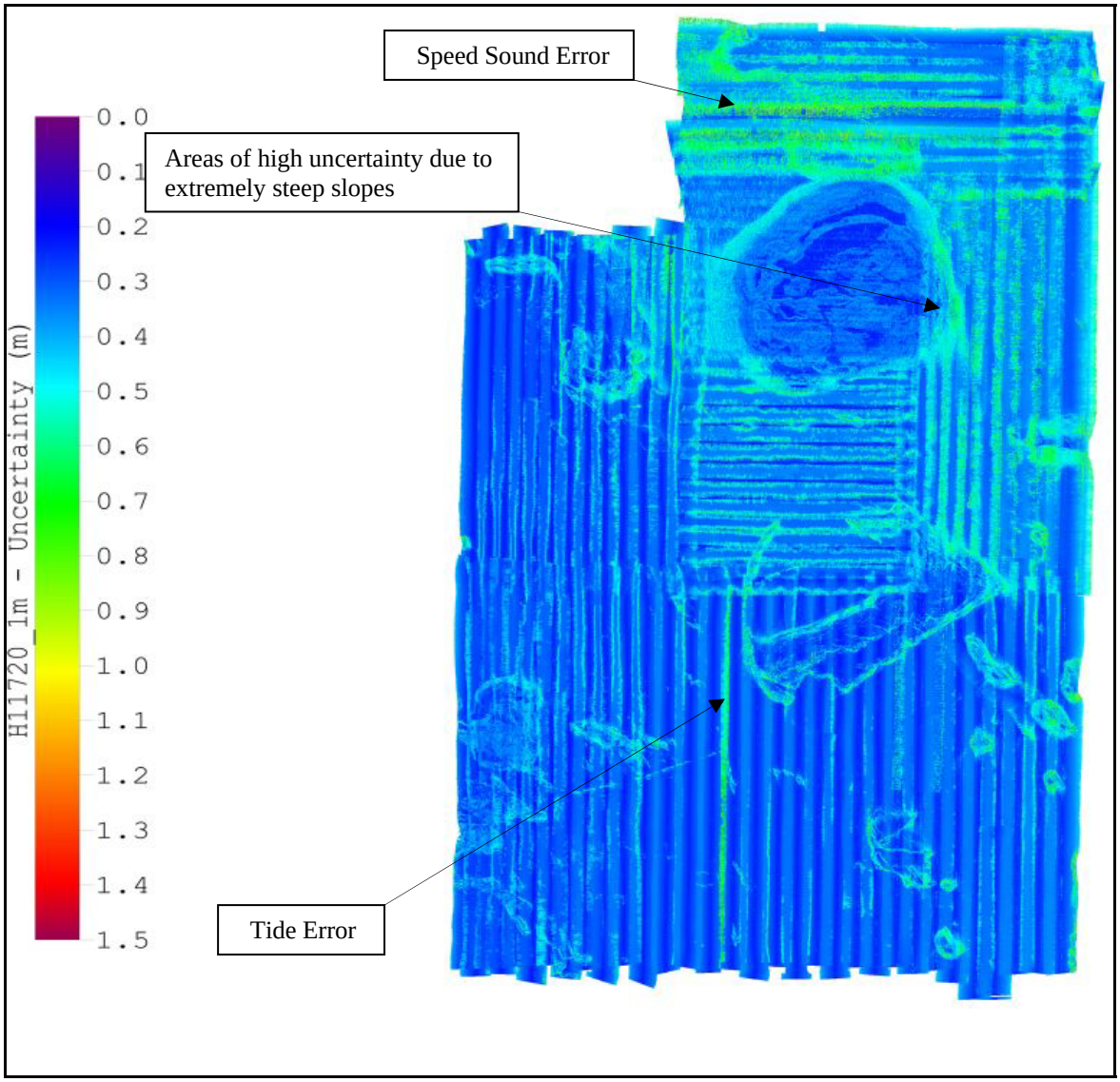


Figure 3 H11720 Uncertainty DTM

Survey Junctions

H11720 (Sheet J) junctions with:

Registry #	Scale	Date	Junction Side
H11716	1:10,000	2007	Northwest[3]
H11719	1:10,000	2007	West[4]

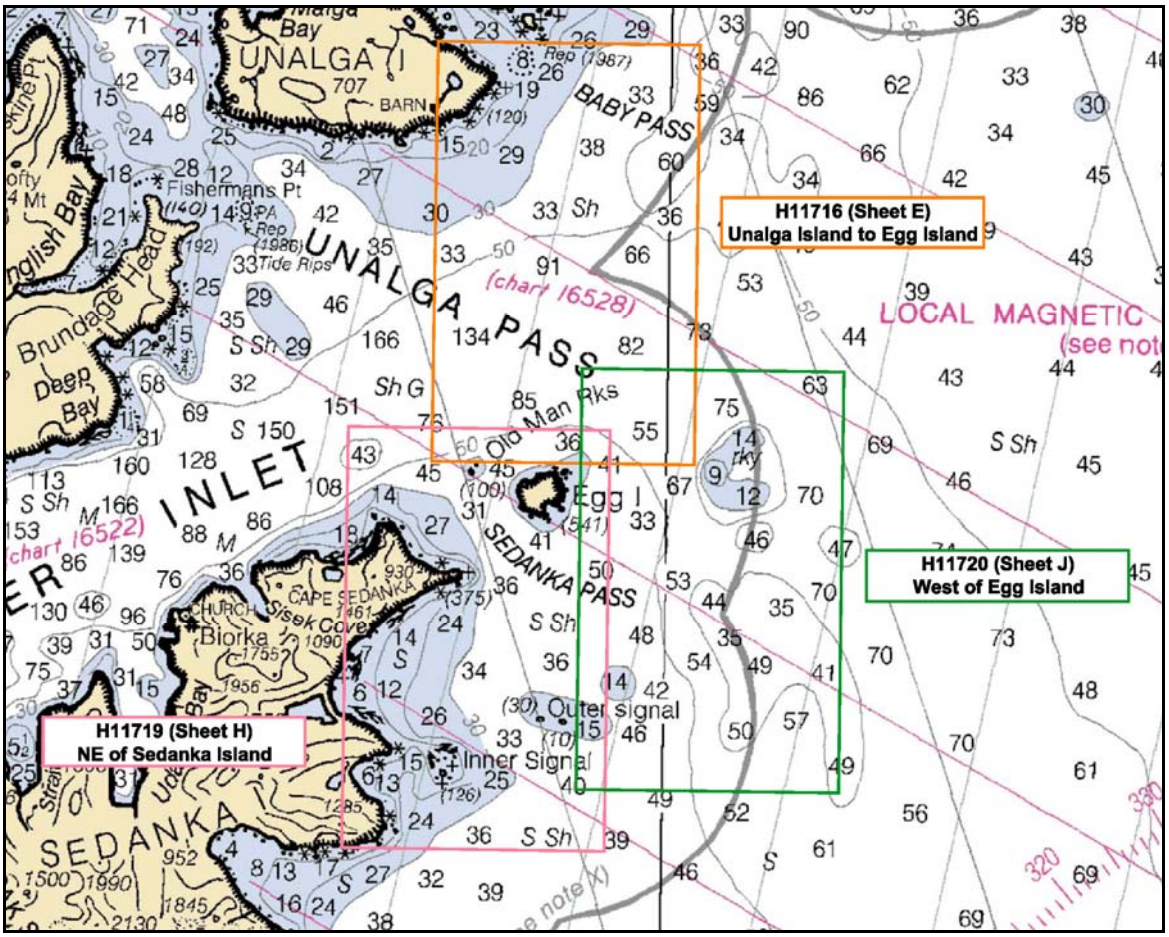


Figure 4 H11720 Survey Junctions

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 (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 H11720 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 3 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[8] for H11720 is called H11720, and it contains four different BASE surfaces of different resolutions. To ensure sufficient overlap between these surfaces the follow parameters were used:

Depth Threshold: 0 to 20 meters, resolution = 1m, Name in BASE Surface H11720_1m
Depth Threshold: 15 to 45 meters, resolution = 2m, Name in BASE Surface H11720_2m
Depth Threshold: 40 to 60 meters, resolution = 4m, Name in BASE Surface H11720_4m
Depth Threshold: 50 to Max depth, resolution = 5m, Name in BASE Surface H11720_5m

The final S57 file for this project is called "H11720_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.[9]

C – Horizontal & Vertical Control

Refer to the OPR-Q191-KR-07 Horizontal and Vertical Control Report[10] 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	53º49'44"N	166º12'59" W	June-August
9462662	Seabird SBE26 (w/submersible pressure gauge)	Reef Bight, AK	54º09'25"N	166º04'24" 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.

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.

D – Results and Recommendations

Chart Comparison[11]

H11720 survey was compared with charts:

Chart No.	Scale	Edition	Edition Date
16522	40,000	6th	Feb. 2004
16528	40,000	16th	Jun. 1998
16531	80,000	7th	Feb. 2002
16520	300,000	22nd	Mar. 2004

Note: Electronic charts US3AK61M, US4AK6FM, US5AK6BM and US5AK6CM.

Comparison of Soundings

In general, the soundings from chart 16522 coincide with the soundings from H11720 to within 1 to 5 fathoms; areas that do vary to any degree are as follows:

- Item # 1: Hydrographic survey H11720 revealed a depth of 40 fathoms in the vicinity of a 54 fathom sounding on chart 16528 located at 53º49’06” N, 165º58’21” W. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.[12]
- Item # 2: Hydrographic survey H11720 revealed a depth of 23 fathoms in the vicinity of a 33 fathom sounding on chart 16528 located at 53º48’40” N, 166º00’57” W. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.[13]

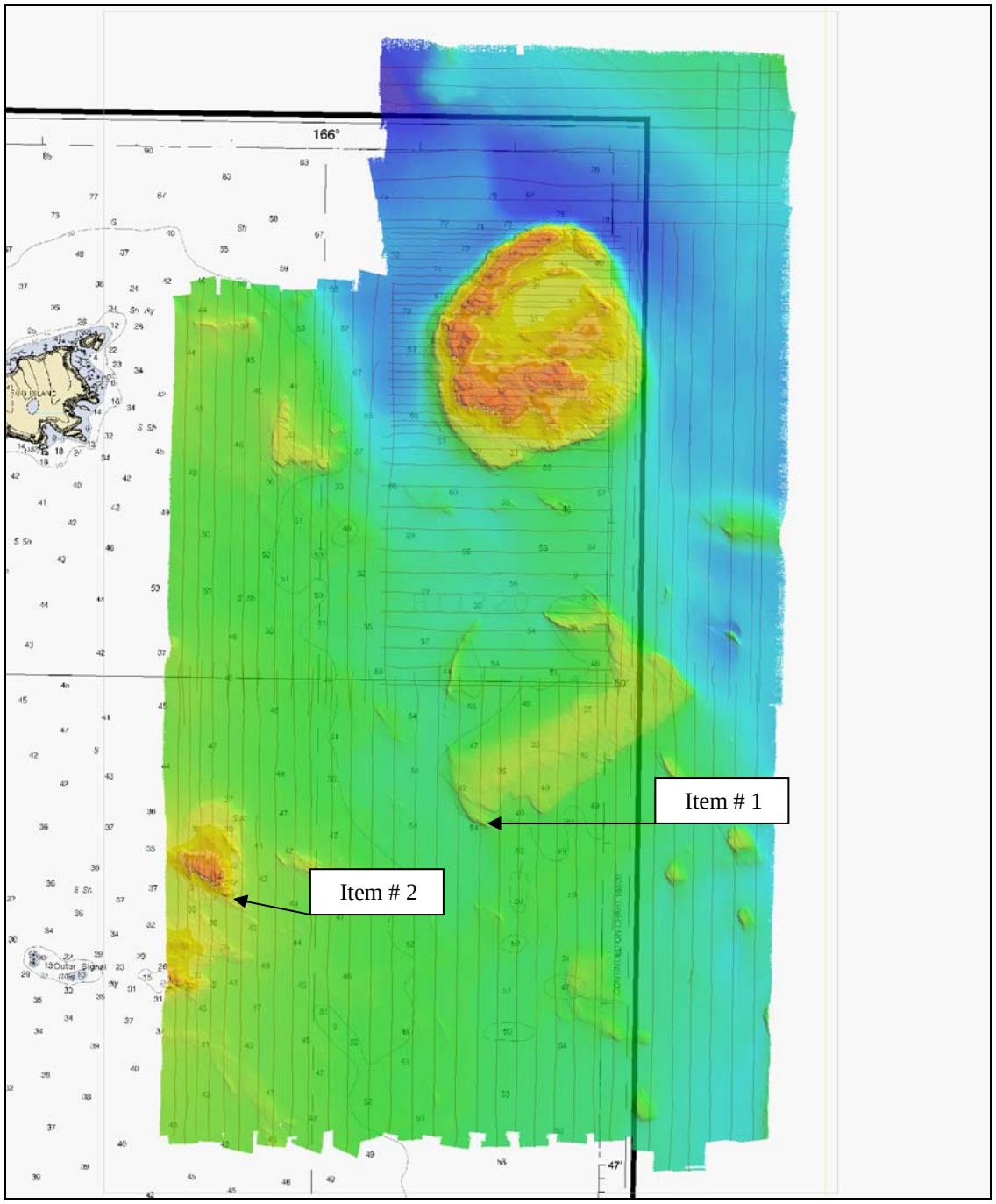


Figure 5 H11720 Chart Comparison (Chart 16522)

It should also be noted that the soundings from H11720 coincide with the soundings from charts 116528, 16531, and 16520 to within 1 to 5 fathoms.[14] [15]

In general, the soundings from electronic chart US3AK61M coincide with the soundings from H11720 to within 5 to 15 meters[16]; areas that do vary to any degree are as follows:

- Item # 1: Hydrographic survey H11720 revealed a depth of 85.0 meters in the vicinity of a 128 meter sounding on electronic chart US3AK61M located at 53º50'23" N, 165º55'47" W. This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.[17]

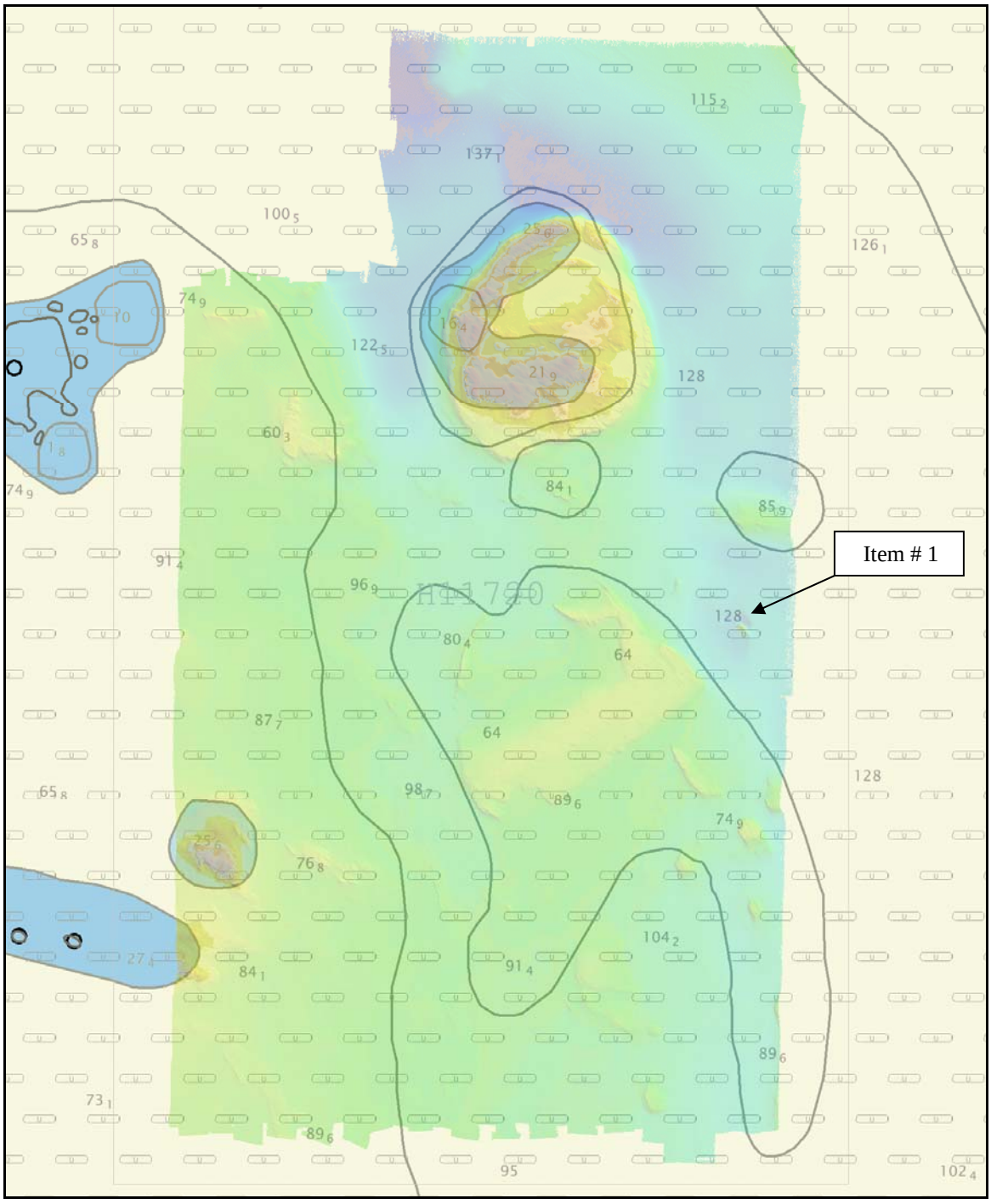


Figure 6 H11720 Electronic Chart Comparison (Chart US3AK61M)

It should also be noted that soundings from H11720 coincide with soundings from electronic charts US4AK6FM, US5AK6BM, US5AK6CM to within 5 to 15 meters.[18]

Automated Wreck and Observation Information System

There were no AWOIS items assigned to H11720.[19]

Charted Features

There were no charted features labeled PA, ED, PD, or Rep within the limits of H 11720.[20]

Dangers to Navigation

No Dangers to Navigation were located during the survey of H11720.[21]

Bottom Samples

The R/Vs Davidson 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 positions were 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 H11720_S57_Features[22] file.

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. [23]

E – Approval Sheet

Approval Sheet

For

H11720

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

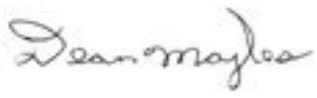
OPR-Q191-KR-07 Statement of Work and 2007 Specifications & Deliverables;
Fugro Pelagos, Inc. Acquisition Procedures (2007- NOAAAcquisitionProcedures);
Fugro Pelagos, Inc. Processing Procedures (2007-NOAAProcessingProcedures);

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

Revisions Compiled During Office Processing and Certification

[1] Filed with the project records
[2] Concur
[3] H11716 is currently at the beginning of the compilation stage. Junction will be discussed in the DR for H11716
[4] H11719 has completed the SAR process but has not yet begun to be compiled. Junction will be discussed in the DR for H11719
[5] Concur
[6] Concur
[7] Concur
[8] Should read “The final fieldsheet for H11720 is called H11720” not “The final Bathymetric with Associated Statistical Error (BASE) surface for H11720 is called H11720”
[9] There was no shoreline collected for this survey
[10] Filed with the project records
[11] Data are adequate to supersede charted data within the common area
[12] Concur
[13] Concur
[14] Should read chart 16528, not 116528.
[15] Concur
[16] Concur
[17] Concur
[18] Concur
[19] Concur
[20] Concur
[21] Concur
[22] “H11720_S57_Features.000”
[23] Concur

H11720 HCell Report

Grant Froelich, 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 ENC and RNC in the region: NOAA ENCs, US3AK61M, US4AK6FM, US5AK6BM, US5AK6CM, and NOAA RNCs, 16520, 16531, 16528 and 16522.

HCell compilation of survey H11720 utilized Office of Coast Survey HCell Specifications Version 3.1, with approved modifications to better align with PHB's HCell process and to meet MCD needs.

1. Compilation Scale

Depths for HCell H11720 were compiled to the largest scale chart in the region, 16522 and 16528, 1:40000, 16531, 1:80000 and 16520, 1:300000. Non-bathymetric features have not been generalized to chart scale; their position, characterization and density are as delivered from the field.

2. Soundings

A survey-scale sounding (SOUNDG) feature object layer was built from the 4-meter Combined Surface in CARIS BASE Editor. A shoal-biased selection was made at 1:15000 survey scale for areas covered by the 1:40000 scale charts, 1:20000 survey scale for areas covered only by the 1:80000 scale chart and 1:30000 survey scale for areas covered only by the 1:300000 scale chart using a Radius Table file with values shown in the table, below. The resultant sounding layer contains 10,877 depths ranging from 19.8 to 163.4 meters.

Upper limit (m)	Lower limit (m)	Radius (mm)
-4.7	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 and imported into a new layer created to accommodate chart 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 highest resolution BASE Surface together with the extents of the soundings layer were used to digitize the hydrographic extents, which were then used to create the single, all encompassing depth area (DEPARE).

3.2 Depth Contours

Depth contours at the intervals on the largest scale chart are included in the H11720_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 Generalized	Actual Value of Chart Contours
10	18.288	18.5166	10.125
20	37.576	37.9476	20.750
50	91.44	91.8166	50.750
60	109.728	111.0996	60.750
70	128.016	129.3876	70.750

Contours delivered in the H11720_SS file have not been deconflicted against shoreline features, soundings and hydrography as all other features in the H11720_CS file and soundings in the H11720_SS have been. This results in conflicts between the H11720_SS file contours and HCell features at or near the survey limits. Conflicts with M_QUAL, DEPARE and SBDARE objects, and with DEPCNT objects representing MLLW, should be expected. HCell features should be honored over H11720_SS.000 file contours in all cases where conflicts are found.

4. Meta Areas

The following Meta object areas are included in HCell H11720:

M_QUAL
M_CSCL

M_QUAL objects were constructed on the basis of the limits of the hydrography. (See 3.1 *Depth Areas*.) M_CSCL objects were created on the basis of the limits of chart coverage. (See 1. *Compilation Scale*.)

5. Features

5.1 Generalization of Features to Chart Scale

Features gathered by field units are delivered to PHB and applied to the preliminary HCell without reduction in number or character. This preliminary HCell is used to perform evaluation and verification of survey soundings and features, features are deconflicted against hydrography, and geometry is corrected as needed. Linear and area features are also digitized against the BASE Surfaces, and features to be retained are imported from the chart. This features file is used as the basis for the final HCell compilation with features reduced to the largest scale RNC and ENC. In addition, the product of the survey scale features file, H11720_Features.000, is archived at PHB.

Pending further guidance from MCD, features generalization has been accomplished primarily through reduction in the number of features included in the HCell. Generalizing area features to point objects is entrusted to the RNC division. Where line and area objects are included in the

HCell, complexity of the lines and edges comprising the features have been smoothed commensurate with chart scale.

5.2 Compilation of Features to the HCell

Shoreline features for H11720 were delivered from the field in one 000 file defining new rocky seabed area features and bottom samples. These were deconflicted against the chart and hydrography during office processing.

During office processing, additional rocky seabeds were digitized from the high resolution BASE Surfaces.

The source of all features included in the H11720 HCell can be determined by the SORIND field.

5.2 Mean High Water Used for HCells

For the purposes of determining the height at which a rock becomes an islet, the CO-OPS *"Tide Note for Hydrographic Survey"*, *"Height of High Water Above the Plane of Reference"* is used.

6. S-57 Objects and Attributes

The H11720_CS HCell contains the following Objects:

$CSYMB	Blue Notes
DEPARE	The all-encompassing depth area
M_CSCL	Compilation scale Meta object
M_QUAL	Data quality Meta object
SBDARE	Bottom samples and rocky seabed areas
SOUNDG	Soundings at the chart scale density

The H11720_SS HCell contains the following Objects:

DEPCNT	Generalized contours at chart scale intervals
SOUNDG	Soundings at the survey scale density

All S-57 Feature Objects in the H11720_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. By agreement with MCD, the NINFOM field is populated with an abbreviated version of the Blue Note (30 characters or less), describing the chart disposition, to be used by MCD in generating their Chart History spreadsheet.

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

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 0 fathoms (MLLW) 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. (This is a deviation from the traditional 'fathoms and feet' charting rule that requires that all depths above MLLW will be shown in feet. The display in fathoms and feet for depths between MLLW and 2 feet above MHW accommodates S-57 rules that require the same charting units to be used for all depth units (DUNI) in an ENC.)
- All height units (HUNI) which have been converted to charting units, and that are 2.00 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 Junction with H11508

H11720 junctions with H11716 and H11719. While the SAR process has been completed for both surveys, compilation had not finished on H11716 and had not yet begun on H11719. These junctions will be discussed in the DRs for surveys H11716 and H11719.

10. QA/QC and ENC Validation Checks

H11720 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 are MCD approved as inherent to and acceptable for HCells.

11. Products

11.1 HSD, MCD and CGTP Deliverables

- H11720 Base Cell File, Chart Units, Soundings and features compiled to 1:40000, 1:80000 and 1:300000.
- H11720 Base Cell File, Chart Units, Soundings compiled to 1:15000, 1:20000 and 1:30000.
- H11720 Descriptive Report including end notes compiled during office processing and certification, the HCell Report, and supplemental items.
- H11720 Survey outline to populate the SURDEX.

11.2 File Naming Conventions

- Chart units base cell file, chart scale soundings — H11720 _CS.000
- Chart units base cell file, survey scale sounding set — H11720 _SS.000
- Descriptive Report package — H11720 _DR.pdf
- Survey outline — H11720_Outline.gml & *.xsd

11.3 Software

CARIS HIPS Ver. 6.1	Inspection of Combined BASE Surfaces
CARIS BASE Editor Ver. 2.3	Creation of soundings and bathy-derived features, creation of the depth area, meta area objects, and Blue Notes; Survey evaluation and verification; Initial HCell assembly.
CARIS S-57 Composer Ver. 2.1	Final compilation of the HCell, correct geometry and build topology, apply final attributes, export the HCell, and QA.
CARIS GIS 4.4a	Setting the sounding rounding variable for conversion of the metric HCell to NOAA charting units with NOAA rounding.

CARIS HOM Ver. 3.3	Perform conversion of the metric HCell to NOAA charting units with NOAA rounding.
HydroService AS, dKart Inspector Ver. 5.1	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:

Grant Froelich, Physical Scientist, PHB, Seattle, WA; 206-526-4374; grant.froelich@noaa.gov.

APPROVAL SHEET
H-11720

Initial Approvals:

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

Grant Froelich
2010.02.10 09:30:22
-08'00'

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.

Digitally signed
by Russ Davies
Date: 2010.02.10
10:53:07 -08'00'

I have reviewed the H-Cell, 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.

Gary C. Nelson
2010.02.10
10:40:07 -08'00'

Digitally signed by David Scharff
DN: cn=David Scharff, o=OCS,
ou=NOAA,
email=david.scharff@noaa.gov, c=US
Reason: AWOIS and Surf Check
complete
Date: 2010.02.22 08:01:35 -05'00'