

H11760

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. H11760

LOCALITY

State Alaska

General Locality Southeast Alaska

Sublocality Northern Vicinity of Endicott Arm

2007

CHIEF OF PARTY

..... Commander Andrew L. Beaver, NOAA

LIBRARY & ARCHIVES

DATE

<p style="text-align: center;">U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION</p> <p style="text-align: center;">HYDROGRAPHIC TITLE SHEET</p>	<p>REGISTRY No</p> <p style="text-align: center;">H11760</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>Southeast Alaska</u></p> <p>Sub-Locality <u>Northern Vicinity of Endicott Arm</u></p> <p>Scale <u>1:10,000</u> Date of Survey <u>10/17/2007-11/01/2007</u></p> <p>Instructions dated <u>9/25/2007</u> Project No. <u>OPR-O168-FA-07</u></p> <p>Vessel <u>FAIRWEATHER (S220), Launch 1010, Launch 1018, Ambar 700</u></p> <hr/> <p>Chief of party <u>Commander Andrew L. Beaver, NOAA</u></p> <p>Surveyed by <u>LTJG Glazewski, ST Jacobs, LT Dowling</u></p> <p>Soundings by <u>Reson 8101ER, Reson 8111, Reson 8160</u></p> <p>SAR by <u>Fernando Ortiz</u> Compilation by <u>Tyanne Faulkes</u></p> <p>Soundings compiled in <u>Fathoms</u></p>	
<p>REMARKS: <u>All times are UTC. UTM Projection 8</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>	

Descriptive Report to Accompany Hydrographic Survey H11760

Project OPR-O168-FA

Endicott Arm, Alaska

Scale 1:10,000

November 2007

NOAA Ship FAIRWEATHER

Chief of Party: Commander Andrew L. Beaver, NOAA

A. AREA SURVEYED

The survey area is located in Southeast Alaska, within the sub-locality of Northwest Endicott Arm. This survey corresponds to the area outlined in red in Figure 1 below. The outlined area is part of Sheet B in the sheet layout provided with the Letter Instructions. Due to time constraints the Northwestern most portion of Sheet B was not surveyed during the 2007 program. The area surveyed is bounded on the Southeast corner at 57°36'36"N, 133°12'36"W and the Northwest corner at 57°44'24"N, 133°28'48"W.

Data acquisition and field operations were conducted from October 17 to November 1, 2007 (DN 290 to DN 305).

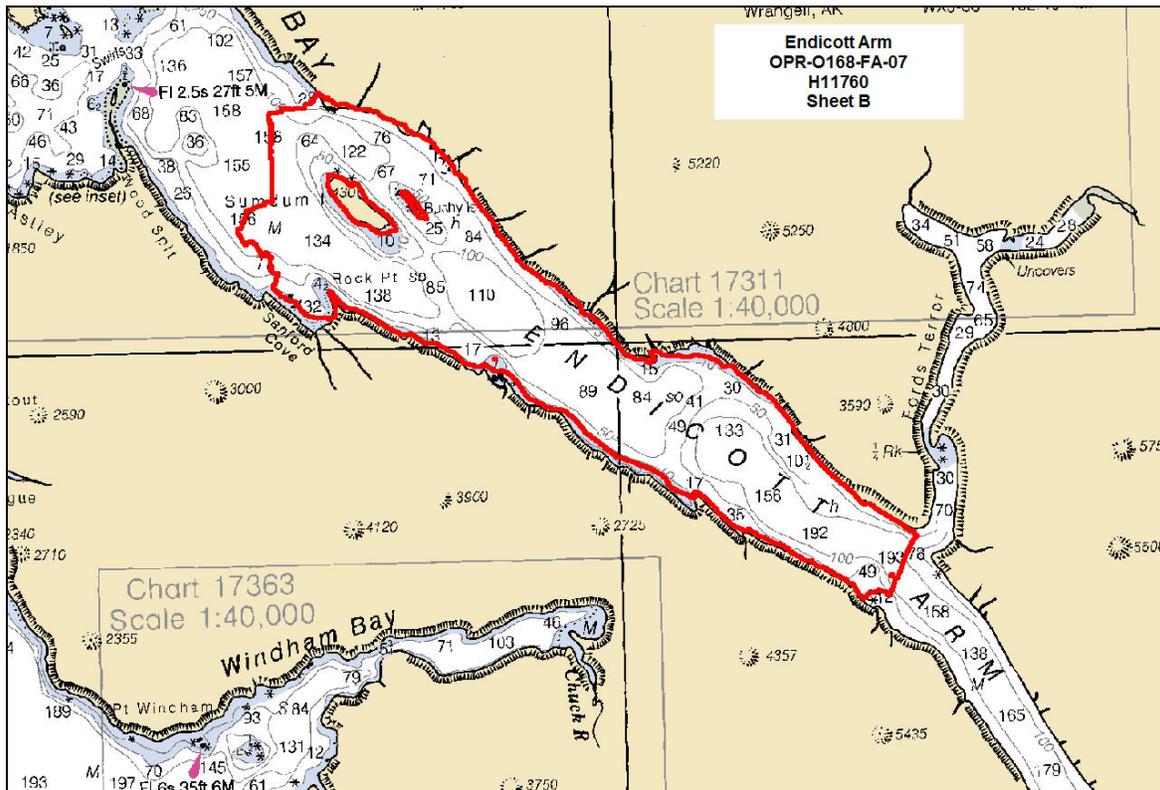


Figure 1: H11760 Survey Outline

One hundred percent multibeam echosounder (MBES) coverage was obtained in the survey area at least to depths of eight meters and often shoaler. Data were acquired as close to shore as safely possible. Additional coverage was obtained in order to determine least depths over features or shoals.

Line 293-1849 (Vessel S220-8160) straddled both H11760 and H11759 surveys. The sound velocity files (CAT, NODC, SV) for the line are located with the H11759 raw SVP data. H11760 survey contains a concatenated sound velocity file which includes the processed sound velocity data from the Moving Vessel Profiler for the above mentioned line.

Due to time/daylight constraints, shoreline data were not acquired for H11760.

Main Scheme Mileage for H11760 totaled 208.85, as shown in Table 1.

MAIN SCHEME - Mileage	
Single Beam MS	0
Multibeam MS mileage	208.85
SideScan MS	0
Total MS	208.85
CROSSLINE - Mileage	
Single Beam XL	0
Multibeam XL	21.58
Total XL	21.58
OTHER	
Developments/AWOIS - Mileage	0
Shoreline/Nearshore Investigation - Mileage	0
Total # of Investigated Items	4
Total Bottom Samples	6
Total SNM	23.62
Specific Dates of Acquisition	10/20, 10/21, 10/22, 10/23, 10/24, 10/25, 10/30, 10/31, 11/01
Specific Dn#s of Acquisition	293, 294, 295, 296, 297, 298, 303, 304, 305

Table 1. Survey Statistics

B. DATA ACQUISITION AND PROCESSING

A complete description of data acquisition/processing systems and survey vessels along with quality control procedures and data processing methods are included and described in the *OPR-O168-FA-07 Data Acquisition and Processing Report (DAPR)*, submitted under separate cover. Items specific to this survey and any deviations from the aforementioned report are discussed in the following sections. This hydrographic survey was completed as specified by Hydrographic Survey Project Instructions OPR-O168-FA, dated September 25, 2007.¹

B1. Equipment and Vessels

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

	FAIRWEATHER	Launch 1010	Launch 1018	Ambar 700
Hull Registration Number	S220	1010	1018	2302
Builder	Aerojet-General Shipyard	The Boat Yard, Inc.	The Boat Yard, Inc.	Marine Silverships Inc
Length Overall	231 feet	28' 10"	28' 10"	23
Beam	42 feet	10' 8"	10' 8"	9' 4"
Draft, Maximum	15' 6"	4' 0" DWL	4' 0" DWL	1' 4"
Cruising Speed	12.5 knots	24 knots	24 knots	22 knots
Max Survey Speed	10 knots	10 knots	10 knots	
Primary Echosounder	RESON 8111 & RESON 8160	RESON 8101	RESON 8101	
Sound Velocity Equipment	SBE 19plus & 45, MVP 200	SBE 19plus	SBE19plus	
Attitude & Positioning Equipment	POS/MV V3	POS/MV V3	POS/MV V3	
Type of operations	MBES	MBES, Bottom Samples	MBES, Tide	HORCON

Table 2: Vessel Inventory

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

B2. Quality Control

Surface comparisons were conducted by overlaying surfaces from two different sources: one containing main scheme data, and the other containing only crossline data. These surfaces, used to compute the difference, satisfy the requirement of the resolution defined in section 5.1.2.1 of the *Hydrographic Specifications and Deliverables Manual (HSSDM)*. The vertical accuracy requirement has been met and the table of analysis is included in Separate IV

Crosslines

Shallow water multibeam crosslines for this survey totaled 21.58 linear nautical miles (lnm), comprising 10.33% of the 208.85 lnm of total SWMB hydrography. Both main scheme and crossline mileage are summarized in Table 1.

Junctions

SAME PROJECT JUNCTION:

Survey H11760 junctions with H11759, which is Sheet A of the same project. The area of overlap between the sheets was reviewed in CARIS Subset Editor for consistency and data were found to be in good general agreement within one meter.² Overlap between survey sheets was approximately 100 x 400 meters.

JUNCTION TO H10756

Hydrography in the Northern Vicinity of H11760 did not overlap with Survey H10756, conducted in 1997 by NOAA Ship RAINIER. Therefore, no junction analysis was performed between these two surveys.

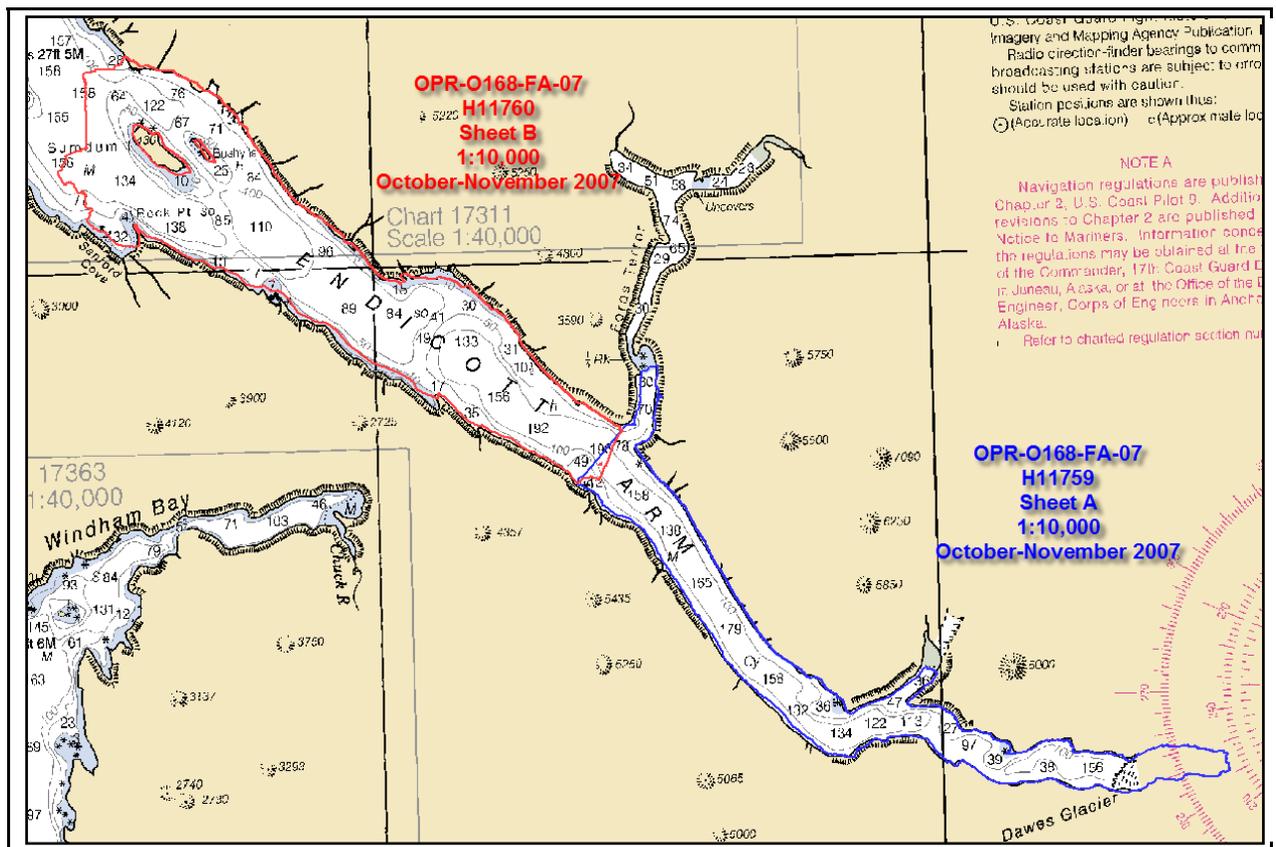


Figure 2: Junction between H11759 and H11760

Quality Control Checks

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

Accuracy Standards

All data meet the data accuracy specifications as stated in the HSSDM, with the exception of several soundings on the south shore of H11760.⁶ These soundings were initially rejected for high TPE values but were later reaccepted by the Hydrographer after review and assessment as suitable for inclusion in the survey. See figure 4.

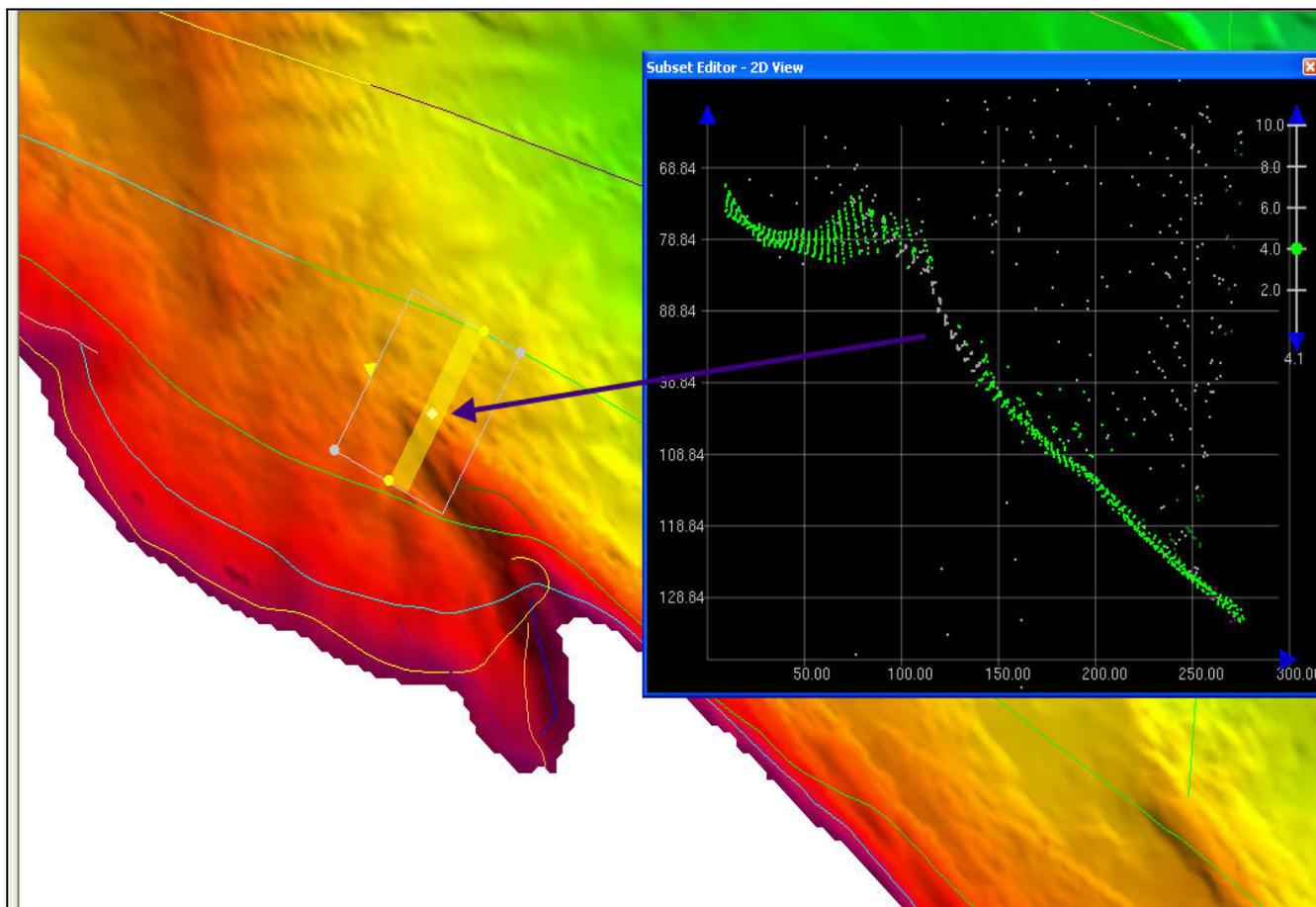


Figure 4. Data reaccepted

B3. Corrections to Echo Soundings

Data reduction procedures for survey H11760 conform to those detailed in the *Data Acquisition and Processing Report for OPR-O168-FA*.

B4. Data Processing

A detailed listing of the surface resolutions used for each depth ranges are given in Table 3. The grid resolutions were chosen to satisfy the complete multibeam coverage requirement of 10 to 20 percent of depth as stated in section 5.1.2 of the HSSDM.

Lo (m)	Hi (m)	Res. (m)
0	40	2
30	70	5
50	120	10
100	200	20
180	350+	35

Table 3: H11760 Surface Resolutions by Depth Range

Survey H11760 has been thoroughly cleaned and combined. Both the 10 meter combined (NW and SE) surfaces have been checked and reviewed for noise in both CARIS and Fledermaus programs.

Splitting H11760 into 2 smaller field sheets facilitated data cleaning by decreasing process times. Accordingly, there are a total of three fieldsheets for survey H11760 titled “Northwest”, “Southeast”, and “H11760”. The “Northwest” and “Southeast” fieldsheets are comprised of 2,5, and 10 meter resolution surfaces. Fieldsheet “H11760” encompasses the entire survey and contains the two coarsest resolutions, 20 and 35 meter.⁷

The resolution and depth range schemes used for coverage assessment of H11760 are shown in Table 3. Combined surface, incorporating 2, 5, and 10 meter resolutions served as the final combined base surface outputs. It should be noted, that each final combined surface for the Northwest and Southeast fieldsheets employed the use of a 10 meter finalized surface with a depth range of 50 to 500 meters. This range successfully eliminated the data gap problems previously mentioned above in Data Quality Factors. The finalized surfaces called “H11760_50to120_Coverage_10m_Final” demonstrated full coverage but were not used in the final combined outputs.

As previously stated, in areas where there were large holidays (> 3 nodes), the Hydrographer reaccepted good data that were initially filtered during TPE processing. One typical example is shown in figure 4.

C. HORIZONTAL AND VERTICAL CONTROL

A complete description of horizontal and vertical control for survey H11760 can be found in the *OPR-O169-FA-07 Horizontal and Vertical Control Report*, submitted under separate cover. A summary of horizontal and vertical control for this survey follows.

Horizontal Control

The horizontal datum for this project is the North American Datum of 1983 (NAD83). Differential GPS (DGPS) and Post Processing Kinematic (PPK) were the sole methods of positioning for all data collected. The U.S. Coast Guard DGPS beacon at Gustavus (288 kHz) was the primary source of differential correctors with Level Island (295 kHz) serving as primary backup.

In addition to occasionally poor DGPS reception, satellite acquisition was at times very limited due to the extremely steep topography in the project area. This was primarily a problem in the easternmost portion of Endicott Arm in the vicinity of the Dawes Glacier, and led to occasional high Dilution of Position (DOP) values in excess of 4. When Maximum Horizontal Uncertainty exceeded HSSDM requirements due to lack of satellites, survey operations were halted until the uncertainty could be reduced to within allowable limits. If no U.S. Coast Guard DGPS corrector beacon could be detected due to geographic limitations survey operations were conducted in Course Acquisition (C/A) Mode. Notes in daily acquisition logs indicated this was a problem for line 296-2038 on vessel 1010 and lines 297-2009 and 297-2017 for vessel 1018. A list of these comments is included as a word document in the Acquisition and Processing folder. Data affected by these issues has been reviewed and meets the horizontal accuracy required by the *NOS HSSDM* dated April 2007.⁸

Vertical Control

The vertical datum for this project is Mean Lower-Low Water (MLLW). The operating National Water Level Observation Network (NWLON) primary tide station at Juneau, Alaska (945-2210) served as control for datum determination and as the primary source for water level reducers for survey H11759 during acquisition.

FAIRWEATHER personnel installed one Sutron 8210 “bubbler” tide gauge on November 18, 2007 at the tertiary station listed in Table 4 below. The gauge was installed in order to provide information to the Center for Operational Oceanographic Products and Services (CO-OPS N/OPS1) for the determination of time and height correctors, in accordance with the Project Instructions. The gauge, tide staff and accompanying equipment were removed on November 1, 2007.

Station Name	Station Number	Type of Gauge	Date of Installation	Date of Removal
Upper Endicott Arm, Alaska	945-2005	Tertiary 30 Day	October 18 th , 2007	November 1, 2007

Table 4: Tide Gauge Information

Refer to the *OPR-O168-FA Horizontal and Vertical Control Report* for further information about the tide station.

A request for delivery of final approved (smooth) tides for survey H11760 was forwarded to N/OPS1 on November 3, 2007 in accordance with the Field Procedures Manual (FPM), dated March, 2007. A copy of the request is included in Appendix V.

Fairweather received the Tide Note for Survey H11760 on December 20, 2007. Final approved water level data were received by Fairweather on December 20, 2007 for tertiary tide station 945-2005, Upper Endicott Arm, AK. The Tide Note for Hydrographic Survey H11760 along with applicable files are included in Appendix V.⁹

As per the Letter Instructions, all data were reduced to MLLW using the final approved water levels (smooth tides) from the Upper Endicott Arm station (945-2005) by applying tide file 9452005.tid and time and height correctors through the zone corrector file H11760CORF.zdf. **It will not be necessary for**

the Pacific Hydrographic Branch to reapply the final approved water levels (smooth tides) to the survey data during final processing.

D. RESULTS AND RECOMMENDATIONS

D1. Chart Comparison

Chart comparison procedures were followed as outlined in the FPM.

Survey H11760 was compared with RNC chart 17360 (34th Ed.; March 2006, 1:217,828) and ENC Chart US3AK3UM (Preliminary, 1st Ed.; issue date 9/12/2007) provided on the project CD. Additionally, comparisons were also made to RNC chart 17311 (1st Ed.; April 200, 1:40,000). All charts have been updated with the Notice to Mariners through November 10, 2007 (45/07). See Table 5 for details.¹⁰

<u>NOAA Chart Number</u>	<u>Chart Scale</u>	<u>Edition Number</u>	<u>Edition Date</u>
17360	1:217,828	34th	March, 2006
17311	1:40,000	1st	April, 2000
US3AK3UM		1 st	September, 2007

Table 5: NOAA Charts compared with Survey H11760.

Chart 17360

Depths from survey H11760 generally agreed within one to two fathoms with depths on chart 17360. Several shoaler depths on the chart slightly misrepresented the bottom on account of the “steep and deep” nature of the ledges on which they lie. Figure 5 depicts one such occurrence.¹¹

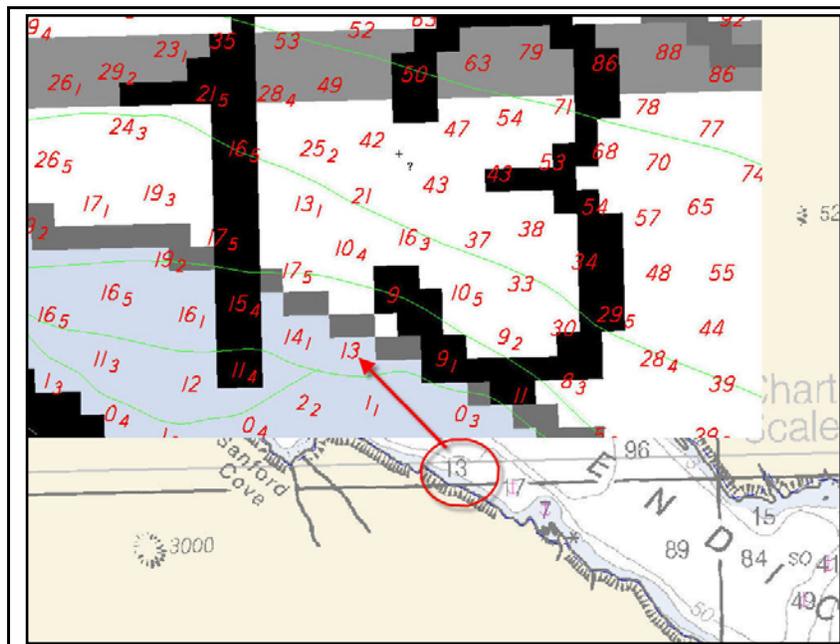


Figure 5. Charted 13 fathom sounding over steep ledge

Another sounding mid-channel between Sumdum Island and Rock Point appears to be substantially shoaler (134 fathoms, charted) than the actual depth of approximately 153 fathoms (in red). See Figure 6.

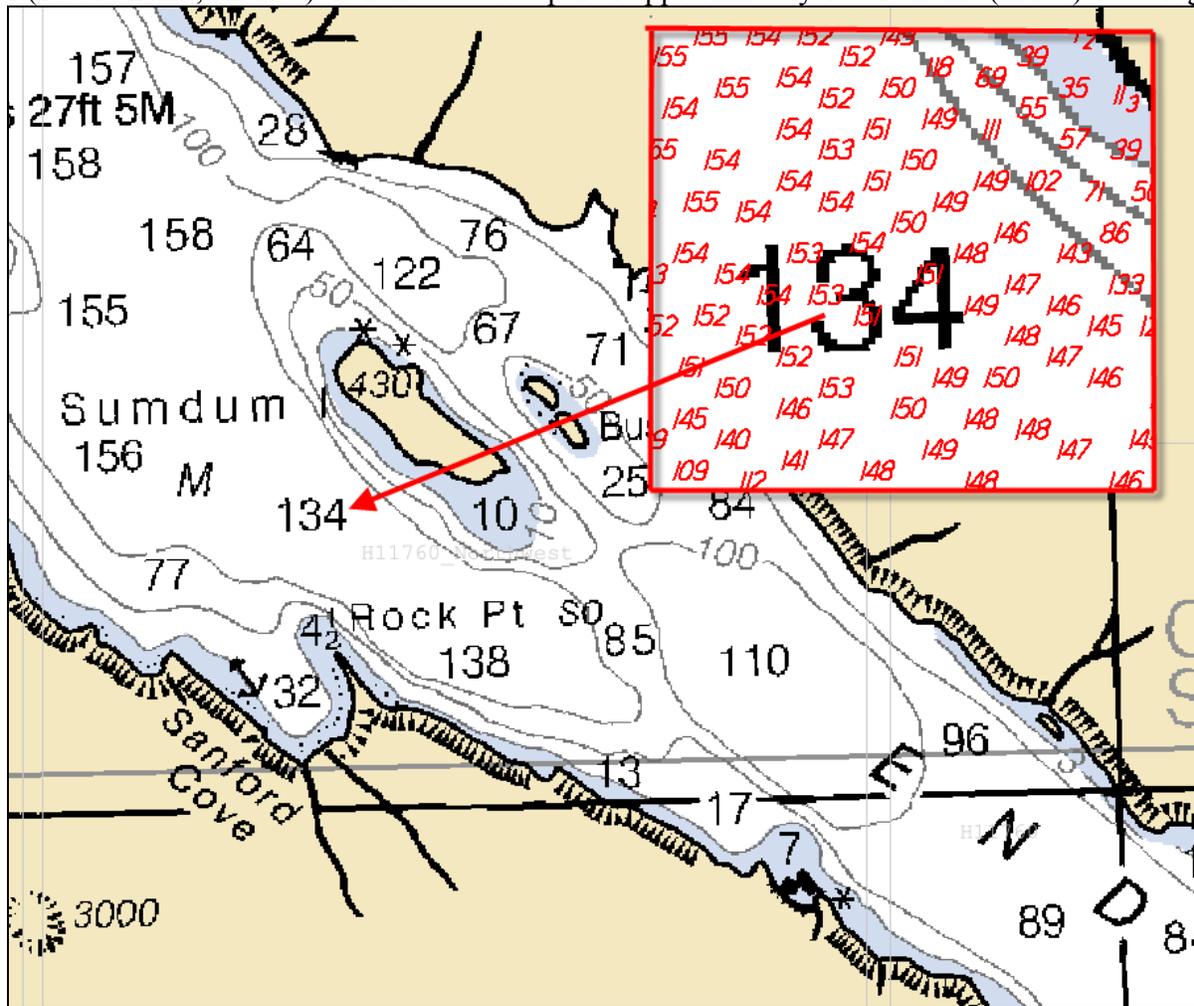


Figure 6. Shoaler-than-actual sounding

Chart 17311

Similarly, Depths from survey H11760 generally agreed within one to two fathoms with depths on chart 17311. Some of the shoaler soundings represented on the chart near steep areas appears slightly off centered. However, they remain accurate within the scale of the chart.¹²

One charted sounding, midway down the northern shore (Figure 7) appears to be substantially shoaler than charted soundings in the vicinity. The sounding layer was generated from the 20 meter surface.

Chart Comparison Recommendations

The Hydrographer has determined that bottom coverage requirements have been met and data accuracy meets requirements specified by the *HSSDM*. **The surveyed soundings are adequate to supersede prior surveys in their common areas.**¹³

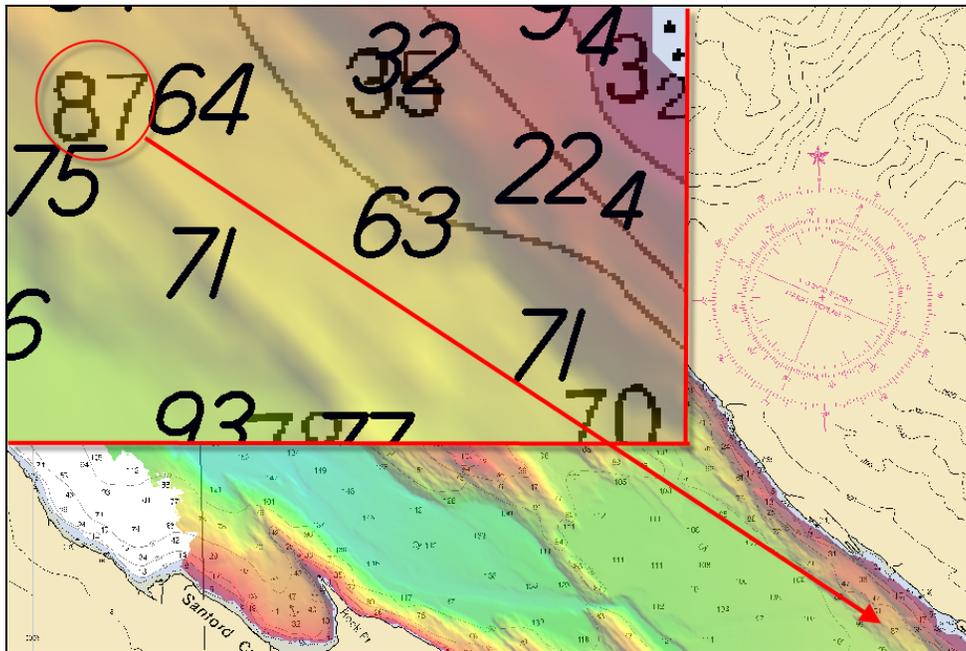


Figure 7. Charted sounding (circled in red) compared to survey sounding

Automated Wreck and Obstruction Information System (AWOIS) Investigations

There were no AWOIS items located within the limits of H11760.¹⁴

Dangers to Navigation

There were no dangers to navigation found within the survey limits.¹⁵

D.2 Additional Results

Shoreline Source

Source shoreline data for Sheet A were provided on the project CD and were taken from photogrammetric survey project AK0608 (NAD 83) GC-10673 which mirrored the features depicted on the current edition of chart 17360. Shoreline features were imported into CARIS Notebook 3.0 as files H11760_Original_Composite_Source.hob for reference and H11760_Composite_Source.hob for edits, though no edits were made.¹⁶

Shoreline Verification

No Shoreline verification was conducted during the project owing to a lack of suitable low water shoreline windows. Due to the extremely steep and deep nature of the shorelines in Endicott Arm and the

scale of chart 17360 (1:217,828), the suggested NALL line served more as an outer boundary of near shore MBES and inner boundary of Ships Hydrography.

The SORIND and SORDAT information for data imported into CARIS Notebook are shown in Table 6.¹⁷

Shoreline Source	SORIND	SORDAT
Project	US,US,graph,H11760	20071101
Chart	US,US,graph,Chart 17360	20060300

Table 6: SORIND/SORDAT Shoreline Features

Shoreline Data Processing

No shoreline acquisition was conducted during the survey. The only Pydro features exported to CARIS Notebook were 6 bottom samples collected on the last day of the survey and 4 charted rocks will requiring repositioning due to MBES coverage.

Source Shoreline Changes, New Features and Charted Features

No adequate shoreline windows existed and therefore shoreline verification was not conducted on OPR-O168-FA-07. Nevertheless, four charted rocks on Sheet B were flagged “report” in Pydro and exported into Notebook, in the H11760_Disprovals.hob layer. These charted rocks were reviewed after noticing MBES coverage over their charted locations.

Shoreline Recommendations

The Hydrographer recommends repositioning these features inshore of MBES or removal from Charts 17311 and 17360. See H11760 Features Report.¹⁸

Aids to Navigation

There were no aids to navigation within the survey limits.¹⁹

Bottom Samples

Bottom samples were collected on November 1, 2007 (DN305) and are included as seabed area classifications along with the other S57 features in the Pydro Preliminary Smooth Sheet. The bottom sample positions were also imported into the Notebook H11760_Updates.hob.

During acquisition on DN305, bottom samples were mistakenly logged as SBDARE lines instead of SBDARE points. The Microsoft Access Database file named TR1305_B.mdb was copied and edited to contain point features instead of line features. The new MS Access file was named TR1305_BS_PTS_NEW and imported into Pydro. The original and edited .mdb files are both included with the raw data folders.

Additional Recommendations

It is recommended by the Hydrographer that any future chart include a ***Note*** concerning the very poor GPS coverage and/or DGPS signal to be expected in the Southeastern most portion of Endicott Arm due to the extreme glacial topography of the area.²⁰

E. Supplemental Reports

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

<u>Title</u>	<u>Date Sent</u>	<u>Office</u>
Hydrographic Systems Readiness Review Memo 2007	April 23, 2007	N/CS34
Data Acquisition and Processing Report for OPR-O168-FA-07	April 21, 2008	N/CS34
Horizontal and Vertical Control Report for OPR-O168-FA-07	November 11, 2007	N/CS34
Tides and Water Levels Package for OPR-O168-FA-07	November 19, 2007	N/OPS1
Coast Pilot Report for OPR-O168-FA-07	March 5, 2008	N/CS26



UNITED STATES DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration
NOAA Marine and Aviation Operations
NOAA Ship FAIRWEATHER S-220
1010 Stedman Street
Ketchikan, AK 99901

February 20, 2008

MEMORANDUM FOR: CDR David Neander, NOAA
Chief, Pacific Hydrographic Branch

FROM: CDR Andrew L. Beaver, NOAA
Commanding Officer

Andrew L. Beaver
I am approving this
document
2008.03.28 09:49:02
-07'00'

TITLE: Approval of Hydrographic Survey H11760,
OPR-O168-FA-07

As Chief of Party, I have ensured that standard field surveying and processing procedures were adhered to during acquisition and processing of hydrographic survey H11760 in accordance with the Hydrographic Manual, Fourth Edition; Hydrographic Survey Guidelines; Field Procedures Manual, Mar 2007; and the NOS Hydrographic Surveys Specifications and Deliverables, as updated for April 2007. Additional guidance was provided by applicable Hydrographic Technical Directives. These data are adequate to supersede charted data in their common areas. This survey is complete and no additional work is required. All data and reports are respectfully submitted to N/CS34, Pacific Hydrographic Branch.

I acknowledge that all of the information contained in this report is complete and accurate to the best of my knowledge.

In addition, the following individuals were responsible for oversight of acquisition and processing of this survey:

Dan Jacobs
2008.02.20 12:03:40
-08'00'

ST Dan Jacobs
Survey Manager

I have reviewed this document
2007.07.07 08:55:58 -08'00'

LT Jennifer Dowling
Field Operations Officer

Digitally signed by Lynnette Morgan
DN: cn=Lynnette Morgan, c=US, o=NOAA, ou=NOAA
Ship Fairweather, email=lynnette.v.morgan@noaa.gov
Reason: Signed for:
Date: 2008.04.19 13:40:58 -07'00'

CST Grant Froelich
Chief Survey Technician

Attachment



¹ Concur.

² Concur.

³ Concur.

⁴ Concur.

⁵ Concur with clarification. During the survey acceptance review at the branch the hydrographer discovered holidays between lines. These holidays occurred in depths greater than 53-meters of water and there is no indication of significant features existing in the gaps.

⁶ Concur.

⁷ Concur with clarification. During office review the resolutions and depth threshold were changed in order to preserve data integrity for the combined surfaces. The surface used for compilation was created at the coarsest resolution which is now 10 meters rather than 35. The new depth thresholds, surfaces and resolutions are listed below. H11760_Office_Combined_10m was used for cartographic compilation.

Field Sheet	Finalized Surface	Resolution	Depth Range
H11760 Office	H11760 Office 2m	2m	0-70m
H11760 Office	H11760 Office 5m	5 m	45-150m
H11760 Office	H11760 Office 10m	10 m	125-450m

⁸ Concur.

⁹ Concur with clarification. Tide note has been appended to this document.

¹⁰ Concur with clarification. Chart 17360, 35th Edition dated June 2008 of Local Notice to Mariners dated 8/31/2010 and Chart 17311, 1st Edition dated April 2000 of Local Notice to Mariners dated 8/31/2010 were used for chart comparison and compilation.

¹¹ Concur.

¹² Concur.

¹³ Concur.

¹⁴ Concur.

¹⁵ Concur.

¹⁶ Concur.

¹⁷ Concur.

¹⁸ Concur with clarification. The submitted hob files were used in the compilation of HCell H11760. During compilation some modifications were made to accommodate chart scale. Chart features as depicted in the HCell.

¹⁹ Concur.

²⁰ Concur with clarification. This should be added into the Coast Pilot for this region.



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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : December 20, 2007

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-O168-FA-2007
HYDROGRAPHIC SHEET: H11760

LOCALITY: Sumdum Island, Endicott Arm, AK
TIME PERIOD: October 22 - November 1, 2007

TIDE STATION USED: 945-2005 Upper Endicott Arm, AK
Lat. 57° 31.3'N Long. 133° 03.3' W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 4.603 meters

REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: SA449 & SA450

Refer to attachments for zoning information.

Note 1: Provided time series data are tabulated in metric units (meters), relative to MLLW and on Greenwich Mean Time on the 1983-2001 National Tidal Datum Epoch (NTDE).

Peter J. Stone

Digitally signed by Peter J. Stone
DN: cn=Peter J. Stone, c=US, o=CO-OPS,
ou=NOAA/NOS, email=peter.stone@noaa.gov
Reason: I am approving this document
Date: 2007.12.21 12:09:15 -05'00'

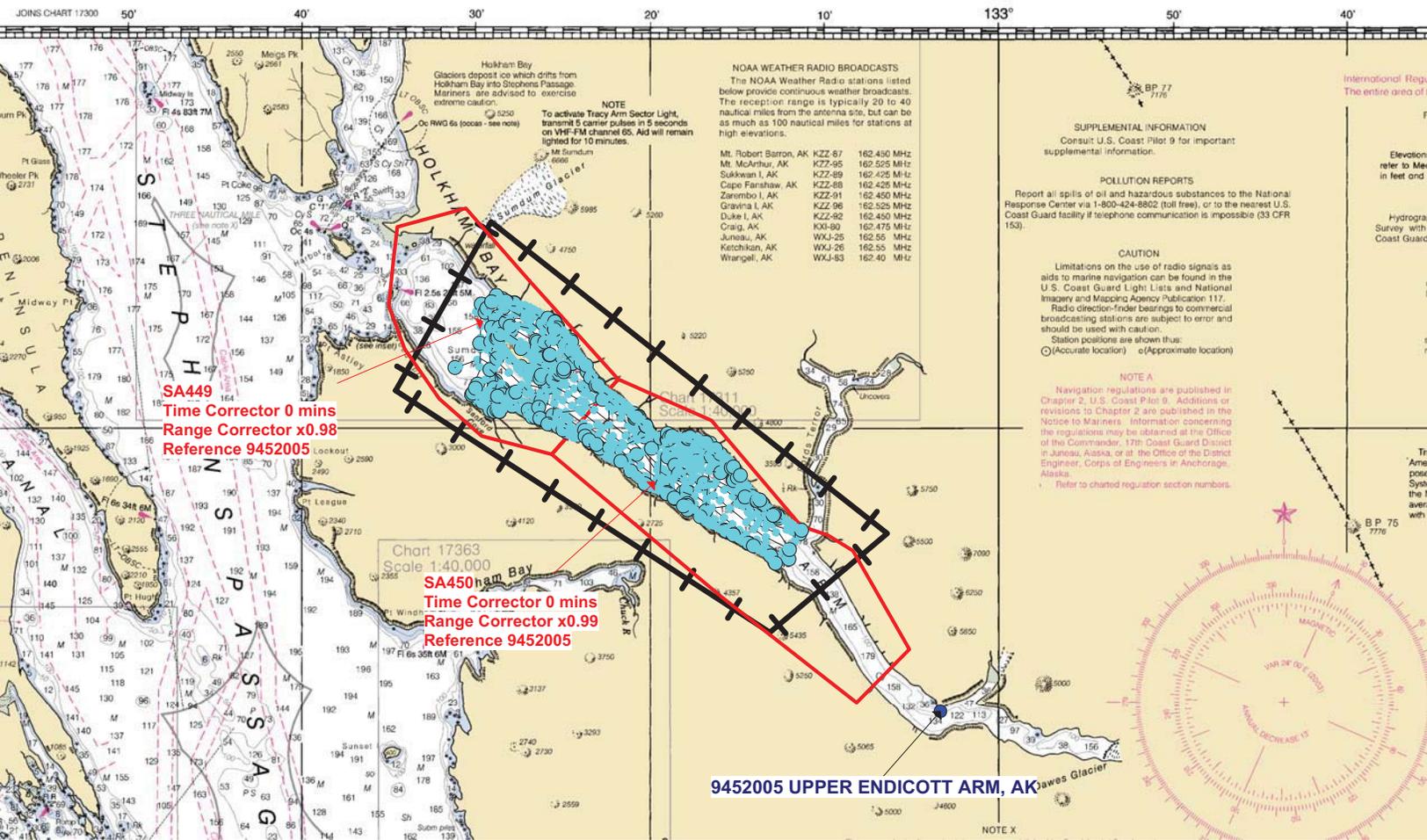
CHIEF, PRODUCTS AND SERVICES DIVISION



NOAA and its critical corrections are available about Print-on-demand help@Nautical.com

Final Tidal Zoning for OPR-0168-FA-2008, H11760 Sumdum Island, Endicott Arm, AK

Formerly C&GS 820; 1st Ed. Mar. 1988 C-1937-473 KAPP-2679



H11760 HCell Report
Tyanne Faulkes, Physical Scientist
Pacific Hydrographic Branch

1. Specifications, Standards and Guidance Used in HCell Compilation

HCell compilation of survey H11760 used:

Office of Coast Survey HCell Specifications: Draft, Version: 4.0, 17 March, 2010.
HCell Reference Guide: Version 2.0, 22 February, 2010.

2. Compilation Scale

Depths and features for HCell H11760 were compiled to the largest scale raster charts shown below:

Chart	Scale	Edition	Edition Date	NTM Date
17311	1: 40,000	1 st	4/2000	8/31/2010
17360	1: 217,828	35 th	6/2008	8/31/2010

The following ENC's were also used during compilation:

Chart	Scale
US3AK3UM	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 and 1:25,000 survey scale using a Radius Table file with values shown in the table, below.

Shoal Limit (m)	Deep 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 (SS) and imported into a new layer (CS) created to accommodate chart density depths. Manual selection was used to accomplish a density and distribution that closely represents the seafloor morphology.

4. Depth Contours

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

Chart Contour Intervals in Fathoms from Chart 17311 & 17360	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 H11760_SS.000
0	0	0.2286	0.125	0
3	5.4864	5.715	3.125	3
10	18.288	18.5166	10.125	10
20	36.576	37.9476	20.75	20
50	91.44	92.8116	50.75	50
100	182.88	184.2516	100.75	100

With the exception of the zero contours included in the *_CS file, contours have not been deconflicted against shoreline features, soundings and hydrography, as all other features in the *_CS file and soundings in the *_SS have been. This may result in conflicts between the *_SS file contours and HCell features at or near the survey limits. Conflicts with M_QUAL, COALNE and SBDARE objects, and with DEPCNT objects representing MLLW, should be expected. HCell features should be honored over *_SS.000 file contours in all cases where conflicts are found.

5. Meta Areas

The following Meta object areas are included in HCell H11760:

M_QUAL
M_CSCL

The Meta area objects were constructed on the basis of the limits of the hydrography.

6. Features

Features addressed by the field units are delivered to PHB where they are deconflicted against the hydrography and the largest scale chart. These features, as well as features to be retained from the chart and features digitized from the Base Surface, are included in the HCell. The geometry of these features may be modified to emulate chart scale per the HCell Reference Guide on compiling features to the chart scale HCell.

7.S-57 Objects and Attributes

The *_CS HCell contains the following Objects:

\$CSYMB	Blue Notes-Notes to the MCD chart Compiler
DEPCNT	Modified GC MLLW
M_CSCL	Meta area to define different area at smaller scale than compilation scale
M_QUAL	Data quality Meta object
SBDARE	Bottom samples and rocky seabed areas
SOUNDG	Soundings at the chart scale density

The *_SS HCell contains the following Objects:

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

8. Spatial Framework

8.1 Coordinate System

All spatial map and base cell file deliverables are in an LLDG geographic coordinate system, with WGS84 horizontal, MHW vertical, and MLLW (1983-2001 NTDE) sounding datums.

8.2 Horizontal and Vertical Units

DUNI, HUNI and PUNI are used to define units for depth, height and horizontal position in the chart units HCell, as shown below.

Chart Unit Base Cell Units:

Depth Units (DUNI):	Fathoms and feet
Height Units (HUNI):	Feet
Positional Units (PUNI):	Meters

During creation of the HCell in CARIS BASE Editor and CARIS S-57 Composer, all soundings and features are maintained in metric units with as high precision as possible. Depth units for soundings measured with sonar maintain millimeter precision. Depths on rocks above MLLW and heights on islets above MHW are typically measured with range finder, so precision is less. Units and precision are shown below.

BASE Editor and S-57 Composer Units:

Sounding Units:	Meters rounded to the nearest millimeter
Spot Height Units:	Meters rounded to the nearest decimeter

See the HCell Reference Guide for details of conversion from metric to charting units, and application of NOAA rounding.

9. Data Processing Notes

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

10. QA/QC and ENC Validation Checks

H11760 was subjected to QA checks in S-57 Composer prior to exporting to the metric HCell base cell (000) file. The millimeter precision metric S-57 HCell was converted to chart units and NOAA rounding applied. dKart Inspector was then used to further check the data set for conformity with the S-58 ver. 2 standard (formerly Appendix B.1 Annex C of the S-57 standard). All tests were run and warnings and errors investigated and corrected unless they are MCD approved as inherent to and acceptable for HCells.

11. Products

11.1 HSD, MCD and CGTP Deliverables

H11760_CS.000	Base Cell File, Chart Units, Soundings and features compiled to 1:40,000 and 1:217,828
H11760_SS.000	Base Cell File, Chart Units, Soundings and Contours compiled to 1:10,000 and 1:25,000
H11760_DR.pdf	Descriptive Report including end notes compiled during office processing and certification, the HCell Report, and supplemental items
H11760_outline.gml	Survey outline
H11760_outline.xsd	Survey outline

11.2 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, 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.

12. Contacts

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

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APPROVAL SHEET
H11760

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.