

H11570

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. H11570

LOCALITY

State Alaska

General Locality Ernest Sound and Eastern Passage

Sublocality Menefee Inlet

2007

CHIEF OF PARTY

..... Andrew L. Beaver CDR, NOAA

LIBRARY & ARCHIVES

DATE

NOAA FORM 77-28 (11-72)	U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION HYDROGRAPHIC TITLE SHEET	REGISTRY No H11570
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>Ernest Sound and Eastern Passage</u> Sub-Locality <u>Menefee Inlet</u> Scale <u>1:10,000</u> Date of Survey <u>April 13 - April 30, 2007</u> Instructions dated <u>3/13/2007</u> Project No. <u>OPR-O119-FA-07</u> Vessel <u>NOAA Ship FAIRWEATHER S220</u> Chief of party <u>Commander Andrew L. Beaver, NOAA</u> Surveyed by <u>LTJG Gonsalves, CST Froelich, LT Dowling</u> Soundings by echo sounder, hand lead, pole <u>Reson 8101ER</u> Graphic record scaled by <u>N/A</u> Graphic record checked by <u>N/A</u> Automated Plot <u>N/A</u> Verification by <u>M. Herzog</u> Evaluation By <u>M.E.Litrico</u> Soundings in <u>Fathoms</u> at <u>MLLW</u>		
REMARKS: <u>All times are UTC.</u> <u>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.</u>		

Descriptive Report to Accompany Hydrographic Survey H11570

Project OPR-O119-FA-07
Ernest Sound and Eastern Passage, Alaska

Scale 1:10,000

April, 2007

NOAA Ship FAIRWEATHER

Chief of Party: Commander Andrew L. Beaver, NOAA

A. AREA SURVEYED

The survey area was located in Ernest Sound and Eastern Passage, within the sub-locality of Menefee Inlet. This survey corresponds to Sheet J in the sheet layout provided with the Letter Instructions, as shown in Figure 1 below. The survey area is bounded on the Southwest corner at 56°00'00"N, 132°17'00"W and the Northeast corner at 56°09'00"N, 132°07'00"W.¹

Data acquisition was conducted from April 13 to April 30, 2007 (DN 103 to DN 120).

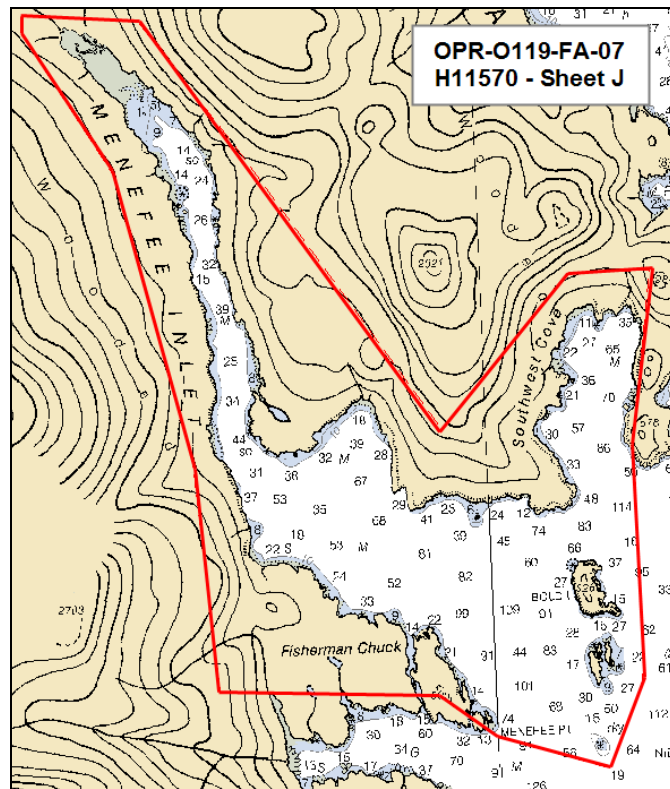


Figure 1: H11570 survey limits

One hundred percent multibeam echosounder (MBES) coverage was obtained in the survey area offshore of the 8-meter depth curve.² When conditions allowed, multibeam echosounder (MBES) data was acquired parallel to contours and at a line spacing of no less than 25 meters at depths between four and eight meters. Additional coverage was obtained when determining least depths over features or shoals offshore of the Navigable Area Limit Line (NALL), which is defined as the furthest offshore of either the

4-meter depth contour or a distance of 64 meters (0.8 mm at the scale of the largest scale chart) from the Mean High Water line.

Shoreline data were acquired for H11570. These data were attributed as S-57 objects for submittal.

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-O119-FA-07 Data Acquisition and Processing Report (DAPR)*, submitted under separate cover.³ 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 Letter Instructions OPR-O119-FA, dated March 13, 2007.⁴

B1. Equipment and Vessels

Equipment and vessels used for data acquisition and survey operations during this survey are listed below in Table 1.

	Jensen Launch 1010	Jensen Launch 1018	MonArk
Hull Registration Number	1010	1018	1706
Builder	The Boat Yard, Inc.	The Boat Yard, Inc.	MonArk
Length Overall	28' 10"	28' 10"	17'
Beam	10' 8"	10' 8"	7'2"
Draft, Maximum	4' 0" DWL	4' 0" DWL	1' 3"
Cruising Speed	24 knots	24 knots	20 knots
Max Survey Speed	10 knots	10 knots	
Primary Echosounder	RESON 8101	RESON 8101	
Sound Velocity Equipment	SBE 19plus	SBE19plus	
Attitude & Positioning Equipment	POS/MV V4	POS/MV V4	
Type of operations	MBES, Bottom Samples	MBES	Shoreline

Table 1: Vessel Inventory

No vessel configurations used during data acquisition deviated from the *OPR-O119-FA-07 Data Acquisition and Processing Report (DAPR)*.

B2. Quality Control

Internal consistency and integrity of data among acquisition platforms collected for survey H11570 were manually examined by the Hydrographer in CARIS subset mode. The internal consistency and integrity of data collected for survey H11570 were found to be good as the data agreed within day-to-day, vessel-to-vessel and line-to-line. Minor sound-velocity correction errors were observed in the upper reaches of Menefee Inlet and are discussed further in the Data Quality Factors section of this report.⁵

Crosslines

Shallow water multibeam crosslines for this survey totaled 11.09 linear nautical miles (lnm), comprising 11.1% of the 111.43 lnm of total MBES hydrography. Both main scheme and crossline mileage are summarized in Table 2.

MAIN SCHEME - Mileage	
Single Beam MS	0
Multibeam MS mileage	100.35013
SideScan MS	0
Total MS	100.35013
CROSSLINE - Mileage	
Single Beam XL	0
Multibeam XL	11.089365
Total XL	11.089365
OTHER	
Developments/AWOIS - Mileage	0
Shoreline/Nearshore Investigation - Mileage	22.2
Total # of Investigated Items	4
Total Bottom Samples	12
Total SNM	6.3
Specific Dates of Acquisition	April 13 - 15, April 17 - 18, April 26 - 27, April 30
Specific Dn#s of Acquisition	Dn103 - 105, Dn107-108, Dn116-117, Dn120

Table 2: H11570 Survey Statistics

The Hydrographer has determined, through manual examination of the data, that the crossline agreement with main scheme data meet the vertical accuracy requirements as stated in the March, 2007 *NOS Hydrographic Surveys Specifications and Deliverables Manual (HSSDM)*.⁶

Junctions

Survey H11570 junctions with H11571 and H11573, which are Sheets K and M, respectively of the same project. The area of overlap between survey H11570 and H11571 was approximately 300 meters wide. Data were reviewed in CARIS Subset Editor and depths were found to be consistent between the two

surveys, meeting the requirements as stated in the *HSSDM*.⁷ At the time of this writing, survey H11573 was still in the early phases of multibeam acquisition, thus the junction analysis between these sheets will be documented in the H11573 Descriptive Report. The sheet limits and area of overlap for Sheets J, K and M are shown in Figure 2.

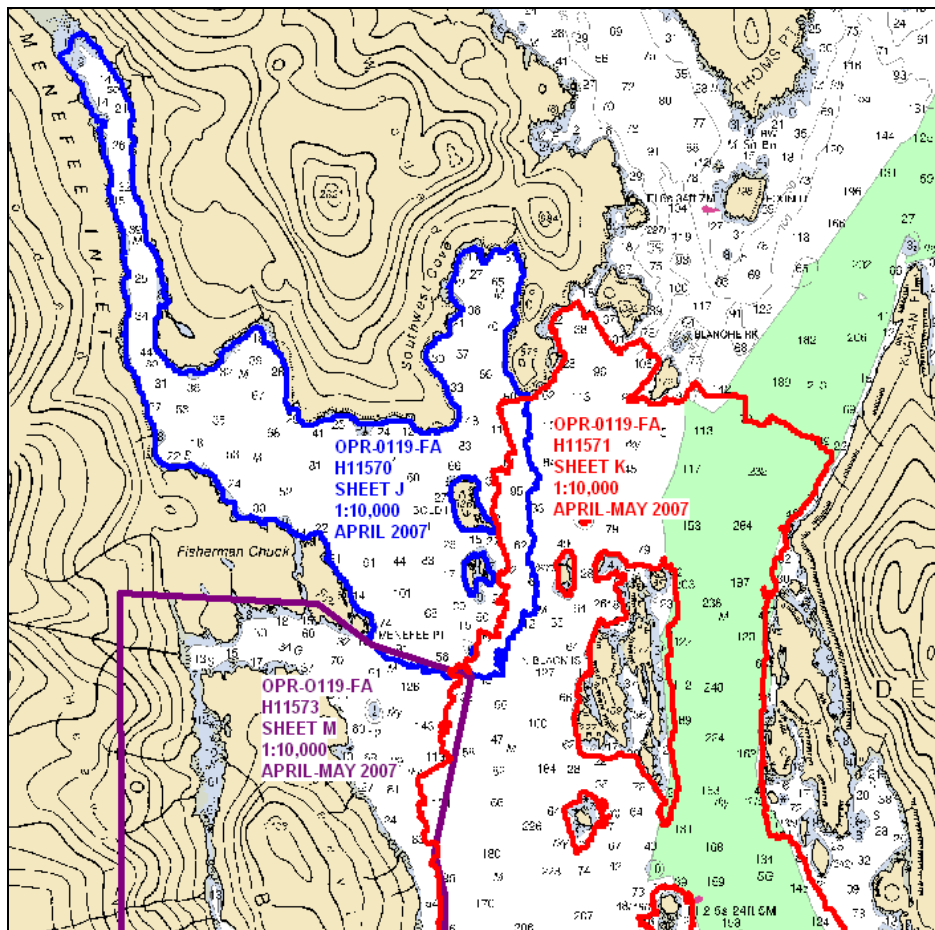


Figure 2: Junctions between H11570, H11571 and H11573

Quality Control Checks

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

Data Quality Factors

COVERAGE ASSESSMENT:

Coverage Assessment followed procedures as outlined in the DAPR.

Figure 3 shows two different representations of a shoal located NE of Bold Island (56°04'06"N, 132°08'00"W): one displaying the various resolution surfaces at their appropriate depths (5m between 30-70m, 10m between 50-120m and 20m between 100-200m), and one displaying the shoal at the highest

cited resolution, 5 meters. Due to the steep nature of the bathymetry in Ernest Sound, it is difficult to get the various resolution surfaces (when filtered by depth) to exhibit overlap. Twenty meters of overlap was used between both the 5 and 10m surfaces as well as the 10 and 20m surfaces and, as shown in Figure 3, there still appear to be gaps along edges of the shoal; gaps despite there being sufficient data to render the entire shoal at a 5m resolution. This phenomenon is only exhibited on the edges of shoals with sharp changes in elevation; as such, the tops (i.e. least depths) of these features are always preserved and well-depicted in the BASE surfaces. According to Section 5.1.2.1 of the HSSDM, a gap is only considered a holiday if it measures larger than 3 nodes across. Each of these gaps were measured and found to be smaller than the requisite 3 nodes; therefore complete multibeam coverage has been demonstrated.⁸

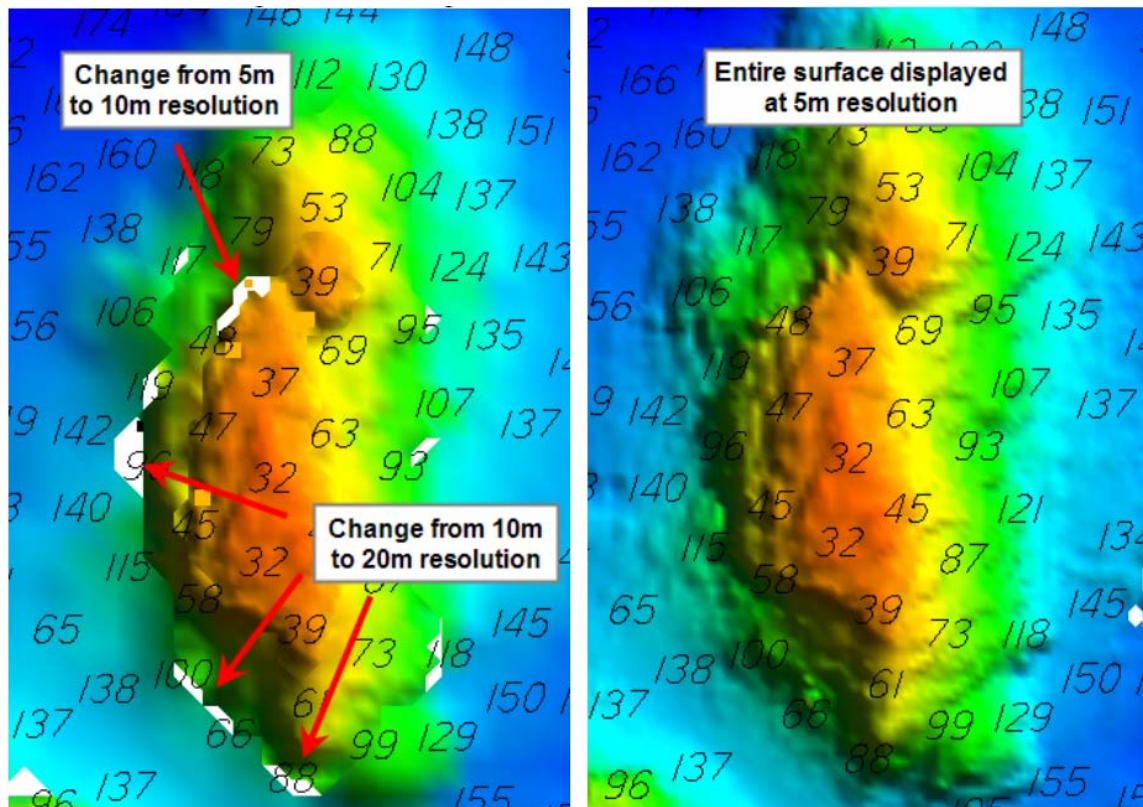


Figure 3: Two representations of a shoal NE of Bold Island: one showing the appropriately range filtered 5m, 10m and 20m surfaces (left), and one displaying the shoal strictly at a 5m resolution (right). Note that despite there being sufficient data to render the entire shoal at a 5m resolution, gaps appear in the multi-resolution surface due to the steep nature of the seafloor.

At position 56°05'12.0"N, 132°11'42.0"W, 1 nm northeast of the mouth of Menefee Inlet (see Figure 4), there is a small unnamed river. During shoreline verification, a submerged delta was found extending from the river mouth well beyond the 64-meter mean high water bufferline (see the pink -?- line in Figure 4). Attempts were made to obtain complete multibeam coverage to the 8-meter contour near this feature; however space for the safe maneuvering of the launches was limited in this area. As such, given the questionable navigational significance offshore of this unnamed river, the limits of hydrography were moved offshore in this isolated area.

The remainder of survey H11570 meets the coverage requirements stated in the Letter Instructions.⁹

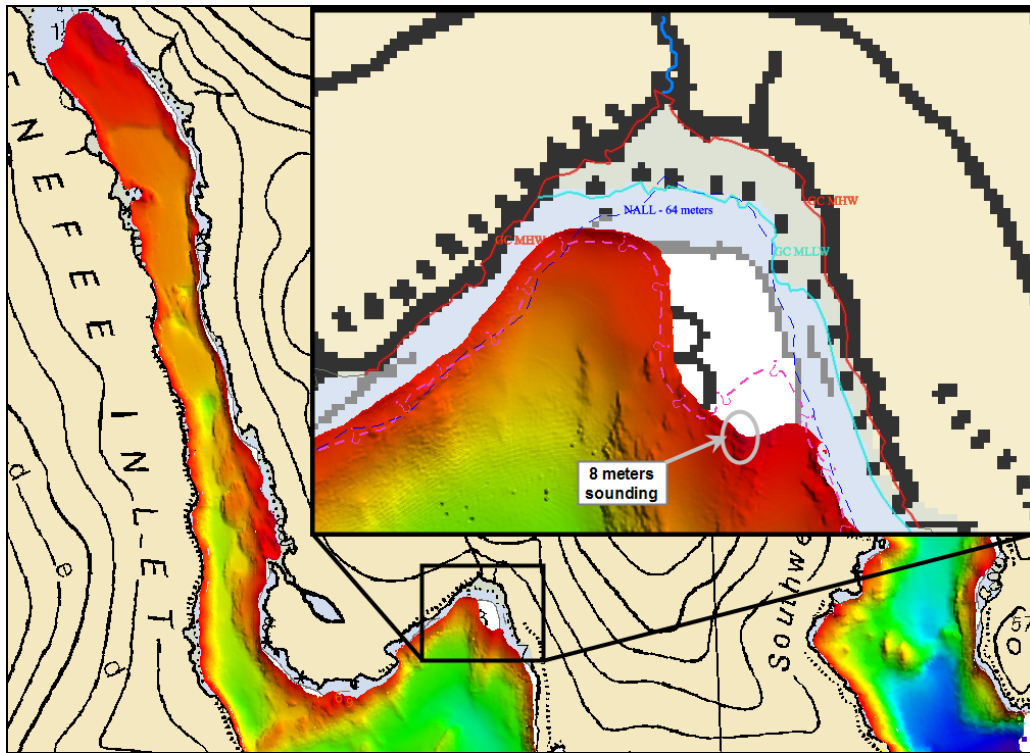


Figure 4: Region of limited coverage near river delta

DESIGNATED SOUNDINGS:

Designation of soundings followed procedures as outlined in the DAPR.

TRUEHEAVE:

TrueHeave data could not be applied to MBES data collected on lines 104-2059 to 104-2347 from April 14, 2007 (DN 104), vessel FA_1018_Reson8101, due to a corrupt file; thus, real time heave correctors were used. MBES data quality from that day does not appear to have been affected by the lack of TrueHeave, due to the negligible swell in the protected waters of Menefee Inlet.¹⁰

SOUND VELOCITY:

Menefee Inlet is 5 kilometers long but only 600 meters at its widest point with over a dozen fresh water streams punctuating its shoreline. With these physical considerations, getting an accurate model of the sound velocity profile for a given point and then being able to extrapolate said profile an appreciable distance from the SV cast's location was difficult. After a first attempt at surveying Menefee Inlet, pronounced sound velocity issues in the data, particularly at the head of the inlet, dictated that isolated areas would be reacquired to minimize errors (see Figure 5).

On April 30 (Dn 120), portions of Menefee Inlet were rerun and the lines were added to those already acquired. Despite the additional data, there are still prevalent SV errors at the head of Menefee Inlet. With heavy filtering of the outerbeams, the data was reduced to a point where CUBE could depict a bottom within an accuracy meeting the specifications stated in the HSSDM (see Figure 6); however, the CUBE surface is by no means an ideal representation of the seafloor.

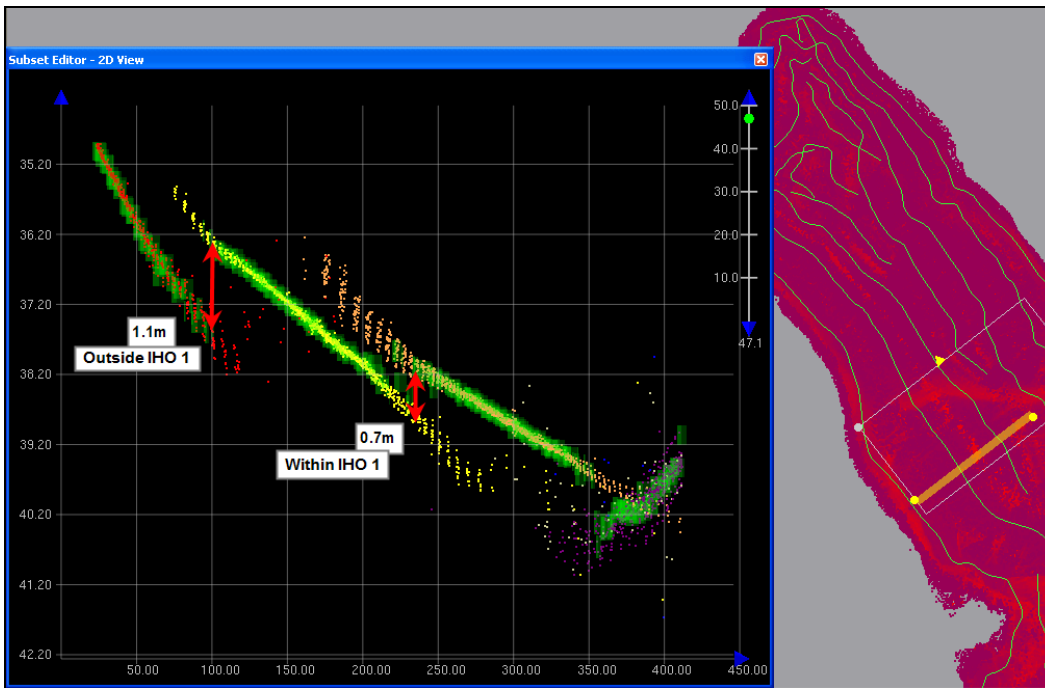


Figure 5: Initial vertical errors associated with poor sound velocity correction at the head of Menefee Inlet dictated that areas of questionable data quality would be reacquired.

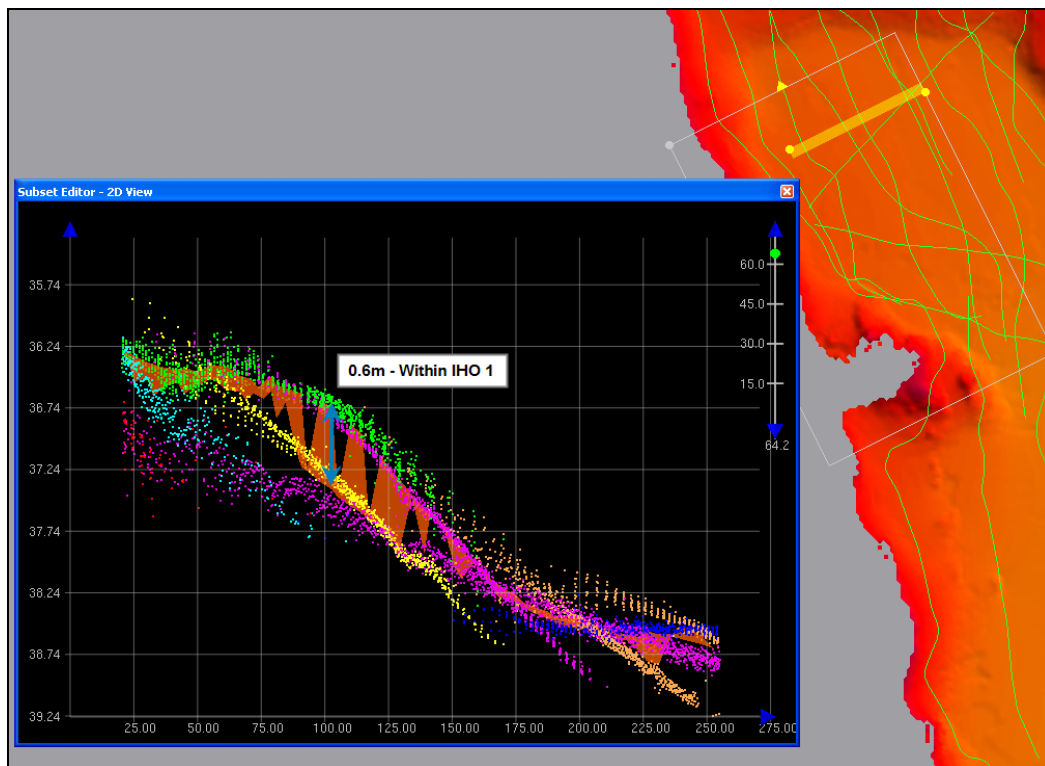


Figure 6: With additional data, CUBE still has difficulty choosing the correct bottom, though the amplitude of the hypotheses does now fall within IHO Order 1, meeting the accuracy specifications as stated in the HSSDM.

There are further artifacts that can be seen when closely examining the depth or standard deviation CUBE surfaces in Menefee Inlet, Figure 7. In all cases, these errors are most likely associated with sound velocity refraction. Nevertheless, the data meet the accuracy specifications as stated in the HSSDM.¹¹

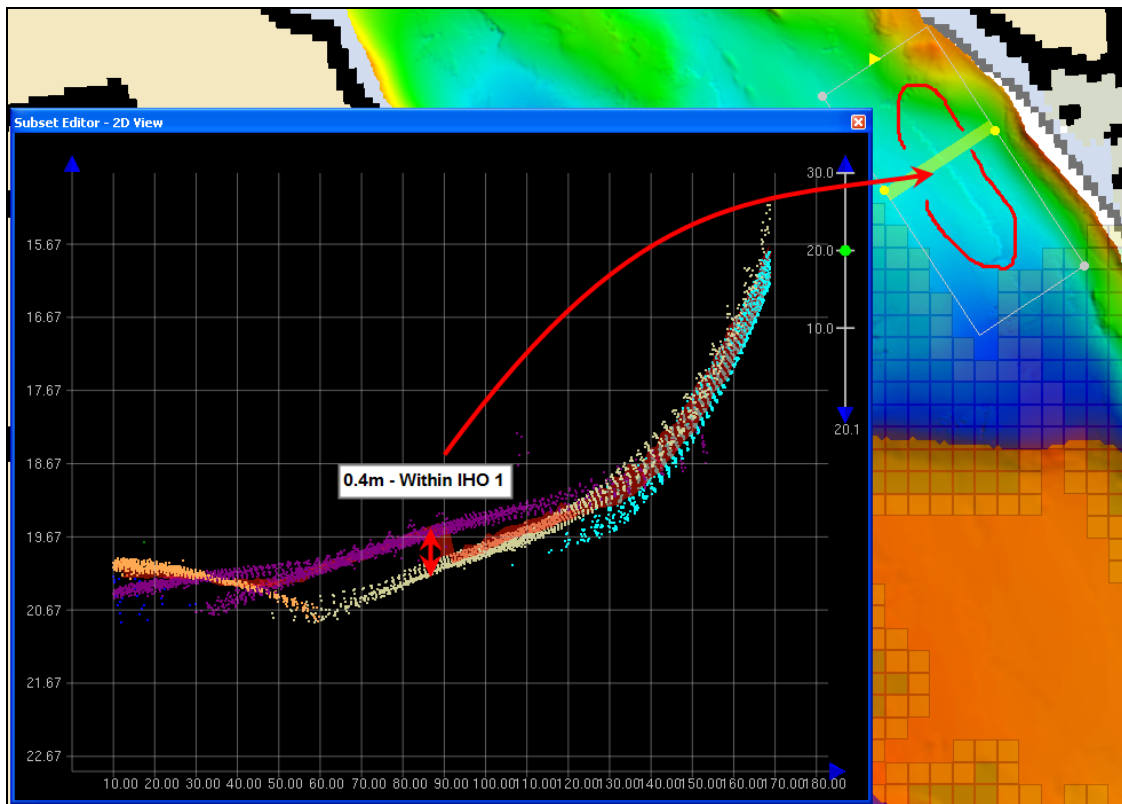


Figure 7: One example of a data artifact that can be seen in the CUBE surfaces near the head of Menefee Inlet.

ATTITUDE DATA:

After departing the Ernest Sound working grounds, it was discovered that Launch 1018 was recording attitude data at a rate of 1Hz, as compared to the normal 25Hz, see Figure 8. Given the working conditions of Ernest Sound were typically flat calm seas with light winds, Launch 1018 was rarely subjected to a dynamic environment; thus the data integrity was not compromised. There were two noted exceptions, see Figure 9, at the heads of Menefee Inlet and Southwest Cove. In these confined bays, the dynamics of the launch's movements, necessitated by avoiding for the shoreline, resulted in the launch pitching/rolling at a rate greater than the attitude data was being logged. Though artifacts can be seen in the surfaces due to the sparse attitude data, the data still meets the data accuracy specifications as stated in the HSSDM.¹²

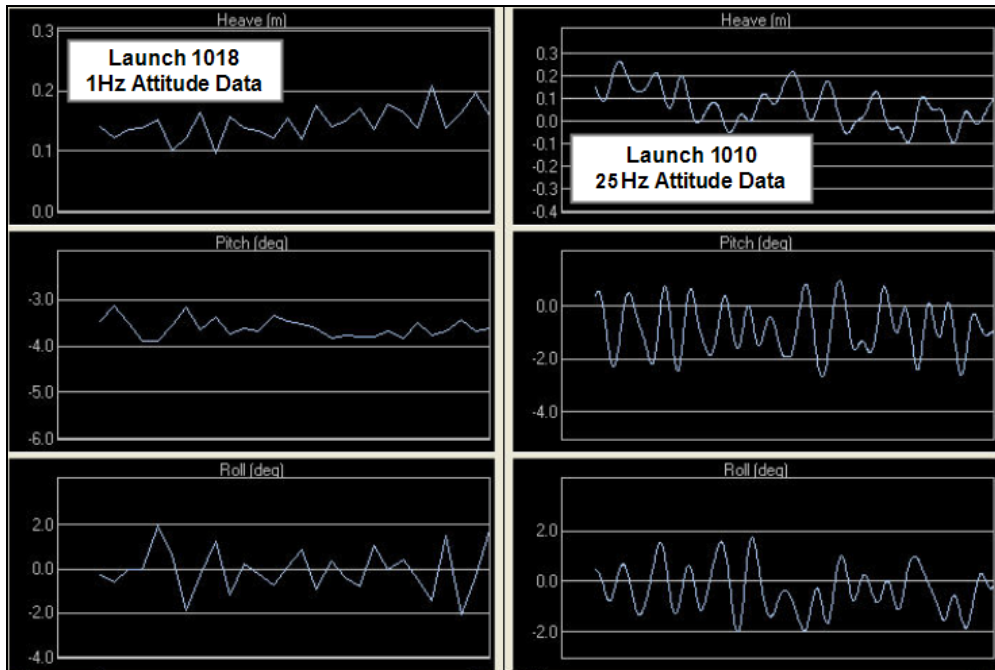


Figure 8: A 30-second time series of attitude data as logged by Launch 1018 and Launch 1010 .

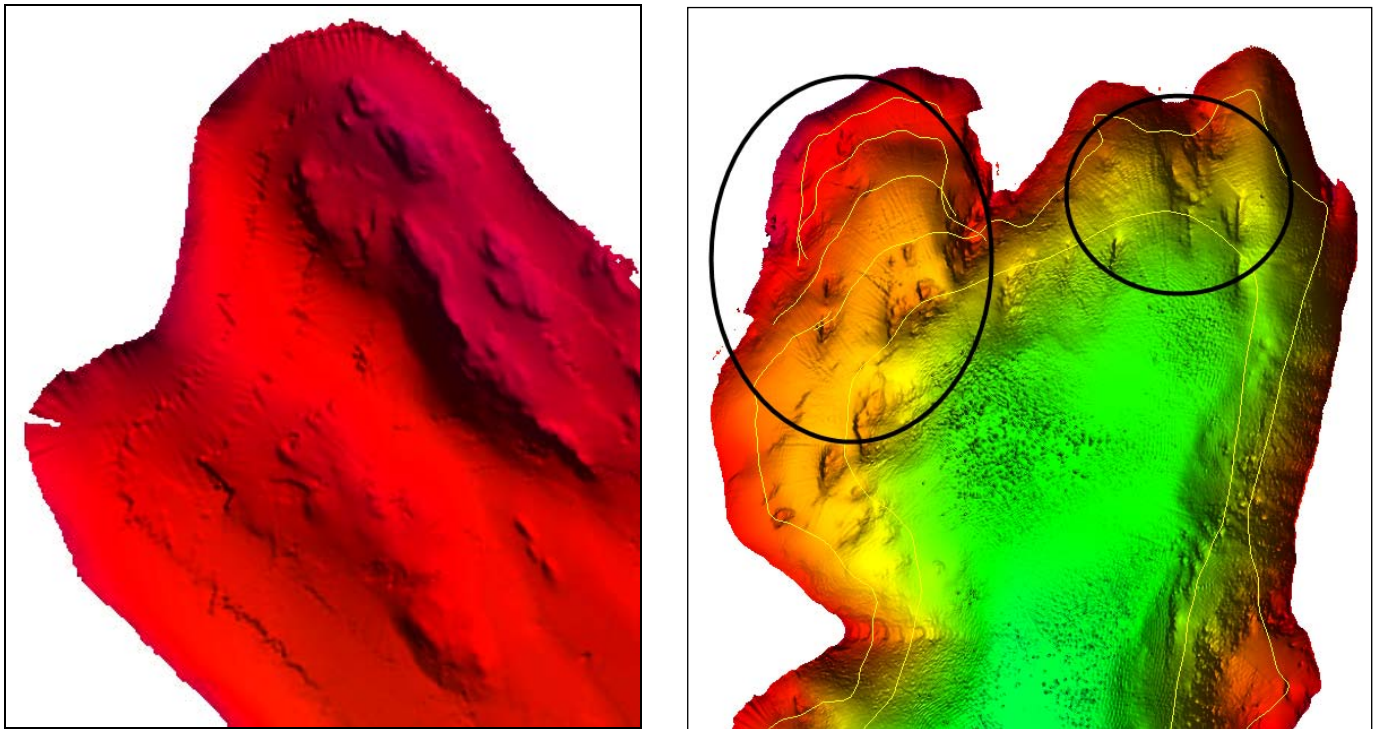


Figure 9: The dynamic tracklines of Launch 1018 at the head of Menefee Inlet (left) and Southwest Cove (right) induced timing-like artifacts in the surfaces.

Accuracy Standards

All data meet the data accuracy specifications as stated in the *HSSDM*.¹³

B3. Corrections to Echo Soundings

Data reduction procedures for survey H11570 conform to those detailed in the DAPR, with the exceptions discussed below.

SOUND VELOCITY:

The majority of the MBES data collected for survey H11570 used a sound velocity profile selection method of casts taken previous in time; however, on April 27 and April 30 (Dn 117 & 120), Launch 1010 was focused on acquiring crosslines. For these two days, the sound velocity was corrected using the cast nearest in distance within a time of four hours. All sound velocity profile selection methods have been documented in the Acquisition and Processing Logs. ¹⁴

B4. Data Processing

Data processing procedures for survey H11570 conform to those detailed in the DAPR.

A detailed listing of the surface resolutions used for each depth range are given in Table 3. The low-end thresholds (e.g. 30m at 5m resolution) were chosen to satisfy the object detection requirements stated in section 5.1.1.2 of the HSSDM. The high-end thresholds (e.g. 70m at 5m resolution) were chosen to avoid unnecessary cleaning of the data while still maintaining as high a resolution surface for a given depth as practical.

FAIRWEATHER			
Depth Ranges		Resolutions	
Lo (m)	Hi (m)	Overlap (m)	Res. (m)
0	40		2
30	70	10	5
50	120	20	10
100	350	20	20

Table 3: H11570 Surface Resolutions by Depth Range

There is a total of one fieldsheet fulfilling the various resolution requirements for survey H11570. Fieldsheet H11570 encompasses the entire survey area to the two-, five-, ten-, twenty and thirty-five-meter resolutions.

Survey H11570 has been examined for noise “pimples” in offshore areas (as described in HydroGeek Volume 3) via the creation of a combined surface; all such fliers have been removed.

C. HORIZONTAL AND VERTICAL CONTROL

A complete description of horizontal and vertical control for survey H11570 can be found in the *OPR-O119-FA-07 Horizontal and Vertical Control Report*, ¹⁵ 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) was the sole method of positioning. Differential corrections came from the U.S. Coast Guard beacons at Annette Island (323 kHz) and Gustavus (288 kHz).

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 Ketchikan (945-0460) served as control for datum determination and as the primary source for water level reducers for survey H11570 during acquisition.

FAIRWEATHER personnel installed one Sutron 8210 “bubbler” tide gauge at the tertiary station listed 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.

Station Name	Station Number	Type of Gauge	Date of Installation	Date of Removal
Thoms Point	945-0970	Tertiary 30 Day	April 12, 2007	May 22, 2007

Table 4: Tide Gauge Information

Refer to the *OPR-O119-FA-07 Horizontal and Vertical Control Report* for further information about the tertiary tide station.

All data were reduced to MLLW using observed water levels with preliminary zoning downloaded from the CO-OPS website for station Ketchikan by applying tide file 9450460.tid and time and height correctors through the preliminary zone corrector file O119FA2007CORP.zdf.

Final approved water level data (smooth tides) were not applied by the FAIRWEATHER. The Pacific Hydrographic Branch will apply final approved water levels (smooth tides) to the survey data during final processing.¹⁶ A request for delivery of final approved water level data (smooth tides) for survey H11570 was forwarded to N/OPS1 on May 1, 2007 in accordance with the FPM. A copy of the request is included in Appendix V.¹⁷

D. RESULTS AND RECOMMENDATIONS

D1. Chart Comparison

Chart comparison procedures were followed as outlined in the FPM.

Survey H11570 was compared with charts 17385 (16th ed, Sep. 2006, Scale 1:80,000), and 17360 (34th ed, Mar. 2006, Scale 1:217,828). All charts have been updated with the Notice to Mariners through March 10, 2007 and the most recent Notice to Mariners from May 12, 2007 was consulted. There were no new changes within the survey area.¹⁸

Chart 17385

South of Bold Island, see Figure 10, there are two charted (17385) soundings, a 15-fathom and 22-fathom sounding which, while representative of their local areas, are not representative of the shoalest depths in their respective areas. A 6-fathom 4-foot surveyed sounding is 80m southwest of the charted 15-fathom and a 3-fathom 2-foot surveyed sounding is 150m northwest of the charted 22-fathom.¹⁹ These soundings have been designated in accordance with procedures outlined in the DAPR.

- 6-fathom 4-foot (12.315m shoalest reliable depth) - 56°03'25.6"N, 132°08'24.7"W
- 3-fathom 2-foot (6.189m shoalest reliable depth) - 56°03'15.8"N, 132°08'04.1"W

The rest of the depths on chart 17385 generally agree with the depths from survey H11570.²⁰

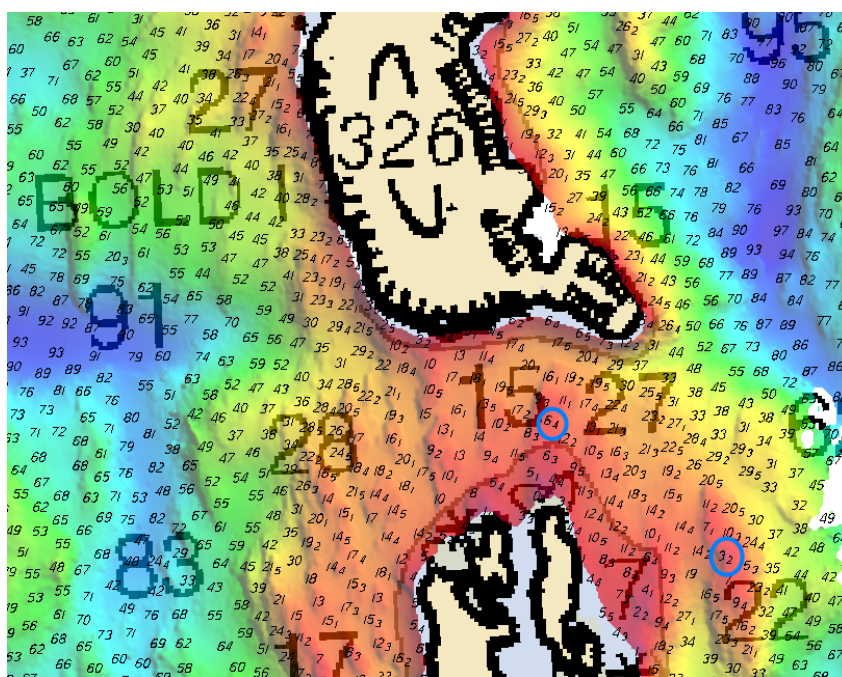


Figure 10: Charted (17385) 15 and 22-fathom soundings respectively adjacent to the shoaler surveyed 6fm-4ft and 3fm-2ft soundings

Chart 17360

Depths from survey H11570 agreed within one to two fathoms with depths on chart 17360. Some of the shoaler depths represented on the chart near the shoreline appears to have been pulled off shore for cartographic representation, but remain accurate within the scale of the chart.²¹

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.**²² Final chart comparisons will be made at the Pacific Hydrographic Branch after the application of smooth tides.

Automated Wreck and Obstruction Information System (AWOIS) Investigations

There were no AWOIS items located within the limits of H11570.²³

Dangers to Navigation

One danger to navigation was found and reported to the Mapping and Charting Division for final submission to the Seventeenth Coast Guard District on May 15, 2007. A copy of the preliminary Danger to Navigation Report is included in Appendix I.²⁴

D2. Additional Results

Shoreline Verification and Processing

FAIRWEATHER personnel conducted limited shoreline verification at times near predicted low water, in accordance with the Standing Project Instructions and HTD-2007-7. A composite source file from HSD's Operations Branch was provided with the project instructions. A sole shoreline source was included in the composite source file: Geographic Cell (GC) Shoreline compiled by the Remote Sensing Division (RSD) from photogrammetric surveys. Navigationally significant charted (17385) features located within the survey limits were also digitized into the composite source layer. All shoreline features from the composite source seaward of the Navigable Area Limit Line (NALL) were verified or disproved during shoreline operations.

Detached positions (DPs) and generic positions (GPs) acquired during shoreline verification were recorded in Trimble TerraSync 2.4.1 and on paper DP forms. Scanned copies of the DP forms are included in the digital Separates folder and hard copies can be found with the *Separates to be Included with Survey Data*. In addition, annotations describing shoreline were recorded on hard copy plots (boat sheets) of the digital shoreline.²⁵

DPs and GPs were inserted into Pydro where they were tide corrected, S57 attributed and resolved according to Pydro flagging logic. A survey feature report for shoreline items was generated and included as H11570_Features_Report.pdf in Appendix II.²⁶ The report includes all significant shoreline items requiring specific attention that were flagged Report in Pydro. Investigation or survey methods for these items were included under the Remarks tab and, when appropriate, recommendations to the cartographer were included in the Recommendations tab.

Shoreline deliverable .HOB files were compiled in Caris Notebook 3.0. Edits to existing source shoreline features were made in the H11570_Composite_Source.hob file, with GC and charted features modified or deleted as necessary. Field notes accompanying verified source features were entered in the remarks attribute field. GPs and DPs were imported into Notebook from Pydro; these features are included in the H11570_Updates and/or H11570_Disprovals .HOB files.

Approved tides will be applied by the Pacific Hydrographic Branch to tide correct all the DP features included in the Pydro PSS.²⁷ The H11570_Updates/H11570_Disprovals .HOB file(s) will need to be updated to include any changes to depth values following application of smooth tides. In Notebook, tide-corrected depths acquired to verify source features must be transferred from the H11570_Updates

\$CSYMB feature to the source rock or feature that is being verified in the H11570_Composite_Source.hob file.

If a source feature was edited in Notebook, the SORIND and SORDAT attribute fields were modified to reflect the survey number (US,US,graph,H11570) and final survey date. Unmodified source shoreline features were left with their original SORIND and SORDAT values. The SORIND/SORDAT information for shoreline features included in the final Notebook .HOB files is included in Table 4.

Shoreline Source	SORIND	SORDAT
RSD	US,US,graph,GC10493	19970810
RNC	US,US,graph,Chart17360	20060301
RNC	US,US,graph,Chart17385	20050601
Survey	US,US,graph,H11570	20070430

Table 4: SORIND/SORDAT Shoreline Features

For a more detailed description of shoreline verification and processing refer to the DAPR.

Shoreline Recommendations

The Hydrographer recommends that the shoreline depicted in the CARIS Notebook files and final sounding files supersede and complement shoreline information compiled on the NOAA charts.²⁸

Aids to Navigation

There were no Aids to Navigation found within the survey limits.²⁹

Bottom Samples

Bottom samples were collected on April 28 and April 30, 2007 (DN118 and DN120) and are included as seabed classifications along with the other S57 features in the Pydro Preliminary Smooth Sheet. The bottom sample positions were also imported to the Notebook H11570_Updates.hob file.³⁰

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
OPR-O119-FA-07 Data Acquisition and Processing Report	July 7, 2007	N/CS34
OPR-O119-FA-07 Horizontal & Vertical Control Report	May 30, 2007	N/CS34, N/OPS1
OPR-O119-FA-07 Tides and Water Levels Package	May 30, 2007	N/OPS1
OPR-O119-FA-07 Coast Pilot Report	July 7, 2007	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

May 9, 2007

MEMORANDUM FOR: CDR Don Haines, NOAA
Chief, Pacific Hydrographic Branch

FROM: CDR Andrew L. Beaver, NOAA
Commanding Officer

Andrew L. Beaver
I am approving this
document
2007.07.07 16:51:45 Z

TITLE: Approval of Hydrographic Survey H11570,
OPR-O119-FA

As Chief of Party, I have ensured that standard field surveying and processing procedures were adhered to during acquisition and processing of hydrographic survey H11570 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:

Michael O. Gonsalves
I attest to the accuracy and integrity of
this document
2007.06.20 12:11:07 -08'00'

LTjg Michael O. Gonsalves
Survey Manager

I have reviewed this
document
2007.06.26 19:17:43 -08'00'

LT Jennifer Dowling
Field Operations Officer

Grant Froelich
I have reviewed this document
2007.07.07 16:15:08 Z

CST Grant Froelich
Chief Survey Technician

Attachment



Revisions Compiled During Office Processing and Certification

¹ Concur

² Concur

³ Filed with project records

⁴ Filed with project records.

⁵ Concur

⁶ Concur

⁷ Concur

⁸ Concur

⁹ Concur with clarification. The Pacific Hydrographic Branch (PHB) reviewer noted other instances where the inshore limit of hydrography was not met that were not noted in the Descriptive Report. Because the shoreline is steep in these areas the reviewer recommended accepting the survey. For more information, see Comments Note 7 and the images at the end of the Comments section in the H11570_SAR_Checklist filed with survey records.

¹⁰ Concur

¹¹ Concur with clarification. See endnote 9.

¹² Concur

¹³ Concur with clarification. See endnote 9.

¹⁴ Filed with survey records

¹⁵ Filed with project records

¹⁶ Concur. Final tides were applied at Pacific Hydrographic Branch. A copy of the tide note is attached to this report.

¹⁷ Filed with survey records

¹⁸ Survey H11570 was compared to chart 17385 (16th ed.; 09/01/2006 with Notice to Mariners dated 10/31/2009) and chart 17360 (35th ed.; 06/01/2008 with Notice to Mariners dated 11/14/2009).

¹⁹ Shoaler soundings have been brought forward to the HCell.

²⁰ Concur

²¹ Concur

²² Concur

²³ Concur

²⁴ Concur. Attached to this report.

²⁵ Filed with survey records

²⁶ Filed with survey records

²⁷ Concur. Tides applied at Pacific Hydrographic Branch.

²⁸ Concur

²⁹ Concur

³⁰ Concur. Three charted bottom samples from chart 17385 were blue-noted to be retained.

H11570 Danger to Navigation Report

Registry Number: H11570
State: Alaska
Locality: Ernest Sound and Eastern Passage
Sub-locality: Menefee Inlet
Project Number: OPR-O119-FA
Survey Dates: 4/13/2007 - 4/30/2007

Charts Affected

Number	Version	Date	Scale
17385	16th Ed.	09/01/2006	1:80000
17360	34th Ed.	03/01/2006	1:217828
17420	27th Ed.	11/01/2005	1:229376
16016	20th Ed.	11/01/2003	1:969756
531	23rd Ed.	01/01/2006	1:2100000
530	31st Ed.	06/01/2005	1:4860700
50	6th Ed.	06/01/2003	1:10000000

Features

No.	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	Sounding	6.28 m	056° 03' 15.773" N	132° 08' 04.158" W	---

1 - Danger To Navigation

1.1) 100/9**DANGER TO NAVIGATION****Survey Summary**

Survey Position: 056° 03' 15.773" N, 132° 08' 04.158" W
Least Depth: 6.28 m
Timestamp: 2007-107.22:47:53.787 (04/17/2007)
Survey Line: h11570 / fa_1010_reson8101 / 2007-107 / 107-2247
Profile/Beam: 100/9
Charts Affected: 17385_1, 17360_1, 17420_1, 16016_1, 531_1, 530_1, 50_1

Remarks:

A 3-fathom, 2-foot shoal (6.189m) was found by multibeam echosounder 150m northwest of a charted (17385) 22 fathom sounding. Note: This sounding is presently corrected with observed Ketchikan tides using preliminary zoning; after the application of verified smooth tides the value of this sounding may change.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11570/fa_1010_reson8101/2007-107/107-2247	100/9	0.00	000.0	Primary

Hydrographer Recommendations

The Hydrographer recommends forwarding the sounding to the Marine Charting Division as a danger to navigation, and replacing the 22-fathom sounding (on chart 17385) with a 3-fathom, 2-foot sounding.

Cartographically-Rounded Depth (Affected Charts):

3 ¼fm (17385_1, 17360_1, 17420_1, 16016_1, 530_1)
 3fm 2ft (531_1)
 6.3m (50_1)

Feature Images

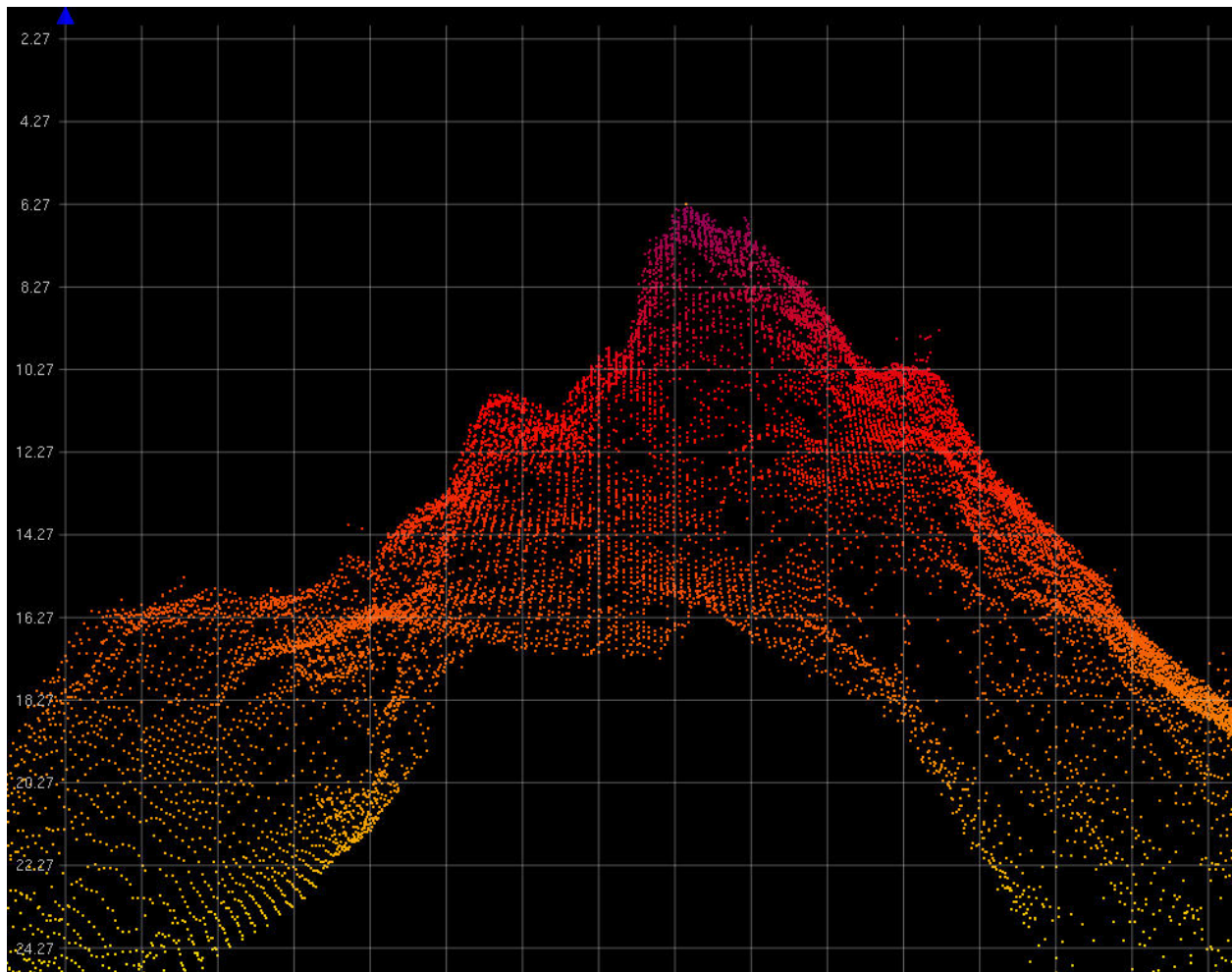


Figure 1.1.1

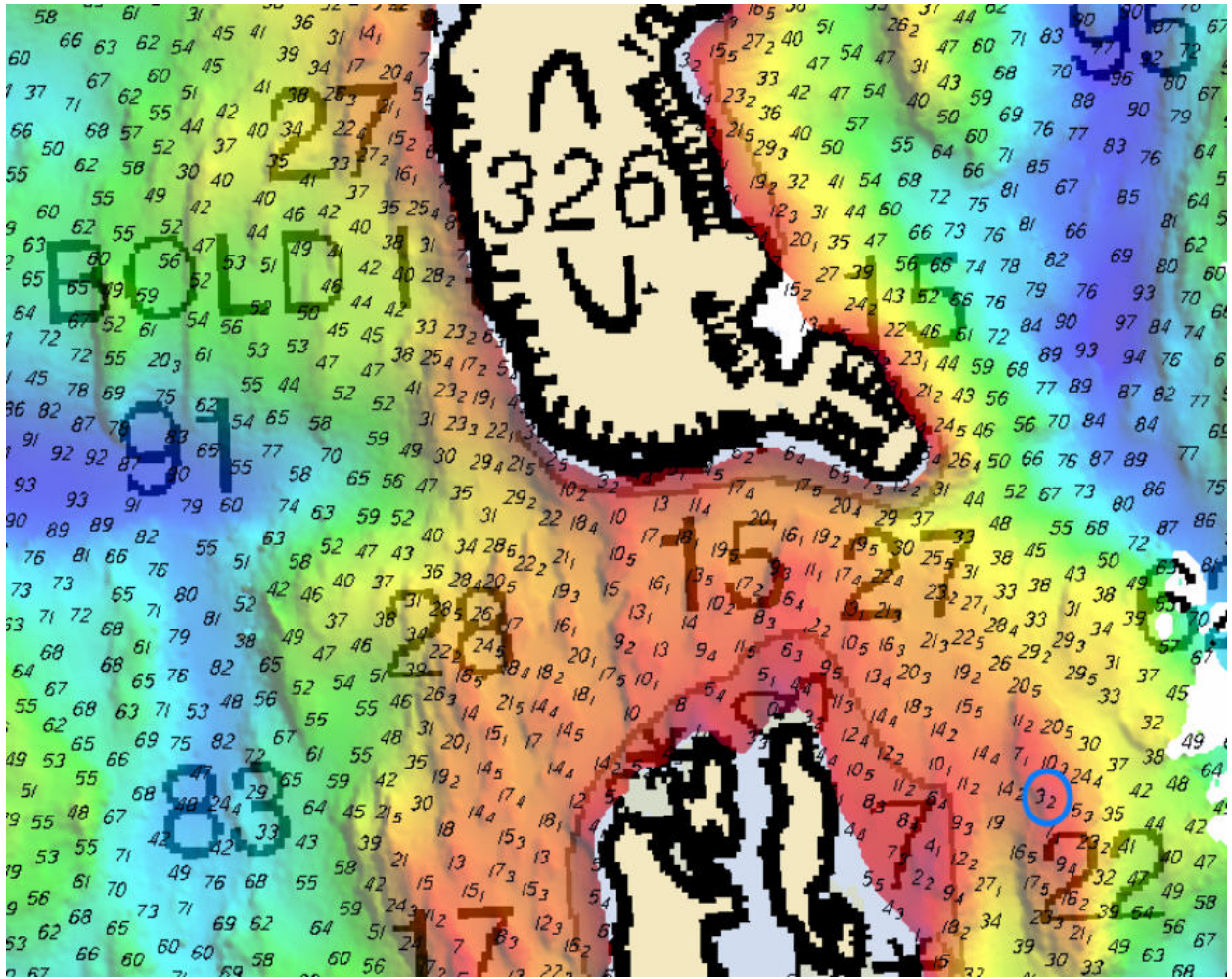


Figure 1.1.2



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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : July 5, 2007

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-O119-FA-2007
HYDROGRAPHIC SHEET: H11570

LOCALITY: Menefee Inlet, AK
TIME PERIOD: April 13 - April 30, 2007

TIDE STATION USED: 945-0970 Thoms Point, AK
Lat. 56° 07.1'N Long. 132° 04.7' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 4.670 meters

TIDE STATION USED: 945-0460 Ketchikan, AK
Lat. 55° 19.9' N Long. 131° 37.6' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 4.433 meters

REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: SA116 & SA117

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).

Note 2: Use tide data from the appropriate station with applicable zoning correctors for each zone according to the order in which they are listed in the Tidezone corrector file (*.ZDF). For example, tide station one (TS1) would be the first choice for an applicable zone followed by TS2, etc. when data are not available.

Peter J. Stone

Digitally signed by Peter J. Stone
DN: cn=Peter J. Stone, o=CO-OPS, ou=NOAA/
NOS, email=peter.stone@noaa.gov, c=US
Date: 2009.10.14 07:00:22 -04'00'

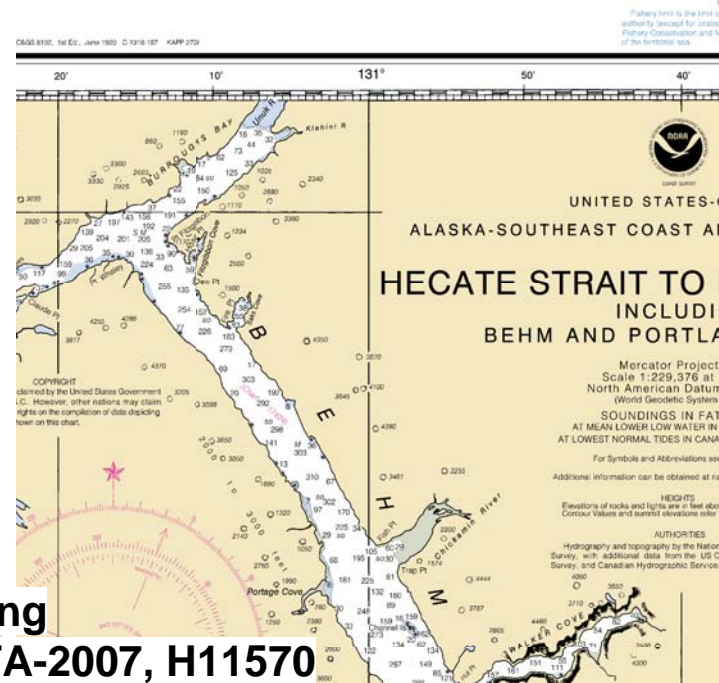
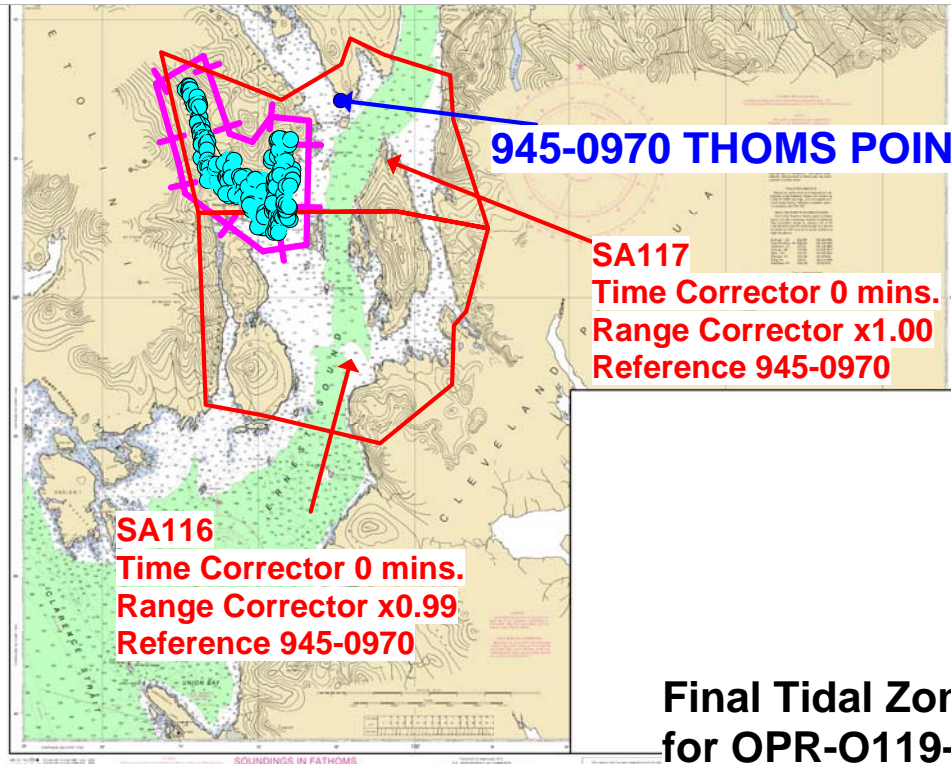
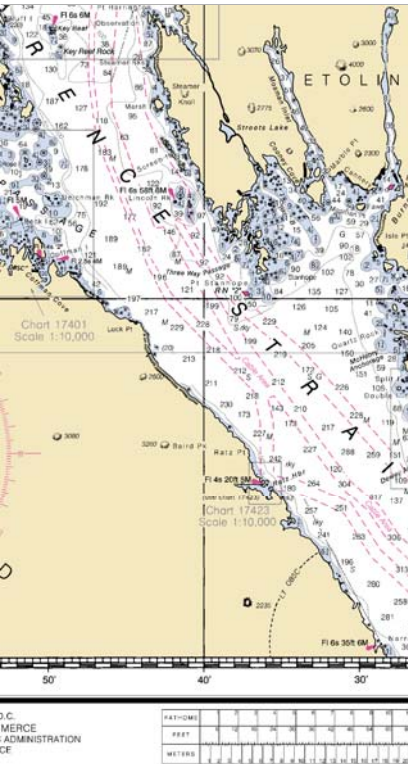
CHIEF, PRODUCTS AND SERVICES DIVISION



Final tide zone node point locations for OPR-O119-FA-2007, H11570

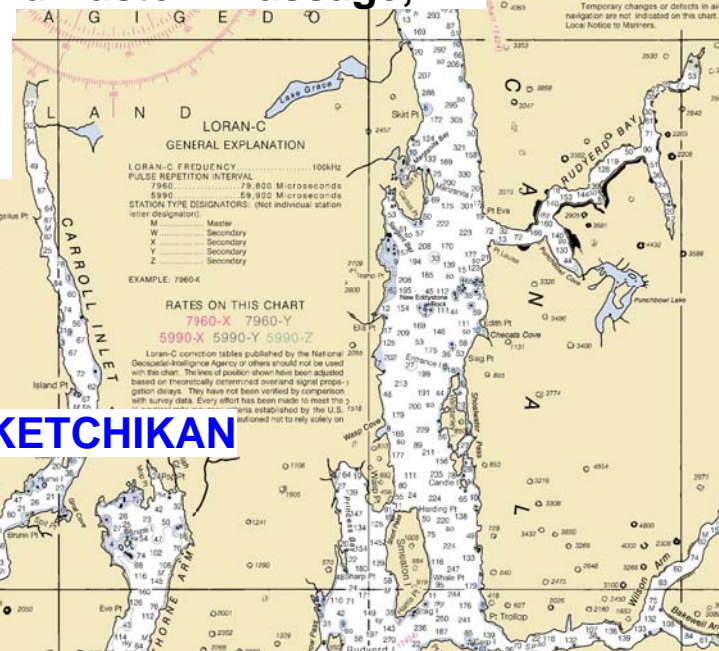
Format: Tide Station (in recommended order of use)
 Average Time Correction (in minutes)
 Range Correction
 Longitude in decimal degrees (negative value denotes Longitude West),
 Latitude in decimal degrees

	Tide Station Order	AVG Time Correction	Range Correction
Zone SA116	945-0970	0	x0.99
	945-0460	0	x1.05
-131.957153 55.983659			
-131.943951 55.991965			
-131.920439 56.04175			
-132.018721 56.052018			
-132.230563 56.05108			
-132.222667 55.935868			
-132.161117 55.929514			
-132.036082 55.912845			
-131.958945 55.948125			
-131.957153 55.983659			
Zone SA117	945-0970	0	x1.00
	945-0460	+6	x1.06
-131.920439 56.04175			
-131.957818 56.106856			
-131.961061 56.133332			
-132.031824 56.14577			
-132.067839 56.155399			
-132.07769 56.139917			
-132.141902 56.118694			
-132.270577 56.147212			
-132.230563 56.05108			
-132.018721 56.052018			
-131.920439 56.04175			



Final Tidal Zoning for OPR-O119-FA-2007, H11570 Ernest Sound and Eastern Passage, AK

Statement of Authenticity
The authority of the National Oceanic and Atmospheric Administration (NOAA) is the national authority for the production of nautical charts. The digital data used in this chart was produced by NOAA and the NOAA emblem.



H11570 HCell Report
Mary Beth Litrico, 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 ENC, US4AK30M, and NOAA RNC's, 17385 and 17360.

HCell compilation of survey H11570 utilized Office of Coast Survey HCell Specifications Version 3.1 and HCell Reference Guide Version 1.1.

1. Compilation Scale

Soundings for HCell H11570 were compiled to the largest scale chart in the region, chart 17385, at a scale of 1:80,000. The density and distribution of soundings from H11572 were selected to emulate the distribution on chart 17385. Non-bathymetric features have been generalized to chart scale.

2. Soundings

2.1 Source Data

A survey-scale sounding (SOUNDG) feature object layer was built from the **H11570_10m_Combined** surface in CARIS BASE Editor. A shoal-biased selection was made using a radius table file with values shown in the table below. The resultant sounding layer contains 7886 soundings ranging from 0.366 to 215.946 meters. The sounding feature object source layer was exported as H11570_SS.hob and imported into CARIS HOM to convert units.

Upper limit (m)	Lower limit (m)	Radius (mm)
0	10	3
10	20	4
20	50	4.5
50	345	5

2.2 Sounding Feature Objects

In CARIS BASE Editor, soundings were manually selected from the survey scale sounding set, H11570_SS.hob, and imported into a new layer, H11570_CS.hob. This sounding selection is of a similar density and distribution of soundings on chart 17385 and more closely represents the seafloor morphology.

3. Depth Areas and Depth Contours

3.1 Depth Areas

The **H11570_10m_Combined** BASE Surface was used to define hydrographic extents, and an all encompassing depth area (DEPARE). One depth range, from 0 to 222 meters, was used for DEPARE. Upon conversion to NOAA charting units, the depth range is 0 to 122 fathoms.

3.2 Depth Contours

A 3-fm and a 10-fm depth contour were included in the H11570_SS HCell for MCD raster charting division to use for guidance in creating chart contours. The generalized metric and fathom equivalent contour value is shown in the table below.

Chart Contour in Fathoms	Metric Equivalent of Chart Contour	Metric Equivalent of Chart Contour Generalized	Actual Value of Chart Contour
3	5.4864	5.715	3.000
10	18.288	18.5166	10.000
50	91.44	92.8116	50.000

Contours delivered in the H11570_SS file have not been deconflicted against soundings and hydrography as all other features in the H11570_CS file and soundings in the H11570_SS have been. Therefore, conflicts may exist between the H11570_SS file contours and HCell features at or near the survey limits. Conflicts with M_COVR, M_QUAL, DEPARE and SBDARE objects should be expected. HCell features should be honored over H11570_SS.000 file contours in all cases where conflicts are found.

4. Meta Areas

The following Meta object areas are included in HCell H11570:

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

One features file, **H11570_Updates.hob**, delivered by the field was reviewed in the office and a new feature file was brought forward to compilation called **H11570_Features.hob**. All of these were deconflicted against GC shoreline, the chart and hydrography during office processing. One DTON was reported by the field and none were found in the office. Refer to the SORIND field for the sources of all features included in the H11570 HCell.

Three bottom samples collected during H11570 are included in the HCell and a rocky seabed area was digitized from highest resolution surfaces. Bottom samples were deconflicted as necessary. Three charted bottom samples from chart 17385 were blue-noted to be retained.

6. S-57 Objects and Attributes

The H11570_CS HCell contains the following Objects:

\$CSYMB	Blue Notes
DEPARE	The all-encompassing depth area
M_COVR	Data coverage meta object
M_QUAL	Data quality meta object
SBDARE	Bottom samples and rocky seabed areas
SOUNDG	Soundings at the chart scale density
UWTROC	Rock features

The H11570_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 H11570_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, 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 skyward of 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 shoreward of that.
- 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 Junctions

H11570 junctions with H11573 (already compiled) and H11571 (already compiled). A common junction was made between the surveys.

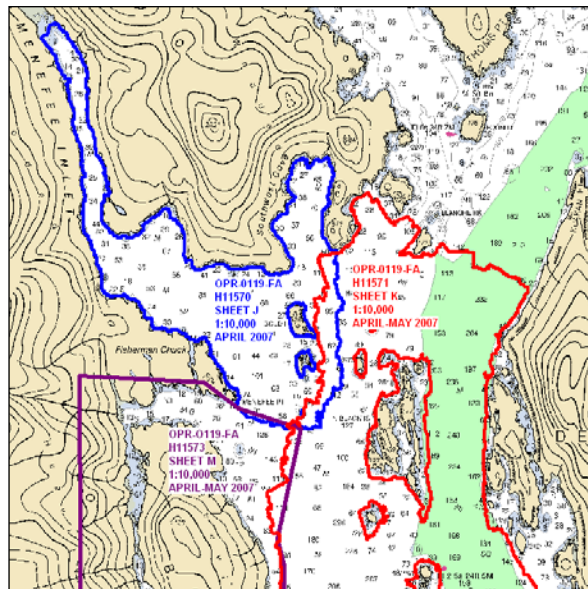


Figure 1. H11709, H11571 and H11573 survey coverage

10. QA/QC and ENC Validation Checks

H11572 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

- H11570_CS, Chart Units, soundings and features compiled to 1:80,000
- H11570_SS, Survey Units, soundings compiled to 1:10,000
- H11570 Descriptive Report including end notes compiled during office processing and certification, the HCell Report, and supplemental items.
- H11570 Survey outline to populate the SURDEX.

11.2 File Naming Conventions

- Chart units base cell file, chart scale soundings, features, Blue Notes H11570_CS.000
- Chart units base cell file, survey scale sounding set H11570_SS.000
- Descriptive Report package H11570_DR.pdf
- Survey outline H11570_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:

Mary Beth Litrico, Physical Scientist, PHB, Seattle, WA; 206-526-4761;
[Mary.E.Litrico @noaa.gov](mailto:Mary.E.Litrico@noaa.gov).

APPROVAL SHEET
H11570

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.

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 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.