

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey Hydrographic

Field No.

Registry No. H11369

LOCALITY

State Alaska

General Locality Behm Canal

Sublocality 1/2 Mile N of Tramp Point to Checats Cove

2004

CHIEF OF PARTY

CDR John E. Lowell Jr., NOAA

LIBRARY & ARCHIVES

DATE

HYDROGRAPHIC TITLE SHEET**H11369**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 AlaskaGeneral Locality Behm CanalSublocality 1/2 Mile North of Tramp Point to Checats CoveScale 1:10000Date of Survey November 4-9, 2004Instructions Dated September 22, 2004Project No. OPR-O193-FAVessel FAIRWEATHER S-220, 1010, 1018, 2302Chief of Party CDR John Lowell, NOAASurveyed by SST Froelich, CST Morgan, LT Wetzer and FAIRWEATHER PersonnelSoundings taken by echo sounder: RESON 8111ER, RESON 8101ER MBESGraphic record scaled by N/AGraphic record checked by N/AProtracted by NA Automated plot by NAVerification by S. WolfskehlSoundings in Fathoms 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. This project is within the critical survey area of the NOAA hydrographic survey priorities and responds to requests from the Southeastern Alaska Pilots Association and various cruise ship companies. Revisions and end notes in red were generated during office processing. All separates are filed with the hydrographic data. As a result, page numbering may be interrupted or non-sequential.

Descriptive Report to Accompany Hydrographic Survey H11369

Project OPR-O193-FA

Behm Canal, Alaska

Scale 1:10,000

November 2004

NOAA Ship FAIRWEATHER

Chief of Party: Commander John Lowell, NOAA

A. AREA SURVEYED

This hydrographic survey was completed as specified by the Hydrographic Survey Letter Instructions for OPR-O193-FA, dated May 12, 2004, and changes dated August 6, 2004 and September 22, 2004, as well as the Draft Standing Project Instructions dated March 21, 2002. The survey area is located in Behm Canal, sub-locality ½ Mile N of Tramp Point to Checats Cove¹. This survey is modified from sheet "C" in the sheet layout provided with the Letter Instructions in order to complete areas deemed navigationally significant in the limited time allotted to this survey at the end of the field season. The modified limits range from Tramp Point to Checats Cove.

One hundred percent Multibeam Echosounder (MBES) coverage was obtained in the survey area in waters 8 meters and deeper. In waters from 4 meters to 8 meters, MBES data were obtained where possible due to safety of crew and vessel concerns as well as time limitations.

No shoreline verification was performed due to time constraints.

Data acquisition was conducted from November 4th to 9th, 2004 (DN 309 to 314).

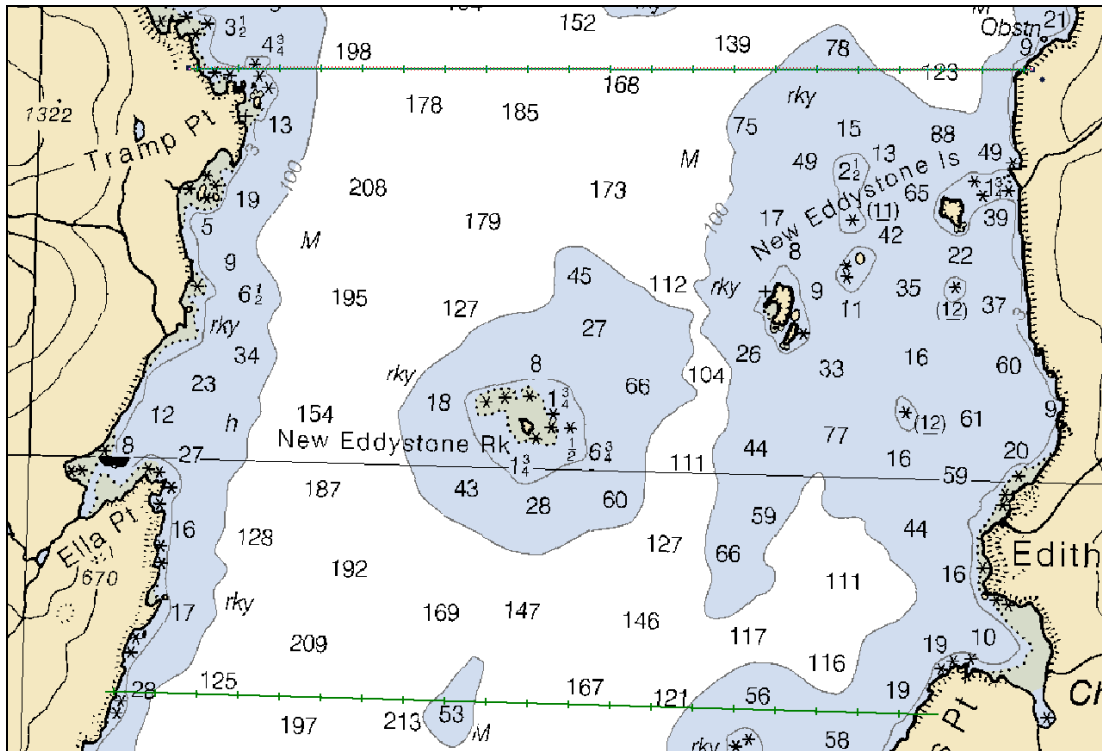


Figure 1. Modified H11369 Survey Limits.

B. DATA ACQUISITION AND PROCESSING

A complete description of data acquisition and processing systems, survey vessels, quality control procedures and data processing methods can be found in the *FAIRWEATHER Data Acquisition and Processing Report – 2004 (DAPR)*², submitted under separate cover. Items specific to this survey, and any deviations from the aforementioned report are discussed in the following sections.

B.1 Equipment and Vessels

NOAA Ship FAIRWEATHER (S220) is a 231' hydrographic survey vessel, equipped with a Reson 8111ER multibeam echosounder (MBES) system. The FAIRWEATHER's survey launches 1010 and 1018 are high speed, 29' aluminum Jensen survey launches. Both survey launches are equipped with Reson 8101ER MBES systems. Launch 2302 is an AMBAR 700, used during shoreline acquisition.

FAIRWEATHER (S220), Launch 1010 and Launch 1018 are each equipped with an Applanix Position and Orientation System for Marine Vessels (POS/MV) 320 version 3. They are also equipped with Applanix TrueHeave and Precise Timing. Sound velocity correctors were acquired on all platforms with a SeaBird SeaCat SBE 19plus sound velocity profiler.

Data were acquired by FAIRWEATHER and her survey launches (vessel numbers 1018, 1010, and 2302). Vessels 1018 and 1010 were used to acquire shallow-water multibeam (SWMB) soundings and sound velocity profiles. Vessel 2302 was used to collect bottom

samples and detached positions (DPs). FAIRWEATHER was used to acquire mid-water multibeam (MWMB) soundings and sound velocity profiles.

In the HVF vessel reports for 1010, 1018 and S220, the DAPR indicates that the “MRU Align StdDev Gyro” and “MRU Align StdDev Roll/Pitch” values are unknown, but these fields are defined as 0.000 in the HVF’s. The values are indeed unknown and, moreover, undocumented in Caris’ Vessel Editor Help Manual. Caris’ Vessel Editor will not allow a null value for these fields however, so a value of 0.000 was entered.

Initial entry dates in each vessel HVF do not correspond with the dates noted in each vessel report. The dates entered precede the dates of the patch tests. As no data was collected before the initial patch tests by any of the FAIRWEATHER’s vessels data quality is not affected.

The sensor latency value noted in the vessel reports can either be entered into each sensor (Navigation, Gyro, Heave, Pitch and Roll) Time Error field or the inverse value can be entered once into the Swath Time Error field. This is seen in both 1018_8101.hvf and S220_8111.hvf.

B.2 Quality Control

Crosslines

Multibeam Echosounder (MBES) crosslines totaled 3.11 nautical miles, comprising 3.1% of MBES hydrography³. The hydrographer has determined, through manual examination of the data, that the accuracy standards have been met and crossline agreement is good.

Junctions

Survey H11369 junctions with survey H11335 to the north. Through manual examination of the data in CARIS subset mode, the hydrographer has determined that there is good agreement between survey H11335 and survey H11369⁴.

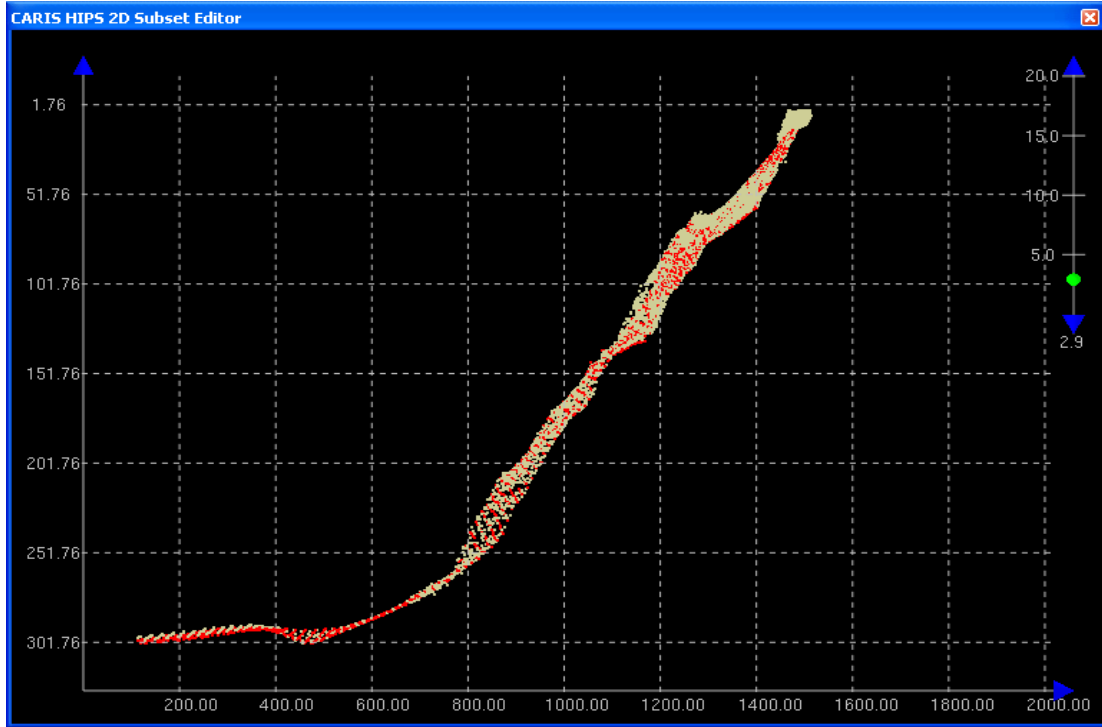


Figure 3. CARIS 2D Subset comparison of survey H11335 (beige) and H11369 (red).

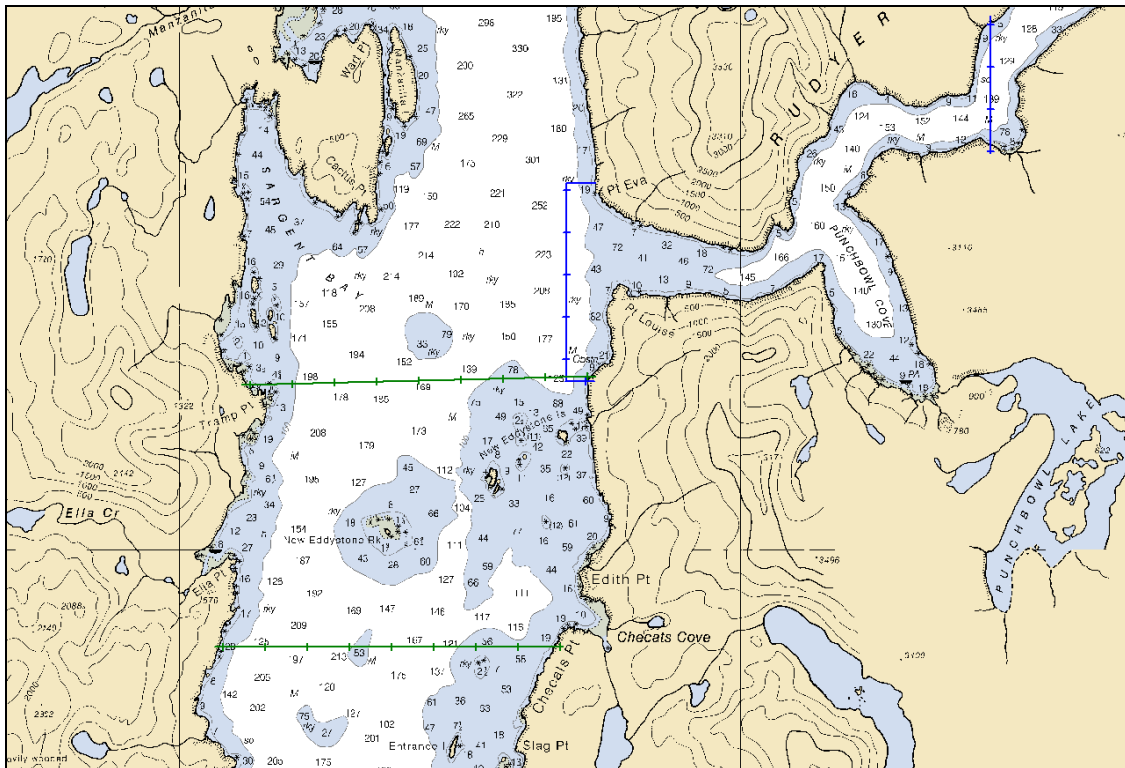


Figure 4. H11335 Survey Limits.

Data Quality Factors

On November 7th (DN 312), it was discovered that bolts in vessel 1010's transducer mount were coming loose. The affected bolts were re-tightened and a roll patch test was conducted on November 8th (DN 313) before and after data acquisition. It was determined by this test that the mount is not retaining its position over time. The morning and afternoon roll patch results differed by 0.13° and differed from the previous roll patch test (DN 293) by 0.91°. An average of DN 313's roll patch results were entered into the 1010_8101 HVF for that day. Modifications will be made to the mount system for both vessel 1010 and 1018 during this winter inport.

Roll artifacts encountered with vessel 1018 are likely attributed to an unstable transducer mount as on vessel 1010. Areas with questionable data were deleted and, when possible, survey plans were adjusted to provide additional coverage. The retained data conforms to the standards prescribed by NOS Hydrographic Surveys Specifications and Deliverables, as updated for 2002. The retained data is adequate to supersede charted soundings⁵.

It was not possible to apply TrueHeave to data from November 6th (DN 311) due to a corrupt TrueHeave file. Despite the lack of a TrueHeave file, data from that day conforms to the standards prescribed by NOS Hydrographic Surveys Specifications and Deliverables, as updated for 2002⁶.

B.3 Corrections to Echo Soundings

Data reduction procedures for survey H11369 conform to those detailed in the *FAIRWEATHER Data Acquisition and Processing Report - 2004*.

Slight data gaps appear in some of the shoaler areas surveyed. An attempt was made to fill in these gaps, but due to mechanical difficulties with the launches at the end of the project, they could not be filled. There are a total of 7 gaps⁷. The smallest gap measures 4x4m and the largest of these gaps is 10x5m long. The majority of the gaps (5 of 7) measured 4x4m. In the vicinity of these gaps the survey did not meet the multibeam coverage requirements as defined by the Letter Instructions and the NOS Hydrographic Surveys Specifications and Deliverables. From examination of corresponding multibeam backscatter no navigationally significant items were found and therefore there is no additional need for MBES coverage⁸.

C. VERTICAL AND HORIZONTAL CONTROL

A complete description of vertical and horizontal control for survey H11369 can be found in the *OPR-O193-FA-04 Horizontal and Vertical Control Report*⁹, submitted under separate cover. A summary of horizontal and vertical control for this survey follows.

C.1 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 from the U.S. Coast Guard beacon at Annette Island (323 kHz) were utilized during this survey.

C.2 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, AK (945-0460) served as control for datum determination and as the primary source for water level reducers for survey H11369.

All data were reduced to MLLW using unverified observed tides from station Ketchikan, AK by applying tide file 9450460.tid and time and height correctors through the revised zone corrector file O193FA2004CORP_rev.zdf.

The Pacific Hydrographic Branch will apply final approved (smooth) tides to the survey data during final processing¹⁰. A request for delivery of final approved (smooth) tides for survey H11369 was forwarded to N/OPS1 on Nov 15th, 2004 in accordance with FPM 4.8. A copy of the request is included in Appendix V.

D. RESULTS AND RECOMMENDATIONS

D.1 Automated Wreck and Obstruction Information System (AWOIS) Investigations

There are no AWOIS items located within the limits of H11369¹¹.

D.2 Chart Comparison

Survey H11369 was compared with charts 17420 (26th Ed.; September 22, 2001, 1:229,376) and 17424 (7th Ed. March 01, 2004, 1:80,000). Chart 17420 was corrected through U.S. Coast Guard *Notice to Mariners* 26.61, November 6th, 2004 at the time of comparison. Chart 17424 was corrected through U.S. Coast Guard *Notice to Mariners* 07.08, June 5th, 2004 at the time of comparison¹².

Chart 17420

Survey H11369 depths generally agreed with depths on chart 17420 within one or two fathoms in areas between 0-100 fathoms. In areas deeper than 100 fathoms, depths from H11369 generally agreed within 5 fathoms.

The charted 169 fathom sounding south of New Eddystone Rock is deeper than data from H11369 by 44 fathoms. The closest 169 fathom sounding from H11369 is 450m to the southwest.

The charted Dangerous Underwater Rock with Uncertain Depth west of the 65 fathom sounding in New Eddystone Islands was not found. It is an extension of a shoal in that area. It is correct as depicted on chart 17424 (see figures 5, 6 and 7).

The 65 fathom sounding in New Eddystone Islands is not the controlling depth of that area. The hydrographer feels that the 13 fathom sounding as shown on chart 17424 is a better representation of the bottom (see figures 5 and 6)¹³.

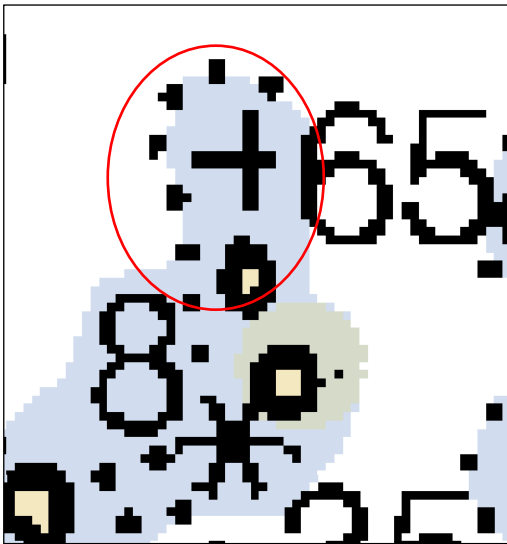


Figure 5. Chart 17420 rock.

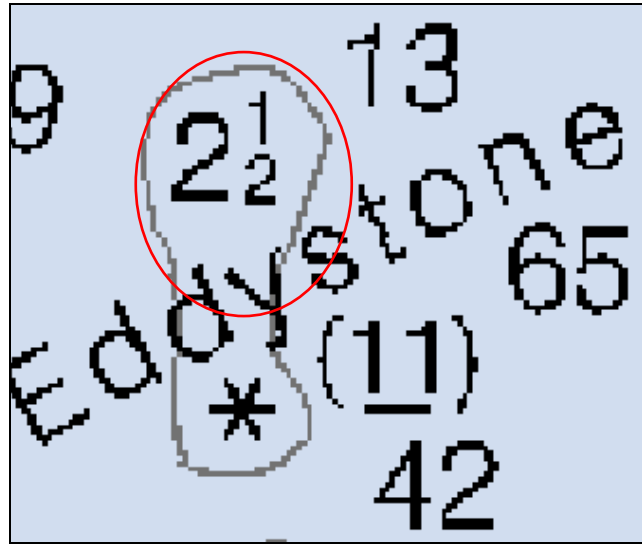


Figure 6. Chart 17424 2 1/2 ftm sounding.

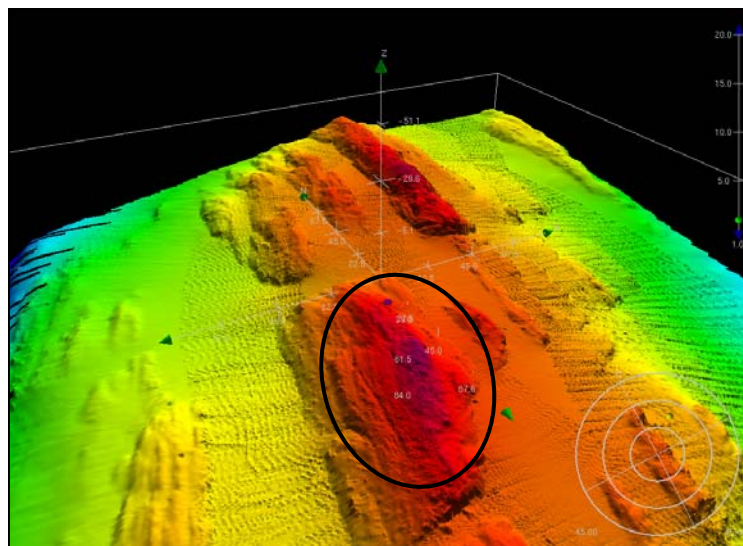


Figure 7. CARIS 3D Subset view of charted 2 1/2 ftm sounding.

In many instances, this survey found shoaler soundings between charted soundings even though agreement at the position of the charted depths was good. This is attributed to increased bottom coverage using MBES methods¹⁴.

Chart 17424

Survey H11369 depths generally agreed with depths on chart 17424 within one or two fathoms in areas between 0-100 fathoms¹⁵. In areas deeper than 100 fathoms, depths from H11369 generally agreed within 5 fathoms¹⁶.

The 18 fathom sounding to the west of new Eddystone Rock was found to be significantly deeper than charted (34 fathom sounding from H11369¹⁷). The rest of the area surrounding New Eddystone Rock was found to agree with charted depths within one or two fathoms.

In many instances, this survey found shoaler soundings between charted soundings even though agreement at the position of the charted depths was good. This is attributed to increased bottom coverage using MBES methods¹⁸.

Recommendations

The Hydrographer has determined that data accuracy standards and bottom coverage requirements have been met in all areas except the areas mentioned in section B.3, and survey data are adequate to supersede charted data in their common areas.

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

D.3 Shoreline

No shoreline verification was conducted for survey H11369 due to time constraints, however, it is noted that shoreline features as currently depicted on charts 17424 and 17420 are adequate for navigational purposes.

D.4 Dangers to Navigation

Two (2) dangers to navigation (DTONs) were found and reported to the Mapping and Charting Division for verification and final submission to the Seventeenth Coast Guard District on November 26, 2004¹⁹. A copy of the preliminary Danger to Navigation Report is included in Appendix II²⁰.

There are two areas of shoaling approximately 340 meters apart in a small passage between two islands on the west end of New Eddystone Islands. These areas are approximately 5

fathoms shoaler than charted. Both were submitted as dangers to navigation because crab fishermen were seen transiting this passage on a daily basis during survey operations.

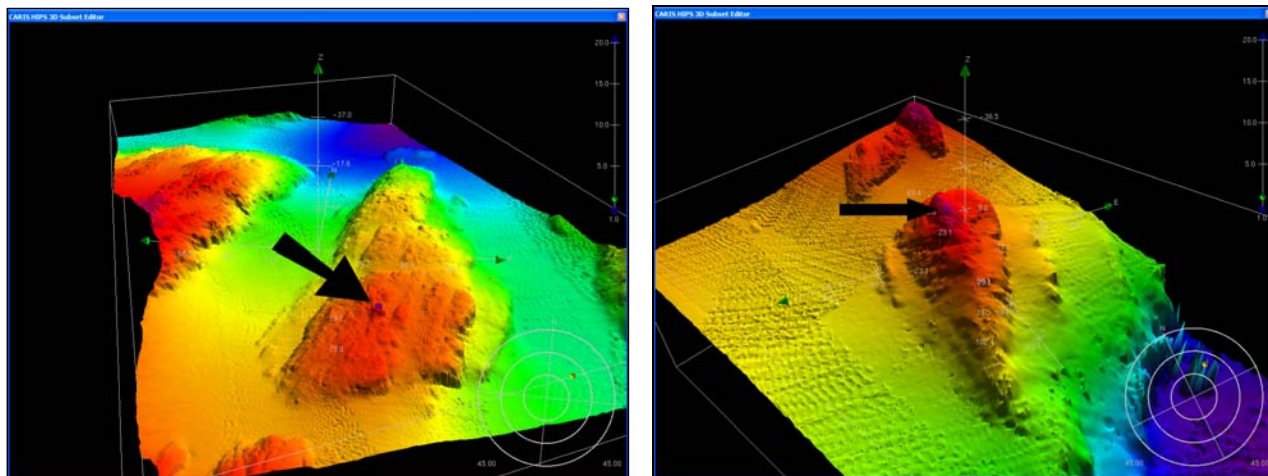


Figure 8. CARIS 3D Subset view of New Eddystone Islands DTONs.

D.5 Aids to Navigation

Survey H11369 included no aids to navigation (ATONs)²¹.

D.6 Miscellaneous

Survey H11369 included one mooring buoy. The mooring buoy was positioned by DP and SWMB and is included in Pydro H11369.pss and Caris Notebook H11369_Features.hob.

Bottom samples were collected and are included as seabed classifications in Pydro H11369.pss and Caris Notebook H11369_Features.hob²².

The relevant chapter of *Coast Pilot 8*; 26th Ed., 2004, has been edited and submitted in digital form to the Coast Pilot Branch.

D.7 Supplemental Reports

<u>Title</u>	<u>Date Sent</u>	<u>Office</u>
FAIRWEATHER Data Acquisition and Processing Report - 2004	05/03/05	N/CS34
Horizontal and Vertical Control Report for OPR-O193-FA	07/15/05	N/CS34 & N/OPS1

Revisions Compiled During Office Processing and Certification

¹ The sublocality was originally Manzanitta Bay to Checates cove, but the area was not completely surveyed due to time constraints.

² Filed with project records

³ This does not meet the 5% of crosslines required by the Field Procedures Manual, however agreement between lines meets accuracy requirements and data quality is unaffected. .

⁴ Concur

⁵ Concur

⁶ Concur

⁷ There is no evidence of shoaling in the vicinity of the gaps; therefore the gaps are not significant.

⁸ Concur

⁹ Filed with project records

¹⁰ Concur; final tides were applied by the Pacific Hydrographic Branch during the Survey Acceptance Review. A tide note is attached to this report

¹¹ Concur

¹² Chart comparisons was performed with the most recent editions of charts 17420 (28th Ed., March 1, 2007, NM March 3, 2007) and 17424 (8th Ed., May 1, 2007, NM May 12, 2007)

¹³ Concur, chart the area as shown in the HCell

¹⁴ Concur

¹⁵ Charted soundings close to shore along the western shoreline tend to be shoaler than the survey soundings. It is likely the charted soundings were depicted farther offshore to prevent crowding

¹⁶ Concur

¹⁷ Concur with clarification, the surveyed depth is 64 fathoms, opposed to 34 fathoms

¹⁸ Concur

¹⁹ The DtoNs were designated during the Survey Acceptance Review and one was compiled to the HCell. DtoN 866/76 was not compiled to the HCell because of a shoaler sounding in the area.

²⁰ The DtoN report is attached to this report

²¹ Concur

²² The bottom samples were compiled to the HCell. Charted bottom samples were retained, unless they were replaced by survey H11369 bottom samples

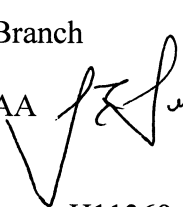


UNITED STATES DEPARTMENT OF COMMERCE

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

July 15, 2005

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

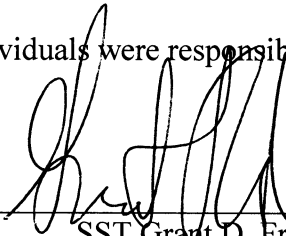
FROM: CDR John E. Lowell, Jr, NOAA 
Commanding Officer

TITLE: Approval of Hydrographic Survey H11369,
OPR-O193-FA

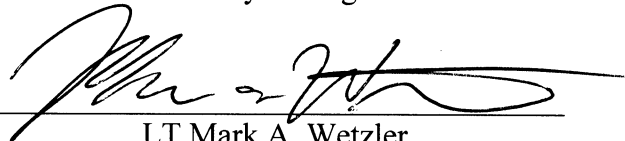
As Chief of Party, I have ensured that standard field surveying and processing procedures were adhered to during acquisition and processing of hydrographic survey H11369 in accordance with the Hydrographic Manual, Fourth Edition; Hydrographic Survey Guidelines; Field Procedures Manual, January 2005 Preliminary Version 1.0; and the NOS Hydrographic Surveys Specifications and Deliverables, as updated for March, 2003. Additional guidance was provided by applicable Hydrographic Technical Directives. This survey is complete within the modified limits. Additional field work will be required to complete the remainder of sheet "C". 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.

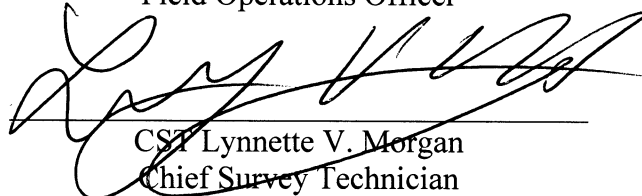
In addition, the following individuals were responsible for oversight of acquisition and processing of this survey:



SST Grant D. Froelich
Survey Manager



LT Mark A. Wetzler
Field Operations Officer



CST Lynnette V. Morgan
Chief Survey Technician

Attachment



Registry Number: H11369
State: Alaska
Locality: Rudyerd Bay
Sub-locality: Manzanita Bay to Checats Cove
Project Number: OPR-O193-FA-04
Survey Date: 11/07/2004

Charts Affected

Number	Version	Date	Scale
17424	7th Ed.	03/01/2004	1:80000
17420	26th Ed.	09/22/2001	1:229376
16016	20th Ed.	11/01/2003	1:969756
531	22nd Ed.	03/01/2004	1:2100000
530	30th Ed.	03/23/2002	1:4860700
50	6th Ed.	06/01/2003	1:10000000

Features

No.	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	Shoal	9.59 m	55.51249370° N	130.89920795° W	---
1.2	Shoal	8.88 m	55.51381603° N	130.90409700° W	---

1 - Dangers to Navigation

1.1) Profile/Beam - 3210/94 from h11369 / 1018_8101 / 2004-312 / 312-1827

DANGER TO NAVIGATION

Survey Summary

Survey Position: 55.51249370° N, 130.89920795° W
Least Depth: 9.59 m
Timestamp: 2004-312.18:35:37.688 (11/07/2004)
Survey Line: h11369 / 1018_8101 / 2004-312 / 312-1827
Profile/Beam: 3210/94
Charts Affected: 17424_1, 17420_1, 16016_1, 531_1, 530_1, 50_1

Remarks:

5.25 fathom sounding. Charted (17424) 11 fathoms. Area is transited by local crab fishermen on a regular basis.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11369/1018_8101/2004-312/312-1827	3210/94	0.00	000.0	Primary

Hydrographer Recommendations

Change charted (17424) 11 fathom sounding to 5.25 fathoms. Submit as Danger to Navigation to MCD.

Cartographically-Rounded Depth (Affected Charts):

5 ¼fm (17424_1, 17420_1, 16016_1, 530_1)
 5fm 1ft (531_1)
 9.6m (50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)
Attributes: INFORM - 5.25 fathom sounding. Charted (17424) 11 fathoms. Area is transited by local crab fishermen on a regular basis.
 QUASOU - 1,6:depth known,least depth known
 TECSOU - 3:found by multi-beam

Office Notes

Chart sounding.

Feature Images

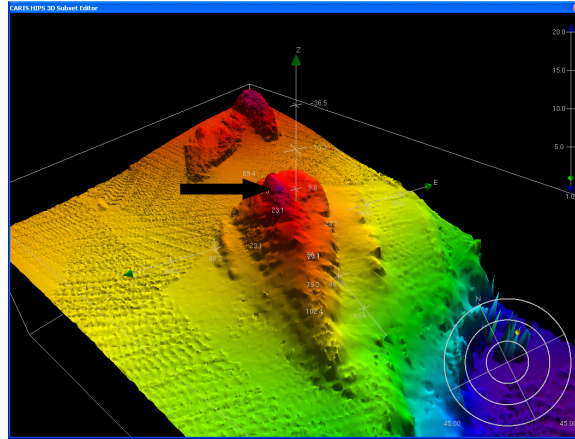


Figure 1.1.1 CARIS 3D Subset view of 5.25 fathom shoal.

1.2) Profile/Beam - 866/76 from h11369 / 1018_8101 / 2004-312 / 312-1951

DANGER TO NAVIGATION

Survey Summary

Survey Position: 55.51381603° N, 130.90409700° W
Least Depth: 8.88 m
Timestamp: 2004-312.19:53:33.037 (11/07/2004)
Survey Line: h11369 / 1018_8101 / 2004-312 / 312-1951
Profile/Beam: 866/76
Charts Affected: 17424_1, 17420_1, 16016_1, 531_1, 530_1, 50_1

Remarks:

4.86 fathom sounding between 8 and 9 fathom charted (17424) soundings. Area is transited by local crab fishermen on a regular basis.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11369/1018_8101/2004-312/312-1951	866/76	0.00	000.0	Primary

Hydrographer Recommendations

Change charted (17424) 9 fathom sounding to 4.75 fathoms. Submit as Danger to Navigation to MCD.

Cartographically-Rounded Depth (Affected Charts):

4 ¾fm (17424_1, 17420_1, 16016_1, 530_1)
 4fm 5ft (531_1)
 8.9m (50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)
Attributes: INFORM - 4.86 fathom sounding between 8 and 9 fathom charted (17424) soundings. Area is transited by local crab fishermen on a regular basis.
 QUASOU - 1,6:depth known,least depth known
 TECSOU - 3:found by multi-beam

Office Notes

Chart sounding.

Feature Images

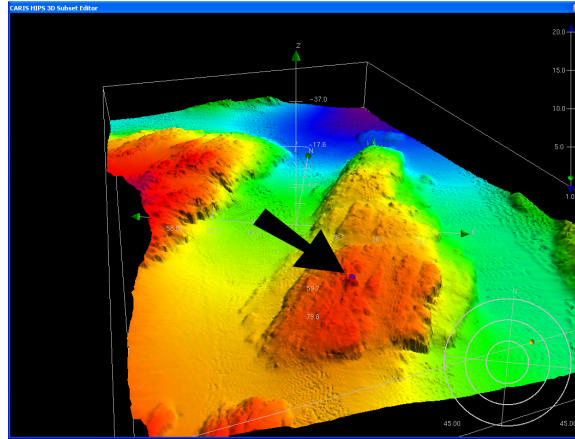


Figure 1.2.1 CARIS 3D Subset view of 4.86 fathom shoal.

Registry Number: H11369
State: Alaska
Locality: Rudyerd Bay
Sub-locality: Manzanita Bay to Checats Cove
Project Number: OPR-O193-FA-04
Survey Date: 11/06/2004

Charts Affected

Number	Version	Date	Scale
17424	7th Ed.	03/01/2004	1:80000
17420	26th Ed.	09/22/2001	1:229376
16016	20th Ed.	11/01/2003	1:969756
531	22nd Ed.	03/01/2004	1:2100000
530	30th Ed.	03/23/2002	1:4860700
50	6th Ed.	06/01/2003	1:10000000

Features

No.	Feature Type	Survey Depth	Survey Latitude	Survey Longitude
1.1	Mooring buoy	[None]	55.50100402° N	130.98856783° W

1 - Item Data

1.1) Profile/Beam - 1/1 from h11369 / trb2_dpne / 2004-311 / morfac.shp

Survey Summary

Survey Position: 55.50100402° N, 130.98856783° W
Least Depth: [None]
Timestamp: 2004-311.18:21:49.000 (11/06/2004)
DP Dataset: h11369 / trb2_dpne / 2004-311 / morfac.shp
Profile/Beam: 1/1
Charts Affected: 17424_1, 17420_1, 16016_1, 531_1, 530_1, 50_1

Remarks:

23111 Blue and white mooring buoy. New position of CHD mooring buoy.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11369/trb2_dpne/2004-311/morfac.shp	1/1	0.00	000.0	Primary
h11369/1010_8101/2004-313/313-2014	29/1	2.62	087.2	Secondary
h11369/1010_8101/2004-313/313-2014	19/36	6.13	030.9	Secondary
ChartGPs - H11369_Charted_ATONs_font_point.shp	1	150.05	017.3	Secondary (grouped)

Hydrographer Recommendations

Rechart charted mooring buoy at location 55°30'03.614" N, 130°59'18.844" W.

S-57 Data

Geo object 1: Mooring/warping facility (MORFAC)
Attributes: BOYSHP - 1:conical (nun, ogival)
 CATMOR - 7:mooring buoy
 COLOUR - 1:white
 COLPAT - 1:horizontal stripes
 CONRAD - 2:not radar conspicuous
 HEIGHT - 0.0 m
 INFORM - 23111 Blue and white mooring buoy. New position of CHD mooring buoy.
 PICREP - no

WATLEV - 2:always dry

Office Notes

Chart new mooring buoy.

Feature Images

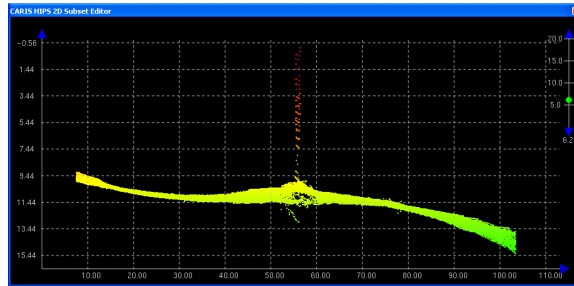


Figure 1.1.1 CARIS 2D Subset view of charted mooring buoy.



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Silver Spring, Maryland 20910

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: May 6, 2005

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-0193-FA-2004
HYDROGRAPHIC SHEET: H11369

LOCALITY: Manzanita Bay to Checats Cove
Behm Canal, AK

TIME PERIOD: November 4 - 9, 2004

TIDE STATION USED: 945-0460 Ketchikan, AK
Lat. 55° 20.0'N Lon. 131° 37.5'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: SA78

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 new 1983-2001 National Tidal Datum Epoch (NTDE).

Note 2: The Fairweather was unable to conduct closing levels at the subordinate gauge, Rudyerd Bay (945-0651). Therefore Rudyerd Bay cannot be used for tide correction. The control water level station at Ketchikan (945-0460) is used as the reference station for the purpose of providing tide correction. The gauge at Rudyerd Bay was used for final zoning.

Thomas W. Meyer 6/6/05

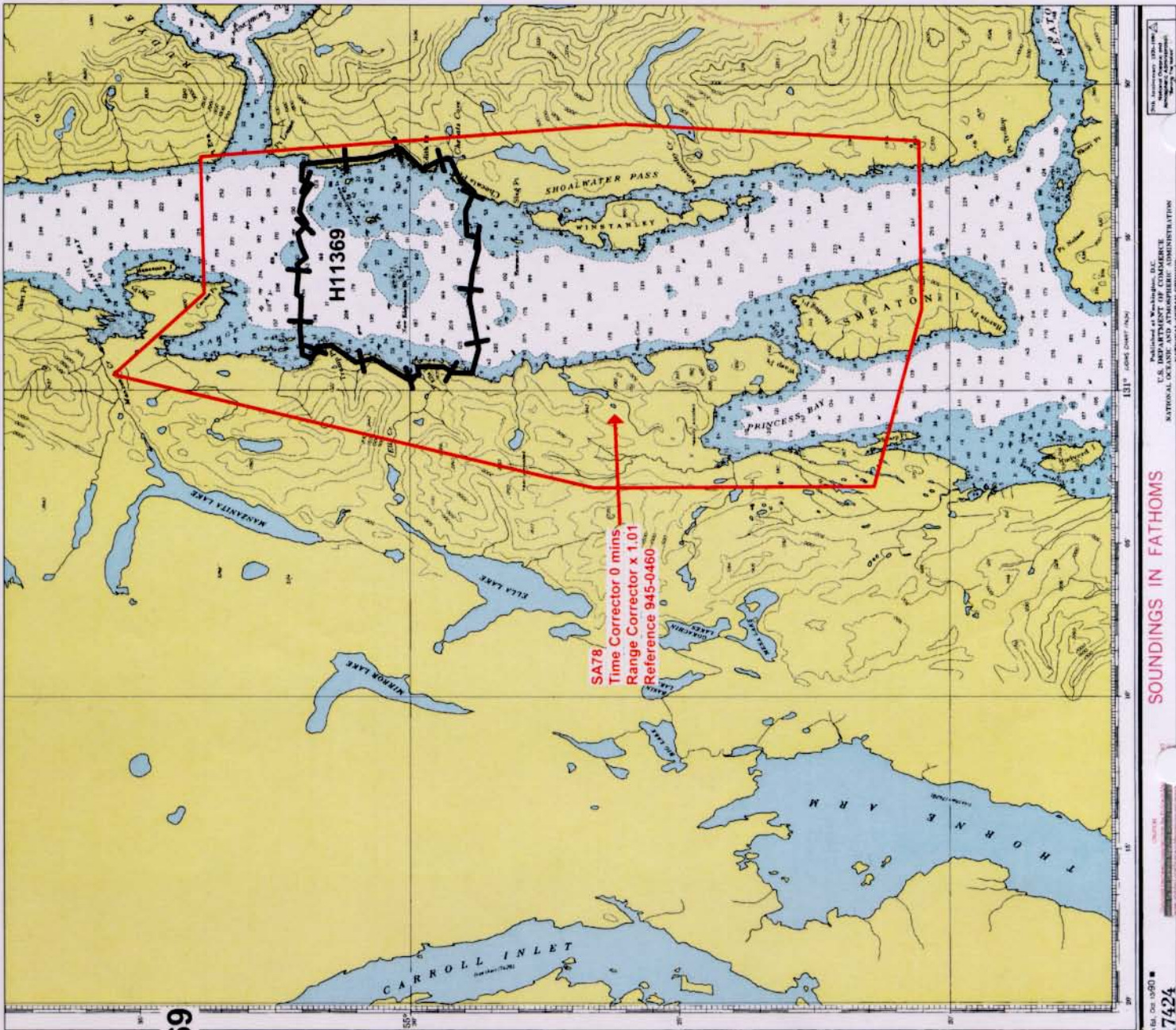
CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION

Final tide zone node point locations for OPR-O193-FA-2004, H11369

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 SA78	945-0460	0	1.01
-131.052527 55.356473			
-131.053306 55.442747			
-130.991892 55.591159			
-130.947613 55.563204			
-130.873177 55.564335			
-130.869921 55.542466			
-130.855183 55.433649			
-130.864215 55.342746			
-130.956111 55.341884			
-131.052527 55.356473			

**Final Tide Zoning
for OPR-0193-FA-2004, H11369
Behm Canal, AK**



H11369 HCell Supplemental Report
Sarah Wolfskehl, Hydrographic Survey Intern
Pacific Hydrographic Branch

Introduction

The primary purpose of the HCell is to directly update NOAA ENC's with new survey information in International Hydrographic Organization (IHO) format S-57. HCell compilation of survey H11369 utilized Office of Coast Survey HCell Specifications Versions 2.0. HCell H11369 will be used to update chart 17424, 1:80,000 (8th Ed.; May 1, 2007, NM 11/24/2007). There is no current ENC for this area.

1. Compilation Scale

Contours and the density of soundings are compiled as appropriate to emulate those of Chart 17424, 1:80,000. Position and density of features included in the HCell have not been generalized from the scale of the hydrographic survey, 1:10,000.

2. Soundings

2.1 Source Data

A 10 m resolution Combined BASE surface, **H11369_final_comb_10m.hns** was used as the basis for HCell production following Branch certification. This surface contained three designated soundings, two of which were submitted as DtoNs by the field.

A survey-scale full density sounding (SOUNDG) feature object source layer was built from the **H11369_final_comb_10m.hns** surface in CARIS BASE Editor. A shoal-biased selection was made at 1:10,000 survey scale using a radius table with values shown in table 1. The sounding feature object source layer was exported as **H11369_sound_ss.hob**, and imported into HOM.

Upper Limit (m)	Lower Limit (m)	Radius (mm)
0	10	3
10	20	4
20	50	4.5
50	400	5

Table 1.

2.2 Sounding Feature Objects

In CARIS BASE Editor soundings were manually selected from the survey scale sounding set **H11369_sound_ss.hob** to create a chart scale sounding set **H11369_sound_cs.hob**. The H11369_sound_cs.hob sounding selection emulates the density and distribution of soundings on chart 17424, while more closely representing the seafloor morphology. The soundings were selected with regard to a 100 fathom, 10, fathom and 3 fathom contour.

3. Depth Areas

3.1 Source Data

The combined Base Surface, **H11369_final_comb_10m.hns**, was used to generate a single all encompassing depth area, and for survey evaluation and verification purposes only, a set of contours. The contour set included the chart equivalent, 100 fathom and 3 fathom contours, as well as a 10 fathom contour that the survey data now supports. The depth contours were not submitted as deliverables, as according to OCS HCell Specifications ver. 2.0.

3.2 Depth Area Feature Objects

One all-encompassing depth range, 0 meters to 400 meters, was used for all depth area objects below MLLW. Upon conversion to NOAA charting units, this depth range is 0 to 219 fathoms. No separate depth areas exist outside the extents of hydrography.

4. Meta Areas

The following Meta object areas are included in HCell H11369:

M_QUAL
M_COVR
M_NSYS

Meta area objects were constructed from filtered perimeter lines delineating the survey limits. The perimeter was first used to create the Skin of the Earth (SOTE) layer, then duplicated to the Meta object layers and attributed per the OCS HCell Specifications ver. 2.0.

5. Survey Features

The features, including bottom samples and one mooring buoy, for H11369 were delivered in Pydro and Notebook format. The features were imported into HOM where the final decisions on the charting of individual features were made. The cartographic actions taken for each feature were noted in the Pydro file **H11369.pss** under the office notes tab. The office notes are printed in red at the bottom of each page of the feature report exported from Pydro.

In addition to the survey features, 8 charted bottom type features were digitized from chart 17424.

6. Shoreline / Tide Delineation

No shoreline features, including MLLW or MHW lines were used in the creation of HCell H11369.

7. Attribution

All S-57 Feature Objects have been attributed as fully as possible based on information provided by the Hydrographer and in accordance with OCS HCell Specifications ver. 2.0.

8. Layout

8.1 CARIS HOM Layering Scheme

100	Survey Scale Soundings
101	Chart Scale Soundings
200	Depth Area/Skin of the Earth
300	Chart Features
301	Notebook Features
302	Pydro Features
600	M_covr
601	M_qual
602	M_nsys
800	Blue Notes (spatial only)
1000	Shoreline (spatial only)
1001	Contours (spatial only)

8.2 Blue Notes

Notes regarding HCell feature compilation are on layer 800 and as shape file sets **H11369_bluenotes_p.shp** and **H11369_bluenotes_l.shp** for point and line figures, respectively. A copy of the survey perimeter is included in the line shape file set for orientation purposes.

9. Spatial Framework

9.1 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.

9.2 Horizontal and Vertical Units

During creation of sounding sets and contours, and creation of the HCell, units are maintained as metric with millimeter resolution. NOAA rounding is applied at the same time that conversion to chart units is made to the metric HCell base cell file, at the end of the HCell compilation process.

The CARIS environment variable, `uslXsounding_round`, controls the depth at which rounding occurs. Setting this variable to NOAA fathoms and feet displays all soundings equal to or greater than 11 fathoms as whole units.

In an ENC viewer fathoms and feet display in the format X.YZZZ, where X is fathoms, Y is feet, and ZZZ is decimals of the foot. For fathoms and feet between 0 and 10 fathoms

4.5 feet (10.75 fms), soundings round to the deeper foot if the decimals of the foot are X.Y75000 or greater. For fathoms and feet deeper or equal to 11 fathoms, soundings round to the deeper fathom if feet and decimals of the foot are X.45000 (X.Y75000) or greater. Drying heights are in feet and are rounded using arithmetic methods. In an ENC viewer, heights greater than 6 feet will register in fathoms and feet using the above stated rules.

HOM Units

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

Chart Unit Base Cell Units

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

10. QA/QC

10.1 Data Processing Notes

Manual chart scale sounding selections were made for this survey. Experience has shown that in areas where bathymetry is steep sided, as in the case of this extremely steep edged fjord, automated sounding selection is impractical.

It is recommended that a 10 fathom contour be generated for this survey area. The hydrographic data now supports a 10 fathom contour.

10.2 ENC Validation Checks

H11369 was subjected to QA and Validation checks in HOM prior to exporting to the HCell base cell (000) file. Full millimeter precision was retained in the export of the metric S-57 base cell data set. This data set was then converted to a chart unit 000 file. dKart Inspector 5.0 (Service Pack 1) was then used to further check the data set for conformity to the S-58 version 2 standard (formerly Appendix B.1 Annex C of the S-57 standard). All tests were run and errors investigated and corrected where necessary.

11. Products

11.1 MCD Deliverables

- H11369 Base Cell File, Chart Units, Soundings compiled to 1:80,000
- H11369 Base Cell File, Chart Units, Soundings compiled to 1:10,000
- H11369 Descriptive Report including end notes compiled during office processing and certification
- H11369 HCell Supplemental Report
- Blue Notes shape files
- BAG (Bathymetry Attributed Grid)
- .000 Features File

11.2 File Naming Conventions

HOM file set prefix: *H11369_hc.**

MCD Chart units base cell file: *US411369_CU.000*

MCD Chart units base cell file, survey scale soundings: *US411369_SS.000*

BAG (for CGTP): *H11369_comb_10m.bag*

Features File (for CGTP): *US411369_Features.000*

11.3 Software

HIPS 6.1:	Management and inspection of Combined BASE surfaces; generation of the BAG
BASE Editor 2.0:	Combination of Product Surfaces and initial creation of the S-57 bathymetry-derived features, examination of base cell files against the chart; chart density sounding selection
HOM 3.3:	Assembly of the HCell, S-57 products, QA
GIS 4.4a:	Setting the sounding rounding variable
Pydro v7.3 (r2014_TCfix)	Creation of AWOIS and DTON reports; export of features for the HCell
dKart Inspector 5.0:	S-58 Validation of the HCell base cell file

12. Contacts

Inquiries regarding this HCell content or construction should be directed to:
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Sarah.Wolfskehl@noaa.gov.

APPROVAL SHEET
H11369

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.