

H11934

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. H11934

### LOCALITY

State Alaska

General Locality Vicinity of Glacier Spit

Sublocality Southern Portion of Cook Inlet

**2008**

### CHIEF OF PARTY

**Captain Donald W. Haines, 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;"><b>HYDROGRAPHIC TITLE SHEET</b></p>	<p>REGISTRY No</p> <p style="text-align: center;"><b>H11934</b></p>
<p><b>INSTRUCTIONS</b> – 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: <b>N/A</b></p>
<p>State <u>Alaska</u></p> <p>General Locality <u>Southern Portion of Cook Inlet</u></p> <p>Sub-Locality <u>Vicinity of Glacier Spit</u></p> <p>Scale <u>1:10,000</u> Date of Survey <u>08/19/2008 to 08/28/2008</u></p> <p>Instructions dated <u>7/24/2008</u> Project No. <u>OPR-P357-RA-FA-08</u></p> <p>Vessel <u>RA1 (1101), RA2 (1103), RA3 (1021), RA4 (2801), RA5 (2802)</u></p> <hr/> <p>Chief of party <u>CAPT Donald W. Haines, NOAA</u></p> <p>Surveyed by <u>RAINIER Personnel</u></p> <p>Soundings by <u>Reson SeaBat 8101 and 7125, Knudsen 320M</u></p> <p>SAR by <u>Mary Beth Litrico</u> Compilation by <u>Fernando Ortiz</u></p> <p>Soundings compiled in <u>Fathoms</u></p>	
<p>REMARKS: <u>All times are UTC. UTM Zone 5</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/> <hr/>	

# Descriptive Report to Accompany Hydrographic Survey H11934

Project OPR-P357-RA-FA-08  
Southern Portion of Cook Inlet, Alaska  
Vicinity of Glacier Spit  
Scale 1:10,000  
August, 2008  
**NOAA Ship *Rainier* (s221)**  
Chief of Party: Captain Donald W. Haines, NOAA

## A. AREA SURVEYED

This hydrographic survey was completed as specified by Hydrographic Survey Project Instructions OPR-P357-RA-FA-08 dated July 24, 2008 and all other applicable direction<sup>1</sup>, with the exception of deviations noted in this report. The survey area is Southern Portion of Cook Inlet, Alaska and the sublocality is Vicinity of Glacier Spit. This survey corresponds to sheet "B" in the sheet layout provided with the Letter Instructions. OPR-P357-RA-FA-08 comprises the first year of a two year project in which the Office of Coast Survey is dedicating sea-days for the NOAA Ships *Rainier* and *Fairweather* to conduct a regional study of Kachemak Bay. Complete multibeam echosounder (MBES) coverage was achieved in the survey area in waters 8 meters and deeper. Except as noted below, from 8 meters to 4 meters, 25 meter spaced MBES was acquired. Extending inshore of the 4 meter curve, and defining the zero meter curve, 100 meter spaced VBES lines were run. Total mileage acquired by each vessel and system is referenced in Table 1.

The four meter curve was not fully reached, as required by project instructions, with 25 meter spaced MBES data in area approaching mudflats on northern shore of survey. One hundred meter spaced VBES lines were run in these areas and, considering the gently sloping nature of the seafloor, should be considered adequate for charting.<sup>1</sup>

Snippet data, as required by project instructions, were not collected by Launch 2801 on DN233.

Limited Shoreline Verification was performed in the survey area.

Data Acquisition Type	Hull Number with Mileage (nm)						Total
	1101	1103	1021	2801	2802	S221	
MBES (mainscheme)	5.60	-	76.92	205.15	154.30	-	441.97
VBES (mainscheme)	68.41	50.65	-	-	-	-	119.06
Crosslines	-	54.02	-	-	-	-	54.02
Developments	-	-	-	-	-	-	-
Bottom Samples	-	-	12	-	-	-	12
Total Number of Items Investigated	-	-	-	1	-	-	1
Total Area Surveyed (sq. nm)	-	-	-	-	-	-	-

Table 1: Statistics for survey H11934

<sup>1</sup> NOS Hydrographic Surveys Specifications and Deliverables (April 2008), OCS Field Procedures Manual for Hydrographic Surveying (May 2008), and all Hydrographic Surveys Technical Directives issued through the dates of data acquisition.

Data acquisition was conducted from August 19 to August 28, 2008 (DN232 to DN241).

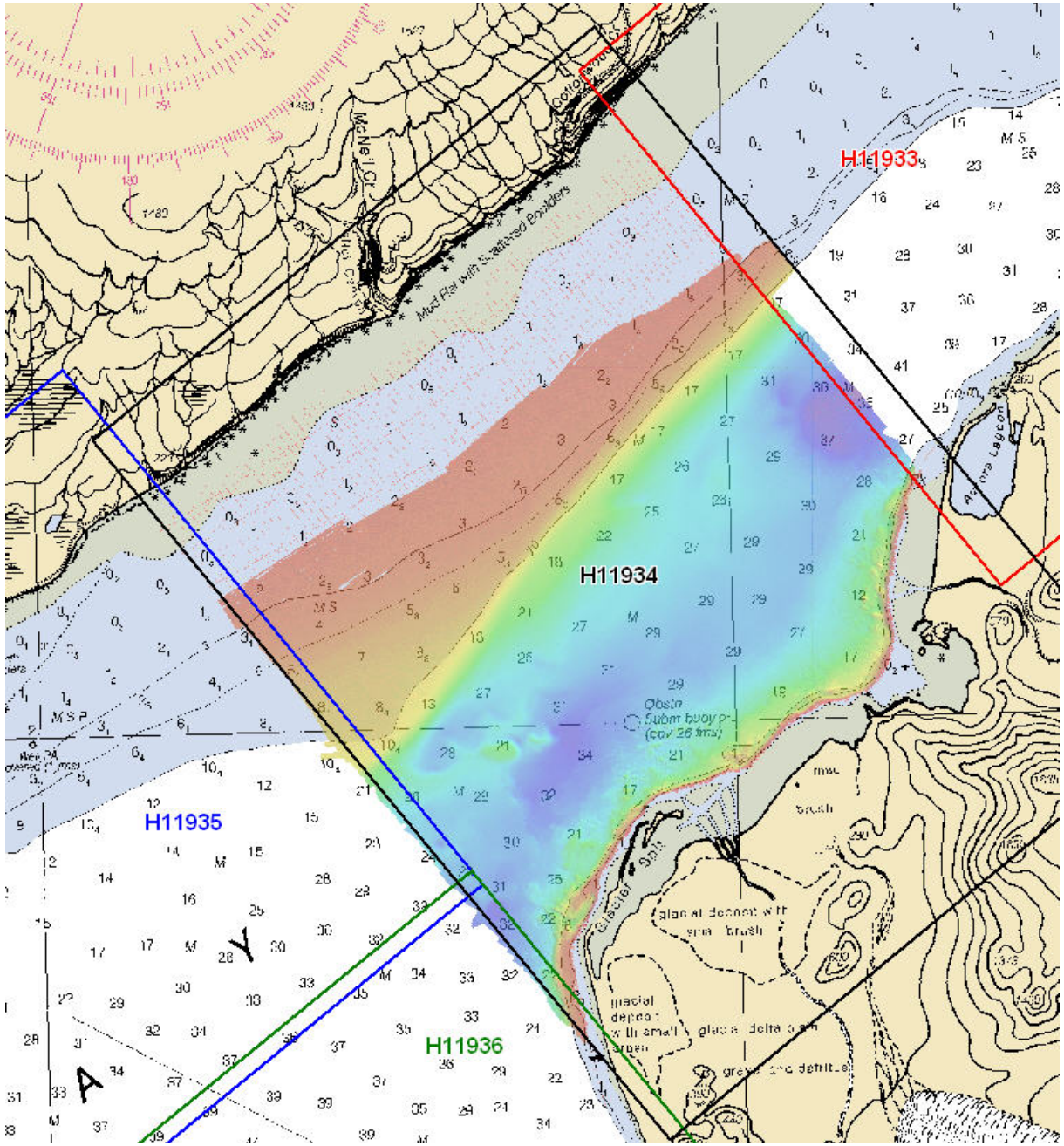


Figure 1: H11934 survey coverage overlaid on Chart 16645 with project sheet layouts.

**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 *OPR-P357-RA-08 Data Acquisition and Processing Report (DAPR)*,<sup>2</sup> submitted under separate cover. Items specific to this survey, and any deviations from the DAPR are discussed in the following sections.

Final Approved Water Levels have been applied to this survey. See Section C. for additional information.

**B1. Equipment and Vessels**

Data for this survey were acquired by the following vessels:

Hull Number	Name	Acquisition Type
1101	RA-1	Reson 8125 titled Multibeam Echo sounder Vertical Beam Echo sounder
1103	RA-2	Vertical Beam Echo sounder Detached Positions Bottom Samples
1021	RA-3	Reson 8101 Multibeam Echo sounder
2801	RA-4	Reson 7125 Multibeam Echo sounder
2802	RA-5	Reson 7125 Multibeam Echo sounder

*Table 2. Data Acquisition Vessels for H11934.*

Sound speed profiles were measured with SEACAT SBE-19, 19+, and Brooke Ocean MVP-30 profilers in accordance with the Specifications and Deliverables.

No unusual vessel configurations were used for data acquisition.

**B2. Quality Control**

**Crosslines**

Vertical Beam Echosounder (VBES) crosslines totaled 54.02 nautical miles, comprising 9.63% of main scheme hydrography. A mainscheme bathymetry BASE surface was compared to a crossline BASE surface using the Fledermaus differencing tool. Results yielded differences averaging 0.03 meter and not exceeding 0.15 meter.

A statistical Quality Control Report has been conducted on representative data acquired with each system used on this survey. Results of these tests are included in the updated 2008 *Rainier* Hydrographic System Readiness Review package submitted with this survey.

## Junctions

The following contemporary surveys junction with H11934 (See Figure 1 above):<sup>3</sup>

<u>Registry #</u>	<u>Scale</u>	<u>Date</u>	<u>Junction side</u>
H11933	1:10,000	2008	Northeast
H11935	1:10,000	2008	West

Data from H11935 and H11936, collected by NOAA Ship *Fairweather*, were not available for comparison at time of this report.<sup>4</sup> All contemporary 2008 junction surveys were run concurrently within project OPR-P357-RA-FA-08. BASE surfaces from H11933 and H11934 were compared using Fledermaus differencing tool and agreed well. The BASE surfaces were four meter surfaces with common nodes. All differences were typically within 0.07 to 0.4 meters, and did not exceed 0.5 meters. Almost all differences can be attributed to sound velocity errors due to the highly variable waters within Kachemak Bay.

## Data Quality Factors

### Sound Speed Artifacts

Severe sound speed artifacts were observed within survey H11934 in vicinity of glacial outflows. After applying sound speed corrections in CARIS HIPS, some lines still exhibited the characteristic “frowns” indicative of inaccurate sound speed corrections. CTD sound speed casts were taken more frequently than the standard 4 hour time interval. In addition, the moving vessel profiler (MVP) was used to take additional casts when possible. Despite the best efforts of the Hydrographer to conduct sufficient sound speed casts, distributed both spatially and temporally, and to correct for sound speed errors in post processing through methods previously mentioned, sound velocity errors were still noticeable in several regions. Artifacts frequently approached 1.50 meters of offset. The Hydrographer compensated by rejecting obvious soundings in error on the outer beams. Acceptable BASE surfaces were then able to be computed and finalized. Despite the few remaining artifacts, the acquired data is adequate to supersede charted depths.<sup>5</sup>



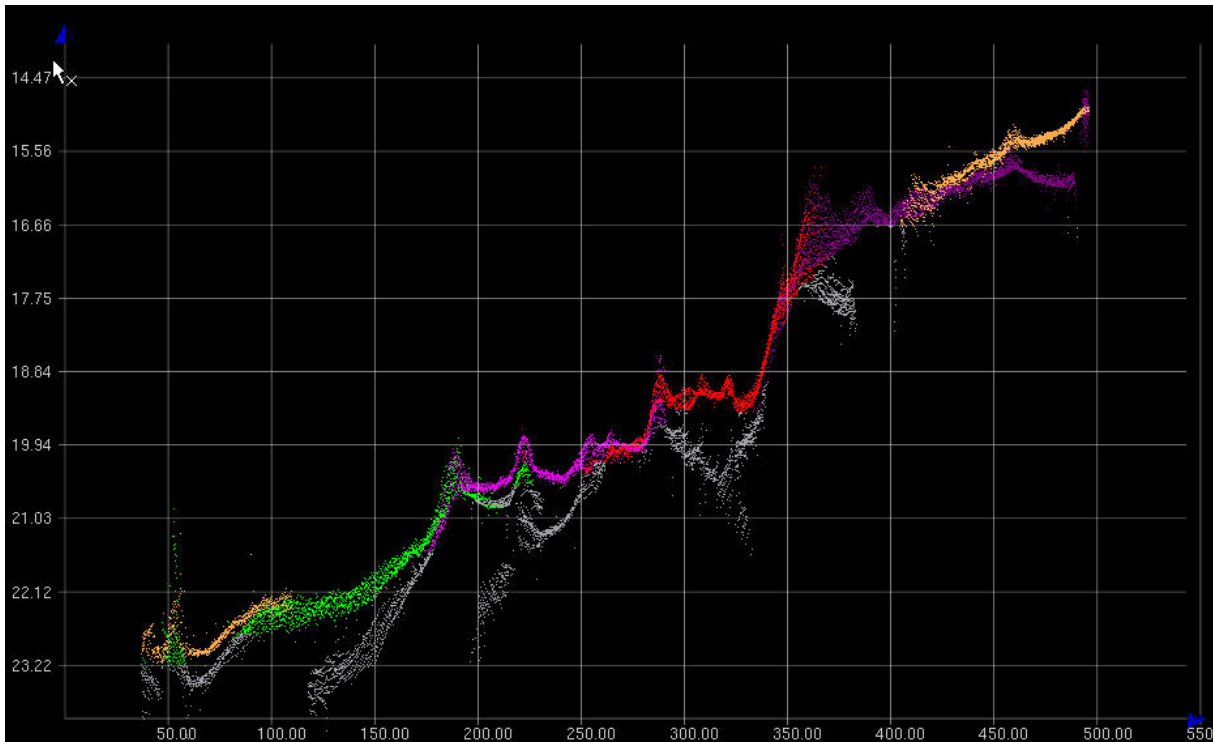


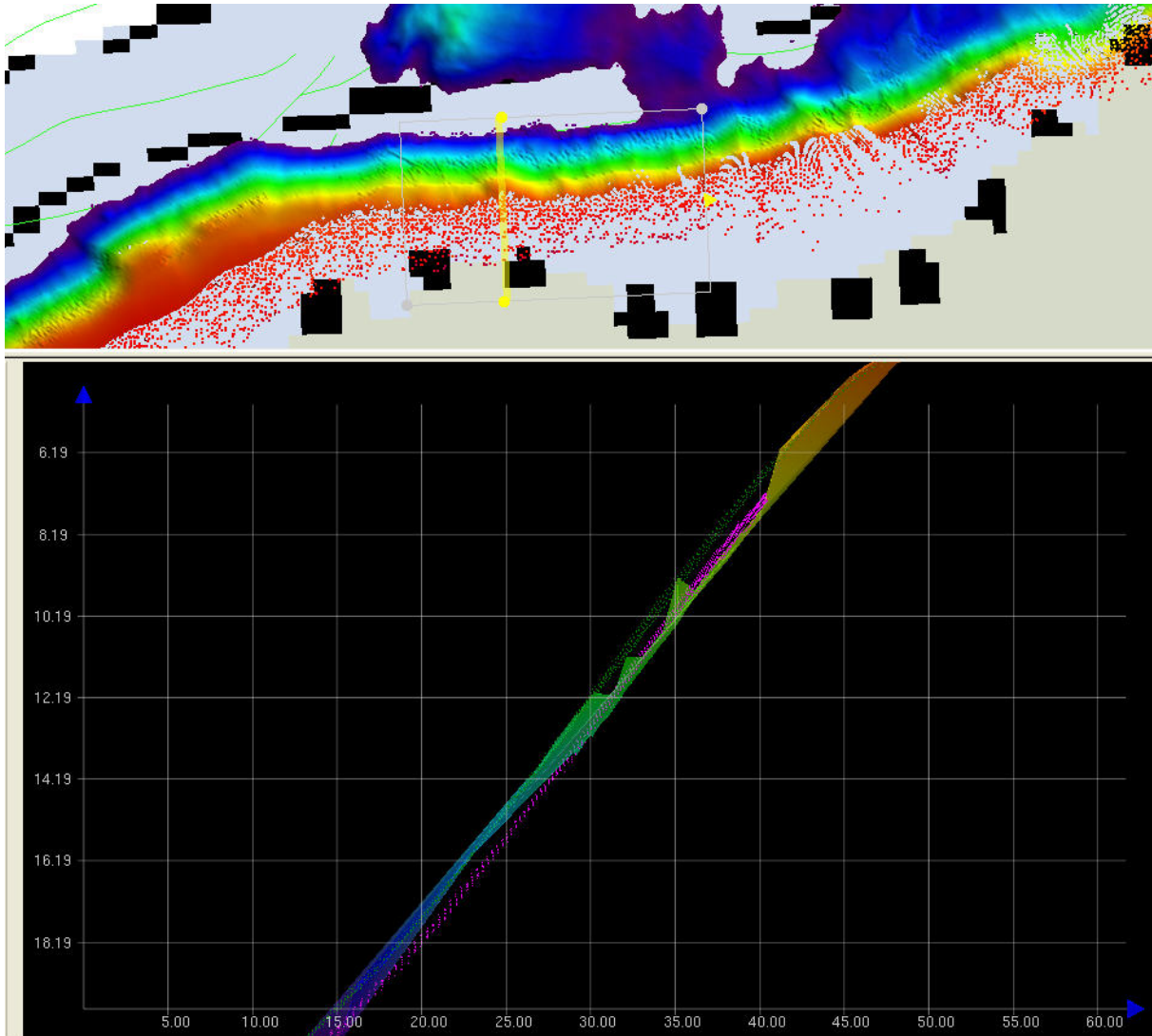
Figure 2: Example of sound speed errors observed in survey H11934 as viewed in subset mode.

#### POS MV Heading Accuracy

During the course of data acquisition, survey personnel noted occasional instances of POS MV heading accuracy decreasing from the normal level of  $\leq 0.05$  degrees to a maximum of 0.078 degrees. This phenomenon was seen almost daily, but was always self correcting after a period of approximately 15 to 20 minutes. The likely cause of decreased heading accuracy was less than optimal satellite geometry.<sup>6</sup>

#### Positional Offset

Positional errors of approximately two meters were observed along the southeast side of H11934. Due to the steepness of the sloping bathymetry in the area, BASE surfaces appeared very ragged as the CUBE algorithm would cause the BASE surface to jump back and forth between the offset data (figure 3). Continuously Operating Reference Stations (CORS) site, dual frequency GPS was logged through the POS MV to a POS file. The resulting POS data were post processed using Applanix POSpac v. 5.1 software in order to achieve sub-meter horizontal accuracy. Seldovia NGS station was used as the reference station for post processing; the resultant Smoothed Best Estimate of Trajectory (SBET) file is included in the raw data. In all cases the positioning uncertainty of the post processed SBET is less than 1 m. The SBET files were applied to the data using the Caris HIPS and SIPS “Load attitude and navigation” function. Applying the SBET files to survey data eliminated any visible offsets. SBET files were loaded into Launch 1101 data from DN232 and Launch 2801 data from DN 237 and DN239. All bathy data was then remerged and surfaces were recreated.



*Figure 3: Example of positional offset observed in survey H11934 as viewed in subset mode.*

### Data Gaps

Within assigned sheet limits are several along track holidays (figure 4). All are located along northwest waters in depths less than 8 meters. The holidays were created due to dropouts of bathymetry data from bathy files. Project time allowed for some, but not all, data dropouts to be rerun. All data gaps fall within area also covered by 100 meter spaced VBES mainscheme lines. No significant features were observed during acquisition and the Hydrographer recommends charting data represented in submitted surfaces.<sup>7</sup>



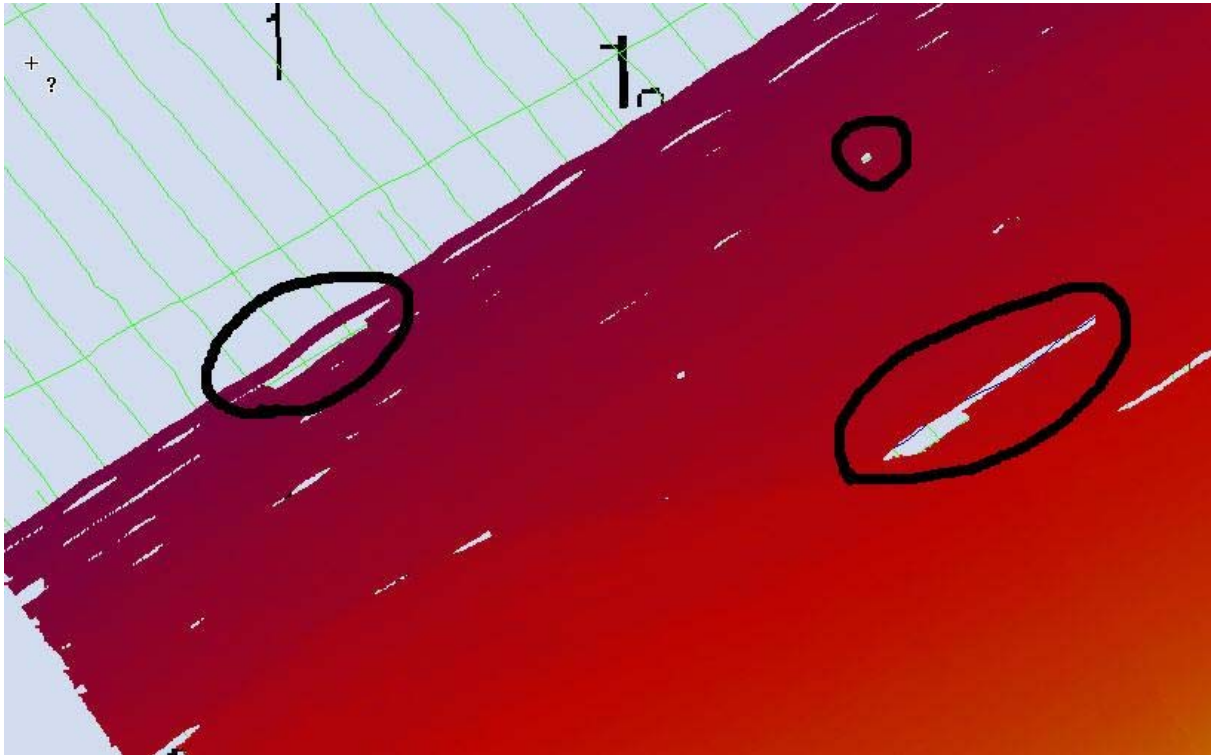


Figure 4: Bathymetry dropouts resulting in holidays.

True Heave

No true heave file was recorded for, and was thus not applied to, Launch 2801 data after line 239-2158 and lines 239-1657-1 and 239-1659-1 on DN239.

**B3. Data Reduction**

Data reduction procedures for survey H11934 conform to those detailed in the *OPR-P357-RA-08 DAPR*.

Many BASE surfaces were used in processing H11934. Final BASE surface resolutions and depth ranges were set according to table 3 below, with field sheets smaller than  $25 \times 10^6$  nodes. CUBE surfaces processed at one meter resolution were computed using “shallow” CUBE parameters whereas CUBE surfaces with resolutions of two and four meters were computed using “deep” CUBE parameters. The submission Field Sheet and BASE Surface structure are shown in Figure 5, 6, and 7.

Depth Range (m)	Resolution (m)
0-21.5	1
18.5-52	2
46-115	4

Table 3: Depth range and surface resolutions for H11934

Soundings and contours were generated in CARIS HIPS from the 4m\_Combined\_Final surface for field unit review purposes. They are included for reference only and are not intended as a deliverable.

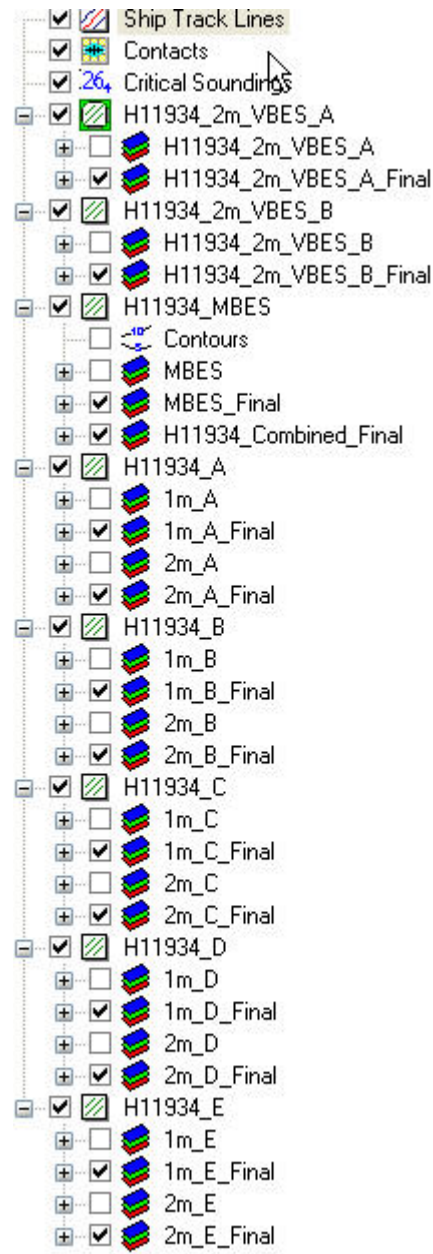


Figure 5: Field sheets and BASE surfaces submitted with H11934.

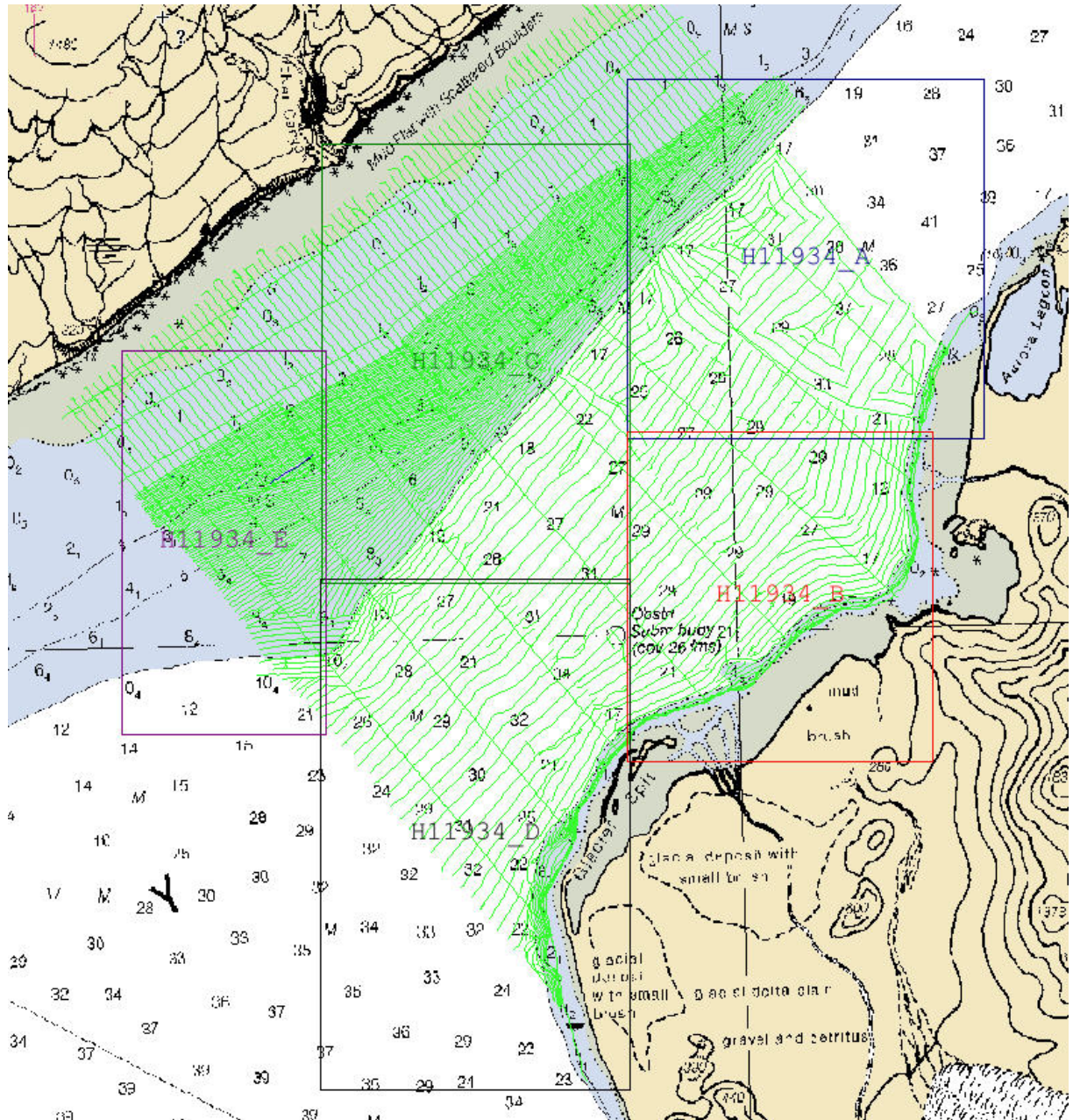


Figure 6: Layout of 1 meter and 2 meter field sheets for H11934.



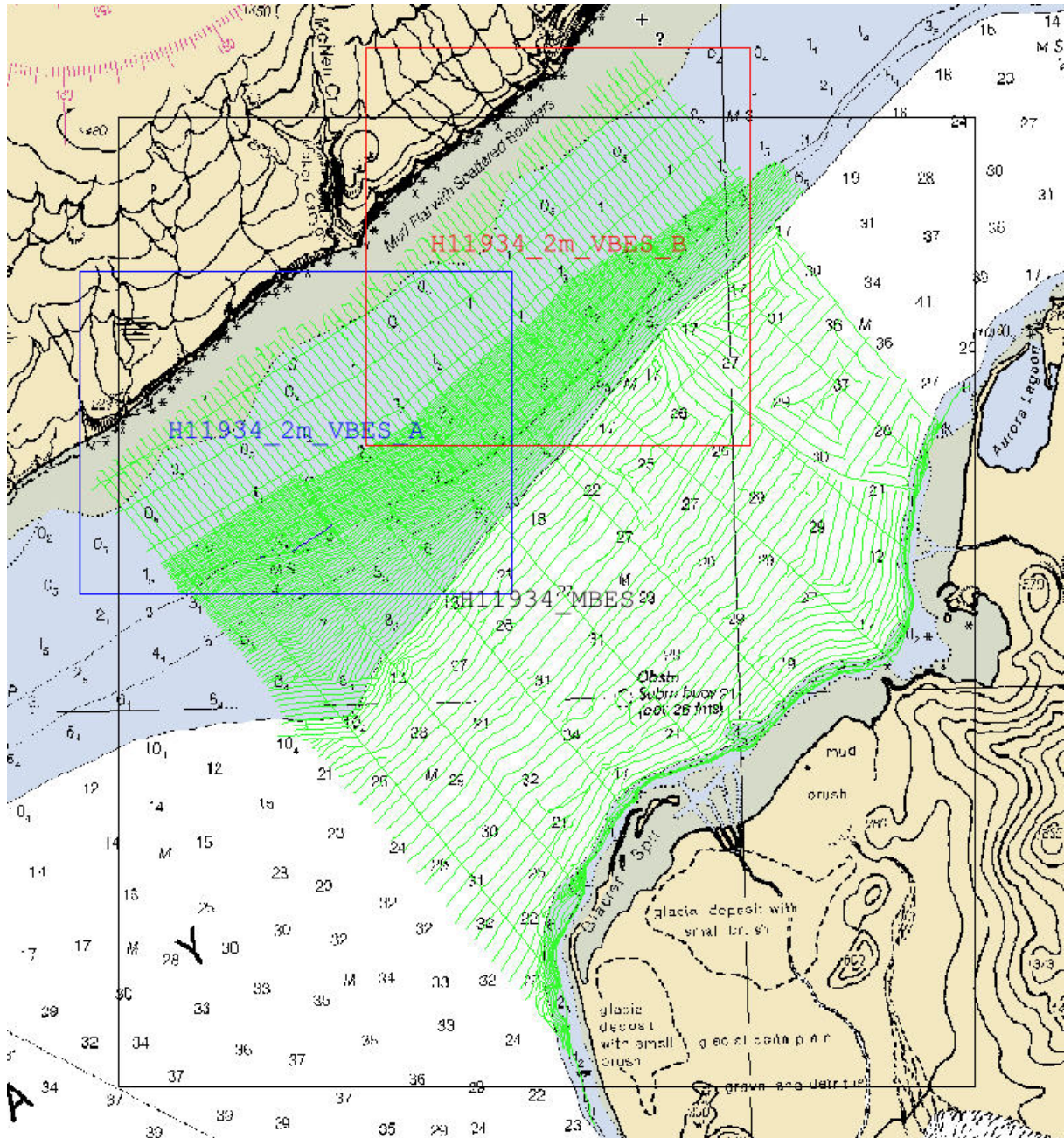


Figure 7: Layout of VBES 2 meter and MBES 4 meter field sheets for H11934

**C. VERTICAL AND HORIZONTAL CONTROL**

Project OPR-P357-RA-FA-08 required static GPS observations and tertiary gauges. NOAA Ship *Fairweather* personnel acquired and processed all of the horizontal and vertical control data. Subsequently, a Horizontal and Vertical Control Report will be submitted by NOAA Ship *Fairweather* for this project.<sup>8</sup>

**Horizontal Control**

The horizontal datum for this project is the North American Datum of 1983 (NAD83). Differential GPS (DGPS) was the primary method of positioning, however, Continuously Operating Reference Stations (CORS) site, dual frequency GPS was logged through the POS

MV to a POS file and applied to select survey lines as discussed above in section B2. The differential corrector beacons utilized for this survey are given in Table 4.

Location	Frequency	Operator	Priority
Kenai	310 kHz	USCG	Primary
Kodiak	313 kHz	USCG	Secondary

Table 4: Differential Corrector Sources for H11934.

**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 Seldovia, AK (945-5500) served as control for datum determination and as the primary source for water level reducers for survey H11934.

NOAA Ship *Fairweather* personnel installed and maintained two Sutron 8210 “bubbler” tide gauges at the tertiary stations listed in the Project Instructions: Kasitsna Bay, AK (945-5517) and Bear Cove, AK (945-5595). As stated above, NOAA Ship *Fairweather* personnel will submit the Horizontal and Vertical Control Report for further information about the tertiary tide stations.

All data were reduced to MLLW using final approved Tidal Constituent and Residual Interpolator (TCARI) water levels from H11934-TCARI.tc and station Seldovia, AK (945-5500) using the tide file 9455500.txt.

The request for Final Approved Water Levels for H11934 was submitted to CO-OPS on September 3<sup>rd</sup>, 2008 and the Final Tide Note was received on October 22<sup>nd</sup>, 2008. This documentation is included in Appendix IV.<sup>9</sup>

It will not be necessary for the Pacific Hydrographic Branch to reapply the final approved water levels.

**D. RESULTS AND RECOMMENDATIONS**

**D.1. Chart Comparison**

**D.1.a. Survey Agreement with Chart**

Survey H11934 was compared with the following raster charts:<sup>10</sup>

Chart	Scale	Edition and Date	Local Notice to Mariners Applied Through
16645	1:82,662	12 <sup>th</sup> Jan. 2002	03/08/2008

Table 5: Charts compared with H11934

With the exceptions noted in this report, soundings from survey H11934 generally agreed well with charted depths. Differences were found to be accurate with greatest difference being one fathom shoaler than charted depths in approximately 35 fathoms of water.



Soundings inshore of the 5 fathom contour, along the northern shore, are generally half a fathom deeper than charted depths and the zero meter curve has thus been pushed further inshore.<sup>11</sup>

On the southern corner of survey H11934, the charted 10 fathom contour is mischarted. A DTON has been submitted on the extent of the ledge (figure 8).<sup>12</sup>

A charted submerged buoy 1,500 meters north of glacial spit and, assigned for AWOIS investigation, was not seen and should be removed from chart.<sup>13</sup>

A charted mooring buoy on southern edge of survey H11934 was not observed during data acquisition and should be removed from chart.<sup>14</sup>

The Hydrographer recommends that survey soundings supersede all prior survey and charted depths in the common area.<sup>15</sup>

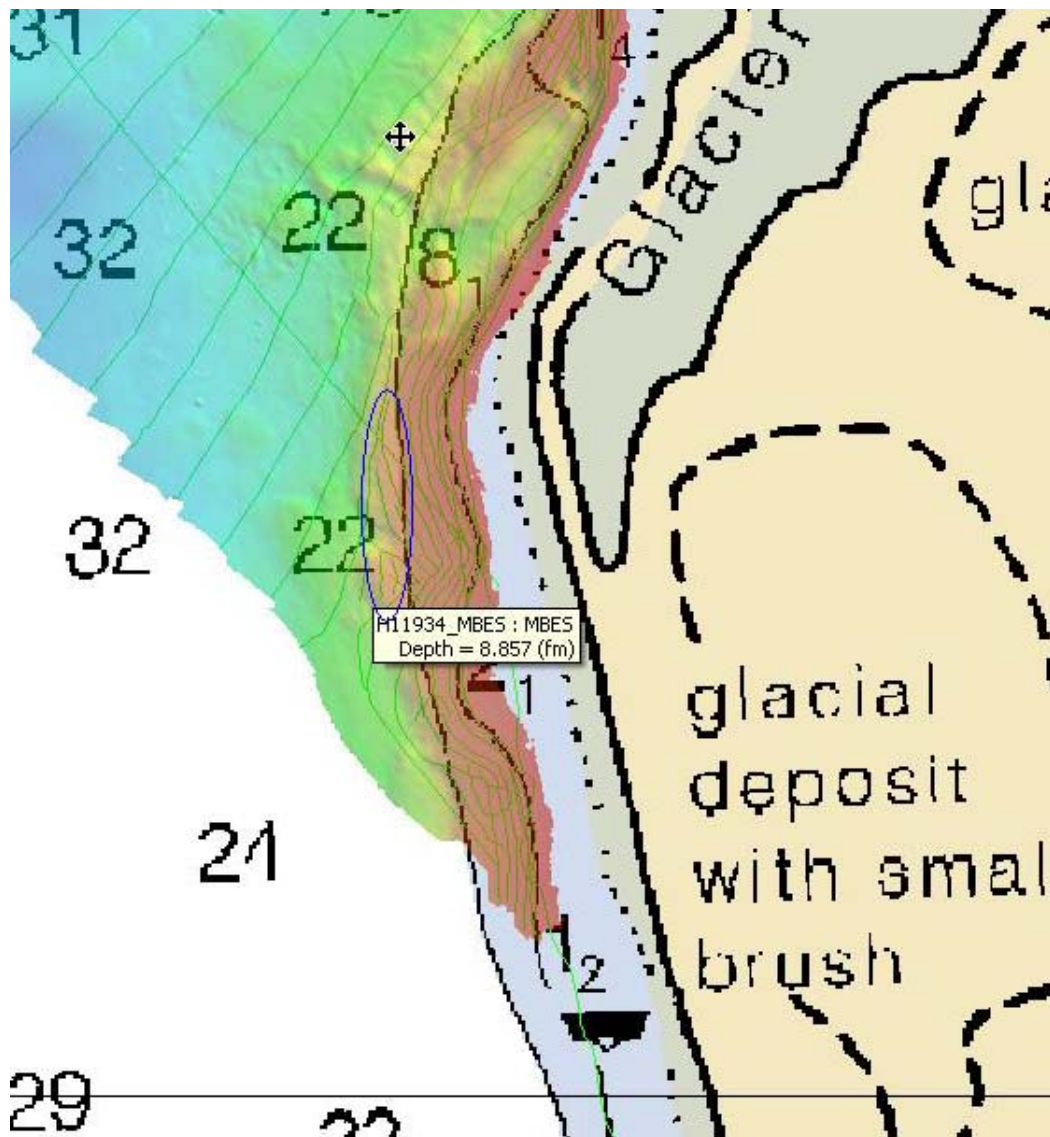


Figure 8: Shoal southwest of glacial spit.



### **D.1.b. Dangers to Navigation**

One danger to navigation (DTONs) was found in survey H11934 and is described in the DTON Report in Appendix I.<sup>16</sup>

### **D.1.c. Other Features**

#### Additional Items

AWOIS item #57303 was investigated and disproved within the limits of H11934. It is described in the Survey Feature Report in Appendix II.<sup>17</sup>

## **D.2. Additional Results**

### **D.2.a. Prior Survey Comparison**

Prior survey comparison was not performed.

### **D.2.b. Shoreline Verification**

#### Shoreline Source

The Pacific Hydrographic Branch provided *Rainier* with a composite source .HOB file using data from the latest ENC's as well as prior survey features. Photogrammetric survey project GC10700 has been adequately applied to ENC's used in the composite source file. This source shoreline was used for orientation purposes in Hypack and Notebook.

#### Shoreline Verification

Traditional "limited shoreline verification" was required for this survey. The following field procedures were followed:

- The composite source shoreline was used for orientation and navigation while transiting along assigned H11934 shoreline.
- All new, charted, and AWOIS items within the limits of H11934 (i.e., offshore of the limits prescribed in the Letter Instructions and discussed in Section A.) were addressed.
- Limited shoreline verification was conducted at predicted low water in accordance with the Specifications and Deliverables and FPM sections 6.1 and 6.2.
- Investigation methods and recommendations are described in the Notebook "Remarks" and "Recommendations" fields. Additional information can also be found in the Pydro Feature Report included in Appendix II

All shoreline data is submitted in Caris Notebook .hob files. The session H11934\_Notebook.wrk contains the following:

<b>HOB File</b>	<b>Purpose and Contents</b>
H11934_Field_Verified.hob	Field verified source features and shoreline, including all edits, updates and DPs.
H11934_Disprovals.hob	Features disproved by this survey. (Pydro keyword "SURVEY" and carto action "delete".)
H11934_Comp_Source.hob	Original Source Data as filtered to the limits of survey H11934.

*Table 6: List and Description of Notebook HOB files.*

### Source Shoreline Changes and New Features

Items for survey H11934 that require further discussion have been attributed in the H11934\_Field Verified.hob. Investigation methods and recommendations are listed in the Remarks and Recommendation tabs. These features are included in the Survey Feature Report in Appendix II.

### Recommendations

The Hydrographer recommends that the shoreline as depicted in the Notebook .HOB files supersede and complement shoreline information compiled on the CFF and charts as described above.<sup>18</sup>

#### **D.2.c. Aids to Navigation**

There are no aids to navigation within the limits of survey H11934<sup>19</sup>

#### **D.2.d. Overhead Features**

There are no overhead features within the limits of survey H11934.<sup>20</sup>

#### **D.2.e. Submarine Cables and Pipelines**

There no cable or pipelines within the limits of survey H11934<sup>21</sup>

#### **D.2.f. Ferry Routes**

There are no ferry routes charted within the limits of survey H11934, and none were observed to be operating in the area.<sup>22</sup>

#### **D.2.g. Bottom Samples**

Twelve (12) bottom samples were collected during survey H11934. Of these, one sample correctly matched current charted bottom type. Three samples did not match current charted bottom, and eight samples were collected in areas without prior data. Bottom samples were collected with *Rainier* and logged into CARIS Notebook. The data is included in the submitted H11934\_Field\_Verified.hob layer.<sup>23</sup>

**D.2.h. Other Findings**


There are no other findings to report for survey H11934.

**E. APPROVAL**

As Chief of Party, Field operations for hydrographic survey H11934 were conducted under my direct supervision, with frequent personal checks of progress and adequacy. I have reviewed the attached survey data and reports. The survey data meets or exceeds requirements as set forth in the NOS Hydrographic Surveys and Specifications Deliverables Manual (April 2008 edition), Field Procedures Manual (May 2008 edition), Standing and Letter Instructions, and all HSD Technical Directives issued through August 2008. 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.

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>
Data Acquisition and Processing Report for OPR-P357-RA-FA-08	TBD	N/CS34
Coast Pilot Report for OPR-P357-RA-FA-08	TBD	N/CS26

Approved and Forwarded:  CAPT Donald W. Haines, NOAA  
2008.11.21 14:23:24 -08'00'

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Captain Donald W. Haines, NOAA  
Commanding Officer, NOAA Ship *Rainier*

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

Survey Sheet Manager:  Digitally signed by Timothy M Smith  
DN: cn=Timothy M Smith, o=NOAA, ou=NOAA  
Ship RAINIER, email=timothy.m.smith@noaa.gov, c=US  
Date: 2008.11.21 09:52:11 -08'00'


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Lieutenant (JG) Timothy M. Smith, NOAA  
Junior Officer, NOAA Ship *Rainier*

Chief Survey Technician:  James B Jacobson  
I have reviewed this document  
2008.11.21 12:44:26 -09'00'

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James B. Jacobson  
Chief Survey Technician, NOAA Ship *Rainier*

Field Operations Officer:  I have reviewed this  
document  
2008.11.21 13:57:44 -08'00'

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Lieutenant Charles Yoos III, NOAA  
Field Operations Officer, NOAA Ship *Rainier*

## Revisions and Corrections Compiled During Office Processing and Certification

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<sup>1</sup> Concur.

<sup>2</sup> Filed with project records.

<sup>3</sup> H11934 junctions with H11935 to the West and H11933 to the Northeast. A common junction was made with and adjoining portion of H11935 and a common junction will be made with H11933 when is compiled.

<sup>4</sup> Concur with clarification. H11934 was compared with H11935 during HCell creation. The surveys are in agreement along their common area.

<sup>5</sup> Concur.

<sup>6</sup> The data is adequate to supersede charted data despite POS MV heading accuracy problems.

<sup>7</sup> Concur with clarification, chart per HCell H11934.CS.000

<sup>8</sup> Filed with project records.

<sup>9</sup> Tide note is attached to this report.

<sup>10</sup> Concur with clarification. During HCell creation the following chart was used for comparison purposes.

Chart	Scale	Edition and Date	Local Notice to Mariners Applied Through
16645	1:82,662	13 <sup>th</sup> Jan. 2007	08/10/2010

<sup>11</sup> Concur.

<sup>12</sup> Concur. DTON has been applied to the chart.

<sup>13</sup> Do not concur with the hydrographers recommendations to remove charted submerged buoy (AWOIS item #57303). A blue note was added to the HCell. It is recommended to retain the charted submerged buoy symbol because the object is within a rocky seabed area, and not clearly disproved.

<sup>14</sup> Concur with the hydrographers recommendations to remove charted mooring buoy. A blue note was added to the HCell.

<sup>15</sup> Concur.

<sup>16</sup> DTON report is appended to this report.

<sup>17</sup> AWOIS report is appended to this report. See Endnote 13.

<sup>18</sup> Concur with clarification. The submitted hob files were used in the compilation of HCell H11934. During HCell compilation, some modifications were made to accommodate chart scale. Chart features as depicted in the HCell.

<sup>19</sup> Concur.

<sup>20</sup> Concur.

<sup>21</sup> Concur.

<sup>22</sup> Concur.

<sup>23</sup> Concur with clarification. 17 Bottom samples were submitted by the field. Due to the new delineation of rocky seabed area in the survey area, only 13 bottom samples collected by the field are included in the HCell.

# H11934 Feature Report

**Registry Number:** H11934  
**State:** Alaska  
**Locality:** Southern Portion of Cook Inlet  
**Sub-locality:** Vicinity of Glacier  
**Project Number:** OPR-P357-RA-FA-08  
**Survey Date:** 08/26/2008

## Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
16645	18th	01/12/2002	1:82,662 (16645_1)	USCG LNM: 09/11/2007 (03/04/2008) CHS NTM: None (02/29/2008) NGA NTM: 10/27/2001 (03/08/2008)
16647	3rd	05/12/2001	1:100,000 (16647_2) 1:100,000 (16647_1)	[L]NTM: ?
16640	24th	09/15/2001	1:200,000 (16640_1)	[L]NTM: ?
16680	10th	07/10/1999	1:200,000 (16680_1)	[L]NTM: ?
16013	30th	07/01/2006	1:969,761 (16013_1)	[L]NTM: ?
531	24th	07/01/2007	1:2,100,000 (531_1)	[L]NTM: ?
500	8th	06/01/2003	1:3,500,000 (500_1)	[L]NTM: ?
530	32nd	06/01/2007	1:4,860,700 (530_1)	[L]NTM: ?
50	6th	06/01/2003	1:10,000,000 (50_1)	[L]NTM: ?

\* Correction(s) - source: last correction applied (last correction reviewed--"cleared date")

## Features

No.	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	AWOIS	[no data]	[no data]	[no data]	---
2.1	Shoal	14.83 m	59° 38' 09.1" N	151° 12' 40.5" W	---



## **1 - AWOIS Features**

## 1.1) AWOIS #53703 - OBSTRUCTION

### No Primary Survey Feature for this AWOIS Item

**Search Position:** 59° 40' 00.3" N, 151° 11' 29.7" W  
**Historical Depth:** [None]  
**Search Radius:** 400  
**Search Technique:** SSS, MB  
**Technique Notes:** 200% SSS or 100% SWMB

#### History Notes:

UNKNOWN-- THE SUBMERGED BUOY COVERED AT 26 FATHOMS FIRST APPEARED AFTER 1991 UP TO 2001 IN THE POSITION 59/40/4.9N AND 151/7/15.9W (NAD83). (ENTERED 7/23/08, EAN)

### Survey Summary

**Charts Affected:** 16645\_1, 16647\_1, 16647\_2, 16640\_1, 16680\_1, 16013\_1, 531\_1, 500\_1, 530\_1, 50\_1

#### Remarks:

AWOIS item not detected with 'object detection' multibeam coverage.

### Feature Correlation

Address	Feature	Range	Azimuth	Status
OPR-P357-RA-FA-08	AWOIS # 53703	0.00	000.0	Primary

### Hydrographer Recommendations

Remove from Chart 16645.

### S-57 Data

**Geo object 1:** Cartographic symbol (\$CSYMB)

## **2 - Dangers to Navigation**

## 2.1) Profile/Beam - 129/229 from h11934 / 2801\_reson7125\_hf\_256beams / 2008-239 / 239-2241

### DANGER TO NAVIGATION

#### Survey Summary

**Survey Position:** 59° 38' 09.1" N, 151° 12' 40.5" W  
**Least Depth:** 14.83 m (= 48.65 ft = 8.108 fm = 8 fm 0.65 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.973$  m ; **TVU (TPEv)**  $\pm 0.435$  m  
**Timestamp:** 2008-239.22:41:57.859 (08/26/2008)  
**Survey Line:** h11934 / 2801\_reson7125\_hf\_256beams / 2008-239 / 239-2241  
**Profile/Beam:** 129/229  
**Charts Affected:** 16645\_1, 16647\_1, 16640\_1, 16680\_1, 16013\_1, 531\_1, 500\_1, 530\_1, 50\_1

#### Remarks:

Sounding represents offshore extent of shoal. Shoal extends beyond charted 10 fathom contour and is to be reported as dangerous.

#### Feature Correlation

Address	Feature	Range	Azimuth	Status
h11934/2801_reson7125_hf_256beams/2008-239/239-2241	129/229	0.00	000.0	Primary

#### Hydrographer Recommendations

Rechart shoal/contour are based on bathymetry.

#### Cartographically-Rounded Depth (Affected Charts):

8fm (16645\_1, 16640\_1, 16680\_1, 16013\_1, 530\_1)

8fm 0ft (16647\_1, 531\_1)

14.8m (500\_1, 50\_1)

#### S-57 Data

**Geo object 1:** Sounding (SOUNDG)  
**Attributes:** QUASOU - 1:depth known  
 SORDAT - 20082808

SORIND - us,us,survey,H11934

TECSOU - 1:found by echo-sounder

VERDAT - 12:Mean lower low water

### Feature Images

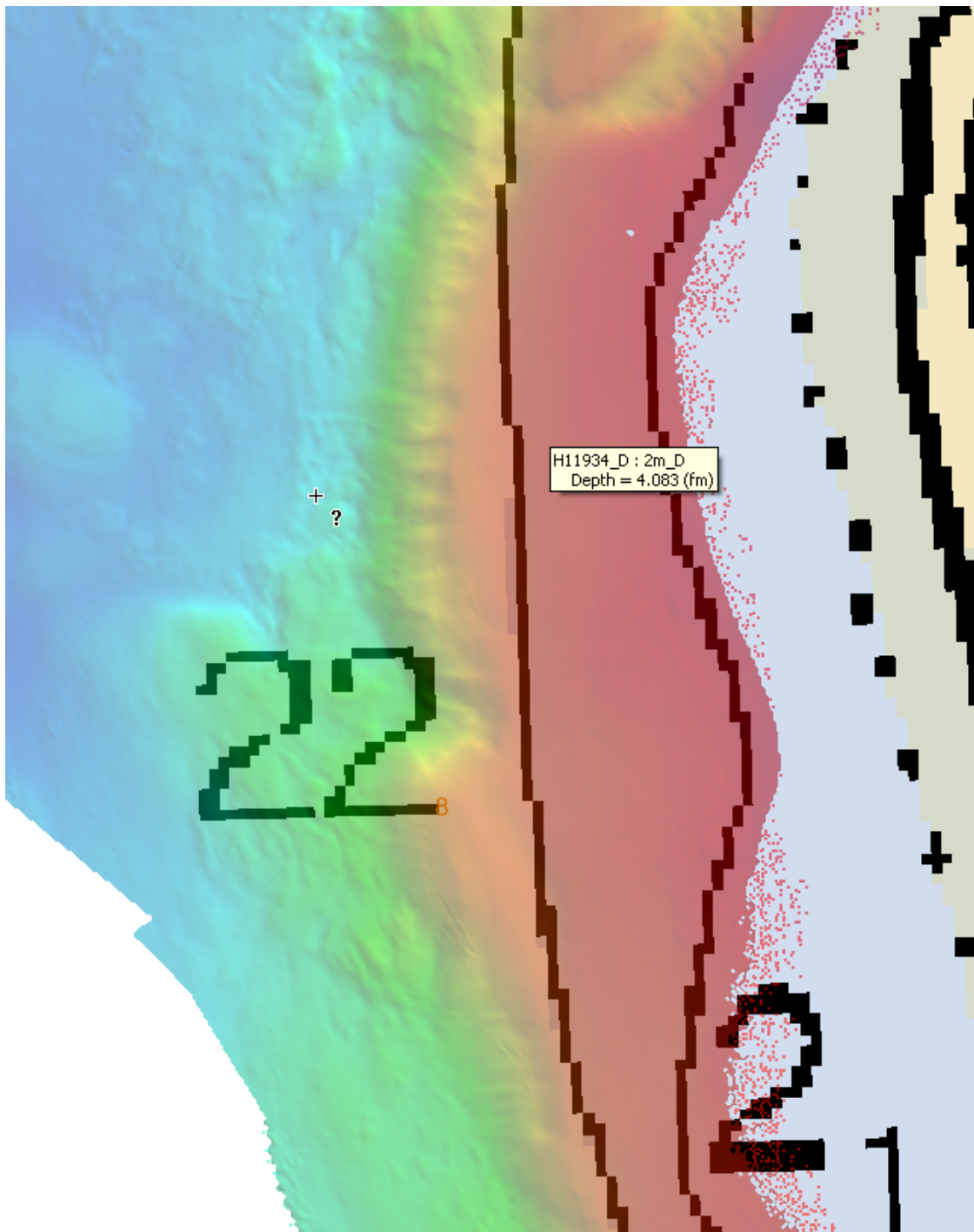


Figure 2.1.1





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

**TIDE NOTE FOR HYDROGRAPHIC SURVEY**

**DATE :** October 22, 2008

**HYDROGRAPHIC BRANCH:** Pacific  
**HYDROGRAPHIC PROJECT:** OPR-P357-FA/RA-2008  
**HYDROGRAPHIC SHEET:** H11934

**LOCALITY:** Vicinity of Glacier, Cook Inlet, AK  
**TIME PERIOD:** August 19 - 28, 2008

**TIDE STATION USED:** 945-5500 Seldovia, AK  
Lat. 59° 26.4' N Long. 151° 43.2' W

**PLANE OF REFERENCE (MEAN LOWER LOW WATER):** 0.000 meters  
**HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE:** 5.252 meters

**REMARKS: RECOMMENDED ZONING**

Please use the TCARI grid, "H11934-TCARI.tc" posted at [ftp://140.90.121.83/pub/outgoing/HPT/Smooth\\_Tides\\_TCARI](ftp://140.90.121.83/pub/outgoing/HPT/Smooth_Tides_TCARI), as the final grid for project OPR-P357-RA/FA-2008, H11934, during the time period between August 19 - 28, 2008.

**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).

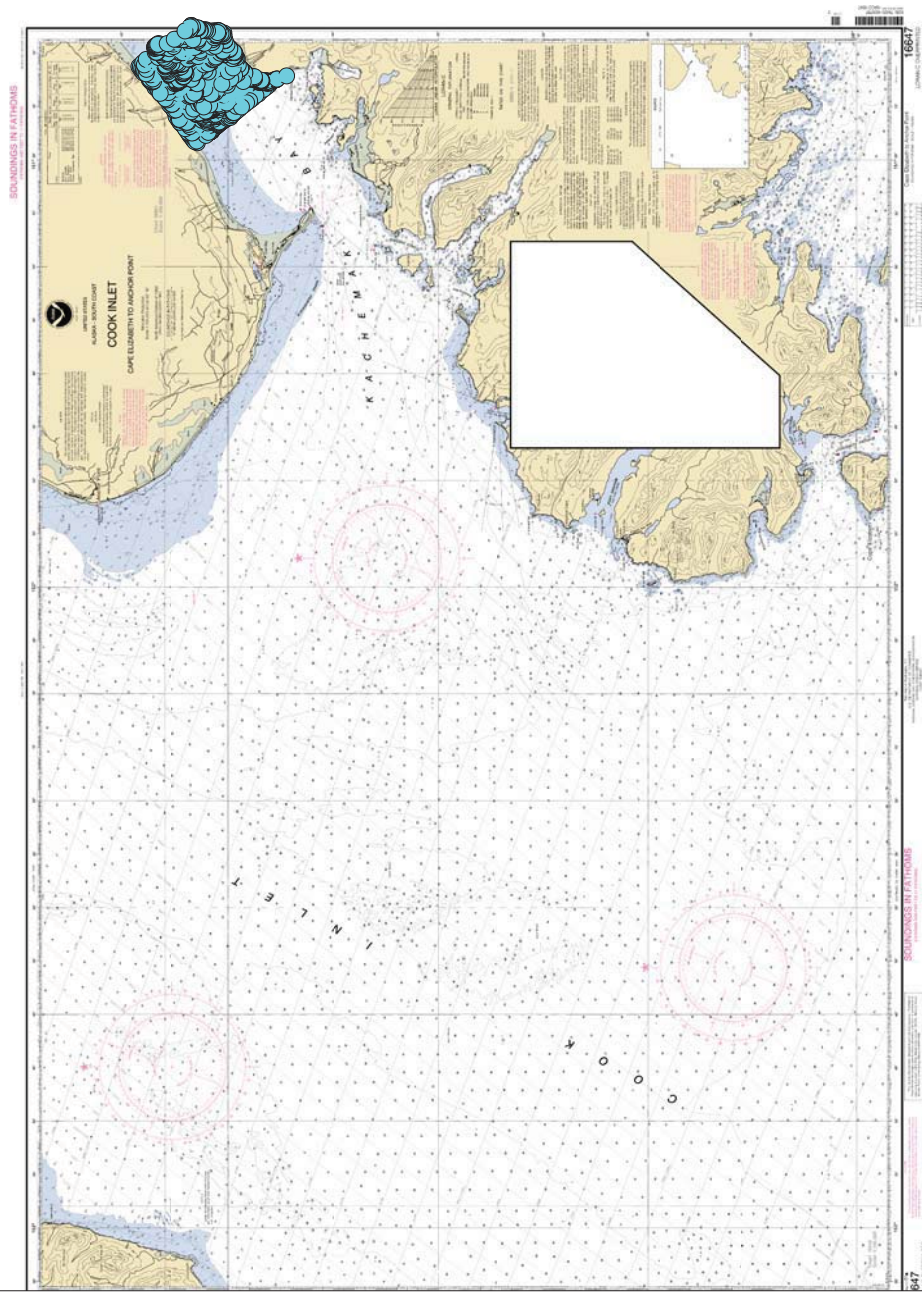
**Note 2:** The water levels stations installed at Bear Cove, Ak (9455595) and Kasitsna Bay, AK (9455517), did not meet the requirements specified in the OCS Hydro Specifications and Deliverables manual. CO-OPS could not verify the stability of the stations sensors or staffs. Therefore, Bear Cove and Katsitna Bay provided only harmonic constants and preliminary datums for this TCARI grid.

**Stephen K. Gill**  
Digitally signed by Stephen K. Gill  
DN: c=US, st=Maryland, l=Silver Spring, ou=Center for Operational Oceanographic Products & Serv., o=National Oceanic and Atmospheric Administration, cn=Stephen K. Gill, email=Stephen.Gill@noaa.gov  
Date: 2008.10.22 17:52:34 -04'00'

CHIEF, OCEANOGRAPHIC DIVISION



**Final Tides for  
OPR-P357-FA-2008, H11934  
Vicinity of Glacier, Cook Inlet, AK  
Final TCARI Grid**



**H11934 HCell Report**  
Fernando Ortiz, Physical Scientist  
Pacific Hydrographic Branch

**1. Specifications, Standards and Guidance Used in HCell Compilation**

HCell compilation of survey H11934 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 H11934 were compiled to the largest scale raster charts shown below:

Chart	Scale	Edition	Edition Date	NTM Date
16645	1:82,662	13th	01/2007	08/10/2010

The following ENC's were also used during compilation:

Chart	Scale
US4AK1AM.000	1:82,662

**3. Soundings**

A survey-scale sounding (SOUNDG) feature object layer was built from the 4-meter Combined Surface in CARIS BASE Editor. A shoal-biased selection was made at 1:10,000 survey scale using a Radius Table file with values shown in the table, below.

Shoal Limit (m)	Deep Limit (m)	Radius (mm)
0	10	2
10	20	3
20	50	3.5
50	500	4

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 16645	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 H11934_SS.000
0	0	0.000	0.000	0
3	5.4864	5.715	3.125	3
5	9.144	9.3726	5.125	5
10	18.288	18.517	10.125	10

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 H11934:

M\_QUAL

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:

DEPCNT	Zero Contours
\$CSYMB	Blue Notes-Notes to the MCD chart Compiler
M_QUAL	Data quality Meta object
SBDARE	Bottom samples, and rocky seabed areas
SOUNDG	Soundings at the chart scale density
UWTROC	Rock features

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

H11934 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

H11934_CS.000	Base Cell File, Chart Units, Soundings and features compiled to 1:82,662
H11934_SS.000	Base Cell File, Chart Units, Soundings and Contours compiled to 1:82,662
H11934_DR.pdf	Descriptive Report including end notes compiled during office processing and certification, the HCell Report, and supplemental items
H11934_outline.gml	Survey outline
H11934_outline.xsd	Survey outline

### 11.2 Software

CARIS HIPS Ver. 6.1	Inspection of Combined BASE Surfaces
CARIS BASE Editor Ver. 3.0	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  
H11934

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

The survey and associated records have been inspected with regard to survey coverage, delineation of the depth curves, development of critical depths, S-57 classification and attribution of soundings and features, cartographic characterization, and verification or disproval of charted data within the survey limits. The survey records and digital data comply with OCS requirements except where noted in the Descriptive Report and are adequate to supersede prior surveys and nautical charts in the common area.

I have reviewed the HCell, accompanying data, and reports. This survey and accompanying digital data meet or exceed OCS requirements and standards for products in support of nautical charting except where noted in the Descriptive Report.